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## -Tree Protection Plan-

### CUBES SELF STORAGE

17414 State Route 527  
Mill Creek, Washington

Prepared for: PacLand  
Prepared by: Washington Forestry Consultants, Inc.  
Date: May 24, 2018

## Introduction

The project proponent is planning to construct a new self-storage building and an associated storm water facility on 4.00 acres at 17414 State Route 527 in Mill Creek, WA. The proponent has retained WFCI to:

- Evaluate and inventory all trees on the site pursuant to the requirements of the City of Mill Creek Tree Protection Ordinance.
- Make recommendations for retention of significant trees, along with required protection and cultural measures.

## Observations

### Methodology

WFCI has evaluated trees 6 inches diameter at breast height (DBH) and larger in the proposed project area, and assessed their potential to be incorporated into the new project.

The tree evaluation phase used methodology developed by Nelda Matheny and Dr. James Clark in their 1998 publication Trees and Development: A Technical Guide to Preservation of Trees during Land Development.

### Site Description

The site slopes gently to the west at a grade between 5 and 10%. It is currently occupied by Li'l Sprout Nursery and Garden Center, which operates a greenhouse and retail space in the eastern

portion of the parcel. There is a large retail greenhouse, a shade house, two sheds, and multiple dilapidated structures on the site. The wetland buffer area is highly disturbed with signs of recent tree removal.

### **Soils Description**

There is one soil type on the 4.0 acre parcel: It is the Everett very gravelly sandy loam. The Everett very gravelly sandy loam is a very deep, somewhat excessively drained soil found on terraces and outwash plains. It formed in glacial outwash. Permeability is rapid. Plant available water capacity is low. The effective rooting depth is 60 inches or more and the hazard of runoff and erosion is slight. The potential for windthrow of trees is 'slight' under normal conditions. Seedling mortality is severe and new trees require irrigation to establish.

### **Tree Conditions**

Buildable Area. -- There are no significant-sized trees growing in the commercial retail space outside the wetland and its buffer.

Wetland and It's Buffer. -- Tree species in the wetland area and its buffer include red alder (*Alnus rubra*), black cottonwood (*Populus trichocarpa*), Scouler's willow (*Salix scouleriana*), curly willow (*Salix matsudana*), western redcedar (*Thuja plicata*), and Pacific willow (*Salix lucida*). Tree size ranges from 6 to 33 inches DBH. Tree condition ranges from 'Very Poor' to 'Fair', with most trees described as being in 'Poor' or 'Very Poor' condition.



**Photo 1:** Appearance of trees in wetland area, most of which are under 6 in. DBH

There are 15 significant-sized trees growing in the wetland and its buffer that have the potential to be impacted by the construction of the self-storage building and associated storm water

facility. A detailed list of all trees by species, DBH, condition, root protection zone (RPZ) radius, save/remove potential, and retention availability is provided in Attachment 3.

### Off-Site Impacts

Three trees growing on the parcel to the north of the project area could be impacted by construction of the project. Some grading has already occurred in the vicinity of two of these trees. Further excavation could potentially cause these trees to decline. These 3 trees will require protection during the construction of the storm water facility.

Table 1. Summary of Off-Site Trees to the North of the Project Area

Tree #	Species	DBH (in.)	Condition	Root Protection Zone (Ft. Radius)
14	Douglas-fir	37	Good	26
15	Douglas-fir	22	Good	18
16	Douglas-fir	21	Good	18



**Photo 2:** View of off-site tree #14. Grading has already occurred in its vicinity. Further disturbance should be avoided in this area.



## Discussion

### Potential for Tree Retention

The trees that grow between the proposed self-storage building and the storm water facility include Scouler's willow, red alder and black cottonwood, most of which are in 'Poor' or 'Very Poor' condition. These species are not suitable for retention near new developments where potential targets could be placed in their vicinity. It is recommended that these trees be removed and replaced as part of the project.

The area that offers the best potential for tree retention is a portion of the buffer area in the northwest corner. Four large western redcedar trees (see Photo 2) that grow near the proposed storm water facility will require protection from the impacts of construction.



**Photo 2:** View of 4 western redcedars near proposed storm water facility

The proposed 'save' trees are illustrated on the proposed site plan in Attachment 2.

## Tree Density Calculations

Chapter 15.10 of the Mill Creek Municipal Code requires that removal of any significant trees have approval by the City planning and development department. In the City of Mill Creek, there is no specific tree retention requirement, except that landowners retain as many significant trees as possible. The following is a summary of the potential tree retention:

Total Project Area	4.0 acres
Total Number of Significant Trees with Potential to be Impacted in Project Area (including wetland + buffer)	15 trees
Trees Excluded from Retention Calculation:	
Trees that are Dead, Diseased, Undesirable, or Potentially Dangerous	<u>11 trees</u>
Number of Healthy, Significant Trees Requiring Protection in Wetland Area:	4 trees
# of Trees to Protect and Retain	4 trees

There are 4 healthy significant trees in the wetland area that should be protected and retained. The remaining trees in the buffer area are either unhealthy, or of an undesirable species and would present a hazard to the development if retained. These 11 trees should be removed from the project area during clearing.

## Recommendations

### Tree Protection Measures

Trees to be saved must be protected during construction by a six foot high chain link fencing (Attachment 4), located at the edge of the critical root zone (CRZ). Placards shall be placed on the fencing every 50 feet indicating the words, "NO TRESPASSING - Protected Trees". The individual CRZ are a radius of one foot for each one inch of DBH (6 feet minimum), unless otherwise delineated by WFCI (see Attachment 3).

Tree protection fences should be placed around the edge of the critical root zone (CRZ). The fence should be erected after logging but prior to the start of clearing. The fences should be maintained until the start of the landscape installation.

There should be no equipment activity (including rototilling) within the critical root zone. No irrigation lines, trenches, or other utilities should be installed within the CRZ. 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 CRZ during construction, they should be cut cleanly with a saw 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 WFCI to determine if the tree can be saved with mitigating measures, or if the tree should be removed.

### **Conclusions and Timeline for Activity**

1. Four significant evergreen conifers and all deciduous trees are proposed to be protected and retained on the site in the Category II wetland area.
2. The final, approved tree protection plan map should be included in the construction drawings for bid and construction of the project and should be labeled as such.
3. Stake and heavily flag the clearing limits.
4. Contact WFCI to attend pre-job conference and discuss tree protection issues with contractors.
5. Complete logging. Complete necessary hazard tree removals and invasive plant removals from the tree protection areas. No equipment should enter the tree protection areas during logging.
6. Install tree protection fences along the 'limits of construction'. The fences should be located at the limits of construction or 5 feet outside of the drip line of the save tree or as otherwise specified by WFCI. Maintain fences throughout construction.
7. Complete clearing of the project.
8. Complete grading and construction of the project.

### **Summary**

The City of Mill Creek Municipal Code requires as many significant trees as possible to be retained on the buildable area of the site. This plan retains 4 large western redcedars and all deciduous trees in the Category II Wetland.

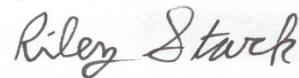
Please give us a call if you have further questions.

Respectfully submitted,

Washington Forestry Consultants, Inc.



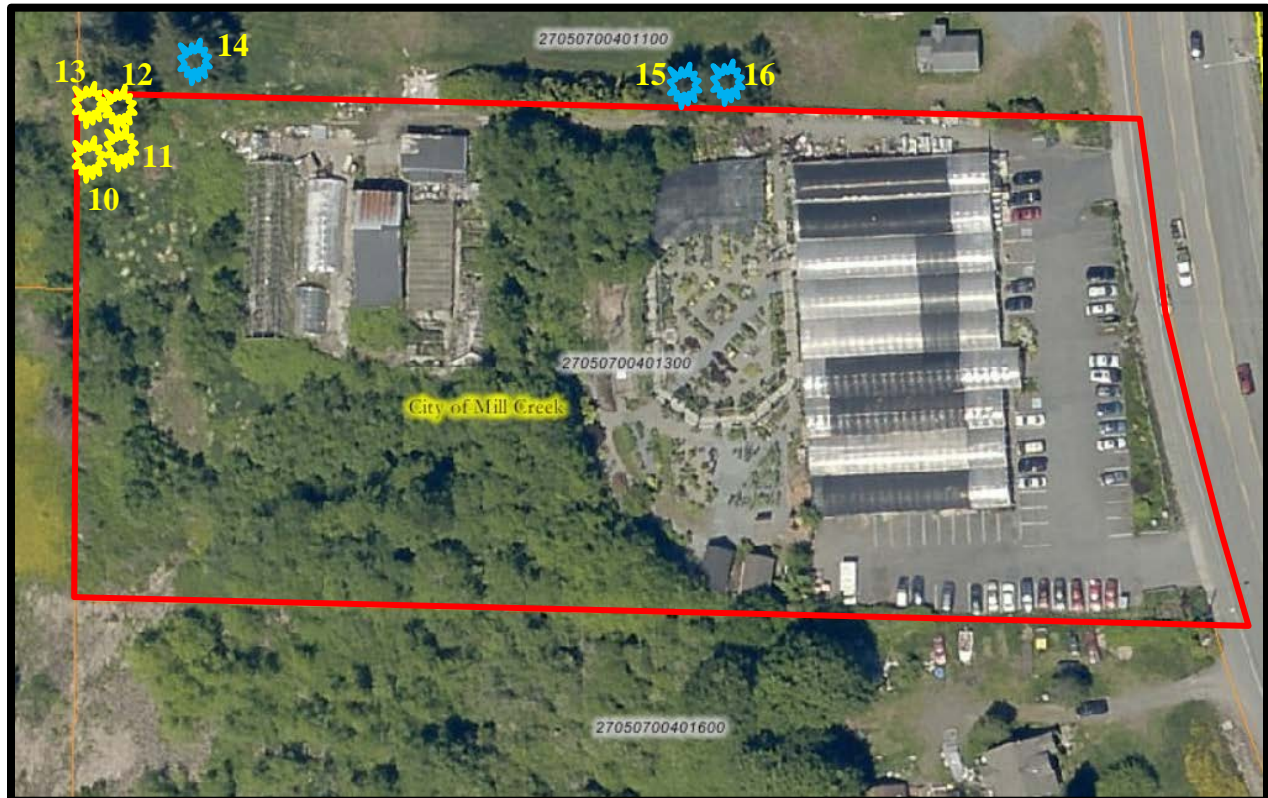
Galen M. Wright, ACF, ASCA  
ISA Bd. Certified Master Arborist PN-129BU  
Certified Forester No. 44  
ISA Tree Risk Assessor Qualified



Riley Stark, Professional Forester  
ISA Certified Arborist®,  
Municipal Specialist, PN-7780AM  
ISA Tree Risk Assessor Qualified

**Attachment 1. Aerial Photo of Cubes Self-Storage in Mill Creek  
with Potential Save Trees Identified**

**(Snohomish County Parcel Viewer 2012)**

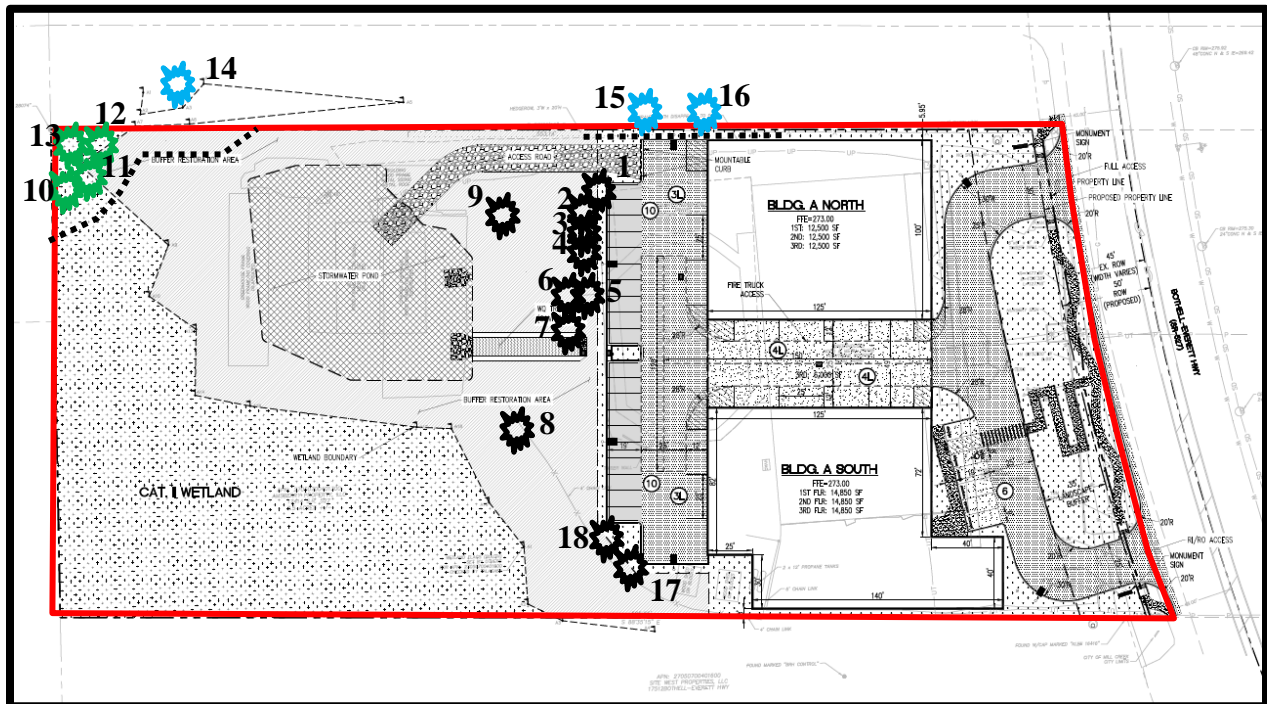


**NORTH**  
↑  
**No Scale**  
■





## Attachment 2. Cubes Proposed Site Plan with Approximate Tree Locations and Protection Zones



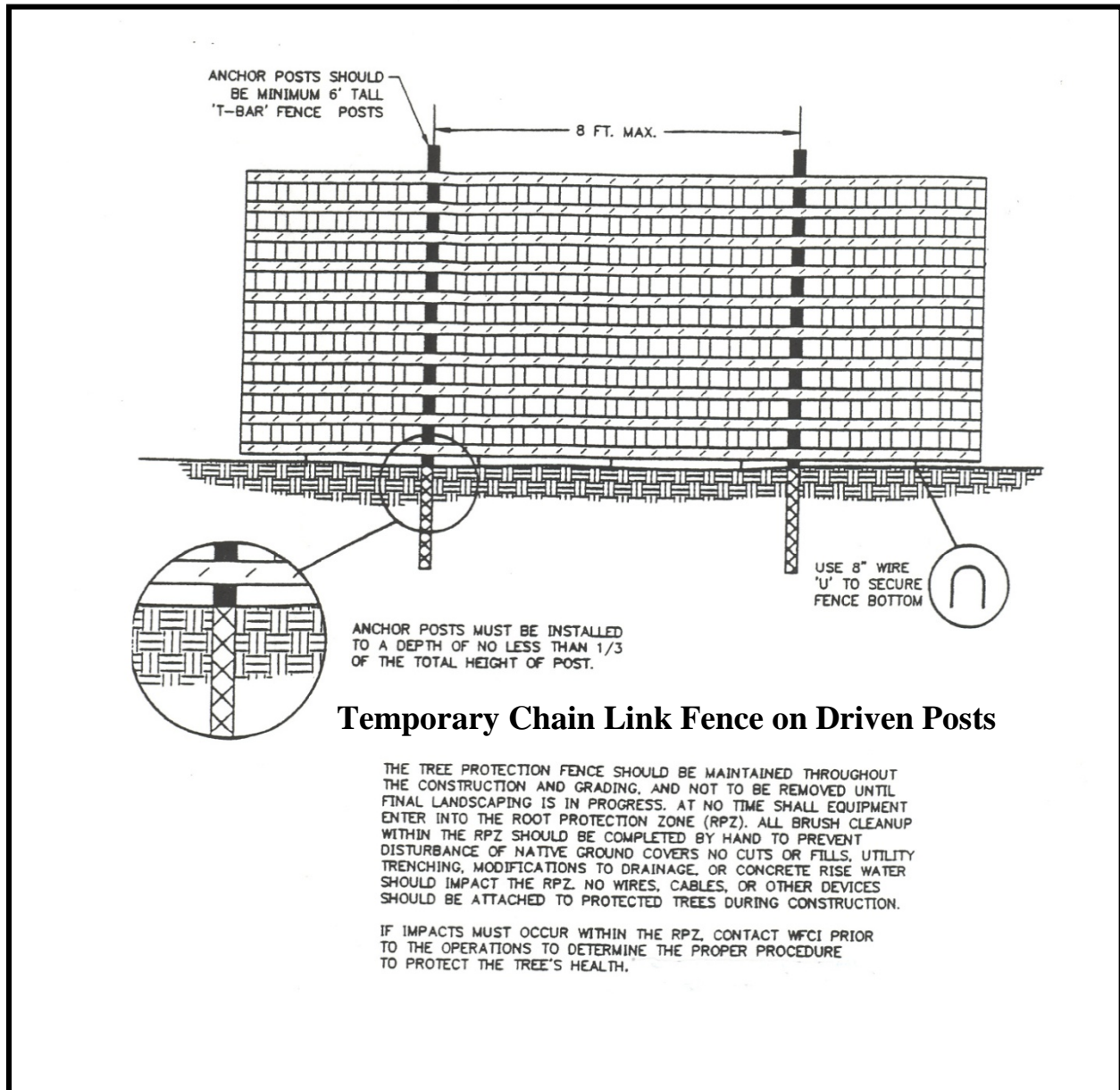
- Parcel Boundary
- ⚙ Significant Tree to Protect and Retain
- ⚙ Off-Site Tree
- ⚙ Poor Health or Potentially Hazardous Tree
- .... Location of Tree Protection Fencing



**Attachment 3. Inventory List of Project Area Trees**

<b>Tree #</b>	<b>Species</b>	<b>DBH (in.)</b>	<b>Condition</b>	<b>Project Plan: Save or Remove</b>	<b>Root Protection Zone (ft. Radius)</b>	<b>Comment</b>
1	Red Alder	10.5	Poor – Dieback	Remove – Tree Health	N/A	
2	Red Alder	7.5	Fair	Remove – In Footprint	N/A	Potentially Hazardous
3	Red Alder	9, 9.5, 5, 7	Very Poor – Dead Tops	Remove – Tree Health	N/A	
4	Red Alder	6, 6, 7.5	Poor – 2 Dead Stems	Remove – Tree Health	N/A	
5	Red Alder	10	Poor – Leaning	Remove – Tree Health	N/A	
6	Scouler's Willow	6.5	Fair	Remove – In Footprint	N/A	Potentially Hazardous
7	Red Alder	8	Very Poor – Dead Top	Remove – Tree Health	N/A	
8	Black Cottonwood	18	Poor – In Decline	Remove – Tree Health	N/A	
9	Black Cottonwood	21	Poor – Impacted Roots	Remove – Tree Health	N/A	
10	Western Redcedar	32	Fair	Save	28	In Wetland
11	Western Redcedar	33	Fair	Save	28	In Wetland
12	Western Redcedar	29	Fair	Save	28	In Wetland
13	Western Redcedar	22, 24, 12	Fair	Save	28	In Wetland
14	Douglas-fir	37	Good	Save	26	Off-Site
15	Douglas-fir	22	Good	Save	18	Off-Site
16	Douglas-fir	21	Good	Save	18	Off-Site
17	Black Cottonwood	13, 10	Poor – Stem Defect	Remove – Tree Health	N/A	Potentially Hazardous
18	Red Alder	7	Very Poor – Mostly Dead	Remove – Tree Health	N/A	

## Attachment 4. Tree Protection Fence Detail



## Attachment 5. Individual Tree Rating Key for Tree Condition

RATING	SYMBOL	DEFINITION
<b>Very Good</b>	<b>VG</b>	<ul style="list-style-type: none"> <li>Balanced crown that is characteristic of the species</li> <li>Normal lateral and terminal branch growth rates for the species and soil type</li> <li>Stem sound, normal bark vigor</li> <li>No root problems</li> <li>No insect or disease problems</li> <li>Long-term, attractive tree</li> </ul>
<b>Good</b>	<b>G</b>	<ul style="list-style-type: none"> <li>Crown lacking symmetry but nearly balanced</li> <li>Normal lateral and terminal branch growth rates for the species and soil type</li> <li>Minor twig dieback O.K.</li> <li>Stem sound, normal bark vigor</li> <li>No root problems</li> <li>No or minor insect or disease problems – insignificant</li> <li>Long-term tree</li> </ul>
<b>Fair</b>	<b>F</b>	<ul style="list-style-type: none"> <li>Crown lacking symmetry due to branch loss</li> <li>Slow lateral and terminal branch growth rates for the species and soil type</li> <li>Minor and major twig dieback – starting to decline</li> <li>Stem partly unsound, slow diameter growth and low bark vigor</li> <li>Minor root problems</li> <li>Minor insect or disease problems</li> <li>Short-term tree 10-30 years</li> </ul>
<b>Poor</b>	<b>P</b>	<ul style="list-style-type: none"> <li>Major branch loss – unsymmetrical crown</li> <li>Greatly reduced growth</li> <li>Several structurally important dead or branch scaffold branches</li> <li>Stem has bark loss and significant decay with poor bark vigor</li> <li>Root damage</li> <li>Insect or disease problems – remedy required</li> <li>Short-term tree 1-10 years</li> </ul>
<b>Very Poor</b>	<b>VP</b>	<ul style="list-style-type: none"> <li>Lacking adequate live crown for survival and growth</li> <li>Severe decline</li> <li>Minor and major twig dieback</li> <li>Stem unsound, bark sloughing, previous stem or large branch failures, very poor bark vigor</li> <li>Severe root problems or disease</li> <li>No or minor insect or disease problems</li> <li>Mortality expected within the next few years</li> </ul>
<b>Dead</b>	<b>DEAD</b>	<ul style="list-style-type: none"> <li>Dead</li> </ul>

**Cultural Care Needs:**

<b>ABBRV.    ACTIVITY</b>		<b>DESCRIPTION</b>
<b>CC</b>	<b>Crown Cleaning</b>	Pruning of dead, dying, diseased, damaged, or defective branches over 1/2 inch in diameter –includes removal of dead tops
<b>CT</b>	<b>Crown Thinning</b>	Pruning of branches described in crown cleaning, plus thinning of up to 20% of the live branches over ½ inch diameter. Branch should be 1/3 to ½ the diameter of the lateral branch. Thinning should be well distributed throughout crown of tree, and should release healthy, long-term branches.
<b>RC</b>	<b>Crown Reduction</b>	Reduction of the crown of a tree by pruning to lateral branches. Generally used to remove declining branches or to lighten end weight on long branches.
<b>CR</b>	<b>Crown Raising</b>	Pruning of lower branches to remove deadwood or to provide ground or building clearances.
<b>RMV</b>	<b>Remove</b>	Remove tree due to decline or hazardous conditions that cannot be mitigated by pruning.
<b>RS</b>	<b>Remove Sprouts</b>	Remove basal sprouts from stem of tree.
<b>Rep</b>	<b>Replace</b>	Tree is small – is in decline or dead. Replace with suitable tree species.
<b>HT</b>	<b>Hazard Tree</b>	Tree is hazardous and cannot be mitigated by pruning. Recommendation is to remove tree.
<b>None</b>	<b>No Work</b>	No work necessary at this time.



## **Attachment 6. Description of Tree Evaluation Methodology**

The evaluation of the tree condition on this site included the visual assessment of:

1. Live-crown ratio,
2. Lateral and terminal branch growth rates,
3. Presence of dieback in minor and major scaffold branches and twigs,
4. Foliage color,
5. Stem soundness and other structural defects,
6. Visual root collar examination,
7. Presence of insect or disease problems.
8. Windfirmness: if tree removal will expose this tree to failure.

In cases where signs of internal defect or disease were suspected, a core sample was taken to look for stain, decay, and diameter growth rates. Also, root collars were exposed to look for the presence of root disease.

In all cases, the overall appearance of the tree was considered relative to its ability to add value to either an individual lot or the entire subdivision. Also, the scale of the tree and its proximity to both proposed and existing houses was considered.

Lastly, the potential for incorporation into the project design is evaluated, as well as potential site plan modifications that may allow otherwise removed tree(s) to be both saved and protected in the development.

Trees that are preserved in a development must be carefully selected to make sure that they can survive construction impacts, adapt to a new environment, and perform well in the landscape. Healthy, vigorous trees are better able to tolerate impacts such as root injury, changes in soils moisture regimes, and soil compaction than are low vigor trees.

Structural characteristics are also important in assessing suitability. Trees with significant decay and other structural defects that cannot be treated are likely to fail. Such trees should not be preserved in areas where damage to people or property could occur.

Trees that have developed in a forest stand are adapted to the close, dense conditions found in such stands. When surrounding trees are removed during clearing and grading, the remaining trees are exposed to extremes in wind, temperature, solar radiation, which causes sunscald, and other influences. Young, vigorous trees with well-developed crowns are best able to adapt to these changing site conditions.

## **Attachment 7. Glossary of Forestry and Arboricultural Terminology**

**DBH:** Diameter at Breast Height (measured 4.5 ft. above the ground line on the high side of the tree).

**Live Crown Ratio:** Ratio of live foliage on the stem of the tree. Example: A 100' tall tree with 40 feet of live crown would have a 40% live crown ratio. Conifers with less than 30% live crown ratio are generally not considered to be long-term trees in forestry.

**Crown:** Portion of a trees stem covered by live foliage.

**Crown Position:** Position of the crown with respect to other trees in the stand.

**Dominant Crown Position:** Receives light from above and from the sides.

**Codominant Crown Position:** Receives light from above and some from the sides.

**Intermediate Crown Position:** Receives little light from above and none from the sides. Trees tend to be slender with poor live crown ratios.

**Suppressed Crown Position:** Receives no light from above and none from the sides. Trees tend to be slender with poor live crown ratios.

## **Attachment 8. Assumptions and Limiting Conditions**

- 1) Any legal description provided to the Washington Forestry Consultants, Inc. is assumed to be correct. Any titles and ownership's to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.
- 2) It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other governmental regulations, unless otherwise stated.
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- 9) Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
- 10) Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the tree or other plant or property in question may not arise in the future.

*Note: Even healthy trees can fail under normal or storm conditions. The only way to eliminate all risk is to remove all trees within reach of all targets. Annual monitoring by an ISA Certified Arborist or Certified Forester will reduce the potential of tree failures. It is impossible to predict with certainty that a tree will stand or fail, or the timing of the failure. It is considered an 'Act of God' when a tree fails, unless it is directly felled or pushed over by man's actions.*