AFM
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ARBORIST REPORT
FOR
3675 W Mercer Way
Mercer Island, WA

August 16th, 2016

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1. Introduction

American Forest Management, Inc. was contacted by Amanda Cavassa with Demetriou Architects, and was asked to compile an 'Arborist Report' for a single home build on three parcels located within the City of Mercer Island, WA.

The proposed home tear-down and reconstruct is located at 3675 W Mercer Way. Our assignment is to prepare a written report on present tree conditions, which is to be filed with the permit application.

Date of Field Examination: August 2nd, 2016

2. Description

Significant trees are comprised of a mix of planted and native species. Subject trees can be identified in the field by a numbered aluminum tag. Tree tag numbers correspond with tree numbers on the attached tree summary tables and the copy of the site plan. Detailed information for assessed trees can be found on the accompanying Tree Condition Summary spreadsheets. Tree/Tag #, species, DBH (diameter at 4 ½ feet above ground), height, measured drip-lines, specific defects and overall condition are given.

64 significant trees were evaluated on the subject property. A significant tree as defined by the City is any conifer 6' in height or larger and any deciduous tree 6" in diameter and larger. Two of these were found to be in a non-viable condition. In addition to the trees on the subject property, there are two neighboring trees with driplines that extend over the property line. These trees are included in this report.

3. Methodology

Each tree in this report was visited. Tree diameters were measured by tape. The tree heights were measured using a Spiegel Relaskop. 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 condition is made. The four condition categories are described below based on the species traits assessed:

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 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 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

A 'viable' tree has determined to be in good health, with a low risk of failure due to structural defects, is wind firm if isolated or remains as part of a grove, and is a species that is suitable for its location. Trees considered 'non-viable' are trees that are in poor condition due to disease, age related decline, have significant decay issues and/or cumulative structural defects, which exacerbate failure potential.

The attached tree map indicates the 'condition' of the subject trees found at the site.

4. Observations

The property contains a wide variety of tree species, sizes and age classes.

Douglas-fir
The Douglas-fir trees on the subject property are generally healthy, mature trees. Many of the Douglas-fir trees are adjacent to the home and in small planters. Common defects include butt swell, and structural defects such as forked tops. All of the Douglas-fir trees are viable.

Western red cedar
The western red cedar trees are in three areas of the property. There are two young western red cedar trees next to the driveway. There are four western red cedar trees in good condition on the steep slope on the east side of the property. The remaining western red cedars are in a cluster on the southeast property line. There are eight western red cedar trees in this location. All eight are semi-mature and growing closely together. Trunk taper and crown vigor was good in all eight trees. The most common defect observed in the western red cedar trees was forked trunks with included bark. All of the western red cedar trees on the property are viable.

Big leaf maple
Big leaf maple trees are dispersed throughout the steep slope above the home. The big leaf maple range in age and condition. One big leaf maple, #103 has a broken top and is in poor condition. This is the only significant, non-viable big leaf maple on the subject property. Common defects include forked trunks, self-corrected leans.

Cherry laurel
Cherry laurel is a small tree found throughout the property. The majority are on the east side of the property on the steep slope. Most of the cherry laurel trees on the property are non-significant. Most of the cherry laurels are leaning and have widespread crowns. Both characteristics are common for the species. All of the cherry laurel trees are viable.

Horse chestnut
There is a grouping of four horse chestnut trees on the south side of the property just below the steep slope. All four are in fair condition. Three are mature and one is semi-mature. Ivy is covering the trunks of these trees. Two of the trees are leaning. All four trees are viable.

Bitter cherry
The majority of the bitter cherry trees are non-significant and on the northwest property line. Of the significant trees, the most common notable defects were small live crowns and poor trunk structure. These trees are semi-mature for the species.

Norway spruce
All of the Norway spruce trees on the property are on the northwest property line, interspersed with the bitter cherry trees. Tree #146 has a thin crown and there is moderate bleeding in the upper trunk. The Norway spruce trees range from fair to good condition. All of the Norway spruce trees are viable.

Details for trees not specifically discussed in this section can be found on the attached tree table.

Neighboring trees
Tree #201 is a bitter cherry east of the property line. This tree leans west. Cherry gummosis was observed on the trunk. The subject tree is in fair condition and is viable.

Tree #202 is a Crimson King maple. This tree has a large crown and no defects were observed. The subject tree is in good condition and is viable.

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 sruvey which is attached and part of this report. The information plotted on the attached survey needs to be transferred to the final tree retention - protection plan to meet City submittal requirements. The trees to be removed shall be shown "X'd" out on the final plan.

The Limits of Disturbance are also provided on the tree summary tables for trees potentially impacted by the proposal. These have also been delineated on the site plan. Tree protection fencing shall be erected at the drip-line or farther out if space is available. Tree protection fencing shall not be erected inside the Limits of Disturbance. Once the site plan is completed, map the driplines, limits of disturbance and tree protection fencing of all of the retained trees on the finished site plan.

At the time of this report, the site plans are very preliminary. The majority of retained trees will likely be on the perimeters of the property. These are the areas that will be least impacted by construction of the new home and garage.

The tree species of highest retention value on this property are the Douglas-fir, Pacific madrone, and western red cedar trees. These three species are native to western Washington and typically have long, productive lifespans. Many of the Douglas-fir trees are adjacent to the home, in small planters and successful retention will be nearly impossible. The new home is significantly larger than the current one and the majority of the Douglas-fir trees will likely be located in the footprint of the new home or garage. There are mature pacific madrones, western red cedars and Douglas-fir trees on the perimeters of the property where retention is more realistic.

It is important to consider species ability to withstand construction damage. Pacific madrone trees are intolerant of site damage and any work within the dripline could severely compromise long term viability. If any of the Pacific madrones will be retained, no work may occur within the dripline of these trees.

Norway spruce trees typically grow to 40' – 60' in height but can get up to 100'. The Norway spruce trees on the subject property are between 35' and 70'. Norway spruce is commonly planted as a windbreak or screen tree. This species is intolerant of root loss.

The cluster of western red cedar trees on the south property line are close to the preliminary new home and deck location. Western red cedar trees are intolerant of root damage and fill. Changes in water table and soil moisture can severely impact their viability. Careful tree protection measures will be necessary to protect these trees. Retaining all eight trees (#131 – 138) as a group, would be best to minimize wind impacts.

Cherry laurel trees were found throughout the property. Cherry laurel is a small tree not native to Washington. This tree is classified as a Weed of Concern in King County. King County discourages planting this species. This species is the lowest priority for retention on this property.

For the majority of the property, ivy was killed and removed from trees. There is still ivy covering the trunks of many trees. This threatens the long term health and viability of the trees. It also impeded visual assessments of tree trunks. The remaining ivy should be killed and removed from trees.

6. Proposed Tree Retention

A total of 64 significant trees were identified on the subject property. 2 are non-viable and not recommended for retention. The subject property contains a total of 62 healthy significant trees.

Once the retained trees are determined, the city arborist will apply a replacement ratio based on a sliding scale of 0:1 up to 4:1, depending upon the criteria in the following priority order:

1. Percentage of slope, slope stability, topography and general soil conditions;
2. Trunk size and canopy of tree to be cut and trunk size and canopy of replacement tree;
3. Size and shape of lot and area available to be replanted; and
4. Proximity to any critical tree area and/or the existence and retention of vegetative cover in any critical tree area.

All replacement trees shall be at least six feet tall, unless a smaller size tree or shrub is approved by the city arborist.

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.

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. 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.

There is no warranty suggested for any of the trees subject to this report. Weather, latent tree conditions, and future man-caused activities could cause physiologic changes and deteriorating tree condition. Over time, deteriorating tree conditions may appear and there may be conditions, which are 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,

Kelly Wilkinson
ISA Certified Arborist #PN-7673A
ISA Tree Risk Assessment Qualified

Tree Protection Standards

1. Tree Protection Fencing shall be erected at prescribed distance per arborist report. Fences shall be constructed of chain link and be at least 4 feet high.
2. Install highly visible signs on protection fencing spaced no further than 15 feet apart. Signs shall state “Tree Protection Area-Entrance Prohibited”, and “City of Mercer island” code enforcement phone number.
3. No work shall be performed within protection fencing unless approved by Planning Official. In such cases, activities will be approved and supervised by a “Qualified Tree Professional”.
4. The original grade shall not be elevated or reduced within protection fencing without the Planning Official authorization based on recommendations from a qualified professional.
5. No building materials, spoils, chemicals or substances of any kind will be permitted within protection fencing.
6. Protection Fencing shall be maintained until the Planning Official authorizes its removal.
7. Ensure that any approved landscaping within the protected zone subsequent to the approved removal of protection fencing be performed with hand labor.

In addition to the above, the Planning Official may require the following:

a. If equipment is authorized to operate within the root zone, the area will be mulched to a depth of 6” or covered with plywood or similar material to protect roots from damage caused by heavy equipment.
b. Minimize root damage by excavating a 2-foot deep trench, at edge of protection fencing to cleanly sever the roots of protected trees.
c. Corrective pruning to avoid damage from machinery or building activity.
d. Maintenance of trees throughout construction period by watering and fertilization.

Photos

Tree #102 – bitter cherry with large ivy stems and burls

Tree #103 – big leaf maple with broken top

East side of property

Tree #121 – Pacific madrone with cankers caused by Nattrassia mangiferae

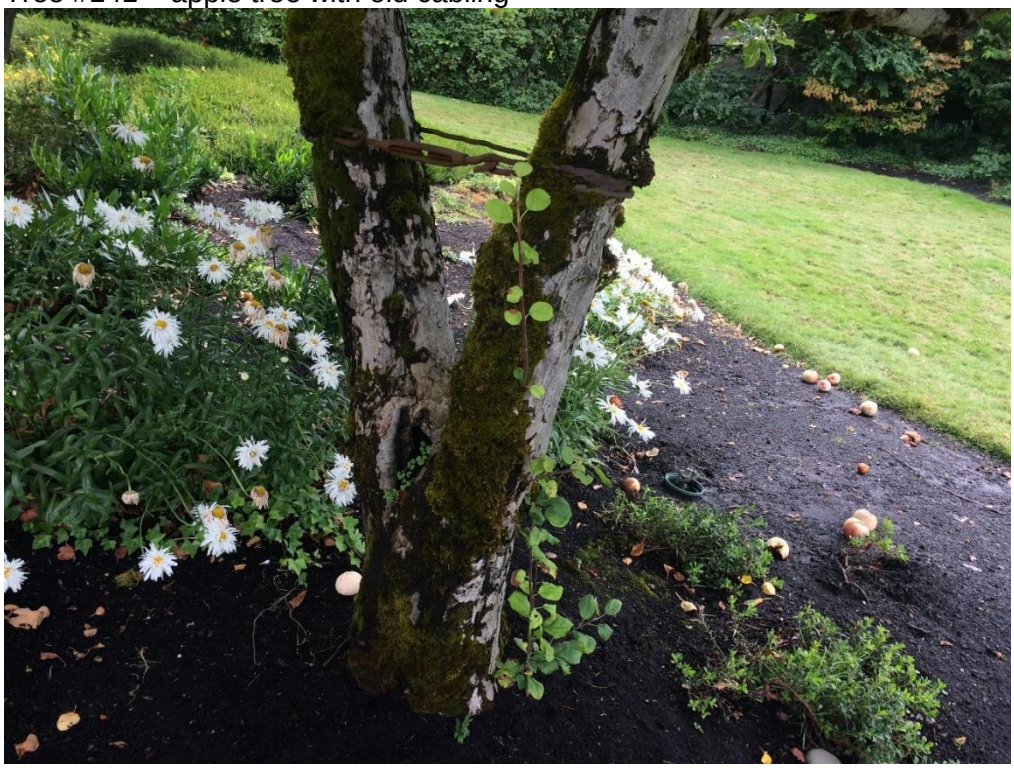
Tree #123 – paper birch leaning west, ivy on the trunk

Tree #131 - #133 – western red cedars on the southeast property line

Western red cedar trees on the southeast property line

Tree #140 – mulberry tree with co-dominant stems

Tree #141 – apple tree with old cabling



Southeast portion of subject property

North side of subject property

North side of subject property

Tree #156 – mature Douglas-fir

Tree #162 – mature Douglas-fir in small planter box adjacent to home, cambium ruptures on the trunk

Tree #163 and #164 – Douglas-fir trees adjacent to the home in a small planter box

Tree Summary Table

For: 3675 W Mercer Way
City of Mercer Island

American Forest Management, Inc.

Date: 8/2/2016
Inspector: Wilkinson

Tree/ Tag #	Species	DBH (inches)	Height (feet)	Drip-Line/Limits of Disturbance (feet)				Condition	Viability	Comments
				N	S	E	W			
101	white ash	11	38	8 / 6	15 / 2	10 / 6	14 / 2	fair	viable	slight lean s
102	bitter cherry	13	18					poor	non-viable	large ivy stems covering trunk, burls
103	big leaf maple	8, 5	26	9				poor	non-viable	broken top, growing on steep slope, small live crown, trunk forks at base
104	white ash	7, 5	42	4 / 6	5 / 6	0 / 6		fair	viable	on steep slope, some decay
105	cherry laurel	8, 5, 5, 4	25	18 / 10	16 / 5	0 / 10	14 / 5	fair	viable	
106	cherry laurel	5, 6, 5, 10	26	12 / 8	15 / 5		18 / 8	fair	viable	
107	big leaf maple	34	88	25 / 10	30 / 15	16 / 15	25 / 8	fair	viable	trunk forks at 5', u-shaped attachment
108	big leaf maple	15, 11, 8	80	12 / 12	10 / 12	9 / 15	7 / 5	fair	viable	2' from ground, fork is an ok attachment
109	big leaf maple	10, 5, 5, 3	21	2 / 10	15 / 10	2 / 10	17 / 8	fair	viable	self corrected lean, forks at base
110	western red cedar	5	26	7 / 5	8 / 5	6 / 6	7 / 4	good	viable	
111	Douglas-fir	31	115	14 / 15	9 / 15	10 / 18	15 / 15	good	viable	
112	cherry laurel	7, 4	23	3 / 4	4 / 4	0 / 4	21 / 10	fair	viable	leans west
113	cherry laurel	3, 4, 2, 4, 5, 6, 9	25	16 / 10	0 / 10	0 / 10	21 / 12	fair	viable	leans west
114	western red cedar	26	80	12 / 15	8 / 15	7 / 18	14 / 12	good	viable	trunk forks at 27', some included bark
115	western red cedar	11	75	8 / 6	7 / 6	9 / 8	8 / 5	good	viable	
116	western red cedar	33	82	9 / 16	14 / 16		13 / 14	good	viable	
117	big leaf maple	16, 14	78	6 / 14			15 / 14	good	viable	forks at 2', good attachment, one stem has a j-shaped crook, ~10' up
118	big leaf maple	25, 21	81	12 / 16	24 / 16	13 / 18	29 / 16	good	viable	forks at base, wide crown
119	Douglas-fir	32	105	13 / 15	7 / 15	10 / 15	11 / 15	good	viable	forked top
120	Pacific madrone	22, 18	93	6 / 18	8 / 18	3 / 18	17 / 16	fair	viable	20% dieback, some decay
121	Pacific madrone	28, 32	58	14 / 20	15 / 20	0 / 20	34 / 25	good	viable	some cankers, forks 4' from the ground
122	red alder	9	45	3	12	5	15	fair	viable	leans west, broken top
123	paper birch	8	30	12	8	5	12	fair	viable	leans west
124	western hemlock	10	49	6	7	9	6	fair	viable	self corrected lean N, some soil plate lifting
125	horse chestnut	21	82	8 / 10		15 / 10		fair	viable	ivy covering trunk
126	horse chestnut	12	80	5 / 6		12 / 6		fair	viable	poor taper
127	horse chestnut	16, 10, 5	84	8 / 10	10 / 10	5 / 10	15 / 10	fair	viable	ivy covering trunk, leans west
128	horse chestnut	8, 4	25	9 / 6	4 / 6	6 / 6	5 / 6	fair	viable	covered in ivy, leans north
129	Lombardy poplar	33, 20	83	16	14	7	20	fair	viable	
130	yellow wood	7, 5, 5, 4	63	16 / 5	4 / 5	0 / 5	13 / 5	good	viable	forks at the base
131	western red cedar	11	64	9 / 6			7 / 6	good	viable	

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City of Mercer Island

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Tree/ Tag #	Species	DBH (inches)	Height (feet)	Drip-Line/Limits of Disturbance (feet)				Condition	Viability	Comments
				N	S	E	W			
132	western red cedar	14	60				5 / 7	good	viable	
133	western red cedar	14, 2	65				4 / 8	good	viable	
134	western red cedar	13	62				7 / 8	good	viable	
135	western red cedar	17	64				6 / 9	good	viable	
136	western red cedar	8	58	4 / 5	7 / 5		6 / 5	good	viable	
137	western red cedar	17, 21	75	10 / 18	14 / 18	5 / 18	15 / 18	good	viable	codominant stems, moderate included bark
138	western red cedar	15	61	4 / 8	12 / 8	13 / 8	5 / 8	good	viable	
139	apple	3, 4, 4	10	6 / 5	9 / 5	8 / 5	4 / 5	good	viable	
140	mulberry	3, 3, 4, 5, 5, 5, 4	13	14 / 7	8 / 7	9 / 7	11 / 7	good	viable	
141	apple	8, 6, 4	12	10 / 6	10 / 6	10 / 6	8 / 6	fair	viable	cable around tree
142	paper birch	14	66	14	12	8	15	fair	viable	
143	western red cedar	5	37	3 / 3	5 / 3	4 / 3	4 / 3	fair	viable	
144	western red cedar	11	56	5 / 6	11 / 3	8 / 6	13 / 6	good	viable	
145	Norway spruce	11	35	5 / 6	9 / 6	7 / 6	8 / 6	good	viable	
146	Norway spruce	17	71	8 / 9	9 / 9	9 / 9	12 / 9	fair	viable	thin crown, bleeding in upper trunk
147	bitter cherry	8	40	4 / 4	7 / 4	5 / 4	0 / 4	fair	viable	leans south, small crown
148	Norway spruce	9	42	7 / 5	11 / 5	9 / 5	8 / 5	good	viable	
149	bitter cherry	16, 3	48	3 / 8	4 / 8	5 / 8	3 / 8	fair	viable	small crown
150	Norway spruce	16	69	6 / 8	10 / 8	8 / 8	10 / 8	good	viable	
151	Norway spruce	7	56	5 / 4	3 / 4	2 / 4	3 / 4	fair	viable	thin crown
152	Norway spruce	10	55	4 / 5	9 / 5	5 / 5	5 / 5	good	viable	
153	bitter cherry	7	28	3 / 4	5 / 4	8 / 4	4 / 4	fair	viable	crook in trunk, dieback in crown
154	bitter cherry	6, 5	48	2 / 5	5 / 5	3 / 5	9 / 5	fair	viable	forks at base, dieback
155	Norway spruce	4	38	6 / 4	6 / 4	7 / 4	5 / 4	good	viable	
156	Douglas-fir	50	125	23 / 22	27 / 22	22 / 22	20 / 22	good	viable	
157	Douglas-fir	26	103	8 / 14	7 / 14	6 / 14	7 / 14	good	viable	
158	western red cedar	7	27	5 / 4	12 / 6	7 / 4	8 / 4	fair	viable	self corrected lean N
159	cherry laurel	6, 13, 8, 4, 4	25	8 / 8	6 / 8	8 / 8	17 / 8	fair	viable	
160	Douglas-fir	22	89	8	13	10	12	fair	viable	mistletoe
161	cherry laurel	9	20	5 / 5	16 / 8	5 / 5	7 / 5	good	viable	forks at 4.5'
162	Douglas-fir	35	112	14	12	17	15	fair	viable	

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Date: 8/2/2016
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Tree/ Tag #	Species	DBH (inches)	Height (feet)	Drip-Line/Limits of Disturbance (feet)				Condition	Viability	Comments
				N	S	E	W			
163	Douglas-fir	36	131	25	15	20	17	fair	viable	some butt swell, small planter
164	Douglas-fir	28	85	11	16	20	7	fair	viable	j-shaped trunk, small planter
Neighboring Trees										
201	bitter cherry	7	42	16	0	0	22	fair	viable	leans west, cherry gummosis
202	Crimson King maple	28	80	6				good	viable	

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

Tree Locator Map