



# Urban Forestry Services

**BARTLETT CONSULTING**

Divisions of The F.A. Bartlett Tree Expert Company

Title: **3003 77<sup>th</sup> Ave Project – Mercer South Park Project  
Street and Landscape Trees  
Level 2 Basic Tree Risk Assessment  
3003 77<sup>th</sup> Ave SE  
Mercer Island, Washington**

Prepared for: Ryan Companies US Inc.  
Attn: Marc Gearhart  
110 110 Ave NE  
Bellevue, Washington 98004

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Miles Becker  
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ISA Tree Risk Assessment Qualified

Reviewed By: Jim Barborinas, Principal

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Date: May 13, 2020

## Summary

Three (3) Norway maple (*Acer platanoides*) and one (1) red oak (*Quercus rubra*) near the southeast corner of the property at 3003 77<sup>th</sup> Ave SE in Mercer Island, Washington were inspected in a Level 2 Basic Tree Risk Assessment. The four (4) trees on private property will be impacted by the proposed building renovations on-site and tree protection for retention is not feasible. Another six (6) Callery pear (*Prunus calleryana*) trees growing in the right of way next to the subject property can be retained with tree protection measures. The four (4) larger trees on the subject property are recommended for removal and replacement with eight (8) trees of native species on-site.

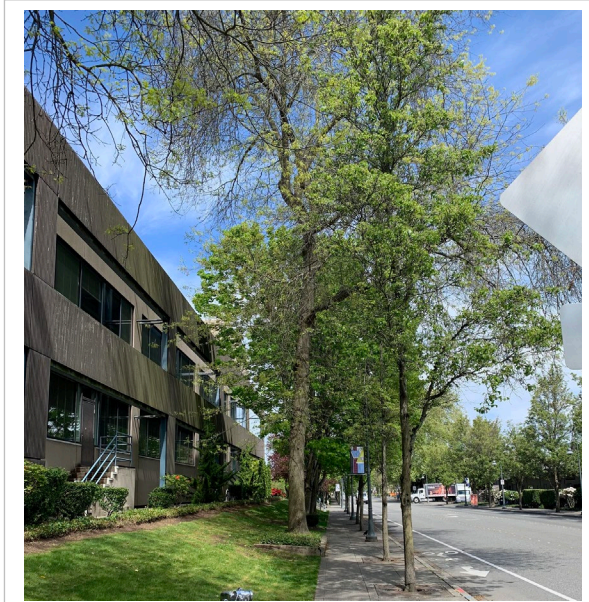
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## Introduction

A commercial office building at 3003 77<sup>th</sup> Avenue SE near the corner of SE 32<sup>nd</sup> Street is planned for renovations. Part of the renovations will be exposing the ground floor and cutting windows on the east face. The ground level is currently partially below the grade of a slight slope down to street level. Window installation will require excavating the soil slope down to the same grade as the street.

Growing on the slope next to 77<sup>th</sup> Avenue SE are four (4) significant deciduous trees on the subject property. The trees are medium-sized and they will likely be impacted by the slope excavation. Further east between the sidewalk and the street are a row of Callery pear (*Prunus calleryana*) trees growing in the right of way. None of the street trees qualify as significant as defined by Mercer Island City Code 19.10. The street trees may also be impacted by the renovations and construction activities on-site.



**Photo 1. These are the healthy larger trees on private property (left) and smaller street trees (right) on the west side of 77<sup>th</sup> Ave SE in Mercer Island. The viewer is looking north.**

We were asked by Marc Gearhart, of Ryan Companies US Inc, to assess the condition of the trees at the southeast corner of the property and their potential for retention. I was on-site May 5, 2020 to inspect the trees in a Level 2 Basic Tree Risk Assessment. The time frame for this Level 2 Basic Tree Risk Assessment is three years from the date of inspection.

## Findings and Discussion

A Tree Assessment Matrix with photos and detailed information on each of the ten (10) trees is attached. A Tree Assessment Site Plan is also attached that indicates the approximate location of each of the trees.

There are three (3) Norway maple and one (1) red oak on the subject property in the area of investigation. They are well established with a trunk diameter measured at 4.5-feet above grade (DBH) ranging from 15-inches to 23.1-inches. The crowns are generally symmetrical and full, ranging from a 14 to 19-foot radius from the trunk. The trees are in fair to good condition and none are hazard trees. The red oak, tree #141, is the largest of the group and there is some moderate twig dieback throughout the crown. Tree #143 has a weakly attached codominant stem leaning over the street that could be pruned back to the trunk to reduce risk.

The property trees are growing slightly above the grade of the sidewalk. They have roots established close to the surface of the slope surrounding each tree. The structural roots visible near the trees suggests that removing soil down to the level of the sidewalk will remove a substantial portion of the root systems. Root loss to that degree for trees of this size will likely destabilize them and lead to their mortality. The critical root zones (CRZ), equal to 1-foot radius for every 1-inch diameter of trunk, of the trees overlap and occupy most of the lower slope along the sidewalk. Based on the proposed grade changes provided by the developer, it will not be feasible to retain the four (4) property trees.

The six (6) Callery pear trees in the right of way next to the subject property are relatively small with DBH ranges from 1.2 to 7.5-inches. At least two of the pear trees have low vigor and extensive dieback in their crowns. The smallest, tree #146, is very young and looks like it was recently planted. The other street trees are generally the same form: a narrow crown and tall trunks, often growing up through the crown of the larger maples and oak on private property. A tall and narrow form is unusual for the species, which tends to have a more rounded and lower growing shape. Competition for light with the larger trees most likely contributed to their growth pattern. Removing the larger trees on private property may encourage a fuller crown on the pear trees when they are also pruned appropriately, such as reduction cuts on the primary stem. The street trees have a low preservation value at this time and replacement may be a better option for improving the urban forest canopy in the long-term.

## **Recommendations**

Leveling the slope down to the grade of the sidewalk is in direct conflict with retaining trees #141, #142, #143, and #144. Remove the property trees and replace on-site at a ratio of 2:1. Submit a Development Tree Removal Permit with the City, showing the location of replacement tree plantings on a site map. Also complete a tree inventory of all significant trees on the property demonstrating that at least 30 percent of trees are retained.

Retain all the street trees for the purposes of the development project. Because of their relatively small critical root zones under the sidewalk, they have a high likelihood of survival with tree protection measures implemented during construction. Submit a tree protection plan to the City that meets the standards described in City Code 19.10.080, including a site map with tree protection measures marked on it. General tree protection guidelines are attached.

Let us know if you have questions regarding this Level 2 Basic Tree Risk Assessment report.



## Tree Risk Assessment Level Descriptions

The tree risk assessment process is based on factors present at the time of assessment. Because trees are living, growing things that change in size and condition over time, the tree assessment process must also recognize and anticipate where and when future assessments should be performed. The Tree Risk Assessment Qualification (TRAQ) training and methodology, developed and administered by the International Society of Arboriculture is the best available methodology for tree risk assessment at this time. There are three levels of assessment that may be considered and employed according to the expectations of the owner or manager, conditions of the site and of the trees involved:

**Level 1 Limited Visual Assessment:** Includes a broad overview of an individual tree or group of trees near specified targets, conducted to identify obvious defects or other conditions of concern. A limited visual assessment typically focuses on identifying trees with imminent and/or probable likelihood of failure. Level 1 assessments do not always meet the criteria for a "risk assessment" if they do not include documented analysis and evaluation of individual trees. This level is typically used for large populations of trees as a means to quickly identify trees with imminent and/or probable likelihood of failure, at a specified schedule and/or immediately after storms.

Level 1 assessments may be done as walk-by, drive-by or aerial patrols as requested by the tree owner or manager. They may not provide enough information to develop risk mitigation recommendations. They can help identify specific areas and/or trees for further inspection at Level 2 or 3. Trees found to require a Level 2 Basic Assessment are assessed, mapped and documented at the higher level at this time. Trees determined to need a Level 3 Advanced Tree Assessment are documented and recommended for additional testing and analysis. The owner is notified with options discussed.

**Level 2 Basic Assessment:** This is a detailed visual inspection of a tree and its surrounding site, and a synthesis of the information collected. It requires that a tree risk assessor walk completely around the tree, looking at the site, buttress roots, trunk, and branches. This basic assessment may include the use of simple tools to gain additional information about the tree or defects. Our Level 2 Basic Assessment Trees are all typically tagged, mapped and information gathered and retained for each tree. Risk mitigation recommendations may be derived from this level of inspection. Defects found in a Level 2 Basic Tree Assessment may require a Level 3 assessment for further testing and analysis. The owner is notified with options discussed.

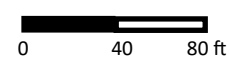
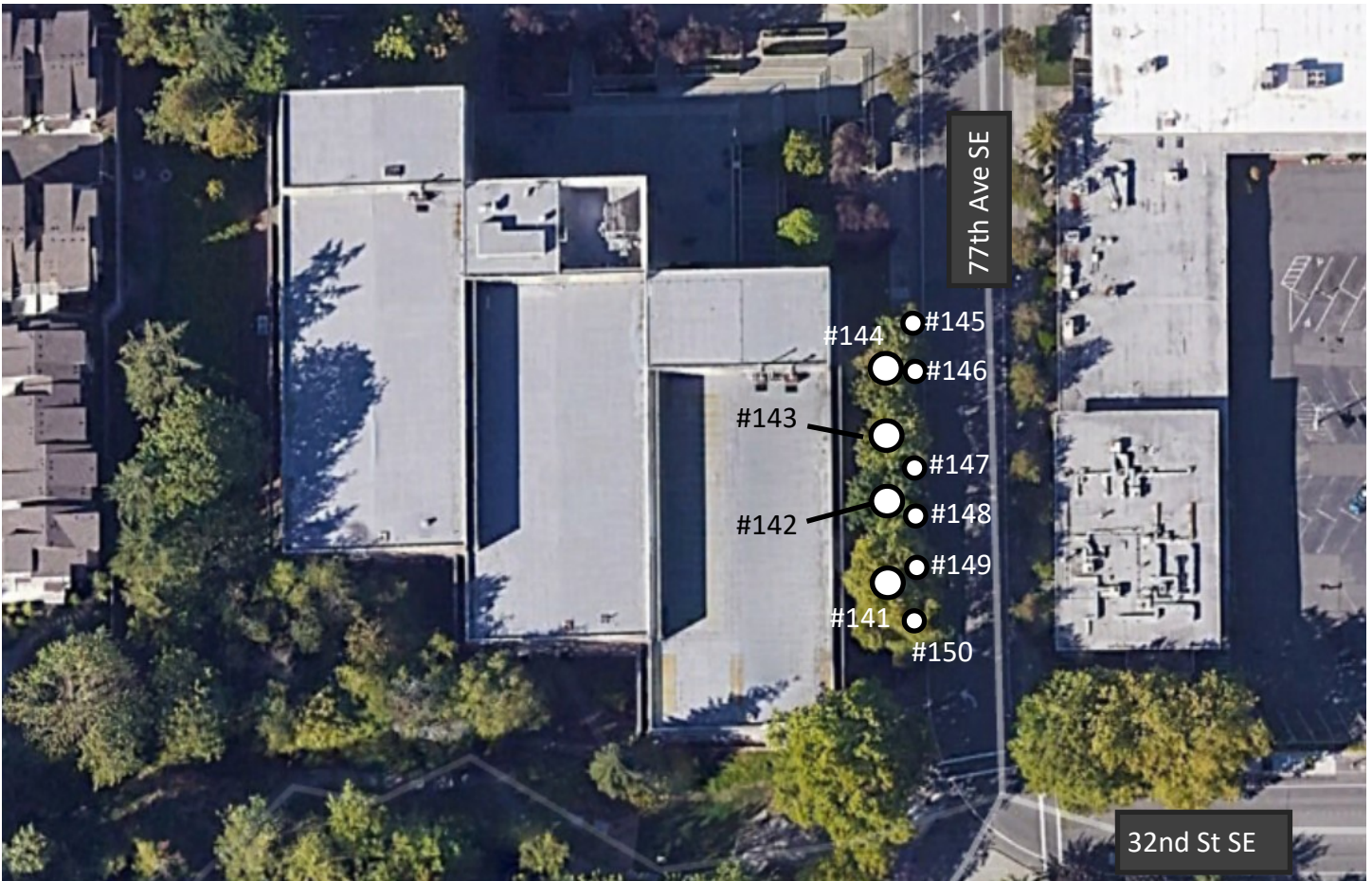
**Level 3 Advanced Assessment:** Advanced assessments are performed to provide more highly detailed information about specific tree components, defects, targets or site conditions. An advanced assessment is performed in conjunction with or after a Level 2 Basic Assessment if the assessor determines the need for (requires) additional information. This level is particularly useful where there are concerns about trees that may otherwise be of high value, or to obtain better information on how serious or extensive a particular defect is. The Level 3 Advanced Tree assessment may include but not be limited to a root crown inspection with air spade, Resistograph or Tomograph use to determine sound wood or an aerial crown inspection.

**The preliminary Level 1 Limited Visual Assessment if requested would help determine where field assessments at Level 2 and Level 3 will be needed.**

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<u>Tree</u>	<u>Species</u>	<u>Dripline Radius (ft)</u>	<u>DBH (in)</u>
141	Red oak	16.0	23.1
142	Norway maple	16.0	15.7
143	Norway maple	14.0	15.0
144	Norway maple	19.0	17.5
145	Callery pear var.	6.0	7.0
146	Callery pear var.	2.0	1.2
147	Callery pear var.	4.0	6.5
148	Callery pear var.	4.0	6.7
149	Callery pear var.	5.0	5.7
150	Callery pear var.	2.0	7.5

**LEGEND**

**PROPERTY TREE**

**RIGHT OF WAY TREE**





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### Tree Assessment Matrix

Tree	Species	DBH (in)	Drip Avg (ft)	CRZ (ft)	Vigor	Structure	Risk	Pres. Cat/Value	Recommendations
141	Red oak <i>Quercus rubra</i>	23.1, (23.1)	16.4	23.1	Fair	Fair to Good	Low	Unknown  Medium	
<b>Notes / Defects</b>	The tree is approximately 18 feet to the building exterior shell. It is in good condition and there are no structural defects. There is some moderate twig dieback in the crown.								<b>Dripline (ft)</b> <b>N</b> 16 <b>S</b> 17.5 <b>E</b> 16 <b>W</b> 16

Photo 1

Photo 2

Photo 3

Photo 4







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142	Norway maple <i>Acer platanoides</i>	15.7, (15.7)	16.0	15.7	Good	Good	Low	Unknown  Medium	
<b>Notes / Defects</b>	The tree has a full crown and no structural defects. There are a few large surface roots visible in the bare ground around the base of the tree.								<b>Dripline (ft)</b> <b>N</b> 16 <b>S</b> 16 <b>E</b> 16 <b>W</b> 16

Photo 1

Photo 2

Photo 3

Photo 4







**Tree Assessment Matrix**

Tree	Species	DBH (in)	Drip Avg (ft)	CRZ (ft)	Vigor	Structure	Risk	Pres. Cat/Value	Recommendations
143	Norway maple <i>Acer platanoides</i>	15, (15)	14.0	15.0	Good	Fair to Good	Low	Unknown  Medium	
<b>Notes / Defects</b>	The tree is leaning slightly towards the street. One codominant stem closest to the street has a weak union that could be managed to reduce risk. The planting area looks like it was originally bounded by some structures that have been removed to open up the space for roots to grow.								<b>Dripline (ft)</b> <b>N</b> 14 <b>S</b> 14 <b>E</b> 14 <b>W</b> 14

**Photo 1**

**Photo 2**

**Photo 3**

**Photo 4**







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144	Norway maple <i>Acer platanoides</i>	17.5, (17.5)	19.3	17.5	Fair	Good	Low	Unknown  Medium	
<b>Notes / Defects</b>	There is a 2-foot girdling root on the southwest side of the trunk flare. There is some twig dieback in the crown and foliage development is delayed compared to other trees in the group. The tree has a large, full crown.								<b>Dripline (ft)</b> <b>N</b> 19 <b>S</b> 19 <b>E</b> 21 <b>W</b> 18

Photo 1

Photo 2

Photo 3

Photo 4







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145	Callery pear var. <i>Prunus calleryana</i> var.	7, (7)	6.0	7.0	Good	Good	Low	Unknown  Low	
<b>Notes / Defects</b>	The tree is tall and it has a narrow crown for its species. The growth form is most likely a result of competition with the adjacent larger maple trees and pruning for street clearance.								<b>Dripline (ft)</b> <b>N</b> 6 <b>S</b> 6 <b>E</b> 6 <b>W</b> 6

Photo 1

Photo 2

Photo 3

Photo 4







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146	Callery pear var. <i>Prunus calleryana</i> var.	1.2, (1.2)	2.0	1.2	Good	Good	Low	Unknown  Low	
<b>Notes / Defects</b>	This is a newly planted tree growing under the crown of an adjacent maple tree.								<b>Dripline (ft)</b> <b>N</b> 2 <b>S</b> 2 <b>E</b> 2 <b>W</b> 2

Photo 1

Photo 2

Photo 3

Photo 4





**Tree Assessment Matrix**

Tree	Species	DBH (in)	Drip Avg (ft)	CRZ (ft)	Vigor	Structure	Risk	Pres. Cat/Value	Recommendations
147	Callery pear var. <i>Prunus calleryana</i> var.	6.5, (6.5)	3.8	6.5	Poor to Fair	Fair	Low	Unknown  Low	
<b>Notes / Defects</b>	The tree has a tall and narrow crown growing up through the maple tree next to it. There is substantial twig dieback and very few scaffold branches.								<b>Dripline (ft)</b> <b>N</b> 4 <b>S</b> 4 <b>E</b> 7 <b>W</b> 0

Photo 1

Photo 2

Photo 3

Photo 4







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148	Callery pear var. <i>Prunus calleryana</i> var.	6.7, (6.7)	5.0	6.7	Poor to Fair	Fair	Low	Unknown  Low	
<b>Notes / Defects</b>	The tree has a tall and narrow crown growing through the crown of a maple tree next to it. The pear crown is asymmetrical towards the street.								<b>Dripline (ft)</b> <b>N</b> 4 <b>S</b> 8 <b>E</b> 8 <b>W</b> 0

Photo 1

Photo 2

Photo 3

Photo 4







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149	Callery pear var. <i>Prunus calleryana</i> var.	5.7, (5.7)	5.0	5.7	Fair	Fair	Low	Unknown  Low	
<b>Notes / Defects</b>	The tree has a tall and narrow crown growing upward through the oak tree crown next to it.								<b>Dripline (ft)</b> <b>N</b> 5 <b>S</b> 5 <b>E</b> 5 <b>W</b> 5

Photo 1

Photo 2

Photo 3

Photo 4







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Tree	Species	DBH (in)	Drip Avg (ft)	CRZ (ft)	Vigor	Structure	Risk	Pres. Cat/Value	Recommendations
150	Callery pear var. <i>Prunus calleryana</i> var.	7.5, (7.5)	6.5	7.5	Good	Fair to Good	Low	Unknown  Low	
<b>Notes / Defects</b>	The tree is leaning slightly and has an asymmetrical crown towards the street. The trunk is slightly swollen at the base at what looks to be a root grafting scar.								<b>Dripline (ft)</b> <b>N</b> 2 <b>S</b> 9 <b>E</b> 9 <b>W</b> 6

Photo 1

Photo 2

Photo 3

Photo 4





## General Tree Protection Guidelines With Critical Root Zone Explanation Attachment

- 1. Responsibilities:** These Guidelines pertain to any disturbance, use or activity within the Critical Root Zone of any retained tree on this project. See attached **Critical Root Zone Explanation** for reference. The owner's arborist and general contractor shall meet onsite before any site work begins, to review and designate the most appropriate methods to be used to protect the retained trees during construction.

These guidelines apply to work provided by all contractors and sub-contractors on the project.

The project consulting arborist shall be contacted prior to any work that may need to enter the tree protection fencing. At least two days notice shall be provided to the project consulting arborist. A proposed method for work shall be provided to the arborist. This method shall be reviewed by the project consulting arborist and either approval and / or comments provided by the project consulting arborist prior to commencing works within the tree protection area. He or she should be notified within 8 hours should any injury occur to any protected tree or its larger roots (greater than 2-inch diameter) so that appropriate assessment and/or treatment may be made.

- 2. Soil Disturbance:** No soil disturbance shall take place before tree protection fences are installed. All evaluated trees to be retained within these areas are clearly illustrated on the Site Plan.
- 3. Designated Tree Removals:** The owner's arborist and contractor shall confirm on site which trees are to be removed and those to be retained. Directional felling and removal of trees will be completed with great care to avoid any damage to the trunks, limbs, and critical root zones of the retained trees.
- 4. The Tree Protection Site Plan,** when provided, shows the recommended location of the Tree Protection Fence (TPF). Immediately after the clearing limits and grading stakes are set in the field, the owner's arborist, during review and discussion with the contractor, will make a final determination on the tree protection requirements depending on construction limits and estimated impact on major roots and soil condition. The arborist may adjust clearing limits in the field so that, in his/her opinion, tree roots and soils are protected while necessary work can proceed.
- 5. The Tree Protection Fence (TPF)** shall be installed along the clearing limits, with special consideration of the Critical Root Zone (CRZ) of trees to be preserved. The CRZ of a tree is generally described as an area equal to 1-foot radius for every 1-inch diameter of tree. For example, a 10-inch diameter tree has a CRZ of 10-foot radius. Work within the CRZ may be limited to hand work or alternate method of construction.

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The Tree Protection Fence (TPF) shall be constructed with steel posts driven into the ground with 6-ft. chain link fence attached. Upon consultation with the contractor, the arborist shall determine the placement of the fence and the extent and method of clearing that may be done near preserved trees. Additional follow-up determinations may be required as work progresses on the project. See attached **Critical Root Zone Explanation**.

No parking, storage, dumping, or burning of materials is allowed beyond the clearing limits or within the Tree Protection Fence.

The TPF shall not be moved without authorization by the owner's arborist or City Arborist. The TPF shall remain in place for the duration of the project.

Work within this area shall be reviewed with and approved by the owner's arborist. Call Urban Forestry Services| Bartlett Consulting at 360-428-5810 with questions.

6. **Silt Fence:** If a silt fence is required to be installed within the Critical Root Zone of a retained tree, the bottom of the silt fence shall not be buried in a trench, but instead, folded over and placed flat on the ground. The flat portion of the silt fence shall be covered with gravel or soil for anchorage.
7. **CRZ over Hardscape:** Where the Critical Root Zone (CRZ) includes an area covered by hardscape, the TPF can be placed along the edge of the hardscape if and until it is removed. After hardscape removal, the available CRZ should be backfilled with topsoil up to 6 inches deep and protected with the TPF. Incorporation of topsoil into the existing sub-grade shall be determined by the consulting arborist. Where applicable a specification for topsoil will be provided or approved by Urban Forestry Services | Bartlett Consulting.
8. **Tree Protection Signs** shall be attached to the fence only and shall be shown as required on the Site Plan. They should read "Protect Critical Root Zone (CRZ) of trees to be retained. No soil disturbance, parking, storage, dumping, or burning of materials is allowed within the Tree Protection Barrier. " Monetary fines, based on the appraised dollar value of the retained trees may also be included on these signs. Telephone contact details for the project consulting arborist should also be included in the sign.
9. **Soil Protection within the Critical Root Zone (CRZ):** Where vehicular access, temporary work pad or storage pad is required within the CRZ of any preserved tree that is not protected with hardscape, the soil shall be protected with 18" of woodchips and/or plywood or metal sheets, or a combination of both, to protect from soil compaction and damage to roots of retained trees. A biodegradable coir mat netting is recommended to be placed on the existing grade before woodchip placement to protect the condition and confirm the location of the existing grade. The netting is a valuable benchmark upon removal of the material within the CRZ.
10. **Landscape Plans, Irrigation Design and Installation Details:** Great care shall be exercised when landscaping within the Critical Root Zone (CRZ) of any tree. Roots of preserved trees and

*General Tree Protection Guidelines*

*By Urban Forestry Services| Bartlett Consulting*

*2019*

*Page 2 of 4*

other vegetation shall not be damaged by planting or installation of irrigation lines. The owner's arborist shall review the Landscape Plan for any potential design and tree preservation conflicts and approve related irrigation and landscape installation activities within the CRZ of retained trees. A proposed method for work shall be provided to and approved by the arborist.

- 11. Backfill and Grade Changes:** The owner's arborist will determine to what extent backfilling may be allowed within the Critical Root Zone of a preserved tree, and if needed, the specific material which may be used. Grade cuts are usually more detrimental than grade filling within the CRZ and shall be reviewed by the arborist well in advance of construction.
- 12. Tree Maintenance and Pruning:** Trees recommended for maintenance and approved by the owner, shall be pruned for deadwood, low hanging limbs, and proper balance, as recommended for safety, clearance or aesthetics. All pruning shall be done by an International Society of Arboriculture Certified Arborist. *ANSI A300 American Standards for Pruning* shall be used. Limbs of retained trees within 10 feet or less, of any power line, depending on power line voltage, may only be pruned by a Utility Certified Arborist. This pruning must be coordinated with the local power company, as they may prefer to provide this pruning.
- 13. Underground Utilities:** Utility installation within the Critical Root Zone (CRZ) of any retained tree shall be reviewed by the Project Consulting Arborist. A less root disturbing route or minimal impact installation method of utility installation may be discussed and recommended i.e. tunneling or trenchless excavation. Trenching through the Interior CRZ of a retained tree is not usually allowed. **See CRZ Explanation to differentiate between the Perimeter and Interior CRZ.** An Air spade and Vac Truck may be required when utility installation is mandatory near a retained tree or other methodology such as trenchless excavation.
- 14. Root Pruning:** Required work may result in the cutting of roots of retained trees. Cutting roots 2" or greater should be avoided. Potential root pruning needs should be reviewed in advance with the Project Consulting Arborist to minimize potential root fracturing and other damage. Severed roots of retained trees shall be cut off cleanly with a sharp saw or pruning shears. Applying pruning paint on trunk or root wounds is not recommended. Severed roots shall be covered immediately after final pruning with moist soil or covered with mulch until covered with soil. Excavation equipment operators shall take extreme care not to hook roots and pull them back towards retained trees. In all cases, the excavator shall sit on ground outside of the CRZ. Soil excavation within the CRZ shall be under the direct supervision of the owner's arborist.
- 15. Supplemental Tree Irrigation:** If clearing is performed during the summer, supplemental watering and/or mulching over the root systems within the Tree Protection Fencing of preserved trees may be required by the owner's arborist. The arborist should be notified of the proposed schedule for clearing and grading work. Supplemental watering and mulching over the root systems of roots impacted or stressed trees are strongly recommended to compensate for root loss and initiate new root growth. Long periods of slow drip irrigation will be most effective. A large coil of soaker hose starting at least 18" from the trunk and covering the Interior Critical Root Zone area is recommended. Water once per week and check soils for at least 12 inches infiltration. This work shall be under the direct supervision of the owner's arborist.



- 16. Additional Measures:** Additional tree protection recommendations may be required and may be specified in Urban Forestry Services| Bartlett Consulting report(s).
- 17. Tree Protection Monitoring:** The owner's arborist may be required to monitor work when disturbance occurs near retained trees and shall make periodic site visits to report to the owner and City if tree protection guidelines are being followed.
- 18. Final Inspection:** The owner's arborist shall make a final site visit to report on retained tree condition following completed work and shall report to the city to release the bond, if necessary for the retained trees.

**Critical Root Zone**

**(CRZ) =**

12" Radius for every Tree inch diameter is generally considered optimum protection.

**Interior Critical Root**

**Zone (ICRZ)**

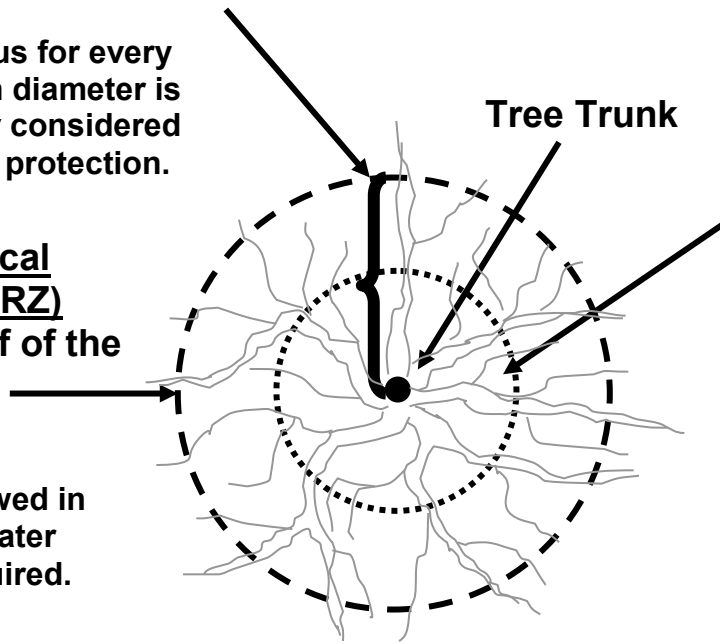
= the inner half of the CRZ

Protecting only this area would cause significant impact to the tree, potentially life threatening, and would require maximum Post Care Treatment to retain the tree. See Post Care Treatment below.

**Perimeter Critical Root Zone (PCRZ)**

= the outer half of the CRZ

The greater the disturbance allowed in this area, the greater Post Care is required.



The Critical Root Zone (CRZ) of a tree is established on the basis of the trunk diameter. The CRZ is a circular area which has a radius of 12 inches for every inch diameter of trunk measured at 4.5 feet above grade. Root systems will vary both in depth and spread depending on size of tree, soils, water table, species and other factors. However, this CRZ description is generally accepted in the tree industry. Protecting this entire root zone area should result in no adverse impact to the tree, except for potentially increased exposure.

The above CRZ drawing has been further differentiated into the 'Perimeter' (PCRZ) and 'Interior' (ICRZ) to help define potential impact and required Post Care.

Generally, the full PCRZ is considered the optimum amount of root protection for a tree. As one encroaches into the "Perimeter CRZ, but not into the "Interior CRZ" the greater Post Care the tree would require to remain alive and stable. The 'Interior CRZ is half the radius of the full PCRZ. Disturbance into the ICRZ could destabilize or cause the tree to decline.

The full ICRZ should never be disturbed if the tree is to have any chance of survival. This 'Interior' CRZ would approximately equal the size of a rootball needed to transplant this tree which in turn would require extensive Post Care and possibly guying.

This Post Care Treatment would include but may not be limited to; regular irrigation, misting, root treatment with special root hormones or growth stimulants, mulching, guying and monitoring for several years. Lack of this treatment would be fatal to the tree.



**Urban Forestry Services**

**BARTLETT CONSULTING**

Divisions of The F.A. Bartlett Tree Expert Company

15119 McLean Rd.  
Mount Vernon, WA 98273

Title: Critical Root Zone (CRZ) Explanation

Source: Urban Forestry Services | Bartlett Consulting  
Jim Barborinas, ISA Certified Arborist PN-0135  
ASCA Registered Consulting Arborist #356,  
Tree Risk Assessor Qualified

Date: 2019

Not to Scale