



AMERICAN FOREST
MANAGEMENT

ARBORIST REPORT
for
WW Sustainable LLC
4657 86th Ave SE
Mercer Island, WA



October 10, 2022
UPDATED MARCH 17, 2023

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Appendix

Site/Tree Photos – pages 7-8
Tree Fencing Detail – attached
Tree Summary Table – attached
Tree Protection Map – attached

1. Introduction

American Forest Management was contacted by Cam Weaver of WW Sustainable LLC and asked to compile an Arborist Report for a parcel located within the City of Mercer Island.

The proposed project is located 4657 86th Ave SE. Our assignment is to prepare a written report on present tree conditions, which is to be filed with the preliminary permit application.

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:January 7th, 2022

2. Description

Seven ‘large’ trees were located and assessed on the property, defined by the City of Mercer Island as "any tree with a diameter of 10 inches or more, or any tree that meets the definition of an exceptional tree". ‘Exceptional’ trees are defined as “A tree or group of trees that because of its unique historical, ecological, or aesthetic value constitutes an important community resource. An exceptional tree is a tree 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. Trees with a diameter of more than 36 inches, or with a diameter that is equal to or greater than the diameter listed in the Exceptional Tree Table”.

Additionally, seven neighboring trees with driplines that extend over the property line are included in this report.

All subject trees on the property, and subject neighboring trees have been identified with a numbered aluminum tag attached to their lower trunks. Field tree tag numbers correspond with attached Tree Condition Summary Table and attached copy of the site survey. The tree summary table provides descriptive data for all assessed trees, including drip-line measurements.

3. Methodology

Each tree in this report was visited. Tree trunk diameters were measured by tape at 4.5 feet above grade for ‘DBH’ measurement. The tree heights were measured using a digital clinometer. Each tree was visually examined for defects and vigor. The tree assessment procedure involves the examination of many factors:

- The crown of the tree is examined for current vigor. This is comprised of inspecting the crown (foliage, buds and branches) for color, density, form, and annual shoot growth, limb dieback and disease. The percentage of live crown is estimated for coniferous species only and scored appropriately.
- The bole or main stem of the tree is inspected for decay, which includes cavities, wounds, fruiting bodies of decay (conks or mushrooms), seams, insects, bleeding, callus development, broken or dead tops, structural defects and unnatural leans. Structural defects include crooks, forks with V-shaped crotches, multiple attachments, and excessive sweep.
- The root collar and roots are inspected for the presence of decay, insects and/or damage, as well as if they have been injured, undermined or exposed, or original grade has been altered.

Based on these factors a determination of viability is made. Trees considered ‘non-viable’ are trees that are in poor condition due to disease, extensive decay and/or cumulative structural defects, which exacerbate failure potential. A ‘viable’ tree is a tree found to be in good health, in sound condition

with minimal defects and is suitable for its location. Also, it will be wind firm if isolated or left as part of a grouping or grove of trees.

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 the 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 the 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, and/or not suitable for its location

The attached Tree Summary Table provides specific information on tree sizes and drip-line measurements.

4. Observations

The following are considered 'large trees' by the City of Mercer Island.

Tree #1 is a co-dominant stemmed cherry (*Prunus sp.*) in fair condition with a calculated DBH of 17 inches. Included bark is present at the union of the trunks. Its canopy was pruned for clearance from the house to north. This tree is proposed to be removed.

Tree #2 is an apple (*Malus sp.*) in fair condition located near the south property line. This tree has a history of excessive pruning to maintain its height. These 'heading cuts' have resulted in tangled regrowth of multiple leaders. This tree is not considered 'large' with a DBH smaller than 10 inches, and is proposed to be removed.

Trees #3 and 4 are western red cedars (*Thuja plicata*) in good condition found near the southwest property corner. Tree #3 has a DBH of 21 inches, and #4 has a DBH of 30 inches. Both have thin upper crowns which is seen in many trees of this species in our area usually because of recent extended summer drought conditions.

Tree #5 is a Douglas-fir (*Pseudotsuga menziesii*) in good condition adjacent to the west property line. It has a DBH of 36 inches which qualifies it as an 'exceptional tree' under the City of Mercer Island's tree regulations. A large, disconnected branch (commonly known as a 'widowmaker') was observed hanging in its crown. This tree has developed good trunk taper and a wide root flare.

Trees #9 and 10 are Douglas-fir in good condition found near the north property line to the west of the existing house. Both are considered 'exceptional' trees with DBH of 36 and 32 inches. The shared canopy of these trees overhangs the existing house.

Tree #12 is a flowering cherry in good condition with a DBH of 14 inches located west of the existing house. This tree is proposed to be removed.

Neighboring Trees

Trees #101- 105 are a row of thundercloud flowering plums (*Prunus cerasifera*) growing east of the property line in the 86th Ave SE right-of-way. These are in fair-poor condition with a history of excessive pruning for overhead utility line clearance and internal decay.

Trees #106 and 108 are apples (*Malus sp.*) growing south of the property line in the SE 47th St right-of-way. These are in fair condition with a history of excessive pruning to maintain a height of 10-15 feet.

Tree #110 is an 'exceptional' Douglas-fir in good condition with a DBH of 39 inches. This mature tree is located adjacent to the driveway of the neighboring home at 4649 86th Ave SE. Its dripline extends over the house on the subject property, and the foundation is 14 feet to the south of this tree. Significant roots are likely to be found in the area between it and the existing foundation.

5. Discussion

The extent of drip-lines (farthest reaching branches) for all trees can be found on the tree summary tables at the back of this report. These have also been delineated on a copy of the site plan which is attached and part of this report. The information plotted on the attached site plan needs to be transferred to the final tree retention - protection plan to meet City submittal requirements.

The recommended Limits of Disturbance (LOD) measurements can also be found on the tree summary table and delineated on the site plan. The LOD measurements are based on species, size, age, condition, drip-line or crown spread and prior improvements. Given the close location of the existing structures to trees #9, 10, and #110, their limits of disturbance are the edge of the existing foundation.

The City of Mercer Island defines an 'exceptional' tree as "a tree 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. Trees with a diameter of more than 36 inches, or with a diameter that is equal to or greater than the diameter listed in the Exceptional Tree Table, are considered exceptional trees". Four 'exceptional' trees were found on the property, and one was found adjacent to the northeast property corner.

The City of Mercer Island defines a grove as "a group of eight or more trees each 10 inches or more in diameter that form a continuous canopy". There are no group of trees on the subject property that qualify as a grove.

The north side of the existing house is within the drip-line of tree #110. The proposed plans show the new construction will use the existing foundation within the drip-line of this tree to minimize potential impacts to its root system. The only other work depicted within the drip-line of any on-site trees is an on-grade covered patio approximately 20 feet east of tree #5. This tree should remain viable if all tree protection measures described below are adhered to. There are several fruit trees in the ROW on the south and east sides of the property. These are in fair- poor condition with extensive decay and are in conflict with overhead utilities. These should be removed and replaced with trees that are more likely to remain viable.

6. Tree Replacement

Any tree removed will need to be replaced per MICC 19.10.070 Tree replacement. Replacement tree specifications are as follows:

B. Replacement Trees.

1. Location. Replacement trees shall be located in the following order of priority from most important to least important:

- a. On-site replacement adjacent to or within critical tree areas as defined in Chapter 19.16 MICC;
 - b. On-site replacement outside of critical tree areas adjacent to other retained trees making up a grove or stand of trees;
 - c. On-site replacement outside of critical tree areas; and
 - d. Off-site in adjacent public right-of-way where explicitly authorized by the city.
2. **Species.** Replacement trees shall primarily be those species native to the Pacific Northwest. In making a determination regarding the species of replacement trees, the city arborist shall defer to the species selected by the property owner unless the city arborist determines that the species selected is unlikely to survive for a period of at least 10 years, represents a danger or nuisance, would threaten overhead or underground utilities or would fail to provide adequate protection to any critical tree area.
3. **Size.**
- a. Coniferous trees shall be at least six feet tall; and
 - b. Deciduous trees shall be at least one and one-half inches in caliper.

7. Tree Protection Measures

The following guidelines are recommended to ensure that the designated space set aside for the preserved trees are protected and construction impacts are kept to a minimum. See the attached City of Mercer Island Tree Protection Fencing Detail handout for additional information.

1. Tree protection fencing shall be erected per prior to moving any heavy equipment on site. Doing this will set clearing limits and avoid compaction of soils within root zones of retained trees.
2. Excavation limits should be laid out in paint on the ground to avoid over excavating.
3. Excavations within the drip-lines of retained trees shall be monitored by a qualified tree professional so necessary precautions can be taken to decrease impacts to tree parts. A qualified tree professional shall monitor excavations when work is required and allowed up to the “limits of disturbance”.
4. Existing concrete foundations should be retained within the retained tree’s drip-lines to minimize damage to adjacent roots. To establish sub grade for foundations, curbs and pavement sections near the trees, soil should be removed parallel to the roots and not at 90-degree angles to avoid breaking and tearing roots that lead back to the trunk within the drip-line. Any roots damaged during these excavations should be exposed to sound tissue and cut cleanly with a saw. Cutting tools should be sterilized with alcohol.
5. Areas excavated within the drip-line of retained trees should be thoroughly irrigated weekly during dry periods.
6. Preparations for final landscaping shall be accomplished by hand within the drip-lines of retained trees. Large equipment shall be kept outside of the tree protection zones.

8. Recommendations

- Obtain all necessary permits from the City of Mercer Island prior to carrying out work that may impact the site trees.
- Consider removing Tree #105 as it is in poor condition and is not considered viable.
- Adhere to tree protection measures outlined in this report for all retained trees.
- Any disturbance within the drip lines of retained trees should be monitored by the project arborist.
- Have retained trees re-assessed for health and structure once development work has been completed.

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 condition. Over time deteriorating tree conditions may appear and there may be conditions not now visible which could cause tree failure. This report or the verbal comments made at the site in no way warrant the structural stability or long-term condition of any tree, 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.

Sincerely,



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

Photographs



Trees #103 and 104 in the 86th Ave SE ROW. Note overhead utility lines and excessive pruning for clearance. These trees are in fair- poor condition and unlikely to remain viable in the long-term.



The existing house viewed from the south. Trees #106 and 107 are on either side of the driveway in the SE 47th St. ROW. These trees are in fair- poor condition and unlikely to remain viable in the long-term.



The lower trunks of Trees #9 and 10 viewed from the south. Note their shared canopy extends over the existing house.

The upper crowns of Trees #9 and 10 viewed from the south. Note their shared canopy extends over the existing house.



TREE PROTECTION AREA (TPZ)

KEEP OUT!

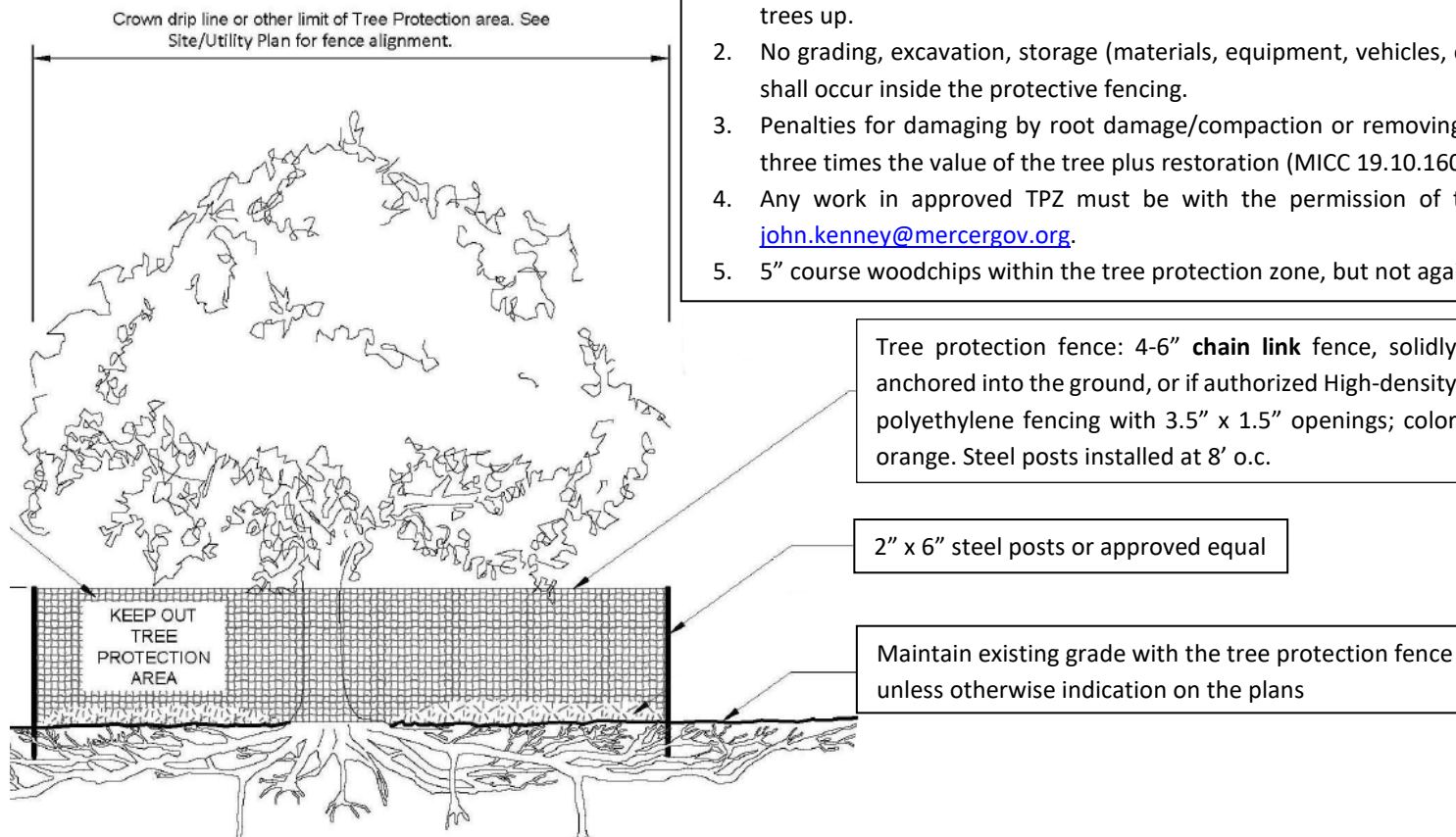
DO NOT REMOVE OR ADJUST THE APPROVED LOCATION OF THIS TREE PROTECTION AREA

Trees enclosed by this fence are protected and are subject to the conditions of the tree permit. Violation of tree conditions may lead to:

1. Correction Notices or Stop Work Orders until compliance is achieved
2. RE Inspection Fees/financial penalties
3. Arborist reports recommending mitigation

Notes

1. No pruning shall be performed unless under the direction of the Project Arborist. Including limbing trees up.
2. No grading, excavation, storage (materials, equipment, vehicles, etc.), or other unpermitted activity shall occur inside the protective fencing.
3. Penalties for damaging by root damage/compaction or removing a saved tree may be a fine up to three times the value of the tree plus restoration (MICC 19.10.160).
4. Any work in approved TPZ must be with the permission of the City Arborist (206) 275-7713, john.kenney@mercergov.org.
5. 5" course woodchips within the tree protection zone, but not against the tree trunk.



Any Work in the protected area must be with the permission of the City Arborist john.kenney@mercergov.org



Tree Summary Table

For: WW Sustainable
4657 86th Ave SE
Mercer Island, WA

American Forest Management, Inc.

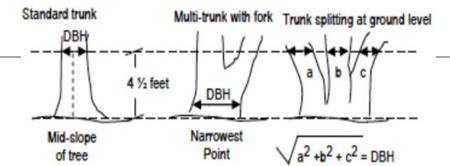
Date: 1/7/2022
Inspector: Benjamin Mark

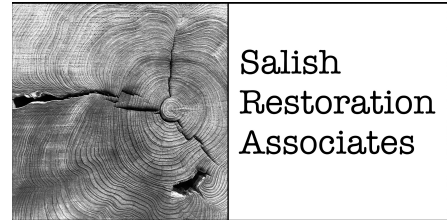
ID #	Common Name	Genus species	DBH in inches (Multistem Calculation)	Exceptional?	Dripline in feet				Condition	Comments
					N	S	E	W		
1	Cherry	<i>Prunus sp.</i>	14,9 (17)	No	8	19	16	15	Fair	Codominant leaders. Included bark at union. Pruned for house clearance to north.
2	Apple	<i>Malus sp.</i>	9	No	11	10	10	6	Fair	Heavily pruned for height. Tangled crown
3	Western red cedar	<i>Thuja plicata</i>	21	No	11	12	17	12	Good	Pruned for utility clearance to the south thin top
4	Western red cedar	<i>Thuja plicata</i>	30	Yes	9	16	19	12	Good	Thin top
5	Douglas fir	<i>Pseudotsuga menziesii</i>	36	Yes	28	29	25	25	Good	Dead branch hanging in crown. Good taper and flare.
6	Douglas fir	<i>Pseudotsuga menziesii</i>	7	No	9	11	6	14	Good	Small trio in northwest corner.
7	Western red cedar	<i>Thuja plicata</i>	7	No	6	10	10	14	Good	
8	Western red cedar	<i>Thuja plicata</i>	7	No	6	9	6	6	Good	
9	Douglas fir	<i>Pseudotsuga menziesii</i>	36	Yes		24	26	25	Good	17' west of existing house nw corner. 2' south of fence
10	Douglas fir	<i>Pseudotsuga menziesii</i>	32	Yes		20	25	25	Good	Good taper and flare.
11	Western red cedar	<i>Thuja plicata</i>	7	No	6	8	10	3	Good	"Pistol butt" trunk sweeps east. Add to survey
12	Cherry	<i>Prunus sp.</i>	14	No	15	14	27	27	Good	Overhangs existing deck to east.

ID #	Common Name	Genus species	DBH in inches	Exceptional?	Dripline in feet				Condition	Comments
					N	S	E	W		
101	Thundercloud flowering plum	<i>Prunus cerasifera</i>	6	No	8	7	11	8	Fair	
102	Thundercloud flowering plum	<i>Prunus cerasifera</i>	13	No	6	12	14	6	Fair	Ohp, topped
103	Thundercloud flowering plum	<i>Prunus cerasifera</i>	18	No	7	12	15	6	Poor	Ohp topped decay
104	Thundercloud flowering plum	<i>Prunus cerasifera</i>	14	No	9	14	12	6	Poor	Ohp topped decay
105	Thundercloud flowering plum	<i>Prunus cerasifera</i>	14	No	11	11	14	12	Poor	Ohp topped decay. Multiple leaders
106	Apple	<i>Malus sp.</i>	15	No	10	11	8	12	Fair	Broken leaders
107	Plum	<i>Prunus sp.</i>	8	No	9	7	9	7	Poor	Multiple leaders internal decay
108	Apple	<i>Malus sp.</i>	10	No	11	14	16	14	Fair	Heavily pruned for height. Tangled crown
109	Apple	<i>Malus sp.</i>	8	No	9	6	6	6	Fair	Heavily pruned for height. Tangled crown
110	Douglas fir	<i>Pseudotsuga menziesii</i>	39	Yes		26			Good	Mature, driveway at norm roof flare. Existing house 14 south. Significant roots likely found in the area up to the existing foundation

Drip-Line and Limits of Disturbance measurements from face of trunk
Trees on neighboring properties - Drip-line and Limits of Disturbance measurements from property lines

Diameter Breast Height Diagrams





Memorandum

To: Cam Weaver
Company: Weaver Construction Co.
From: Benjamin Mark – Salish Restoration Associates
Date: 3/21/23
Re: Planned Excavation Within Driplines of Retained Trees

Greetings Mr. Weaver,

At your request, I reviewed the current site plans to respond to the City of Mercer Island Planning Department's comments regarding tree protection measures for your project at 4657 86th Ave SE.

I prepared the original arborist report submitted for this project on October 10, 2022. In the arborist report, I noted the proximity of two large Douglas-fir trees (#9, and #10) to the existing house and I provided tree protection recommendations to ensure their viability during construction. These measures included limiting all work within the shared drip line of these trees to within the existing home's footprint to minimize root disturbance.

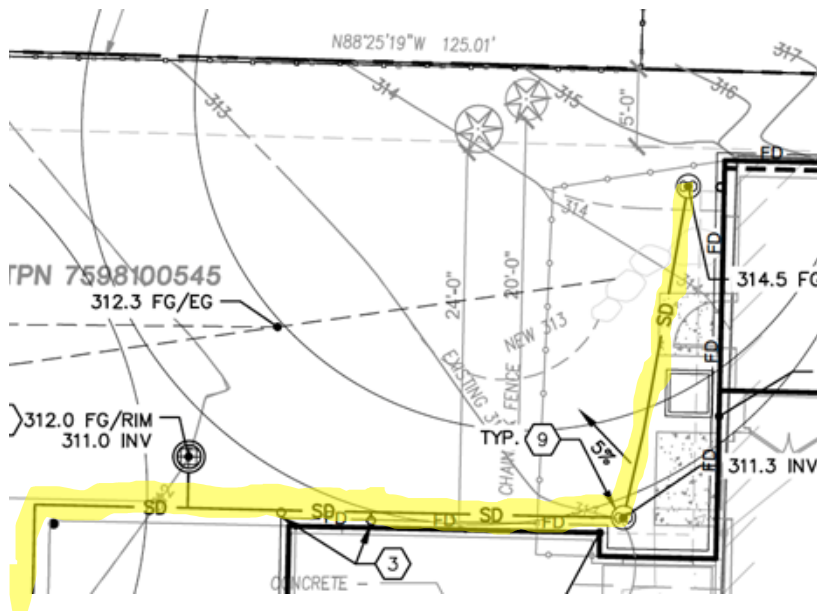
The Planning Department comments dated Feb 16th, 2023 included the following from City Arborist John Kenney:

1. Trees 4,5, 9,10 are exceptional and must be protected and not damaged. Tree protection is only 3' away from tree 10 which would damage the tree. Either move the proposed ADU, decks, buried power, all grading and SD utility line away from these trees. Any encroachment into these trees' dripline must show the trees will not be damaged according to MICC19.10.080. Or advanced root analysis by air excavation with arborist monitoring and follow up analysis required. The arborist will determine the limits of allowable disturbance for the trees where tree protection fence will be placed and not moved. At least 5 feet of space between the building and the fence is required to construct the home without entering the tree protection zone. Arborist must review and cite the civil and site plans. Or if trees cannot be retained and undamaged, they must be justified for removal under MICC19.10.060(A)(3).

The northwest corner of the existing house is within the dripline of Tree #10, approximately 12 feet from the trunk. If a minimum of five feet of space between the building and the tree protection fence is required, this will significantly reduce the area of undisturbed grade within the trees' critical root zone. Any encroachment into these trees' dripline must show the trees will not be damaged according to MICC19.10.080.

Root Disturbance Memo

The current site plan shows a storm drain trench is planned to be installed within the shared drip line of Trees #9 and #10 west of the existing home's footprint. The route of this storm drain is within the required five-foot space between the existing building footprint and the tree protection fence.



Recommendations

Douglas-fir trees typically demonstrate relatively good tolerance of root pruning and are somewhat tolerant of fill placement. However, construction impacts, existing physiological defects, and site changes can combine to destabilize a tree.

Determining the size and number of roots that will be encountered during the installation of the storm drain requires an advanced root analysis by air excavation (Air-spade).

Air excavation of the drainage path will allow the project arborist to assess the potential impacts to trees #9 or #10 and potentially allow for installation of the storm drain below significant structural roots without cutting them.

If all structural roots over three-inches in diameter can be preserved, the tree's structural integrity is unlikely to be affected, but some decline in vigor may be seen in the future due to loss of roots within the 'Critical Root Zone' (CRZ) of these trees.



Root Disturbance Memo

If all tree protection guidelines specified below are closely adhered to, these trees are likely to remain viable.

- Apply three to five inches of arborist chip mulch in the retained tree's drip lines to improve soil structure, retain moisture, and prevent compaction. Mulch should not be placed in contact with the trunk of the tree.
- No heavy equipment should be deployed within the drip lines of retained trees. Wheelbarrows, scaffolding, and construction foot traffic should be limited to load distribution plates or track – mats placed over the mulch.
- Excavate the drainage path within the drip lines with an air-spade to allow the project arborist to assess the roots in the trench. If possible, install the drainage pipe below the structural roots without cutting them. Following excavation, supply supplemental irrigation to the trees until the fill can be replaced.
- Any disturbance within the drip lines should be monitored and assessed by a qualified arborist.
- Monitor the trees for changes in health or structure. Have the trees re-assessed once development activity has finished and after high wind events.

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 condition. Over time, deteriorating tree conditions may appear and there may be conditions not currently visible which could cause tree failure. This report or the verbal comments made at the site in no way warrant the structural stability or long-term condition of any tree, but represent my opinion based on the observations made.

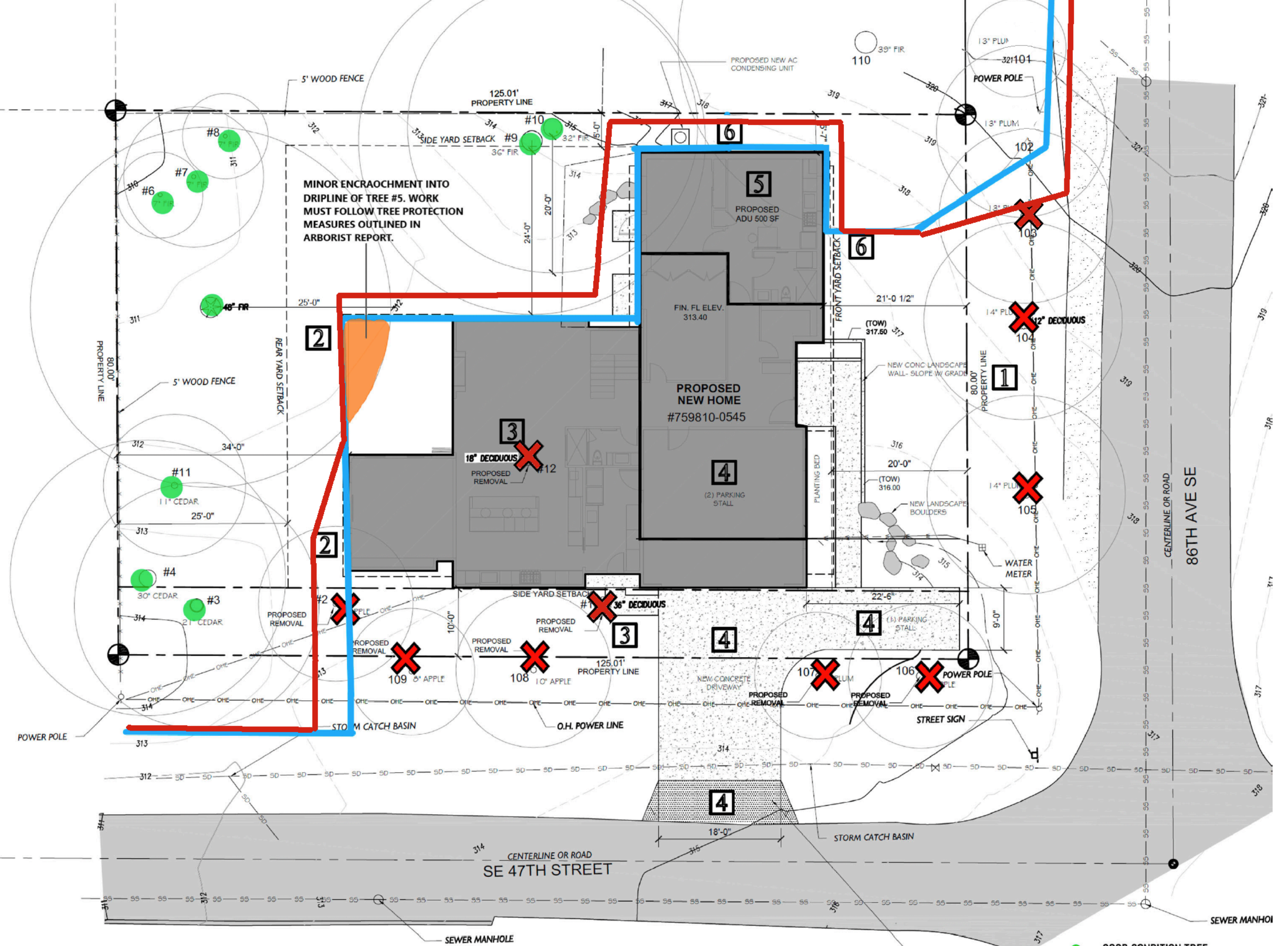
Nearly all trees in any condition standing within reach of improvements or human use areas represent hazards that could lead to damage or injury.

Please call if you have any questions or need further assistance on this project.

Sincerely,



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



- GOOD CONDITION TREE
- FAIR CONDITION TREE
- POOR CONDITION TREE
- ✘ TREE PROPOSED FOR REMOVAL
- LIMIT OF DISTURBANCE
- TREE PROTECTION FENCE

SITE PLAN
LI RESIDENCE

Scale: 1"=10'

PROVIDE NEW ASPHALT DRIVEWAY APRON. SEE CIVIL ENGINEERING DRAWINGS FOR DESIGN / DETAILS)