

Arborist Report

To: Catherine Moran
Site: 5000 West Mercer Way, Mercer Island, WA 98040
Re: Tree Inventory
Date: September 24, 2021
Project Arborist: Josh Petter
ISA Board Certified Master Arborist #PN- 8406B
ISA Qualified Tree Risk Assessor
Reviewed By: Andrea Starbird, Environmental Scientist
Attached: Table of Trees
Tree Site Map

Summary

We inventoried and assessed 28 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. I tagged each tree with an aluminum tree tag. Tree identifier corresponds to the number on each tag.

Of the site trees assessed, five met the exceptional tree criteria for size outlined in the MICC.

The code defines an exceptional tree grove as a group of eight or more trees that are 10 inches diameter at standard height (DSH) or greater with contiguous canopies. The entire site is an exceptional tree grove. Trees that are part of a grove shall also be considered exceptional trees.

There were six adjacent trees that required documentation for this property. Trees on neighboring properties were documented if they appeared to be greater than 10 inches DSH 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.

The removal of 10 exceptional trees requires the replanting of 60 trees. These should be shown on a landscape plan. The final landscape, utility, and grading plans should be provide to Tree Solutions to comment on the final tree retention and replacement numbers.

Assignment and Scope of Work

This report outlines the site inspection by Josh Petter and Haley Galbraith, of Tree Solutions Inc, on September 15, 2020. We were asked to visit the site and provide a formal report including findings and management recommendations. Catherine Moran requested these services for project planning purposes.

Observations

Site

This 18,295 square foot site is located on West Mercer Ave on Mercer Island, zoned as an R-15 property. The site is undeveloped (Parcel # 1924059244) and is largely covered by trees. From the road, the site slopes steeply up to the east, before leveling off, and then sloping up steeply again.

According to King County iMap, there is an erosion hazard area on-site. According to Mercer Island GIS Portal, there is a protected slope that covers most of the eastern and western portions of the site.

The site is largely covered with invasive ivy (*Hedera* spp.) which is carpeting the ground and climbing into the canopies of trees. There is also English holly (*Ilex aquifolium*) and Himalayan blackberry (*Rubus bifrons*) on the site.

Native understory was primarily sword fern (*Polystichum munitum*). Native plant species should be retained in conjunction with the trees slated for retention.

Trees

Twenty-eight large trees were tagged and assessed on-site.

The trees are predominantly native species, and included bigleaf maple (*Acer macrophyllum*), western redcedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*). Trees ranged from poor to good health and structural condition.

Five site trees (25 through 27, 31, and 35) are exceptional by size. All large trees are part of a grove on-site, meaning all large trees are exceptional.

Off-site tree E is also exceptional by size.

I have included an annotated 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

This report is preliminary as we have not reviewed final design or construction plans for this area. Tree Solutions Inc should review grading, utility, and landscape plans.

Retained trees should be protected at the extent of their critical root zone (CRZ) or 1 foot for every 1 inch, which will function as the limits of disturbance. Retained trees should be fenced as a group and the outermost portion of the driplines should be connected with a straight fence line to maximize the tree protection area. Depending on the tree species, condition, and proposed site plan this can be adjusted in areas detailed within the report. The CRZ for each tree can be found in the attached table of trees.

According to MICC 1910.060.5 at least 30 percent of trees must be retained on-site. All exceptional trees outside the buildable area must be retained to the extent feasible. All trees on the site are considered exceptional, except those that are invasive. According to MICC 19.10.070 all exceptional trees proposed for removal must be replaced at a 6 to 1 ratio. Trees removed will have to be replaced on the site, or if there is not room to accommodate all replacement trees a fee in lieu of \$500 per tree will be required. There is a potential to plant smaller species or conduct restoration instead of planting all of the required trees.

Trees 22, 24 through 27, 38, 43, 45, 46, and 47 are proposed for removal as they are within or adjacent to the new house footprint and associated grading. Removal of these 10 trees will require 60 replacement trees. These should be shown on a landscape plan; those trees that are not proposed on the site should be indicated and a fee in lieu should be paid.

Tree 23 is an invasive holly tree that should be removed. There are numerous other non-significant holly trees that should also be removed to prevent the spread around the property.

Tree 43 will have to be removed carefully to prevent damage to the adjacent trees. This could be directionally felled away from the retained trees or removed with rigging to reduce the impact to adjacent trees.

Tree 47 is a western hemlock that appeared to be growing within the steep slope buffer, however, it is growing on a very large stump, reducing the structural stability and retention value of this tree.

Trees 28 through 32

These trees are to the east, upslope, of the proposed soldier pile wall. There will be a 1 foot-deep trench that will be dug behind the wall in order to be backfilled with gravel. This must be done with pneumatic excavation. Roots must be cleanly cut at the soil line or if possible retained and covered with gravel. Roots cannot be cut with an excavator as that leads to roots shattering and can compromise the structural stability of the tree.

Tree 35 through 37

These are a group of three bigleaf maples along the southern extent of the property. Tree 38, another bigleaf maple, will be removed to the north of this grouping. Tree 38 must be directionally felled away from these trees. This could be left as a wildlife habitat snag. If that is not desirable the stump should be cut flush with the ground and left in place, this should not be pulled out to prevent disturbance to the roots of adjacent trees.

Tree 35 has decay on the west side and wounds present. We recommend conducting micro-resistance drill testing on this tree to ensure that the tree is sound prior to construction. If this tree is deemed to be stable a qualified arborist must be on site during the installation of piles 17 and 18 to ensure that the machinery doesn't damage the tree.

Trees 39 through 44

This is a group of trees along the western edge of the property. Fencing should initially be installed at the critical root zone of these trees. Excavation for the foundation should be done first with hydro

excavation under supervision of an ISA certified arborist. Roots over 2 inches in diameter must be cleanly cut at the extent of excavation and covered with two layers of burlap. Tree protection fencing must be secured at the edge of excavation, or 5 feet from the foundation. Contractors must be prepared to work in a tight space along this side of the building.

Tree 43 is proposed for removal. This tree must be directionally felled away from the retained trees. The stump should be left in place and not ripped out to prevent damage to the adjacent trees.

Retained Trees

All invasive plants should be removed prior to the start of construction. Invasive ivy within the driplines of the retained trees must be removed by hand by a qualified restoration specialist. Once ivy is removed the tree protection areas must be covered with 4 inches of coarse arborist woodchips, which should be kept 1 foot from the trunks of the trees.

Supplemental irrigation is required for the dry season (June through September) and should be run 2 to 3 times per month with a goal of saturating the soil to a depth of 8 to 12 inches.

Recommendations

- Obtain all necessary permits and approval from the City prior to commencement of site work.
- Update site plans to include tree numbers, driplines, and critical root zones.
- Excavation behind the soldier pile wall must be done with pneumatic excavation to cleanly expose and cut roots. Roots must be retained and pushed down under the gravel if possible.
- Provide Tree Solutions Inc with utility, grading, and landscape plans to determine final impacts to tree retention.
- If retained, conduct micro-resistance drill testing on tree 35 to determine structural integrity.
- 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 F, and should be included in the plan set when soliciting bids for construction work.
 - Add tree protection fencing and specifications to all plan sheets.
- All off-site trees must be protected during construction. See specifications in Appendix F.
- All pruning should be conducted by an International Society of Arboriculture (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,
Josh Petter,
Consulting Arborist

Appendix A Photographs



Photo 1. Looking up at the previously broken top (red arrow) of tree number 40. If retained, some reduction pruning should be done on the limb extending out over the road. Additionally, an aerial assessment should be conducted to determine the condition of the branch attachments.



Photo 2. Tree 46 has a large wound that initiates at the base, this tree has a low retention value.

Appendix B 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 C 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 D 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 E 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.

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 F Tree Protection Specifications

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

Tree Protection Fencing

All trees planned for retention or on neighboring properties that overhang the site shall be protected for the entire duration of the construction project. Tree protection fencing shall consist of high visibility mesh or chain link fencing installed at the extent of the tree protection area. Where trees are being retained as a group the fencing should encompass the entire area.

Excavation

Excavation done at or within the tree protection area should be carefully planned to minimize disturbance. Where feasible consider using alternative methods such as pneumatic excavation which uses pressurized air to blow soil away from the root system, directional drilling to bore utility lines, or hand excavation to expose roots. Excavation done with machinery (backhoe) in proximity of trees should be performed slowly with flat front buckets, removing small amounts of soil at a time with one person on the ground spotting for roots. When roots are encountered, excavation should stop and roots should be cleanly pruned as needed so they are not ripped or torn.

Soil Protection

No parking, materials storage, or dumping (including excavated soils) are allowed within the tree protection area. Any heavy machinery should remain outside of the protection area unless soils are protected from the load. Acceptable methods of soil protection include applying 1 inch plywood over 3 to 4 inches of wood chip mulch, or use of AlturnaMats™ (or equivalent product).

Root Pruning

Root pruning should be limited to the extent possible. All roots shall be pruned with a sharp saw making clean cuts. Avoid fracturing and breaking roots with excavation equipment. Root cuts shall be immediately covered with soil or mulch and kept moist.

Duff/Mulch

Retain and protect as much of the existing duff and understory as possible. Retained trees in areas where there are exposed soils shall have 4 to 6 inches of wood chips applied to help prevent water evaporation and compaction. Keep mulch 1 foot away from the base of the tree.

Irrigation

Retained trees will require supplemental water if construction occurs during summer drought periods.

Canopy Pruning

Any 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 Standard Practices for Pruning. Use of an arborist with an International Society of Arboriculture Certification to perform pruning is strongly advised.

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. *Critical Root Zone is the radius extending from the center point of the tree

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	Dripline Radius (feet)				Exceptional Threshold	Over 24 inches	Exceptional	Critical Root Zone (Feet)*	Proposed Action	Notes
							N	E	S	W						
20	<i>Thuja plicata</i>	Western Redcedar	28.6		Good	Good	15.2	13.2	12.2	15.2	30.0	Yes	Exceptional Grove	28.6	Retain	Some erosion present on ditch side; structural roots exposed but still good structure
21	<i>Alnus rubra</i>	Red alder	18.0		Good	Good	10.8	0.0	10.8	20.8	-	No	Exceptional Grove	18.0	Retain	Heavy ivy coverage; diameter at standard height estimated; assessment limited due to ivy; phototropic west
22	<i>Acer macrophyllum</i>	Bigleaf Maple	25.3		Good	Good	23.1	23.1	23.1	23.1	30.0	Yes	Exceptional Grove	25.3	Remove	Hollow at base; looks stable; corrected lean; codominant at approximately 20 feet
23	<i>Ilex aquifolium</i>	English holly	15.1	6.3,7.5,6.7, 6.8,6.3	Good	Good	12.6	12.6	12.6	12.6	-	No	Exceptional Grove	15.1	Remove - Invasive	Multistem at base
24	<i>Acer macrophyllum</i>	Bigleaf Maple	12.5	10,7.5	Fair	Fair	8.5	8.5	8.5	8.5	30.0	No	Exceptional Grove	12.5	Remove	Codominant near base; heavy ivy coverage; diameter at standard height estimated; trunk wound on larger stem
25	<i>Acer macrophyllum</i>	Bigleaf Maple	41.6	28.8,28.9, 8	Good	Good	29.7	19.7	25.7	21.7	30.0	Yes	Exceptional - Size	41.6	Remove	Codominant at base; third trunk could be subordinated; heavy ivy at base and climbing into canopy; remove ivy; consider advanced assessment

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Over 24 inches	Exceptional	Critical Root Zone (Feet)*	Proposed Action	Notes
26	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	50.0		Good	Good	23.1	14.1	32.1	18.1	30.0	Yes	Exceptional - Size	50.0	Remove	Heavy ivy coverage; previous basal sprouting; slightly swollen base
27	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	33.4		Good	Good	15.4	19.4	25.4	19.4	30.0	Yes	Exceptional - Size	33.4	Remove	Ivy at base; starting to climb trunk
28	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	14.2	9.7,10.4	Good	Fair	12.6	12.6	12.6	12.6	30.0	No	Exceptional Grove	14.2	Retain	Codominant at base; cavity with hollow
29	<i>Tsuga heterophylla</i>	<i>Western Hemlock</i>	10.0		Fair	Fair	8.4	6.4	8.4	4.4	24.0	No	Exceptional Grove	10.0	Retain	
30	<i>Tsuga heterophylla</i>	<i>Western Hemlock</i>	14.3		Good	Good	12.6	12.6	8.6	12.6	24.0	No	Exceptional Grove	14.3	Retain	
31	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	35.5		Good	Good	23.5	17.5	13.5	17.5	30.0	Yes	Exceptional - Size	35.5	Retain	Trunk wound approximately at 14 feet; ivy climbing trunk
32	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	14.0		Good	Good	10.6	0.0	12.6	22.6	30.0	No	Exceptional Grove	14.0	Retain	Diameter at standard height estimated due to thick ivy coverage; tension root to east; further evaluation should be done after ivy has been removed
33	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	21.7	10.2,19.2	Good	Good	8.9	8.9	26.9	26.9	30.0	No	Exceptional Grove	21.7	Retain	Measured above swollen base; fungi at base; stilted root; looks to be some erosion on site; canopy phototropic south/southwest
34	<i>Tsuga heterophylla</i>	<i>Western Hemlock</i>	15.8		Good	Fair	9.7	6.7	6.7	12.7	24.0	No	Exceptional Grove	15.8	Retain	Broken top or topped; four reiterated tops, decay likely
35	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	33.7		Good	Fair	13.4	7.4	37.4	17.4	30.0	Yes	Exceptional - Size	33.7	Retain	Stilted roots; possible slope failure at some point; corrected lean; ivy starting to climb trunk; decay on west side with wounds present
36	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	18.0		Good	Good	0.8	0.8	16.8	2.8	30.0	No	Exceptional Grove	18.0	Retain	

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Over 24 inches	Exceptional	Critical Root Zone (Feet)*	Proposed Action	Notes
37	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	12.7		Good	Good	0.0	0.0	18.5	32.5	30.0	No	Exceptional Grove	12.7	Retain	
38	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	24.4		Good	Good	0.0	0.0	17.0	29.0	30.0	Yes	Exceptional Grove	24.4	Remove	
39	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	15.8		Fair	Fair	0.0	0.0	19.7	0.0	30.0	No	Exceptional Grove	15.8	Retain	Broken top; only drip to south
40	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	25.9		Fair	Poor	1.1	1.1	39.1	31.1	30.0	Yes	Exceptional Grove	25.9	Retain	Broken top; branches starting to regrow trunk; branch over road originating from decayed area; should remove or reduce branch
41	<i>Thuja plicata</i>	<i>Western Redcedar</i>	12.4		Good	Fair	10.5	10.5	10.5	10.5	30.0	No	Exceptional Grove	12.4	Retain	Leaning trunk with branches growing vertically; rubbing on tree F
42	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	19.9		Fair	Fair	6.8	6.8	12.8	22.8	30.0	No	Exceptional Grove	19.9	Retain	Cavity at base; low vigor; heavy ivy at base
43	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	29.0	13.9,25.5	Fair	Fair	19.2	15.2	19.2	11.2	30.0	Yes	Exceptional Grove	29.0	Remove	Previous top failure; dogwood near base that looks nice; codominant trunks near base, listed as 2 trees on survey
44	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	17.0		Fair	Fair	22.7	0.0	0.0	28.7	30.0	No	Exceptional Grove	17.0	Retain	Previous top failure with trees reiterating
45	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	12.2		Fair	Poor	20.5	0.0	0.0	18.5	30.0	No	Exceptional Grove	12.2	Remove	Suppressed; previously broken top; wound to 12 feet
46	<i>Acer macrophyllum</i>	<i>Bigleaf Maple</i>	22.8		Fair	Poor	5.0	15.0	19.0	19.0	30.0	No	Exceptional Grove	22.8	Remove	Previous partial trunk failure; low retention value

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Over 24 inches	Exceptional	Critical Root Zone (Feet)*	Proposed Action	Notes
47	<i>Tsuga heterophylla</i>	Western Hemlock	14.0		Fair	Fair	12.6	12.6	13.6	12.6	24.0	No	Exceptional Grove	14.0	Remove	Growing on large stump; diameter at standard height estimated; not on survey
A	<i>Acer macrophyllum</i>	Bigleaf Maple	24.7	16,16,10	Good	Good	-	-	29.0	-	30.0	Yes	Exceptional Grove	24.7	Retain	Diameter at standard height estimated in direction canopy overhangs the site
B	<i>Acer macrophyllum</i>	Bigleaf Maple	23.0		Good	Good	-	-	26.0	-	30.0	No	Exceptional Grove	23.0	Retain	Diameter at standard height estimated in direction canopy overhangs the site
C	<i>Tsuga heterophylla</i>	Western Hemlock	18.0		Good	Good	-	-	-	14.8	24.0	No	Exceptional Grove	18.0	Retain	Diameter at standard height estimated in direction canopy overhangs the site
D	<i>Thuja plicata</i>	Western Redcedar	12.0		Good	Good	-	-	-	18.5	30.0	No	Exceptional Grove	12.0	Retain	Diameter at standard height estimated in direction canopy overhangs the site
E	<i>Acer macrophyllum</i>	Bigleaf Maple	40.0		Good	Good	-	-	-	33.7	30.0	Yes	Exceptional - Size	40.0	Retain	Diameter at standard height estimated in direction canopy overhangs the site
F	<i>Acer macrophyllum</i>	Bigleaf Maple	25.5	18,18	Good	Fair	1.1	6.1	34.1	34.1	30.0	Yes	Exceptional Grove	25.5	Retain	Cedar tree, number 41, rubbing on trunk

TOPOGRAPHIC & BOUNDARY SURVEY

LEGAL DESCRIPTION

THAT PORTION OF THE SOUTH HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 19, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., DESCRIBED AS FOLLOWS:

BEGINNING ON THE EAST LINE OF SAID SUBDIVISION, DISTANT NORTH 00°02'18" EAST 300 FEET FROM THE SOUTHEAST CORNER THEREOF; THENCE NORTH 89°24'27" WEST TO THE EASTERLY LINE OF WEST MERCER WAY AND THE TRUE POINT OF BEGINNING; THENCE SOUTH 89°24'27" EAST 115 FEET; THENCE NORTH 00°35'33" EAST 150 FEET; THENCE NORTH 89°24'27" WEST 107.15 FEET, MORE OR LESS, TO SAID EAST LINE OF WEST MERCER WAY; THENCE SOUTHERLY ALONG SAID LINE 150 FEET, MORE OR LESS, TO THE TRUE POINT OF BEGINNING. SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

BASIS OF BEARINGS

THE CENTERLINE OF WEST MERCER WAY BEARING = NORTH 19°47'48" EAST PER R1.

REFERENCES

- R1. RECORD OF SURVEY, REC. NO. 20121120900002.
- R2. WEST MERCER ESTATES, VOL.104, PG.19, RECORDS OF KING COUNTY, WASHINGTON.

VERTICAL DATUM

NAVD88, PER GPS OBSERVATIONS.

SURVEYOR'S NOTES

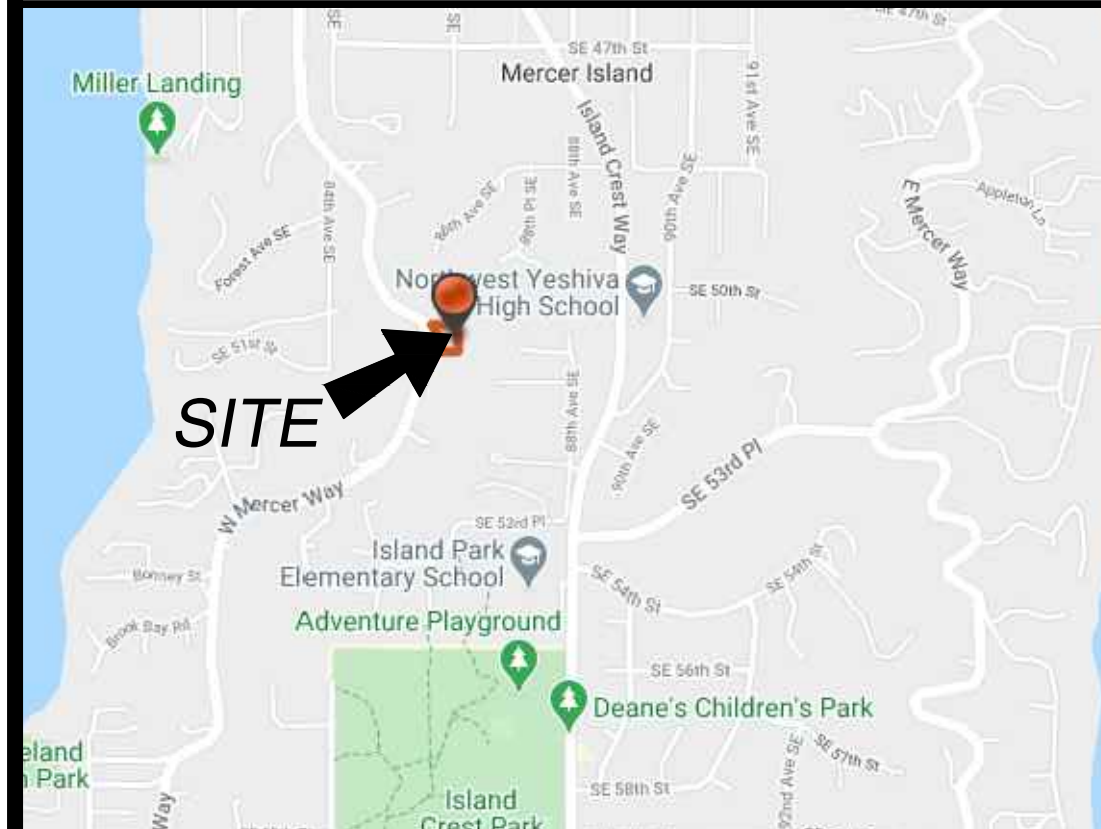
1. THE TOPOGRAPHIC SURVEY SHOWN HEREON WAS PERFORMED IN AUGUST OF 2020. THE FIELD DATA WAS COLLECTED AND RECORDED ON MAGNETIC MEDIA THROUGH AN ELECTRONIC THEODOLITE. THE DATA FILE IS ARCHIVED ON DISC OR CD. WRITTEN FIELD NOTES MAY NOT EXIST. CONTOURS ARE SHOWN FOR CONVENIENCE ONLY. DESIGN SHOULD RELY 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.(S) 1924059244
5. SUBJECT PROPERTY AREA PER THIS SURVEY IS 18,025 S.F. (0.41 ACRES)
6. THE PROPERTY DESCRIBED HEREON IS THE SAME AS THE PROPERTY DESCRIBED IN CHICAGO TITLE INSURANCE COMPANY, CERTIFICATE NO. 0186958-ETU, WITH AN EFFECTIVE DATE OF AUGUST 14, 2020 AND THAT ALL EASEMENTS, COVENANTS AND RESTRICTIONS REFERENCED IN SAID TITLE COMMITMENT OR APPARENT FROM A PHYSICAL INSPECTION OF THE PROPERTY OR OTHERWISE KNOWN TO ME HAVE BEEN PLOTTED HEREON OR OTHERWISE NOTED AS TO THEIR EFFECT ON THE PROPERTY.
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 332-130-090.

LEGEND

- | | | | |
|--|--------------------------|--|------------------|
| | ASPHALT SURFACE | | WATER MH |
| | BUILDING | | WATER LINE |
| | CENTERLINE ROW | | WATER METER |
| | CULVERT PIPE | | WATER VALVE |
| | DITCH (FLOWLINE) | | STEEP SLOPE AREA |
| | FIRE HYDRANT | | |
| | CATCH BASIN (TYPE 1) | | |
| | MONUMENT IN CASE (FOUND) | | |
| | POST | | |
| | POWER (OVERHEAD) | | |
| | POWER POLE | | |
| | IRON PIPE (FOUND) | | |
| | REBAR & CAP (SET) | | |
| | ROCKERY | | |
| | SEWER LINE | | |
| | SEWER MANHOLE | | |
| | STORM DRAIN LINE | | |
| | TREE (AS NOTED) | | |

VICINITY MAP

N.T.S.



SCHEDULE B ITEMS

1. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
DISCLOSED BY: DEED
PURPOSE: ROAD
RECORDING NO.: 4523171
AFFECTS: NORTHWESTERLY PORTION AS DESCRIBED THEREIN (PLOTTED)
2. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
DISCLOSED BY: DEED
PURPOSE: ROAD AND UTILITIES
RECORDING NO.: 4828502
AFFECTS: NORTHWESTERLY PORTION AS DESCRIBED THEREIN (PLOTTED)
3. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
DISCLOSED BY: STATUTORY WARRANTY DEED
PURPOSE: INGRESS, EGRESS AND UTILITIES
RECORDING NO.: 5597166
AFFECTS: NORTH 10 FEET OF SAID PREMISES (PLOTTED)
4. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
DISCLOSED BY: STATUTORY WARRANTY DEED
PURPOSE: ROAD FOR INGRESS AND EGRESS
RECORDING NO.: 5706728
AFFECTS: NORTH (PLOTTED)
5. EASEMENT(S) FOR THE PURPOSE(S) SHOWN BELOW AND RIGHTS INCIDENTAL THERETO, AS GRANTED IN A DOCUMENT:
GRANTED TO: W CORPORATION
PURPOSE: GAS
RECORDING DATE: 12/15/17
RECORDING NO.: 4523171
AFFECTS: FIVE (5) DISTRIBUTION LINES WITHIN THE NORTH (NOT PLOTTED)
6. NOTICE OF ADJACENT INTERESTS AND CONFLICTS
RECORDING DATE: 08/27/20
RECORDING NO.: 4523171
(NOT PLOTTED)

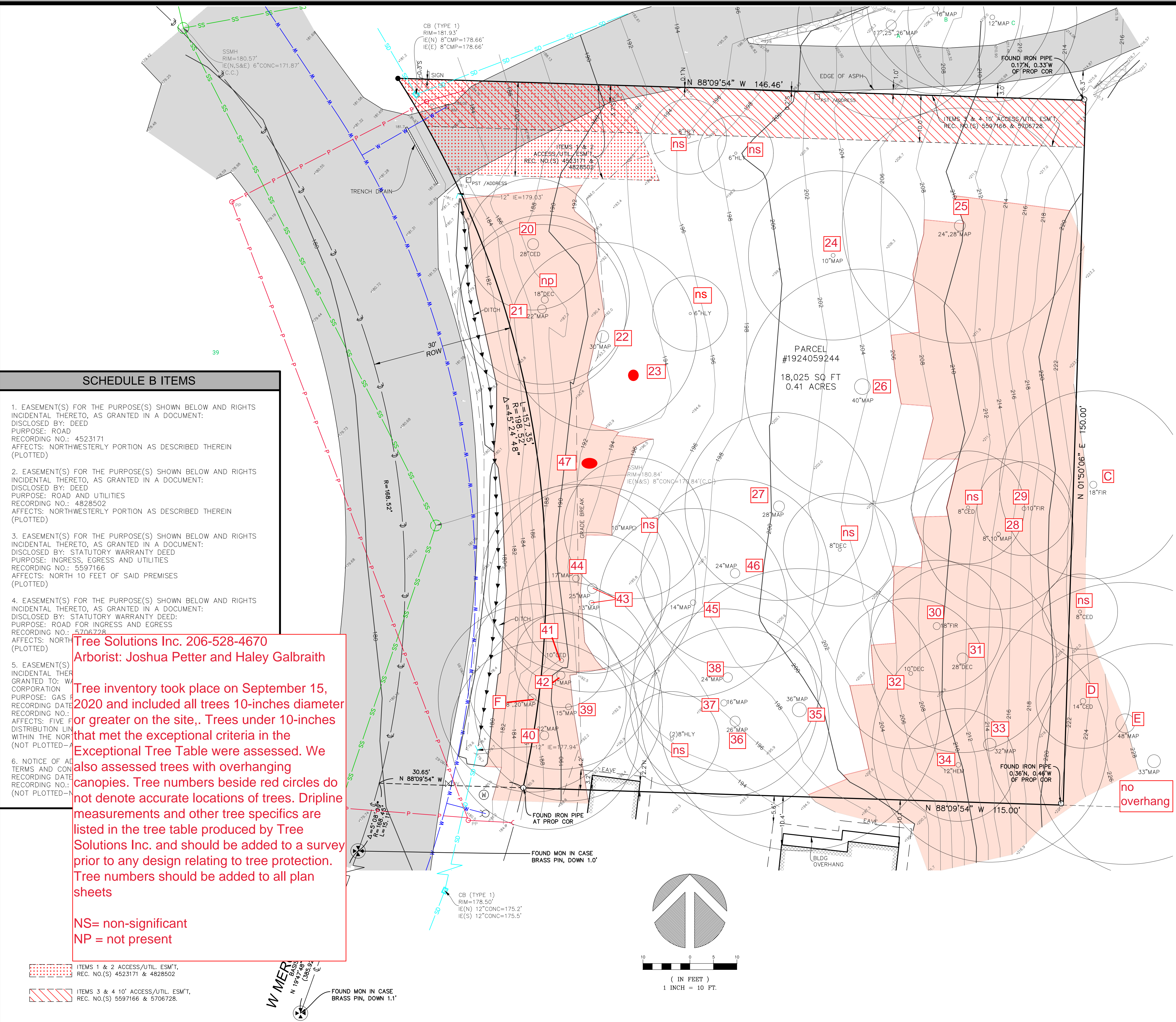
Tree Solutions Inc. 206-528-4670
Arborist: Joshua Petter and Haley Galbraith

Tree inventory took place on September 15, 2020 and included all trees 10-inches diameter or greater on the site. Trees under 10-inches that met the exceptional criteria in the Exceptional Tree Table were assessed. We also assessed trees with overhanging canopies. Tree numbers beside red circles do not denote accurate locations of trees. Dripline measurements and other tree specifics are listed in the tree table produced by Tree Solutions Inc. and should be added to a survey prior to any design relating to tree protection. Tree numbers should be added to all plan sheets

NS= non-significant
NP = not present

- ITEMS 1 & 2 ACCESS/UTIL. ESM'T, REC. NO.(S) 4523171 & 4828502
- ITEMS 3 & 4 10' ACCESS/UTIL. ESM'T, REC. NO.(S) 5597166 & 5706728.

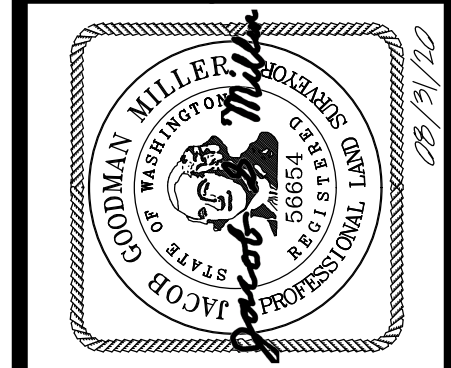
FOUND MON IN CASE BRASS PIN, DOWN 1.1'



measure success

TOPOGRAPHIC & BOUNDARY SURVEY
NW 1/4 OF NW 1/4 SEC 19, TWP. 24N., RGE. 05E., W.M.
PARCEL NO. 1924059244

MORAN RESIDENCE
5000 W MERCER WAY
MERCER ISLAND, WA 98040



Terrane
10801 Main Street, Suite 102, Bellevue, WA 98004
phone 425.458.4498 support@terrane.net
www.terrane.net

JOB NUMBER:	201386
DATE:	08/27/20
DRAFTED BY:	TGC
CHECKED BY:	JGM
SCALE:	1" = 10'
REVISION HISTORY	
08/31/20	STEEP SLOPE AREA
SHEET NUMBER	
1 OF 1	