

ARBORIST REPORT
For:
NATHAN KORPELA
8441 SE 33rd Place Mercer Island, WA



September 11th, 2023

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Appendix

Tree Summary Table – attached

Tree Locator Map – attached

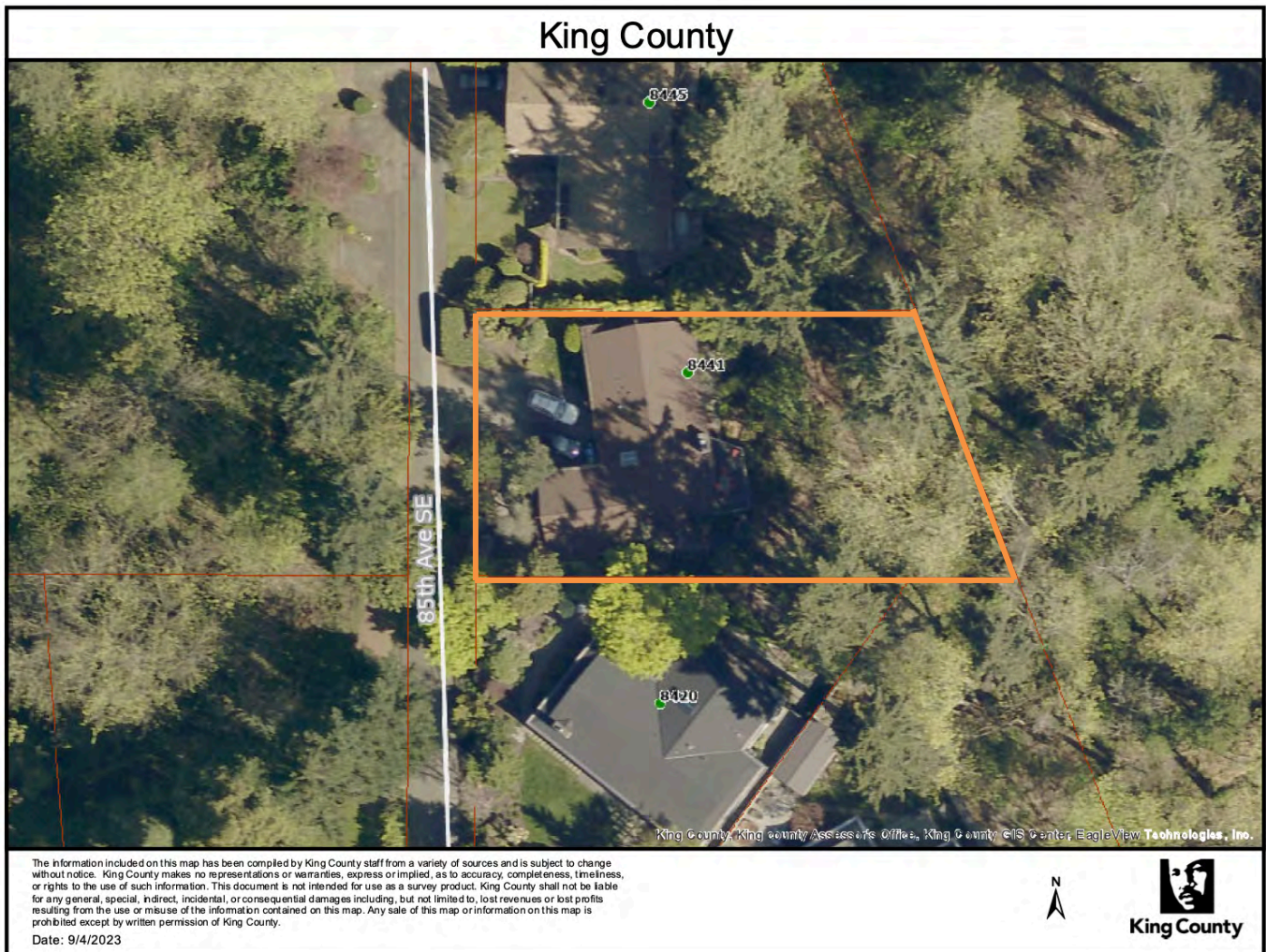
1. Introduction

Salish Restoration Associates was contacted by Nathan Korpela and asked to compile an Arborist Report for a development project on King County Parcel # 666680-0290 located at 8441 SE 33rd Pl. Mercer Island, Washington.

Our assignment is to prepare a written report on current tree conditions which is to be filed with the preliminary permit application for redevelopment of the subject parcel and identify the potential for tree retention in the proposed layout.

This report encompasses all criteria set forth under the City of Mercer Island's tree regulations (Chapter 19.10 of the Mercer Island City Code).

Date of Field Examination: August 29th, 2023



2. Description

The City of Mercer Island defines a 'Large (Regulated) Tree' as any tree with a Diameter at 4.5 feet above grade (DBH) of ten inches or more, or any tree that meets the definition of an 'Exceptional' tree. A total of eight trees with DBH larger than ten inches were located on the property.

Six of the eight Regulated Trees on the property are 'Exceptional Trees'. The City of Mercer Island defines an Exceptional Tree as one that is rare or exceptional by virtue of its size, species, condition, cultural/historic importance, age, and/or contribution as part of a tree grove. The City of Mercer Island defines a 'Grove' as a group of eight or more trees ten inches or larger DBH that form a continuous canopy. In accordance with MICC 19.16.010, trees #4, 5, 6, 7, 8, and 9 are included in a grove extending into a neighboring greenbelt and park. The City may prioritize the retention of Exceptional Trees and limit their removal.

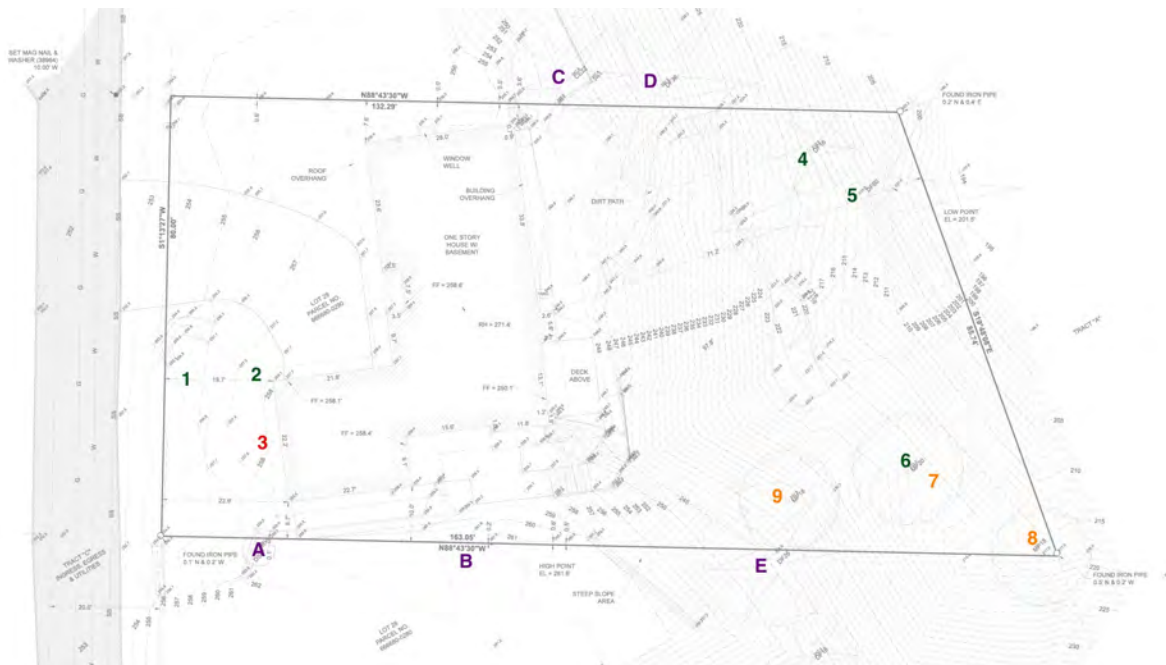
The proposed site plan shows two Regulated Trees (#1 and #2) are conflicting with proposed improvements and will need to be removed to accomplish this work. Tree #3 is below the size threshold to be a Regulated Tree and is in poor condition. This small tree is unlikely to positively contribute to the site and should also be removed. The remaining six Regulated Trees are planned to be retained on the site plan.

There are five Regulated Trees located on the adjacent parcels to the north and south that have canopies overhanging the subject property. These trees must be protected throughout development activity on the site.

The existing home is found on the western half of the property. The site plan shows this structure will be significantly rebuilt. The west side of the subject parcel is generally flat with a steep slope on the east side dropping approximately 50 feet in elevation to the property boundary with a neighboring greenbelt and park beyond. Many large native trees are found in the greenbelt, several of which have English ivy climbing into their crowns. Other invasive species including Himalayan blackberry and English holly are found on the slope.

MICC tree regulations allow removal of trees associated with property development when done in a way that minimizes tree removal and retains at least 30% of the regulated trees on site. Regulated and Exceptional Trees are prioritized for retention.

Existing Site Conditions



3. Methodology

The trees in this report were inspected on August 29th, 2023. Each tree's diameter was measured at 4.5 feet above grade with diameter tape. The inspection procedure involved evaluating several factors related to the health and stability of trees on the site.

The crown of each tree was inspected for vigor. This includes examining the foliage, buds, and branches for color, density, form, annual shoot growth, limb dieback, or disease. The live crown ratio (LCR) was estimated for coniferous species and scored accordingly.

The trunk of each tree was inspected for defects such as cavities, wounds, or fungal fruiting bodies (conks or mushrooms). Other defects inspected for include seams, insects, bleeding, callus development, broken or dead tops, cracks, and unnatural leans. Structural defects such as crooks, forks with V-shaped crotches, multiple attachments, or excessive sweep were also noted.

The root collar and surface roots were inspected for decay, insects, or damage, and inspected for signs they have been injured, undermined, or exposed, or if the original grade had been altered.

Each observed tree was assigned a numbered aluminum tag which corresponds with the numbers on the Tree Summary Table and Tree Locator Map. The Tree Locator Map indicates the location of each Regulated Tree with its dripline and limits of disturbance delineated, and the Tree Summary Table provides specific information on tree sizes and dripline measurements, as well as their condition and any relevant observations made during the inspection.

The four condition categories are described below:

Excellent – free of structural defects, no disease or pest problems, no root issues, excellent structure/form with uniform crown or canopy, foliage of normal color and density, above average vigor, it will be wind firm if isolated, suitable for its location.

Good – free of significant structural defects, no disease concerns, minor pest issues, no significant root issues, good structure/form with uniform crown or canopy, foliage of normal color and density, average or normal vigor, will be wind firm if isolated or left as part of a grouping or grove of trees, suitable for its location.

Fair – minor to moderate structural defects not expected to contribute to a failure in near future, no disease concerns, moderate pest issues, no significant root issues, asymmetric or unbalanced crown or canopy, average or normal vigor, foliage of normal color, moderate foliage density, will be wind firm if left as part of a grouping or grove of trees, cannot be isolated, suitable for its location.

Poor – major structural defects expected to cause fail in near future, disease or significant pest concerns, decline due to old age, significant root issues, asymmetric or unbalanced crown or canopy, sparse or abnormally small foliage, poor vigor, not suitable for its location.

4. Observations

Site Trees

Tree #1 is a Japanese black pine (*Pinus thunbergia*) with a DBH of 10.8 inches found on a slope south of the driveway leading the existing home. This tree is in good health and structural condition. Its trunk is forked into codominant stems joined at ten feet. This tree is 17 feet west of the existing garage.



PHOTO 1: Tree #1 viewed from the north. Note codominant stems.

Tree #2 is a Scot's pine (*Pinus sylvestris*) with a DBH of 10.7 inches found 4.5 feet west of the existing garage. This tree is in good health and structural condition. It will likely need to be removed to accomplish the development goals.



PHOTO 2: Trees #1, #2 viewed from the north. Note proximity to existing garage

Tree #3 is a Florida dogwood (*Cornus florida*) with a DBH of 6.8 inches found five feet south of the existing house. This tree is in poor health and structural condition due to a fungal infection (anthracnose) and extensive pruning. This is not a 'Regulated Tree' due to its size, and it is not likely to remain viable in the long term.



PHOTO 3: Poor condition dogwood Tree #3 viewed from the south. Note lack of live foliage.

Tree #4 is a western hemlock (*Tsuga heterophylla*) with a DBH of 18.1 inches. This tree is dominated by several very large Douglas-fir in the grove. Interior trees growing in a forested environment are protected from the elements and do not typically develop large anchoring root systems. The frequency of failure of interior trees retained following dominant tree removal is high for the first few years after clearing. This is due to increased exposure to wind loading in combination with poorly tapered trunks, low live crown ratios, and small root systems. This tree should not be isolated.

Tree #5 is a remnant old-growth Douglas-fir (*Pseudotsuga menziesii*) with a DBH of 63 inches found on a steep slope near the east boundary of the subject property. This tree is in good health and fair structural condition. The top has blown out at approximately 60 feet and long, over-extended branches reach to the south and east. several codominant leaders have emerged to form the crown. This tree has a strong taper and well-developed root flare and is the dominant tree in the area. Further loss of limbs can be expected in high winds or heavy loading.



PHOTO 4: Tree 5 viewed from the southwest. Note overextended branches and low live crown ratio

Trees #6, 7, 8, and 9 comprise a group of big leaf maple (*Acer macrophyllum*) found near the southeast property corner. Tree #6 has a DBH of 32.8 inches and is generally healthy. It is growing on a steep slope and is in fair structural condition with a very large overextended crown. A corrugated drain pipe from the house was found just north of its root flare. Loss of limbs can be expected in high winds or heavy loading.



PHOTO 5: Tree #6 viewed from the northeast. Note long overextended branches.

Tree #7 is a big leaf maple in fair-poor health condition with a DBH of 13 inches. This tree is dominated by the adjacent larger trees in the grove. Its crown is mostly lost to windthrow and a large codominant leader is dead. A column of decay extends into the root flare.



PHOTO 6: Tree #7 viewed from the northeast. Note large dead branches.

Tree #8 is a big leaf maple in fair-poor health condition with a DBH of 24 inches found near the southeast corner of the property. Large dead and broken stems are present on the east side with decay extending through the trunk. Its crown is off-balance to the east.

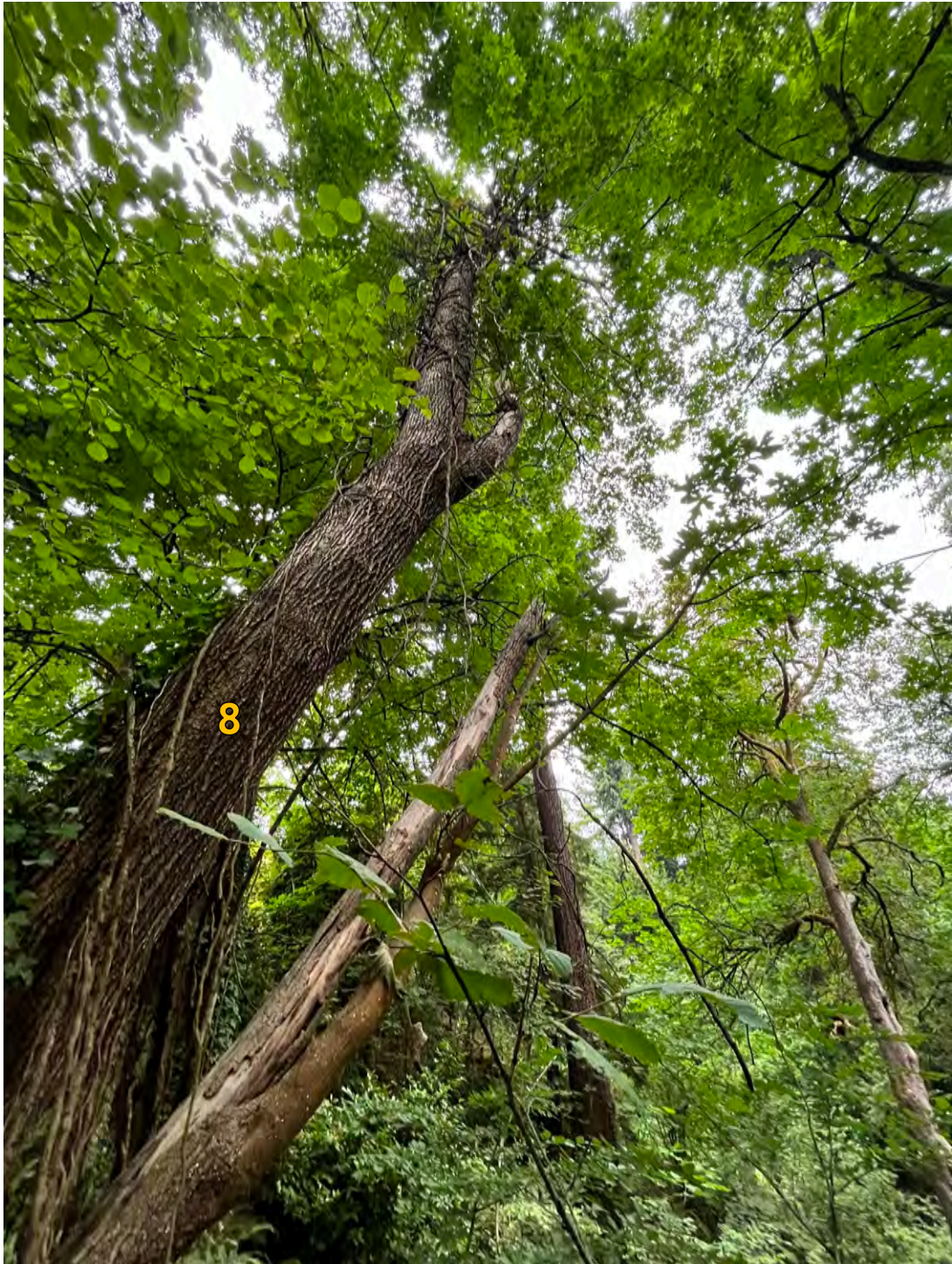


PHOTO 7: Tree #8 viewed from the south. Note large dead codominant leader and off-balance crown.

Tree #9 is a big leaf maple with a DBH of 19 inches found near the south property line. This tree is in fair health and structural condition. Its top has blown out and it is dominated by a neighboring Douglas-fir which has resulted in large lateral branches extending to the north.



PHOTO 8: Tree #9 viewed from the east. Note missing top and long, overextended branches.

Neighboring Trees

Tree #A is a Portuguese laurel (*Prunus lusitanica*) with three codominant stems for a calculated DBH of 13.8 inches. This tree is in good health and fair structural condition. It is located south of the subject property beyond a stone retaining wall. It is unlikely any significant roots of this tree extend into the construction zone.



PHOTO 9: Neighboring Tree #A viewed from the north. Note codominant trunks.

Tree #B is a Japanese maple (*Acer palmatum*) in good health and fair structural condition. This tree has four codominant trunks with a calculated DBH of 15 inches. It is located beyond a rock retaining wall on the subject property six feet to the north of this tree. Its lowest branch slightly overhangs the existing house six feet above the south gutter line.



PHOTO 10: Neighboring Tree #B viewed from the northeast. Note large pruning wounds.

Tree #C is a western red cedar (*Thuja plicata*) in good health and fair structural condition. This tree's root flare is buried by a failing wood retaining wall. The corner of the subject house is 12 feet to the southwest. The northwest corner of the existing house is slightly within this tree's dripline.

Tree #D is a Douglas-fir with a DBH of 45.4 inches in fair health and structural condition. The top of this tree has blown out resulting in a low live crown ratio. The trunk is rolled under on the east side as a physiologic response to the steep slope. A girdling branch was observed at approximately 80 feet above grade on the south side.



PHOTO 11: Neighboring Tree #D viewed from the south. Note girdling branch in the crown.

Tree #E is a Douglas-fir with a DBH of 19 inches in fair health and structural condition. The top of this tree has blown out at 55 feet resulting in a low live crown ratio. The canopy mostly extends to the east and west and dominates on-site tree #9 to the north.



PHOTO 12: Neighboring Tree #E and On-site Tree #9 viewed from the east.

5. Discussion

The dripline is the area below a tree's canopy equal to the length of the branches measured in each cardinal direction. This is a general baseline for determining the appropriate 'Limit of Disturbance' (LOD) for some trees, but the LOD may be larger or smaller than the dripline and is based on species, age, condition, existing improvements, and the anticipated overall impact on the subject tree. The LOD and dripline measurements are shown on the Tree Summary Table and Tree Locator Map.

The site plan shows Trees #1 and #2 are in conflict with the proposed site improvements and will need to be removed to accomplish the development goals. Tree #3 is not a Regulated Tree due to its size. It is in poor condition and should be removed. All other Regulated and Neighboring Trees are to be protected throughout the construction period.

The current site plan is in compliance with minimum tree retention requirements per MICC 19.10.060.

6. Tree Protection Measures

The following guidelines are recommended to ensure that the designated areas set aside for the preserved trees are protected and construction impacts are kept to a minimum. Tree protection should adhere to best management practices for tree and soil protection during development activity.

1. Tree protection fencing shall be erected no closer to retained trees than the 'Limit of Disturbance' (LOD) as shown on the Tree Locator Map prior to moving any heavy equipment on site. Doing this will set clearing limits and avoid compaction of soils within the LOD of retained trees.
2. Excavation limits should be laid out in paint on the ground to avoid over excavating.
3. Work within retained tree's driplines must be monitored by the project arborist so necessary precautions can be taken to decrease impacts to tree parts.
4. To establish sub grade for foundations, curbs and pavement sections within the CRZ, soil should be removed parallel to the roots and not at 90° angles to avoid breaking and tearing roots that lead back to the trunk within the LOD. Any roots damaged during these excavations should be exposed to sound tissue and cut cleanly with a saw.
5. Areas excavated within the dripline of retained trees should be thoroughly irrigated daily during dry periods.
6. Large equipment and storage of materials must be kept outside of the LOD at all times. Preparations for final landscaping shall be accomplished by hand within the driplines of retained trees.

7. Recommendations

- **Check Critical Area buffers before planning on removing any trees.** Obtain all necessary permits from the City of Mercer Island prior to carrying out work that may impact the site trees and comply with all applicable federal and state laws, rules and regulations.
- Avoid changing the grade within the CRZ of retained trees. If this is unavoidable, follow all tree protection measures outlined above. It is possible to work within the CRZ, up to the LOD with written provisions specific to the site.
- Adhere to tree protection measures outlined in this report for all retained trees.
- Any disturbance within the driplines of retained trees must be monitored by the project arborist.
- When excavating must occur within the dripline of retained trees, a hand shovel should be used when roots larger than one inch in diameter are encountered. Mechanical excavation equipment could rip or shred roots causing unnecessary damage. Cutting roots greater than three inches in diameter can potentially increase the likelihood of tree failure. If root cuts are required, roots should be exposed by hand and then cleanly cut with a sharp tool to promote occlusion of the wound and encourage re-growth.
- Have retained trees near improvements re-assessed for health and structure once development work has been completed.
- Create a finalized site development plan that shows the location of all improvements and tree protection for preserved trees.

8. Tree Removal and Retention Per MICC 19.10.060

19.10.060 Tree removal – Associated with a development proposal.

A. Single-Family Zoning Designations.

1. In the R-8.4, R-9.6, R-12, and R-15 zoning designations, tree retention is required for the following development proposals:
 - a. An addition or remodel to an existing single-family dwelling that will result in the addition of more than 500 square feet of gross floor area on a lot with a net lot area of 6,000 square feet or more;
 - b. A new single-family dwelling on a lot with a net lot area of 6,000 square feet or more;
 - c. A subdivision or short subdivision.
2. Retention Requirement. Development proposals specified under subsection (A)(1) of this section shall retain trees as follows:
 - a. A minimum of 30 percent of trees with a diameter of 10 inches or greater, or that otherwise meet the definition of large tree, shall be retained over a rolling five-year period.

- b. In addition to the retention required in subsection (A)(2)(a) of this section, the development proposal shall be designed to further minimize the removal of large trees and maximize on-site tree retention as follows:
 - i. Site improvements, including but not limited to new single-family homes, additions to a single-family home, appurtenances, accessory structures, utilities, and driveways, shall be designed and located to minimize tree removal during and following construction.
 - ii. The following trees shall be prioritized for retention:
 - (a) Exceptional trees;
 - (b) Trees with a diameter of more than 24 inches;
 - (c) Trees that have a greater likelihood of longevity; and
 - (d) Trees that are part of a healthy grove.
 - iii. Trees shall not be removed outside the area of land disturbance except where necessary to install site improvements (e.g., driveways, utilities, etc.).
 - iv. Tree removal for the purposes of site landscaping should be limited to those trees that will pose a future safety hazard to existing or proposed site improvements.
 - c. Provide tree replacement pursuant to MICC 19.10.070.
3. Retention of Exceptional Trees. Development proposals specified under subsection (A)(1) of this section shall retain exceptional trees with a diameter of 24 inches or more. Exceptional trees with a diameter of 24 inches or more that are retained shall be credited towards compliance with the retention requirements of subsection (A)(2) of this section. Removal of exceptional trees with a diameter of 24 inches or more, shall be limited to the following circumstances:
- a. Retention of an exceptional tree(s) with a diameter of 24 inches or more will result in an unavoidable hazardous situation; or
 - b. Retention of an exceptional tree(s) with a diameter of 24 inches or more will limit the constructable gross floor area to less than 85 percent of the maximum gross floor area allowed under Chapter 19.02 MICC; or
 - c. Retention of an exceptional tree(s) with a diameter of 24 inches or more will prevent creation of a residential lot through a subdivision or short subdivision that is otherwise allowed by this title.
4. Calculation of Rolling Five-Year Period. For the purposes of this section, the rolling five-year period begins five years prior to the date of application for a development approval that is subject to tree retention.

5. Compliance Required. Development proposals on lots that have removed more than 70 percent of large trees within the rolling five-year period, such that the 30 percent tree retention requirement under subsection (A)(2) of this section cannot be met, shall not receive approval unless and until compliance has been achieved. For example, a lot that has removed all of the trees in year “one” may not receive a preliminary subdivision approval in year “four.” However, the preliminary subdivision approval may be granted in year “six,” such that the rolling five-year period does not include the tree removal in year “one.”

9. Limiting Conditions

There is no warranty suggested for any of the trees subject to this report. Weather, latent tree conditions, and future human-caused activities could cause physiologic changes and deteriorating tree conditions. Over time, deteriorating tree conditions may appear and there may be conditions that are not now visible which could cause tree failure. This report or the verbal comments made at the site in no way warrant any tree's structural stability or long-term condition, but represent my opinion based on the observations made.

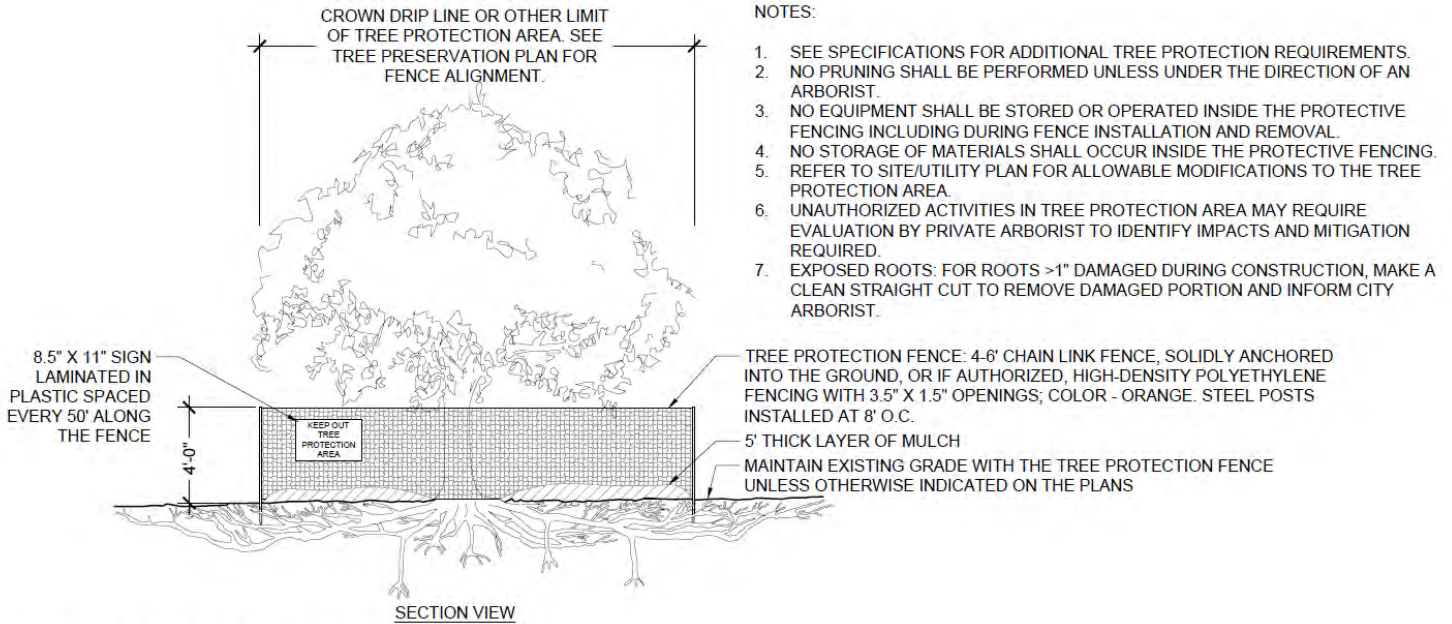
Nearly all trees in any condition standing within reach of improvements or human use areas represent hazards that could lead to damage or injury.

Please call if you have any questions or if we can be of further assistance.



Benjamin Mark
ISA Certified Arborist #PN-6976A
ISA Tree Risk Assessment Qualified (TRAQ)

Tree Fencing Details



NOTES:

1. SEE SPECIFICATIONS FOR ADDITIONAL TREE PROTECTION REQUIREMENTS.
2. NO PRUNING SHALL BE PERFORMED UNLESS UNDER THE DIRECTION OF AN ARBORIST.
3. NO EQUIPMENT SHALL BE STORED OR OPERATED INSIDE THE PROTECTIVE FENCING INCLUDING DURING FENCE INSTALLATION AND REMOVAL.
4. NO STORAGE OF MATERIALS SHALL OCCUR INSIDE THE PROTECTIVE FENCING.
5. REFER TO SITE/UTILITY PLAN FOR ALLOWABLE MODIFICATIONS TO THE TREE PROTECTION AREA.
6. UNAUTHORIZED ACTIVITIES IN TREE PROTECTION AREA MAY REQUIRE EVALUATION BY PRIVATE ARBORIST TO IDENTIFY IMPACTS AND MITIGATION REQUIRED.
7. EXPOSED ROOTS: FOR ROOTS >1" DAMAGED DURING CONSTRUCTION, MAKE A CLEAN STRAIGHT CUT TO REMOVE DAMAGED PORTION AND INFORM CITY ARBORIST.

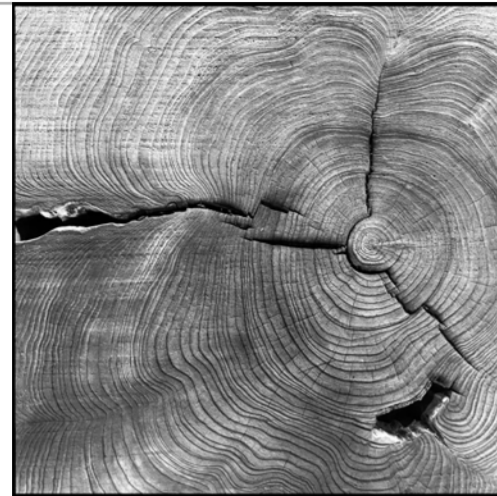
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TREE PROTECTION

SCALE: 1/4" = 1'-0"

References

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- Dunster & Associates Environmental Consultants Ltd. Assessing Trees in Urban Areas and the Urban-Rural Interface, US Release 1.0. Silverton: Pacific Northwest Chapter ISA, 2006
- Lilly, Sharon. Arborists' Certification Study Guide. Champaign, IL: The International Society of Arboriculture, 2001.
- Matheny, Nelda and James R. Clark. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. Champaign, IL: International Society of Arboriculture, 1998.
- France, Robert L, Handbook of Regenerative Landscape Design. Boca Raton FL: CRC Press, 2008.



**Salish
Restoration
Associates**

Tree Summary Table

For: Korpela Project
At: 8441 SE 33rd Pl Mercer Island, WA

Salish Restoration Associates LLC

Date: 8/29/2023
Inspector: Benjamin Mark

Regulated (Large) Trees: Greater than 10",
Exceptional trees: Per attached list. Trees on
neighboring properties - Drip-line and Limits of
Disturbance measurements from property lines

ISA TRAQ Risk Assessments were not carried out for any tree in this report.

ON-SITE TREES

Tree/ Tag #	Evergreen/Deciduous	Common Name	Genus species	DBH Inches (Multistem calc.)	Healthy	Fair	Dead/Dying	Dripline				Limits of Disturbance	Photo #	REGULATED?	Exceptional?	Comments
								N	S	E	W					
1	Evergreen	Japanese black pine	<i>Pinus thunbergii</i>	10.8	☑	☐	☐	10	8	10	12	8nsew	1, 2	Yes	No	Codominant stems forked at 10 feet 17 feet from the corner of the garage
2	Evergreen	Scot's pine	<i>Pinus sylvestris</i>	10.7	☑	☐	☐	7	10	8	7	8nsew	2	Yes	No	4.5 feet from the corner of the garage.
3	Deciduous	Florida dogwood	<i>Cornus florida</i>	6.8	☐	☐	☑	9	10	5	9	8nsew	3	No	No	Poor condition from extensive infection of anthracnose. 5 feet west of house
4	Evergreen	Western hemlock	<i>Tsuga heterophylla</i>	18.1	☑	☐	☐	16	12	11	11	13nsew		Yes	YES	Dominated by old growth Douglas fir to the south.
5	Evergreen	Douglas fir	<i>Pseudotsuga menzeisii</i>	63	☑	☐	☐	20	25	28	20	25nsew	4	Yes	YES	Remnant old growth. Top blown out. On steep slope. Good flare and taper
6	Deciduous	Big leaf maple	<i>Acer macrophyllum</i>	32.8	☑	☐	☐	46	28	25	21	20nsew	5	Yes	YES	Very large crown. Corrugated drain pipe from house was found just north of its root flare.
7	Deciduous	Big leaf maple	<i>Acer macrophyllum</i>	13	☐	☑	☐	18	19	22	26	20nsew	6	Yes	YES	Dominated by adjacent trees. Crown is mostly lost. Codominant leader is dead.
8	Deciduous	Big leaf maple	<i>Acer macrophyllum</i>	24	☐	☑	☐	20	18	23	15	20nsew	7	Yes	YES	Large, dead, broken stems on the east side. Decay is present. Crown is off-balance to the east
9	Deciduous	Big leaf maple	<i>Acer macrophyllum</i>	19	☐	☑	☐	24	20	11	20	18nsew	8, 12	Yes	YES	Will not be affected by the planned construction.

NEIGHBORING TREES

Tree/ Tag #	Evergreen/Deciduous	Common Name	Genus species	DBH Inches (Multistem calc.)	Healthy	Fair	Dead/Dying	Dripline				Limits of Disturbance	Photo #	REGULATED?	Exceptional?	Comments
								N	S	E	W					
A	Evergreen	Portuguese laurel	<i>Prunus lusitanica</i>	8, 8, 8 (13.8)	☑	☐	☐	8				4n	9	Yes	No	4' stone retaining wall just to the north and west.
B	Deciduous	Japanese maple	<i>Acer palmatum</i>	8, 8, 8, 6 (15)	☑	☐	☐	10			19	6n	10	Yes	No	Rock retaining wall on subject property 6' to the north of this tree. It's lowest branch slightly overhangs the existing house 6' above the south gutter line.
C	Evergreen	Western red cedar	<i>Thuja plicata</i>	21.7	☑	☐	☐		17		17	12s, 20e, 12w		Yes	YES	Root flare buried by failing wood retaining wall. Corner of house is 12 feet to the southwest.
D	Evergreen	Douglas fir	<i>Pseudotsuga menzeisii</i>	45.4	☑	☐	☐		23		17	20nsew	11	Yes	YES	Low live crown ratio, top blown out. Girdling stem at 80 feet. Trunk is under rolled on the east side.
E	Evergreen	Douglas fir	<i>Pseudotsuga menzeisii</i>	19	☑	☐	☐	8				10n	12	Yes	YES	Top blown out at 55 feet. Canopy mostly extends to the east and west..

TREE LOCATOR MAP



#GOOD CONDITION TREE

#FAIR CONDITION TREE

#POOR CONDITION TREE

#NEIGHBORING TREE

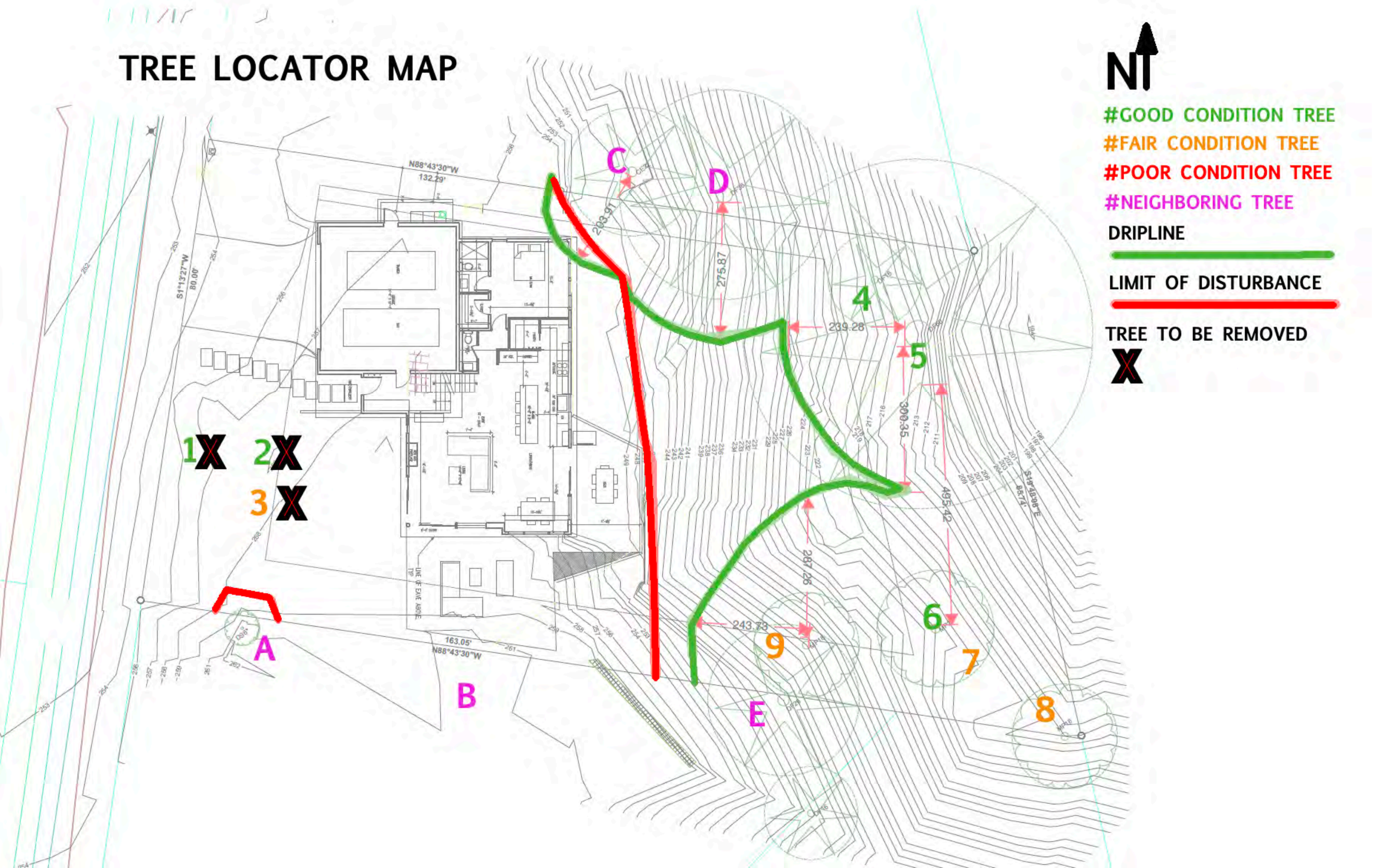
DRIPLINE



LIMIT OF DISTURBANCE



TREE TO BE REMOVED



1X 2X
3X

A

B

C

D

4

5

6

7

8

9

E