

Arborist Report

To: JayMarc c/o Rob de Clerk
Site: 3745 77th Ave SE, Mercer Island, WA
Re: Tree Inventory
Date: February 4th, 2022
Project Arborist: George White
ISA Certified Arborist #PN-8098A
ISA Qualified Tree Risk Assessor
Reviewed By: Joseph Sutton-Holcomb
ISA Certified Arborist #PN-8397AM
Municipal Specialist, ISA Qualified Tree Risk Assessor
Referenced Documents: Preliminary Site Plan: Piha Residence (JayMarc Homes 1/31/2022)
Attached: Table of Trees
Tree Site Map

Summary

We inventoried and assessed eight trees on this lot. Based on the Mercer Island City Code (MICC) large (regulated) and exceptional trees are required to be assessed for development projects. MICC considers any tree 10 inches in diameter or greater measured at 4.5 above grade to be "large". We 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 two 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. We used an alphabetical tree identifier for trees off-site.

Two of the eight trees assessed onsite are proposed for removal due to conflicts with the proposed structure. One of the trees proposed for removal is exceptional but is less than 24 inches in diameter, and the other is greater than 24 inches in diameter but is not exceptional. In total, MICC 19.10.070 requires that nine replacement trees must be planted on-site or in the adjacent right-of-way.

Assignment and Scope of Work

This report outlines the site inspection by George White and Andrea Starbird of Tree Solutions Inc, on October 28th, 2021. We were asked to visit the site and provide a formal report including our findings and management recommendations. Rob de Clark, of JayMarc Homes requested these services for project planning purposes.

Observations & Discussion

Site

The 10,011 square foot site fronts 153rd Ave SE in Mercer Island. A single-family home currently exists on site.

Proposed Plans

The most recent plans (Piha Residence, JayMarc Homes 1/31/2021) propose demolishing existing house and building a new single-family house with a new driveway and covered patio.

Trees

Eight large trees were tagged and assessed on site: including ornamental trees species Japanese maple (*Acer palmatum*), common buckthorn (*Rhamnus cathartica*), and Austrian black pine (*Pinus nigra*), and native conifer species Douglas-fir (*Pseudotsuga menziesii*).

Trees 261 and 263 are common buckthorns with poor structure. These trees are likely volunteers and should not be prioritized for retention.

I have included an aerial photograph to serve as the site map and attached a table of trees that has detailed information about each tree.

Discussion—Construction Impacts

Tree 256

Tree 256 is an exceptional Japanese maple currently proposed for removal (See photo 2). because the footprint of the tree conflicts with the over-excavation and clearance needed to build the proposed garage on the northeast corner of the proposed structure.

MIMC 19.10.070 requires that each exceptional tree removed as part of a development project must be replaced with six new trees. The trees must be planted on site or in the adjacent right-of-way (ROW).

Tree 257

Tree 257 is a 27-inch common buckthorn that is currently proposed for removal (See photo 1). The city of Mercer Island prioritizes trees with a DSH greater than 24 inches for retention. MIMC 19.10.020 requires that this tree must be replaced with three trees planted on site or in the adjacent ROW.

Trees A and B

Trees A and B are both large, off-site trees. Due to existing site conditions, I expect the impact to these trees to be negligible. To ensure impacts are minimal, the existing rockeries on the north and south edges of the site must be retained.

Retained trees

Trees 258-263 are a row of large trees growing near the eastern property line that are proposed for retention.

MIMC 19.10.070 requires that a recommended limit of disturbance (RLOD) is established for any large tree on site. I have identified the RLOD based on a Tree Protection Zone (RLOD) of 1 foot per 1-inch DSH, per ISA Best Management Practices (BMPs).

Under specific circumstances the RLOD can be reduced to the dripline of a retained tree if specific mitigation specifications are followed. In this case, I believe that it is appropriate to reduce the RLOD to the dripline for trees 258 and 260 as the root impacts will be limited to a small portion of the root zone, and the impacts will be limited to one side of these trees. The RLOD for tree 258 will be reduced from 26 feet to 18 feet, and the RLOD for tree 260 will be reduced from 30 feet to 20 feet. Trees 259 and 161-263 should be protected at 1 foot per diameter inch in accordance with ISA BMPs.

The RLOD for each individual tree is noted in the attached table of trees. The RLOD must be shown on all plans. Install tree protection fencing at the perimeter of the RLOD, per the specifications outlined in Appendix G.

No material storage, vehicle access, heavy equipment use, or machine excavation is permitted within the RLOD. Any work inside of the RLOD may be permitted with the approval of the city arborist and must comply with the tree protection specifications provided in Appendix G. Any excavation within the RLOD shall be monitored by the project arborist. This includes excavation related to irrigation installation, fence construction, and tree planting.

A 4-inch layer of arborist wood chips shall be installed within the driplines of retained trees. All retained trees must receive supplemental irrigation throughout the dry months (May-September) for the duration of the project and for the following 2 years.

Replacement Trees

Because of the size and aesthetic value of the removed trees, MIMC 19.10.070 requires that nine replacement trees be planted on-site or in the adjacent ROW. Replacement trees should primarily be species native to the Pacific Northwest. Evergreen trees shall be at least 6-feet tall when planted and deciduous trees must be at least 1.5 inches in caliper. The applicant must ensure that the trees are maintained for a period of 5 years following planting.

The city may grant a *fee-in-lieu* of planting the required number of replacement trees if the city arborist determines that there is insufficient area to replant the required number of replacement trees on-site or in the adjacent ROW.

Recommendations

- Obtain all necessary permits and approval from the City prior to commencement of site work.
- Update site plans to include the recommended limits of disturbance.
- Tree protection consisting of chain link fencing should be installed at the recommended limits of disturbance of all retained trees. Trees growing in a group should be protected at the edge of

their shared RLOD. General tree protection specifications can be found in Appendix G. Tree Protection measures should be identified on all pertinent plans.

- 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.
- Coordinate any work within the RLOD with the project arborist including those related to the landscape phase of the project.
- Include nine replacement trees pursuant to MMIC 19.10.070 in landscape planning.

Respectfully submitted,

George White,
Consulting Arborist

Appendix A 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)

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 B 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 C Site Map

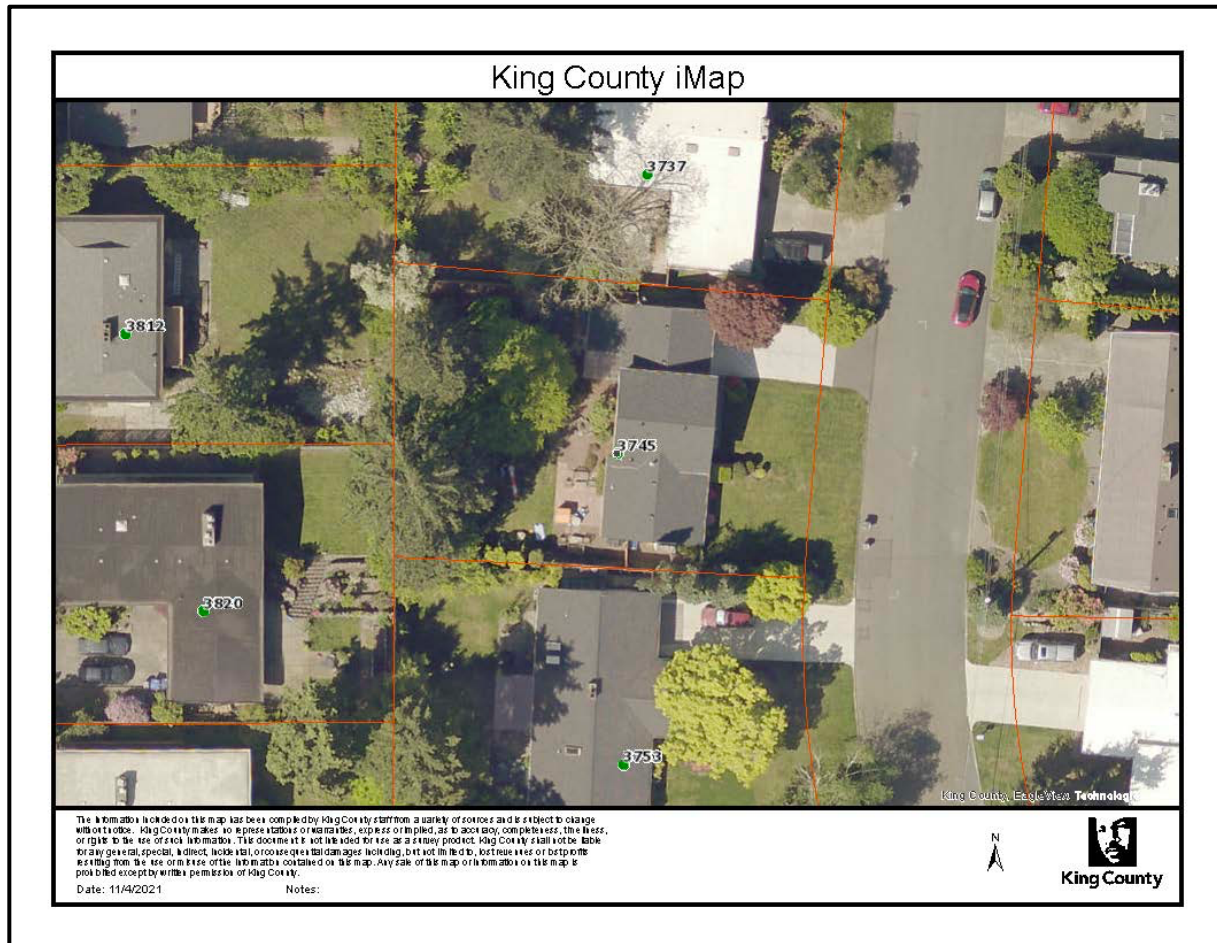


Figure 1. Site Map

Appendix D Photographs



Photo 1. Backyard trees. All trees to remain except tree 257 (indicated with red arrow).



Photo 2. Tree 256 (indicated with red arrow). This exceptional Japanese maple is in conflict with the proposed structure and is proposed for removal.

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. **Recommended Limits of Disturbance (RLOD):** The city of Mercer Island requires recommended limits of disturbance (RLOD) of 1 foot per 1-inch DSH. In some cases, the RLOD may extend outside tree protection fencing. Work within the RLOD 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 RLOD 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, RLOD fencing may be placed at the edge of existing hardscape within the RLOD to allow for staging and traffic.
 - c. Where work is planned within the RLOD, install fencing at edge of RLOD and move to limits of disturbance at the time that the work within the RLOD is planned to occur. This ensures that work within the RLOD 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 RLOD, 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 RLOD 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 RLOD, including where the RLOD extends beyond the tree protection fencing.
8. **Soil Protection:** No parking, foot traffic, materials storage, or dumping (including excavated soils) are allowed within the RLOD. Heavy machinery shall remain outside of the RLOD. 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 RLOD for as long as possible.
9. **Soil Remediation:** Soil compacted within the RLOD 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 RLOD, canopy management (pruning or tying back) shall be conducted to ensure that vehicular traffic does not

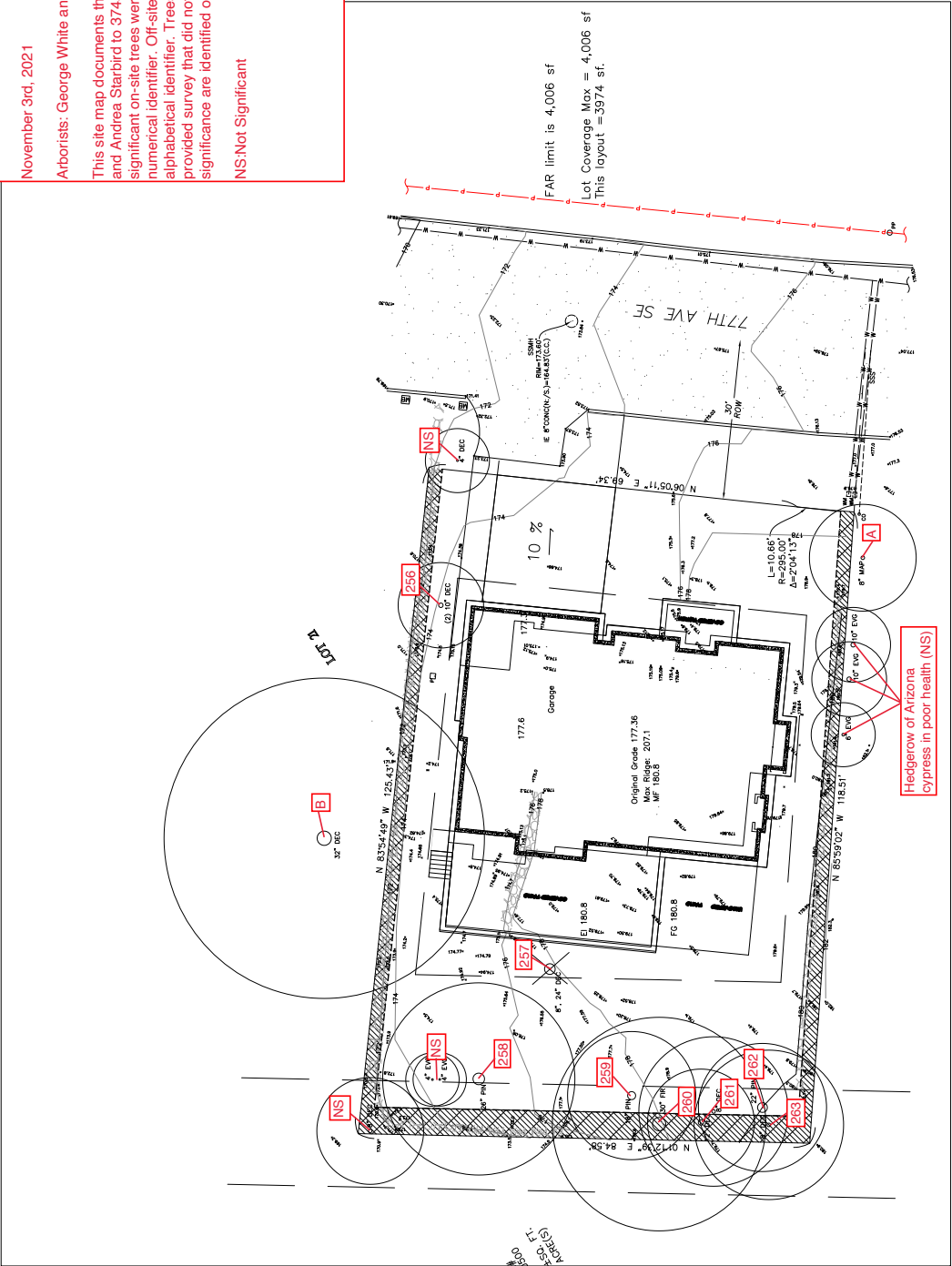
damage canopy parts. Exhaust from machinery shall be located five feet outside the dripline of retained trees. No exhaust shall come in contact with foliage for prolonged periods of time.

11. **Duff/Mulch:** Apply 6 inches of arborist wood chip mulch or hog fuel over bare soil within the RLOD to prevent compaction and evaporation. RLOD 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 RLOD 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 RLOD.
13. **Fill:** Limit fill to 1 foot of uncompacted well-draining soil, within the RLOD 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 RLOD. Where equipment must traverse the newly exposed soil, apply soil protection as described in section 8. Replace fencing at edge of RLOD 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 RLOD 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 RLOD 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 RLOD 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 RLOD:
 - **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**

Tree Solutions
 Tree Inventory
 November 3rd, 2021
 Arborists: George White and Andrea Starbird

This site map documents the visit of George White and Andrea Starbird to 3745 77th Ave SE. All significant on-site trees were tagged with a numerical identifier. Off-site trees were assigned an alphabetical identifier. Trees identified on the provided survey that did not meet the criteria for significance are identified on this map as NS

NS: Not Significant



Hedgerow of Arizona
 cypress in poor health (NS)

FAR limit is 4,006 sf
 Lot Coverage Max = 4,006 sf
 This layout = 3974 sf.

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.

Limits of disturbance are determined by 1 foot per 1 inch DSH, or on a tree by tree basis.

Tree ID	Scientific Name	Common Name	DSH (inches)	Health Condition	Structural Condition	Dripline Radius (feet)						Exceptional Size	Above 24 inches	Propose Action	Limits of Disturbance	Notes
						N	E	S	W							
256	<i>Acer palmatum</i>	Japanese Maple	16.5	good	fair	9.7	12.2	10.7	8.7			Exceptional - Size	No	Remove	N/A Tree to be removed	Old tag #197, previously topped, located 2 feet south of driveway, canopy overhanging driveway, on top of rocky
257	<i>Rhamnus cathartica</i>	Common buckthorn	27.0	good	fair	17.1	17.6	25.1	17.1				Yes	Remove	N/A Tree to be removed	Large indiscriminate pruning cuts, excessive epicormic sprouts
258	<i>Pinus nigra</i>	Austrian Black Pine	26.1	good	fair	17.7	17.6	12.6	18.1			Exceptional - Size	Yes	Retain	Furthest extent of dripline (18')	Multiple trunks, narrow unions, multiple reiterations
259	<i>Pinus nigra</i>	Austrian Black Pine	17.1	good	fair	24.2	17.2	6.7	11.7				No	Retain	17'	Corrected phototropic lean, surface roots on lawn with lawnmower damage
260	<i>Pseudotsuga menziesii</i>	Douglas-fir	30.5	good	good	18.8	15.3	18.8	20.3			Exceptional - Size	Yes	Retain	Furthest extent of dripline (20')	Leaf scorch
261	<i>Rhamnus cathartica</i>	Common buckthorn	10.9	good	poor	7.5	20.5	16.5	13.5				No	Retain	11'	Previously failed stem, likely a volunteer, many sprouts, dramatic lean
262	<i>Pinus nigra</i>	Austrian Black Pine	22.2	good	good	17.9	13.9	15.9	12.4				No	Retain	22.2'	Codominant at 20 feet, surface roots with lawnmower damage
263	<i>Rhamnus cathartica</i>	Common buckthorn	11.0	good	poor	11.5	10.5	14.5	3.5				No	Retain	11'	Epicormic sprouts, leans on fence, phototropic lean
A	<i>Acer palmatum</i>	Japanese Maple	10.0	good	good	12.4	12.4	12.4	12.4			Exceptional - Size	No	Retain	10' or at existing rocky	

Table of Trees
3745 77th Ave SE, Mercer Island, WA

Arborists: AS, GW
Date of Inventory: 10/28/2021
Table Prepared: 02/04/2022

Tree ID	Scientific Name	Common Name	DSH (inches)	Health Condition	Structural Condition	N	E	S	W	Exceptional	Above 24 inches	Propose Action	Limits of Disturbance	Notes
B	<i>Catalpa speciosa</i>	Western catalpa	31.9	Good	poor	21.8	20.3	24.3	19.3		Yes	Retain	32' or at existing rockery	Previously topped, multiple reiterated offset leaders, in deck, recent clearance and crown reduction pruning.