



# A.B.C Consulting Arborists LLC

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## Cheshire Short Plat Tree Protection Plan

**July 25, 2019**

Updated: February 6, 2020

### PREPARED FOR:

Derek Cheshire  
7615 E Mercer Way  
Mercer Island, WA 98040

### PREPARED BY:

**A.B.C. Consulting Arborists LLC**

Daniel Maple,  
*Registered Consulting Arborist #627*  
*ISA Municipal Specialist # PN-7970AM*  
*ISA Tree Risk Assessment Qualified (TRAQ)*  
*ISA Board Certified Master Arborist #PN-7970BM*

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# TABLE OF CONTENTS

<b>CONSULTING ARBORIST</b> .....	<b>2</b>
<b>ASSIGNMENT</b> .....	<b>3</b>
<b>LIMITATIONS OF ASSIGNMENT</b> .....	<b>3</b>
<b>METHODOLOGY</b> .....	<b>3</b>
<b>SITE</b> .....	<b>3</b>
<b>TREES</b> .....	<b>4</b>
Non-Viable Trees.....	4
Trees That Conflict with Proposed Improvements .....	4
Viable Trees to be Retained.....	4
Trees Adjacent to the Site.....	4
<b>TREE RENTENTION</b> .....	<b>4</b>
<b>REPLANTING</b> .....	<b>4</b>
<b>TREE PROTECTION ZONES (TPZ)</b> .....	<b>5</b>
<b>CRITICAL ROOT ZONES (CRZ)</b> .....	<b>5</b>
<b>FENCING</b> .....	<b>5</b>
<b>ROOT PROTECTION</b> .....	<b>6</b>
<b>ATTACHMENTS</b> .....	<b>7</b>

## CONSULTING ARBORIST

Daniel J. Maple / A.B.C. Consulting Arborists, LLC  
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### Certifications

ASCA Registered Consulting Arborist (RCA)	# 627
ISA Board Certified Master Arborist	PN-7970BM
ISA Certified Arborist Municipal Specialist	PN-7970AM
ISA Tree Risk Assessment Qualified (TRAQ)	June 30, 2020
AFF Qualified Tree Farm Inspector	# 169449
Commercial Applicator	# 92432
Commercial UAV Airman Pilot (Drone)	# 4135495

## ASSIGNMENT

Provide the following as required by the city of Mercer Island to short plat the above property:

1. Location, species, and diameter of all Regulated Trees (6 inches DBH for deciduous and 6 feet tall or taller for evergreen).
2. Location, species, and diameter of all Regulated Trees in the right of way adjacent to the site.
3. The approximate size and location of all Regulated Trees within 15' of property boundary.
4. Number trees on map for easy identification of individual trees to be saved and/or removed.
5. Clearly mark all trees proposed to be cut.
6. Provide tree health/risk, mitigation options and post construction viability.

## LIMITATIONS OF ASSIGNMENT

This report is limited to a Visual Assessment (VA) of the site and the trees. It is not a risk assessment, structural assessment or comprehensive health assessment. The report is limited to the scope of the assignment.

## METHODOLOGY

To evaluate the trees, as well as to prepare this report, I drew upon my 30+ years of experience in the field of arboriculture and my formal education. I followed the protocol of the International Society of Arboriculture (ISA) and I performed my assessment using and/or considering the following Best Management Practices:

**ANSI A300 Part 2** – *Soil Management a.) Modification b.) Fertilization & c.) Drainage.*

**ANSI A300 Part 5** – *Managing Trees During Site Planning, Site Development, and Construction.*

**ANSI A300 Part 8** – *Root Management.*

**ANSI A300 Part 9** – *Tree Risk Assessment (Second Edition).*

**ISA BMP's** – *Tree Inventories (Second Edition 2013)*

Best Management Practices were developed to aid in the interpretation of professional standards and guide work practices based upon current science and technology. Using this process, I performed my assessment, which included looking at the overall health of the trees as well as the site conditions. This is a scientifically based process to look at the entire site, surrounding land and soil, as well as a general look at the trees themselves.

## SITE

A 92,347 sq. ft. (2.12-acre) site, **Zoned** SF R-9.6. The back part of the site has critical slope and soils are moderate in depth and well drained (saturated near a spring). The front portion, relevant to this report is moderately sloped. A small seasonal stream goes thru the front of the site. Soils are moderate in depth and well drained. No other relevant site conditions were noted.

## TREES

There were 31 trees 6" and greater DBH on the proposed short plat. They were tagged and numbered 111-115 117-133, 135-143. There were 8 trees 6" DBH and greater in the ROW next to the proposed short plat. They were tagged and numbered 104-110, 132, & 144. Please refer to Attachment 1, Tree Plotter Image for an orientation to the site and the approximate location of the trees.

6 of the 31 trees were between 6 & 10" DBH. 24 were over 10" and are large regulated trees.

### Non-Viable Trees

Of the 31 trees on the proposed short plat there were 8 large regulated trees and 1 <10" trees that were non-viable for retention. Leaving 17 large regulated & 5 <10" viable trees.

On the ROW next to the proposed short plat there was 1 large regulated and 1 <10" non-viable tree.

### Trees That Conflict with Proposed Improvements

There was 7 large regulated and 2 <10" trees that conflict with improvements. They will be removed.

### Viable Trees to be Retained

There were 10 large regulated and 3 <10" viable trees that are currently proposed for retention<sup>1</sup>.

### Trees Adjacent to the Site

There were no offsite trees near the proposed improvements. No offsite trees will be impacted or require tree protection measures other than those noted in the ROW.

## TREE RETENTION

Per Mercer Island city code 19.10.060 A, 2. A minimum of 30% of the trees with a DBH 10" or greater shall be retained.

The proposed short-plat had 31 trees (25 large regulated, 6 <10"). Of the 25 large regulated trees, 8 were non-viable and are excluded from the calculations; leaving 17 viable large regulated trees.

We are proposing to remove 7 of the 17 viable large regulated trees; leaving 10 or 41%.

## REPLANTING

Per Code 19.10.070 Table A; trees that are remove shall be replanted at the ratio:  
<10" 1:1, 10" to 24" 2:1, 24" to 36" 3:1 >36" and exceptional trees 6:1

We are proposing to remove 2 <10" 5 10"-24" 1 24"-36" 1 36" or Exceptional.

**We will need to replant 21 Trees<sup>2</sup>.** See Attachment 6-Tree Inventory and Replacement

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<sup>1</sup>; As this is a conceptual plan; additional trees may need to be removed pending final design and layout.

<sup>2</sup> Landscape design to be provided by Jason Henry / Berger Partnership P.S. 1721 Eight Ave. N. Seattle WA 98109

## TREE PROTECTION ZONES (TPZ)

In order for trees to survive the stresses placed upon them in the construction process, tree protection must be planned in advance of equipment arrival on site. If tree protection is not planned integral with the design and layout of the project, the trees will suffer needlessly and possibly die. With proper preparation, often costing little or nothing extra to the project budget, trees can survive and thrive after construction. This is critical for tree survival because damage prevention is the single most effective treatment for trees on construction sites. Once trees are damaged, the treatment options available are limited.

### General

The TPZ is the optimal protection zone set to preserve trees during construction. The TPZ radius generally is 8-Inches to 18-Inches of protection for every 1-Inch of DBH, based on the trees size, vigor and construction tolerances (*ANSI A300 Part 5 BMP, Matheny, Clark, 1998*).

The TPZ can usually safely be reduced by 20% as long as it does not impact the CRZ. Greater than 20% reductions may be possible, pending review, written permission, and direct oversight of the work, by the Consulting Arborist.

The trees to be saved, must be protected during construction by temporary 6' tall chain-link, or like fencing, located 10' beyond the edge of the trees farthest extending limbs on all sides (dripline). The individual tree protection zones (TPZ) are 10' past the driplines of the tree(s), unless otherwise delineated by A.B.C. Consulting Arborist LLC. See **Attachment 2** for tree specific TPZ and CRZ.

No irrigation lines, trenches, or other utilities shall be installed within the TPZ, without detailed written instructions and the oversight of the Consulting Arborist, to reduce the impacts to the tree roots, and construction related stressors. Cuts or fills should impact no more than 20% of a tree's root system. If topsoil is added to the root zone of a protected tree, the depth should not exceed 2 inches of a sandy loam or loamy fine sand topsoil and should not cover more than 20% of the root system.

If roots are encountered outside the TPZ during construction, they shall be cut cleanly with a saw (not ripped or torn) and covered immediately with moist soil. Noxious vegetation within the critical root zone should be removed by hand. If a proposed save tree must be impacted by grading or fills, then the tree should be re-evaluated by A.B.C. Consulting Arborist LLC to determine if the tree can be saved with mitigating measures, or if the tree should be removed.

See **Attachment 3** for complete tree protection instructions.

## CRITICAL ROOT ZONES (CRZ)

The CRZ is the area where the roots vital for the trees survival are located, the CRZ is generally ½ of the TPZ. At no time or for any reason shall the roots within the CRZ be impacted. See **Attachment 2** for tree specific TPZ and CRZ.

## FENCING

6' tall chain link (or like fencing) shall be installed the TPZs prior to commencement of site clearing and shall remain in place for the duration of the project. When possible, it is preferred that trees be fenced as a group, rather than individuals. At no time shall any vehicle or equipment be allowed inside the TPZ/Fencing. No placing or stock-piling of any material of any kind shall be allowed inside the TPZ.

Removal of any vegetation within the TPZ shall be done by hand. Should any disturbance be required inside the TPZ to install utilities or any other needs during the construction period, they will require project specific instructions by the Consulting Arborist and approval by the city prior to undertaking any said activity in the TPZ.

## **ROOT PROTECTION**

Any roots encountered of 1" in diameter or greater, shall be cut with loppers, pruners, reciprocal saw or like device to provide a clean smooth cut. At no time, shall 1" or greater diameter roots be ripped or torn. Exposed roots shall be covered with wet burlap, or like item, to keep roots from drying out and shall be covered with soil as soon as reasonably possible.

Protect tree root systems from damage due to noxious materials caused by runoff or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations. Protect root systems from damage due to removal of adjacent trees.

**SEE ATTACHMENT 3** For Complete Tree Protection Instructions.

Thank you for contacting A.B.C. Consulting Arborists LLC for your arboricultural needs.

Sincerely,



Daniel Maple, Consulting Arborist

*Registered Consulting Arborist #627  
ISA Municipal Specialist #PN-7970AM  
ISA Tree Risk Assessment Qualified (TRAQ)  
ISA Board Certified Master Arborist #PN-7970BM*

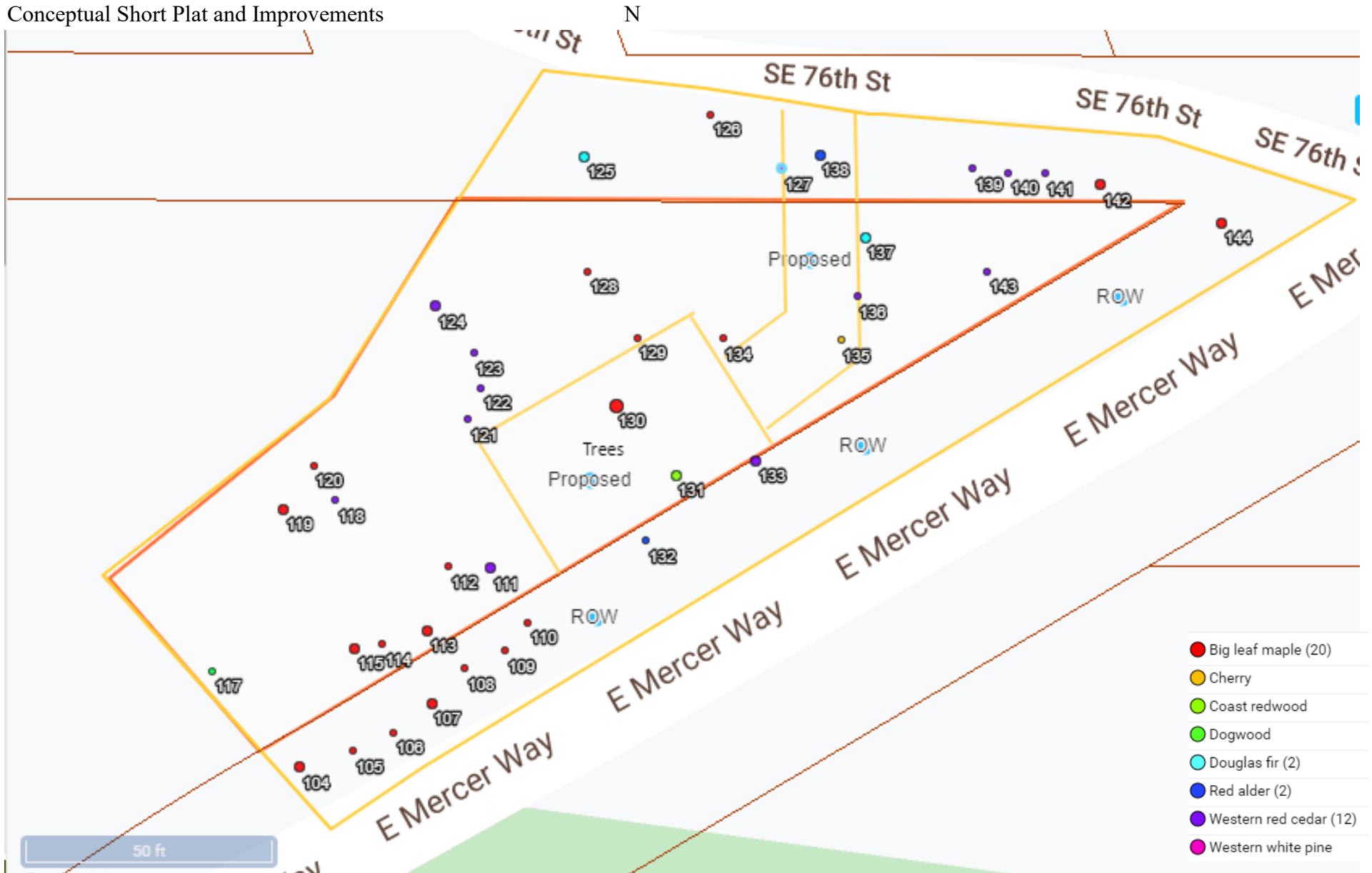


# ATTACHMENTS

<b>ATTACHMENT 1 - TREE PLOTTER IMAGE .....</b>	<b>8</b>
<b>ATTACHMENT 2 - TREE SUMMARY, TPZ, CRZ.....</b>	<b>13</b>
<b>ATTACHMENT 3 - TREE PROTECTION .....</b>	<b>15</b>
<b>ATTACHMENT 4 - ROOT ZONE ENHANCEMENT .....</b>	<b>18</b>
<b>ATTACHMENT 5 - MULCHING .....</b>	<b>19</b>
<b>ATTACHMENT 6 - TREE INVENTORY AND REPLACEMENT.....</b>	<b>21</b>
<b>ATTACHMENT 7 - ASSUMPTIONS AND LIMITING CONDITIONS.....</b>	<b>23</b>
<b>ATTACHMENT 8 - REFERENCES .....</b>	<b>24</b>

**ATTACHMENT 1 - TREE PLOTTER IMAGE**

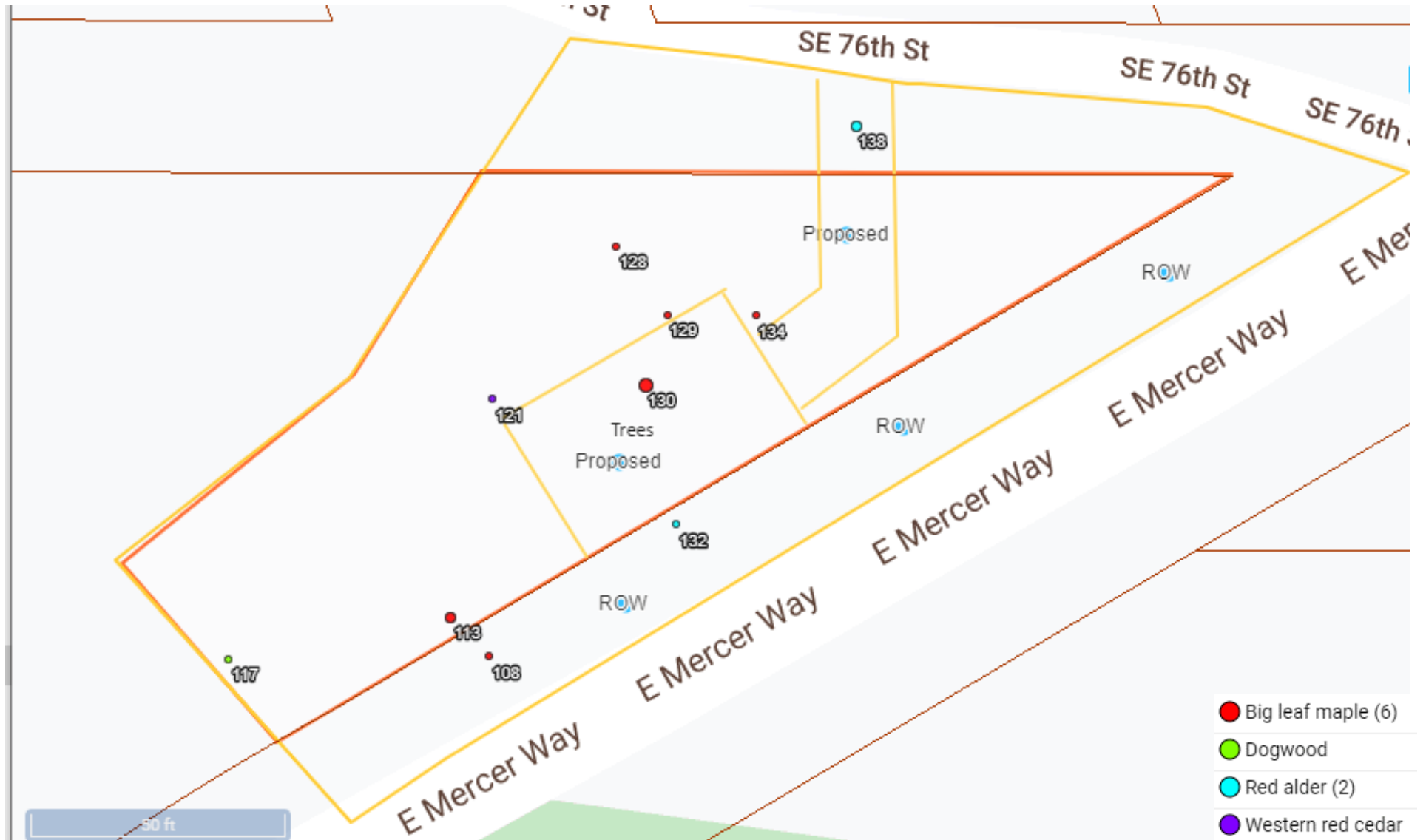
Conceptual Short Plat and Improvements



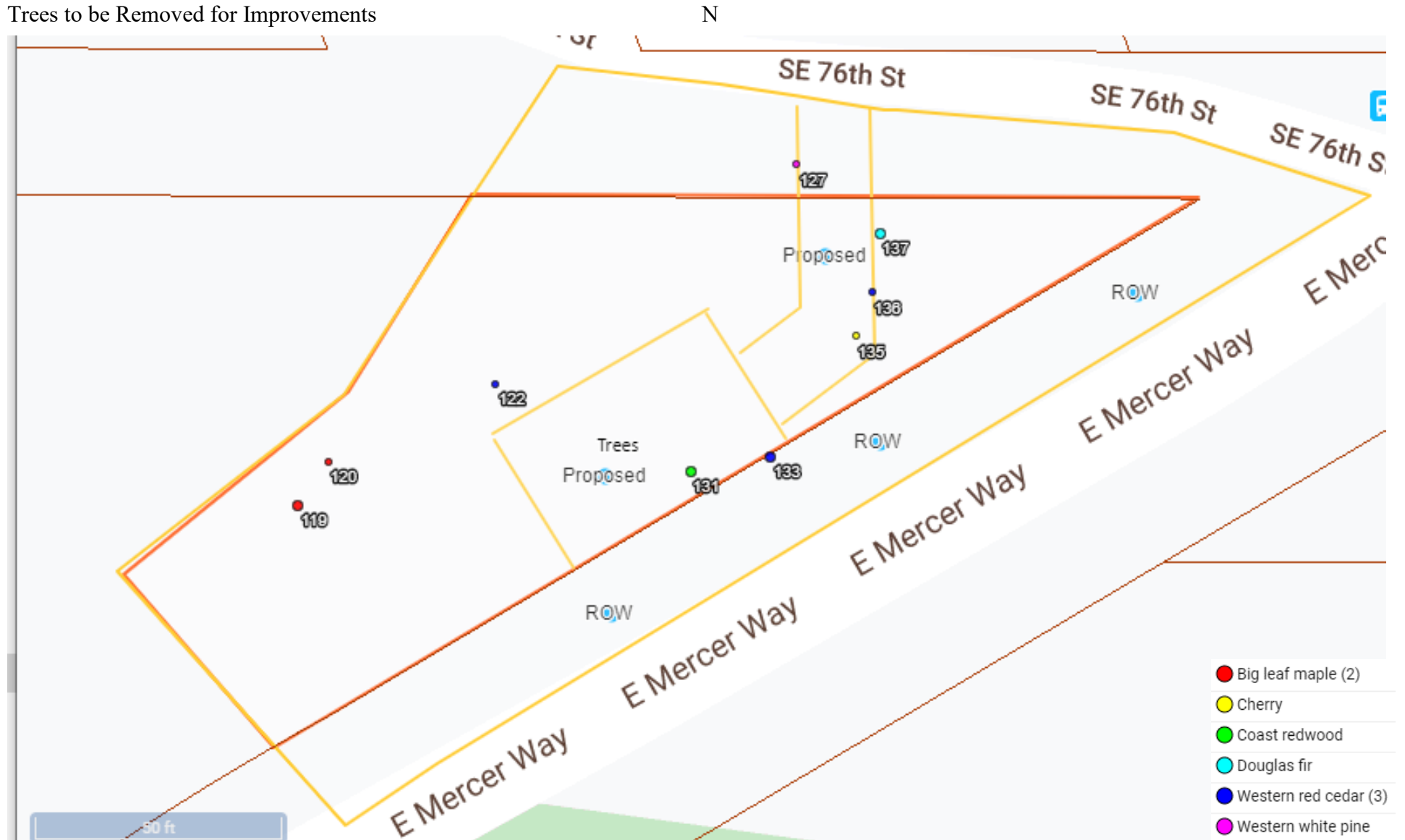


Non-Viable Trees

N

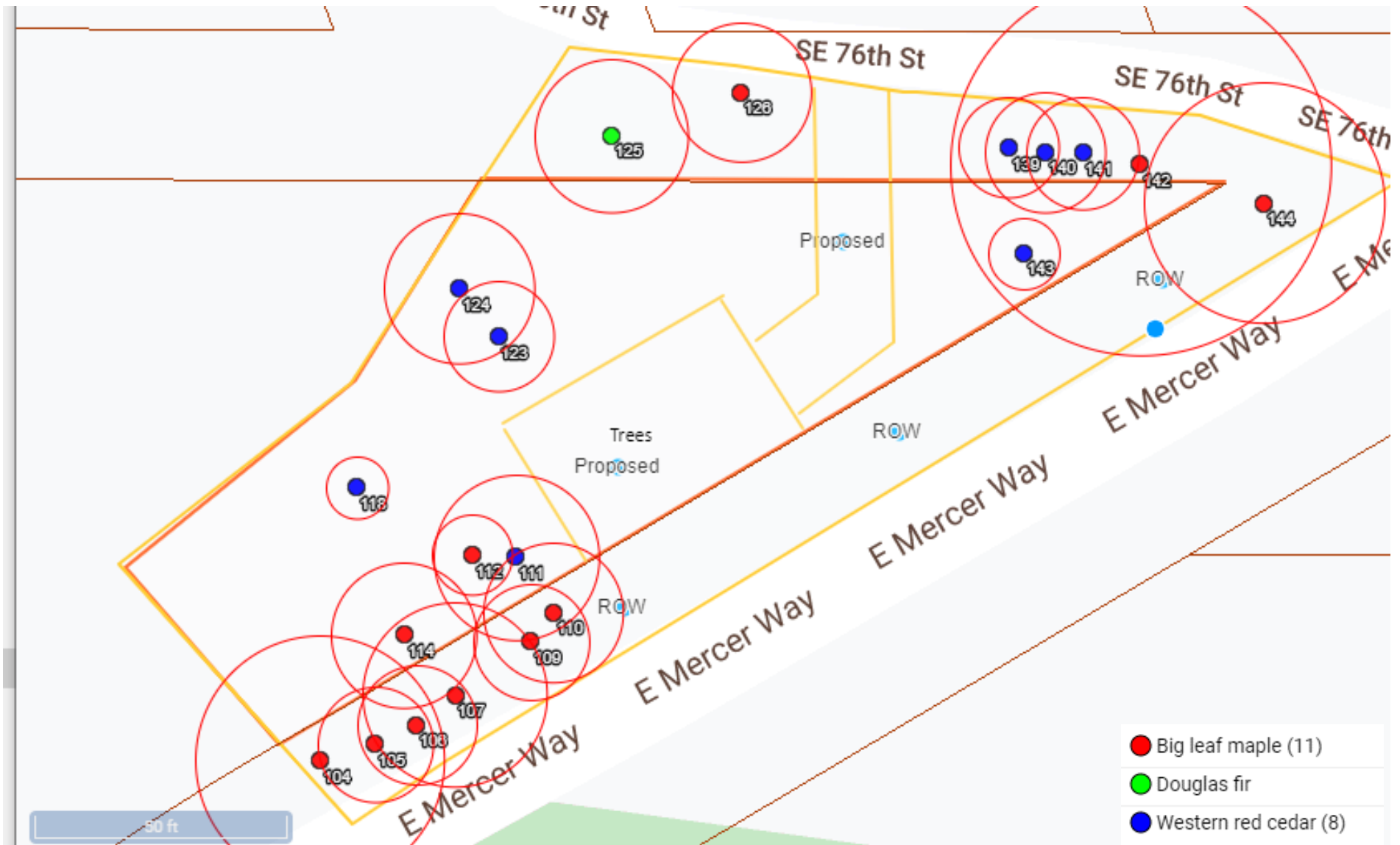


Trees to be Removed for Improvements

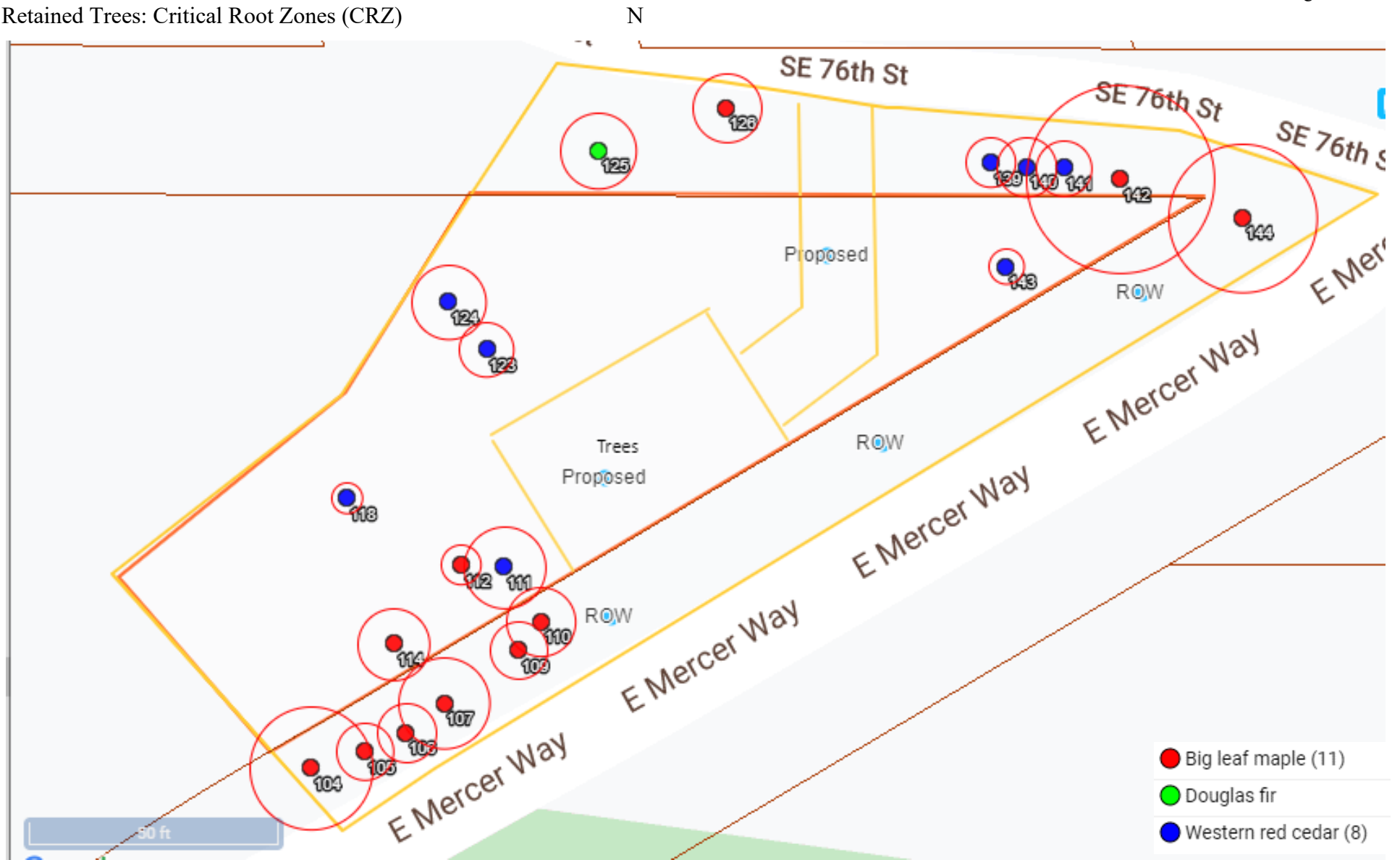


Retained/Impacted Trees: Tree Protection Zones (TPZ)

N



Retained Trees: Critical Root Zones (CRZ)



**ATTACHMENT 2 - TREE SUMMARY, TPZ, CRZ**

ID	Common	Latin	DBH	Height	Spread	Condition	Action	TPZ- [ft]	CRZ- [ft]	Notes
104	Big leaf maple	<i>Acer macrophyllum</i>	24.84	75	23	Good (80+)	Retain-Viable	24.84	12.42	
105	Big leaf maple	<i>Acer macrophyllum</i>	11.5	65	20	Fair (70+)	Retain-Viable	11.5	5.75	
106	Big leaf maple	<i>Acer macrophyllum</i>	11.9	50	28	Poor (50+)	Retain-Viable	11.9	5.95	Suppressed
107	Big leaf maple	<i>Acer macrophyllum</i>	18.4	68	40	Fair (70+)	Retain-Viable	18.4	9.2	
108	Big leaf maple	<i>Acer macrophyllum</i>	8.6	50	25	Poor (50+)	Not Viable	8.6	4.3	Suppressed/heavy lean, bowed over road.
109	Big leaf maple	<i>Acer macrophyllum</i>	11.56	55	21	Fair (70+)	Retain-Viable	11.56	5.78	
110	Big leaf maple	<i>Acer macrophyllum</i>	13.93	50	28	Fair (70+)	Retain-Viable	13.93	6.965	
111	Western red cedar	<i>Thuja plicata</i>	16.5	50	26	Good (80+)	Retain-Viable	16.5	8.25	
112	Big leaf maple	<i>Acer macrophyllum</i>	8	50	12	Fair (70+)	Retain-Viable	8	4	
113	Big leaf maple	<i>Acer macrophyllum</i>	16	72	20	Very Poor 25+	Not Viable	16	8	Mostly dead, not long-term viable
114	Big leaf maple	<i>Acer macrophyllum</i>	14.5	72	28	Poor (50+)	Retain-Viable	14.5	7.25	
115	Big leaf maple	<i>Acer macrophyllum</i>	15	50	20	Very Poor 25+	Not Viable	15	7.5	Extensive root decay.
117	Dogwood	<i>Cornus species</i>	10	25	10	Dead (0)	Not Viable	10	5	Dead
118	Western red cedar	<i>Thuja plicata</i>	6.2	29	18	Good (80+)	Retain-Viable	6.2	3.1	
119	Big leaf maple	<i>Acer macrophyllum</i>	15	68	18	Fair (70+)	Conflicts with plans	15	7.5	Poor taper/LCR,
120	Big leaf maple	<i>Acer macrophyllum</i>	10	48	18	Fair (70+)	Conflicts with plans	10	5	
121	Western red cedar	<i>Thuja plicata</i>	7	28	15	Poor (50+)	Not Viable	7	3.5	Previously uprooted
122	Western red cedar	<i>Thuja plicata</i>	7.6	30	15	Fair (70+)	Conflicts with plans	7.6	3.8	
123	Western red cedar	<i>Thuja plicata</i>	11	42	26	Good (80+)	Retain-Viable	11	5.5	
124	Western red cedar	<i>Thuja plicata</i>	15	45	22	Fair (70+)	Retain-Viable	15	7.5	
125	Douglas fir	<i>Pseudotsuga menziesii</i>	15.3	35	15	Good (80+)	Retain-Viable	15.3	7.65	
126	Big leaf maple	<i>Acer macrophyllum</i>	13.87	50	34	Good (80+)	Retain-Viable	13.87	6.935	
127	Western white pine	<i>Pinus monticola</i>	8.2	48	18	Good (80+)	Conflicts with plans	8.2	4.1	
128	Big leaf maple	<i>Acer macrophyllum</i>	13	62	25	Poor (50+)	Not Viable	13	6.5	Stressed dying
129	Big leaf maple	<i>Acer macrophyllum</i>	13	62	25	Poor (50+)	Not Viable	13	6.5	Stressed dying
130	Big leaf maple	<i>Acer macrophyllum</i>	48	75	43	Poor (50+)	Not Viable	48	24	Declining / decay/ K. deutzia
131	Coast redwood	<i>Sequoia sempervirens</i>	28	98	35	Excellent (90+)	Conflicts with plans	21	10.5	
132	Red alder	<i>Alnus rubra</i>	12.1	50	0	Dead (0)	Not Viable	15.125	7.5625	
133	Western red cedar	<i>Thuja plicata</i>	36	90	24	Excellent (90+)	Conflicts with plans	36	18	
134	Big leaf maple	<i>Acer macrophyllum</i>	13	40	29	Poor (50+)	Not Viable	13	6.5	Suppressed /bowed crown/ not long-term viable
135	Cherry	<i>Prunus ssp.</i>	10	45	22	Fair (70+)	Conflicts with plans	12.5	6.25	
136	Western red cedar	<i>Thuja plicata</i>	11.1	40	22	Good (80+)	Conflicts with plans	11.1	5.55	
137	Douglas fir	<i>Pseudotsuga menziesii</i>	22	98	30	Good (80+)	Conflicts with plans	22	11	
138	Red alder	<i>Alnus rubra</i>	16	50	26	Fair (70+)	Not Viable	20	10	Top is dead, alder borers
139	Western red cedar	<i>Thuja plicata</i>	10	34	15	Good (80+)	Retain-Viable	10	5	
140	Western red cedar	<i>Thuja plicata</i>	12	45	25	Good (80+)	Retain-Viable	12	6	
141	Western red cedar	<i>Thuja plicata</i>	11.2	43	25	Good (80+)	Retain-Viable	11.2	5.6	
142	Big leaf maple	<i>Acer macrophyllum</i>	38	25	25	Very Poor 25+	Retain-Viable	38	19	Tree topped @ 20'. Monitor and prune as needed
143	Western red cedar	<i>Thuja plicata</i>	7.1	40	25	Good (80+)	Retain-Viable	7.1	3.55	
144	Big leaf maple	<i>Acer macrophyllum</i>	24	55	25	Fair (70+)	Retain-Viable	24	15	

## **TPZ / CRZ NOTES**

- 1. The TPZ listed shall be the TPZ that is used.**
- 2. The TPZ can be reduced to the CRZ, unless noted otherwise, as long as the TPZ is not reduced by more than 20%.**
- 3. This may be further reduced on a case by case basis, upon review, approval, and under the direct over site of A.B.C. Consulting Arborists LLC.**
- 4. Install Fencing Per Attachment 3, prior to starting construction activity.**

### ATTACHMENT 3 - TREE PROTECTION

The following minimum Tree Protection Measures can be copied and introduced into all relevant documents such as site plans, permit applications and conditions of approval, and bid documents so that everyone involved is aware of the requirements.

1. Tree Protection Fencing Shall Be Continuous 6' min. Chain Link or like Fencing and.:
  - a. Tree Protection Fences will need to be placed around each tree or group of trees to be retained.
    - i. Tree Protection Fences are to be placed according to the attached drawing (bottom of attachment) at a distance of not less than 10' feet outside the dripline of the tree or group of trees to be saved, **or at the designated TPZ See Attachment 2 for TPZ/CRZ**
    - ii. Tree Protection Fences must be inspected prior to the beginning of any demolition or construction work activities.
    - iii. Nothing must be parked or stored within the Tree Protection Fences—no equipment, vehicles, soil, debris, or construction supplies of any sorts.
  - b. Signs:
    - i. The Tree Protection Fences need to be clearly marked with the following or similar text in four inch or larger letters every 40'

**TREE PROTECTION FENCE, DO NOT ENTER!**  
DO NOT PARK OR STORE MATERIALS WITHIN THE  
PROTECTION AREA

**Questions contact** Daniel Maple of A.B.C. Consulting Arborists LLC.  
**Cell:** (509) 953-0293    **Email:** Daniel@AbcArborist.Com

**Signs along the TPZ may be waived at the discretion of the City and/or its officials.**

2. Cement Trucks/Washout:
  - a. Cement trucks must not be allowed to deposit waste or wash out materials from their trucks within the Tree Protection Fences.
  - b. No waste, wash out, or contaminated water shall be allowed to flow into the Tree Protection Area.
3. Canopy Pruning:
  - a. The canopies of some of the trees may need to be properly pruned to allow Sight lines (vehicular), access of equipment, materials, or building and construction clearance.
  - b. If so, the pruning must be done by an International Society of Arboriculture, (ISA) Certified Arborist using current industry standard pruning techniques. (ANSI A300 Pruning Standards and ANSI Z131.1 Safety Standards as well as all OSHA, WISHA, and local standards must be followed.)
  - c. Plant debris can be chipped and utilized on site for the mulch under the trees.

5. When excavation occurs near trees that are scheduled for retention, the following procedure must be followed to protect the long-term survivability of the tree:

- a. An International Society of Arboriculture, (ISA) Certified Arborist must be working with all equipment operators.
  - i. The Certified Arborist should be outfitted with an Airspade™, shovel, hand pruners, a pair of loppers, a handsaw, and a power saw (a “saws all” type reciprocating saw is recommended).
- b. The hoe must be placed to “comb” the material directly away from the trunk as opposed to cutting across the roots.
  - i. Combing is the gradual excavation of the ground cover plants and soil in depths that only extend as deep as the tines of the hoe.
- c. When any roots of one-inch diameter or greater, of the tree to be retained, is struck by the equipment, the Certified Arborist should stop the equipment operator.
- d. The Certified Arborist should then excavate around the tree root by Airspade™ (recommended) or by hand/shovel and cleanly cut the tree root.
  - i. The Certified Arborist should then instruct the equipment operator to continue.

6. Putting Utilities Under the Root Zone:

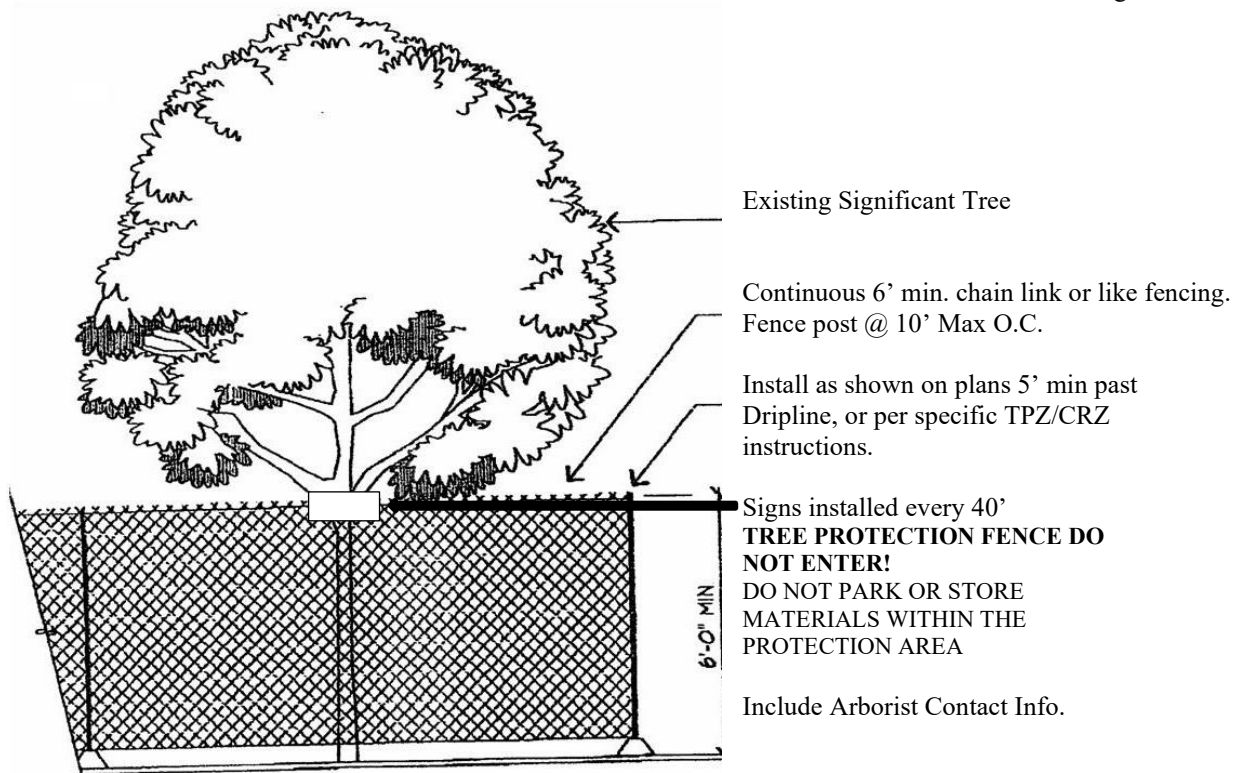
- a. Boring under the root systems of trees (and other vegetation) shall be done under the supervision of an ISA Certified Arborist. This is to be accomplished by excavating a limited trench or pit on each side of the critical root zone of the tree and then hand digging or pushing the pipe through the soil under the tree. The closest pit walls shall be a minimum of 7 feet from the center of the tree and shall be sufficient depth to lay the pipe at the grade as shown on the plan and profile.
- b. Tunneling under the roots of trees shall be done under the supervision of an ISA Certified Arborist in an open trench by carefully excavating and hand digging around areas where large roots are exposed. No roots 1 inch in diameter or larger shall be cut.
- c. The contractor shall verify the vertical and horizontal location of existing utilities to avoid conflicts and maintain minimum clearances; adjustment shall be made to the grade of the new utility as required.

7. Watering:

The trees will require significant watering throughout the summer and early fall in order to survive long-term. An easy and economical watering can be done using soaker hoses placed three feet from the trunk of the tree and spiraled around the tree. One 75-foot soaker hose per tree is adequate. It is best to place the soakers using landscape staples, (available from HD Fowler in Bellevue for pennies apiece) then cover the area with three to six inches of mulch. The mulch will minimize evaporation and will also stimulate the microbial activity of the soil which is another benefit to the health of the tree.

- a. Water the tree to a depth of 18 to 20 inches. I recommended leaving the water on the soaker hoses for six to eight hours and then digging down to determine how deep your water is penetrating. Then adjust accordingly. It may take a good two days of watering to reach the proper depth.
- b. Once the water reaches the proper depth, turn off the hoses for four weeks and then water again. Water more often when temperatures increase— every three weeks when temperatures exceed 80 degrees and every two weeks when temperatures exceed 90 degrees. This drying out of the soil in between watering is important to prevent soil pathogens from attacking the trees.





Six-foot high temporary chain link (or like material) fencing shall be installed as shown on plans. Fencing shall be installed prior to construction activity and remain in place until construction is completed. Fencing panels are recommended. Fencing shall completely encircle the tree(s). Install fence posts using pier blocks. Avoid driving posts or stakes into major roots.

Make a clean straight cut, using loppers, reciprocal saw, or like tool, to remove damaged portion of root(s) over 1" inch diameter that are damaged during construction. **ALL** exposed roots shall be temporarily covered with damp burlap and covered with soil the same day, if possible, to prevent drying out. If not possible, the burlap must be kept moist at all times.

Work within the protection fencing shall be done manually. No stockpiling of materials, soil, debris, vehicular traffic, or storage of machinery or equipment shall be allowed within the limits of the fencing.

Cement trucks must not be allowed to deposit waste or wash out materials from their trucks within the tree protection fences, or in a manner that would allow the waste or wash out material to enter the TPZ.

The area within the tree protection fencing should be covered with wood chips, hog fuel, or similar materials, to a depth of 3 to 6 inches. The materials should be placed prior to beginning construction and remain until the tree protection fencing was taken down.

Should the tree protection fencing need to be installed inside the TPZ to allow for construction activity, then the following shall be done.

For construction equipment, cover the area from the tree protection fencing to the outer edge of the TPZ with 8 to 10 inches of wood chips, hog fuel, or similar materials, to reduce compaction cover area with steel plates.

For foot traffic' cover the area from the tree protection fencing to the outer edge of the TPZ with 6 inches of wood chips, hog fuel, or similar materials, to reduce compaction, cover with ¾ inch to 1-inch plywood.

The steel plates, plywood and wood chips are to remain in place until all construction activity is completed. The steel plates, plywood and woodchips shall then be removed and the tree protection fencing installed along the outer edge of the tree protection zone.

#### **ATTACHMENT 4 - ROOT ZONE ENHANCEMENT**

Construction and site development create large stresses on trees. Changes in soil temperature, soil moisture regimes, wind exposure, and/or exhaust fumes all create a harsh environment for tree survival. Some of the ways to combat these stresses, along with the Tree Protection Measures outlined above is to:

- 1) Reduce competition for needed nutrients and water by removing the vegetation under the dripline of a tree.
- 2) The use of Cambistat™ (a growth regulator) has been shown to: reduce construction related stress, improve overall tree health and vigor. If applied 6-12 months prior to construction, it increases fine root growth, reduces construction related stressors, and may allow the TPZ to be reduced.
- 3) Applying a layer of Eco compost, or like compost, over the exposed roots under the dripline of the tree will increase nutrients, beneficial micro-organisms, and overall soil structure in this zone.
- 4) The use of a woody mulch under the dripline of a tree has been proven to increase water availability, increase microbial activity, and improve soil structure. At the same time, it reduces mechanical injury to the tree will occur from maintenance workers and their equipment. (mowers, edger's, weed cutters, etc.)
- 5) Mulch should be of a medium to coarse, woody, material, and should be 3"-4" deep (not to exceed 6"). The mulch should not contact the trunk of the tree, but shall remain 6" from the trunk. Mulch that is too thick, or too close to the trunk can be harmful to the tree.
- 6) Apply a combination of tree-based fertilizer and Mycorrhizal Fungi into the root systems of the trees to be retained. Mycorrhizal Fungi are a group of beneficial fungi that form symbiotic relationships with the roots of trees and shrubs. Trees with this fungal association grow more roots and take up more water and nutrients than those without.
- 7) Trees have different chemical needs than turf or shrubs. A fertilizer formulated specifically to promote healthy growth without causing irregular growth is important to stimulate healthy regrowth after construction (DIEHARD™ Products are Recommended)

**ATTACHMENT 5 - MULCHING**

Mulching is one of the easiest and most effective ways to improve urban soil quality entry health. Mulching is the application materials to the soil surface to improve or protect the tree and/or soil. Most materials can be organic or inorganic. When selecting mulch, organic materials are usually preferred over inorganic materials. Organic mulches moderate soil temperatures reduce soil compaction and erosion, and increase soil organic matter; thereby stimulating microbial activity, soil aggregation, and nutrient availability. Inorganic mulches may be fire resistant, do not decompose, reflect, or transfer heat more readily into the soil, and tend to be more stable when exposed to high wind or flooding.

**Table 2) Potential uses and limitations of typical mulches for urban trees.**

Mulch	Uses									Limitations					
	Prevent compaction	Prevent erosion	Limit evaporation	Deter past	Control weeds	Promote aggregation	Increase organic matter	Increase nutrients	Expensive or limited availability	Crusting or matting	Unstable	Anaerobic soils	Salts or contaminants	Potential N immobilization	Temporary or unknown effects
Grass clippings		X				X	X	X		X	X				X
Fresh leaves		X				X	X	X		X					X
Needles		X	X			X	X	X							
Hay/straw		X	X			X	X	X						X	
*Arborist woodchips	X	X	X		X	X	X	X						X	
Bark	X	X	X	X	X	X	X	X						X	
Eucalyptus		X	X	X		X	X	X	X						
Cypress		X	X	X		X	X	X	X						
Pecan shells		X	X			X	X	X	X						
Leaf mold		X	X			X	X	X		X					
Compost		X	X			X	X	X				X			
Fabrics		X			X				X		X				
Recycled rubber	X	X		X	X				X			X			
Stone/gravel	X	X			X				X						
Black plastic		X	X		X				X		X				

\*Arborist woodchips are less costly and hold up better, they are the preferred mulch, in moderate to high traffic areas.

## Mulching guidelines for urban landscapes

1. Depth of mulch application is dependent upon mulch texture, density, material decomposition rate, and climate. Wooden chip mulch should be applied and maintained at depths of 3-6 inches for trees. Materials that are finer, denser, and slower to decompose should be applied at lesser depths. thicker mulch layers should be applied in arid regions to retain more water in the soil.
2. Apply a sufficiently thick layer of mulch, usually 2-4 inches, to kill existing weeds and prevent new weed seeds from germinating or reaching the soil surface. If thinner layers are applied, kill or remove weeds prior to installing mulch.
3. Do not place impervious plastic sheeting or fabric barriers under mulch. Impervious barriers stop water movement and limit incorporation of organic matter into the soil.
4. The mulch area should cover as much of the tree root zone as possible, from near the trunk to the dripline, is considered ideal.
5. For recent transplants, mulch beyond the root ball. The minimum recommended radius is 3 feet. Maintain mulch for at least three years to facilitate root growth and protect trees from mechanical damage.
6. For larger existing trees, the minimum radius for mulch is at least three times the trunk diameter.
7. Mulch applied as a continuous bed around multiple trees is more effective than single rings around individual trees.
8. Average chip size of most organic mulches should be 1-2 inch.
9. Avoid woodchips from trees that are known to have allelopathic affects (e.g., *Juglans nigra*) and from individual trees that may have soil transmittable diseases (e.g., Verticillium wilt).

On wet sites, soil drying can be promoted by removing organic mulches. Be aware of some other potential negative impacts of mulches, including: toxicity (allelopathy and “sour” anaerobic mulches with pH of <2.5), slime molds (unsightly, but mostly harmless), matting (hydrophobic layers from fungal mats and mulches), flammability, and some fungus problems (e.g., *Sphaerobolus*, *Mutinuscaninu*, and *M. elegans*).

**ATTACHMENT 6 - TREE INVENTORY AND REPLACEMENT**

**TREE INVENTORY & REPLACEMENT SUBMITTAL  
 INFORMATION**

**EXCEPTIONAL TREES**

*Exceptional Trees- means a tree or group of trees that because of its unique historical, ecological or aesthetic value constitutes an important community resource. A tree that is rare or exceptional by virtue of its size, species, condition, cultural/historical 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 shown in MICC 19.16 under Tree, Exceptional.*

List the total number of trees for each category and the tree identification numbers from the arborist report.

Number of trees 36" or greater 2  
 List tree numbers: 133, 142

Number of trees 24" or greater (including 36" or greater) 6  
 List tree numbers: 83, 86, 104, 131, 133, 142

Number of trees from Exceptional Tree Table (MICC 19.16) 0  
 List tree numbers: \_\_\_\_\_

**LARGE REGULATED TREES**

*Large Regulated Trees- means any tree with a diameter of 10 inches or more, and any tree that meets the definition of an Exceptional Tree.*

Number of Large Regulated Trees on site 17 (A)  
 List tree numbers: 111,114,119, 120, 123-126,131, 133, 135-137 139-142

Number of Large Regulated Trees on site proposed for removal 7 (B)  
 List tree numbers: 119, 120, 131, 133, 135-137

**Percentage of trees to be retained ((A-B)/Ax100) note: must be at least 30%** 41 %

**RIGHT OF WAY TREES**

*Right of Way Trees- means a tree that is located in the street right of way adjacent to the project property.*

Number of Large Regulated Trees in right of way 8  
 List tree numbers: 104-110, 144

Number of Large Regulated Trees in right of way proposed for removal 1  
 List tree numbers; 132

Reason for removal: 132 Non-viable (1 add. under 10" #108 8.6" non-viable should be removed).

**TREE REPLACEMENT**

Tree replacement- removed trees must be replaced based on the ratio in the table below. Replacement trees shall be conifers at least six feet tall and or deciduous at least one and one-half inches in diameter at base.

Diameter of Removed Tree (measured 4.5' above ground)	Tree replacement Ratio	Number of Trees Proposed for Removal	Number of Tree Required for Replacement Based on Size/Type
Less than 10"	1	2	2
10" up to 24"	2	5	10
Greater than 24" up to 36"	3	1	3
Greater than 36" and any Exceptional Tree	6	1	6
<b>TOTAL TREE REPLACEMENTS</b>			21

## **ATTACHMENT 7 - ASSUMPTIONS AND LIMITING CONDITIONS**

1. A field examination of the site was made for this report (date referenced in report). Reasonable care has been taken to obtain information from reliable sources, however, the certified/consulting arborist cannot guarantee the accuracy or validity of information provided by any outside sources.
2. Information provided in this report covers only tree's that were indicated for examination in the assignment and reflects the apparent condition of those tree(s) at the time of inspection. This inspection is limited to a visual method of the trees in question, excluding any core sampling, probing, dissection, aerial inspection, or excavation unless noted in writing and is contingent upon the appropriate fee for such services having been authorized in writing. There is no guarantee nor warranty, expressed or implied that any problems with any trees may not arise in the future.
3. All drawings, sketches, and photographs submitted with this report, are intended as visual aids only, and are not exact to scale. They should not be construed as engineering or architectural report or surveys unless noted and specified.
4. The certified/consulting arborist is not required to give any testimony or to attend meetings or dispute resolution proceedings relating this report unless subsequent contractual arrangements and fee agreements are made.
5. Any alterations made to this report automatically invalidates this report.
6. This document is protected by copy right laws©. Unless otherwise required by law, possession of this report or a copy of this report does not imply a right of publication or use for any purpose by anyone other than the person for whom it was created without prior expressed written permission and verbal consent of the certified/consulting arborist.
7. The report and values/opinions expressed, represent the work of the certified/consulting arborist, and the arborist's fees are in no way contingent upon the reporting of any specified values, stipulated results, or occurrence of a subsequent event.

## ATTACHMENT 8 - REFERENCES

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