



Apr 09 2020

CITY OF FEDERAL WAY
COMMUNITY DEVELOPMENT

- Tree Conservation Plan -

THE WOODLANDS AT REDONDO CREEK

Pacific Hwy. & S. 304th St.
Federal Way, WA

Prepared for: American Classic Homes

Prepared by: Washington Forestry Consultants, Inc.

Date of Report: March 20, 2020

Introduction

The project proponent is planning to construct 67 new homes on 21.85 acres in Federal Way, Washington. The proponent has retained WFCI to:

- Complete and inventory and assessment of the trees on the site, excluding the critical areas and their buffers.
- Make recommendations for retention, removal, protection, and/or cultural care.
- Complete tree retention and replacement calculations according to Federal Way municipal code 19.120.130.
- Prepare a tree protection plan.

Observations

Methodology

WFCI has evaluated significant 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. Areas of potential save trees were identified as well. Twelve variable area plots were installed on a systematic grid across the interior of the site. The plot locations are marked in the field with pink and black stripped flagging. Data from the counts of significant trees were entered into SuperAce[®], a forest inventory software program that projected the total number of significant trees in the interior, buildable area of the project. This plot data will be used to determine tree unit density of 25 tree units per acre of net developable acreage for single family residential zone

development. Sampling was designed to, and achieved a 95% confidence level for the projection of the population of significant trees.

Site Description

The project area includes 2 parcels totaling 21.85 acres. There is no history of development on this parcel. Topography is gently sloping west to a wetland area. There is extensive garbage covering the site with many active homeless camps. The project area is bordered by single family homes to the north and east, S. 304th Street to the south and Pacific Hwy. to the west.

Soils Depth and Productivity

According to the Natural Resource Conservation Service Soil Survey, the soil type on the site is an 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.

Tree Conditions

There are two forest cover types on the site for the purposes of description. A stand table summary of species by diameter range for each type is located in Attachment 3.

Type I. – This is a red alder (*Alnus rubra*) dominant stand with Douglas-fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*). There are 1,746 trees in this type, with 288 trees being in ‘Fair’ or better condition. The diameter range for trees in the type is from 8 to 26 inches DBH. Tree conditions range from ‘Dead’ to ‘Good’ with most trees described as being in ‘Poor’ condition or worse.

Table 1. Summary of Trees in Cover Type I.

Species	DBH Range (in.)	Condition Range	# of Healthy Significant Trees	# of Unhealthy Significant Trees
Red Alder	8-20	‘Dead’ – ‘Fair’	172	1,323
Western Hemlock	9-18	‘Poor’ – ‘Fair’	79	109
Douglas-fir	20-26	‘Poor’ - ‘Good’	37	26
Total	8-26	‘Dead’ – ‘Good’	288	1,458

The understory vegetation consists of dense shrubs including salal (*Gaultheria shallon*), salmonberry (*Rubus spectabilis*), sword fern (*Polystichum munitum*), Indian plum (*Oemleria cerasiformis*) and Himalayan blackberry (*Rubus armeniacus*).

Type II. – This is a Douglas-fir dominant stand with red alder, western hemlock and bigleaf maple (*Acer macrophyllum*). There are 853 trees in this type, with 253 trees being in ‘Fair’ or better condition. The diameter range for trees in the type is from 8 to 42 inches DBH. Tree conditions range from ‘Dead’ to ‘Good’ with most trees described as being in ‘Poor’ condition or worse.

Table 2. Summary of Trees in Cover Type II.

Species	DBH Range (in.)	Condition Range	# of Healthy Significant Trees	# of Unhealthy Significant Trees
Douglas-fir	8-42	‘Poor’ – ‘Good’	196	188
Red Alder	9-16	‘Dead’ – ‘Fair’	57	380
Western Hemlock	16-28	‘Poor’	0	24
Bigleaf Maple	24	‘Very Poor’	0	8
Total	8-42	‘Dead’ – ‘Good’	253	600

The understory vegetation consists of dense shrubs including salal, salmonberry, and Himalayan blackberry.

Overall Summary of Trees

There are a total of 2,058 trees of which 541 are in ‘Fair’ or better condition. Trees in Poor, Very Poor, or that are ‘Dead’ are unhealthy and not considered to be long-term trees. These unhealthy trees have no potential to be saved in a development project.

Off-Site Impacts

Tree removal for this project may impact off-site trees on the northern and eastern sides of the project area. A tree risk assessment should be conducted on these trees after site clearing if trees are to be removed from these margins of the property.

Planned Tree Retention

Tree retention will occur in three designated tracts on the site. The required grading limits the potential for tree retention in other areas of the project. Tracts A & D occur in the western portion of the site along Redondo Creek. Tract F is located in the northern area of the site.

Planned Tree Retention by Tract:

Tract A: 123 Healthy Significant Trees- 246.0 Tree Units

Tract D: 18 Healthy Significant Trees- 36.5 Tree Units

Tract F: 6 Healthy Significant Trees- 12.0 Tree Units

Totals: 147 Healthy Significant Trees- 294.5 Tree Units

Tree Retention Calculations

Federal Way municipal code 19.120.130 requires a minimum tree unit density of 25 tree units per acre for single family residential zone development. The developable area is 17.82 acres, so 446 total tree units will need to be retained on site.

The following is a summary of the planned tree retention and removal:

Total Project Acreage:	21.85 acres
Net Development Area:	17.82 acres
Minimum Density Requirement:	445.5 tree units
(25 tree units/acre x 17.82 acres)	
Planned Tree Retention:	<u>294.5 tree units</u>
Shortfall of Tree Unit Requirement:	151.0 tree units

By retaining 294.5 tree units in 147 of the healthy significant trees on the site, this plan falls short of the minimum tree density requirement by 151.0 tree units. A total of 151 medium canopy tree species or 100 large canopy tree species will be required to meet the minimum tree density requirement.

Tree Protection Measures

Trees to be saved must be protected during construction by a six foot high chain link fencing (Attachment 4), located 5 feet outside of the drip line of the trees. An existing fence surrounds much of the property – this should be adequate to protect these edges. Placards shall be placed on the fencing every 50 feet indicating the words, "NO TRESPASSING - Protected Trees". The individual RPZ are a radius of one foot for each one inch of DBH (6 feet minimum), 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 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 RPZ 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 impacting 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.

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. The final, approved tree conservation plan map should be included in the construction drawings for bid and construction of the project and should be labeled as such.
2. Stake and heavily flag the clearing limits.
3. 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. WFCI can inspect and mark any additional hazard trees or trees that **will** be impacted by grading, trenching or development for removal.
4. 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. WFCI should inspect the save trees after logging, to identify any trees that may have been damaged, or any other hazard trees. The logger can then remove these trees before they depart the site.
5. 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.
6. Complete clearing of the project. Maintain fences throughout construction.
7. Do not excavate stumps within 10' of trees to be saved. These should be individually evaluated by WFCI to determine the method of removal.
8. 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.
9. Complete grading and construction of the project.


Summary

Federal Way municipal code 19.120.130 requires a minimum tree unit density of 25 tree units per acre for net developable acreage. The developable area is 17.82 acres, so 446.0 total tree units will need to be retained on site. There are very few trees on the site that have the potential to be retained because of poor health or grading issues. One hundred and forty-seven (147) healthy trees are planned to be retained in three tracts on the site for a total 294.5 tree units. This falls short of the required tree unit retention by 151.0 tree units requiring replacement trees to be planted.

Please give us a call if you have any further questions.

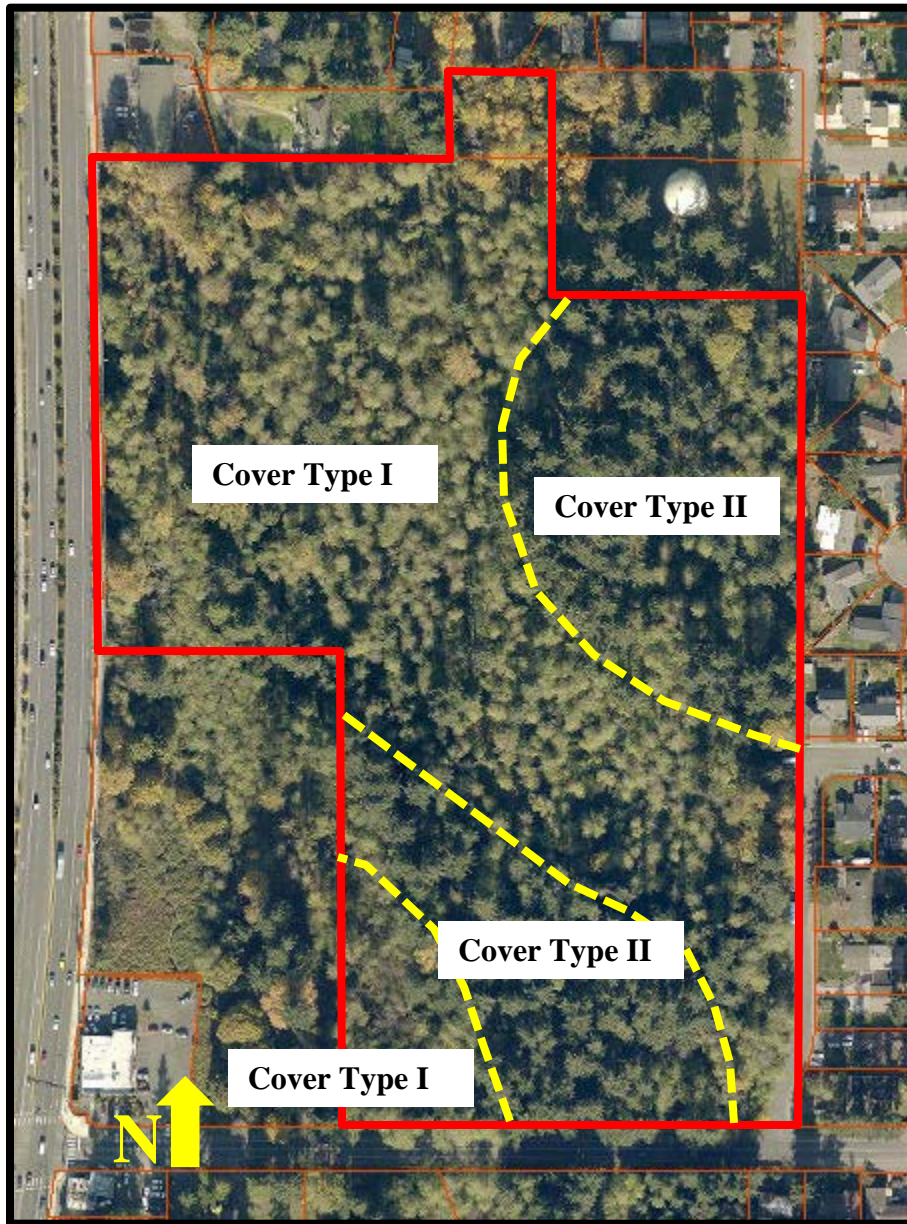
Respectfully submitted,

Washington Forestry Consultants, Inc.



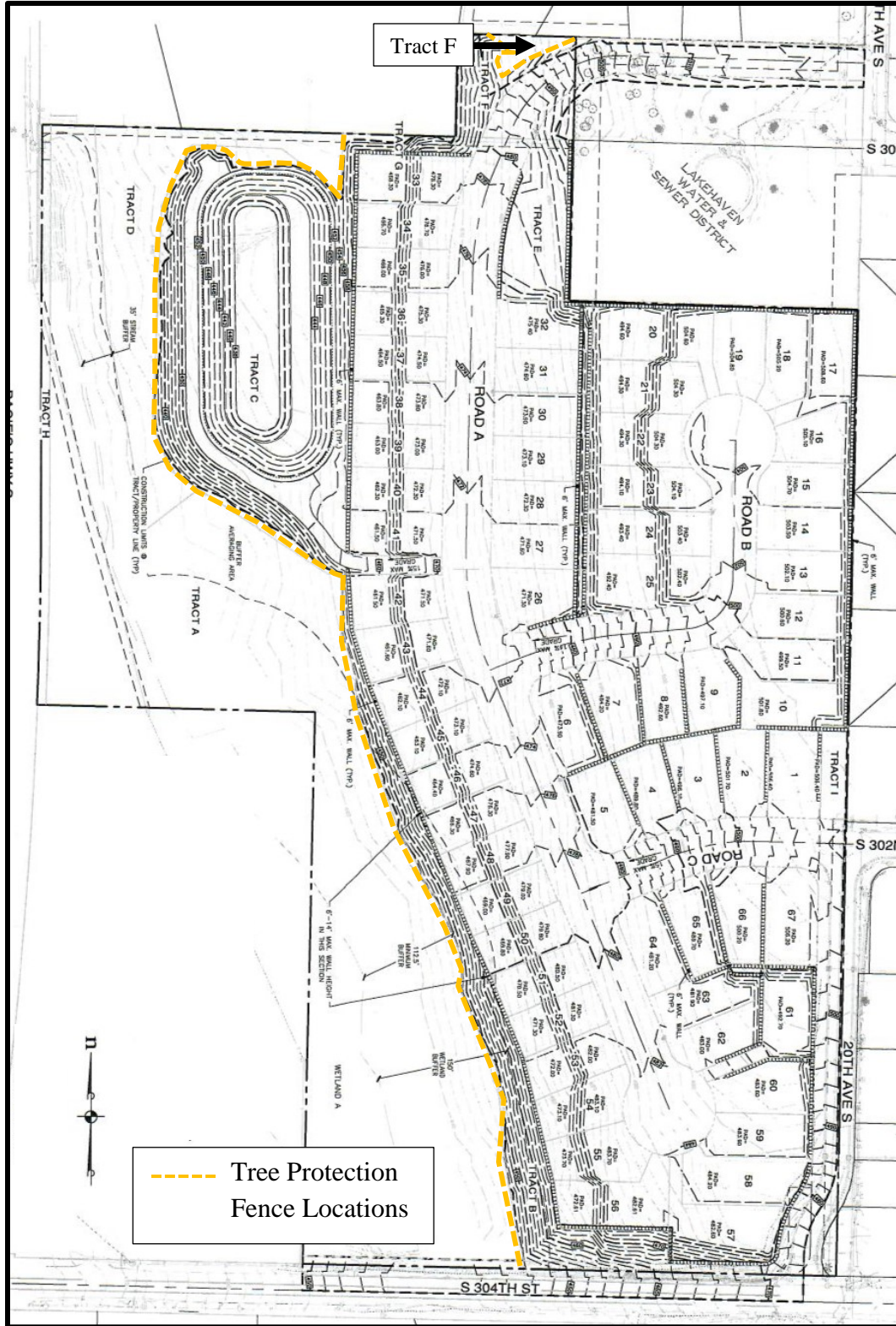
Galen M. Wright, ACF, ASCA
ISA Bd. Certified Master Arborist PN-129BU
Certified Forester No. 44
ISA Tree Risk Assessor Qualified

**Attachment 1. Aerial Photo of The Woodlands at Redondo Creek Site
(King County iMap).**



- Property Boundary
- - - Forest Cover Type Boundaries

Attachment 2. The Woodlands at Redondo Creek Preliminary Site Plan



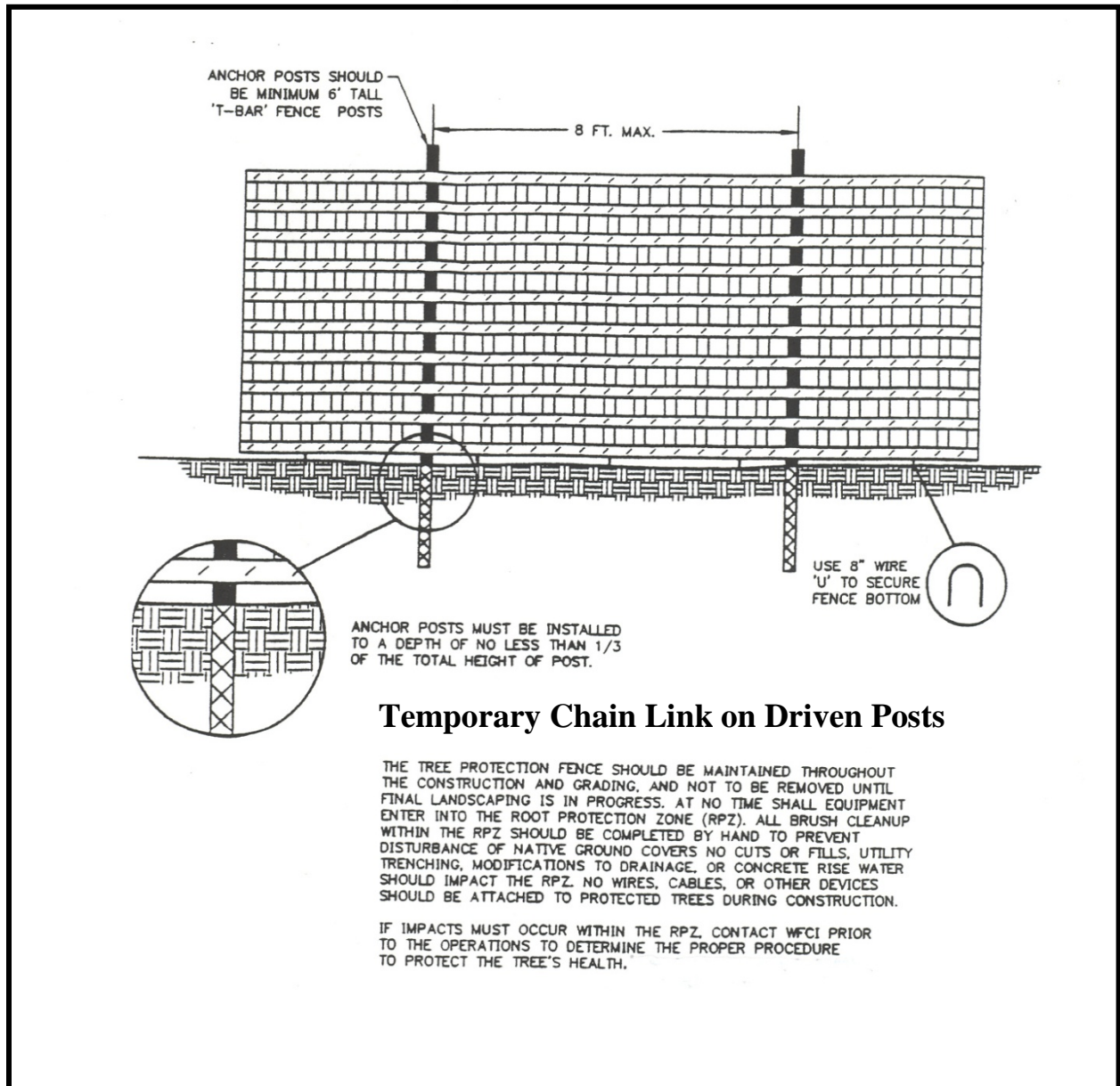
Attachment 3. Stand Table Reports for The Woodlands at Redondo Creek tree inventory.

Stand Table Summary																		
TC TSTNDSUM																		
Project KING																		
T04N R21W S04 T0001											T04N R21W S04 T0001							
Twp Rge Sec Tract Type Acres Plots Sample Trees											Page: 1							
04N 21W 04 DELICHK 0001 14.40 6 35											Date: 6/4/2019							
											Time: 1:19:46PM							
S Sp	T	Sample			Av Ht Tot	Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Net		Totals					
		DBH	Trees	FF 16'					Net Cu.Ft.	Net Bd.Ft.	Tons/ Acre	Cu.Ft. Acre	Bd.Ft. Acre	Tons	Cunits	MBF		
RA	8	1	77	55	9.549	3.33	9.55	6.3	20.0	1.66	60	191	24	9	3			
RA	9	1	81	43	7.545	3.33												
RA	10	3	85	58	18.335	10.00	24.45	9.5	30.0	6.42	233	733	92	34	11			
RA	12	4	88	53	16.977	13.33	25.46	10.6	31.7	7.45	271	806	107	39	12			
RA	13	4	89	64	14.465	13.33	21.70	13.0	45.0	7.74	281	976	111	41	14			
RA	14	4	78	55	12.473	13.33	18.71	12.9	45.0	6.64	242	842	96	35	12			
RA	15	2	80	57	5.432	6.67	8.15	20.0	43.3	4.48	163	353	65	23	5			
RA	16	5	82	56	11.937	16.67	11.94	21.7	58.0	7.12	259	692	103	37	10			
RA	17	1	85	58	2.115	3.33	4.23	20.1	70.0	2.34	85	296	34	12	4			
RA	18	1	89	75	1.886	3.33	3.77	26.7	100.0	2.77	101	377	40	14	5			
RA	20	2	89	77	3.056	6.67	3.06	36.0	130.0	3.02	110	397	44	16	6			
RA	Totals				28	84	57	103.769	93.33	131.01	13.8	43.2	49.65	1,805	5,665	715	260	82
DF	20	1	88	80	1.528	3.33	3.06	17.5	45.0	1.52	53	138	22	8	2			
DF	24	1	88	101	1.061	3.33	3.18	28.3	126.7	2.57	90	403	37	13	6			
DF	26	2	87	87	1.808	6.67	3.62	44.2	147.5	4.55	160	533	66	23	8			
DF	Totals				4	88	88	4.397	13.33	9.86	30.8	109.0	8.64	303	1,074	124	44	15
WH	9	1	76	69	7.545	3.33	7.55	10.3	30.0	2.49	78	226	36	11	3			
WH	13	1	85	76	3.616	3.33	7.23	13.5	40.0	3.12	98	289	45	14	4			
WH	18	1	86	69	1.886	3.33	3.77	17.5	45.0	2.11	66	170	30	9	2			
WH	Totals				3	80	71	13.048	10.00	18.55	13.0	36.9	7.72	241	685	111	35	10
Totals					35	83	59	121.214	116.67	159.42	14.7	46.6	66.01	2350	7,425	951	338	107

The Woodlands at Redondo Creek –Tree Conservation Plan

TC TSTNDSUM		Stand Table Summary														
Project KING																
T04N R21W S04 T0002											T04N R21W S04 T0002					
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	Page:	Date:	Time:						
04N	21W	04	DELICHK	0002	7.60	6	50	1	6/4/2019	1:17:03PM						
S Spec	T	DBH	Sample Trees	Av FF 16'	Av Ht 41	Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Net Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals		
									Net Cu.Ft.	Bd.Ft.				Tons	Cunits	MBF
DF		8	1	99	41	9.549	3.33	9.55	5.1	20.0	1.40	49	191	11	4	1
DF		10	1	85	22	6.112	3.33							19	7	2
DF		15	1	85	73	2.716	3.33	5.43	16.1	50.0	2.50	88	272	26	9	4
DF		16	2	86	117	4.775	6.67	7.16	16.5	70.0	3.37	118	501	53	18	7
DF		18	2	87	101	3.773	6.67	9.43	25.7	94.0	6.91	243	887	30	11	4
DF		19	1	88	117	1.693	3.33	5.08	27.6	113.3	4.00	140	576	110	39	15
DF		20	4	88	110	6.112	13.33	18.33	27.8	108.3	14.53	510	1,986	20	7	2
DF		22	1	87	73	1.263	3.33	2.53	36.9	110.0	2.66	93	278	25	9	4
DF		24	1	88	130	1.061	3.33	3.18	35.8	163.3	3.25	114	520	164	57	26
DF		26	5	89	127	4.520	16.67	13.56	55.8	248.7	21.55	756	3,372	190	67	30
DF		28	6	88	123	4.677	20.00	14.03	62.5	283.3	24.99	877	3,976	22	8	3
DF		29	1	90	104	.727	3.33	2.18	47.0	210.0	2.92	103	458	32	11	5
DF		30	1	84	126	.679	3.33	2.04	73.3	320.0	4.26	149	652	35	12	6
DF		32	1	90	130	.597	3.33	1.79	89.7	443.3	4.58	161	794	38	13	6
DF		34	2	84	108	1.057	6.67	3.17	55.7	246.7	5.04	177	782	21	7	3
DF		35	1	84	108	.499	3.33	1.50	65.6	293.3	2.80	98	439	21	7	3
DF		40	1	85	118	.382	3.33	1.15	85.4	400.0	2.79	98	458	19	7	3
DF		42	1	84	117	.346	3.33	1.04	82.8	386.7	2.45	86	402	19	7	3
DF	Totals		33	89	87	50.537	110.00	101.15	38.2	163.5	109.99	3,859	16,543	836	293	126
WH		16	1	87	102	2.387	3.33	7.16	19.1	80.0	4.37	136	573	33	10	4
WH		28	1	85	99	.780	3.33	2.34	51.0	236.7	3.82	119	553	29	9	4
WH	Totals		2	87	101	3.167	6.67	9.50	26.9	118.6	8.18	256	1,126	62	19	9
RA		9	1	82	62	7.545	3.33	15.09	4.5	15.0	1.85	67	226	14	5	2
RA		10	2	91	37	12.223	6.67									
RA		11	2	86	29	10.102	6.67									
RA		12	1	62	32	4.244	3.33	4.24	12.1	20.0	1.41	51	85	11	4	1
RA		13	2	73	37	7.233	6.67									
RA		14	2	82	54	6.236	6.67	6.24	13.9	60.0	2.39	87	374	18	7	3
RA		15	1	83	47	2.716	3.33	2.72	25.6	30.0	1.91	70	81	15	5	1
RA		16	3	73	49	7.162	10.00	4.77	18.5	75.0	2.42	88	358	18	7	3
RA	Totals		14	81	42	57.461	46.67	33.06	11.0	34.0	9.99	363	1,125	76	28	9
BM		24	1	93	77	1.061	3.33	2.12	53.2	210.0	2.99	113	446	23	9	3
BM	Totals		1	93	77	1.061	3.33	2.12	53.2	210.0	2.99	113	446	23	9	3
Totals			50	85	64	112.227	166.67	145.84	31.5	131.9	131.16	4591	19,240	997	349	146

Attachment 4. Tree Protection Fence Detail



Attachment 5. Individual Tree Rating Key for Tree Condition

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

Attachment 6. 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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- 5) Loss or alteration of any part of this report invalidated the entire report.
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- 8) This report and any values expressed herein represent the opinion of Washington Forestry Consultants, Inc., and the fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence neither of a subsequent event, nor upon any finding in to reported.
- 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.