

Arborist Report

To: JayMarc Homes c/o Kenady Hague
Site: 4541 88th Ave SE, Mercer Island, WA, 98040
Re: Tree Inventory and Assessment
Date: April 26, 2022
Project Arborist: Connor McDermott,
ISA Certified Arborist #PN- 8704A
ISA Qualified Tree Risk Assessor
Reviewed By: Joseph Sutton-Holcomb
ISA Certified Arborist #PN-8397AM
Municipal Specialist, Qualified Tree Risk Assessor
Referenced Documents: Topographic and Boundary Survey (Terrane 06/11/2021)
Site Plan A2.1 (JayMarc Homes 04/11/2022)
Attached: Table of Trees
Tree Site Map
Planting Plan

Summary

I inventoried and assessed 12 trees on this lot, six of which were regulated trees. Based on the Mercer Island City Code (MICC) 8-inches in diameter and greater (regulated) and exceptional trees are required to be assessed for development projects. I tagged each tree with an aluminum tree tag. Tree identifier corresponds to the number on each tag.

Of the trees assessed, four met the exceptional tree criteria outlined in the MICC.

There were three adjacent trees that required documentation for this property. Trees on neighboring properties were documented if they appeared to be greater than 10 inches diameter 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. I used an alphabetical tree identifier for trees off-site.

Assignment and Scope of Work

This report outlines the site inspection by Connor McDermott of Tree Solutions Inc, on June 17, 2021. I was asked to visit the site and provide a formal report including findings and management

recommendations. Kenady Hague of JayMarc Homes, the developer of the property, requested these services for project planning purposes.

Observations

Site

This 8,775 square foot site was located on 88th Ave SE of Mercer Island in a R-9.6 zone designation. There is currently a single-family home with an attached driveway and deck that exist currently on the site.

According to King County iMap, there are no environmentally critical area designations on site.

Trees

The on-site species included western redcedar (*Thuja placata*), coast redwood (*Sequoia sempervirens*), Douglas-fir (*Pseudotsuga menziesii*), Pacific dogwood (*Cornus nutalii*), European birch (*Betula pendula*).

Per Mercer Island City Code (MICC) 19.10.060.A.2 30 percent of the trees of regulated size must be retained during construction and throughout a 5 year period. Exceptional trees, and trees over 24 inches are preferred to be retained by the City, this would Trees 190, 194, 195, and 201 are preferred for retention because they are either exceptional or a tree over 24 inches, per MICC19.10.060.A.2.b.ii.a (Photos 1 and 2).

While on-site the homeowner informed me that 13 replacement trees were planted on site to replace a previously removed tree. The replacement species that included arborvitae (*Thuja occidentalis*), Japanese maple (*Acer palmatum*), pear (*Pyrus communis*), and flowering cherry (*Prunus serrulata*) (Photos 3 and 4). I inventoried two of the replacement trees that met the minimum size requirements found in MICC 19.10.070.B.3.

During my site assessment I observed invasive species or species of concern in King County including Portuguese laurel (*Prunus lusitanica*), European mountain-ash (*Sorbus aucuparia*), English holly (*Ilex aquifolium*). I recommend these species for removal.

The off-site tree species included western redcedar, and Douglas-fir.

The Table of Trees attached to this report provides limits of disturbance for construction activity. Any impacts within these limits should be reviewed by a qualified arborist, as additional tree protection measures may be warranted. If work occurs within the limits of disturbance without arborist review, the trees may become structurally unstable or decline in health.

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

In discussion with the developer, Gary Upper of JayMarc Homes, I received a preliminary plan that was dated 04/11/2022. This plan proposes for a site redevelopment with the house moved west by 14-feet and a covered deck added to the northwest corner of the home (Figure 1). I have not reviewed final construction plans for the site.

Replacement trees

Prior to the development, one exceptional tree was removed, and six replacement trees were required to be planted and retained during a five-year rolling period. Per MICC 19.10.070.B.3, the required minimum size of the supplemental tree worth one (1) tree credit shall be four 6-feet tall for native or other conifers and 1.5-inch caliper for deciduous or evergreen broad-leaf tree). All trees must be spaced 10-feet on center apart. At least half of the replacement trees species must be native to the Pacific Northwest (MICC 19.10.070.B.2).

Two of the existing replacement trees fit the requirements of a replacement tree above and four additional replacement trees are required to fulfill the previous tree removal on site. I have attached a planting plan that should be implemented within the wet season (October through March) once construction is completed (MICC 19.10.070.B.5).

Removal of existing foundation and excavation for the water line- Tree 190

Excavation and demolition of the existing home foundation should be excavated from the existing structure to the new foundation or east to west to not compact the newly exposed soil and protect the existing rooting area.

There are currently pavers at the base of tree 190. If they are to be removed, then I recommend that the pavers are removed by hand and the area to be landscaped.

A waterline is proposed approximately 21-feet southwest and within the tree protection zone (TPZ) for tree 190. I recommend hydro excavation to be utilized to the depth of excavation for the water line and at the furthest extent of the encroachment. A certified arborist should be present during excavation of the area to assess the root loss and cut exposed roots cleanly.

Tree removal within TPA- Trees 191, 192, 196, 197

Four non-regulated trees are proposed for removal and within the tree protection area. I recommend the trees are cut flush to ground level and the stump retained. If the ground is to be removed the stump must be ground up with a stump grinder and not ripped or pulled.

Driveway Removal and Installation-Trees 193, 194, and A

According to the most recent design plans the driveway is slated to be removed and replaced with change in size. If tree protection fencing is set at the end of the existing driveway and the excavation is limited to the rooting area then the encroachment into the tree protection zone of trees 190, 193, 194, and A then the construction impact should be limited to the trees.

Tree 195 and B

The design plan shows encroachment 36-feet east of tree 195 and 21-feet northeast of the base of tree B. The TPZ fence can be set to the furthest point of intrusion of trees 195 and B if the following measures are taken. To safely retain the trees, air excavation should be utilized to trench at the furthest extent of the encroachment and excavated to the depth of the subbase required so the exposed roots are able to be cut cleanly. An arborist should be present during excavation of the area to assess the root loss. If extensive structural roots over 2 inches are exposed during construction, the trees should be reassessed as extensive root cuts within a close proximity to the base can destabilize the trees.

Along this TPZ line I recommend installation of 6 inches of wood chips to protect the rooting areas of the trees. If any work or staging or access is required within TPZ then it requires soil protection with 3/4-inch plywood sheets.

If these measures are taken, we believe the TPZ of tree B can be set 36-feet east of tree 195 and 20-feet north of the tree and the retained throughout construction.

Recommendations

- Obtain all necessary permits and approval from the City prior to commencement of site work.
- Exceptional and trees over 24 inches are preferred for retention. Trees 190, 194, 195, and 201 fit this criteria.
- Excavate from the existing structure to the new foundation to protect the newly exposed soil for tree 190 and the existing rooting area.
- Use hydro-excavation to the furthest limits of excavation for the water line within the TPZ of tree 190.
- Set the TPZ fencing around the existing driveway to protect trees 190, 193, 194, and A.
- TPZ can be set to the furthest point of encroachment, as shown on the plans, of trees 195 and B if air excavation is used at the furthest point of encroachment and roots cut cleanly and assessed by an arborist.
- Place 6 inches of arborist woodchips to protect the rooting area of tree B and potential vehicle access.
- Remove all non-regulated trees within the TPZ of the retained trees flush with the ground level. Do not rip or pull the stumps from the ground. If the stumps need to be removed, then grind with a stump grinder.
- Tree protection consisting of chain link fencing should be installed at the dripline of all retained trees. Trees growing in a group should be protected at the edge of their shared driplines. General tree protection specifications can be found in Appendix G.
- All off-site trees must be protected during construction.
- All pruning should be conducted by an ISA certified arborist following current ANSI A300 specifications.
- 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 and ISA Best Management Practices (BMP) – Managing Trees During Construction.

Respectfully submitted,

Connor McDermott,
Consulting Arborist

Appendix A Site Plan

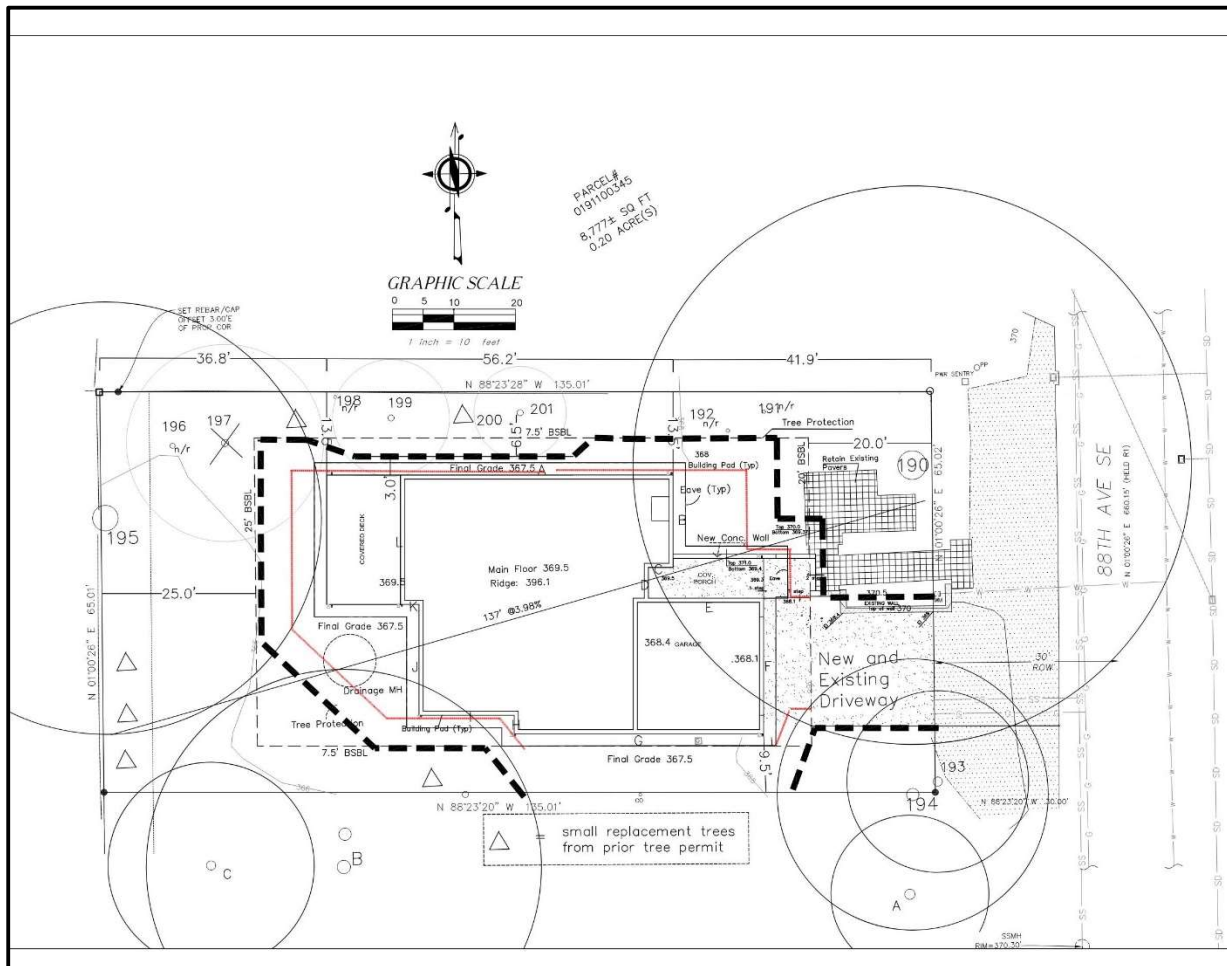


Figure 1. Site Plan A2.1 (Gary Upper, 04/11/2022). The plans show the footprint of the new house moving west, replacement of the existing driveway in place, and placement of the TPZ fencing in the dotted line.

Appendix B Photographs

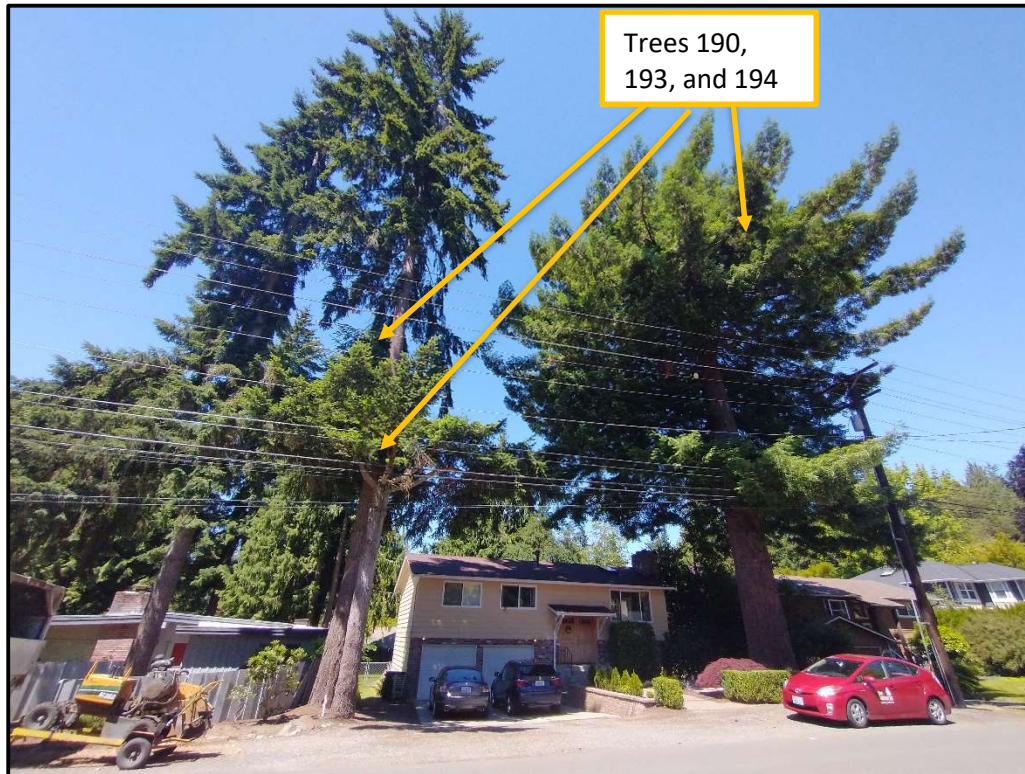


Photo 1. The site viewed from the east. Trees 190, 194 are called out as priorities for retention as they are either regulated as exceptional or over 24 inches per MCC. Tree 193 should be retained with tree 194 as they are grown together and the root systems of the trees are likely linked.



Photo 2. Tree 195 is a mature western redcedar that is a priority for retention per MCC 19.10.060.A.2.b.ii.a as the tree is exceptional. If retained the soil conditions should be improved in the rooting area and watered during the dry months (April through September). Use air excavation at the furthest point of encroachment 36 feet east of the tree to assess the root impacts and set the TPZ.

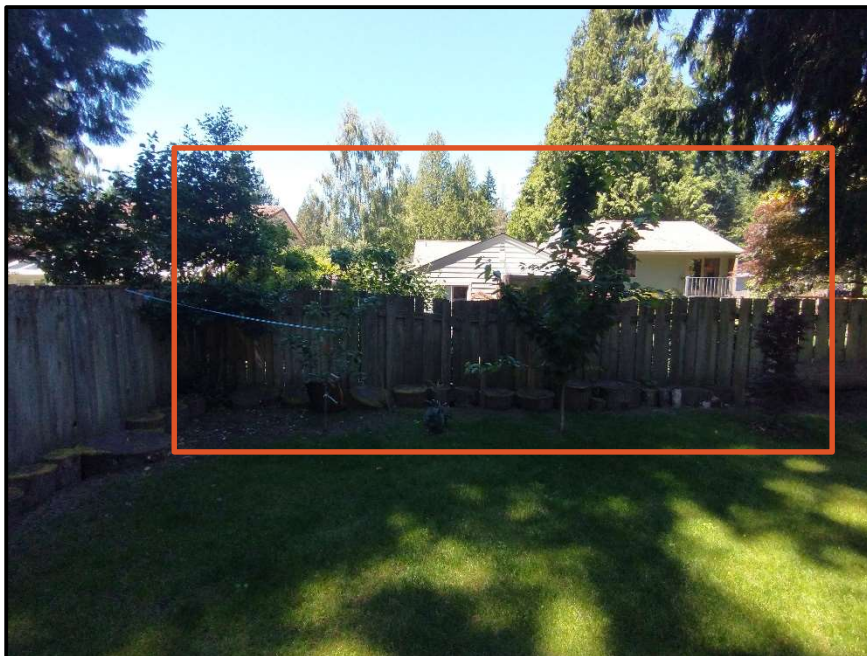


Photo 3. Replacement trees planted in the backyard outlined in red.



Photo 4. Front entry of the home viewed from the east. I recommend that excavation begin from the existing structure to the new foundation area to protect the newly exposed soil. The existing pavers should be removed by hand and the TPZ fencing should be placed.

Appendix C 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 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. Some cases require 12 times the trunk diameter. 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 D **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 E 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.

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 city of Seattle Director's Rule 16-2008 or 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.

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.

Appendix G 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 city of Mercer Island requires a tree protection zone (TPZ) that is based on the ISA Best Management Practices (BMP) for tree protection. 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 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:** In areas where work such as installation of utilities is required within the TPZ, a locking gate will be installed in the fencing to facilitate access. 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, with 3" tall text. 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 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 4 to 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 five 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. 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 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**

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. Dripline is measured from the center of the tree to the outermost extent of the canopy. Recommended limits of disturbance (RLOD) is based on 8x trunk diameter. Ensure tree protection standards comply with MICC 19.10.080 and ISA Best Management Practices (BMP) – Managing Trees During Construction.

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Dripline Radius (feet)				Exceptional Threshold	Exceptional	Limits of Disturbance	Proposed Action	Notes
							N	E	S	W					
190	<i>Sequoia sempervirens</i>	Coast Redwood	63.9		Good	Fair	32.7	26.7	35.7	33.7	30.0	Exceptional - Size	43	Retain	Managed for powerlines to east; topped; lifting patio area on north side of tree; old Ganoderma conk at base of tree detached
191	<i>Ilex aquifolium</i>	English holly	6.0		Fair	Good	6.3	7.3	6.3	5.3	-		-	Remove	Tree topped and remaining top is dead; trunk with multiple kinks; not a regulated tree
192	<i>Ilex aquifolium</i>	English holly	6.5		Good	Fair	6.3	5.3	5.3	9.3	-		-	Remove	Trunk likely layered; leans to northwest; roots cut to south towards home: not a regulated tree
193	<i>Pseudotsuga menziesii</i>	Douglas-fir	20.8		Good	Poor	22.9	16.9	16.9	10.9	30.0		14	Retain	Topped at level of powerlines; reiterative stems managed for height; mulch raked from base; existing driveway 6 feet from tree
194	<i>Pseudotsuga menziesii</i>	Douglas-fir	31.9		Good	Fair	19.3	15.3	17.3	15.3	30.0	Exceptional - Size	21	Retain	East side of canopy pruned back for powerlines; shared tree with adjacent neighbor; mulch raked from base
195	<i>Thuja plicata</i>	Western Redcedar	49.5		Good	Good	20.1	27.1	22.1	24.1	30.0	Exceptional - Size	33	Retain	Impacting back fence; water in summer if retained; starting to see drought stress; lean to north; limited mulch at base
196	<i>Prunus lusitanica</i>	Portuguese cherry laurel	10.2		Good	Good	18.4	8.4	4.4	9.4	-		-	Remove	Lean to north; base buried by mulch; not a regulated tree
197	<i>Sorbus aucuparia</i>	Mountain-Ash	15.2		Good	Good	18.6	17.6	10.6	8.6	29.0		-	Remove	Measured at narrowest point below union; western stem previously removed; sapsucker damage on trunk; Invasive species; not regulated tree
198	<i>Prunus laurocerasus</i>	Cherry laurel	8.1	6.5, 4.8	Good	Good	8.3	10.3	8.3	10.3	-		-	Remove	Not a regulated tree; along property line; multistemmed at base
199	<i>Prunus spp. (serrula, serrulata)</i>	Flowering Cherry	13.0		Good	Good	11.5	8.5	8.5	8.5	23.0		9	Retain	gumosis on rooting graft; surface roots; measured above graft; 8 inches measured below graft
200	<i>Betula pendula</i>	European White Birch	7.2		Good	Fair	8.3	8.3	8.3	8.3	24.0		-	Remove	Not a regulated tree; topped at 7 feet; species is susceptible to bronze birch borer (BBB)
201	<i>Cornus nutallii</i>	Pacific Dogwood	10.5		Fair	Good	9.4	10.4	9.4	9.4	6.0	Exceptional - Size	7	Retain	Shows signs of anthracnose
202	<i>Prunus spp. (serrula, serrulata)</i>	Flowering Cherry	2.0		Good	Good	5.6	5.6	5.6	5.6	23.0		1	Retain	Replacement tree planting for previous tree removal on site
203	<i>Prunus spp. (serrula, serrulata)</i>	Flowering Cherry	2.7		Good	Good	4.6	4.6	4.6	4.6	23.0		2	Retain	Replacement tree planting for previous tree removal on site

Table of Trees
4541 88th Ave SE, Mercer Island, WA

Arborist: C McDermott
Date of Inventory: 06/17/2021
Table Prepared: 04/26/2022

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Exceptional	Limits of Disturbance	Proposed Action	Notes
A	<i>Pseudotsuga menziesii</i>	Douglas-fir	18.0		Good	Good	0.8	0.8	16.8	0.8	30.0		12	Retain	Rooting area limited by walkway; unlikely to be impacted by construction; managed for powerline clearance
B	<i>Thuja plicata</i>	Western Redcedar	46.7	32, 34	Good	Fair	20.9	1.9	1.9	1.9	30.0	Exceptional - Size	31	Retain	Multistem at 2 feet; 3 trunks to canopy; pruned for clearance over shed and fence; swept base; possible to manage by cabling
C	<i>Pseudotsuga menziesii</i>	Douglas-fir	24.0		Good	Good	13.0	1.0	1.0	1.0	30.0		16	Retain	crown raised to 40 feet; canopy does not overhang site; limited organic matter in rooting area

TOPOGRAPHIC & BOUNDARY SURVEY

measure success

LEGAL DESCRIPTION

(PER STATUTORY WARRANTY DEED RECORDING# 20150610001513)
 LOT 5, BLOCK 5 OF ALLWEIGHTS ADDITION TO SEATTLE, AS PER PLAT RECORDED IN VOLUME 16 OF PLATS, PAGE 20, IN KING COUNTY, WASHINGTON;
 EXCEPT THE SOUTH 10 FEET THEREOF;
 TOGETHER WITH THE EAST 1/2 OF VACATED ALLEY ADJACENT THERETO, AS VACATED BY COMMISSIONERS RECORDS FILED DECEMBER 2, 1948 UNDER VOLUME 45, PAGE 3;
 SITUATE IN THE CITY OF MERCER ISLAND, COUNTY OF KING, STATE OF WASHINGTON.

BASIS OF BEARINGS

N 43°41'31" W BETWEEN FOUND CENTERLINE MONUMENTATION - AS CALCULATED PER R1

REFERENCES

R1. RECORD OF SURVEY, VOL. 127, PG. 204, RECORDS OF KING COUNTY, WASHINGTON.

VERTICAL DATUM

NAVD88 PER CITY OF MERCER ISLAND BENCHMARK #4049 (47366)
 IP FIELDED W/ CONC W/ TACK IN LEAD (DN 0.7") INTX SE 46TH ST & 88TH AVE SE
 ELEV: 362.31

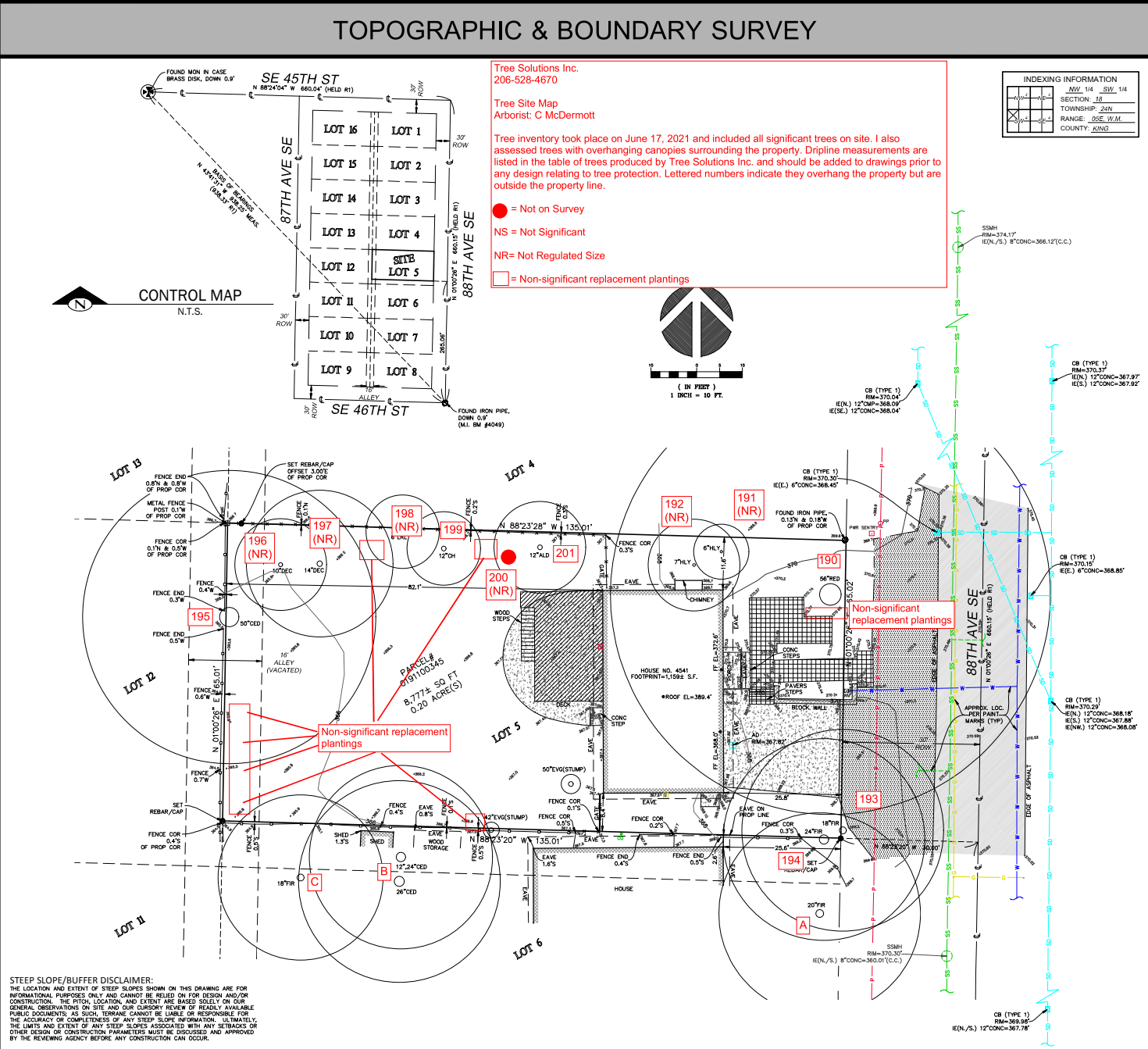
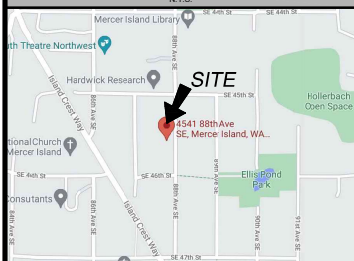
SURVEYOR'S NOTES

1. THE TOPOGRAPHIC SURVEY SHOWN HEREON WAS PERFORMED IN JUNE OF 2021. THE FIELD DATA WAS COLLECTED AND RECORDED ON MAGNETIC MEDIA THROUGH AN ELECTRONIC THEODOLITE. THE DATA FILE IS ARCHIVED ON DISC OR CD. WRITTEN FIELD NOTES MAY NOT EXIST. CONTOURS ARE SHOWN FOR CONVENIENCE ONLY. DESIGN SHOULD RELY ON SPOT ELEVATIONS.
2. ALL MONUMENTS SHOWN HEREON WERE LOCATED DURING THE COURSE OF THIS SURVEY UNLESS OTHERWISE NOTED.
3. THE TYPES AND LOCATIONS OF ANY UTILITIES SHOWN ON THIS DRAWING ARE BASED ON INFORMATION PROVIDED TO US, BY OTHERS OR GENERAL INFORMATION READILY AVAILABLE IN THE PUBLIC DOMAIN INCLUDING, AS APPLICABLE, IDENTIFYING MARKINGS PLACED BY UTILITY LOCATE SERVICES AND OBSERVED BY TERRANE IN THE FIELD. AS SUCH, THE UTILITY INFORMATION SHOWN ON THESE DRAWINGS ARE FOR INFORMATIONAL PURPOSES ONLY AND SHOULD NOT BE RELIED ON FOR DESIGN OR CONSTRUCTION PURPOSES; TERRANE IS NOT RESPONSIBLE OR LIABLE FOR THE ACCURACY OR COMPLETENESS OF THIS UTILITY INFORMATION. FOR THE ACCURATE LOCATION AND TYPE OF UTILITIES NECESSARY FOR DESIGN AND CONSTRUCTION, PLEASE CONTACT THE SITE OWNER AND THE LOCAL UTILITY LOCATE SERVICE (800-424-5555).
4. SUBJECT PROPERTY TAX PARCEL NO. 0191100345.
5. SUBJECT PROPERTY AREA PER THIS SURVEY IS 8,777± S.F. (0.20 ACRES)
6. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT. EASEMENTS AND OTHER ENCUMBRANCES MAY EXIST THAT ARE NOT SHOWN HEREON.
7. FIELD DATA FOR THIS SURVEY WAS OBTAINED BY DIRECT FIELD MEASUREMENTS WITH A CALIBRATED ELECTRONIC 5-SECOND TOTAL STATION AND/OR SURVEY GRADE GPS OBSERVATIONS. ALL ANGULAR AND LINEAR RELATIONSHIPS ARE ACCURATE AND MEET THE STANDARDS SET BY WAC 332-150-090.

LEGEND

- AREA DRAIN
- ASPHALT SURFACE
- BUILDING
- CENTERLINE ROW
- CLEARCUT
- CONCRETE SURFACE
- DECK
- FENCE LINE (CHAIN LINK)
- FENCE LINE (WOOD)
- GAS METER
- GAS LINE
- GRAVEL SURFACE
- INLET (TYPE 1)
- IRON PIPE (FOUND)
- POWER (OVERHEAD)
- MONUMENT IN CASE (FOUND)
- PAVER SURFACE
- POST
- POWER METER
- POWER SERVICE
- POWER POLE
- REBAR & CAP (SET)
- RETAINING WALL
- SEWER MANHOLE
- SEWER LINE
- STORM DRAIN LINE
- WATER METER
- WATER LINE
- WOOD STEPS
- WOOD STORAGE
- WOOD SURFACE

VICINITY MAP



Tree Solutions Inc.
 206-528-4670
 Tree Site Map
 Arborist: C McDermott

Tree inventory took place on June 17, 2021 and included all significant trees on site. I also assessed trees with overhanging canopies surrounding the property. Dipline measurements are listed in the table of trees produced by Tree Solutions Inc. and should be added to drawings prior to any design relating to tree protection. Lettered numbers indicate they overhang the property but are outside the property line.

● = Not on Survey
 NS = Not Significant
 NR = Not Regulated Size
 □ = Non-significant replacement plantings

INDEXING INFORMATION	
SECTION: 18	SW 1/4
TOWNSHIP: 24N	
RANGE: 05E W.M.	
COUNTY: KING	

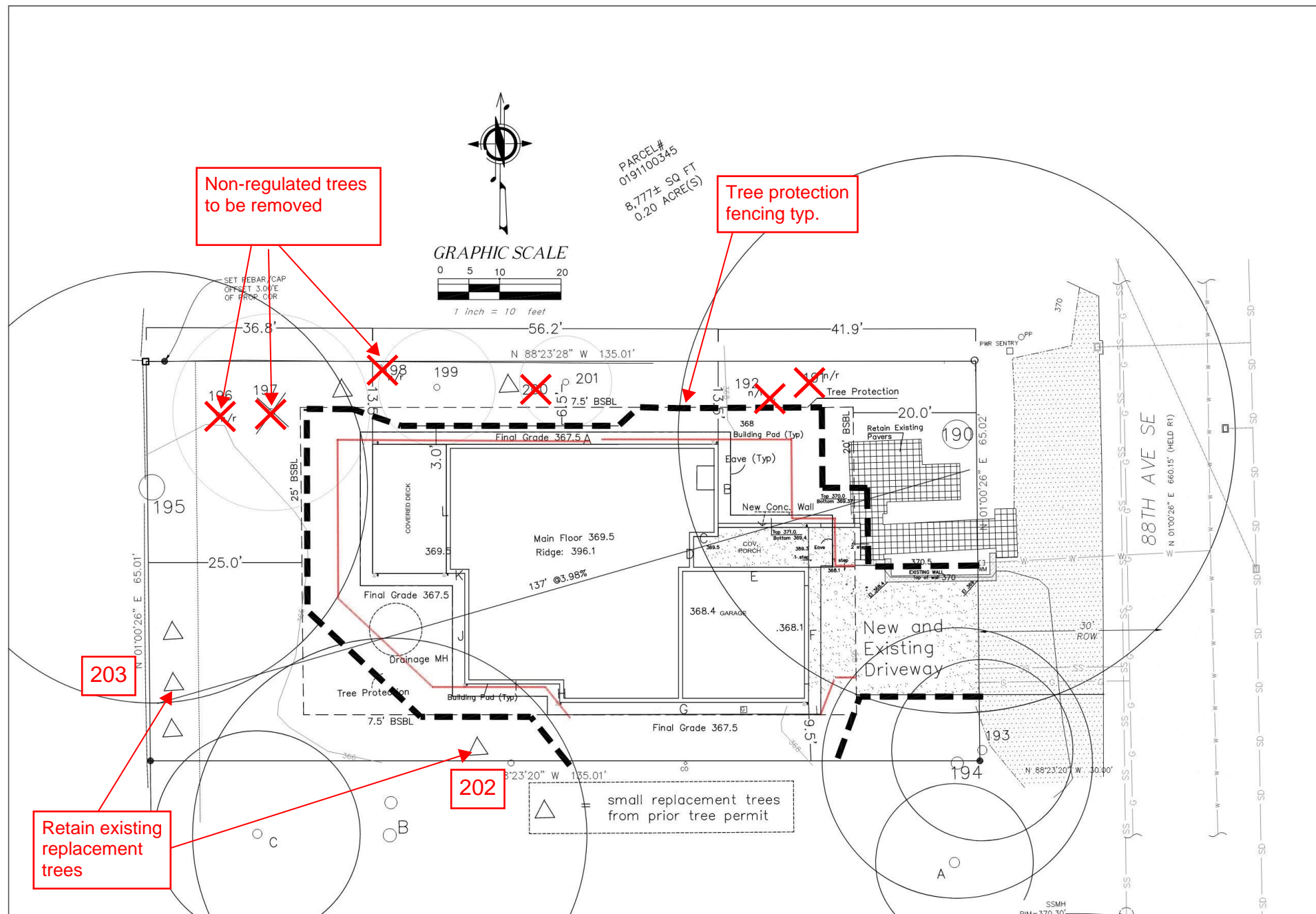
TOPOGRAPHIC & BOUNDARY SURVEY
 PARCEL NO. 0191100345
 JAYMARC HOMES- LIAO RESIDENCE
 4541 88TH AVE SE
 MERCER ISLAND, WA 98040



Terrane
 10801 Main Street, Suite 102, Bellevue, WA 98004
 phone 425.458.4488 support@terrane.net www.terrane.net

JOB NUMBER:	211129
DATE:	06/11/21
DRAFTED BY:	RSN
CHECKED BY:	JGMC/SP
SCALE:	1" = 10'
REVISION HISTORY:	
SHEET NUMBER:	1 OF 1

STEEP SLOPE/BUFFER DISCLAIMER:
 THE LOCATION AND EXTENT OF STEEP SLOPES SHOWN ON THIS DRAWING ARE FOR INFORMATIONAL PURPOSES ONLY AND CANNOT BE RELIED ON FOR DESIGN AND/OR CONSTRUCTION. THE PRESENCE, LOCATION AND EXTENT ARE BASED SOLELY ON OUR GENERAL OBSERVATIONS ON SITE AND OUR CURSORY REVIEW OF READILY AVAILABLE PUBLIC DOCUMENTS. AS SUCH, TERRANE CANNOT BE HELD RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY STEEP SLOPE INFORMATION. ULTIMATELY, THE LIMITS AND EXTENT OF ANY STEEP SLOPES ASSOCIATED WITH ANY SETBACKS OR OTHER DESIGN OR CONSTRUCTION PARAMETERS MUST BE DISCUSSED AND APPROVED BY THE REVIEWING AGENCY BEFORE ANY CONSTRUCTION CAN OCCUR.



Key Map



Parcel size: 8,775 square feet
 Supplemental plantings required for previous tree removal: 4 trees
 Supplemental plantings required on-site: 4 trees, 1 credit each

Tree Solutions Inc
 Consulting Arborists

2940 Westlake Ave N #200
 Seattle, WA 98109
 www.treesolutions.net
 206-528-4670

Connor McDermott
 ISA #PN-8704A
 ISA Qualified Tree Risk Assessor

Liao Residence
 4541 88th Ave SE,
 Mercer Island, WA
 Parcel # 0191100345

April 26, 2022

Tree Removals: No regulated trees are proposed to be removed for this development. Several non-regulated trees including trees 191, 192, 196, 197, 198, and 200 are proposed for removal.

Tree Protection: Trees 190, 193, 194, 195, 199, 201, A, B, and C and supplemental tree plantings 202 and 203 will be protected with tree protection fencing and specifications as included in the Arborist Report (Tree Solutions Inc, 04/26/2022)

Clearing and Grubbing Notes: All trees to be removed that are located within the TPZ of site trees shall not be ripped, pulled, or pushed over. The tree should be cut to the base and the stump either left 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.

Existing Conditions

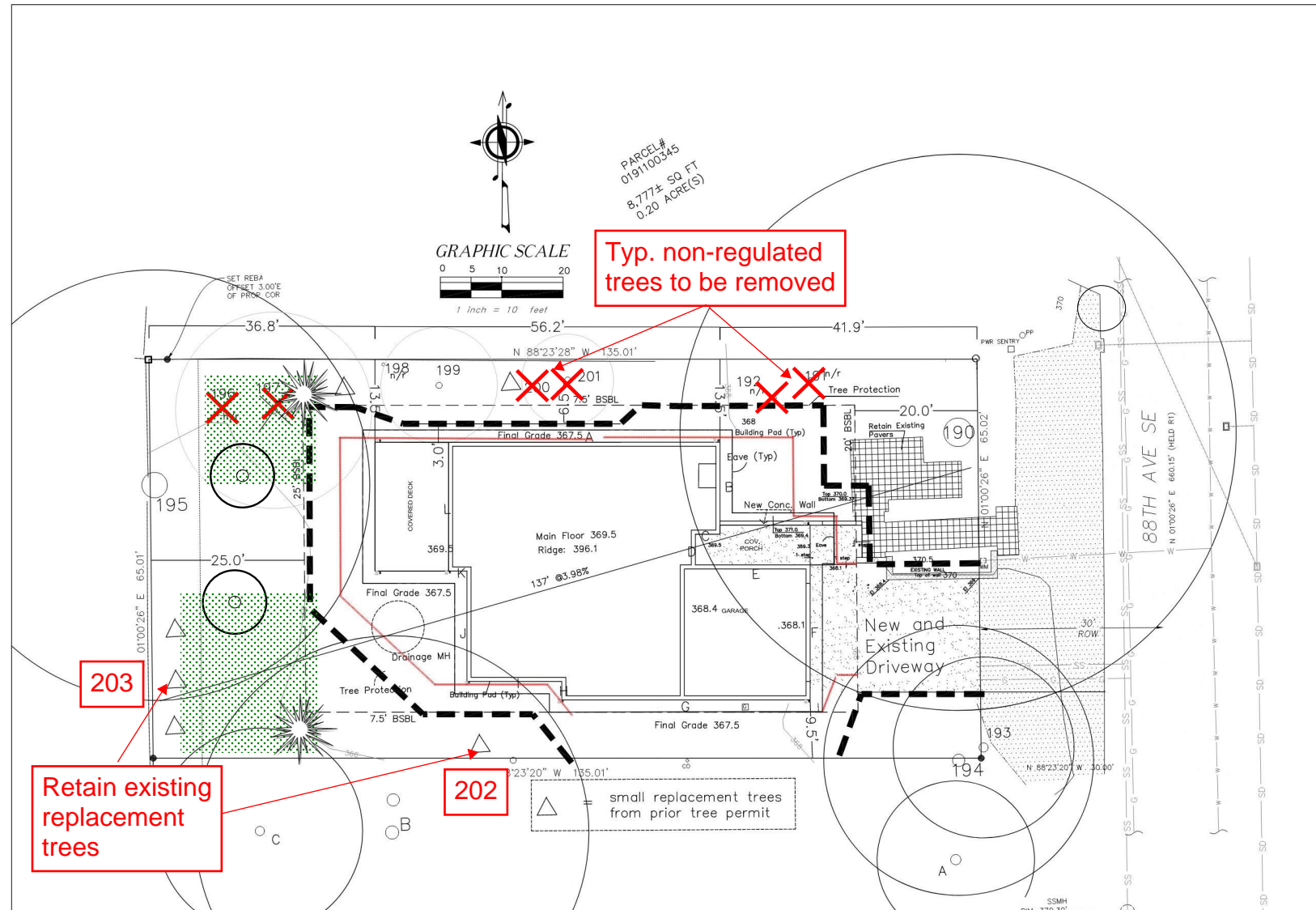
L-1

Liao Residence
 4541 88th Ave SE,
 Mercer Island, WA
 Parcel # 0191100345

April 26, 2022

Planting Plan

L-2



Plant schedule

Sym	Qty	Name	Scientific Name	Size	Spacing
	2	Pacific Crabapple	<i>Malus fusca</i>	2-inch caliper	10' o.c.
	2	Shore Pine	<i>Pinus contorta</i> <i>var contorta</i>	6-foot tall	10' o.c.
	10	Sword fern	<i>Polystichum munitum</i>		2' o.c.
	10	Salal	<i>Galtheria shalon</i>		2' o.c.
All plants shall conform to American Association of Nurserymen (AAN) grades and standards as published in the "American Standard for Nursery Stock".					

Notes: Tree Removal and Planting

Tree Removals:

The City of Mercer Island requires that four trees to be planted on this property to fulfill the tree replacement requirements from a prior exceptional tree removal.

Replacement trees:

Prior to the development, one exceptional tree was removed and six replacement trees were required to be planted and retained during a five-year rolling period. Two of the existing replacement trees fit the requirements of a replacement tree. Four additional replacement trees are required to fulfill the previous tree removal on site.

The required minimum size of the supplemental tree worth one (1) tree credit shall be four 6-feet tall for native or other conifers and 1.5-inch caliper for deciduous or evergreen broad-leaf tree (MICC 19.10.070.B.3) . All trees must be spaced 10-feet on center apart. At least half of the replacement trees species must be native to the Pacific Northwest (MICC 19.10.070.B.2).

All plants shall conform to American Association of Nurserymen (AAN) grades and standards as published in the "American Standard for Nursery Stock" manual.

Clearing and Grubbing Notes:

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 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.

Vegetation removal and planting should be done by hand within tree protection areas. All removed plant material shall be properly disposed of off-site.

Removal of invasive plants within tree protection areas should be done using a combination of hand tools, hand-held power equipment, and chemical controls such as foliar herbicide spray and spot-treatments following stem cutting.

Specifically, Ivy (*Hedera spp*) and Himalayan blackberry (*Rubus bifrons*) within tree protection areas should be cleared and grubbed by hand-digging out the roots, or plants shall be cut at the base and chemical treatment shall be applied when the plants are actively growing. Remove invasive plant material from the site for disposal.

English holly (*Ilex aquifolium*) and Cherry laurel (*Prunus laurocerasus*) within tree protection areas should be treated with herbicide pellets injected directly into their stems. Trees and shrubs smaller than three inches diameter will be cleared and grubbed. Vegetative matter shall properly disposed of off site.

All herbicide use must be performed under the supervision of a licensed pesticide applicator with a Commercial Applicator's License per WAC 16-228-1231. All on-site transport, use, and clean-up of pesticides / herbicides shall conform to regulations set forth by WAC 16-228-1220. The applicator will follow King County's noxious weed regulatory guidelines and King County's best management practices for invasive species removal using herbicide.

Basic Planting Instructions:

Trees must be planted in the wet season (October 1 through April 1) after the completion of the development work (MICC 19.10.070.B.5).

Before planting, set out the plants according to the planting plan. Remove invasive vegetation from all areas within 5-feet of proposed planting holes. Adjust locations of plants if the planting hole location per the planting plan requires damaging existing tree roots or native vegetation.

Dig bowl-shaped planting holes at least twice the width of the root ball. The hole should be just slightly deeper than that of the planted plant. Rough up the sides of the planting hole.

Remove the plant from its container and gently loosen bound roots on the outer inch of the soil and cut roots that encircle the root ball.

Set the plant in the hole so that the top of the soil remains level with the surrounding soil. Fill the surrounding space with loose native soil. Cover any exposed roots but do not pile dirt on the stem as it can kill some plants.

Gently press the filled soil to collapse air pockets, but allow the soil to remain loose. Form a temporary water basin around each plant to encourage water collection.

Water thoroughly.

Mulch with 3-inches of wood chips. Do not allow mulch to touch the base of the plant.

Maintenance:

The replacement trees are required to be maintained in a healthy condition for 5 years after planting. If a replacement tree dies, becomes diseased, or is removed within the 5 year period a new replacement tree is required to be replanted (MICC 19.10.070.D).

Irrigate the tree twice per week deeply using drip irrigation, or a 15-to 20-gallon water bag at the base of the tree. Maintain irrigation through the 5 year establishment period.

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April 26, 2022

Planting Specifications

L-3