Tree Solutions Inc
Consulting Arborists

Project No. TS - 7271

Preliminary Arborist Report

To:	Offe Engineers, Constantine Builders
Site:	8817 SE 44th St, Mercer Island, 98040
Re:	Tree Inventory for proposed parcel division
Date:	Oct. 29, 2020
Project Arborist:	Joseph Sutton-Holcomb ISA Certified Arborist #PN- 8397A ISA Qualified Tree Risk Assessor
Reviewed By:	Josh Petter ISA Certified Arborist #PN-8406A ISA Qualified Tree Risk Assessor
Referenced Documents:	Site Plan – Offe Engineers (dated 10.20.2020)
Attached:	Table of Trees Tree Site Map Short Plat Drawings (Offe Engineers, dated 10.28.2020)

Summary

I inventoried and assessed 38 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 trees assessed, nine met the exceptional tree criteria outlined in the MICC.

I found two possible Exceptional tree groves on-site. Per MICC, trees that are part of a grove shall also be considered Exceptional trees, unless they also meet the definition of a hazardous tree. The Exceptional grove status should be confirmed during the construction planning process if construction is proposed to occur in proximity to grove trees, as it will affect tree protection and permissible development impacts to trees. The attached annotated survey shows the locations of the possible groves.

There were eight adjacent trees that required documentation for this property. Trees on neighboring properties were documented if they appeared to be greater than 10-inches diameter at standard height (DSH) and their driplines extended over the property line. I used an alphabetical tree identifier for trees off-site.

Assignment and Scope of Work

This report outlines the site inspection by Joseph Sutton-Holcomb and Andrea Starbird, of Tree Solutions Inc, on July 21, 2020. I was asked to visit the site and provide a report including findings and management recommendations. George Constantine, of Constantine Builders, requested these services for project planning purposes.

Observations

Site

This 19,500 square foot site is located at SE 44th St in Mercer Island. According to King County iMap, no environmentally critical areas exist on-site. The tax parcel number for the property is 759810-0191. An existing wood frame single-story house exists on-site, which is currently unoccupied.

Proposed Plans

The most recent plans (Site Plan – Layout A & Layout B, dated Oct. 20, 2020) propose to subdivide the property into northern and southern parcels. Twenty trees are proposed for removal to accommodate installation of utilities, access driveways, and to allow for construction of two single-family residences.

The plans show 20 site trees proposed for removal. Five of these 20 trees are exceptional by size, and 16 are exceptional due to grove status.

Eighteen (18) trees are proposed for retention. Of these 18 trees, nine will be impacted by construction. Two of the retained and impacted trees are exceptional by size, and all impacted trees are exceptional due to grove status.

Trees

Thirty-eight trees were tagged and assessed on-site. We also assessed eight off-site trees that were directly adjacent to western edge of the parcel on the other side of the driveway.

Nine of the 38 trees are Exceptional by size according to MICC. Additionally, I have identified two possible exceptional groves on the site. The MICC defines a grove as a group of eight or more trees, each equaling or exceeding 10 inches diameter at standard height (DSH). All trees in an Exceptional grove shall be considered Exceptional and protected as such per the code. It appears that one of the possible groves includes some of the adjacent site trees across the driveway. See the aerial map included in the photos. The attached annotated survey shows the locations of the possible groves.

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

I have not reviewed a full set of construction drawings, but I have reviewed plans from Offe Engineers proposing a subdivision of the parcel. These plans show proposed building locations, driveway locations, and proposed storm, water, and sewer lines. I reviewed the impacts to trees as shown on the plans and provided feedback on which trees were feasible for retention.

All impacted trees are noted as such in the table of trees, and are given limits of disturbance. Tree protection fencing shall be placed at these limits of disturbance prior to any work occurring on the site, including demolition, and remain in place until all construction has concluded.

In cases where a tree has limits of disturbance within the dripline on one specific side of the tree, the limits of disturbance on all other sides are the dripline or greater.

If, for any reason, impacts are proposed to occur within the limits of disturbance, Tree Solutions and the City of Mercer Island shall be notified and given the opportunity to monitor the excavation and advise on mitigation techniques. Impacts within the limits of disturbance without monitoring and mitigation could result in tree decline or destabilization.

The plans I reviewed show several trees impacted within their limits of disturbance, including trees 401, 405, 418, 423, 430, and H.

Trees 418 and H are impacted by proposed paving activity, which may be less impactful if no grade cuts are needed below the existing grade. Some amount of forest duff, or the "O" soil horizon, could be removed to accommodate paving with minimal effects on these trees. This work shall be monitored by Tree Solutions if it occurs within the limits of disturbance.

Additionally, the tree protection specifications included in Appendix F. shall be followed for all impacted and retained trees.

Tree protection requirements during construction
The MICC chapter 19.10.080 "Tree Protection Standards" requires that a Tree Protection Plan be created for all development projects in proximity to trees. This tree protection plan must be consistent with the ISA Best Management Practices – Managing Trees During Construction.

In my professional opinion, the Recommended Limits of Disturbance (RLOD) for the trees on this parcel should be the dripline, as defined in the attached Table of Trees, or the defined Limits of Disturbance also provided in that table.

I have not reviewed a tree protection plan that shows limits of disturbance and tree protection fencing locations for retained and impacted trees. I recommend creating such a plan as soon as possible.

The MICC allows for alternative methods for tree protection. It states the following:

The city arborist may approve construction-related activity or work within the tree protection barriers if the city arborist concludes:

1. That such activity or work will not threaten the long-term health of the retained tree(s); and

2. That such activity or work complies with the protective methods and best building practices established by the International Society of Arboriculture. (Ord. 17C-15 § 1 (Att. A)).

When construction document drafts are available, Tree Solutions should review to determine how the plans will impact tree health and stability. Once we identify appropriate Limits of Disturbance for

impacted trees, Tree Solutions can update the arborist report to include that information, and the project team can add that information to the tree protection plan for review by the City Arborist.

Recommendations

- Obtain all necessary permits and approval from the City prior to commencement of site work.
- Create site plans that include limits of disturbance and critical root zones of all retained trees on-site.
- Tree protection consisting of chain-link fencing shall 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 shall 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,

Joseph Sutton-Holcomb,
Consulting Arborist

Appendix A **Photographs**

Photograph 1. A view looking north at some of the trees near the driveway. The existing house and shed can also be seen.

Photograph 2. A large “L” shaped wound with associated decay and significant response growth on tree 430, an Exceptional bigleaf maple. This tree is considered in “fair” structural condition despite this defect due to the good response growth; it is a species characteristic of bigleaf maples to often survive with large wounds for long periods of time.

Photograph 3. A view looking north along the driveway at the western edge of the property. To the left, the most densely forested portion of the property, which is likely an exceptional grove. Some of the adjacent site trees assessed are visible on the left side of the driveway.

Photograph 4. An aerial view of the property from King County iMap. Contiguous tree canopy covers a large portion of the site, resulting in Exceptional Grove status for many of the trees on the property.

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 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 F **Tree Protection Specifications**

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):** Tree Solutions requires a tree protection zone (TPZ) be defined for each retained tree. 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 tree protection is placed at the top of a rockery, high visibility fencing shall be used.
    e. 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**

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Table of Trees

8817 SE 44th St. Mercer Island, WA

Arborist: Joseph S-H, Andrea S
Date of Inventory: July 21, 2020
Table Prepared: Oct 27, 2020

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Exceptional Grove? (Yes/No)	Exceptional	Proposed Action	Limits of Disturbance*	Notes
401	*Pseudotsuga menziesii*	*Douglas-fir*	37.4		Good	Good	31.1	29.6	28.1	29.6	*30.0*	*Yes*	Exceptional - Size	Retain	12.5' radius from face of trunk, 15.5' preferable	Adjacent to driveway, utility box 3' from trunk, prominent surface roots, codominant at 60', one stem significantly smaller
402	*Thuja plicata*	*Western Redcedar*	26.0		Good	Good	14.1	14.1	14.1	14.1	*30.0*	*Yes*		Impact	11' radius from face of trunk	Typical drought stress canopy sparseness, ivy on stem, blackberries in dripline, brush pile in root zone
403	*Thuja plicata*	*Western Redcedar*	12.8		Good	Good	8.5	8.5	8.5	8.5	*30.0*	*Yes*		Impact	10' radius from face of trunk	Brush pile in root zone, suppressed by larger adjacent Douglas-firs
404	*Pseudotsuga menziesii*	*Douglas-fir*	26.5		Good	Good	19.1	19.1	19.1	19.1	*30.0*	*Yes*		Impact	15' radius from face of trunk	Wound 3'-6' with response, brush on north side
405	*Pseudotsuga menziesii*	*Douglas-fir*	52.5		Good	Good	25.2	31.2	31.2	28.2	*30.0*	*Yes*	Exceptional - Size	Impact	18' radius from face of trunk on east side, 21' radius in all other directions	Concrete pad from shed is 4' from trunk, light attached to trunk at 15', cut enveloped electrical line on east side, crown raised in past, 3 reiterated scaffolds with narrow attachment angles, could prune to subordinate
406	*Arbutus menziesii*	*Madrone*	16.7	15.1, 7.2	Good	Good	13.2	12.7	18.7	20.7	*6.0*	*No*	Exceptional - Size	Remove	N/A	Shared tree, phototropic to southwest, bricks at base
407	*Castaneda dentata*	*American chestnut*	9.9		Good	Good	17.4	13.4	15.4	15.9		*No*		Impact	10' radius from face of trunk	Chestnut tree, not on survey, stub cuts on trunk
408	*Malus sp.*	*Apple*	17.0	13.3,10.6	Good	Fair	16.7	16.7	16.7	16.7	*20.0*	*No*		Remove	N/A	3"diameter stub cuts, 7' from fence
409	*Pinus jeffreyi*	*Jeffrey pine*	29.7		Good	Good	18.2	21.2	25.2	16.2	-	*No*		Remove	N/A	Clusters of 3 needles 5-6" long, ivy on trunk, 7.5' from fence to south, needle disease causing premature wilt/drop, tree health is good overall
410	*Pseudotsuga menziesii*	*Douglas-fir*	15.5		Good	Fair	13.6	16.6	12.6	19.6	*30.0*	*Yes*		Impact	8' radius from face of trunk	Codominant stems at 12', one stem is smaller & subordinate, trunk is 6' from fence, brush in root zone
411	*Pseudotsuga menziesii*	*Douglas-fir*	34.3		Good	Good	24.4	24.4	24.4	24.4	*30.0*	*Yes*	Exceptional - Size	Impact	11' from face of trunk to NE only, 14' is preferable	Epicormic release on north side of trunk, unusual trunk anatomy as well
412	*Pseudotsuga menziesii*	*Douglas-fir*	11.8		Good	Fair	3.5	12.0	11.5	7.5	*30.0*	*Yes*		Retain	Tree dripline	Utility line in contact with stems, most of live canopy to southeast, codominant stems with narrow union, third stem was removed in past
413	*Pseudotsuga menziesii*	*Douglas-fir*	8.1		Good	Fair	1.3	10.3	10.3	8.8	*30.0*	*no (under 10" diameter)*		Retain	Tree dripline	Topped for wire clearence, 3 reiterated trunks, most of live canopy to southeast
414	*Pseudotsuga menziesii*	*Douglas-fir*	17.1		Good	Fair	10.7	15.7	22.7	12.7	*30.0*	*Yes*		Retain	Tree dripline	Broken top with reiteration at 45', ivy at base
415	*Pseudotsuga menziesii*	*Douglas-fir*	24.7		Good	Good	18.0	18.0	21.0	25.0	*30.0*	*Yes*		Retain	Tree dripline	Epicormic release, growing 2' from driveway, ivy at base, lost top possibly due to storm damage
416	*Pseudotsuga menziesii*	*Douglas-fir*	12.7		Good	Fair	12.0	17.0	13.5	16.0	*30.0*	*Yes*		Retain	Tree dripline	Previously topped, ivy at base

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417	*Pseudotsuga menziesii*	*Douglas-fir*	12.1		Good	Good	9.5	10.5	10.0	10.0	*30.0*	*Yes*		Impact	11' radius from face of trunk	Ivy at base, recent soil disturbance in dripline
418	*Pseudotsuga menziesii*	*Douglas-fir*	17.6		Good	Good	13.7	18.7	11.2	15.7	*30.0*	*Yes*		Impact	8' from trunk to north, 11' to east, 11' to west.	Soil disturbance in root zone, driveway 7’ from trunk
	Pseudotsuga menziesii	*Douglas-fir*	35.1		Good	Good	22.0	23.0	18.0	18.0	*30.0*	*Yes*	Exceptional - Size	Remove	N/A	Existing house 16’ from trunk to east,brush and soil disturbance in dripline on west side
420	*Pseudotsuga menziesii*	*Douglas-fir*	19.7		Good	Good	13.8	7.8	13.8	13.8	*30.0*	*No*		Remove	N/A	Dead ivy up to 65’, has been severed at base but canopy is stunted from this
421	*Pseudotsuga menziesii*	*Douglas-fir*	31.0		Good	Good	22.8	24.3	32.3	23.3	*30.0*	*Yes*	Exceptional - Size	Remove	N/A	Dead ivy in tree, ivy at base, epicormic release on lower trunk, compaction in root zone to west
422	*Pseudotsuga menziesii*	*Douglas-fir*	21.6		Good	Fair	15.9	18.9	11.9	17.4	*30.0*	*Yes*		Remove	N/A	Kink in trunk at 45’ previously lost top higher up on the stem
423	*Pseudotsuga menziesii*	*Douglas-fir*	25.1		Good	Good	20.5	12.0	17.0	21.5	*30.0*	*Yes*		Impact	13' radius from face of trunk, 10' to south for driveway	Abuts driveway on west side, compaction in root zone
424	*Pseudotsuga menziesii*	*Douglas-fir*	20.4		Good	Fair	21.4	9.9	11.4	22.4	*30.0*	*Yes*		Remove	N/A	Lost top with multiple small reiterations, driveway 4’ from base
425	*Pseudotsuga menziesii*	*Douglas-fir*	24.9		Good	Good	16.0	16.0	23.0	23.0	*30.0*	*Yes*		Remove	N/A	Dead ivy on trunk
426	*Pseudotsuga menziesii*	*Douglas-fir*	14.6		Good	Good	16.6	15.1	13.6	18.6	*30.0*	*Yes*		Remove	N/A	Kink in trunk at 25', perhaps from losing its top in the past
427	*Pseudotsuga menziesii*	*Douglas-fir*	21.1		Good	Good	19.9	7.9	18.9	17.4	*30.0*	*Yes*		Remove	N/A	Asymmetric canopy, driveway abuts trunk to west approx 4’ from trunk
428	*Pseudotsuga menziesii*	*Douglas-fir*	22.5		Good	Fair	14.9	12.9	20.4	20.9	*30.0*	*Yes*		Remove	N/A	Kink in trunk at 40’
429	*Pseudotsuga menziesii*	*Douglas-fir*	21.7		Good	Good	15.9	12.9	14.9	11.9	*30.0*	*Yes*		Remove	N/A	Dead ivy on trunk, kink in trunk at 50’
430	*Acer macrophyllum*	*Bigleaf Maple*	34.7		Good	Fair	38.4	32.4	23.4	26.4	*30.0*	*Yes*	Exceptional - Size	Impact	15' from trunk to southeast only for building foundation	Cavities with decay in trunk, large cavity at base with wound up to 6’, wound makes an L shape and is 3.5’ x 4’ on the north side, k. Deusta at base, perhaps caused by large trunk failure many years ago, tearouts in canopy, canopy color looks good, good leaf size,
431	*Pseudotsuga menziesii*	*Douglas-fir*	26.3		Good	Fair	23.1	14.6	1.1	16.1	*30.0*	*Yes*		Remove	N/A	Pini conks on trunk, dead branches in crown with saprophytic fungi, lost top many years ago, recommend advanced aerial assessment if tree is retained
432	*Pseudotsuga menziesii*	*Douglas-fir*	12.1		Good	Fair	16.5	8.5	10.0	10.5	*30.0*	*Yes*		Remove	N/A	Large canker on stem at 45’, growing 3’ from old driveway, good candidate for removal
433	*Pseudotsuga menziesii*	*Douglas-fir*	17.5		Good	Good	15.7	8.2	8.2	8.7	*30.0*	*Yes*		Remove	N/A	Ivy on stem to 20’
434	*Pseudotsuga menziesii*	*Douglas-fir*	26.6		Good	Good	17.6	20.6	20.1	17.1	*30.0*	*Yes*		Remove	N/A	Ivy on stem to 15’

Tree Solutions Inc
Consulting Arborists

Table of Trees

8817 SE 44th St. Mercer Island, WA

Arborist: Joseph S-H, Andrea S
Date of Inventory: July 21, 2020
Table Prepared: Oct 27, 2020

Tree ID	Scientific Name	Common Name	DSH (inches)	DSH Multistem	Health Condition	Structural Condition	N	E	S	W	Exceptional Threshold	Exceptional Grove? (Yes/No)	Exceptional	Proposed Action	Limits of Disturbance*	Notes
435	*Pseudotsuga menziesii*	*Douglas-fir*	39.0		Good	Good	21.1	30.1	28.6	24.1	*30.0*	*Yes*	Exceptional - Size	Remove	N/A	House foundation 10’ to southeast of trunk, 6” holly tree on southeast side of trunk, crown raised, first branches at 40’ above ground
436	*Pseudotsuga menziesii*	*Douglas-fir*	27.2		Good	Fair	23.6	23.1	27.6	21.1	*30.0*	*Yes*		Remove	N/A	Large kink in trunk at 55’,likely from lost or removed top
437	*Arbutus menziesii*	*Madrone*	17.2		Good	Good	35.7	15.2	3.7	13.7	*6.0*	*Yes*	Exceptional - Size	Impact	12' radius from face of trunk to south only	Some dieback in lower stems and stems overhanging road, as is typical for madrones in urban environments, large climbing rose on trunk up to 30’, phototropic to north over road, cankers on trunk
438	*Pseudotsuga menziesii*	*Douglas-fir*	19.3		Good	Fair	14.3	17.3	15.3	14.3	*30.0*	*Yes*		Remove	N/A	Pitch flow from trunk, previously lost top, burl on trunk at 5’, pile of deadwood abuts base of tree
A	*Pseudotsuga menziesii*	*Douglas-fir*	23.5		Good	Good	18.0	14.5	26.0	19.0	*30.0*	*Yes*		Retain	Tree dripline	Driveway abuts base of tree
B	*Pseudotsuga menziesii*	*Douglas-fir*	22.2		Good	Fair	12.4	14.9	14.4	15.9	*30.0*	*Yes*		Retain	Tree dripline	Driveway abuts base of tree, twisting top possibly from past damage to stem
C	*Pseudotsuga menziesii*	*Douglas-fir*	28.5		Good	Good	28.7	23.7	15.2	16.2	*30.0*	*Yes*		Retain	Tree dripline	Driveway abuts base of tree, low live crown ratio,slightly sparse canopy
D	*Pseudotsuga menziesii*	*Douglas-fir*	18.2		Good	Good	9.8	13.8	16.8	36.8	*30.0*	*Yes*		Remove	N/A	Apical stem leans strongly to west creating an unusual form, driveway abuts base of tree
E	*Pseudotsuga menziesii*	*Douglas-fir*	25.3		Good	Good	23.1	16.1	16.1	22.1	*30.0*	*Yes*		Remove	N/A	Driveway abuts base of tree, low live crown ratio
F	*Acer macrophyllum*	*Bigleaf Maple*	14.8		Good	Good	10.6	17.1	20.6	23.6	*30.0*	*No*		Impact	4' radius from trunk on east side only, limit grade cuts within dripline	Surface roots impacted by driveway
G	*Acer macrophyllum*	*Bigleaf Maple*	11.7		Good	Good	15.5	11.5	16.0	17.5	*30.0*	*No*		Remove	N/A	base of tree directly abuts driveway to east
H	*Pseudotsuga menziesii*	*Douglas-fir*	32.7		Good	Fair	31.9	28.9	19.4	19.4	*30.0*	*No*		Impact	no grade cuts within 8' of trunk to east	Gravel driveway to east, road to north, lost top at 60’ with reiterations, road 13.5' from trunk

* Limits of disturbance are measured radially from the face of the trunk.

Notes

> Tree dripline is preferred limits of disturbance for all trees
> If limits of disturbance within the dripline are allowed on a specific side only, the limits of disturbance on all other sides is the tree dripline or greater.
> paving within limits of disturbance may be feasible if no grade cuts are made
> any work occuring within limits of disturbance shall be monitored by a qualified ISA Certified Arborist.
> contact project arborist if excavation requires removal of any roots greater than 3" diameter within tree driplines

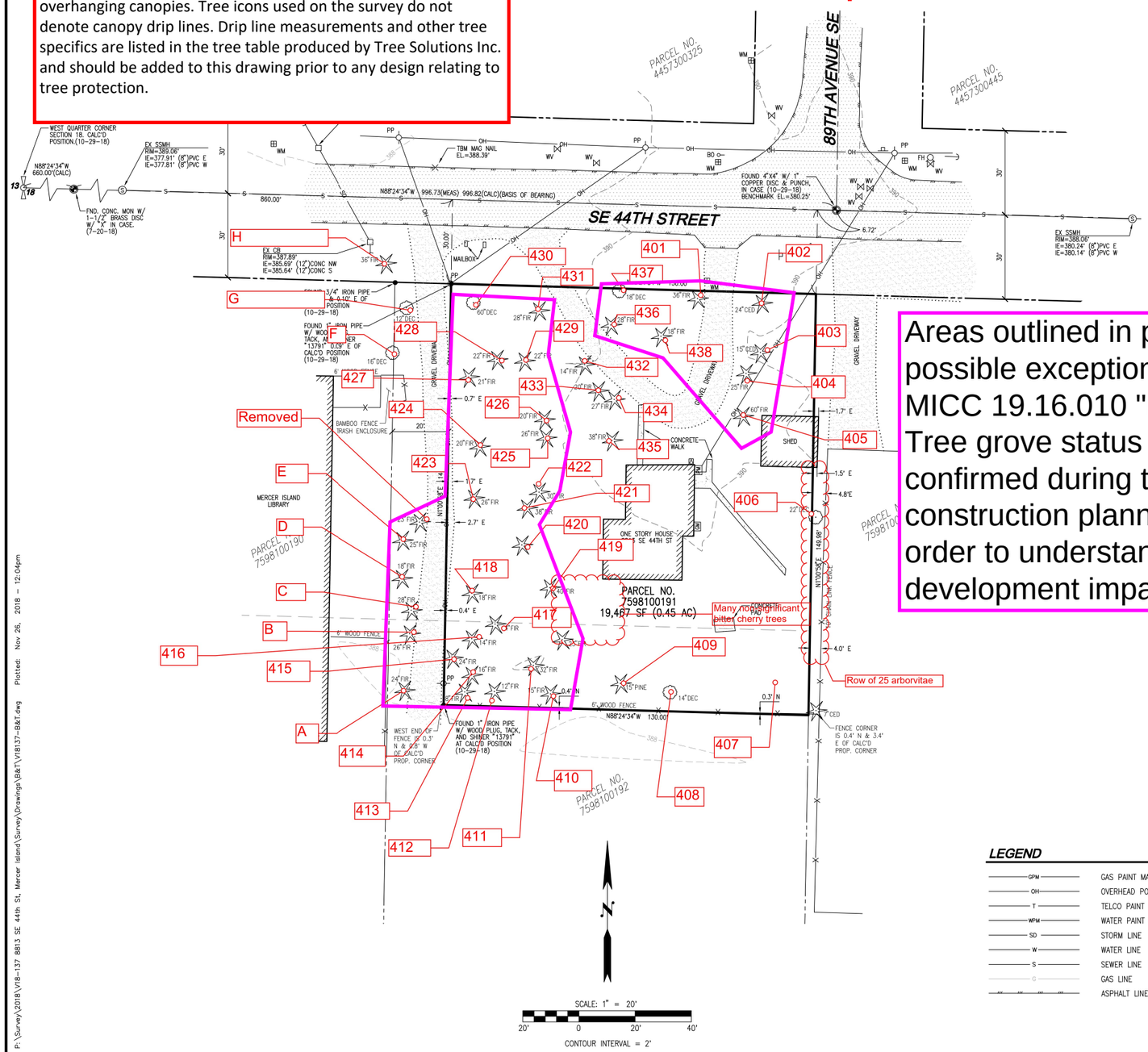
A PORTION OF THE NE 1/4 OF THE SW1/4 OF SEC 18, TWN 24 N, RGE 5 E, W.M., KING COUNTY, WASHINGTON

CONSTANTINE PROPERTY
BOUNDARY AND TOPOGRAPHIC SURVEY

Tree Solutions Inc. Arborist: Joseph Sutton-Holcomb
206-528-4670

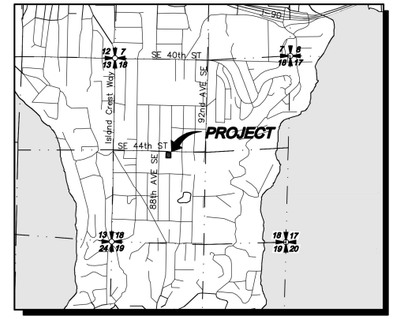
Tree Inventory
July 29, 2020

Tree inventory took place on July 21, 2020 and included all regulated trees on the site. We also assessed trees with overhanging canopies. Tree icons used on the survey do not denote canopy drip lines. Drip line measurements and other tree specifics are listed in the tree table produced by Tree Solutions Inc. and should be added to this drawing prior to any design relating to tree protection.



Areas outlined in purple denote possible exceptional groves Y MICC 19.16.010 "Definitions." Tree grove status should be confirmed during the construction planning process in order to understand permissible development impacts.

SCALE: 1" = 20'
CONTOUR INTERVAL = 2'



VICINITY MAP
SCALE: 1"=2000'

LEGAL DESCRIPTION

CHICAGO TITLE INSURANCE COMPANY
GUARANTEE/CERTIFICATE NO.0136698-ETU
EFFECTIVE DATE: NOVEMBER 5, 2018 AT 8:00AM

THE NORTH 30 FEET OF THE EAST 1/2 OF LOT 9; AND THE EAST 1/2 OF LOT 10, LESS THE WEST 20 FEET THEREOF; BLOCK 8 VITUS SCHMID'S EAST SEATTLE ACRE TRACTS, ACCORDING TO THE PLAT RECORDED IN VOLUME 7, PAGE 76 OF PLATS;

SITUATE IN THE COUNTY OF KING, STATE OF WASHINGTON.

SURVEY INFORMATION

VERTICAL DATUM
NORTH AMERICAN VERTICAL DATUM-1988

BENCHMARK
BENCHMARK:
MONUMENT AT THE INTERSECTION OF SE 44TH ST & 89TH AVE SE
ELEVATION = 380.25'
TBM:
MAG NAIL SET ON NORTH SIDE OF SE 44TH ST
ELEVATION = 388.39'

HORIZONTAL DATUM:
NAD 83/91
WASHINGTON STATE COORDINATES-NORTH ZONE

BASIS OF BEARING
NAD83/91 FROM GPS OBSERVATION
MONUMENTED CENTERLINE OF SE 44TH STREET
(BEARING = N88°24'34"W)

REFERENCES

(R1) PLAT OF VITUS SCHMID'S EAST SEATTLE ACRE TRACTS VOL. 7, PG. 76 OF PLATS, FILLED IN KING COUNTY, WA

(R2) RECORD OF SURVEY AF#199005159008 VOL 72, PG. 293 OF SURVEYS, FILLED IN KING COUNTY, WA

(R2) SHORT PLAT AF#197801069010, FILLED IN KING COUNTY, WA

EQUIPMENT & PROCEDURES

METHOD OF SURVEY:
SURVEY PERFORMED BY FIELD TRAVERSE
INSTRUMENTATION:
LEICA MS-50 ROBOTIC TOTAL STATION WITH DATA COLLECTOR AND LEICA GS-14 GPS MAINTAINED IN ADJUSTMENT TO MANUFACTURES SPECIFICATIONS AS REQUIRED BY WAC 332-130-100
PRECISION:
MEETS OR EXCEEDS STATE STANDARDS WAC 332-130-090

SURVEY NOTES

1. BOUNDARY LINES SHOWN AND CORNERS SET REPRESENT DEED LOCATIONS; OWNERSHIP LINES MAY VARY. NO GUARANTEE OF OWNERSHIP IS EXPRESSED OR IMPLIED. THIS SURVEY WAS PERFORMED WITH THE BENEFIT OF A TITLE REPORT.
2. SURVEY FIELDWORK PERFORMED ON OCTOBER 29, 2018
3. THIS BOUNDARY TOPOGRAPHIC MAP MAY HAVE DEPICTED OCCUPATIONAL INDICATORS (IE: EDGE OF ASPHALT DRIVE, FENCE LINES, BUILDINGS AND RETAINING WALLS-- SEE MAP FOR SITE SPECIFICS) AS PER W.A.C. 332-130. LINES OF OCCUPATION, AS DEPICTED MAY INDICATE AREAS FOR POTENTIAL CLAIMS OF UNWRITTEN OWNERSHIP. THIS BOUNDARY TOPOGRAPHIC MAP HAS ONLY DEPICTED THE RELATIONSHIP BETWEEN LINES OF OCCUPATION AND DEEDED LINES OF RECORD. NO RESOLUTION OR OWNERSHIP BASED ON UNWRITTEN RIGHTS HAS BEEN MADE BY THIS BOUNDARY TOPOGRAPHIC MAP OR BY ANY PERSONNEL OF LDC, INC.
4. POTENTIAL ENCROACHMENTS
   -GRAVEL DRIVEWAY HAS BEEN OBSERVED AS CROSSING THE WESTERLY DEED LINE AS SHOWN HEREON.
   -SHED HAS BEEN OBSERVED AS CROSSING THE EASTERLY DEED LINE AS SHOWN HEREON.

LEGEND

GPM	GAS PAINT MARK	CB	CATCH BASIN	SSMH	SEWER MANHOLE		RETAINING WALL
OH	OVERHEAD POWER LINE	SDMH	STORM MANHOLE	SDCO	STORM CLEANOUT		EXISTING PAVEMENT
T	TELCO PAINT MARK	FH	FIRE HYDRANT	T	TELCO MANHOLE	CONC	EXISTING CONCRETE
WPM	WATER PAINT MARK	CV	GAS VALVE	TEL	TELCO RISER		EXISTING GRAVEL
SD	STORM LINE		GUY ANCHOR	WM	WATER METER		EXISTING BUILDING
W	WATER LINE	PP	POWER POLE	WV	WATER VALVE		CALCULATED QUARTER SECTION CORNER
S	SEWER LINE		JUNCTION BOX		IRRIGATION CONTROL VALVE		
G	GAS LINE		LIGHT POLE	PV	POWER VAULT		
	ASPHALT LINE	PT	LIGHT STANDARD POWER TRANSFORMER	PV	POWER VAULT		

REVISIONS

NO.	DATE	DESCRIPTION	BY

LDC
Engineering
Structural
Planning
Survey
THE CIVIL ENGINEERING GROUP
20210 142nd Avenue NE
Woodinville, WA 98072
Ph. 425.806.1869
Fx. 425.482.2893
www.LDCcorp.com

0. GEORGE CONSTANTINE
8813 SE 44TH ST, MERCER IS., WA
BOUNDARY AND TOPOGRAPHIC SURVEY

MICHAEL ROBERT MARTIN — STATE OF WASHINGTON — 48701 — REGISTERED PROFESSIONAL LAND SURVEYOR — 9-14-18

JOB NUMBER:	V18-137
DRAWING NAME:	V18137-B&T
DESIGNER:	
DRAFTING BY:	NSY
DATE:	11-9-18
SCALE:	1"=20'
JURISDICTION:	

BT-01

SHEET 1 OF 1

Drawing: P:\Survey\2018\V18-137 8813 SE 44th St, Mercer Island\Survey\Drawings\B&T\V18137-B&T.dwg Plotted: Nov 26, 2018 - 12:04pm

SE 44th STREET

89th

N88°24'34"W 996.73(MEAS) 996.82(CALC)(BASIS OF BEARING)

860.00'

TBM MAG NAIL
EL.=388.39'

FOUND 4"X4" W/ 1"
COPPER DISC & PUNCH,
IN CASE (10-29-18)
BENCHMARK EL.=380.25'

EX CB
RIM=387.89'
IE=385.69' (12")CONC NW
IE=385.64' (12")CONC S

EX SSMH
RIM=388.06'
IE=380.24' (8")PVC E
IE=380.14' (8")PVC W

.06'
1' (8")PVC E
1' (8")PVC W

FOUND 3/4" IRON PIPE
0.10' N & 0.10' E OF
CALC'D POSITION
(10-29-18)

FOUND 1" IRON PIPE
W/ WOOD PLUG,
TACK, AND SHINER
"13791" 0.09' E OF
CALC'D POSITION
(10-29-18)

24" tall shoring

storm
water
sewer

5' deep

5' deep

trenchless excavation of water service

10' utility easement

60" DETENTION PIPE

BUILDING PAD AREA

PROPOSED LOT A
9,748 SQ. FEET

48" DETENTION PIPE

PROPOSED LOT B
9,748 SQ. FEET

BUILDING PAD AREA

ONE STORY HOUSE
8813 SE 44TH ST

2,437 SQ. FEET OF PAVEMENT
1,158 SQ. FEET OF NEW IMPERVIOUS

driveway

N 01°00'58" E 149.98'

N 01°00'58" E 149.98'

N 88°24'34" W 130.00'

6' WOOD FENCE

BAMBOO FENCE
TRASH ENCLOSURE

10' CHAIN LINK FENCE

GRAVEL DRIVEWAY

CONCRETE PAD

MAILBOX

MERCER ISLAND
LIBRARY

PARCEL NO.
7598100190

PARCEL NO.
7598100111

WEST END OF
FENCE IS 0.3'
N & 0.8' W
OF CALC'D
PROP. CORNER

FOUND 1" IRON PIPE
W/ WOOD PLUG, TACK,
AND SHINER "13791"
AT CALC'D POSITION
(10-29-18)

FENCE CORNER
IS 0.4' N & 3.4'
E OF CALC'D
PROP. CORNER

#A 24"FIR
#B 26"FIR
#C 28"FIR
#D 15"FIR
#E 5"FIR
#F 16"DEC
#G 12"DEC
#H 36"FIR
#401 36"FIR
#402 24"CED
#403 15"CED
#404 25"FIR
#405 60"FIR
#406 21"DEC
#407 0.3' N
#408 14"DEC
#409 15"PINE
#410 24"FIR
#411 30"FIR
#412 12"FIR
#413 18"FIR
#414 16"FIR
#415 24"FIR
#416 14"FIR
#417 14"FIR
#418 18"FIR
#419 30"FIR
#420
#421 18"FIR
#422 20"FIR
#423 26"FIR
#424 20"FIR
#425 26"FIR
#426 20"FIR
#427 22"FIR
#428 22"FIR
#429 14"FIR
#430 60"DEC
#431
#432
#433 20"FIR
#434
#435 38"FIR
#436
#437 18"DEC
#438

1.7' E
1.5' E
4.8'E
2.7' E
0.4' E
4.0' E
30.00'

10/28/2020