

# WASHINGTON FORESTRY CONSULTANTS, INC.

FORESTRY AND VEGETATION MANAGEMENT SPECIALISTS



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- Tree Retention Plan-

## DuPont 243

1700 Center Drive  
DuPont, WA

Prepared for: Barghausen Consulting Engineers

Prepared by: Washington Forestry Consultants, Inc.

Report Date: August 6, 2023

## Introduction

The project proponent is planning to build a warehouse project on two parcels totaling 19.65-acres in DuPont, Washington. The proponent has retained WFCI to:

- Evaluate and inventory all trees on the site pursuant to **DuPont Municipal Code 25.120 Tree Retention.**
- Make recommendations for tree retention, along with any required protection and cultural measures.

## Observations

### Methodology

WFCI has evaluated all surveyed and mapped trees. Generally, these were trees that are 4 inches diameter at breast height (DBH) and larger in the proposed project area. We then assessed their potential to be incorporated into the new project. A 100% inventory of all landmark trees was conducted to determine the location and condition of the landmark trees on the parcel. Tree locations and species information was gathered from survey data.

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 consists of two tax parcels, 0119266005 and 0119266006. It is relatively flat with some rolling hills and small depressions. The Sequelitchew Creek Trail passes through the southern portion of the parcel. There are no buildings on the site. Access to the site is by Sequelitchew Dr. The parcel is bordered by Sequelitchew Creek on the south and west, forested parcels to the north, and a multi-family residential development to the east.

## Soil Depth and Productivity

According to the USDA Web Soil Survey, there is one soil type on the parcel, the Spanaway gravelly sandy loam.

The Spanaway gravelly sandy loam is a very deep, somewhat excessively drained soil found on terraces. It is formed in glacial outwash and volcanic ash. Permeability is moderately rapid in the subsoil and very rapid in the substratum. Available water capacity is low. The effective rooting depth for trees is 48 inches or more. The potential for windthrow of trees is slight under normal conditions. New trees require irrigation for establishment.

## Tree Conditions

There are 2 cover types on this 19.65-acre property for the purposes of description. Type I was the forested area of the site and Type II is non-forest brush land (see Attachment #1). We found and evaluated a total of 669 trees in the project area. Most of the trees were considered to be healthy, long-term trees if they were saved. The following is a description of the forest cover types:

**Type I.** – This type is a mixed stand of deciduous and conifer trees. It covers 13.55-acres and includes all the Specimen, Landmark, and Significant trees on the site that are 4 inches and larger in diameter. There are 669 trees in this type that had their tree location surveyed. The tree species include Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Oregon white oak (*Quercus garryana*), Pacific yew (*Taxus brevifolia*), Pacific madrone (*Arbutus menziesii*), and bigleaf maple (*Acer macrophyllum*). Tree size ranges from 4 to over 50 inches DBH. Tree condition ranges from ‘Poor’ to ‘Good’, with most trees described as being in the ‘Fair’ or ‘Good’ condition class. Table 1 is a summary of trees located on the project site. A complete list of Landmark trees located on-site is found in Attachment 3.

**Table 1: Summary of Trees in Cover Type I**

| Species          | DBH Range (in) | # of Healthy Landmark Trees* | # of Unhealthy Landmark Trees** | # of Healthy Non-Landmark Trees* | # of Unhealthy Non-Landmark Trees** | Total |
|------------------|----------------|------------------------------|---------------------------------|----------------------------------|-------------------------------------|-------|
| Douglas-fir      | 4 – 50         | 50                           | 5                               | 287                              | 33                                  | 375   |
| Oregon White Oak | 4 – 42         | 6                            | 2                               | 176                              | 15                                  | 199   |
| Western Redcedar | 12 – 36        | 6                            | 0                               | 64                               | 6                                   | 76    |

| Species         | DBH Range (in) | # of Healthy Landmark Trees* | # of Unhealthy Landmark Trees** | # of Healthy Non-Landmark Trees* | # of Unhealthy Non-Landmark Trees** | Total      |
|-----------------|----------------|------------------------------|---------------------------------|----------------------------------|-------------------------------------|------------|
| Bigleaf Maple   | 18 – 41        | 5                            | 0                               | 4                                | 1                                   | 10         |
| Pacific Madrone | 12 – 18        | 0                            | 0                               | 4                                | 0                                   | 4          |
| Pacific Yew     | 13 – 17        | 0                            | 0                               | 3                                | 0                                   | 3          |
| Western Hemlock | 13 – 33        | 1                            | 0                               | 1                                | 0                                   | 2          |
| <b>Total</b>    | <b>4 – 50</b>  | <b>68</b>                    | <b>7</b>                        | <b>539</b>                       | <b>55</b>                           | <b>669</b> |

\*Trees in 'Fair' or 'Good' Condition

\*\*Trees in 'Poor' or 'Very Poor' Condition

Understory shrubs include salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), trailing blackberry, (*Rubus ursinus*), bracken fern (*Pteridium aquilinum*), Indian plum (*Oemleria cerasiformis*), red huckleberry (*Vaccinium parvifolium*), western hazelnut (*Corylus cornuta*), grasses, and broadleaved weeds.



Photo 1: View of typical trees in Cover Type I

**Type II.** – This 6.10-acre cover type consists of mostly open, highly disturbed ground with only small thickets of young Douglas-fir trees. No trees were inventoried or surveyed in this Type. Other vegetation in this area includes abundant Scotch broom (*Cytisus scoparius*), grasses, and broadleaf weeds.



**Photo 2: Non-forest Cover Type II**

### **Landmark Trees**

There are a total of 75 landmark trees in the project area. Landmark trees include Oregon white oak, Pacific yew, and Pacific madrone 24 inches DBH and larger, or Douglas-fir, western redcedar, bigleaf maple, and western hemlock that are 30 inches DBH and larger. *Landmark Oregon White Oak trees are not allowed to be removed without approval from the City of Dupont under a Type I Tree Removal Permit application.* Two healthy white oak Landmark trees are proposed to be removed.

Locations of landmark trees are indicated on the site plan (Attachment #2). A total of **19** healthy landmark trees can be retained on the site. Fifty-six (**56**) landmark trees will need to be removed because they are either unhealthy or located under the footprint of proposed buildings, roads, storm ponds, or parking lots. Other than Oregon white oak, there is no requirement to retain these landmark trees under the footprint of the buildings, storm ponds, and parking lots, as long as tree retention is achieved in the street boundaries and abutting a residential district. All landmark trees are labeled with a blue number at the base corresponding to the table in Attachment 3.

An existing 42-inch Oregon White Oak tree (#12) needs to be removed due to its location in the future Y street right of way.

### **Potential Tree Retention**

The property is in the Manufacturing/Research Park zoning district of DuPont. The DuPont Municipal Code (DMC) requires that a minimum of 1.5 trees per acre shall be retained on the 19.65-acre site. Therefore, at least 29 healthy trees will need to be retained.

The site plan shows that the new construction will extend to the northern edge of the parcel, leaving open space for tree retention in the southern, southwestern, and western areas. The following is a summary of the proposed tree retention:

|                                                    |                |
|----------------------------------------------------|----------------|
| Total Project Acreage:                             | 19.65 acres    |
| Total # of Healthy Trees:                          | 607 trees      |
| Tree Retention Requirement (1.5 Trees per Acre):   | 29 trees       |
| Projected Tree Retention:                          |                |
| Tree Retention Area A                              | 77 trees       |
| Tree Retention Area B                              | 132 trees      |
| Tree Retention Area C                              | 11 trees       |
| Tree Retention Area D                              | <u>6 trees</u> |
| Total Projected Trees in Tree Retention Areas      | 226 trees      |
| Excess of Tree Retention over the Tree Requirement | 197 trees      |
| Projected # of Healthy Trees to be Removed         | 381 trees      |

### **Tree Replacement**

Planned tree retention exceeds the minimum requirement by 197 trees, so no tree replacement is required beyond that required by the landscape code requirements.

### **Tree Protection Measures**

Trees to be saved must be protected during construction by a six-foot-high temporary chain link fencing (Attachment #4), located 5 feet outside of the drip line of the trees. Placards shall be placed on the fencing every 50 feet indicating the words, "NO TRESPASSING - Protected Trees". The individual CRZ is a radius of one foot for each one inch of DBH (6 feet minimum), unless otherwise delineated by WFCI.

Tree protection fences should be placed around the edge of the critical root zone. 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 (CRZ). No irrigation lines, trenches, or other utilities should be installed within the CRZ. Cuts or fills should impact no more than 25% 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 25% 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.

**The proposed location and paving of the proposed Sequalitchew Creek Trail bisects the CRZ of multiple trees in Tree Retention Area A. A Certified Arborist® should be on-site during work in this area to re-evaluate the health of the trees and assess the path alignment to determine the proper method to protect the roots of the save trees. The path follows the existing grade so little soil disturbance will occur. The overall impact of the trail withing the CRZ of the save trees is minimal compared to the entire root zones of the trees. If the trees are healthy, they will be able to tolerate some root impact.**

**Root impact could be reduced using root protection strategies such as structural soil under the pathway or installing a passive aeration under the path. Structural soils are soils that are specially designed to provide nutrients, space, and porosity to accommodate root growth while also allowing for compaction to support pavement without settling. This will protect the roots of the tree and allow for the pathway.**

**The work on the pathway should be confined only to the path area. Tree protection fences should be placed along the sides of the path. The path should be constructed with structural soils as progress is made to prevent root compaction and damage. The on-site arborist should prescribe any pruning or other tree maintenance on a tree-by-tree basis to promote tree health. The health of the trees should be monitored for 3 years after the path has been constructed.**

### **Pruning and Thinning**

All individual trees to be saved near or within developed areas should have their crowns raised to provide a minimum of 8 feet of ground clearance over sidewalks and landscape areas, 15 feet over parking lots or streets, and at least 10 feet of building clearance.

All pruning should be done according to the ANSI A300 standards for proper pruning and be completed by an International Society of Arboriculture Certified Arborist® or be supervised by a Certified Arborist®.

## Conclusions and Timeline for Activity

1. At least 29 trees (1.5 healthy trees per acre) need to be retained in the project area. A total of 226 trees are projected to be retained within the 4 tree protection areas, exceeding the requirement by 197 trees. No tree replacement should be required.
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. WFCI can verify all trees to be saved and/or removed are adequately marked for retention. A tally of the trees within the final tree retention area boundaries can be done at this time to confirm that the minimum 29 tree retention requirement is met.
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. Do not excavate stumps within 10' of trees to be saved. These should be individually evaluated by WFCI to determine the method of removal.
9. Complete all necessary pruning on save trees or stand edges to provide at least 8' of ground clearance near sidewalks and trails, and 15' above all driveways or access roads.
10. Complete grading and construction of the project.

## Summary

We found 607 healthy significant trees in the project area, including 75 Landmark trees. The City of DuPont requires that 1.5 healthy trees per acre are retained in a Manufacturing/Research Park zoned site. Therefore, at least 29 trees will need to be retained as part of this 19.65-acre project. This plan retains 226 trees within 4 tree retention areas. No tree replacement plan should be required.

Please give us a call if you have further questions.

Respectfully submitted,

Washington Forestry Consultants



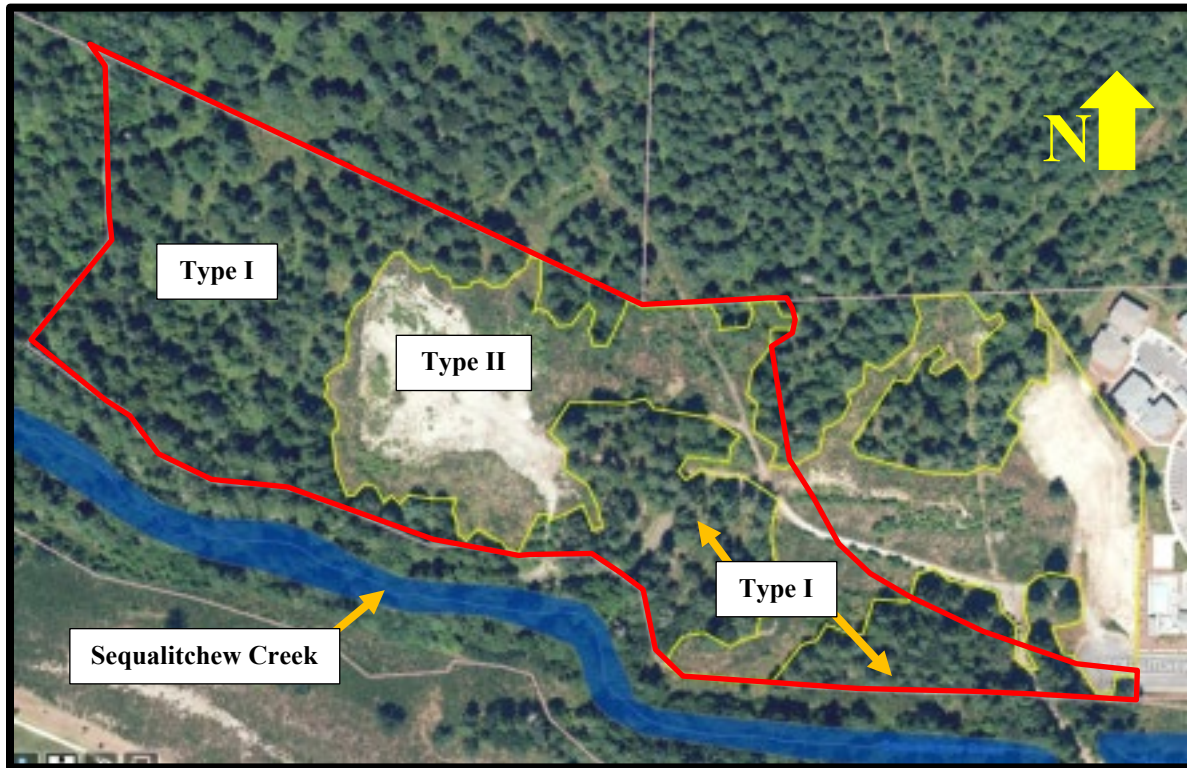
Galen M. Wright, ACF, ASCA  
ISA Bd. Certified Master Arborist PN-129BU  
Certified Forester No. 44  
ISA Tree Risk Assessor Qualified  
ASCA Tree and Plant Appraisal Qualified



Joshua Sharpes  
Professional Forester  
ISA Certified Arborist  
Municipal Specialist, PN-5939AM  
ISA Tree Risk Assessor Qualified

## Attachment 1. Aerial Photo of DuPont 243 with Cover Types

(Pierce County GIS)

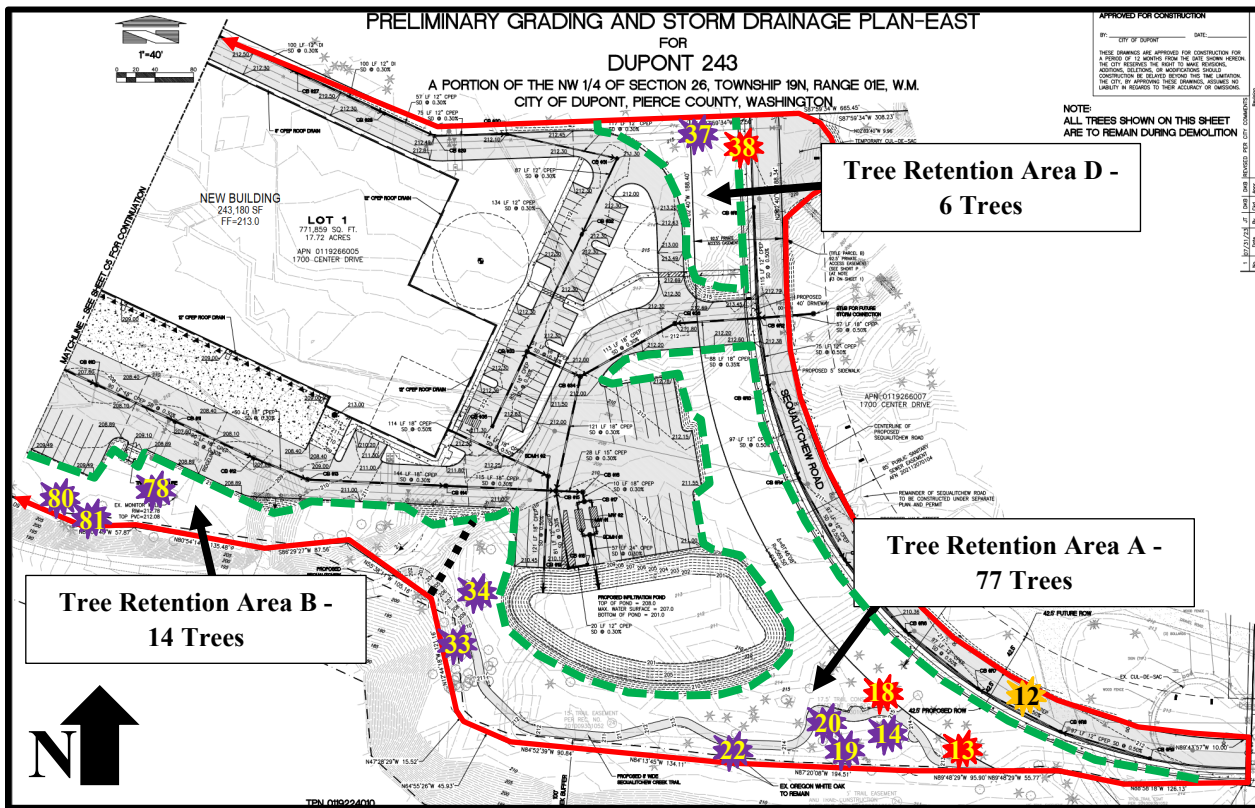


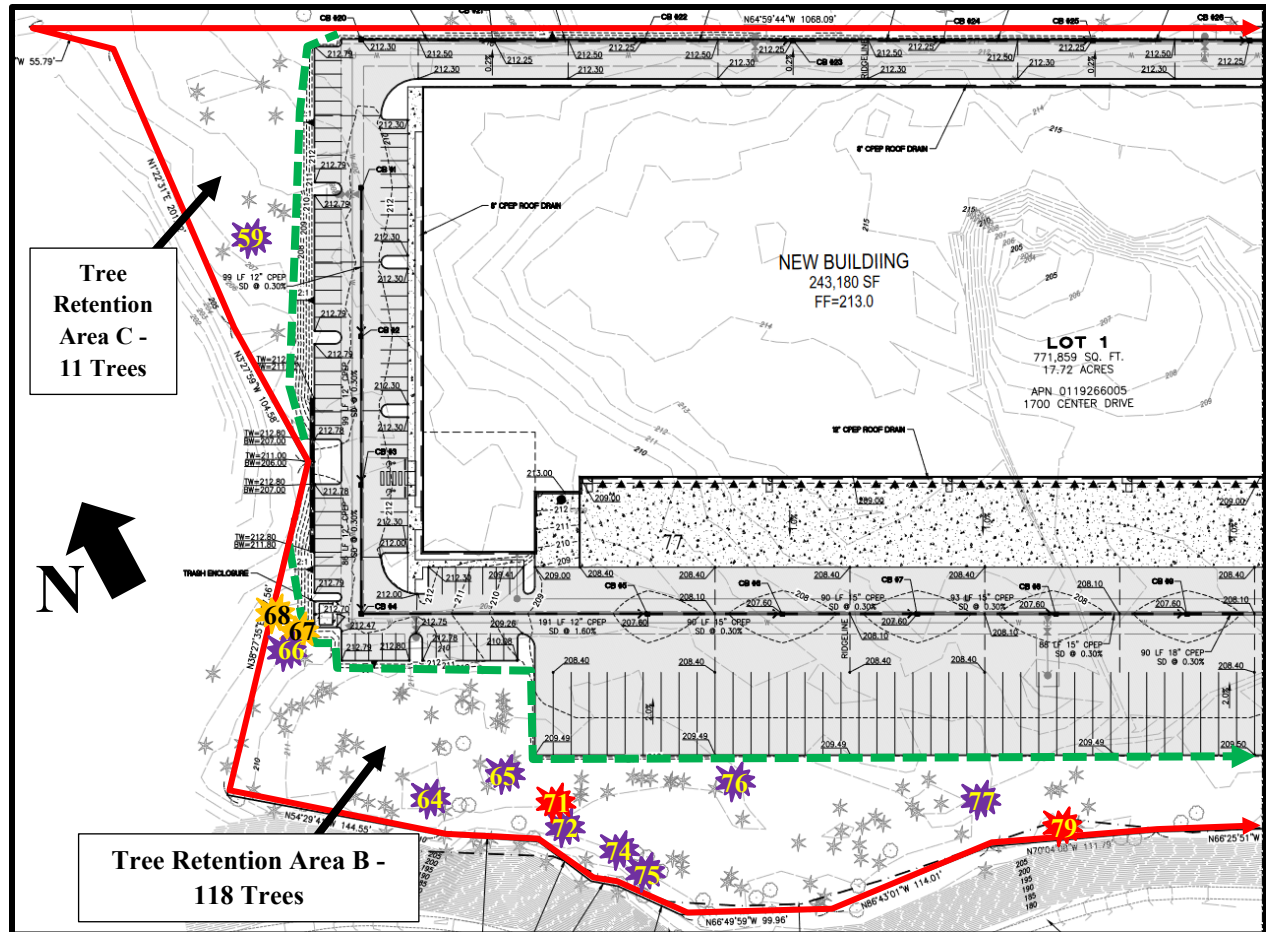
— Project Boundary

— Cover Type Boundary

## Attachment 2. DuPont 243 Site Plan/Tree Map with Landmark Tree Locations Indicated

(2 Pages)





- Site Boundary
- ✱ Healthy Landmark Tree to Retain
- ✱ Unhealthy Landmark Tree
- ✱ Healthy Landmark Tree to Remove
- Tree Protection Fence Location

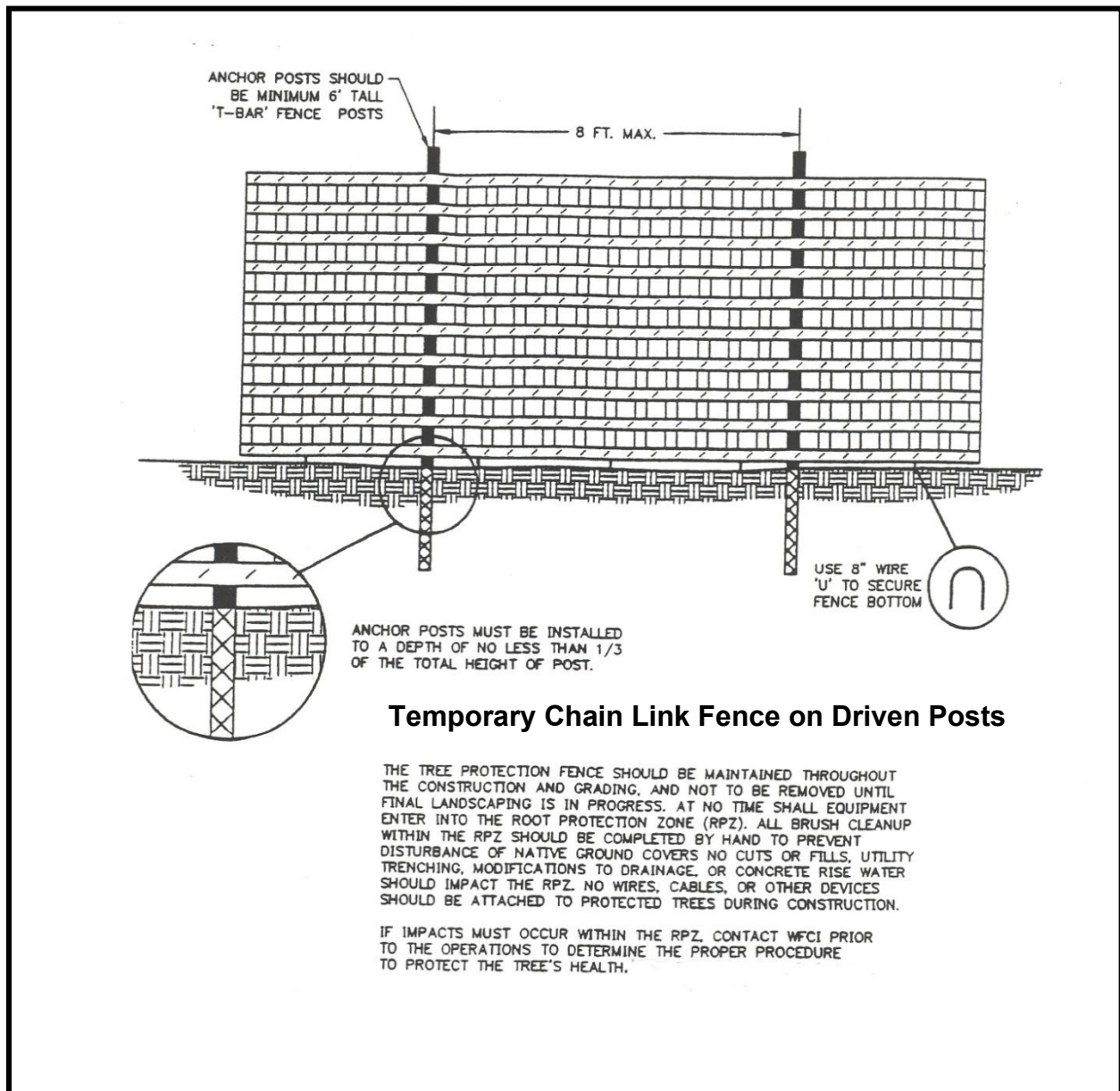
**Attachment 3. List of Landmark Trees on DuPont 243**

| <b>Tree #</b> | <b>Species</b>   | <b>DBH (in.)</b>       | <b>Condition</b> | <b>Savable Based on Tree Condition Alone? Yes or No</b> | <b>Project Plan? Save or Remove</b> | <b>Minimum Recommended Root Protection Zone Radius (ft.)</b> | <b>Comment</b>     |
|---------------|------------------|------------------------|------------------|---------------------------------------------------------|-------------------------------------|--------------------------------------------------------------|--------------------|
| 4             | Douglas-fir      | 33                     | Fair             | Yes                                                     | Remove                              | 26                                                           |                    |
| 5             | Douglas-fir      | 28                     | Good             | Yes                                                     | Remove                              | 28                                                           |                    |
| 6             | Douglas-fir      | 14, 9, 10, 16, 10, 10  | Fair             | Yes                                                     | Remove                              |                                                              |                    |
| 7             | Douglas-fir      | 48                     | Good             | Yes                                                     | Remove                              | 36                                                           |                    |
| 9             | Oregon white oak | 19, 18, 15, 16, 14, 15 | Fair             | Yes                                                     | Remove                              | 42                                                           |                    |
| 10            | Douglas-fir      | 33, 33                 | Good             | Yes                                                     | Remove                              | 30                                                           |                    |
| 11            | Douglas-fir      | 35                     | Fair             | Yes                                                     | Remove                              | 30                                                           |                    |
| 12            | Oregon white oak | 42                     | Fair             | Yes                                                     | Remove                              | 40                                                           |                    |
| 13            | Douglas-fir      | 34                     | Poor             | No                                                      | Remove                              |                                                              | Stem Decay         |
| 14            | Douglas-fir      | 32                     | Fair             | Yes                                                     | Save                                | 28                                                           |                    |
| 15            | Douglas-fir      | 42                     | Good             | Yes                                                     | Remove                              | 36                                                           |                    |
| 16            | Douglas-fir      | 33                     | Fair             | Yes                                                     | Remove                              | 28                                                           |                    |
| 17            | Douglas-fir      | 30                     | Fair             | Yes                                                     | Remove                              | 26                                                           |                    |
| 18            | Oregon white oak | 18, 19                 | Poor             | No                                                      | Remove                              |                                                              | Stem Defect, Decay |
| 19            | Douglas-fir      | 41                     | Fair             | Yes                                                     | Save                                | 30                                                           |                    |
| 20            | Douglas-fir      | 37                     | Good             | Yes                                                     | Save                                | 30                                                           |                    |
| 21            | Douglas-fir      | 31.5                   | Fair             | Yes                                                     | Remove                              | 28                                                           |                    |
| 22            | Oregon white oak | 16, 23, 13             | Fair             | Yes                                                     | Save                                | 30                                                           |                    |
| 23            | Douglas-fir      | 33                     | Poor             | No                                                      | Remove                              |                                                              | 1 dead stem        |
| 24            | Douglas-fir      | 33                     | Fair             | Yes                                                     | Remove                              | 28                                                           |                    |
| 25            | Douglas-fir      | 41                     | Good             | Yes                                                     | Remove                              | 32                                                           |                    |
| 26            | Douglas-fir      | 41, 28                 | Fair             | Yes                                                     | Remove                              |                                                              |                    |
| 27            | Douglas-fir      | 40                     | Good             | Yes                                                     | Remove                              |                                                              |                    |
| 28            | Douglas-fir      | 37                     | Good             | Yes                                                     | Remove                              |                                                              |                    |
| 29            | Douglas-fir      | 50                     | Good             | Yes                                                     | Remove                              |                                                              |                    |
| 30            | Douglas-fir      | 35                     | Fair             | Yes                                                     | Remove                              |                                                              |                    |
| 31            | Douglas-fir      | 41                     | Fair             | Yes                                                     | Remove                              |                                                              |                    |
| 32            | Douglas-fir      | 32                     | Fair             | Yes                                                     | Remove                              | 26                                                           |                    |
| 33            | Douglas-fir      | 19, 19, 17             | Fair             | Yes                                                     | Save                                | 28                                                           |                    |
| 34            | Douglas-fir      | 37                     | Fair             | Yes                                                     | Save                                | 28                                                           |                    |

| Tree # | Species          | DBH (in.)  | Condition | Savable Based on Tree Condition Alone? Yes or No | Project Plan? Save or Remove | Minimum Recommended Root Protection Zone Radius (ft.) | Comment                   |
|--------|------------------|------------|-----------|--------------------------------------------------|------------------------------|-------------------------------------------------------|---------------------------|
| 35     | Douglas-fir      | 31         | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 36     | Douglas-fir      | 41         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 37     | Douglas-fir      | 31         | Good      | Yes                                              | Save                         |                                                       |                           |
| 38     | Douglas-fir      | 34         | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 42     | Douglas-fir      | 28, 22, 28 | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 43     | Douglas-fir      | 50, 50, 30 | Poor      | No                                               | Remove                       |                                                       | Stem defect, Red ring rot |
| 44     | Douglas-fir      | 38         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 45     | Douglas-fir      | 40         | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 46     | Douglas-fir      | 35         | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 47     | Douglas-fir      | 42.5       | Good      | Yes                                              | Remove                       |                                                       |                           |
| 48     | Douglas-fir      | 33         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 49     | Douglas-fir      | 35         | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 50     | Douglas-fir      | 34         | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 51     | Douglas-fir      | 32         | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 52     | Douglas-fir      | 30         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 53     | Douglas-fir      | 33         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 54     | Douglas-fir      | 37         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 55     | Bigleaf maple    | 33         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 56     | Douglas-fir      | 34         | Poor      | No                                               | Remove                       |                                                       | Red ring rot              |
| 57     | Douglas-fir      | 36         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 58     | Bigleaf maple    | 41         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 59     | Hemlock          | 33         | Fair      | Yes                                              | Save                         | 28E                                                   |                           |
| 60     | Douglas-fir      | 38.5       | Fair      | Yes                                              | Remove                       |                                                       |                           |
| 61     | Bigleaf maple    | 36         | Good      | Yes                                              | Remove                       |                                                       |                           |
| 62     | Bigleaf maple    | 24, 24     | Good      | Yes                                              | Remove                       |                                                       |                           |
| 63     | Douglas-fir      | 31.5       | Good      | Yes                                              | Remove                       |                                                       |                           |
| 64     | Western redcedar | 36         | Fair      | Yes                                              | Save                         | 30                                                    |                           |
| 65     | Oregon white oak | 16, 14     | Fair      | Yes                                              | Save                         |                                                       |                           |
| 66     | Western redcedar | 31         | Fair      | Yes                                              | Save                         | 22                                                    |                           |
| 67     | Western redcedar | 31.5       | Fair      | Yes                                              | Remove                       | 22                                                    |                           |
| 68     | Western redcedar | 35         | Fair      | Yes                                              | Remove                       | 26                                                    |                           |
| 69     | Western redcedar | 31         | Good      | Yes                                              | Remove                       |                                                       |                           |

| <b>Tree #</b> | <b>Species</b>   | <b>DBH (in.)</b> | <b>Condition</b> | <b>Savable Based on Tree Condition Alone? Yes or No</b> | <b>Project Plan? Save or Remove</b> | <b>Minimum Recommended Root Protection Zone Radius (ft.)</b> | <b>Comment</b> |
|---------------|------------------|------------------|------------------|---------------------------------------------------------|-------------------------------------|--------------------------------------------------------------|----------------|
| 70            | Douglas-fir      | 31.5             | Fair             | Yes                                                     | Remove                              |                                                              |                |
| 71            | Douglas-fir      | 31.5             | Poor             | No                                                      | Remove                              |                                                              | Dead top       |
| 72            | Western redcedar | 31               | Fair             | Yes                                                     | Save                                | 26                                                           |                |
| 73            | Douglas-fir      | 37               | Good             | Yes                                                     | Remove                              |                                                              |                |
| 74            | Douglas-fir      | 36               | Good             | Yes                                                     | Save                                | 24                                                           |                |
| 75            | Bigleaf maple    | 22, 14, 16       | Good             | Yes                                                     | Save                                |                                                              |                |
| 76            | Douglas-fir      | 31.5             | Fair             | Yes                                                     | Save                                | 24                                                           |                |
| 77            | Douglas-fir      | 42               | Fair             | Yes                                                     | Save                                | 30                                                           |                |
| 78            | Douglas-fir      | 38               | Good             | Yes                                                     | Save                                | 32                                                           |                |
| 79            | Oregon white oak | 18,8             | Poor             | No                                                      | Remove                              |                                                              | suppressed     |
| 80            | Oregon white oak | 24               | Good             | Yes                                                     | Save                                | 28                                                           |                |
| 81            | Oregon white oak | 24.8             | Good             | Yes                                                     | Save                                | 30                                                           |                |
| 82            | Douglas-fir      | 34               | Good             | Yes                                                     | Remove                              |                                                              |                |

## 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>                                                                                                                                                                                                                                                                                                                                                                         |

## **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.
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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.*