

ARBORIST MEMORANDUM

To: City of Shoreline
 CC: Elizabeth Gibson, Project Landscape Architect, KPG
 From: Tristan Fields, ISA Arborist #PN-8826A & Tree Risk Assessment Qualified, KPG
 Date: October 21, 2021
 Re: N 148th Non-Motorized Bridge Project
 Project No: 19019

THE PROJECT

The N 148th Non-Motorized Bridge Project provides design for a bridge across I-5 and trail access at N 148th in Shoreline, Washington. The west side of the access trail will be in alignment with N 148th, east of 1st Ave NE, connecting to the new multi-modal bridge. The impacts occurring on east side of I-5 are outside of the scope of this report.

The N 148th Non-Motorized Bridge Project is part of transportation improvements for the future Shoreline South/145th Link light rail Station.

KPG was contracted to create an arborist report that focuses on the west side of the access trail where there is a series of coniferous trees that will be impacted by the trail development. Each of the trees (Tree #1 through Tree #16) was located and identified and assessed via a visual inspection for general health, potential changes in loads due to construction, and potential targets in the case of failure; in addition, available data was analyzed to determine the likelihood of failure due to construction impacts. The findings are recorded herein. Also included for Tree #1 through Tree #16 are mitigation options and residual risk for each option and a suggested re-inspection interval.

The end of the report includes recommendations on the hedge dividing Iglesia Church of Christ and Unitarian church properties; general notes about the potentially impacted trees on Iglesia Church of Christ property; and general notes about the trees within the WSDOT right-of-way that will be affected by the project development.

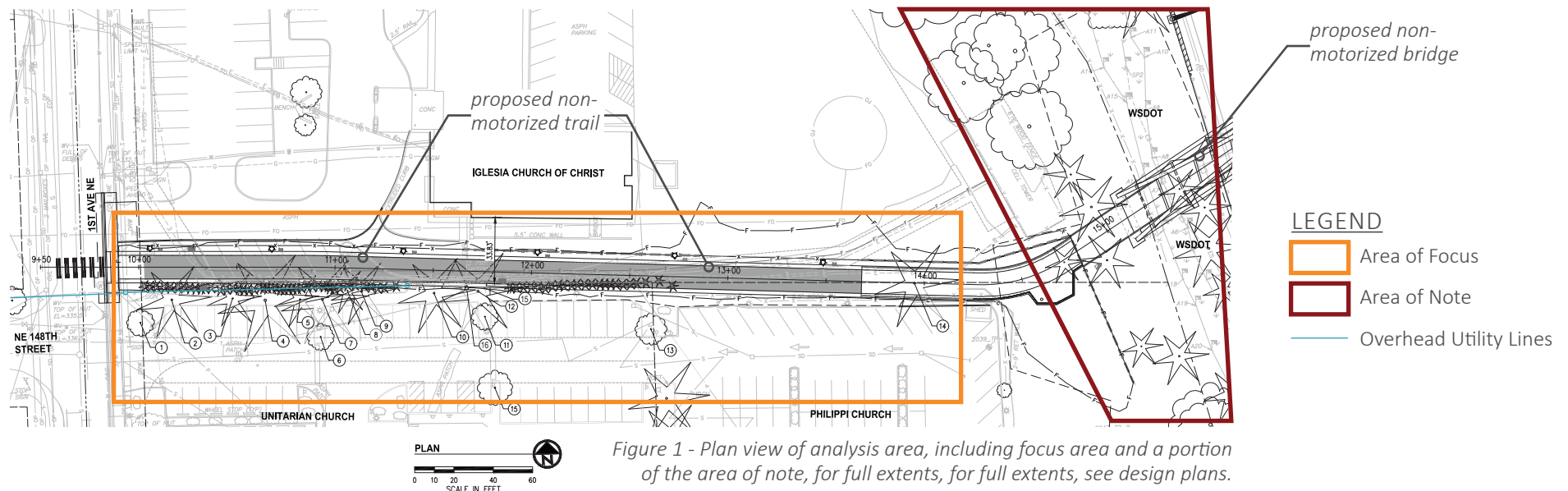


Figure 1 - Plan view of analysis area, including focus area and a portion of the area of note, for full extents, for full extents, see design plans.

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CURRENT SITE CONDITIONS

The trees in the Area of Focus follow an east/west direction along the proposed trail alignment. The strongest winds in this area are predominantly out of the south in the winter, with high speed winds coming out of the south and the southwest, and periodic high winds out of the north.

The soils on site are classified by USDA as Urban land-Alderwood Complex which transitions from a gravelly sandy loam at 7" to a very gravelly sandy loam at 60". On site soil probe confirms this assessment. The gravelly sandy loam soils have the potential of deep feeder roots on the large trees, which may help reduce overall construction impacts.

The slopes on the site vary from approximately 2% to 12% in the Area of Focus to 2% to 35% in the Area of Note.

The trees in the Area of Focus are growing in an approximately 12' wide planter strip in between two parking lots. There is an yew hedge growing the length of the Area of Focus on the north side of the subject trees. The trees have been growing in their current condition for over 20 years.

The gravelly sandy loam soils, and the pavement on both sides of the planter suggest that the feeder and structural roots for the trees are achieving a depth greater than the top 12" of soil.

DESCRIPTION OF POTENTIAL TARGETS

There are two potential major targets in vicinity to the Area of Focus: Iglesia Church of Christ (ICC) and the Shoreline Unitarian Universalist Church (SUUC). Both locations have an occasional to frequent occupancy rate. To the north, ICC is within the potential target zone with the tree fell length of the nearby trees, which range in height from 60' to 80'. To the south, SUUC is within 1.5 times the potential target zone of the tree fell length of trees from the Area of Focus, however the church's parking lot does fall within the potential target zone. Phillippi Presbyterian Church of Seattle (PPCS) is to the east of SUUC, Tree 14 is located on the property and the parking lot does fall within the potential target zone of the eastern line of the trees.

SUMMATION OF TREE ASSESSMENTS

Each of the large coniferous trees within the Area of Focus has experienced varying degrees of pruning due to the overhead utility conflict. However, all of the trees located within Area of Focus (excluding Trees 6, 11 and 13 within

the parking lot islands on SUUC property and Tree 14) scored a minimum of 4 on the Condition Rating from Table 1 (this page). The current trail design was analyzed and found to give a majority of the trees adequate space, allowing for the high probability of continued health after construction. Given the site conditions and the health of the trees, this report is recommending retention of most of the trees as noted in the table on pages 3 and 4, with a recommendation of an annual re-inspection schedule.

Two trees of note are Trees 10 & 12. The proposed trail will skirt within 5' of the base of Tree 12. There shall be an arborist on-site during construction to determine if the tree's root mass is too significantly impacted and should therefore be removed. Because of the proximity of Tree 12 to Tree 10, Tree 10 shall also be carefully considered for construction impacts and potential removal, particularly if Tree 12 is ultimately removed.

The following pages include detailed information on each of the trees analyzed within the Area of Focus, and information about the trees in the Area of Note.

Recommend arborist be on-site and monitor excavation around tree roots of trees 1-15.

TABLE 1 - ASSESSMENT OF RELATIVE CONDITION OF TREES¹

Condition Rating	Overall Vigor	Canopy Density	Amount of Deadwood	History of Failure	Pests	Extent of Decay
1	Severe Decline	<2%	Large; Major Scaffold Branches	More than One Scaffold	Infested	Major-Conks and Cavities
2	Declining	20-60%	Twig & Branch Die back	Scaffold Branches	Infestation of Significant Pests	One to a Few Conks; Small Cavities
3	Low	60-90%	Small Twigs	Small Branches	Minor	Present at Pruning Wounds
4	Good	90-100%	Little or None	None	Minor	Present at Pruning Wounds
5	Excellent	100%	None	None	None, or Insignificant	Absent

¹Matheny, N.P. & Clark, J.R. Trees and Development: A Technical Guide to Preservation of Trees During Land Development. Bright Sparks, 1998

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Tree ID	Species	Common Name	dbh	Height	Crown Width	Condition: Table 1	Retain/Remove
1	<i>Arctostaphylos manzanita</i>	Common Manzanita	8.25"	~12'		5	Retain
2	<i>Pseudotsuga menziesii</i>	Douglas Fir	23"	~70'	34'	5	Retain
3	<i>Pseudotsuga menziesii</i>	Douglas Fir	20" (17", 11")	~65'	24'	4	Retain
4	<i>Pseudotsuga menziesii</i>	Douglas Fir	26"	~75'	35'	4	Retain
5	<i>Pseudotsuga menziesii</i>	Douglas Fir	15"	~60'	33'	4	Retain
6	<i>Cercis canadensis</i>	Eastern Redbud	5"	~13'	15'	2	Replace
7	<i>Pseudotsuga menziesii</i>	Douglas Fir	22"	~80'	36'	4	Retain
8	<i>Chamaecyparis lawsoniana</i>	Lawson Cypress	17" (10", 14")	~60'	28'	4	Retain

TREE 1

Tree 1 is a planted, multi-stemmed, Common Manzanita in excellent health, with no signs of pests or disease. The projects disturbance area is outside of the critical root zone of Tree 1 and construction should bear no impact to Tree 1.

TREE 2

Tree 2 was topped many years ago and developed 2 strong co-dominant leaders with some included bark. There are no signs of pest or disease. There is utility conflict on the north side of the tree with some pruning to reduce interference. Wounds show sap drip with strong signs of healing.

TREE 3

Tree 3 was also topped many years ago, is multi-stemmed with no obvious leader. About 40% of the canopy has been pruned to eliminate utility conflicts. There is evidence of mechanical damage that shows good signs of healing.

TREE 4

Tree 4 has been topped and had regrowth of a strong dominant leader. Tree 4 has an 8-10% lean to the south. During construction additional care to be taken to protect buttress roots extending north.

TREE 5

Tree 5 has one central leader with a formerly co-dominant leader that has been broken, however Tree 5 is showing good vigor.

TREE 6

Tree 6 shows low vigor; suggest replacing with a hardier parking lot species. Refer to Shoreline ROW Street Tree List.

TREE 7

Tree 7 has one strong central leader. During construction additional care to be taken to protect buttress roots extending north.

TREE 8

Tree 8 has two co-dominant leaders with included bark. Like Tree 7 above, during construction additional care to be taken to protect buttress roots extending north.

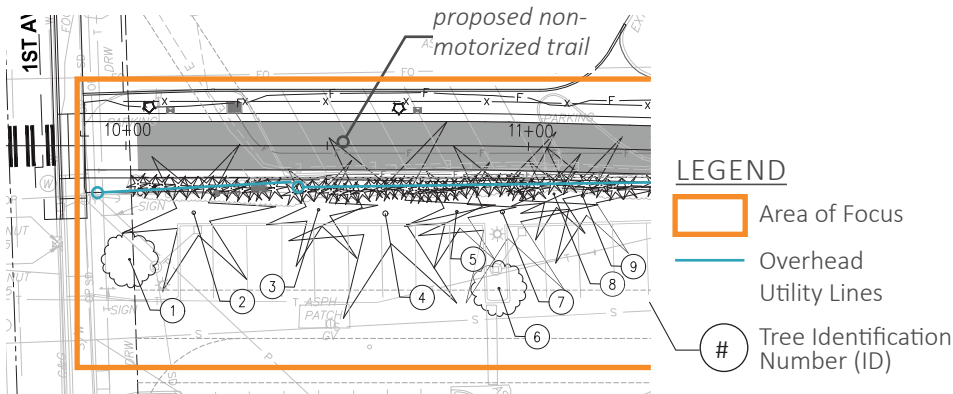


Figure 2 - West side of Area of Focus showing tree identification numbers.

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Tree ID	Species	Common Name	dbh	Height	Crown Width	Condition: Table 1	Retain/Replace
9	<i>Picea sitchensis</i>	Sitka Spruce	16"	~70'	25'	3	Retain
10	<i>Pseudotsuga menziesii</i>	Douglas Fir	22"	~80'	25'	4	Retain
11	<i>Cercis canadensis</i>	Eastern Redbud	4"	~15'	13'	2	Replace
12	<i>Pseudotsuga menziesii</i>	Douglas Fir	24"	~80'	36'	4	Retain
13	<i>Cercis canadensis</i>	Eastern Redbud	6"	15'	17'	2	Replace
14	<i>Cedrus atlantica</i> 'Glauca'	Blue Atlas Cedar				2	Remove
15	<i>Arbutus menziesii</i> *	Madrone	8"	~20'	14.5'	4	Retain
16	<i>Pseudotsuga menziesii</i> *	Douglas Fir	7"	~30'	20'	4	Remove

TREE 9

Tree 9 has two co-dominant leaders from a previous topping. The north side of the tree was pruned due to utility conflicts.

TREE 10

Tree 10 has two buttress root to the north. During construction additional care to be taken to protect buttress roots extending north.

TREE 11

Tree 11 shows low vigor, suckering from the base; suggest replacing with a hardier parking lot species. Refer to Shoreline ROW Street Tree List.

TREE 12

Tree 12 has approximately 15% canopy loss. Otherwise, showing excellent vigor and strong buttresses.

TREE 13

Tree 13 shows branch failure and canopy loss; it is a healthier tree, but suggest replacing with a hardier parking lot species. Refer to Shoreline ROW Street Tree List.

TREE 14

Tree 14 is inaccessible due to blackberry growth, however, over 4 major limbs were lost and canopy is at 55% of fullness. From a distance, vigor looks low. Tree will need to be removed due to trail alignment.

TREE 15 (NOT SURVEYED)

Tree 15 is on the north side of Tree 12, shows excellent vigor, suggest retaining even though the proximity to the trail, removal may be too large of an impact to Tree 12. During construction additional care to be taken.

TREE 16 (NOT SURVEYED)

Tree 16 is a younger Douglas Fir on the north side of Tree 12. During construction additional care to be taken. Suggest remove due to proximity to Tree 12, if supervising arborist deems removal necessary, suggest flush cutting the stump.

* Trees 15 & Tree 16 are identified in approximate positions, not surveyed.

LEGEND

Area of Focus

Tree Identification Number (ID)

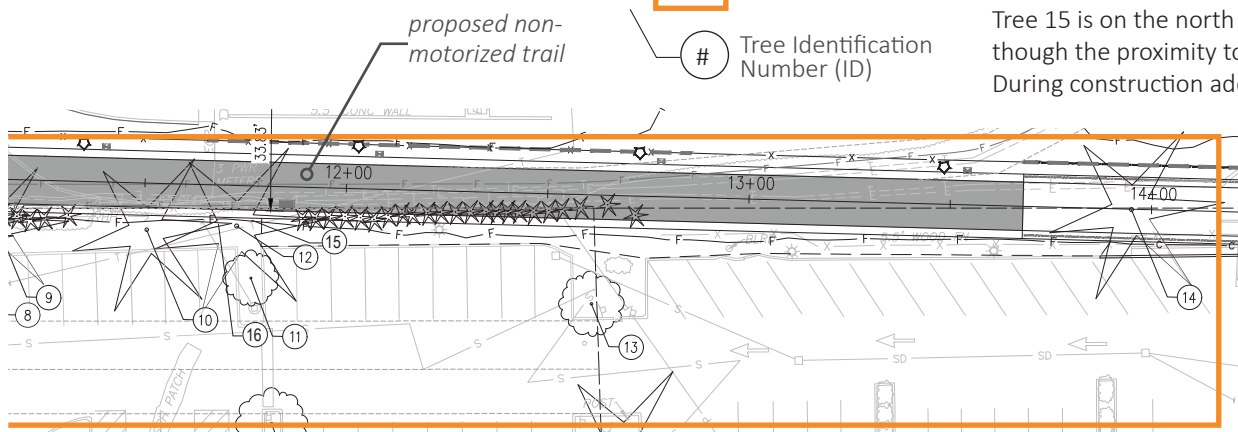


Figure 3 - East side of Area of Focus showing tree identification numbers.

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YEW HEDGE

The yew hedge is located on the north side of the subject trees within Area of Focus (see Figure 4 below). The base of this hedge is within 2' to 5' of the base of the large conifer trees along this row. The hedge is slated to be removed due to site visibility and pedestrian safety along the proposed trail. The hedge's roots are integrated with the large trees. To reduce further impacts to the large trees, cut the hedges flush to the ground, but do not grind the stumps.

AREA OF NOTE

Some of the trees within the Area of Note fall within the area that will be used for staging during construction of the pedestrian bridge. See design plans for full extents of impact. There will be a total of 29 significant trees removed from the PPCS property and 17 trees removed from the WSDOT right-of-way. The trees removed from the PPCS property will be replaced in accordance to the Shoreline Municipal Code 20.50.360, resulting in 65 replacement trees. The trees removed from the WSDOT right-of-way will be replaced in accordance with the WSDOT Roadside Policy Manual Chapter 2.2., resulting in (46) 5-gallon replacement trees.



Image showing the proximity between the yew hedge and the row of trees.



Image showing Area of Note with blackberry, buffer trees, and I-5 in the distance.

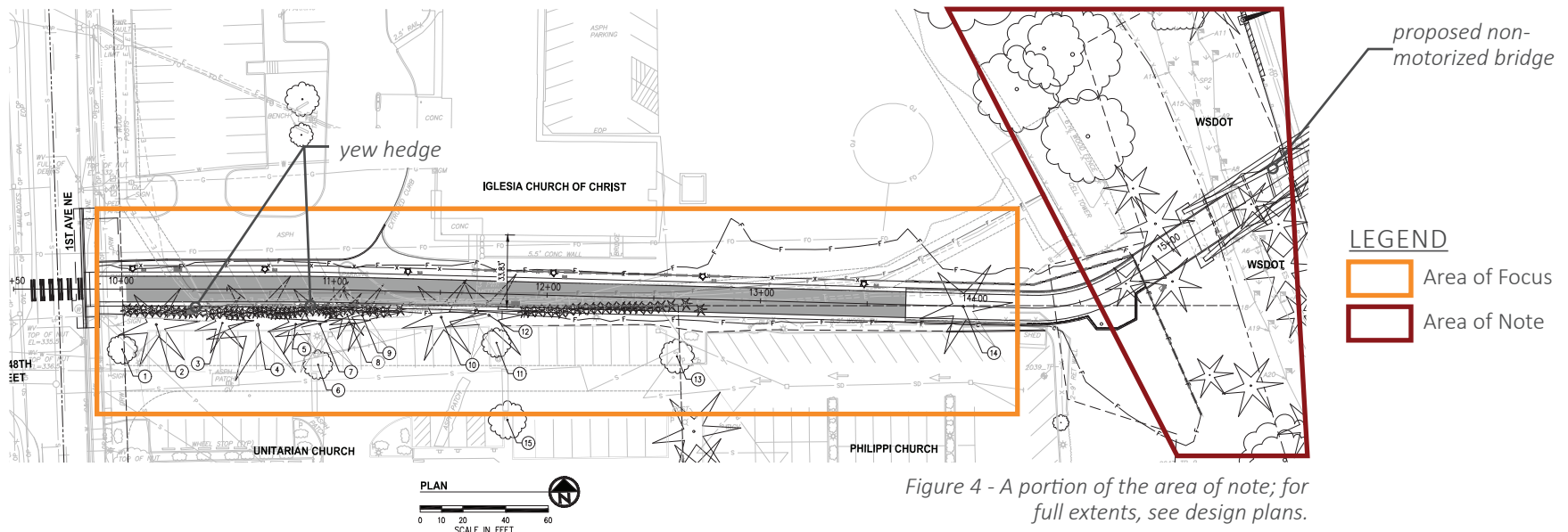


Figure 4 - A portion of the area of note; for full extents, see design plans.

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Images showing utility interaction with row of trees.



Image showing Trees 10 and 12 (left to right) and their proximity to Iglesia Church of Christ.