



EXHIBIT F
TERAGAN
& ASSOCIATES, INC.
ARBORICULTURAL CONSULTANTS

MEMORANDUM

DATE: December 14, 2019
TO: Alex Reverman (Roll Tide Corporation)
FROM: Todd Prager, RCA #597, ISA Board Certified Master Arborist
RE: Tree Plan for the Dubarko Road Subdivision and Condominiums

Summary

This report includes tree removal, preservation, and protection recommendations for the proposed Dubarko Road Subdivision and Condominiums in Sandy, Oregon.

Background

Roll Tide Corporation is proposing to construct a four lot subdivision and 216 unit condominium complex with parking, street access, sidewalks, utilities, and open space at the east end of Dubarko Road in Sandy, Oregon. An existing conditions map of the site and trees is provided in Attachment 1. The proposed site plan with the proposed tree removal and retention is provided in Attachment 2. A detail of the grove of trees to be retained along Highway 26 is provided in Attachment 3.

The assignment requested of our firm for this project was to:

- Assess the existing grove of trees along Highway 26;
- Identify the trees to be removed and retained in the grove;
- Identify trees that are in good condition within the park tract within the northwest portion of the site; and
- Provide tree protection recommendations for the trees to be retained in the grove and park.

Tree Assessment

On September 12 and December 11, 2019 I completed the inventory of existing trees in the grove and park.

The complete inventory data for each tree is provided in Attachment 4 and includes the tree number, common name, scientific name, trunk diameter (DBH), crown

radius, health condition, structural condition, pertinent comments, and whether it is an onsite 11-inch DBH or greater tree in good condition to be retained.¹

The tree numbers in the inventory in Attachment 4 correspond to the tree numbers on the plans in Attachments 1 through 3.

Note that since the site is 15.91 acres, Section 17.102.50 requires 48 trees over 11-inch DBH that are in good condition to be retained. My assignment was to identify at least 48 trees in the grove that meet this criteria. While I assessed 97 trees total in the grove and park, I found 59 that were over 11-inch DBH and in good condition.

Tree Removal and Retention

This section of the report includes tree removal and retention recommendations based on the proposed site plan.

Tree Removal

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH as long as no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

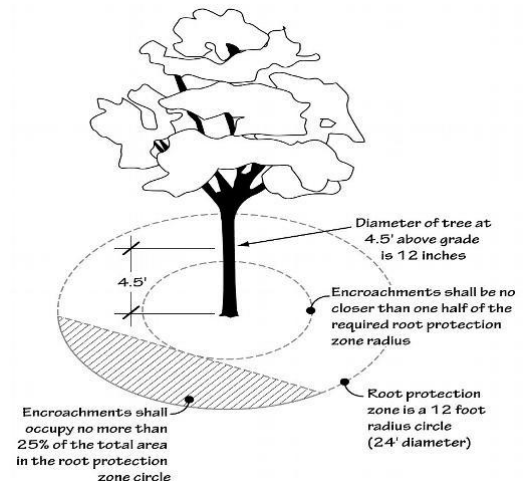


Figure 1: Alternative minimum protection zone

Using the criteria described above, while considering the tree conditions and their locations relative to grading, paving, construction, and other site improvements, 21 of the assessed trees at the edges of the grove and park are proposed for removal.

Note that the grove is comprised of relatively young trees that are competing for space, water, nutrients, and light. The grove could benefit from selective thinning of trees to improve the growth of the more dominant trees that are presently in good condition. Also, invasive understory and vine species such as Himalayan blackberry (*Rubus armeniacus*) and English ivy (*Hedera helix*) should be removed to improve the condition of the understory and prevent vine growth on the retained trees. At a minimum, the trees in the grove that are in good condition will be retained while other trees may be marked for selective removal to improve the overall health of the grove. The invasive understory species may also be removed to improve the health of the grove.

¹ Section 17.102.50 of the City of Sandy Code requires three onsite trees over 11-inch DBH that are in good condition to be retained.

Tree Retention

Fifty-nine (59) trees within the grove and park that are in good condition and over 11-inch DBH are proposed to be retained. Tree preservation has been maximized to the extent practicable with trees removed only as necessary for building construction, parking lot construction, street construction, and improvements to Highway 26. Note that trees 15584.1 and 15644 are in poor or very poor health and/or structural condition, along the new edges of the grove, and proposed for removal for safety purposes.

Section 17.102.50.A of the City of Sandy Code includes five criteria for tree retention with development. The five criteria followed by my findings in *italics* are listed below:

1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.

Finding: The site is 15.91 acres in size so 48 trees over 11-inch DBH in good condition are required to be retained. The proposed preservation includes 59 trees over 11-inch DBH in good condition within the grove along Highway 26 and park tract to be retained. This criterion is met.

2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.

Finding: The retained trees are clustered within the grove of trees along Highway 26. Clusters of trees will also be retained within the park tract. This criterion is met.

3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.

Finding: All of the trees subject to this standard are in good health condition and likely to grow to maturity. Future selective thinning of the grove is recommended to improve the availability of space, water, nutrients, and light for the retained trees. Also, invasive understory and vine species such as Himalayan blackberry and English ivy should be removed to improve the condition of the understory and prevent vine growth on the retained trees.

Trees along portions of the southwest, east, and north sides of the grove are proposed for removal for construction. It will be important to reassess and monitor the trees along the newly exposed edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk. Since the bulk of the grove will be retained, I anticipate that the overall grove will remain viable. However, selective thinning of trees within the grove should be delayed until the changes in wind dynamics from edge tree removal is more thoroughly assessed. Retaining more of the interior trees will help to protect the overall integrity of grove from blow-down during the near term. It will also be very

important to protect the root zones of the trees in the grove and park tract from construction impacts with tree protection fencing and other measures to further minimize the risk of blow-down. Tree protection measures are further described in the next section of this report.

Since the bulk of the grove will be retained and measures to monitor and protect the trees in the grove and park tract will be implemented, this criterion is met.

4. If possible, at least two of the required trees per acre must be of conifer species.

Finding: All 59 trees over 11-inch DBH and in good condition are conifer species. This criterion is met.

5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

Finding: The trees that are over 11-inch DBH and in good condition that are within the conservation easement along Highway 26 will be counted towards the tree retention standards. This criterion is met.

Tree Protection Recommendations

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH as long as no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

The reason for using this alternative is because it allows the tree protection zone to better relate to the size of the tree and its root zone. For example, a 10 foot tree protection setback would not be adequate for a 36-inch DBH tree which should have a minimum setback of at least 18 feet. Also, driplines can be highly variable based on species growth habits and onsite conditions such as the presence of adjacent trees or past pruning.

The critical root zone radii of 1 foot per inch of DBH is shown for the trees to be retained along the edges of the grove and park on the plan sheets in Attachments 2 and 3. The trees to be retained can be adequately protected by placing tree protection fencing as shown in Attachments 2 and 3. The tree protection fencing will protect at least 75 percent of their critical roots zones and avoid any encroachments closer than a radius of .5 feet per inch of DBH to a tree to be retained. No grading, stockpiling, storage, disposal, or any other construction related activity shall occur in the tree protection zones unless specifically reviewed and approved by the project arborist.

The following additional protection measures shall apply to the trees at the site:

- *Tree Protection Fencing*: Establish tree protection fencing in the locations shown in Attachments 2 and 3. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
- *Directional Felling*: Fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. No vehicles or heavy equipment shall be permitted within the tree protection zones during tree removal operations.
- *Stump Removal*: The stumps of the trees to be removed from within the tree protection zones shall either be retained in place or stump ground to protect the root systems of the trees to be retained.
- *Retaining Wall on North Side of Grove*: A low retaining wall is recommended on the north side of the grove of trees along Highway 26 to eliminate grading in the tree protection zone to better protect the root systems of the trees at the northern edge of the grove.
- *Protect Tree Crowns*: Care will need to be taken to not contact or otherwise damage the crowns of the trees that may extend into the construction area.
- *Monitoring of New Grove Edges*: Trees along portions of the southwest, east, and north sides of the grove are proposed for removal for construction. It will be important to reassess and monitor the trees along the newly exposed edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk. This monitoring should occur for the next two to three storm seasons following site clearing.
- *Selective Thinning of Grove Trees*: Selective thinning of the grove is recommended to improve the availability of space, water, nutrients, and light for the retained trees. Also, invasive understory and vine species such as Himalayan blackberry and English ivy should be removed to improve the condition of the understory and prevent vine growth on the retained trees.

Any thinning of trees within the grove should be delayed until the changes in wind dynamics from edge tree removal is more thoroughly assessed. Retaining more of the interior trees will help to protect the overall integrity of the grove from blow-down during the near term. After, site adaptations of the trees are better understood in the following two to three storm seasons following disturbance, the project arborist may prescribe a selective thinning treatment.

Additional tree protection recommendations for the trees to be retained are provided in Attachment 5.

Conclusion

Fifty-nine (59) trees over 11-inch DBH in good condition are proposed to be retained within the grove of trees along Highway 26 and park tract at the northeast portion of the site. The required tree retention for the 15.91 acre site is 48 trees.

While the grove of trees will have areas of disturbance along the edges, I anticipate that the overall grove will remain viable. It will be important to reassess and monitor the trees along the newly exposed edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk.

Once the grove is stabilized, I recommend selective thinning of trees to improve the availability of space, water, nutrients, and light for the retained trees. Also, invasive understory and vine species such as Himalayan blackberry and English ivy should be removed to improve the condition of the understory and prevent vine growth on the retained trees.

Please contact me if you have questions, concerns, or need any additional information.

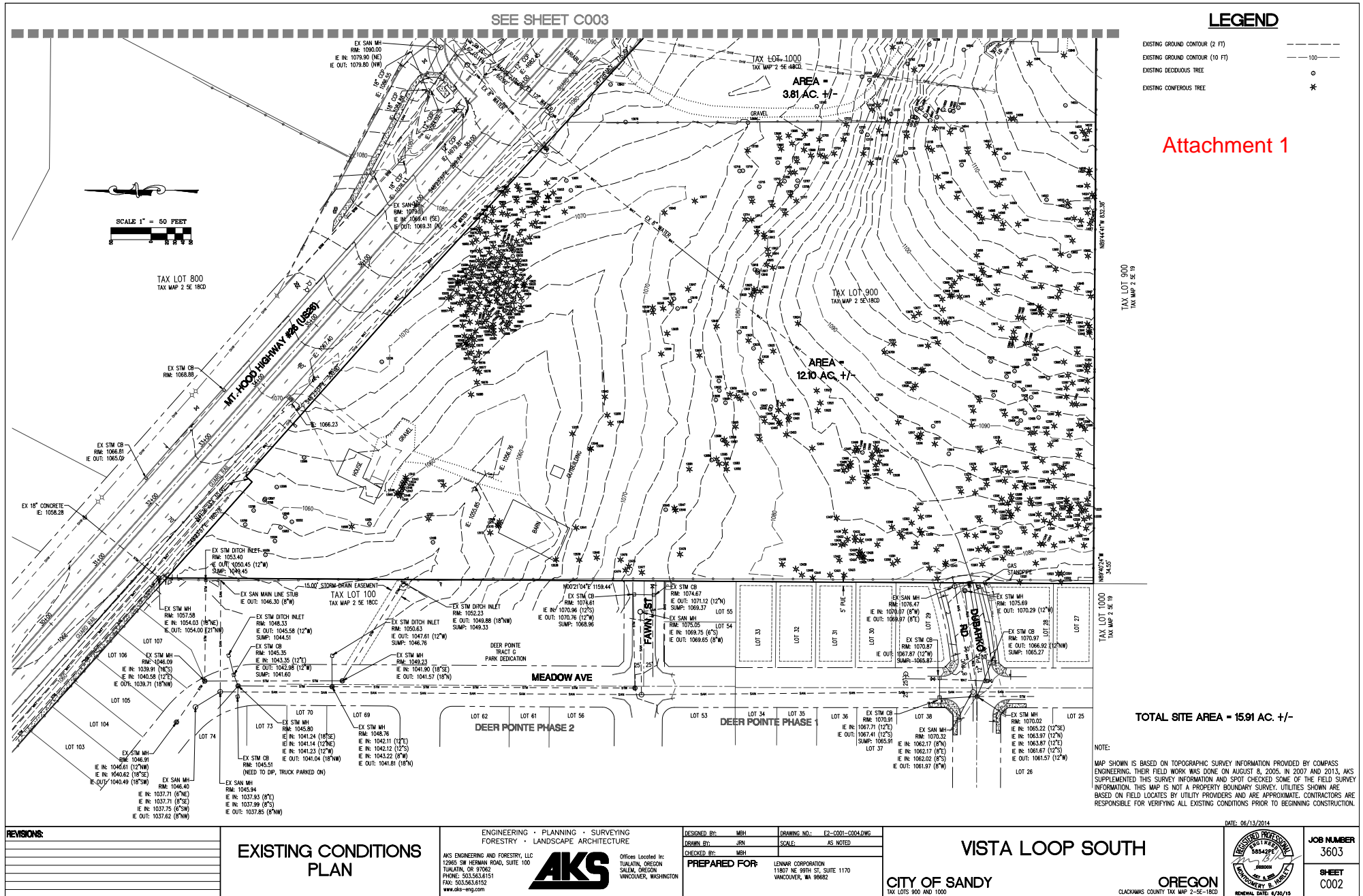
Sincerely,



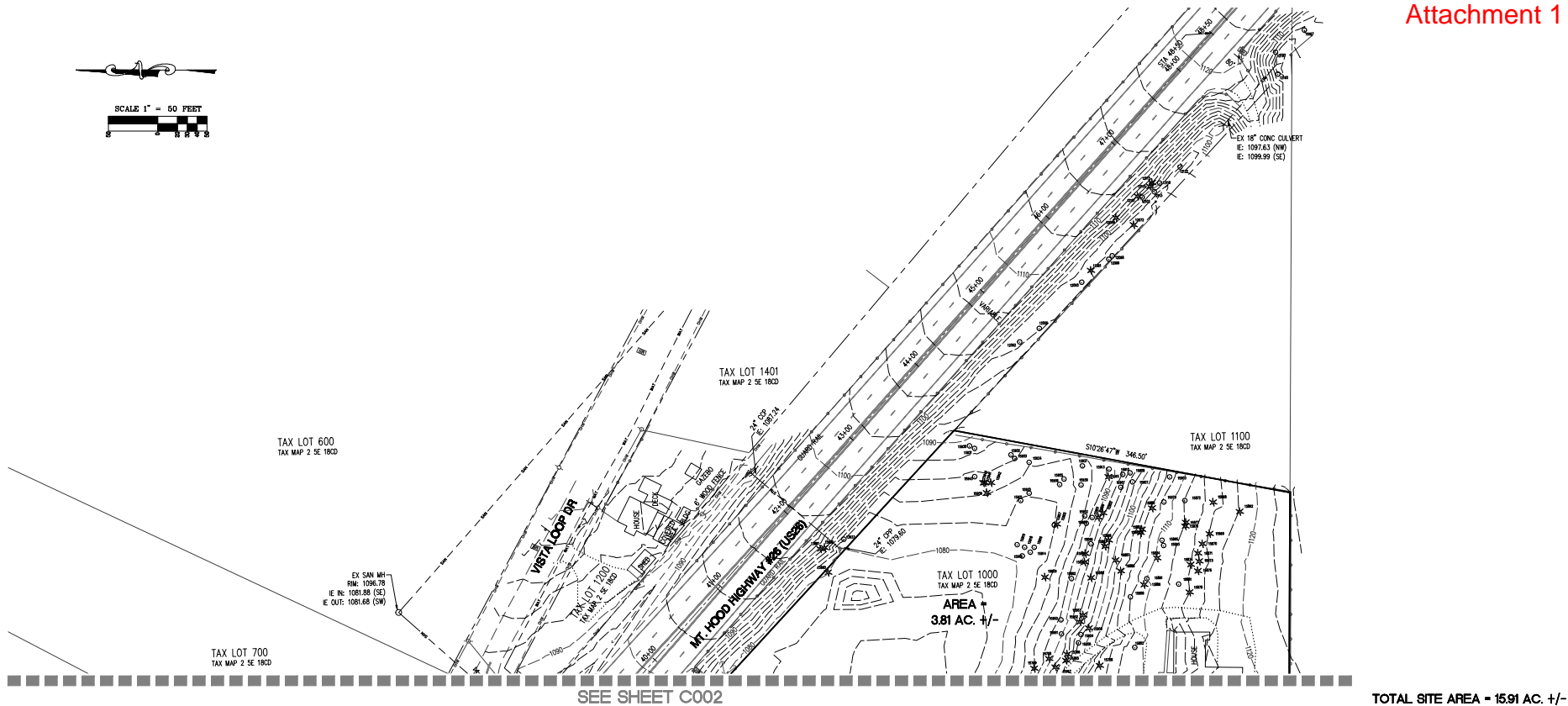
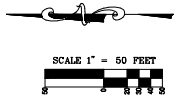
Todd Prager

*ASCA Registered Consulting Arborist #597
ISA Board Certified Master Arborist, WE-6723B
ISA Qualified Tree Risk Assessor
AICP, American Planning Association*

Attachments: Attachment 1 - Existing Site Conditions with Existing Trees
Attachment 2 - Site Plan with Trees Removal and Retention
Attachment 3 - Grove Detail with Tree Removal and Protection
Attachment 4 - Tree Inventory
Attachment 5 - Tree Protection Recommendations
Attachment 6 - Assumptions and Limiting Conditions



Attachment 1



SEE SHEET C002

TOTAL SITE AREA = 15.91 AC. +/-

NOTE:
 MAP SHOWN IS BASED ON TOPOGRAPHIC SURVEY INFORMATION PROVIDED BY COMPASS ENGINEERING. THEIR WORK WAS DONE ON AUGUST 8, 2005. IN 2007 AND 2013, AKS SUPPLEMENTED THIS SURVEY INFORMATION AND SPOT CHECKED SOME OF THE FIELD SURVEY INFORMATION. THIS MAP IS NOT A PROPERTY BOUNDARY SURVEY. UTILITIES SHOWN ARE BASED ON FIELD LOCATES BY UTILITY PROVIDERS AND ARE APPROXIMATE. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.

DATE: 06/13/2014

REVISIONS:

EXISTING CONDITIONS PLAN

ENGINEERING • PLANNING • SURVEYING
 FORESTRY • LANDSCAPE ARCHITECTURE

AKS

AKS ENGINEERING AND FORESTRY, LLC
 12962 SW HERMAN ROAD, SUITE 100
 TUALATIN, OR 97062
 PHONE: 503.263.6151
 FAX: 503.263.5152
 www.aks-eng.com

Offices Located In:
 TUALATIN, OREGON
 SALEM, OREGON
 VANCOUVER, WASHINGTON

DESIGNED BY: MSH	DRAWING NO.: E2-C007-C004.DWG
DRAWN BY: JPH	SCALE: AS NOTED
CHECKED BY: MSH	
PREPARED FOR: LEMAR CORPORATION	11807 NE 99TH ST, SUITE 1170 VANCOUVER, WA 98682

VISTA LOOP SOUTH

CITY OF SANDY

OREGON

TAX LOTS 900 AND 1000
 CLATSOP COUNTY TAX MAP 2-5E-18CD
 RENEWAL DATE: 6/30/15

PROFESSIONAL SEAL

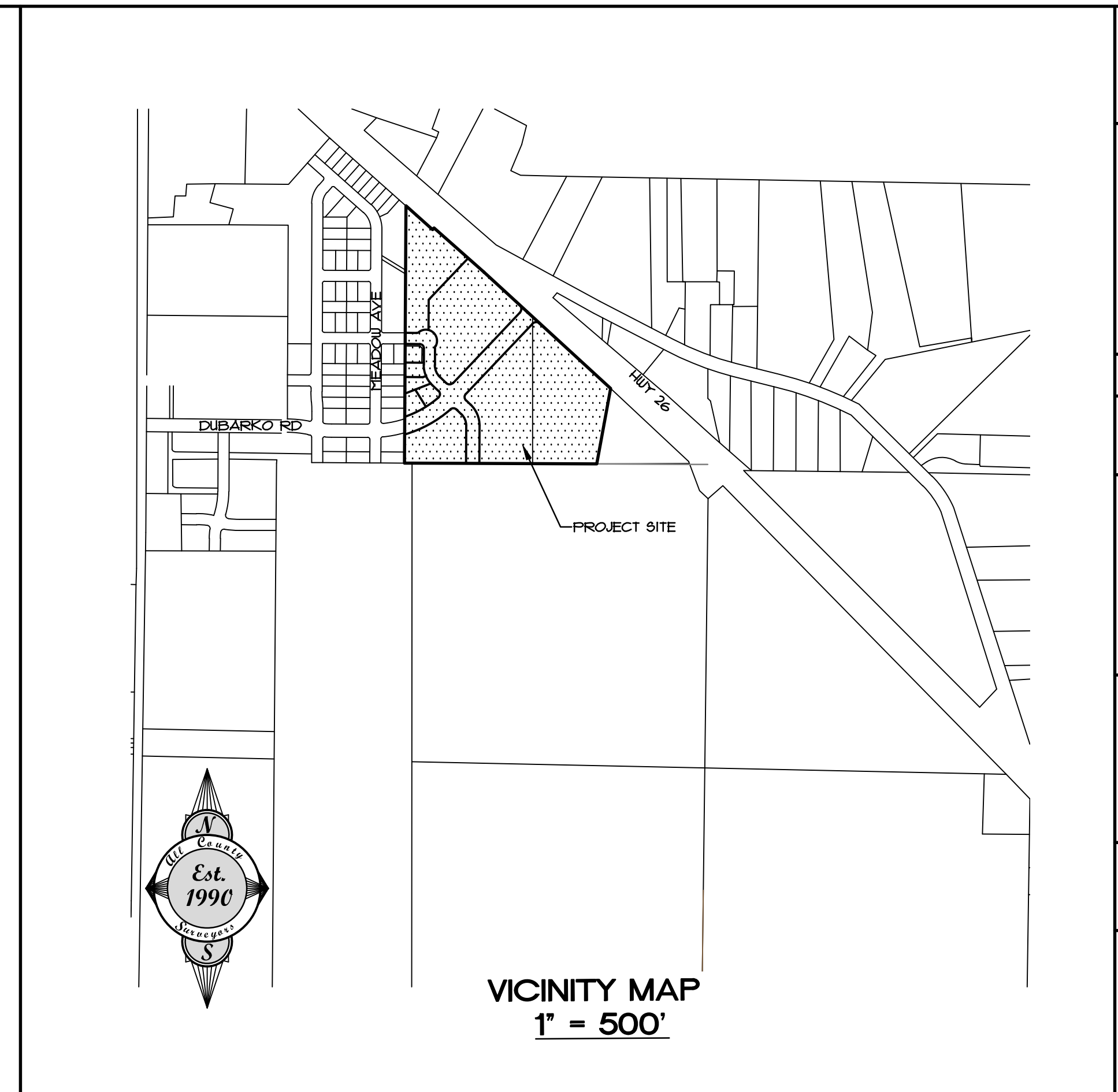
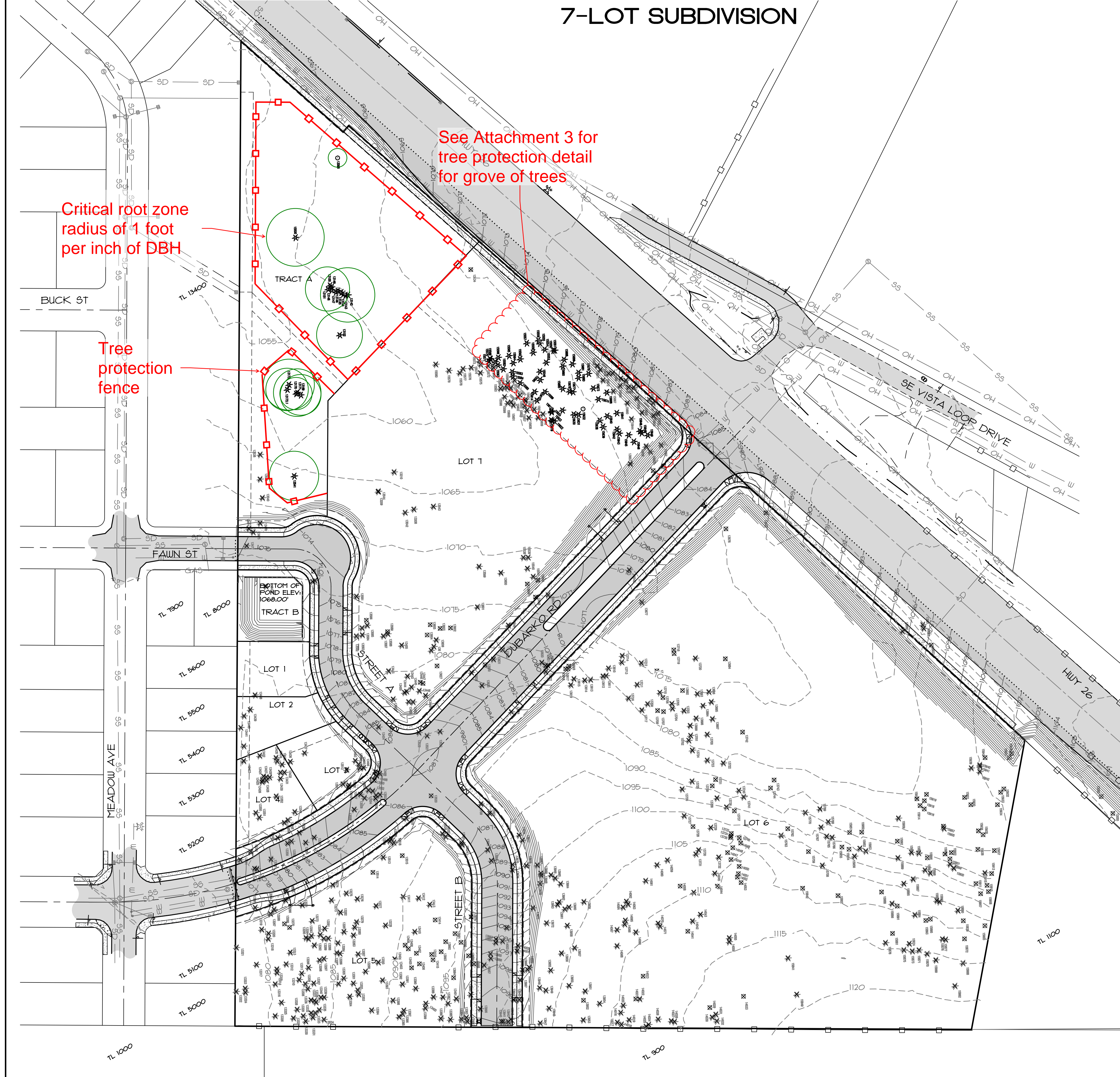
3603

SHEET C003

TREE NUMBER	SPECIES	DBH (IN)	TREE NUMBER	SPECIES	DBH (IN)	TREE NUMBER	SPECIES	DBH (IN)	TREE NUMBER	SPECIES	DBH (IN)	TREE NUMBER	SPECIES	DBH (IN)	TREE NUMBER	SPECIES	DBH (IN)
1002	MAPLE	11, 36	1039	CE3MR	19	1049	DOUGLAS FIR	15	1071	CE2MR	46	1507	DOUGLAS FIR	6	1597	DOUGLAS FIR	6
1005	MAPLE	25	1040	CE3MR	16	1050	DOUGLAS FIR	9	1073	ALDER	25	1401	BIG LEAF MAPLE	25	1597	DOUGLAS FIR	12
1006	MAPLE	26	1031	CE3MR	12	1051	CE3MR	13	1074	DOUGLAS FIR	17	1402	DOUGLAS FIR	25	1598	DOUGLAS FIR	12
1007	CE2MR	6	1032	CE3MR	8	1052	DOUGLAS FIR	22	1075	ALDER	24	1403	DOUGLAS FIR	15	1599	BIG LEAF MAPLE	6
1008	UNKNOWN DECID.	13	1033	DOUGLAS FIR	13	1053	CE3MR	9	1076	DOUGLAS FIR	36	1404	DOUGLAS FIR	14	1601	DOUGLAS FIR	14
1009	DOUGLAS FIR	17	1034	CE3MR	10	1054	DOUGLAS FIR	13	1077	DOUGLAS FIR	12	1405	DOUGLAS FIR	32	1602	DOUGLAS FIR	6
1010	DOUGLAS FIR	17	1035	DOUGLAS FIR	11	1055	DOUGLAS FIR	10	1078	BIG LEAF MAPLE	42	1406	DOUGLAS FIR	42	1603	DOUGLAS FIR	27
1012	CE2MR	17	1036	CE3MR	10	1056	CE3MR	6	1079	BIG LEAF MAPLE	6	1407	DOUGLAS FIR	24	1604	ALDER	8
1013	DOUGLAS FIR	19	1037	CE3MR	13	1057	CE2MR	16	1080	CE2MR	12	1408	DOUGLAS FIR	32	1605	ALDER	8
1014	MAPLE	7	1038	CE3MR	16	1058	CE2MR	16	1081	BIG LEAF MAPLE	24	1409	DOUGLAS FIR	24	1606	DOUGLAS FIR	12
1015	MAPLE	14, 21	1039	CE3MR	14	1059	CE2MR	17	1082	DOUGLAS FIR	17	1430	DOUGLAS FIR	28	1607	DOUGLAS FIR	10
1016	DOUGLAS FIR	2, 22	1040	DOUGLAS FIR	15	1060	DOUGLAS FIR	10	1083	CE2MR	15	1431	DOUGLAS FIR	18	1608	DOUGLAS FIR	18
1017	DOUGLAS FIR	25	1041	DOUGLAS FIR	26	1061	DOUGLAS FIR	20	1084	DOUGLAS FIR	17	1609	DOUGLAS FIR	17	1609	DOUGLAS FIR	17
1018	MAPLE	12	1042	DOUGLAS FIR	13	1062	CE2MR	16	1085	DOUGLAS FIR	18	1610	BIG LEAF MAPLE	16	1610	DOUGLAS FIR	12
1019	MAPLE	7, 8, 15	1043	DOUGLAS FIR	12	1063	CE2MR	27	1086	DOUGLAS FIR	18	1611	BIG LEAF MAPLE	28	1611	DOUGLAS FIR	12
1020	MAPLE	12	1044	ALDER	14	1064	ALDER	9	1087	DOUGLAS FIR	19	1612	DOUGLAS FIR	6	1612	DOUGLAS FIR	12
1021	DOUGLAS FIR	12	1045	DOUGLAS FIR	27	1065	ALDER	8	1088	FRUIT	36	1613	DOUGLAS FIR	32	1613	DOUGLAS FIR	10
1022	DOUGLAS FIR	12	1046	DOUGLAS FIR	32	1066	DOUGLAS FIR	22	1089	DOUGLAS FIR	36	1614	DOUGLAS FIR	6	1614	DOUGLAS FIR	6
1023	DOUGLAS FIR	12	1047	CE3MR	21	1067	DOUGLAS FIR	13	1090	DOUGLAS FIR	36	1615	DOUGLAS FIR	10	1615	DOUGLAS FIR	10
1024	DOUGLAS FIR	12	1048	DOUGLAS FIR	12	1068	CE2MR	25	1091	DOUGLAS FIR	34	1616	DOUGLAS FIR	6	1616	DOUGLAS FIR	12
1025	DOUGLAS FIR	12	1049	DOUGLAS FIR	16	1069	CE2MR	25	1092	DOUGLAS FIR	34	1617	DOUGLAS FIR	6	1617	DOUGLAS FIR	12
1026	DOUGLAS FIR	12	1050	DOUGLAS FIR	16	1070	CE2MR	24	1093	ALDER	13	1618	DOUGLAS FIR	6	1618	DOUGLAS FIR	12
1027	DOUGLAS FIR	12	1051	DOUGLAS FIR	11	1071	ALDER	14	1094	ALDER	12	1619	DOUGLAS FIR	12	1619	DOUGLAS FIR	16
1028	DOUGLAS FIR	12	1052	DOUGLAS FIR	26	1072	DOUGLAS FIR	12	1095	ALDER	10	1620	DOUGLAS FIR	12	1620	DOUGLAS FIR	15
1029	DOUGLAS FIR	12	1053	DOUGLAS FIR	19	1073	DOUGLAS FIR	19	1096	ALDER	10	1621	DOUGLAS FIR	12	1621	DOUGLAS FIR	15
1030	DOUGLAS FIR	12	1054	DOUGLAS FIR	24	1074	DOUGLAS FIR	12	1097	ALDER	12	1622	DOUGLAS FIR	12	1622	DOUGLAS FIR	18
1031	DOUGLAS FIR	12	1055	DOUGLAS FIR	18	1075	ALDER	12	1098	DOUGLAS FIR	20	1623	DOUGLAS FIR	12	1623	DOUGLAS FIR	12
1032	DOUGLAS FIR	12	1056	DOUGLAS FIR	12	1076	DOUGLAS FIR	15	1099	DOUGLAS FIR	18	1624	DOUGLAS FIR	12	1624	DOUGLAS FIR	12
1033	DOUGLAS FIR	12	1057	DOUGLAS FIR	12	1077	ALDER	12	1100	DOUGLAS FIR	15	1625	DOUGLAS FIR	12	1625	DOUGLAS FIR	12
1034	DOUGLAS FIR	12	1058	DOUGLAS FIR	12	1078	DOUGLAS FIR	12	1101	DOUGLAS FIR	12	1626	DOUGLAS FIR	12	1626	DOUGLAS FIR	12
1035	DOUGLAS FIR	12	1059	DOUGLAS FIR	12	1079	DOUGLAS FIR	20	1102	DOUGLAS FIR	12	1627	DOUGLAS FIR	12	1627	DOUGLAS FIR	12
1036	DOUGLAS FIR	12	1060	DOUGLAS FIR	12	1080	DOUGLAS FIR	20	1103	DOUGLAS FIR	12	1628	DOUGLAS FIR	12	1628	DOUGLAS FIR	12
1037	DOUGLAS FIR	12	1061	DOUGLAS FIR	12	1081	DOUGLAS FIR	20	1104	DOUGLAS FIR	12	1629	DOUGLAS FIR	12	1629	DOUGLAS FIR	12
1038	DOUGLAS FIR	12	1062	DOUGLAS FIR	12	1082	DOUGLAS FIR	20	1105	DOUGLAS FIR	12	1630	DOUGLAS FIR	12	1630	DOUGLAS FIR	12
1039	DOUGLAS FIR	12	1063	DOUGLAS FIR	12	1083	DOUGLAS FIR	20	1106	DOUGLAS FIR	12	1631	DOUGLAS FIR	12	1631	DOUGLAS FIR	12
1040	DOUGLAS FIR	12	1064	DOUGLAS FIR	12	1084	DOUGLAS FIR	20	1107	DOUGLAS FIR	12	1632	DOUGLAS FIR	12	1632	DOUGLAS FIR	12
1041	DOUGLAS FIR	12	1065	DOUGLAS FIR	12	1085	DOUGLAS FIR	20	1108	DOUGLAS FIR	12	1633	DOUGLAS FIR	12	1633	DOUGLAS FIR	12
1042	DOUGLAS FIR	12	1066	DOUGLAS FIR	12	1086	DOUGLAS FIR	20	1109	DOUGLAS FIR	12	1634	DOUGLAS FIR	12	1634	DOUGLAS FIR	12
1043	DOUGLAS FIR	12	1067	DOUGLAS FIR	12	1087	DOUGLAS FIR	20	1110	DOUGLAS FIR	12	1635	DOUGLAS FIR	12	1635	DOUGLAS FIR	12
1044	DOUGLAS FIR	12	1068	DOUGLAS FIR	12	1088	DOUGLAS FIR	20	1111	DOUGLAS FIR	12	1636	DOUGLAS FIR	12	1636	DOUGLAS FIR	12
1045	DOUGLAS FIR	12	1069	DOUGLAS FIR	12	1089	DOUGLAS FIR	20	1112	DOUGLAS FIR	12	1637	DOUGLAS FIR	12	1637	DOUGLAS FIR	12
1046	DOUGLAS FIR	12	1070	DOUGLAS FIR	12	1090	DOUGLAS FIR	20	1113	DOUGLAS FIR	12	1638	DOUGLAS FIR	12	1638	DOUGLAS FIR	12
1047	DOUGLAS FIR	12	1071	DOUGLAS FIR	12	1091	DOUGLAS FIR	20	1114	DOUGLAS FIR	12	1639	DOUGLAS FIR	12	1639	DOUGLAS FIR	12
1048	DOUGLAS FIR	12	1072	DOUGLAS FIR	12	1092	DOUGLAS FIR	20	1115	DOUGLAS FIR	12	1640	DOUGLAS FIR	12	1640	DOUGLAS FIR	12
1049	DOUGLAS FIR	12	1073	DOUGLAS FIR	12	1093	DOUGLAS FIR	20	1116	DOUGLAS FIR	12	1641	DOUGLAS FIR	12	1641	DOUGLAS FIR	12
1050	DOUGLAS FIR	12	1074	DOUGLAS FIR	12	1094	DOUGLAS FIR	20	1117	DOUGLAS FIR	12	1642	DOUGLAS FIR	12	1642	DOUGLAS FIR	12
1051	DOUGLAS FIR	12	1075	DOUGLAS FIR	12	1095	DOUGLAS FIR	20	1118	DOUGLAS FIR	12	1643	DOUGLAS FIR	12	1643	DOUGLAS FIR	12
1052	DOUGLAS FIR	12	1076	DOUGLAS FIR	12	1096	DOUGLAS FIR	20	1119	DOUGLAS FIR	12	1644	DOUGLAS FIR	12	1644	DOUGLAS FIR	12
1053	DOUGLAS FIR	12	1077	DOUGLAS FIR	12	1097	DOUGLAS FIR	20	1120	DOUGLAS FIR	12	1645	DOUGLAS FIR	12	1645	DOUGLAS FIR	12
1054	DOUGLAS FIR	12	1078	DOUGLAS FIR	12	1098	DOUGLAS FIR	20	1121	DOUGLAS FIR	12	1646	DOUGLAS FIR	12	1646	DOUGLAS FIR	12
1055	DOUGLAS FIR	12	1079	DOUGLAS FIR	12	1099	DOUGLAS FIR	20	1122	DOUGLAS FIR	12	1647	DOUGLAS FIR	12	1647	DOUGLAS FIR	12
1056	DOUGLAS FIR	12	1080	DOUGLAS FIR	12	1100	DOUGLAS FIR	20	1123	DOUGLAS FIR	12	1648	DOUGLAS FIR	12	1648	DOUGLAS FIR	12
1057	DOUGLAS FIR	12	1081	DOUGLAS FIR	12	1101	DOUGLAS FIR	20	1124	DOUGLAS FIR	12	1649	DOUGLAS FIR	12	1649	DOUGLAS FIR	12
1058	DOUGLAS FIR	12	1082	DOUGLAS FIR	12	1102	DOUGLAS FIR	20	1125	DOUGLAS FIR	12	1650	DOUGLAS FIR	12	1650	DOUGLAS FIR	12
1059	DOUGLAS FIR	12	1083	DOUGLAS FIR	12	1103	DOUGLAS FIR	20	1126	DOUGLAS FIR	12	1651	DOUGLAS FIR	12	1651	DOUGLAS FIR	12
1060	DOUGLAS FIR	12	1084	DOUGLAS FIR	12	1104	DOUGLAS FIR	20	1127	DOUGLAS FIR	12	1652	DOUGLAS FIR	12	1652	DOUGLAS FIR	12
1061	DOUGLAS FIR	12	1085	DOUGLAS FIR	12	1105	DOUGLAS FIR	20	1128	DOUGLAS FIR	12	1653	DOUGLAS FIR	12	1653	DOUGLAS FIR	12
1062	DOUGLAS FIR	12	1086	DOUGLAS FIR	12	1106	DOUGLAS FIR	20	1129	DOUGLAS FIR	12	1654	DOUGLAS FIR	12	1654	DOUGLAS FIR	12
1063	DOUGLAS FIR	12	1087	DOUGLAS FIR	12	1107	DOUGLAS FIR	20	1130	DOUGLAS FIR	12	1655	DOUGLAS FIR	12	1655	DOUGLAS FIR	12
1064	DOUGLAS FIR	12	1088	DOUGLAS FIR	12	1108	DOUGLAS FIR	20	1131	DOUGLAS FIR	12	1656	DOUGLAS FIR	12	1656	DOUGLAS FIR	12
1065	DOUGLAS FIR	12	1089	DOUGLAS FIR	12	1109	DOUGLAS FIR	20	1132	DOUGLAS FIR	12	1657	DOUGLAS FIR	12	1657	DOUGLAS FIR	12
1066	DOUGLAS FIR	12	1090	DOUGLAS FIR	12	1110	DOUGLAS FIR	20	1133	DOUGLAS FIR	12	1658	DOUGLAS FIR	12	1658	DOUGLAS FIR	12
1067	DOUGLAS FIR	12	1091	DOUGLAS FIR	12	1111	DOUGLAS FIR	20	1134	DOUGLAS FIR	12	1659	DOUGLAS FIR	12	1659	DOUGLAS FIR	12
1068	DOUGLAS FIR	12	1092	DOUGLAS FIR	12	1112	DOUGLAS FIR	20	1135	DOUGLAS FIR	12	1660	DOUGLAS FIR	12	1660	DOUGLAS FIR	12
1069	DOUGLAS FIR	12	1093	DOUGLAS FIR	12	1113	DOUGLAS FIR	20	1136	DOUGLAS FIR	12	1661	DOUGLAS FIR	12	1661	DOUGLAS FIR	12
1070	DOUGLAS FIR	12	1094	DOUGLAS FIR	12	1114	DOUGLAS FIR	20	1137	DOUGLAS FIR	12	1662	DOUGLAS FIR	12	1662	DOUGLAS FIR	12
1071	DOUGLAS FIR	12	1095	DOUGLAS FIR	12	1115	DOUGLAS FIR	20	1138	DOUGLAS FIR	12	1663	DOUGLAS FIR	12	1663	DOUGLAS FIR	12
1072	DOUGLAS FIR	12	1096	DOUGLAS FIR	12	1116	DOUGLAS FIR	20	1139	DOUGLAS FIR	12	1664	DOUGLAS FIR	12	1664	DOUGLAS FIR	12
1073	DOUGLAS FIR	12	1097	DOUGLAS FIR	12	1117	DOUGLAS FIR	20	1140	DOUGLAS FIR	12	1665	DOUGLAS FIR	12	1665	DOUGLAS FIR	12
1074	DOUGLAS FIR	12	1098	DOUGLAS FIR	12	1118	DOUGLAS FIR	20	1141	DOUGLAS FIR	12	1666	DOUGLAS FIR	12	1666	DOUGLAS FIR	12
1075	DOUGLAS FIR	12	1099	DOUGLAS FIR	12	1119	DOUGLAS FIR	20	1142	DOUGLAS FIR	12	1667	DOUGLAS FIR	12	1667	DOUGLAS FIR	12
1076	DOUGLAS FIR	12	1100	DOUGLAS FIR	12	1120	DOUGLAS FIR	20	1143	DOUGLAS FIR	12	1668	DOUGLAS FIR	12	1668	DOUGLAS FIR	12
1077	DOUGLAS FIR	12	1101	DOUGLAS FIR	12	1121	DOUGLAS FIR	20	1144	DOUGLAS FIR	12	1669	DOUGLAS FIR	12	1669	DOUGLAS FIR	12
1078	DOUGLAS FIR	12	1102	DOUGLAS FIR	12	1122	DOUGLAS FIR	20	1145	DOUGLAS FIR	12	1670	DOUGLAS FIR	12	1670	DOUGLAS FIR	12
1079	DOUGLAS FIR	12	1103	DOUGLAS FIR	12	1123	DOUGLAS FIR	20	1146	DOUGLAS FIR	12	1671	DOUGLAS FIR	12	1671	DOUGLAS FIR	12
1080	DOUGLAS FIR	12	1104	DOUGLAS FIR	12	1124	DOUGLAS FIR	20	1147	DOUGLAS FIR	12	1672	DOUGLAS FIR	12	1672	DOUGLAS FIR	12
1081	DOUGLAS FIR	12	1105	DOUGLAS FIR	12	1125	DOUGLAS FIR	20	1148	DOUGLAS FIR	12	1673	DOUGLAS FIR	12	1673	DOUGLAS FIR	12
1082	DOUGLAS FIR	12	1106	DOUGLAS FIR	12	1126	DOUGLAS FIR	20	1149	DOUGLAS FIR	12	1674	DOUGLAS FIR	12	1674	DOUGLAS FIR	12
1083	DOUGLAS FIR	12	1107	DOUGLAS FIR	1												

BULL RUN TERRACE

7-LOT SUBDIVISION



Attachment 2



DATE	NO.	REVISION	BY
DESIGNED:	CTH	OF	1
DRAWN:	CTH		
CHECKED:	RLM		
APPROVED:	RLM		



SCALE	VERT.	N/A
HORIZ.	DATE:	07/26/2018
FILE:	19-035-Planning.dwg	
SECTION	TWP.	29
RANGE	5E	

BULL RUN TERRACE SUBDIVISION

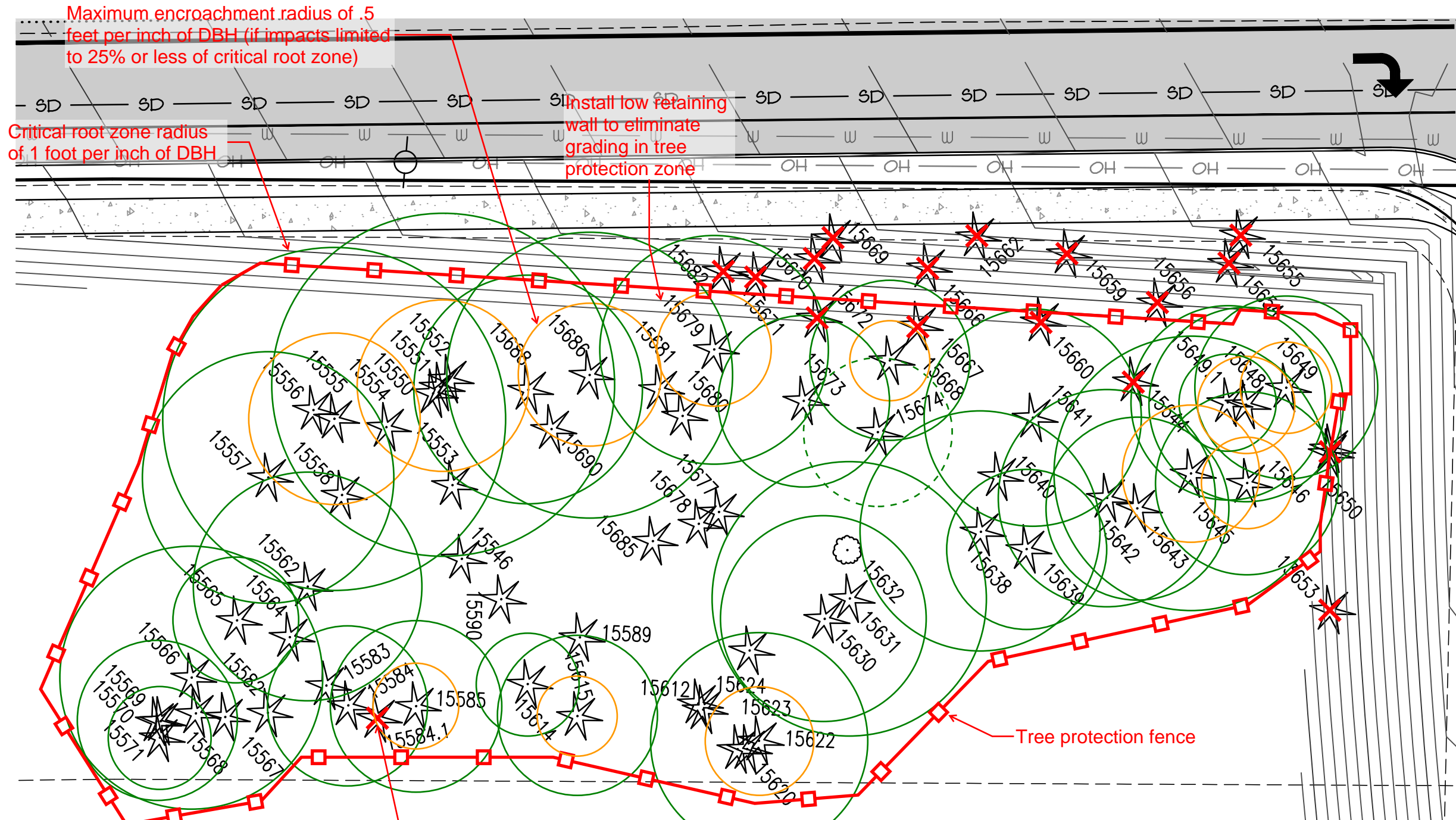
TREE RETENTION EXHIBIT

40808 & 41010 HWY 26, SANDY, OR 97055

Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering
 P.O. Box 955 Sandy, OR 97055
 Phone: (503) 668-4731
 Fax: (503) 668-4730

CLIENT:
ROLL TIDE PROPERTIES CORPORATION
 PO BOX 103
 CORNELIUS, OR 97113

GROVE DETAIL



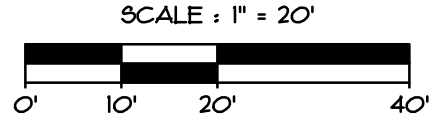
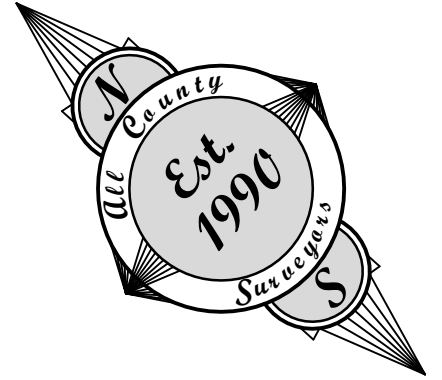
Maximum encroachment radius of .5 feet per inch of DBH (if impacts limited to 25% or less of critical root zone)

Critical root zone radius of 1 foot per inch of DBH

Install low retaining wall to eliminate grading in tree protection zone

Tree protection fence

Trees to be removed from within tree protection zone to be removed by hand without the use of vehicles or heavy equipment in tree protection zone. Stump shall be flush cut and retained or carefully surface ground. Do not pull stumps with an excavator.



Attachment 3

All County Surveyors & Planners, Inc.
 Surveying, Planning and Civil Engineering
 P.O. Box 955 Sandy, OR 97055
 Phone: (503) 668-3151
 Fax: (503) 668-4730
 Subject to General Conditions 2006 ©

Attachment 4

Tree No	Common Name	Scientific Name	DBH ¹	C-Rad ²	Condition ³	Structure ³	Comments	Treatment	Onsite Trees >11" DBH in Good Cond. to be Retained
13096	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	10	good	good		retain	x
13134	bigleaf maple	<i>Acer macrophyllum</i>	55	38	good	fair	open grown, multiple leaders at 10', cable constricting lower trunk	remove	
13142	Douglas-fir	<i>Pseudotsuga menziesii</i>	32	28	fair	fair	one sided, codominant at 5' with included bark, 70% girdled at lower trunk	retain	
13143	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	13	fair	poor	overtopped by adjacent trees, poor trunk taper	retain	
13144	Douglas-fir	<i>Pseudotsuga menziesii</i>	34	23	good	fair	multiple leaders at 5' with included bark, one sided, west 10" leader dead	retain	x
13145	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	5	fair	poor	overtopped by adjacent trees, poor trunk taper	retain	
13146	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	23	good	fair	one sided	retain	x
13147	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	19	good	fair	one sided, marginal trunk taper	retain	x
13148	Douglas-fir	<i>Pseudotsuga menziesii</i>	25	24	good	fair	one sided	retain	x
13149	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	20	poor	poor	overtopped by adjacent trees, one sided, suppressed	retain	
13150	Douglas-fir	<i>Pseudotsuga menziesii</i>	22	30	good	fair	one sided	retain	x
13151	Douglas-fir	<i>Pseudotsuga menziesii</i>	24,12	25	good	fair	one sided, codominant at ground level	retain	x
13152	Douglas-fir	<i>Pseudotsuga menziesii</i>	37	26	good	fair	open grown, multiple leaders at 25'	retain	x
13169	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	24	good	fair	one sided	retain	x
13170	Douglas-fir	<i>Pseudotsuga menziesii</i>	19	20	good	fair	one sided	retain	x
13171	western redcedar	<i>Thuja plicata</i>	28	20	good	fair	moderately one sided	retain	x
13172	western redcedar	<i>Thuja plicata</i>	30	17	good	fair	one sided, pressed against trees 13172.1	retain	x
13172.1	Douglas-fir	<i>Pseudotsuga menziesii</i>	25	21	good	fair	one sided, pressed against trees 13172	retain	x
13538	western redcedar	<i>Thuja plicata</i>	39	24	good	fair	codominant at 6' with included bark	remove	
13539	Douglas-fir	<i>Pseudotsuga menziesii</i>	32	23	good	fair	moderately one sided	remove	
13540	western redcedar	<i>Thuja plicata</i>	37,33	29	good	fair	codominant at 3' with included bark	remove	
13541	western redcedar	<i>Thuja plicata</i>	29	21	good	good		retain	x
13653	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	15	fair	fair	thin crown, large wound at lower trunk	remove	
15500	Douglas-fir	<i>Pseudotsuga menziesii</i>	34	21	good	good		retain	x
15546	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	15	good	poor	25% live crown ratio, poor trunk taper	retain	x
15550	Douglas-fir	<i>Pseudotsuga menziesii</i>	6	0	very poor	very poor	dead	retain	
15551	Douglas-fir	<i>Pseudotsuga menziesii</i>	30	15	good	fair	codominant at 1', west stem has 33% live crown ratio	retain	x
15552	n/a	n/a	n/a	n/a	n/a	n/a	same as tree 15551	n/a	n/a
15553	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	15	good	poor	25% live crown ratio, poor trunk taper	retain	x
15554	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	10	fair	poor	poor trunk taper, suppressed	retain	
15555	Douglas-fir	<i>Pseudotsuga menziesii</i>	30	25	good	fair	moderately one sided	retain	x

Attachment 4

Tree No	Common Name	Scientific Name	DBH ¹	C-Rad ²	Condition ³	Structure ³	Comments	Treatment	Onsite Trees >11" DBH in Good Cond. to be Retained
15556	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	10	poor	poor	overtopped by adjacent trees, suppressed	retain	
15557	grand fir	<i>Abies grandis</i>	22	20	good	fair	one sided, codominant at 30' with included bark	retain	x
15558	Douglas-fir	<i>Pseudotsuga menziesii</i>	12	15	good	poor	33% live crown ratio, poor trunk taper	retain	x
15562	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	15	good	fair	40% live crown ratio, marginal trunk taper	retain	x
15564	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	15	good	poor	marginal trunk taper, 33% live crown ratio	retain	x
15565	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	15	fair	fair	one sided, marginal trunk taper, 5" codominant dead stem at 3'	retain	
15566	Douglas-fir	<i>Pseudotsuga menziesii</i>	23	20	good	fair	one sided	retain	x
15567	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	15	good	fair	marginal trunk taper, 40% live crown ratio	retain	x
15568	Douglas-fir	<i>Pseudotsuga menziesii</i>	7	0	very poor	very poor	dead	retain	
15569	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	8	fair	poor	poor trunk taper	retain	
15570	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	15	fair	fair	one sided, overtopped by adjacent trees	retain	
15571	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	5	fair	poor	poor trunk taper, suppressed	retain	
15582	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	5	fair	poor	poor trunk taper, suppressed	retain	
15583	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	15	good	poor	poor trunk taper, 25% live crown ratio	retain	x
15584	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	15	good	fair	marginal trunk taper, 40% live crown ratio	retain	x
15584.1	Douglas-fir	<i>Pseudotsuga menziesii</i>	8	0	very poor	very poor	dead	remove	
15585	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	20	good	poor	35% live crown ratio, poor trunk taper	retain	x
15589	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	20	good	poor	33% live crown ratio, marginal trunk taper	retain	x
15590	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	15	good	poor	35% live crown ratio, poor trunk taper	retain	x
15612	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	0	very poor	very poor	dead	retain	
15614	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	10	fair	poor	25% live crown ratio, poor trunk taper	retain	
15615	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	15	good	poor	25% live crown ratio, poor trunk taper	retain	x
15619	Douglas-fir	<i>Pseudotsuga menziesii</i>	20,16	20	good	fair	codominant at ground level with included bark, marginal trunk taper	retain	x
15620	n/a	n/a	n/a	n/a	n/a	n/a	same as tree 15619	n/a	n/a
15621	n/a	n/a	n/a	n/a	n/a	n/a	duplicate tree point?	n/a	n/a
15622	Douglas-fir	<i>Pseudotsuga menziesii</i>	19	20	good	fair	one sided, bowed trunk, marginal trunk taper	retain	x
15623	Douglas-fir	<i>Pseudotsuga menziesii</i>	8	10	good	poor	one sided, poor trunk taper	retain	
15624	Douglas-fir	<i>Pseudotsuga menziesii</i>	9	0	very poor	very poor	dead	retain	
15630	Douglas-fir	<i>Pseudotsuga menziesii</i>	18	20	good	fair	one sided	retain	x
15631	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	20	good	fair	one sided	retain	x
15632	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	15	good	poor	40% live crown ratio, poor trunk taper	retain	x
15638	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	20	good	fair	one sided	retain	x
15639	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	15	good	fair	one sided, marginal trunk taper, bowed trunk	retain	x

Attachment 4

Tree No	Common Name	Scientific Name	DBH ¹	C-Rad ²	Condition ³	Structure ³	Comments	Treatment	Onsite Trees >11" DBH in Good Cond. to be Retained
15640	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	15	good	fair	one sided, 70% live crown ratio, marginal trunk taper	retain	x
15641	Douglas-fir	<i>Pseudotsuga menziesii</i>	19	20	good	fair	40% live crown ratio, marginal trunk taper	retain	x
15642	Douglas-fir	<i>Pseudotsuga menziesii</i>	19	15	good	fair	moderately one sided, marginal trunk taper, 50% live crown ratio	retain	x
15643	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	15	good	fair	one sided	retain	x
15644	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	20	good	poor	33% live crown ratio, marginal trunk taper	remove	
15645	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	25	good	fair	one sided	retain	x
15646	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	15	good	fair	one sided	retain	x
15648	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	15	good	fair	one sided, 60% live crown ratio, marginal trunk taper	retain	x
15649	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	20	good	fair	one sided, marginal trunk taper	retain	x
15649.1	Douglas-fir	<i>Pseudotsuga menziesii</i>	17	20	good	fair	moderately one sided, marginal trunk taper	retain	x
15650	Douglas-fir	<i>Pseudotsuga menziesii</i>	23,16	25	good	fair	codominant at ground level, north stem has poor trunk taper	remove	
15651	n/a	n/a	n/a	n/a	n/a	n/a	same as tree 15650	n/a	n/a
15654	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	20	good	fair	one sided, codominant at 12' with included bark	remove	
15655	Douglas-fir	<i>Pseudotsuga menziesii</i>	24	25	good	fair	one sided	remove	
15656	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	15	good	fair	marginal trunk taper, 40% live crown ratio	remove	
15659	Douglas-fir	<i>Pseudotsuga menziesii</i>	21	20	good	fair	moderately one sided, 6" dead codominant stem at base of trunk	remove	
15660	Douglas-fir	<i>Pseudotsuga menziesii</i>	19	20	good	fair	35% live crown ratio, marginal trunk taper, dead 8" codominant stem at 15'	remove	
15662	Douglas-fir	<i>Pseudotsuga menziesii</i>	8	0	very poor	very poor	dead	remove	
15666	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	15	good	fair	marginal trunk taper, 35% live crown ratio	remove	
15667	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	15	good	fair	40% live crown ratio, marginal trunk taper	remove	
15668	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	15	good	fair	40% live crown ratio, marginal trunk taper	retain	x
15669	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	15	good	fair	one sided, overtopped by adjacent trees	remove	
15670	Douglas-fir	<i>Pseudotsuga menziesii</i>	23	20	good	fair	moderately one sided	remove	
15671	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	10	good	poor	one sided, poor trunk taper	remove	
15672	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	20	good	poor	33% live crown ratio, marginal trunk taper	remove	
15673	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	15	good	fair	35% live crown ratio, marginal trunk taper	retain	x
15674	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	10	good	poor	25% live crown ratio, poor trunk taper	retain	x
15677	Douglas-fir	<i>Pseudotsuga menziesii</i>	13	10	good	poor	25% live crown ratio, poor trunk taper	retain	x
15678	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	10	good	poor	33% live crown ratio, poor trunk taper	retain	x

Attachment 4

Tree No	Common Name	Scientific Name	DBH ¹	C-Rad ²	Condition ³	Structure ³	Comments	Treatment	Onsite Trees >11" DBH in Good Cond. to be Retained
15679	Douglas-fir	<i>Pseudotsuga menziesii</i>	16,12	20	good	fair	codominant at ground level with included bark, south stem has marginal trunk taper with 25% live crown ratio	retain	x
15680	Douglas-fir	<i>Pseudotsuga menziesii</i>	11	10	good	poor	25% live crown ratio, poor trunk taper	retain	x
15681	Douglas-fir	<i>Pseudotsuga menziesii</i>	14	10	good	poor	poor trunk taper, 20% live crown ratio	retain	x
15682	Douglas-fir	<i>Pseudotsuga menziesii</i>	26	20	good	fair	one sided	remove	
15685	Douglas-fir	<i>Pseudotsuga menziesii</i>	22	20	good	fair	moderately one sided	retain	x
15686	Douglas-fir	<i>Pseudotsuga menziesii</i>	25	25	good	fair	one sided	retain	x
15688	Douglas-fir	<i>Pseudotsuga menziesii</i>	20	20	good	fair	marginal trunk taper, 50% live crown ratio	retain	x
15690	Douglas-fir	<i>Pseudotsuga menziesii</i>	16	20	good	poor	33% live crown ratio, poor trunk taper	retain	x

¹DBH is the trunk diameter in inches measured in accordance with International Society of Arboriculture standards.

²C-Rad is the approximate crown radius in feet.

³Condition and Structure ratings range from very poor, poor, fair, to good.

Attachment 5

Additional Tree Protection Recommendations

The following recommendations meet or exceed City of Sandy Code requirements:

Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
 - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
 - c. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outline in the current edition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
 - a. Trees to remain in the grove should be protected by installation of tree protection fencing as shown in Attachments 2 and 3.
 - b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
 - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
 - d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts placed no farther than ten feet apart to prevent it from being moved by contractors, sagging, or falling down.
 - e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
 - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

TREE PROTECTION ZONE

**DO NOT REMOVE OR ADJUST THE APPROVED
LOCATION OF THIS TREE PROTECTION FENCING.**

Please contact the project arborist if alterations to the approved location of the tree protection fencing are necessary.

Todd Prager, Project Arborist - 971-295-4835

- b. Signage should be placed every 75-feet or less.

During Construction

1. Protection Guidelines Within the Tree Protection Zones:
 - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
 - b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
 - c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
 - d. Construction trailers should not to be parked/placed within the tree protection zones.
 - e. No vehicles should be allowed to park within the tree protection zones.
 - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

After Construction

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

Attachment 6

Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. The site plans and other information provided by Roll Tide Corporation and their consultants was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to:
 - Assess the existing grove of trees along Highway 26;
 - Identify the trees to be removed and retained in the grove;
 - Identify trees that are in good condition within the park tract within the northwest portion of the site; and
 - Provide tree protection recommendations for the trees to be retained in the grove.



TERAGAN & ASSOCIATES, INC. ARBORICULTURAL CONSULTANTS

MEMORANDUM

DATE: September 15, 2020

TO: Alex Reverman (Roll Tide Corporation)

FROM: Todd Prager, RCA #597, ISA Board Certified Master Arborist

RE: Additional Tree Preservation at the Dubarko Road Subdivision and Condominiums

Summary

This report includes recommendations for preserving additional trees along the west property line at the proposed Dubarko Road Subdivision and Condominiums in Sandy, Oregon.

Background

Teragan & Associates prepared an arborist report dated December 14, 2019 with a tree assessment, preservation, removal, and protection recommendations for the Dubarko Road Subdivision and Condominiums project.

Roll Tide Corporation has requested my review and recommendations regarding the preservation of additional trees along the west property line of the site.

Tree Assessment

On September 15, 2020, I assessed the additional trees along the west property line of the site. Attachment 1 is a site plan with the tree locations and Attachment 2 is a summary of my assessment data for each tree.

Of the six trees that I assessed, all but one (tree 13438) can be retained and protected according to the recommendations in the next section of this report.

Tree Protection Recommendations

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH as long as no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

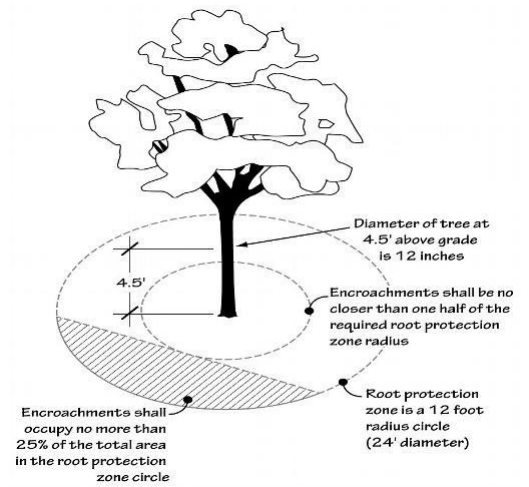


Figure 1: Alternative minimum protection zone

The critical root zone radii of 1 foot per inch of DBH and typical minimum construction setback of .5 feet per inch of DBH is shown for the trees to be retained along the west property line in Attachment 1. The trees to be retained will have at least 75 percent of their critical roots zones radii protected from construction. However, trees 13421 and 13423 will have encroachments for construction of the driveway for lot 4 closer than a radius of .5 feet per inch of DBH from their trunks.

Even with the driveway construction, the trees along the west property line can be retained and protected as follows:

- *Tree Protection Fencing*: Establish tree protection fencing in the locations shown in Attachment 1. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
- *Directional Felling*: Fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. No vehicles or heavy equipment shall be permitted within the tree protection zones during tree removal operations.
- *Stump Removal*: The stump of the tree 13438 shall be stump ground to protect the root systems of the trees to be retained.
- *Curb/Pavement Construction*: Construction of the new curb/paving in the tree protection zone of trees 13421 and 13423 shall occur under project arborist supervision. Use extruded curbs and a modified pavement profile as shown in Figure 1 for new pavement in the tree protection zones.

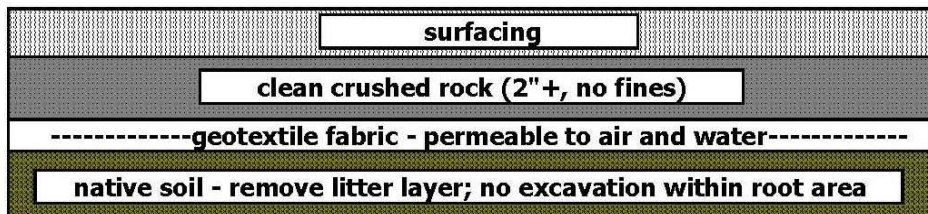


Figure 1. Sample profile for areas within tree protection zones. Depth of rock is dependent on grading.

The additional tree protection recommendations from my December 14, 2019 report are provided in Attachment 3.

Conclusion

Five of the six additional trees along the west property line of the site can be retained and protected according to the recommendations in this report.

Please contact me if you have questions, concerns, or need any additional information.

Sincerely,



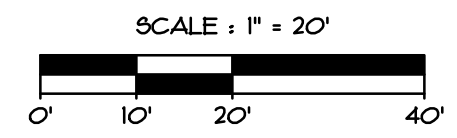
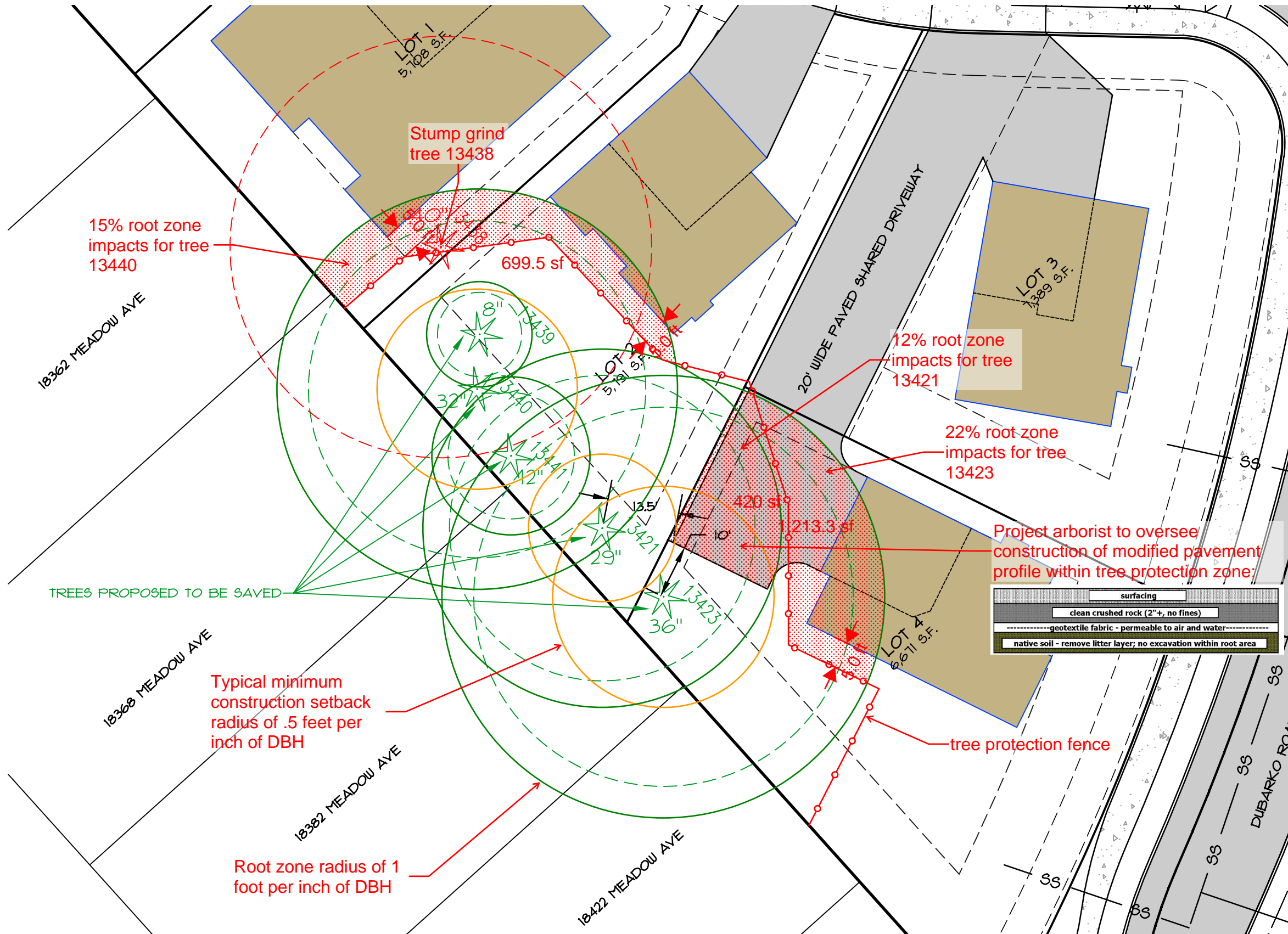
Todd Prager

*ASCA Registered Consulting Arborist #597
ISA Board Certified Master Arborist, WE-6723B
ISA Qualified Tree Risk Assessor
AICP, American Planning Association*

Attachments: Attachment 1 - Site Plan with Additional Tree Removal and Retention
Attachment 2 - Additional Tree Inventory
Attachment 3 - Tree Protection Recommendations
Attachment 4 - Assumptions and Limiting Conditions

BULLRUN TERRACE

TREES ON WEST SIDE OF PROPERTY



Attachment 1

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
Subject to General Conditions 2006 ©



Attachment 2

Tree No	Common Name	Scientific Name	DBH ¹	C-Rad ²	Condition ³	Structure ³	Comments	Treatment
13421	Douglas-fir	<i>Pseudotsuga menziesii</i>	34	20	good	fair	swelling at lower trunk, previously lost top with new top at 15'	retain
13423	Douglas-fir	<i>Pseudotsuga menziesii</i>	42	20	good	fair	moderately one sided	retain
13438	Douglas-fir	<i>Pseudotsuga menziesii</i>	46	20	good	fair	moderately one sided	remove
13439	Douglas-fir	<i>Pseudotsuga menziesii</i>	10	10	good	fair	overtopped by adjacent trees, one sided	retain
13440	Douglas-fir	<i>Pseudotsuga menziesii</i>	38	20	good	fair	moderately one sided	retain
13441	Douglas-fir	<i>Pseudotsuga menziesii</i>	15	15	fair	fair	overtopped by adjacent trees, marginal trunk taper, small Porodaedalea conks at lower trunk	retain

¹ **DBH** is the trunk diameter in inches measured in accordance with International Society of Arboriculture standards.

² **C-Rad** is the approximate crown radius in feet.

³ **Condition** and **Structure** ratings range from very poor, poor, fair, to good.

Attachment 3

Additional Tree Protection Recommendations

The following recommendations meet or exceed City of Sandy Code requirements:

Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
 - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
 - c. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outline in the current edition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
 - a. Trees to remain in the grove should be protected by installation of tree protection fencing as shown in Attachment 1.
 - b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
 - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
 - d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts placed no farther than ten feet apart to prevent it from being moved by contractors, sagging, or falling down.
 - e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
 - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

TREE PROTECTION ZONE

**DO NOT REMOVE OR ADJUST THE APPROVED
LOCATION OF THIS TREE PROTECTION FENCING.**

Please contact the project arborist if alterations to the approved location of the tree protection fencing are necessary.

Todd Prager, Project Arborist - 971-295-4835

- b. Signage should be placed every 75-feet or less.

During Construction

1. Protection Guidelines Within the Tree Protection Zones:
 - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
 - b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
 - c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
 - d. Construction trailers should not to be parked/placed within the tree protection zones.
 - e. No vehicles should be allowed to park within the tree protection zones.
 - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

After Construction

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

Attachment 4

Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. The site plans and other information provided by Roll Tide Corporation and their consultants was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to review and provide recommendations regarding the preservation of additional trees along the west property line of the site.