Arborist Report/Tree Protection Plan
1017 Hot Springs Road

Prepared for:
The Goerner Family
1900 Garden Street
Santa Barbara, California 93101

Prepared by:
Duke McPherson
201 East Mountain Drive
Santa Barbara, California 93108

May 18, 2020

Table of Contents

Duke McPherson, Arborist
201 East Mountain Drive
Santa Barbara, CA 93108
Phone 805 705-9529
E-mail: treemanduke@cox.net

May 18, 2020

The Goerner Family
1900 Garden Street
Santa Barbara, California 93101

Arborist Report/Tree Protection Plan
2017 Hot Springs Road

Introduction

I was asked by John and Marcia Goerner to present an arborist report regarding their property at 2017 Hot Springs Road, Santa Barbara California. I have worked extensively with Sarah Bronstad of Vanguard Planning, Inc. in the preparation of this report. I had originally prepared previous reports meant to help protect native trees during the construction of a lengthy driveway to their proposed house site. The present report addresses changes in circumstances and requirements and is, as a result, completely revised. The following describe some of the changes from earlier reports:

1. The proposed new house will be self-contained in terms of electrical production and natural gas delivery and other utilities which will alleviate the necessity of excavating a ditch the entire length of the driveway. This will reduce impact to adjacent native tree root zones.
2. The Montecito Fire Department is requiring the widening of the road in some sections and the placement of several emergency vehicle turnouts. This will result in the removal or encroachment of a number of native Western Sycamores, *Platanus racemosa* and Coast Live Oaks, *Quercus agrifolia* with the necessity of mitigation by way of replacement with new nursery stock.
3. Two major destructive events have occurred, a wild fire and a violent storm causing debris flow and creek scouring both of which have compromised the health of many trees.
4. The present Arizona crossing has been deemed inadequate requiring the construction of a bridge over the creek. This adds another plan section and includes more native trees which will be affected.

Determining Critical Root Zones

In this report I employ the tree trunk Diameter at Breast Height (DBH) formula for determining tree root areas which are not to be disturbed by construction activities. The diameter of the tree at 4.5' up from ground level in inches is calculated to equal the radius of the root zone in feet resulting in the Critical Root Zone (CRZ). As an example, a 12" DBH tree would have a 12' radius CRZ. This formula improves on the 'dripline + 5' method in instances such as this where canopies are asymmetrical. The CRZ for those trees with multi trunks was determined by adding the squares of each DBH and taking the square root of the total. Example: A double trunk tree, 12" + 12" DBH squared and totaled = 288, its square root is 17" which is equivalent to a 17' CRZ.

Report Summary

A total of 79 native trees are represented in this report for removal or possible encroachment by road, bridge, and turnout construction. Of that number, 21 Coast Live Oaks and 16 Western Sycamores are to have CRZ's impacted by 20% or more. Two Oaks and 8 Sycamores are proposed for removal. In the section titled Tree Mitigation Replacement Totals on pages 19 and 20, fifteen gallon nursery stock is recommended: 24 for Sycamores, 22 for Oaks (refer to a discussion regarding how these mitigation ratios were arrived at). The locations for planting will be incorporated in the project's landscape plan (See Nursery Tree Establishment and Maintenance on page 20 for general recommendations)**.** Protection measures to be taken during construction can be found on page 21. The various site plan sections with numbered trees to correspond with the trees exempted from CRZ encroachment consideration can be found below.

Trees Exempted from CRZ Encroachment Consideration

In the Comments column in the Tree Inventory can be found trees which I considered exempt from CRZ encroachment even though the plan shows trees with 20% or more of their root zone apparently compromised by construction activity:

1. Many Oaks and one Sycamore all located on the western slope above the driveway in Section C-1.4 have not been included in with the list for mitigation. This is because the initial driveway cut undertaken years ago severed all tree roots on that side. Road grading will not affect them.
2. In Section C-1.6, four trees represented by #'s 45, 47, 49, and 50 are down the slope far enough that roots have either not penetrated the roadway or they have been sheared off during road cutting..
3. Trees #51 and 59 in Section C-1.9 have not been included for mitigation as they are positioned downslope of the road. In the same section, trees #95 and #96 are upslope on the road curve which was cut long ago and severed their roots.
4. Other trees compromised or destroyed which should be removed without mitigation:
    a. Sycamore tree #63 in C-1.2 is a decayed tree.
    b.Sycamore tree # 11 in C-1.4 was toppled by wind.
    c. Sycamore tree # 35 in C-1.5 is hazardous due to fire burn at base.

Plan Section Overview and Tree Inventory

The tree inventory includes a Plan Section Overview on page 4 showing each plan section which is covered in the inventory on pages 5-18. Out of 9 sections total, 6 are included as they have trees which are encroached upon by construction. Tables listing the trees which are adjacent to road, bridge abutment work, and turnout grading accompany the plan sections showing tree Critical Root Zones. Those trees and CRZ's located 10' or more away from proposed work areas were shown but not numbered.

The number sequence throughout the plan sections has been reshuffled from an earlier more orderly sequence. This is due to added circumstances such as the requirement to build a bridge to replace the Arizona crossing and the destruction caused by fire and debris flow. Numbered tags were applied to trees in the field to help in coordinate trees with plans and inventory tables.

In most cases plan layouts will need slight magnification to clearly see all detail.

Plan SectionOverview

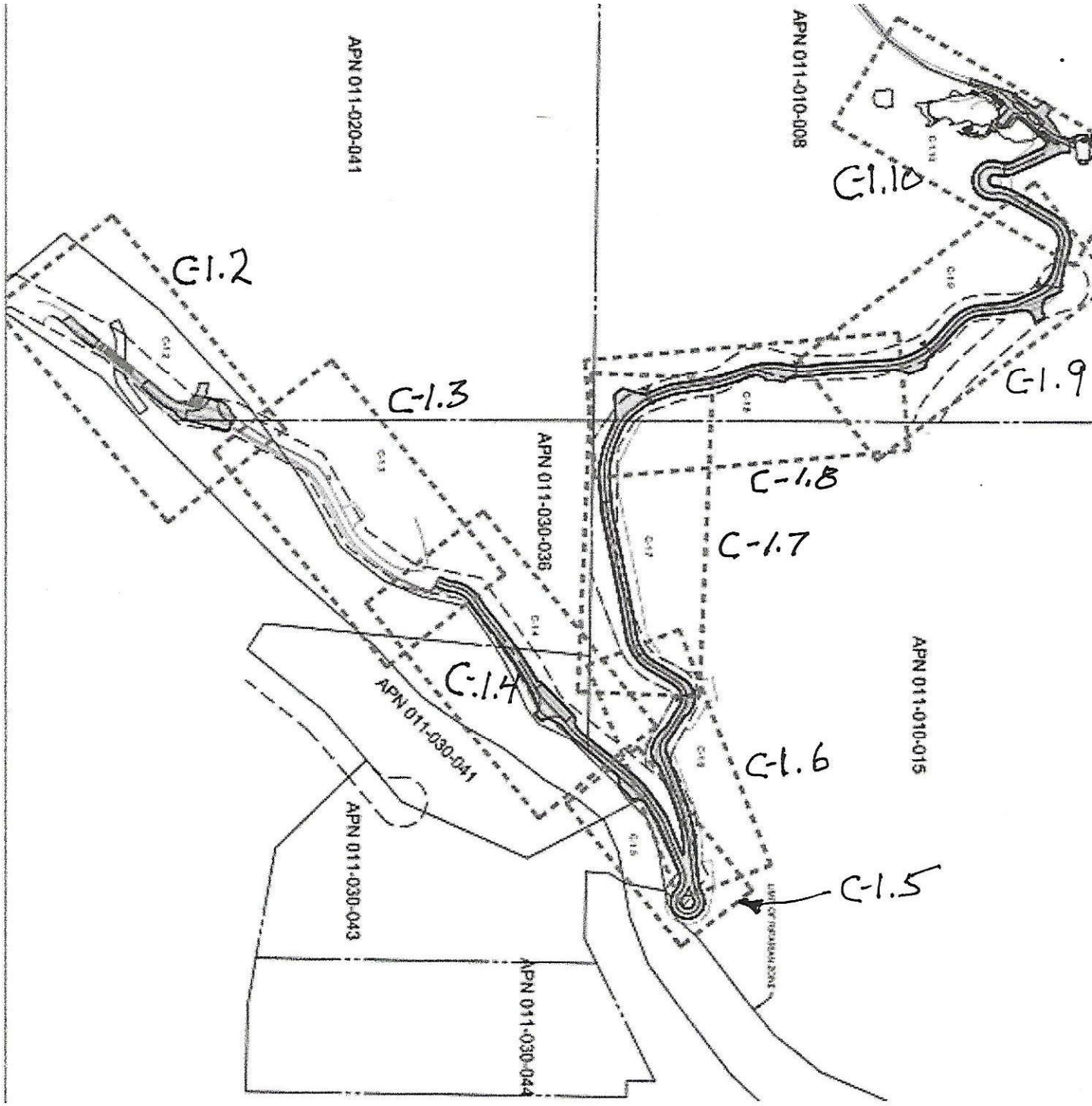


Figure 1. Driveway overview showing Sections C-1.2 through C-1.10. Three sections, C-1.3, 1.7, and 1.8 are not dealt with in this report due to a lack of trees.

Tree Inventory

Section C-1.2
East Side of Road

Tree Number	**Species**	**Trunk Diameter in inches. Critical Root Zone (CRZ) in feet.**	**Protect in Place (PIP)? Remove(R)?**	**Mitigation?**	**Comments**
69	Coast Live Oak	30	PIP	Yes >20% 1 Oak	Road grading and paving.
70	Oak	24	PIP	Yes >20% 1 Oak	Road work, near bridge abutments.
71	Oak	16	PIP	Yes >20% 1 Oak	Road work, near bridge abutments.
85	Oak	14	PIP	No	
86	Sycamore	24	PIP	Yes >20% One oak or sycamore	Road work, turnout installation.
62	Oak	27	PIP	Yes >20% One oak	Road work, turnout installation.
54	Sycamore	14	PIP	No < 20%	Road work, turnout installation.
56	Oak	20	R	Yes 1 Oak	Road work and turnout installation. Has a large hollow.
87	Sycamore	15	PIP	No < 20%	Road work and turnout installation

83	Oak	31	PIP	Yes >20% One oak.	Road work.

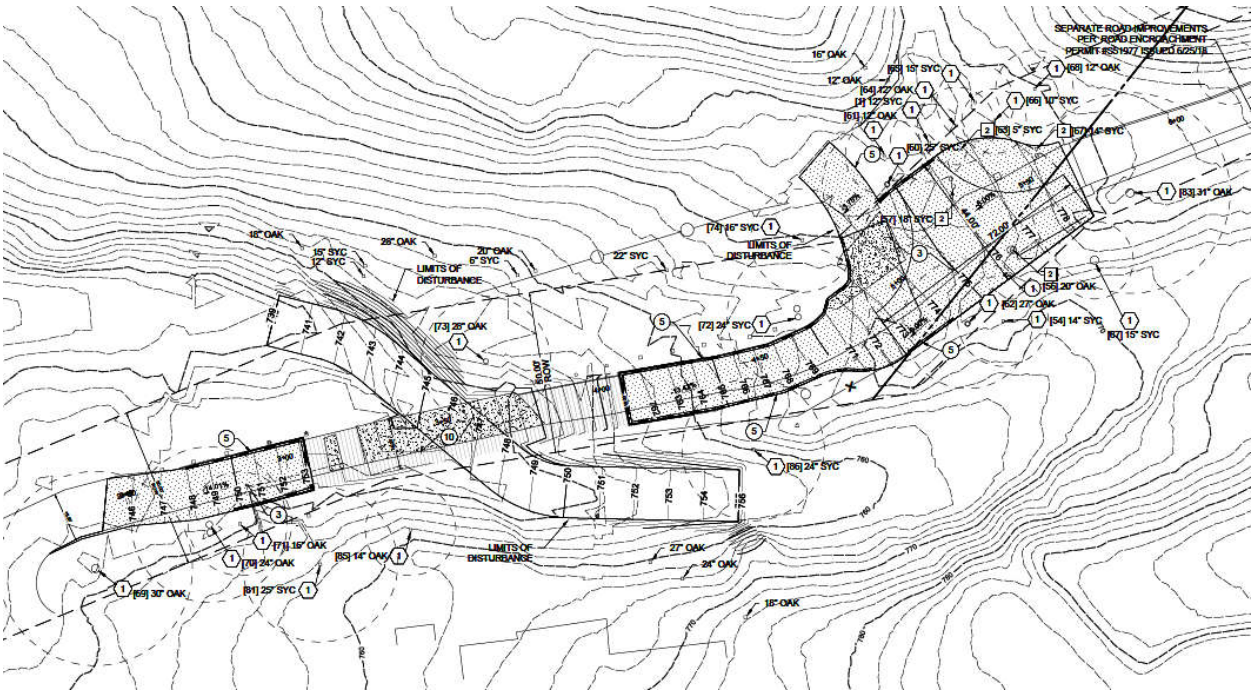


Figure 2. Plan section C-1.2 shows native trees and their Critical Root Zones adjacent or within roadway, turnout, and bridge development. East side inventory table is on page 5, west side is on page 7.

Section C-1.2
West Side of Road

Tree Number	**Species**	**Trunk Diameter in inches. Critical Root Zone (CRZ) in feet.**	**Protect in Place (PIP)? Remove (R)?**	**Mitigation?**	**Comments**
73	Coast Live Oak	28	PIP	Yes >20% 1 Oak	Bridge abutment construction.
72	Sycamore	24	PIP	Yes >20% 1 Sycamore or 1 Oak	Road and Turnout construction.
74	Sycamore	16	PIP	No < 20%	Turnout construction.
61	Oak	12	PIP	No < 20%	Turnout construction.
1	Sycamore	12	PIP	No	
60	Sycamore	25	PIP	>20% One Sycamore or one oak.	Turnout Work.
63	Sycamore	5	R	No	Decayed tree.
65	Sycamore	15	PIP	No <20%	Turnout work.
66	Sycamore	10	PIP	No	
67	Sycamore	14	R	Yes One Sycamore or one oak.	Turnout work.
68	Oak	12	PIP	No	

Section C-1.3
Not included, no trees present for consideration.

Section C-1.4
East Side of Road

Tree Number	**Species**	**Trunk Diameter in inches. Critical Root Zone (CRZ) in feet**	**Protect in Place (PIP)? Remove(R)?**	**Mitigation?**	**Comments**
75	Coast Live Oak	12	PIP	No	
76	Oak	14	PIP	No	
77	Sycamore	48	PIP	No <20%	Road work.
78	Sycamore	18	PIP	No	
9	Sycamore	16	PIP	>20% One sycamore or one oak.	Road work.
11	Sycamore	7	Destroyed by wind.	No	
79	Sycamore	14	PIP	No	
80	Sycamore	10	PIP	No	
82	Sycamore	6	PIP	No	
13	Oak	14	PIP	No <20%	Road work.
15	Oak	16	PIP	>20% One oak	Turnout work.
18	Sycamore	28	R	Two sycamores or two oaks.	Road and turnout work.

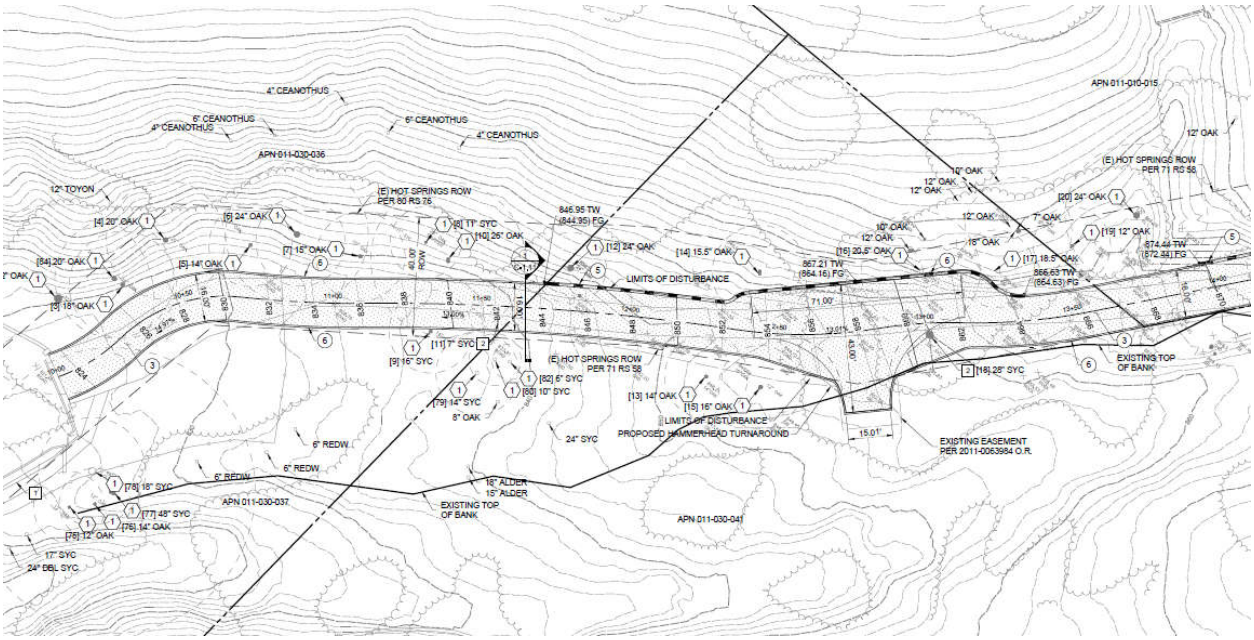


Figure 3. Plan section C-1.4 showing native trees and their CRZ,s within road and turnout development. Table for the east side can be found on page 8, that for the west side on page 10.

Section C-1.4
West Side of Road

Tree Number	Species	Trunk Diameter in inches. Critical Root Zone (CRZ) in feet.	Protect in Place (PIP)? Or Remove	Mitigation?	Comments
2	Coast Live Oak	32	PIP	No	Upslope of road cut. Roots severed years ago.
84	Oak	20	PIP	No	"
3	Oak	18	PIP	No	"
4	Oak	20	PIP	No	"
5	Oak	14	PIP	No	"
6	Oak	24	PIP	No	"
7	Oak	15	PIP	No	"
8	Sycamore	11	PIP	No	"
10	Oak	26	PIP	No	"
12	Oak	24	PIP	No	"
14	Oak	5.5	PIP	No	"
16	Oak	20.5	PIP	>20% One oak	Road work
17	Oak	18.5	PIP		Upslope of road cut. Roots severed years ago.
19	Oak	12	PIP	No	

Section C-1.5
East and West Side of Road

(To cul-de-sac. Section C-1.6 overlaps with 1.5 and continues the survey from the cul-de-sac).

Tree Number	**Species**	**Trunk Diameter in inches. Critical Root Zone in feet. (CRZ)**	**Protect in Place (PIP)? Remove (R)?**	**Mitigation?**	**Comments**
22 (west side)	Coast Live Oak	16+18	PIP	No	Upslope of road cut. Roots severed years ago.
23	Sycamore	12+16	PIP	>20% One Sycamore or one oak.	Turnout
24	Sycamore	18	PIP	<20%	Turnout
26	Coast Live Oak	24	PIP	No <20%	Road work.
25	Sycamore	22	PIP	>20% One Sycamore or one oak.	Road work.
27	Sycamore	18	PIP	>20% One Sycamore	Road work.
29	Sycamore	20	R	Two Sycamores	Road work.
28	Sycamore	14	PIP	No	
30	Sycamore	16	R	Two Sycamores	Road work.
31	Oak	18	PIP	>20% One Sycamore	Road work.

Tree Number	Species	Trunk Diameter in inches. Critical Root Zone in feet. (CRZ)	Protect in Place (PIP)? Remove (R)?	Mitigation?	Comments
32 (west side)	Oak	30	PIP	>20% Two oaks.	Road widening. Special protection needed for this tree.
35	Sycamore	18	Hazardous tree due to trunk fire burn.	No	Remove without mitigation consideration.
36 (west side)	Sycamore	24	PIP	>Two sycamores or two oaks.	Road widening.
33	Oak	24	PIP	>20% One oak.	Road work.
34	Sycamore	24	R	One Sycamore or one oak.	Road work.
37	Sycamore	14	PIP	No	
38	Oak	12	PIP	No	
39	Oak	24	PIP	>20% One oak.	Road widening.
40	Sycamore	20	PIP	>20% One Sycamore or one oak.	Road widening.
41	Oak	36	PIP	>20% Two oaks.	Road widening. Special protection needed.

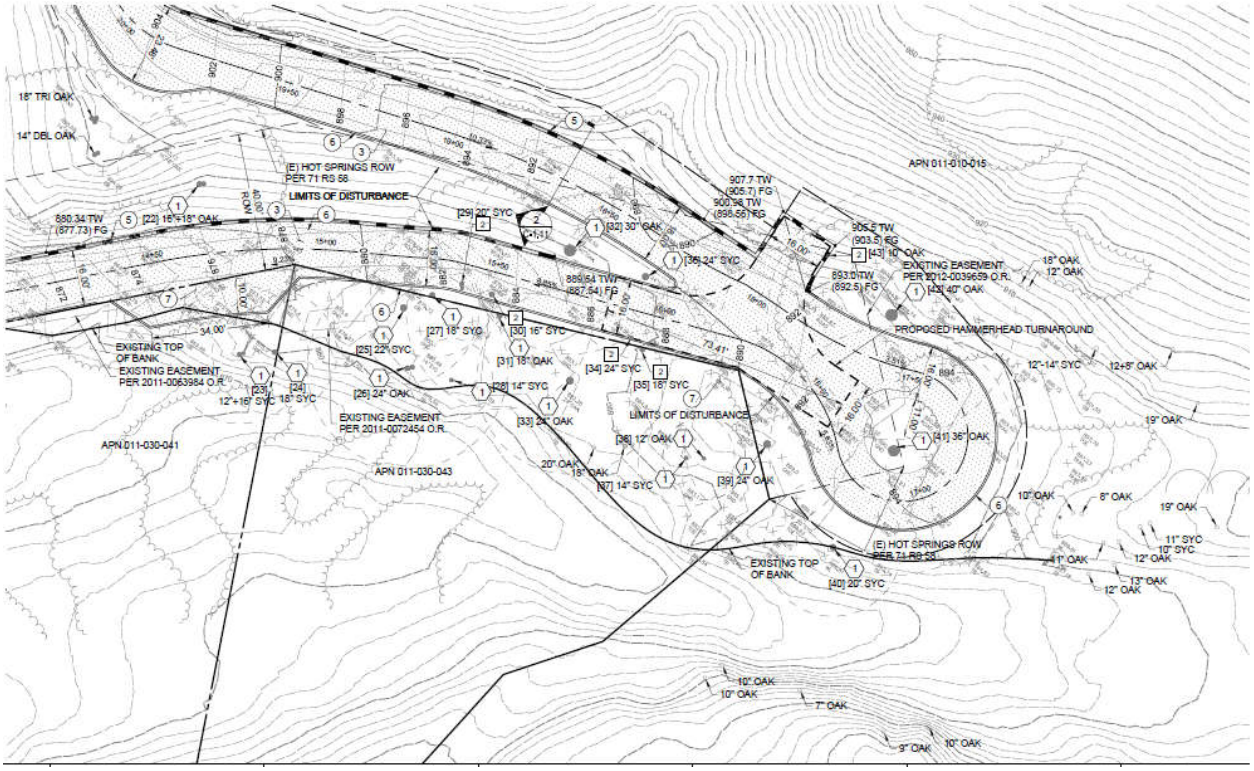


Figure 4. Section C-1.5. The tables on pages 11 and 12 cover both east and west sides of the road without dividing them in two. Section C-1.6 overlaps this section and begins with tree #s 42 and 43.

Section C-1.6

Tree Number	**Species**	**Trunk Diameter in inches. Critical Root Zone (CRZ) in feet**	**Protect in Place (PIP)? Remove (R)?**	**Mitigation?**	**Comments**
42	Coast Live Oak	40	PIP	Yes >20% Two oaks	Road work, turnout installation.
43	Oak	10	PIP	Yes >20% One oak	Turnout installation.
45	Oak	6+12+13	PIP	No	Down slope, remote from road work.
50	Oak	14	PIP	No	Down slope, remote from road work.
46	Oak	4+10+14+14	PIP	No	Down slope, remote from road work.
47	Oak	11	PIP	No	Down slope, remote from road work.

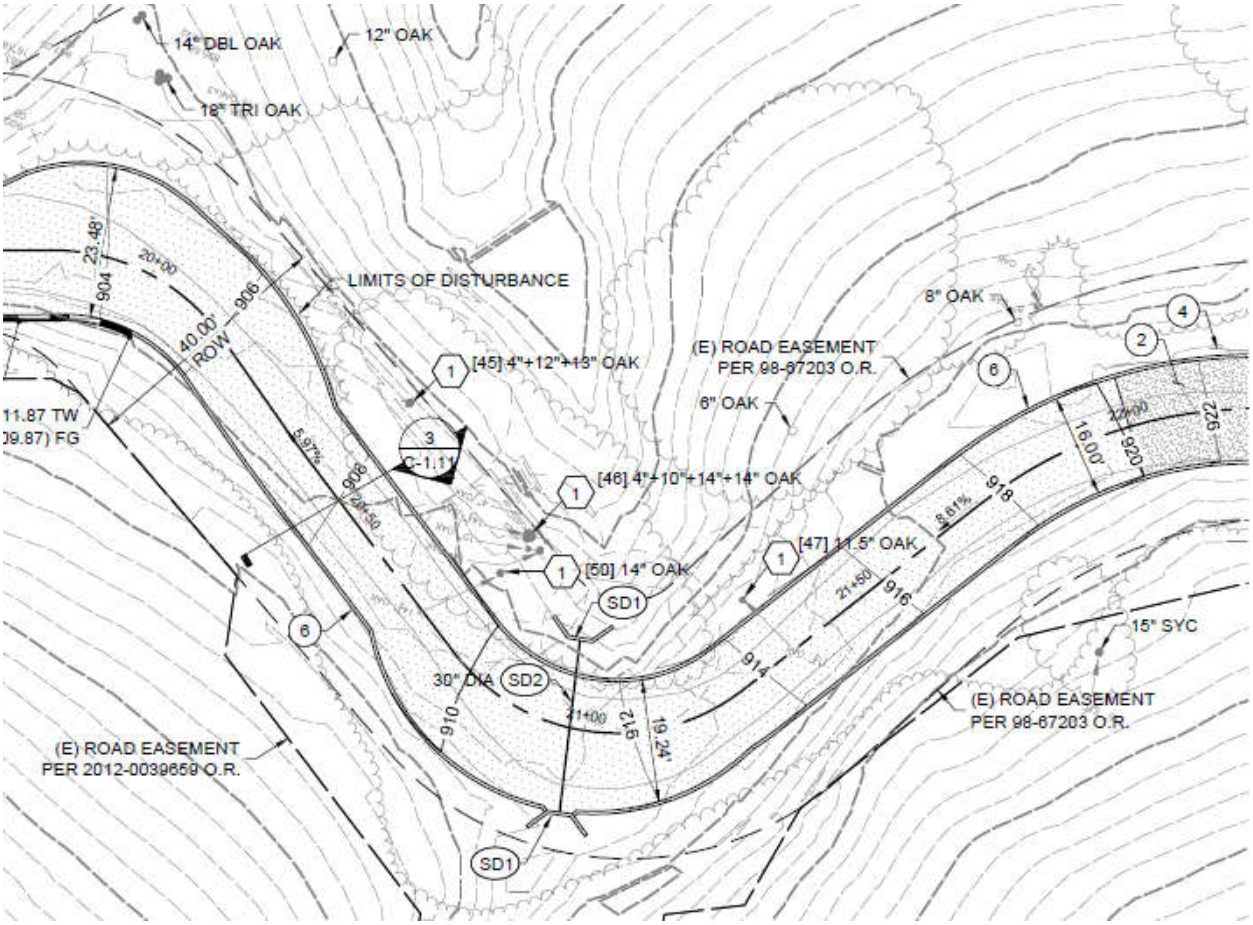


Figure 5. Section C-16. Oak trees #42 and 43 are shown on the previous plan section.

Section C-1.7 and 1.8
Not included. No trees present for consideration

Section C-1.9
Both Sides of Road

Tree Number	**Species**	**Trunk Diameter in inches. Critical Root Zone (CRZ) in Feet.**	**Protect in Place (PIP)? Remove (R)?**	**Mitigation?**	**Comments**
51	Coast Live Oak	20	PIP	No	Down slope
59	Oak	14.5	PIP	No	Down slope
96	Oak	22.5	PIP	No	Upslope and remote from road.
95	Oak	24	PIP	No	Upslope and remote from road.
94	Oak	10	PIP	No	Upslope and remote from road.

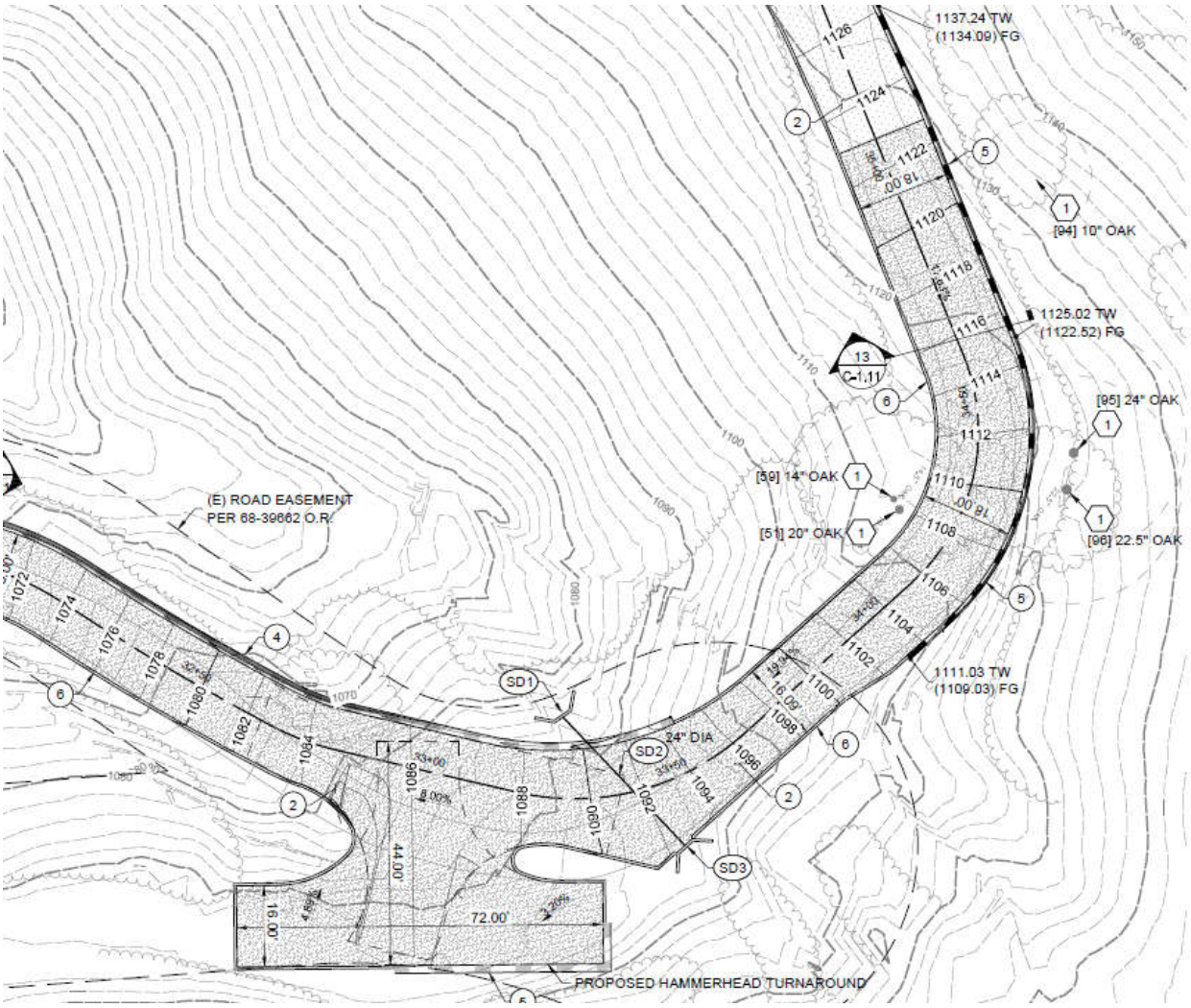


Figure 6. Plan section C-1.9 shows four oak trees located on both sides of a road curve.

Section C-1.10

Tree Number	Species	Trunk Diameter in inches. Critical Root Zone (CRZ) in feet.	Protect in Place (PIP)? Remove (R)?	Mitigation?	Comments
90	Coast Live Oak	10+10+12+13+15	PIP	>20% One Oak.	Road work and turnout construction.

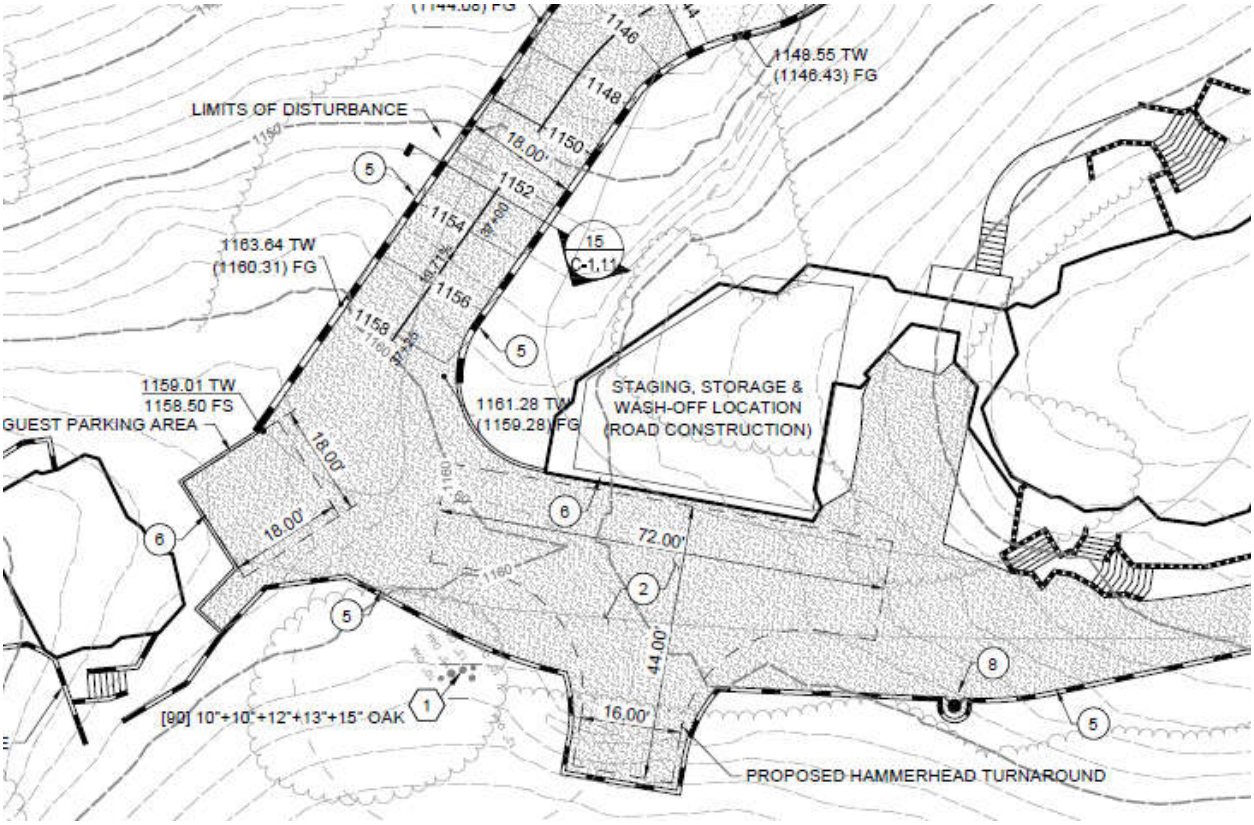


Figure 7. Section C-1.10 shows a multi-trunk single specimen.

Mitigation Discussion and Replacement Totals

The ratios arrived at here are derived from an original 10:1 Oak removed or encroached upon and 6:1 for Sycamores using 1 gallon nursery stock. The ratio is reduced here using larger 15 gallon stock to 1:1 owing to the fact that larger nursery specimens will have a better chance of survival. Tree DBH and size of CRZ encroached upon or removed were also factored into mitigation planting numbers. **From the tables below, the total number of Oaks to be planted will be 22, for Sycamores, 24.**

Tree Removals

Plan Section	Tree Name and Number	Mitigation Plantings, 15 gallon size
C-1.2	Coast Live Oaks(O) #56	1
	Western Sycamore(WS) #67	1
C-1.4	WS #11	1
	WS #18	1
C-1.5	WS #29	2
	WS #30	2
	WS #34	1
	O #43	1

Subtotal: 10 (8 Sycamores, 2 Oaks)

Encroachment into 20% or more of tree CRZ

Plan Section	Tree Name and Number	Mitigation Plantings, 15 gallon size
C-1.2	Coast Live Oaks (O) #s 69,70,71	3
"	62, 83, 73	3
C-1.2	Western Sycamores(WS) #s 86, 72, 60	3
C-1.4	WS # 9	1
"	WS #18	2
"	O #15, #16	2
C-1.5	O #31	1
"	O #32	2
"	O #40, 39	2
"	O #41	2
"	O #33	1
"	WS #23,25,27,35	4
"	WS #35	2

Encroachment into 20% or more of tree CRZ (continued)

Plan Section	Tree Name and Number	Mitigation Plantings 15 gallon size
1.5	WS #39, 40,23,25,27	5
"	WS #32	2
C-1.6	Coast Live Oak #42	2
"	O #43	1
C-1.10	O #90	1

Subtotal: 36 trees (20 Oaks, 16 Sycamores)

Mitigation Totals: 22 Oaks, 24 Sycamores

Nursery Tree Establishment and Maintenance

It will be important to locate plantable areas on the property and to install irrigation lines to each tree. An Easement Exhibit has been prepared by Bruce Jones of Ashley and Vance Engineering, Inc. which shows potential sites for the planting of both tree species along the Goerner easesment. I have chosen what I feel is the ideal nursery size, 15 gallon, for planting on this site. This will provide an ample root system in each specimen for maximum establishment over time. The ideal irrigation system to be employed is the 'drip' variety, with approximaely four dripper outlets per plant. Trees should be irrigated for a period of three years, after which they will have estsablished roots widespread enough to survive on their own.

Tree Protection Measure to be taken during the Construction Phase.

This phase covers all road, turnout, and bridge activity as well as main residence construction.

1. It will be imperative to set up firmly staked, semi-permanent tree protection fencing before any stage of construction activity begins. All trees adjacent to work zones are to be fenced off as far out from tree trunks as is feasible.

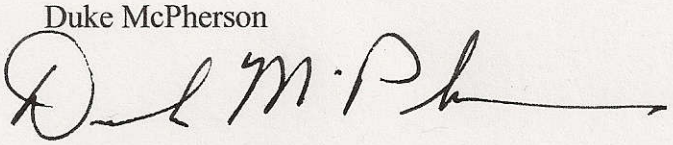
2. No parking of vehicles will be permitted within tree Critical Root Zones particularly in tree groves.

3. Portable concrete washout receptacles are to be provided and kept outside CRZ's. At the end of construction, they are to be hauled off site.

4. Of particular importance will be the protection of roadside trees in section C-1.5 where a 'pinch point' constricts travel. Vertical lengths of wood may need to be attached to these trees to prevent scaring.

Report prepared by:

Duke McPherson



Certified Arborist with the
International Society of Arboriculture
Certification # WE-0690A