Arborist Report

Tree Inventory and Assessment

3508 96th Ave SE Mercer Island, WA 98040

Prepared for:

Sam Adams

Prepared by:

Alan Haywood

Certified Arborist, PN-0330AM

~~**March 23, 2022**~~

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Summary

There were nineteen trees large enough to count towards the City of Mercer Island's tree retention requirements on the lot owned by Mr. Sam Adams at 3508 96th Ave SE. Five of those trees were in poor condition and not suitable for retention. Three of the trees were large enough to be considered Exceptional trees by the City standards. The City requires at least 30 percent of the trees to be retained and prioritizes the retention of the Exceptional trees. Of the fourteen trees that were suitable for retention, the City would require at least four to be saved and would prefer the three Exceptional trees to be among the trees retained.

The North Mercer Interceptor Sewer Improvement Project will require the removal of thirteen trees from the site and nine trees from the adjacent ROW to the west. All three of the Exceptional trees will be removed. Four trees are proposed for retention.

Introduction

Background and History

I was contacted by Sam Adams to provide a tree inventory and assessment for their vacant property at 3508 96th Ave SE Mercer Island, WA 98040. He explained to me that he was proposing to build a house on the property and this report would be part of the permit application process with the City of Mercer Island. It was located at the end of the short dead-end street, 96th Ave SE. The street ends at the paved Mountains To Sound Greenway Trail to the south. Just past the trail is the Interstate 90 Freeway.

According to Mr. Adams, the property was vacant because the previous owner demolished a house that had previously stood there. The western half of the property had been mostly cleared, with just a few smaller trees remaining. The eastern half of the property was vegetated with mostly native trees and smaller plants, as well as a few invasive species, including English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus discolor*).

Mr. Adams provided me with a Topographic Survey/site map dated 9/30/20. In addition to the property lines, it showed the locations of the significant trees onsite. The trees were labeled and their diameter was included.

Assignment

My assignment was to:

- Complete the tree inventory, including counting, measuring, tagging, identifying and assessing all of the significant trees on the site.
- Provide a site map with the trees numbered according to the inventory.
- Provide an arborist report that notes the condition and viability of the trees. Note any trees that are in poor condition now that would be a hazard (high risk) to the proposed development or to neighboring properties. Also identify any that would become hazardous due to damage or exposure that the trees would receive as part of the development.
- *Provide a tree retention and replacement plan.*

Limits of the Assignment

I was not provided a site plan showing the limits of clearing and grading, the location of any new structures or the location of utilities.

I was not asked to provide a Tree Removal and Retention Plan, since there was no conceptual construction plan yet.

I was asked to provide a tree removal and retention plan in 2023, after a conceptual site plan was developed.

Methodology

I examined the trees using the standard visual tree assessment method, as outlined in the *Tree Risk Assessment Manual* published by the International Society of Arboriculture. This is considered a Level 2 Basic Tree Risk Assessment. All of my observations were made from ground level. I did not climb the trees, perform any invasive tests on them or excavate any soil from around them.

The tree risk assessment methodology is based on three factors:

- How likely is the tree (or a tree part) to fail?
- How likely is the tree (or tree part) to hit a target of value when it fails?
- How likely is the tree (or tree part) to damage or injure the target if it hits it?

Tree structure, as well as health, plays a role in the risk determination. The proximity of a target of value is also considered. The presence of people and the duration of that presence (occupancy) is also factored it to the risk level determination.

Tree risk is categorized as Low, Moderate, High or Extreme. A normal healthy tree is generally considered low risk, because it is not likely to fail. It is the presence of defects in the tree that increases the likelihood of failure. If no one would be harmed or nothing of value would be damaged by the tree failure, it is also considered low risk. A tree that is likely to fail, but is unlikely to strike a target, is not a high risk tree.

Most trees are either Low Risk or Moderate Risk and are not considered Hazard Trees. However, a property owner's tolerance for risk may be low and a tree of Moderate Risk may be out of their comfort zone. In such cases, removal of the tree should be sought through other permitted means, not hazard tree removal. The definition of a Hazard Tree varies by jurisdiction.

Tree diameter measurements are taken at 4.5' above ground. This is known as Diameter at Breast Height – DBH. I used a diameter tape for this measurement. I used metal tags and flagging tape for tagging and numbering the trees.

Purpose and Use of this Report

The purpose of this report is to provide the tree information I gathered from my site visit and inspection for the purposes of generating a report to meet the permit requirements of the City of Mercer Island. This report is for the sole use of my client and may not be reproduced, used in any way, or disseminated in any form, without prior consent of the client and Alan Haywood – Arborist & Horticulturist, LLC.

Observations

I visited the site on March 4, 2022. I found the site to mostly level from the street heading east. In the northeast corner of the property, there was a gentle downhill slope. The site was dominated by several bigleaf maples (Acer macrophyllum) and one large Douglas fir (Pseudotsuga menziessii), with a few other trees present. The understory was a mix of vine maple, beaked hazelnut, small bitter cherries, a small western redcedar, western sword fern, salal, salmonberry and trailing blackberry. There were also a few non-native trees and invasive plant species (ivy and blackberry) present.

I tagged the trees with aluminum tags and numbered them according to the tree numbers shown on the Topographic Survey. Some trees in the western cleared area were already tagged. Trees that I found that were not shown on the plan, I numbered as well. Some trees that were in the numerical tree sequence were not on the Topographic Survey (1, 2, 3, 8, 9 and 10) were no longer present on the site. I came to this conclusion based on the sequence of the numbered trees that were present. I included these missing trees in the report, thinking that there may be a record of them associated with the demolition permit of the house. I also noted six newly planted trees on the site. My assumption was that they were replacement trees that were planted as mitigation for trees that had been removed at the same time as the house was removed.

I counted 19 trees on the property that were large enough to meet the Mercer Island criteria for a tree to be counted – 10" DBH and three that were large enough to be considered Exceptional – 24" DBH. Six of the countable trees were in poor condition and were not viable trees to be retained.

The tree inventory chart is included in Appendix A. There was a total count of 20 trees shown on the Topographic Survey map that were shown to be on the property. Another four were shown to be off site. Three of the off-site trees were in the street ROW and one was shown to be mostly in the neighbor's yard to the east. According to my count and measurements, six of the trees on the map were too small (under 10" DBH) to be counted. One of those was in poor condition and not viable for retention. I also counted another four trees that were large enough to be counted that weren't shown on the map (trees # 11, 12, 19 and 31). Based on my inventory and assessment, there were 25 trees on the property:

- 6 were too small to be counted
- 16 were large enough to be counted
- 3 qualified as exceptional

Of the 16 trees that were countable, 5 of them were in poor condition and not suitable for retention. These 5 trees would qualify as high risk trees, if there were a target within striking distance of them. High risk trees are generally considered hazard trees. This left 3 Exceptional trees and 11 countable trees for a total of 14 on the property to consider for retention.

There were also the 6 trees that had been recently planted on the property. They were 2" caliper trees, which were still staked and had a temporary irrigation system set up to water them. I assume that these trees are also required to be retained, but they are of a size that they could easily be transplanted.

There were 11 off-site trees included in the inventory and assessment. Eight of these trees were on the street ROW, with 3 of them being shown on the Topographical Survey. Only 2 were large enough to be counted and 1 of those was dead. The rest of the trees present in the street ROW were too small to be counted, but I inventoried and assessed them, nonetheless. These are

essentially City owned trees and the City and City owned trees would require City permission for removal, or could be required to be removed as part of this project by the City.

The large off site tree shown on the east border, mostly on the neighbor's property, was no longer present. I did use that symbol on the map for another tree on the property that was close to that location.

There were 2 trees on the neighbor's property to the north that overhung the subject property. One was large enough to the counted and the other was exceptional. These trees would require protection from any future development. There was also a row of Leyland Cypress planted as a hedge along the fence in the backyard of the neighbor to the north. None of these trees were large enough to count.

The complete tree inventory and assessment is shown in Appendix A and Appendix B. The trees large enough to be counted for retention and in good enough condition to be viable for retention broke down as follows:

- Douglas fir – 2
- Bigleaf maple -8
- Pacific Madrone – 1
- Black Cottonwood – 1
- European Plum – 1
- Unidentified Deciduous Tree – 1(To be identified when it leafs out)

Discussion and Recommendations

The City of Mercer Island requires a minimum of 30% of the trees with a diameter of 10" or greater be retained for all development proposals. They also require that the development proposal be designed to minimize the removal of large trees. Trees that are defined in the City Code to be "Exceptional" are prioritized for retention. Trees that are in poor health and declining condition, and trees that have significant defects that make them likely to fail, are not considered viable for retention.

There were three trees onsite that qualified as Exceptional Trees:

- Tree # 22 – 30" Bigleaf Maple
- Tree #23 – 30" Bigleaf Maple (with 13" dead leader)
- Tree #26 – 10" Pacific Madrone

There was also a 10" DBH Pacific Madrone off site, on the street ROW. However, it was dead and therefore, not viable for retention.

The North Mercer Interceptor Sewer Improvement Project will require the removal of fourteen trees from the site, along the south and east border of the project. It will also require the removal of eight trees from the ROW to the west of the site. All three of the Exceptional trees onsite will be removed as part of the sewer project. Eight trees are proposed for removal and are located in the proposed house footprint. One tree is proposed to be removed due to its poor condition and one ROW tree is proposed for removal that is located in the proposed driveway location.

The trees that are proposed for retention are #4, 5, 13, 19 and 20. They are native bigleaf maple trees and one cherry Tree. #4 and 19 are considered too small to be regulated. These five trees, as well as the two Douglas firs (#10 and 11) that are located offsite to the north should have tree protection measures taken.

~~Since my assignment was only to inventory and assess the trees and I wasn't provided with a construction proposal, I can't comment on the retention and removal of specific trees at this time. I can make recommendations for consideration when site design work begins.~~

The current plan shows eleven trees to be removed because they are in the building footprint and four trees to be removed because they are in the King County Utility easement on the east side of the property.

The current industry methodology for tree root protection is the Critical Root Zone (CRZ) formula. A CRZ is developed for an individual tree by measuring its DBH and measuring one foot out from the trunk in all directions for every one inch of trunk diameter. Using this formula, a 10" diameter tree would have a CRZ of 10' extending out from the trunk in all directions.

In some circumstances, it isn't possible to develop the property as proposed and protect this much of the root zone. What has been found successful is to allow encroachment into the CRZ on one side of the tree by up to 50%. This will still preserve over three quarters of the CRZ and most healthy trees can withstand this. This is particularly true when the other side of the tree is not disturbed at all. The same 10" DBH tree could have soil disturbance up to 5' away from its trunk on one side and be expected to survive, if the rest of its CRZ is left undisturbed. ~~Some jurisdictions refer to~~ this 50% measurement of the CRZ *is sometimes referred to* as the "Interior Critical Root Zone (ICRZ)."

To prevent unintended disturbances in the CRZ, a Tree Protection Zone (TPZ) should be established where no significant disturbance will take place. Ideally, this is at or beyond the CRZ. If the TPZ is reduced by up to 50% on one side, that would be the border of the TPZ. If the TPZ can't be set up to preserve at least three quarters of the CRZ, the tree is probably not a good candidate for retention. *This should be done for trees #4, 5, 13, 19 and 20 as well as the two Douglas firs (#10 and 11) that are located offsite to the north.*

Best management practices to reduce impacts to CRZs can include:

- Fencing of the TPZ - this is often required by the permitting jurisdiction.
- Cantilevering over root zones rather than installing a solid foundation wall.
- Use of pier piling construction methods instead of solid foundation walls.
- Cutting of large roots (over 2" diameter) that need to be removed, not tearing them out with excavation equipment
- Keeping Cut roots moist to prevent dehydration and further dieback. Covering them with moist organic mulch, wood chips or moist fabric (burlap, cloth tarp, etc.) until they are covered with soil.
- Tunneling under roots when possible.
- Using pneumatic or hydraulic excavation methods to preserve roots, rather than open trenching with excavation equipment.
- Prohibiting the storage of materials and the use of heavy equipment within the TPZ.
- *Providing extra irrigation during the summer dry season.*
- *Providing supplemental organic fertilizer and root bio-stimulant products to promote root growth.*

All of the above practices should be considered and implemented as is deemed appropriate by the City of Mercer Island. Agencies sometimes require an arborist to be onsite to monitor work done within the protected CRZs of trees. If any of the trees can't be saved due to unforeseen circumstances during construction, then the arborist can help make that determination. Tree replacement or other mitigation measures can be required by the permitting agency. Again, the arborist can help advise on what would be appropriate under the existing circumstances. *The proposed utility connection to the house is shown to run through the CRZ of the neighbor's two large Douglas firs. I recommend either tunneling or compressed air excavation through the CRZ of the these two trees.*

Tree #13 is proposed for retention, but its ICRZ will be impacted by the house construction. Appropriate BMPs will be implemented to try to successfully retain the tree. However, it is recognized that that it may not survive or thrive after construction and that removal would be required if that were the case. The City could determine appropriate mitigation at that time. The City might also determine that the risk to the tree is too great and that removal is the better course of action with some sort of mitigation planting added to the plan.

The proposed mitigation planting for this project is located along the south border of the property and on the western portion of the property on the north side of the driveway. Because of the utility easement on the east side of the property, the potential mitigation planting sites are limited. At some point, off-site mitigation planting or fee in lieu of mitigation may have to be considered, if what is proposed isn't acceptable. It is also a possibility that a smaller tree slated for removal could be transplanted and retained elsewhere on the site. Trees #11 and 12 are slated for removal, due to their condition, but they could be retained in their current location.

Tree Replacement

The proposed tree removal will require 11 tree replacement trees. At least Fifty percent of the replacements are required to be native species. The trees proposed as replacements are 1 Douglas fir, 4 shore pines and 3 vine maples for native species and 3 Japanese flowering cherries as non-native ornamental species. The trees will be planted in the dormant season and will be mulched per City specifications and will be given supplemental organic fertilizer with bio-stimulants for enhanced root growth.

Conclusion

The information in this report is based on my site visit and inspection completed on March 4, 2022 and the plans for the project that I have reviewed. I attest that all of the information within this report is accurate, to the best of my knowledge. It does not provide any guarantees or implications that conditions of the trees on the site won't change over time. All trees eventually fail and even sound, healthy trees fail during severe weather events.

Thank you for the opportunity to be of service to you with this project. Please feel free to contact me if you have any questions about this report or if you have any further need for my services.

Sincerely,

Alan Haywood

Alan Haywood – Arborist & Horticulturist, LLC.

ISA Certified Arborist/Municipal Specialist – PN 0330-AM
ISA Qualified Tree Risk Assessor
ASCA Qualified Tree and Plant Appraiser
WSNLA Certified Professional Horticulturist - 2332
ecoPRO Certified Sustainable Landscape Professional – 6017
WSDA Licensed Pest Control Consultant – 7627

Appendix A: Tree Chart – On Subject Property-*Revised 5/23*

Tree #	Species	DBH "	Cndtn	Excptnl	Comments & Recommendations
1					Not Present
2					Not Present
3					Not Present
4	BL	9	Fair	No	**Small.** Adjacent to the property line – could be a shared tree. Leans to the west, ivy on trunk, growing next to a Hawthorn tree on adjacent property. **Retain.**
5	CH	7 & 4	Fair	No	**Small.** Trunk forks at 1', leans to the south, ivy on trunk, over topped by neighbor's 24" Douglas fir. **Retain.**
6	EP	8, 5, 5, 5 & 7	Fair	No	One 3" trunk is dead, crown is dense and overgrown due to previous pruning practices, some cherry bark tortrix infestation present. **To be removed as part of King County Sewer Improvement Project.**
7	EP	3, 4, 5, 6, & 7	Poor	No	**Small.** Trunks 3, 5 and 7" are dead. Decay and cracks in trunk are present. **To be removed as part of King County Sewer Improvement Project.**
8					Not Present
9					Not Present
10					Not Present
11	As	2, 3, 3, 3, 4 & 5	Fair	No	**Small.** Poor structure, **To be removed.**
12	BS	7	Poor	No	**Small.** Leans to the west with an uneven crown. Sparse foliage and low vigor due to spruce aphid damage. **To be removed.**
13	BLM	19	Fair	No	Ivy on trunk. **Retain.**
14	BLM	18	Fair	No	Ivy on trunk. **To be removed – In house footprint.**
15	BLM	18	Fair	No	Ivy on trunk. **To be removed – In house footprint.**
16	BLM	14	Poor	No	Decay in trunk from 10 – 15'. **To be removed – In house footprint.**
17	BLM	11	Fair	No	Uneven crown due to crowding. **To be removed – In house footprint.**
18	BLM	15	Poor	No	Main trunk dead at 15'. **To be removed – In house footprint**
19	BLM	7	Good	No	**Small. Retain.**
20	BLM	11 & 14	Fair	No	Ivy on trunk, bark inclusion at fork. **Retain.**
21	BLM	7, 12, 7 & 7	Poor	No	Brittle Cinder fungus (*Kretzchmaria deusta*) present, dead wood in crown. **To be removed – In house footprint.**
22	BLM	30	Fair	Yes	Trunk forks at 12', ivy on trunk, dead wood in crown. **To be removed– In house footprint.**
23	BLM	30 & 13	Fair	Yes	30" trunk forks at 7'. 13" trunk forks at 5' with one dead leader. Recommend removal of dead leader. **To be removed as part of King County Sewer Improvement Project.**
24	DF	26	Good	No	Ivy on trunk. **To be removed – In house footprint.**

Tree #	Species	DBH "	Cndtn	Excptnl	Comments & Recommendations
25	BLM	15	Fair	No	Dead wood in crown. **To be removed ~~as part of King County Sewer Improvement Project.~~ – In house footprint.**
26	PM	10	Fair	Yes	Significant lean over trail. Tree is stable – phototropic lean is characteristic of the species. **To be removed ~~as part of King County Sewer Improvement Project.~~ – In house footprint.**
27	DF	13	Fair	No	Uneven crown. **To be ~~removed as part of King County Sewer Improvement Project.~~ – In house footprint.**
28	BCW	12	Fair	No	Trunk has dogleg and leans to the south with low taper. **To be removed as part of King County Sewer Improvement Project.**
29	BLM	18 & 10	Poor	No	Ivy on trunk, 18" trunk is forks at 18' – one fork broken off. 10" trunk has decay up to 7' with a basal hollow. **To be removed as part of King County Sewer Improvement Project.**
30	DT	4, 5, 6 & 6	Fair	No	Basal inclusion. **To be removed as part of King County Sewer Improvement Project.**
31	SS	12	Poor	No	Trunk has significant lean to the north that is self-corrected at 12'. Trunk forks at 6' with bark inclusion. **To be removed as part of King County Sewer Improvement Project.**
Cs-1	Cs	2	Fair	No	Replacement Tree. **To be relocated on site.**
Cs-2	Cs	2	Fair	No	Replacement Tree. **To be relocated on site.**
Cs-3	Cs	2	Fair	No	Replacement Tree. **To be relocated on site.**
VM-1	VM	2	Fair	No	Replacement Tree, **To be removed as part of King County Sewer Improvement Project.**
VM-2	VM	2	Fair	No	Replacement Tree, **To be removed as part of King County Sewer Improvement Project.**
VM-3	VM	2	Fair	No	Replacement Tree, **To be removed as part of King County Sewer Improvement Project.**

Abbreviations

As = Ash sp. (*Fraxinus* sp.)
DF = Douglas Fir (*Pseudotsuga mensiezii*)
BCW = Black Cottonwood (*Populus trichocarpa*)
BL = Black Locust (*Robinia Pseudoacacia*)
BLM = Bigleaf Maple (*Acer macrophyllum*)
BS = Colorado Blue Spruce (*Picea pungens*)
CH = Common Hawthorn (*Crataegus monogyna*)
Cs = Cascara (*Rhamnus purshiana*)
DT = Deciduous Tree – Unidentified
PM = Pacific Madrone
EP = European Plum (*Prunus x domestica*)
SS = Sitka Spruce (*Picea sitchensis*)
VM = Vine Maple (*Acer circinatum*)

Appendix B: Tree Chart – Off Site *in ROW*

Tree #	Species	DBH "	Cndtn	Excptnl	Comments & Recommendations
1	NS	6	Fair	No	**Small**, In ROW. **To be removed**
2	BL	6 & 2	Fair	No	**Small**, In ROW. **To be removed as part of King County Sewer Improvement Project.**
3	BL	5&5	Fair	No	**Small**, In ROW. **To be removed as part of King County Sewer Improvement Project.**
4	PM	10	Poor	Yes	Dead with Damaged trunk **.To be removed as part of King County Sewer Improvement Project.**
5	SW	9	Fair	No	**Small**, In ROW. **To be removed as part of King County Sewer Improvement Project.**
6	FP	3	Fair	No	**Small**, In ROW. **To be removed as part of King County Sewer Improvement Project.**
7	BL	9, 7 & 9	Fair	No	In ROW. **To be removed as part of King County Sewer Improvement Project.**
8	As	8	Fair	No	**Small**, In ROW. **To be removed as part of King County Sewer Improvement Project.**
9	BL	8"	Fair	No	**Small**, In ROW. **To be removed as part of King County Sewer Improvement Project.**
10	DF	24"	Fair	No	Neighbor to the north. **Retain.**
11	DF	20"	Fair	No	Neighbor to the north. **Retain.**

Abbreviations

As = Ash sp. (*Fraxinus* sp.)

BL = Black Locust (*Robinia Pseudoacacia*)

FP = Flowering Plum

NS = Norway Spruce

PM = Pacific Madrone

SW = Scouler's Willow

Appendix C: Tree Map