

- Preliminary Tree Protection Plan -

**BRITTON NORTH**

2365 Shady Lane Ct. NE  
Lacey, WA 98516

Prepared for: Lacey Community Development  
Prepared by: Washington Forestry Consultants, Inc.  
Date: December 7, 2021

**Introduction and Overview**

The Calida Group is planning on constructing a multi-family project in two phases on 29.64 acres at 2365 Shady Lane Ct. NE in Lacey. The City of Lacey has retained WFCI to:

- Evaluate all existing trees on the site, pursuant to Chapter 14.32 (August, 2006) of the Lacey Tree Protection and Vegetation Preservation Ordinance.
- Make recommendations for trees suitable to be saved in open space or tree tract areas, along with required protection and cultural measures.

**Observations**

**Methodology**

WFCI has conducted an inventory and assessment of the trees on the project site to determine the number, distribution and condition of existing trees. The inventory was conducted using 12 variable area plots installed on a systematic grid across the project site. The potential of trees over 4" diameter at breast height (DBH) to be incorporated into the new project were assessed. Many smaller trees were evaluated in the project area as well. The tree evaluation phase used methodology developed by Matheny and Clark (1998)<sup>1</sup> the International Society of Arboriculture (ISA).

<sup>1</sup> Nelda Metheny and James R. Clark. Trees and Development: A Technical Guide to Preservation of Trees during Land Development. International Society of Arboriculture, Champaign, IL.

## Site Description

The 29.64-acre site is gently sloped to the north and mostly forested. There is a wetland and associated buffer located in the northwest corner on the site. A cleared area and City of Lacey pump station is located on the west side of the site. The property is bordered by undeveloped land and single-family homes to the north and west; an undeveloped lot to the east, Britton Parkway NE to the south.

## Soil Depth and Productivity

**Figure 1. Soil Map of Britton North Site.**



- 2 – Alderwood gravelly sandy loam**
- 14 – Bellingham silty clay loam**
- 33 – Everett very gravelly sandy loam**
- 39 – Giles silt loam**
- 48 – Indianola loamy sand**
- 85 – gravel pit**
- 108 – Skipopa silt loam**
- 110 – Spanaway gravelly sandy loam**

According to the Natural Resource Soil Conservation Survey there are 8 soil types on the site. The gravel pit type is part of the Everett very gravelly sandy loam type.

The first soil type is the Alderwood gravelly sandy loam, a moderately deep, moderately well drained soil found on glacial till plains. It is formed in ablation till overlying basal till. A weakly cemented hardpan is at a depth of 20 to 40 inches. Permeability is moderately rapid above the hardpan and very slow in the pan. Available water capacity is low. Effective rooting depth is 20-40 inches. A perched seasonal high-water table is at a depth of 18-36 inches from November to March. The potential for windthrow of trees is moderate under normal conditions. New trees require irrigation for establishment.

**In areas where grading brings the hardpan nearer to the surface, the hardpan must be fractured under new trees to provide soil volume for root development and to improve drainage around the tree.**

The second soil type is the Bellingham silty clay loam, a very deep, poorly drained soil found in depressions. It formed in alluvium and lacustrine sediments. Permeability is slow. Plant available water capacity is high. The effective rooting depth is limited by a seasonal high-water table that is at a depth of 18 to 36 inches from October to March. The hazard of runoff and erosion is slight. The soil is not suited to year-round logging because of the muddiness of the soil caused by seasonal wetness. The chance of windthrow is very high under normal conditions. Seedling mortality is severe because the high-water table inhibits the respiration of roots.

The third soil type is the Everett very gravelly sandy loam, a very deep, somewhat excessively drained soil found on terraces and outwash plains. It is formed in glacial outwash. Permeability is rapid and 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 soil is suited to year-round logging. The windthrow potential is slight under normal conditions. Seedling mortality is severe and new trees require irrigation to establish.

The fourth soil type is the Giles silt loam, a deep, well-drained soil found on terraces. It formed in glacial outwash and volcanic ash. Permeability is moderate. Plant available water capacity is high. The effective rooting depth is 40 to 60 inches. The hazard of runoff and erosion is slight. The soil is not suited to year-round logging because of the muddiness of the soil caused by seasonal wetness. The chance of windthrow is slight under normal conditions. Seedling mortality is severe.

The fifth type is the Indianola loamy sand, very deep, somewhat excessively drained soil. It is formed in sandy glacial outwash on broad uplands. Permeability is rapid. The available water capacity for plants is low to moderate. The effective rooting depth for trees is 60 inches or more. The potential for windthrow of trees is *low* under normal conditions.

The sixth soil type is the Skipopa silt loam, a moderately deep, somewhat poorly drained soil found on terraces. It formed in volcanic ash and loess over glaciolacustrine sediment. Permeability is moderate in the subsoil and very slow in the substratum. Plant available water capacity is moderate. The effective rooting depth is 15 to 30 inches. A perched water table fluctuates between depths of 12 to 24 inches from November to May. The hazard of runoff and

erosion is slight. The soil is not suited to year-round logging because of the muddiness of the soil caused by seasonal wetness. The chance of windthrow is slight under normal conditions. Seedling mortality is severe.

The seventh soil type is the Spanaway gravelly sandy loam, 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 four forest cover types for the purposes of description.

Type I.- This cover type is the 15.80-acre forested portion of the parcel that runs along Britton Parkway NE. It is a mature stand of Douglas-fir (*Pseudotsuga menziesii*) with a small number of Oregon white oak (*Quercus garryana*), bigleaf maple (*Acer macrophyllum*), and red alder (*Alnus rubra*). The stand appears to be about 50+ years old. The stocking of the stand mostly uniform at about 156 trees per acre. There are two open areas in the stand that are more open and have more oak trees. There were no disease centers found with these areas and appear the same size in historical air photos. Tree size ranges from 4 to 30 inches DBH.

**Table 1.** Summary of Trees in Type I of the Britton North Project Area.

Species	DBH Range (in.)	Condition Range	Trees/Acre	# Healthy Trees	# Unhealthy Trees	Total # of Trees
Douglas-fir	7 – 30	Dead – Good	131	1,568	502	2,070
Oregon White Oak	7 – 12	Fair	20	316	0	316
Bigleaf Maple	15 – 20	Fair	3	47	0	47
Red Alder	15	Fair	2	32	0	32
<b>Totals</b>	<b>7 - 30</b>	<b>Dead – Good</b>	<b>156</b>	<b>1,963</b>	<b>502</b>	<b>2,465</b>

We project that 2,465 trees are growing in this type. The condition of living trees ranges from ‘Dead’ to ‘Good’ condition, with about 80% of trees described as being in ‘Fair’ or better condition. This leaves about 1,963 healthy, long-term trees in this cover type. Mortality in this stand is due primarily to drought stress.





**Photo 1.** View of trees in Type I on Britton North site.

The understory shrub stocking includes salal (*Gaultheria shallon*), western hazelnut (*Corylus cornuta*), tall Oregon grape (*Mahonia aquifolium*), snowberry (*Symphoricarpos alba*), ocean spray (*Holodiscus discolor*), grasses, and broadleaved weeds.

**Type II-** This cover type is the 5.31-acre forested portion of the parcel located on the mid to lower slope of the project. It is a mature red alder dominant stand. Other species in the type include bigleaf maple, western redcedar (*Thuja plicata*), black cottonwood (*Populus trichocarpa*), and Douglas-fir. The stand is the same age as Type I. The stocking of the stand mostly uniform at about 156 trees per acre. There are two open areas in the stand that are more open and have more oak trees. There were no disease centers found with these areas and appear the same size in historical air photos. Tree size ranges from 4 to 30 inches DBH.

**Table 2.** Summary of Trees in Type II of the Britton North Project Area.

Species	DBH Range (in.)	Condition Range	Trees/ Acre	# Healthy Trees	# Unhealthy Trees	Total # of Trees
Red Alder	8 – 17	Very Poor – Good	48	192	63	255
Bigleaf Maple	14 – 36	Poor – Fair	20	102	4	106
Western Redcedar	22 – 40	Fair – Good	6	32	0	32
Black Cottonwood	14	Fair	5	27	0	27
Douglas-fir	34	Good	1	5	0	5
<b>Totals</b>	<b>8 – 40</b>	<b>Very Poor - Good</b>	<b>80</b>	<b>358</b>	<b>67</b>	<b>425</b>



We project that 425 trees are growing in this type. Tree conditions range from ‘Very Poor’ to ‘Good’, with about 84% of trees described as being in ‘Fair’ or better condition. This leaves about 358 healthy, long-term trees in this cover type.



**Photo 2.** View of trees in Type II on Britton North site.

The understory shrub stocking is dominated by western sword fern (*Polystichum munitum*) and western hazelnut. There is also salmonberry (*Rubus spectabilis*).

**Type III.-** This 1.23-acre cover type is located in the northwest corner of the site. It is a pure stand of black cottonwood. Bigleaf maple and red alder occur in small numbers along the edges. The stocking of the stand uniform at about 300 trees per acre. Tree size ranges from 4 to 26 inches DBH.

**Table 3.** Summary of Trees in Type III of the Britton North Project Area.

Species	DBH Range (in.)	Condition Range	Trees/ Acre	# Healthy Trees	# Unhealthy Trees	Total # of Trees
Red Alder	4 – 16	Fair	12	15	0	15
Bigleaf Maple	6 - 20	Fair	3	3	0	3
Black Cottonwood	8 - 26	Poor – Fair	285	281	70	351
<b>Totals</b>	<b>4 – 26</b>	<b>Poor – Fair</b>	<b>300</b>	<b>299</b>	<b>70</b>	<b>369</b>



We project that 369 trees are growing in this type. Tree conditions range from ‘Poor’ to ‘Fair’, with about 76% of trees described as being in ‘Fair’ or better condition. This leaves about 299 healthy, long-term trees in this cover type.



**Photo 3.** View of trees in Type III on Britton North site.

The understory shrub stocking is dominated by salmonberry and other wetland species.

Type IV.- This cover type covers the cleared areas of the project area including the City of Lacey pump station and the connected roadway. The type occurs along the western side of the site. There are no trees in the type.

The understory shrub stocking includes trailing blackberry (*Rubus ursinus*), Scotch broom (*Cytisus scoparius*), grasses, and broadleaved weeds.



**Photo 4.** View of cover Type IV on Britton North site.

### **Forest Practices Permit**

Trees removed from this parcel will contain more than 5,000 board feet. **Therefore, a forest practices permit from the City of Lacey is required.**

## **Recommendations**

### **Tree Retention in Tree Tract**

The City of Lacey Tree and Vegetation: Urban Forest Management Ordinance (Chapter 14.32) requires that a minimum of 5% of the gross project area be set aside as a dedicated tree tract.

The following is a summary of the tree tract calculations:

Total Project Area:	29.64 acres
Critical Areas and Buffers:	<u>16.30 acres</u>
Buildable Area:	13.34 acres
5% Minimum Requirement for Tree Tract:	0.67 acres
Planned Tree Tract (not detailed site plan):	0.67 acres



**The site plan does not show a dedicated tree tract area. It needs to be shown on the site plan and the area calculated.** It must be outside of the wetland and buffer on the site.

### Lot Tree Planting Requirement

The City of Lacey Tree and Vegetation Protection and Preservation Ordinance (Chapter 14.32) requires 4 trees per 5,000 ft<sup>2</sup> on multi-family residential lots over 7,500 ft<sup>2</sup>.

The following is a summary of tree retention requirements:

Total Project Area:	29.64 acres
Critical Areas and Buffers:	<u>16.30 acres</u>
Net Project Acreage:	13.34 acres

Required Tree Planting/Retention (4 Trees/5,000 ft.<sup>2</sup>): 465 trees

Four hundred and sixty-five trees are required to be retained or planted in the buildable area of the site, outside of the tree tract. These trees are in addition to the trees required in the landscaping ordinance.

Planted landscape trees should be selected from the Lacey approved general tree list and be at least 2-inch caliper B&B trees for deciduous species and 7-8-foot-tall B&B conifers. Thirty percent (30%) of planted trees need to be native conifers. The projected cost of 465 replacement trees is \$132,525. Final landscape plans should be reviewed by WFCI before final approval.

### Street Tree Planting Requirement

Street trees will need to be planted along the Britton Parkway NE frontages. The following is the recommended street tree species and numbers of necessary trees planted on 45 ft. centers.

Table 4. Recommended street trees.

Street	Length of Frontage	Tree Species	Botanical Name	# of Trees	Minimum Size	Spacing
Britton Parkway NE	1,303 Ft.	Sugar maple	<i>Acer saccharum</i> 'Commemoration'	29	2 in. caliper B&B	45 ft. OC
<b>Sum</b>				<b>29</b>		

It is projected that the installed cost of the street trees will be \$12,428.

### Hazard Tree Removal

All trees within range of the proposed project or other targets should have hazard tree evaluation completed after staking, but prior to the logging. Trees that will be hazardous to the new buildings or other targets should be removed during the logging operation; this includes trees in the designated tree tract.

## **Tree Protection Requirements**

Trees and tree tracts to be saved must be protected during construction by temporary orange mesh fencing on driven posts, located at the edge of the critical root zone. The individual critical root zones are 5 feet outside the dripline of all edge trees unless otherwise delineated by WFCI.

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 critical root zone. If roots are encountered outside the critical root zone, 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 and mitigating measures, or if the tree should be removed.

## **Timeline for Tree Protection Activity**

Update the site plan to show the required 5% tree tract. WFCI will then update the tree protection plan. Then submit ‘tree protection plan map’ on the face of the grading plan to the City of Lacey for approval. The tree plan map should include the tree tract boundaries, the locations of tree protection fencing, a tree protection fence schematic and this ‘Timeline for Tree Protection Activity.’ The tree protection plan map should be part of the construction drawings packet sent out to contractors for bid.

1. Heavily flag and stake the clearing limits.
2. Conduct a pre-job conference with WFCI prior to the start of clearing.
3. WFCI will re-evaluate all trees within the tree tract at this time with the clearing limits marked. In particular, we want to examine edge trees in the tree tract to determine if any additional trees can be saved, or if any proposed save trees require mitigation or removal due to probable construction/grading damage.
4. Complete the logging. Hazard trees and unhealthy, short-term trees should be thinned from the tree tract at this time.
5. Install tree protection fences after logging but prior to the start of land clearing. Maintain fences throughout construction.
6. WFCI should be contacted to inspect the fences prior to the start of grading.
7. Construct project.



## Summary

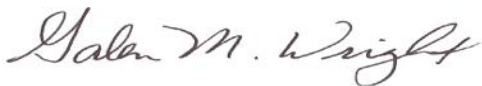
The project proponent is planning on developing a multi-family complex on 13.34 acres of a 29.64 acres parcel in Lacey. While the project buildable area is substantially treed, the intensity of grading and improvements will make tree retention challenging. **The site plan does not show a 5% tree tract. This area needs to be delineated on the site plan and a replanting plan developed if it is not already trees, or needs additional tree planting to meet the Lacey code.**

At least 465 trees will need to be planted or retained within the buildable area of the lots (outside of the tree tract) in addition to at least 29 street trees along Britton Parkway NE. This tree planting is in addition to the requirements of the landscaping ordinance.

Please give us a call if you have any questions.

Respectfully submitted,

Washington Forestry Consultants, Inc.



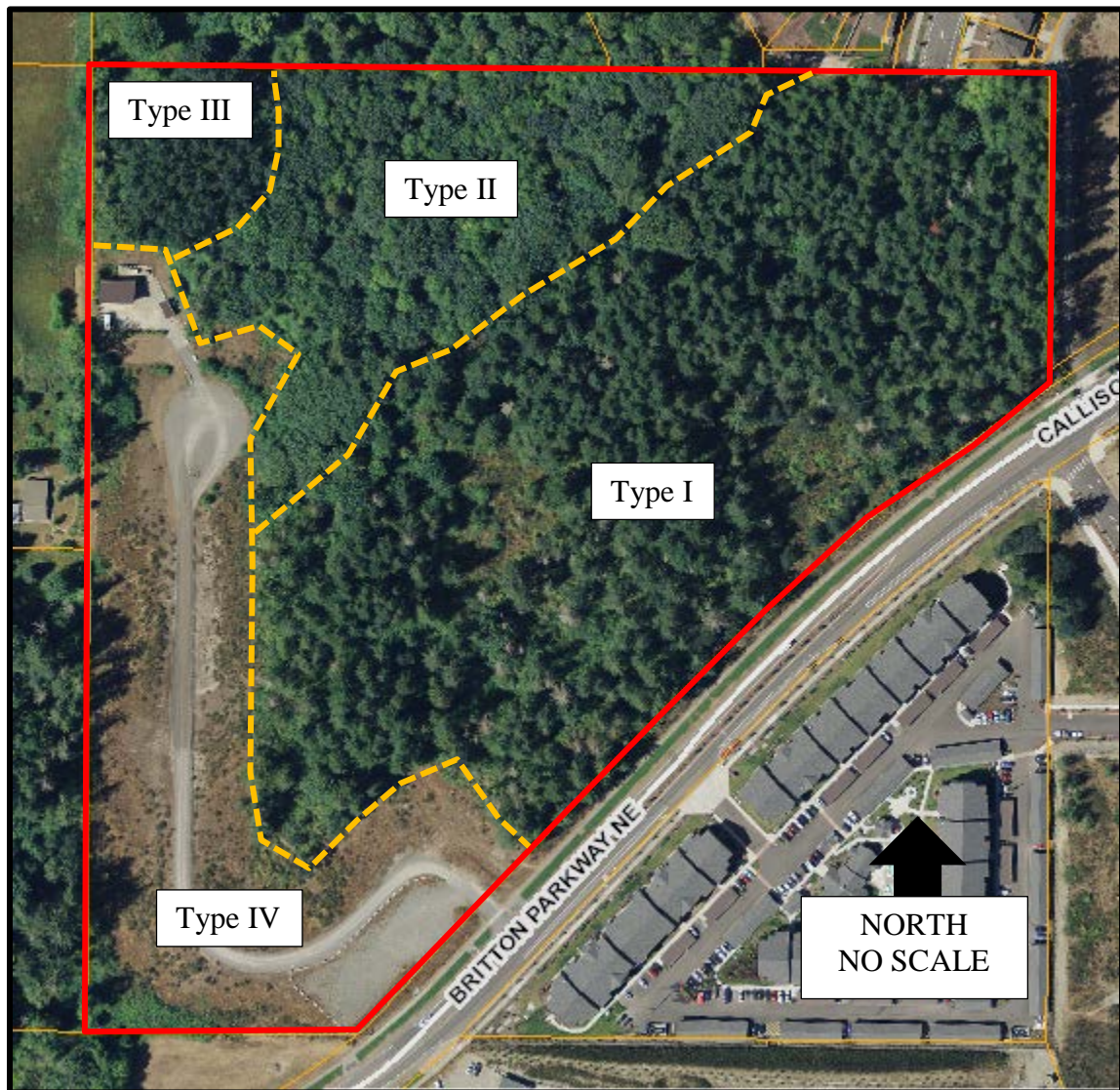
Galen M. Wright, ACF, ASCA  
ISA Bd. Certified Master Arborist PN-129BU  
Certified Forester No. 44  
ISA Tree Risk Assessor Qualified  
ASCA Tree and Plant Appraisal Qualified



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

## Attachment 1. Aerial Photo of Britton North Project Area

(2018 Thurston County GeoData)



— Project Area Boundary

- - - Cover Type Boundary

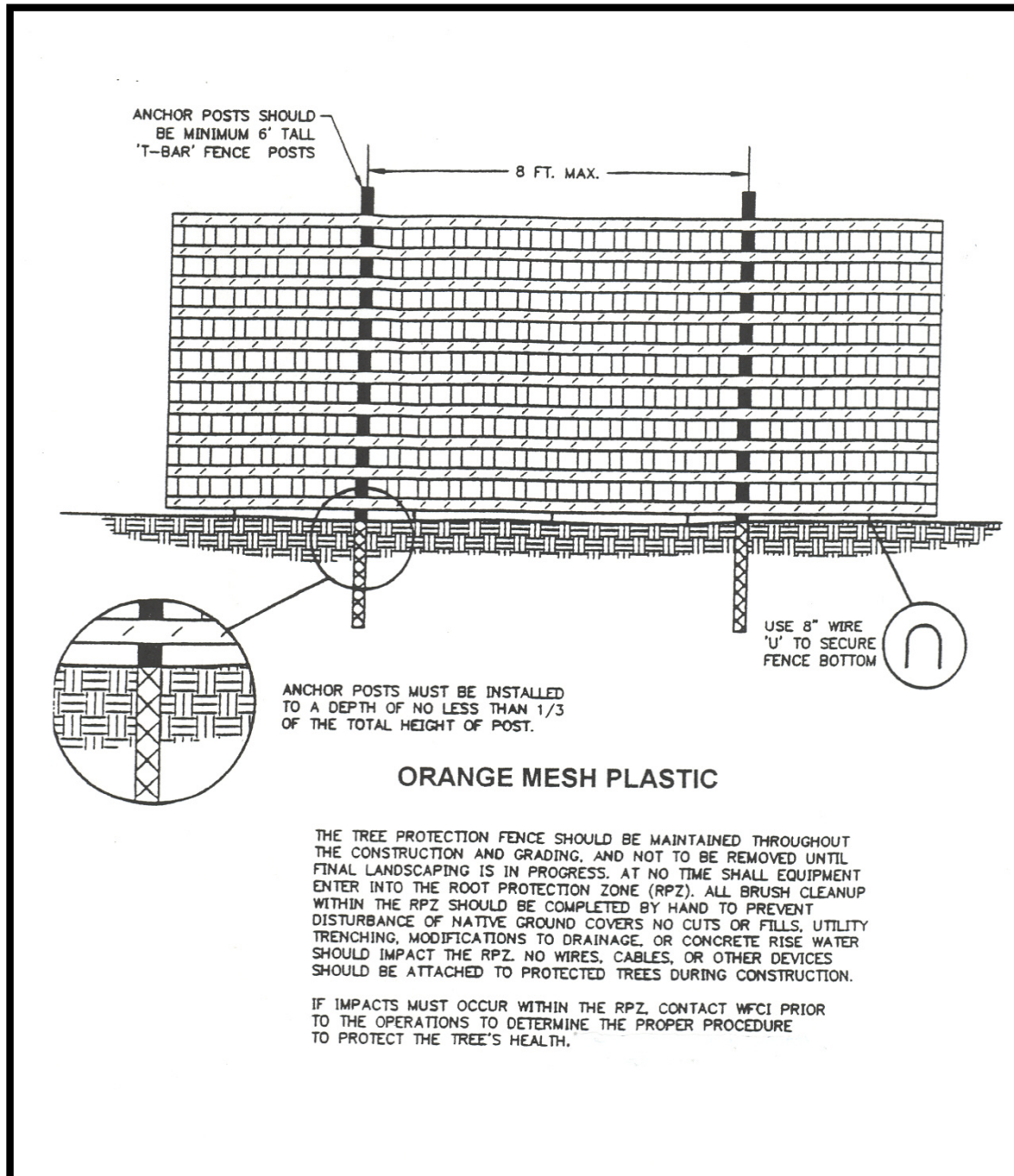


## Attachment 2. Britton North Site Plan



--- Approximate Tree Protection Fence Location

### Attachment 3. Tree Protection Fence Detail





## **Attachment 4. 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).

**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.

**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.

**Root Protection Zone/Critical Root Zone:** A radius from the trees stem of 1 foot for each 1 inch of DBH unless otherwise determined by WFCI. For example, a 7 inch DBH tree would have a critical root zone radius of 7 feet.

**Condition Class Descriptions:**

<b>CONDITION CLASS</b>	<b>CHARACTERISTICS</b>
<b>Excellent</b>	Single stem; Normal foliage color; No branch dieback; No apparent insect or disease problems; No other apparent problems;
<b>Very Good</b>	Single stem; Normal foliage color; No branch dieback or only a few minor branches died back; No apparent insect or disease problems; No other apparent problems, or they are minor and do not impact the long-term survival of the tree;
<b>Good</b>	Single stem; Normal foliage color; Minor branch dieback; Minor problems such as crown unbalanced; Minor foliage problems; Expected to be a long-term tree;
<b>Fair</b>	Single stem or double stem that is not expected to fail soon; Crown may be slightly thinned due to exposure or reduced vigor; Minor branch dieback and 1 or 2 major branches died back; Minor insect or disease problems; Tree expected to survive;
<b>Poor</b>	Single or Multiple stem tree; Thinning crown; Foliage color yellowed; Inadequate live crown ratio; Major and minor branch dieback; Not a long-term tree or quality tree for development;
<b>Very Poor</b>	Single or Multiple stem tree; Severe thinning crown; Yellow foliage; Major branch dieback; Expected to die within 5 years or so;
<b>Hazard Tree</b>	Dead, dying, diseased, defective; Would be hazardous to new development or if other targets are placed within reach of tree;

## **Attachment 5. 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.***