

inft3 / in feet cubed  
250 Lorraine Blvd.  
San Leandro, CA 94577

09/17/2021

County of Sonoma  
Design Review Committee  
% Doug Bush  
2550 Ventura Avenue  
Santa Rosa CA 95403-2859

This letter serves to advise the County that revisions have been prepared to address the Design Review comments to #PLP18-0013, delivered by Scott Orr, dated 03/07/2018.

Revisions to the scope of work enhance the previously-approved Development Plan for improvements proposed at 18285 Sonoma Highway, Sonoma, CA 95476, aka *Boyes Springs Food Center Mixed-Use Redevelopment*.

The revisions are presented in good faith for your review and consideration. We look forward to our meeting on Tuesday, 09/21/21 @ 2pm, and we welcome your feedback.

Respectfully,



Bryan J. Hassemer, AIA, in feet cubed  
bryan@inft3.com  
530.448.0909

# DESIGN REVIEW COMMITTEE RECORD OF ACTION

## March 7, 2018

**Item No:** 1  
**Time:** 1:30 PM  
**File No.:** PLP18-0013  
**Applicant:** Tim Sloat for KS Mattson Partners LP  
**Staff:** Scott Orr- Project Planner

**Con't from:** Not Applicable  
**Env. Doc:** Not Applicable

**Proposal:** Conceptual Design Review for a Mixed Use Project for 29 market rate residential units, 8 affordable units, and 7,000 square feet of commercial uses. This project will include the following; (1) General Plan Amendment to add the LC designation to an additional 0.08 acres and to change the residential portion of the site to Medium Density Residential allowing 12 dwelling units per acre; (2) Zone Change from LC/R1 to Planned Community; (3) Major Subdivision to create 11 parcels; (4) Preliminary and Precise Development Plan for Planned Community Zoning; (5) Use Permit; (6) Design Review with Hearing; and (7) Sign Program.

**Location:** 18285 Sonoma Highway, Sonoma  
**APN:** 056-415-020, -018,-017, 016  
**Supervisory District:** 1  
**Zoning:** LC (Limited Commercial) TS (Traffic Sensitive), R1 (Low Density Residential), B6 5 DU (5 Dwelling Units Per Acre), LG/SPR (Local Guidelines/The Springs Highway 12 Corridor), SR (Scenic Resource) and X (Vacation Rental Exclusion Combining District).

**Public Hearing:** No

**Design Review Committee:** Don MacNair, Jim Henderson & Karin Theriault

**Staff:** Scott Orr-Project Planner

**Applicant:** Tim Sloat for KS Mattson Partners LP, Karen Massey-Project Planning Consultant, Quadriga Landscape Architects/Rachael McQueen, Adobe Associates/Casey McDonald- Project Civil Engineer

**Others:**

**PROJECT DESIGN:**

Preliminary Review       Final Review       Referral Only

**ACTION:**

Project Design Needs Revision (see attached comments)	Project Design Approved (subject to comments and conditions attached)	Bring Back on Consent Prior to Issuance of Building Permit	Project continued to: _____	Bring Back to Staff Prior to Issuance of Building Permit
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<b>Site Plan</b> <b>Architecture</b>	X <hr/> X <hr/>	<hr/> <hr/>	<hr/> <hr/>	<hr/> <hr/>	<hr/> <hr/>
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Parking & Circulation	X				
Landscaping & Irrigation	X				
Signs	X				
Grading		X			
Exterior Lighting	X				

**VOTE:** Don McNair: X Jim Henderson: X Karin Theriault: X  
**Ayes:** 3 **Noes:** 0 **Absent:** 0 **Abstain:** 0

**DESIGN REVIEW RECORD OF ACTION  
 COMMENTS & CONDITIONS**

**Applicant:** Tim Sloat for KS Mattson Partners LP **File:** PLP18-0013  
**Address:** 18285 Sonoma Highway, Sonoma **Date:** March 7, 2018

**NOTE:** The applicant is urged to respond under each comment as to how plans have been revised. If a recommended change is not made, please indicate why. Please submit your responses with plans for Final Design Review.

**SITE PLAN**

1. Ensure the outdoor seating areas are located outside of the public right-of-way.

**Response:** Outdoor seating areas are located outside of the public right-of-way.

2. Ensure that the proposed concrete design is retained through time and is carried out evenly throughout the new commercial areas.

**Response:** Decorative paving has been designed to continue around the front of the commercial area.

**ARCHITECTURE: Building Elevations, Colors, Materials, etc.**

1. Ensure all colors and materials examples are provided for review and approval at the next Design Review Committee meeting.

**Response:** Color examples and high-resolution material images are provided to the DRC.

2. Consider providing a trellis area on the roof deck to provide shade/shelter to persons utilizing that area.

**Response:** A wood trellis is provided on roof deck

3. Consider tying the plaza area to the rear portion of the new commercial building.

**Response:** See L2.1 and L2.2 for “promenade” concept of how landscaped plaza ties into the south side of the new commercial building. There are additional landscaped areas to the north of the new building at the apartment entrance. The rear of the new building is dedicated to parking, driveways, and surface drainage / bioretention.

4. The trash enclosure facing Calle Del Monte should be redesigned to fit in better with the architectural theme of the proposed project.

**Response:** Green screen vine trellises added to trash enclosure to hide CMU walls

5. Consider reducing the overall height of the new commercial portion of the project.

**Response:** Overall height has been minimized to the extent possible while keeping interior ceiling heights at an acceptable level for residential and commercial spaces.

6. Focus on the northwest entry area of the new commercial portion of project so it is more in keeping with the proposed southwest entry.

**Response:** Northwest entry enhanced with deeper overhang. Mimicking the same expression of the southwest entry is not desirable.

7. Ensure all design elements are in keeping with each other and reflect the same design era.

**Response:** Materials, details and fenestration revised to create more consistent design identity and era. The Art Deco style of the podium is paired with a modern yet timeless upper level design.

8. Ensure the windows at the retail food center are symmetrical and are in keeping with the design era.

**Response:** Window layout revised to be symmetrical with detailing consistent with design era.

9. Consider orienting the west-facing apartment windows to be more horizontal.

**Response:** Orientation of west facing windows has not been changed. However, the Design Team can consider detailing and materials to give a more horizontal expression.

10. The proposed mural should be more balanced with the rest of the building.

**Response:** Mural reduced in size and updated to suggest a vibrant, whimsical theme for the project site with more muted color scheme. Actual art and artist selection TBD.

11. Improve the lobby entry to the apartment building.

**Response:** Lobby revised with more rational, code compliant stair and elevator layout.

## **PARKING & CIRCULATION**

1. Provide a parking space count (including the number of required Accessible spaces) that includes the square footage of each existing use to be retained, the square footage of all new uses, and the required number of spaces for each use. Ensure the required number of bicycle parking spaces is included in the parking space count.

**Response:** Parking count indicated on Project Information Sheet G0.01. Code compliant accessible parking provided for each parking area. Bicycle Parking is indicated on Sheet A1.01.

2. Ensure the bicycle racks do not block any walkways or accessibility.

**Response:** Bicycle racks do not block walkways or accessibility.

## **LANDSCAPING: Design, Plant Types and Sizes, Irrigation, etc.**

1. Provide an arborist's report for retention of the existing trees on the subject site.

**Response:** Arborist's report has been provided by Sherby Sanborn Consulting Arborist, dated 3/3/18.

2. Consider providing landscape screening on the roof deck to provide shade to persons utilizing that area.

**Response:** A trellis has been designed to help provide shade on the roof deck. We are researching options to provide landscape screening to provide additional shade and interest.

3. If the applicant desires to install street trees in the ground at the Highway 12 frontage, the proposed buildings will have to be moved further back onto the site (to the east) to avoid the Caltrans right-of-way area.

**Response:** Tree wells and/or large potted trees along Highway 12 will be proposed to CalTrans for approval. Final location, tree well size, and tree type to be determined based on CalTrans advisory.

4. Retaining the existing trees on the site might be difficult during new site development; the driplines of those trees will have to be avoided and heavily mulched to retain moisture at the roots.

**Response:** Many of the existing trees have been removed. Refer to Arborist's Report.

5. Consider avoiding the driplines of the existing trees at the new bio-retention areas.

**Response:** Remaining existing trees will follow mitigation measures outlined in the Arborist's Report.

6. If the existing trees on the site cannot be retained, replace those trees with large, new trees.

**Response:** Removed trees will be replaced with 36" box oaks. Project is seeking mitigation values for 36" box trees.

7. Consider installing landscaping at the proposed low masonry wall in the parking area.

**Response:** Landscaping has been proposed in parking area. Low plantings in addition to vines have been proposed for on/around the masonry walls.

8. Provide a landscape and irrigation plan for review and approval. Ensure all proposed landscaping meets the most current WELO (Water Efficiency Landscape Ordinance) requirements.

**Response:** Refer to MacNair Landscape Architecture irrigation plan and planting diagrams provided. All landscape areas will meet the most current WELO requirements.

## **SIGNS**

1. Provide the square footage of the existing grocery store sign on the site to be retained. The Design Review Committee agrees with the applicant that the existing grocery store sign should be retained and not included in the overall new sign calculation for the site because the existing sign is considered an iconic neighborhood element and should be retained as is- with no changes. Please note, the sign is **not** considered historic nor does the subject site include a zoning historic designation (“HD”); the request for the existing square footage of the sign is for documentation purposes only.

**Response:** See 10/A9.02 for existing grocery sign.

2. Provide a signage plan and details for all new sign areas.

**Response:** Signage plan and details provided on A9.01 and A9.02.

## **EXTERIOR LIGHTING**

1. Provide an exterior lighting plan and cut sheets. Ensure all exterior lighting is Dark-Sky compliant.

**Response:** See A9.03 and E-3.0 for a lighting plan and photometrics. Lighting models are provided; however, pending owner approval & manufacturer availability, cutsheets are not provided.



# Sherby Sanborn Consulting Arborist

ISA Certified Arborist Number WE-0258A

ISA Qualified Tree Risk Assessment

P.O. Box 447, Glen Ellen, CA 95442-0447 Phone/Fax 707.935.0892 [ssanborn@sonic.net](mailto:ssanborn@sonic.net)  
<http://www.sherbysanborn-arborist.com>

May 3, 2018

Tim Sloat, CDP ICSC  
Real Estate Development Manager  
KS Mattson Partners, LP  
P.O. Box 5490  
Vacaville, CA 95696

Re: Tree report for Boys Food Center, 18285 Sonoma Hwy, Sonoma, CA.

Dear Mr. Sloat:

The following is the tree report you requested

## Summary

The site will be developed as a mixed-use project. There are eleven trees on the site all of which are protected species as defined by the Sonoma County Tree Protection Ordinance. The site also contains 3 Valley Oaks, *Quercus lobata*, a protected species of special significance. Due to the nature of this proposed development, buildings, parking, sidewalks and other infrastructure does not allow the preservation all the trees on the site following the requirements of the Sonoma County Tree Protection Ordinance. As a result, 3 trees will be preserved, and 8 trees will be removed having an arboreal value of 28. These trees should be replaced with either 28 15-gallon or 14-24 inch box trees.

**© This report and associated specifications, dated May 3, 2018, are for the exclusive use of my clients and their representatives, and may not be reproduced by outside parties in whole or in part for any other purpose without the written permission of Sherby Sanborn, Consulting Arborist.**

## Scope of Work

To evaluate the existing trees on the above site for their health and suitability for preservation within the development. Additionally, for those trees that can be retained and incorporated into the proposed development site plan, to provide protection and mitigation measures consistent with the Sonoma County Tree Protection Ordinance.

## Limitation of Observations

Construction impacts such as soil compaction, root cutting, mechanical damage and improper pruning, to name just a few human activities, can affect tree health and safety. Therefore, my evaluations are based on the condition of these trees on November 6, 2017. I cannot be held responsible for activities or impacts that occur after the above date. As an arborist I make recommendations based upon on-site observation and information regarding the trees and the site provided to me by the client. Such information, if inaccurate or incomplete, will affect the accuracy of these recommendations. In addition, property boundaries should be verified by client before treatments are applied. Failure to do so can lead to trespass and legal damages.

## Disclosure Statement

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to structural failure of a tree or anticipate extreme weather events that could contribute to failure. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the scope of the Arborists services such as property boundaries, property ownership, site lines, disputes between neighbors, and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should then be expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

## Observations

There are eleven trees on the property that are 9 inches or greater in DBH (trunk diameter at 4.5 feet above median soil grade). No oaks or other trees, smaller than 9 inches DBH were observed. All the trees are growing adjacent to residences, in back yards and in parking areas. All the tree species present on the property are listed in the Sonoma County Tree Replacement Ordinance. Tree's No. 1-5, 8, 9, and 11 are Protected Species while tree's No. 6, 7, and 10 are Valley Oaks, *Quercus lobata*, and Protected Trees of Special Significance. See Table 1, page 5 for tree numbers, common name and other pertinent tree related data. Several of the trees have structural defects that make them unsuitable for retention within the development.

- **Tree No. 2**, a California Coast Live Oak, has trunk decay and other defects that will likely cause failure. This is a poor candidate for retention
- **Tree No. 3**, a California Bay, has four trunks arising from its base with a potentially weak structure. Bay trees are also prone to root decay, particularly from *Ganoderma applanatum* a serious root and trunk decay fungi. Additionally, California Bay is the reservoir of Sudden Oak Death (SOD) a fungus that affects California Coast Live Oak, the dominant species on the site.
- **Tree No. 6** is a Valley Oak and a Protected Species of Special Significance. This particular tree has lost more than half of its top that was broken at a height of about 15 feet. I don't consider this tree an acceptable specimen for retention.
- **Tree No. 9**, a California Coast Live Oak, shows evidence of upper crown thinning. This could be the result of paving around half its root system, drought, root disease, or a combination of all three. This tree should not be considered for retention.

## Discussion and Conclusions

The Tree Location Map page 4 shows the location and disposition of trees within the proposed grading plan. Because the property is planned as a mixed use, high density development, the opportunity to retain



large mature trees is limited. Although many of these trees have pavement over much of their roots, this pavement was laid over the existing soil grade many years ago. Today's construction requirements for paving, sidewalks and curbing, as well as utilities and storm drains will result in the removal of a significant proportion of each tree's root system. Some trees are also impacted because new buildings will occupy their current location. The necessity for parking, driveways and sidewalks puts the greatest limitation on tree preservation. This is particularly true for trees No. 3, 6, 7, 8, 9, and 10. Trees No. 2 and 11 are in locations where buildings are proposed.

Within the current site plan, tree's Number 1, 4, and 5 have sufficient room to be protected. The map on page 4 shows the location of each tree and the delineation of the recommended Tree Protection Zone (TPZ). The TPZ's are based on the crown radius measured from the trunk to the most distant point at the edge of the dripline. That radius is then used to form a circle around the trunk. These three trees present the best opportunity for preservation. With some minor adjustment there is sufficient room for these trees to successfully be preserved.

### **Recommendations**

**Tree No. 1:** The proposed well around the trunk needs to be enlarged to more closely match the TPZ. Alternatively, a combination of well enlargement and porous pavers with alternative curbing B (page 6) can be used to accomplish this. As an alternative, to traditional curb detailing, the paving surface can be installed first with anchor stakes to which either treated lumber, or a second concrete pour can be attached.

Currently, this tree has pavement covering much of the area within its proposed TPZ. Removing this pavement in a way that reduces soil compaction and root damage is critical. This can be accomplished by keeping the tires or tracks of heavy machinery on the pavement itself and pulling the pavement up then back, away from the trunk.

**Tree No. 4:** Some minor adjustments in the location of the sidewalk would be beneficial, however, hand trenching for footings along the south edge with root pruning should result in minimal impact to tree health. This same recommendation can be applied in the area where the building foundation encroaches into the west side of the TPZ.

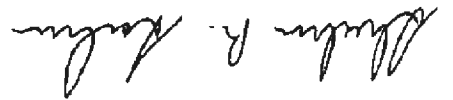
**Tree No. 5:** The current site plan shows very minimal encroachment of pavement at the edges of the TPZ. There is a proposed 6 inch SD pipe that will go through the TPZ and if it remains at that location, special mitigations will be required. The Sonoma County Tree Protection Ordinance requires hand digging of trenches through TPZ's. I also recommend the use of either an air-spade or hydrovac to dig trenches through root zones. Both tools prevent damage to fine roots and those that are larger. Some root pruning may be required to fit the pipe below the roots. Root pruning should be kept to a minimum and avoid cutting any roots larger than 2 inches in diameter.

Appendix A lists all the tree protection measures required by the Sonoma County Tree Ordinance. At the end of those requirements, I have included additional mitigations I recommend be implemented that can enhance tree preservation.

### **Tree Replacement, Arboreal Value**

The development area and site as described in the Sonoma County Tree Protection Ordinance are the same and Chart 1, of Sec. 26-88-010 (8) was used to calculate arboreal values for removed trees (see Table 1). The total arboreal value is 28 and requires the planting of either 28, 15-gallon or 14, 24 inch box trees.

Sincerely,

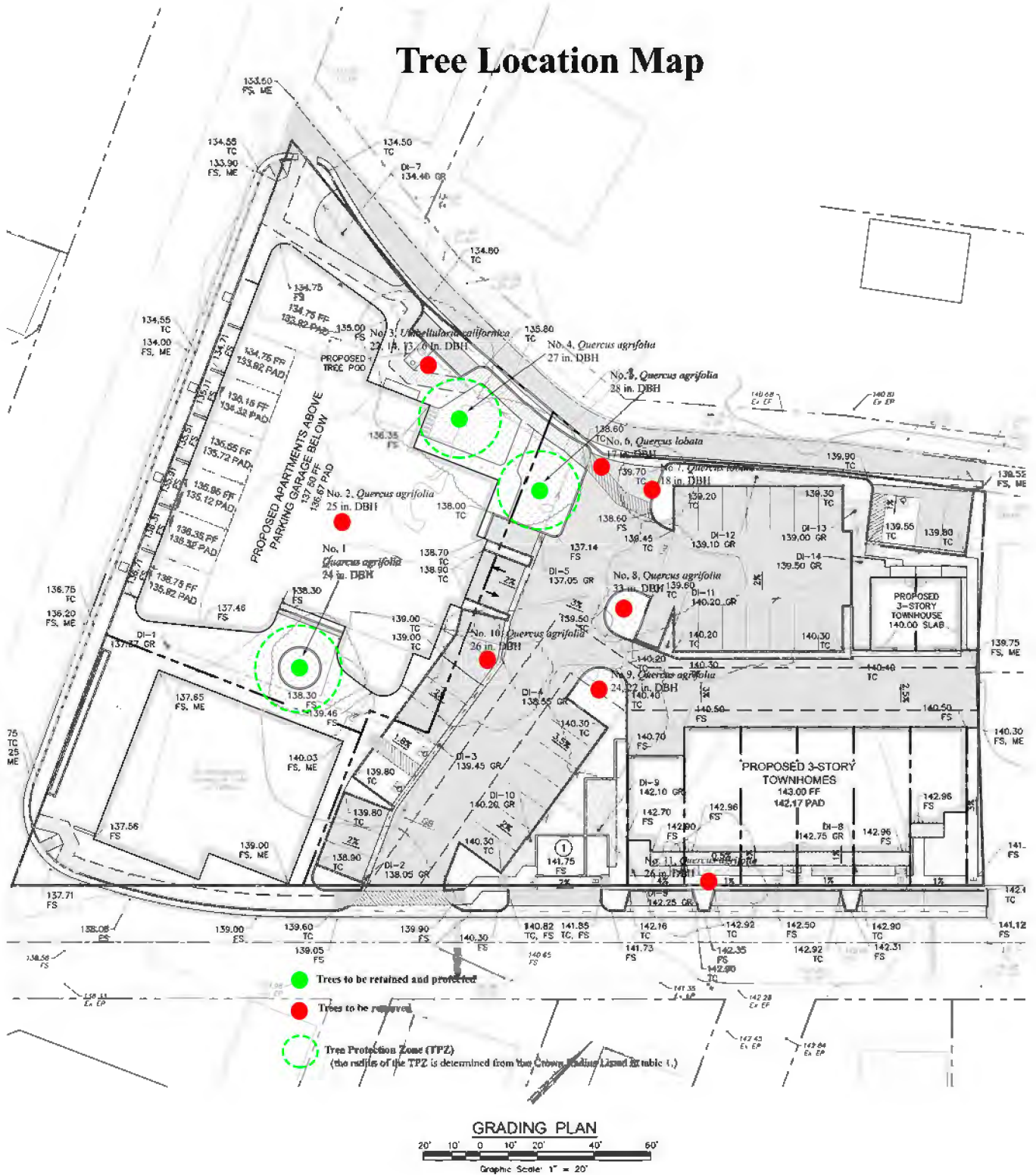


Sherburn Sanborn  
SRS: ss

**References**

Mattheck, Claus, 1998. *Design in Nature, Learning from Trees*. Springer. 276 pages.

# Tree Location Map



**Table 1**

**Location: 18285 Sonoma Highway (Boyes Food Center), Sonoma.**

Date									
11/6/2017									
Tree Tag Number (s)	Common Name	Species	Number of Trunks	DBH (trunk diameter)	Crown Radius	Health	Structure	Comments	Arboreal Value *, **
1	Coast Live Oak	<i>Quercus agrifolia</i>	1	24.0	31.0	Very Good	Very Good	Already paved around three sides of trunk. May be preserved with mitigations.	3
2	Coast Live Oak	<i>Quercus agrifolia</i>	1	25.0	20.0	Very Good	Poor	Trunk decay and tree leans over parking area. REMOVE.	3
3	California Bay	<i>Umbellularia californica</i>	4	22, 14, 13, 6	31.0	Good	Fair	The four trunks present a weak structural configuration. Species prone to root pathogens. Significant construction impacts. REMOVE.	5
4	Coast Live Oak	<i>Quercus agrifolia</i>	1	27.0	29.0	Very Good	Good	May be preserved with mitigations	3
5	Coast Live Oak	<i>Quercus agrifolia</i>	1	28.0	19.0	Very Good	Good	May be preserved with mitigations	4
6	Valley Oak	<i>Quercus lobata</i>	1	17.0	12.0	Fair	Poor	Top broken out at approximately 15 feet. REMOVE.	2
7	Valley Oak	<i>Quercus lobata</i>	1	18.0	23.0	Good	Good	Substantial construction impacts. REMOVE.	2
8	Coast Live Oak	<i>Quercus agrifolia</i>	1	33.0	18.5	Very Good	GOOD	Substantial construction impacts. REMOVE.	4
9	Coast Live Oak	<i>Quercus agrifolia</i>	2	24, 22	27.5	Very Good	FAIR	Substantial construction impacts. REMOVE.	6
10	Valley Oak	<i>Quercus lobata</i>	1	26.0	31.0	Good	Good	Substantial construction impacts. REMOVE.	3
11	Coast Live Oak	<i>Quercus agrifolia</i>	1	26.0	25.0	Good	Good	Substantial construction impacts. REMOVE.	3

\* 1 Arboreal Value (AV) = Two 15 Gallon Trees. Two AV = One 24" box tree, or \$400 in lieu fee

\*\* Arboreal Values were obtained from Chart No. 1 of the Sonoma County Tree Protection Ordinance Sec. 26-88-010 (8).

University of Florida



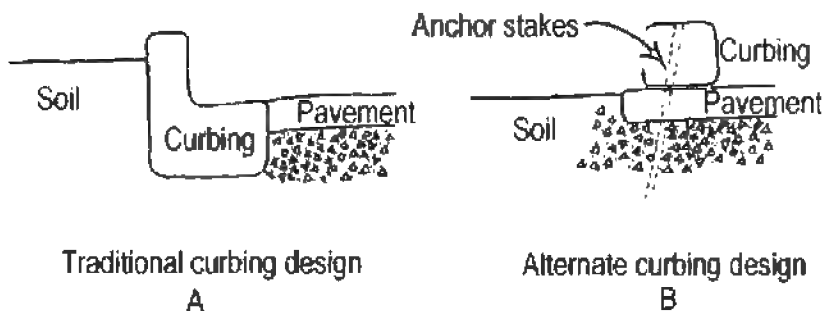
# Landscape Plants

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## To curb or not to curb?

Instead of installing curbing around a parking lot island or median strip in the traditional manner, consider placing the curb on top of the pavement edge.



Traditional curbing design  
A

Alternate curbing design  
B

**A** Curbs designed in the traditional fashion often deflect roots laterally and under the curb. This can result in broken curbs as roots enlarge.

**B** Curbs placed on top of the pavement may allow more roots to grow under the pavement and could be less expensive to install. They can be constructed from concrete, treated wood, or synthetic materials.

Curbing can be constructed from treated wood, which is lighter than concrete, to prevent pavement sag. Also consider building islands without curbs or with only shallow curbs. Deep curbs often deflect roots, preventing them from growing beneath pavement, which also restricts root growth and stresses the trees. Building parking lots without curbs around islands could increase tree health by allowing more roots to escape the island and grow beneath the pavement.

A possible disadvantage of this is that the property owner might perceive the raised pavement near aggressive surface roots a hazard. Cracks created by roots also allow water to enter the soil beneath the pavement; freezing and thawing in cracks then causes further pavement damage.

But remember, most pavement cracks after it is installed, often without help from the trees! If pavement remains intact, trees are growing poorly.

## **Appendix A: Tree Protection Mitigations for Construction Sites**

### **1 - The Sonoma County Tree Protection Ordinance requires that:**

- (2) “Before the start of clearing, excavation, construction or other work on the sited, every tree designated for protection on the approved site plan shall be clearly delineated with a substantial barrier (steel posts and barbed wire or chain link fencing) at the protection perimeter or limits established during the permit process. These delineation markers shall remain in place for the duration of all work. All trees to be removed shall be clearly marked. A scheme shall be established for the removal and disposal of brush, earth and other debris as to avoid injury to any protected tree.”
- (3) “Where proposed development or other site work must encroach upon the protected perimeter of a protected tree, special measures shall be incorporated to allow the roots to obtain oxygen, water and nutrients. Tree well or other techniques may be used where advisable. No changes in existing ground level shall occur within the protected perimeter unless a drainage and aeration scheme approved by a certified arborist is utilized. No burning or use of use of equipment with an open flame shall occur near or within the protection perimeter (except for authorized controlled burns).”
- (4) “No construction equipment or materials should be stored within the root protection zone. In addition, no dumping of toxic materials shall take place either within or near the tree protection zone. This includes gasoline, other petroleum products, broken drywall, and concrete spoils to name just a few materials potentially toxic to trees and tree roots.”
- (5) “If any damage to a protected tree should occur during or as a result of work on the site, the county shall be promptly notified of such damage. If a protected tree is damages so that it cannot be preserved in a healthy state, the planning director shall require replacement in accordance with the arboreal value chart. If on site replacement is not feasible, the applicant shall pay the in-lieu fee to the tree replacement fund.”
- (6) “The following design standards for protected trees shall be adhered to:
- (i) Underground trenching for utilities should avoid tree roots within the protected perimeter. If avoidance is impractical, tunnels should be made below major roots. If tunnels are impractical and cutting roots is required, it shall be done by hand-sawn cuts after hand digging trenches. Trenches should be consolidated to serve as many units as possible.
  - (ii) Compaction within the drip line or protected perimeter shall be avoided.
  - (iii) Paving with either concrete or asphalt over the protected perimeter should be avoided. If paving over the protected perimeter cannot be avoided, affected trees shall be treated as removed for purposes of calculating arboreal values.
  - (iv) Wherever possible, septic systems and/or leach lines shall not be located on the uphill side of a protected tree.
- (7) “Security posted for the purpose of insuring the proper construction of public or private improvements shall also include an amount sufficient to secure any requirements imposed pursuant to this section. In addition, security for potential tree damage shall be twenty-five percent (25%) of the amount posted for planned tree replacement. In lieu fees shall be paid prior to recording any maps. Such security shall not be released until protection requirements, including planting replacement trees, and any long term maintenance requirements have been satisfactorily discharged. The initial bond amount may be reduced to cover only the maintenance and replacement of trees after construction is completed.”

(8) “The Valley Oak-*Quercus lobata* shall receive special consideration in the design review process to the extent that mature specimens shall be retained to the fullest extent feasible. Valley Oaks contribute greatly to Sonoma County's visual character, landscape and they provide important visual relief in urban settings. On existing parcels created without the benefit of an accompanying EIR, design review shall focus on the preservation of Valley Oaks to the fullest extent feasible. Where such preservation would render a lot unbuildable, partial protection with accompanying appropriate mitigations developed by a certified arborist shall be incorporated into the project design. In such cases where only partial protection can be achieved, full replacement in accordance with the arboreal value chart shall be required.”

## **Other Arborist Recommended Protection Measures**

### **1 - Protective Mulch:**

Applying mulch within the tree protection zone can greatly benefit protected trees. Always use composted coarse wood chip mulch that will not compact. Raw wood chips direct from a chipper, composted chips or Arbor Mulch are all beneficial for trees. Keep mulch away from root collar—large trees require 1 foot of clearance. Mulch should be no more than 2-3 inches deep. Protective mulch used to reduce soil compaction from vehicle traffic should be 6-8 inches deep. Mulch this deep should be temporary and must be removed to a final depth of 2-3 inches when construction is completed. It may also be necessary to reduce mulch depth during the winter months to prevent souring (mold build up).

### **2 - Irrigation:**

All trees, including native oaks can benefit from irrigation prior to and during construction, particularly during our hot summer months. Irrigate the outer two thirds of the crown radius using soaker hoses or a drip irrigation system. For native oaks, it is critically important that irrigation be kept away from the trunk and root collar. When irrigating large oaks, keep water at least eight feet from the trees root collar and trunk. Never allow water to splash on the trunk and root collar. Irrigate to a depth of six inches and allow soil to dry completely before the next irrigation. It may take many hours to moisten the soil to a depth of six inches. The easiest way to test the penetration depth is to dig several small holes within the irrigated area using a garden trowel or similar tool. If the soil isn't moist continue watering. Oaks should be irrigated once every six weeks while other trees can be irrigated more frequently.

### **3 - Trenching and Root Pruning:**

Trenches should be dug using an air-spade or by hand—no power tools or mechanical trenching devices. The air-spade uses compressed air to remove soil around roots without damaging them. Digging should be done in a manner that avoids damaging roots larger than 1 inch. All roots should be cut at right angles and when possible, preferably back to a lateral. Any roots cut during trenching operations should be cleanly cut, at right angles, to sound wood using either pruning shears, loppers, pruning saws or chainsaw. **Why not mechanical trenching?** Most mechanized trenching devices, such as a ditch-witch, don't cut roots cleanly. The root is grabbed, pulled, and torn leaving a ragged, broken surface. Because roots are elastic, when grabbed by a trencher the root stretches before it breaks then snaps back. This action can cause splits and other types of damage to occur between the break and the tree trunk. Such injuries cause roots to die back and provide avenues for soil borne fungi to attack them.

### **4 - Landscaping Under Native Oaks:**

To insure the longevity of native oaks, landscaping underneath their crown should be kept as natural as possible. Irrigation systems should only be installed outside the dripline (the width of the crown, as measured by the lateral extent of the foliage). For more information regarding landscaping under native

oaks, see the publication: *Compatible Plants Under and Around Oaks*, California Oak Foundation, <http://www.californiaoaks.org/>

### Understanding Tree Roots

Where and how deeply roots grow depends on the soil conditions of the site. In fertile, well aerated soil with little competition from other trees, roots will extend in a more or less symmetrical pattern. The roots of a tree can grow laterally through the soil up to two or even three times the radius of the trees crown (figure 11). In addition, approximately 80% of a tree's roots develop within the first twelve to eighteen inches of soil with few roots growing beyond a depth of three feet. The most important limiting factor affecting root development is soil density and oxygen availability. Sonoma County soils have high clay content, so they are denser with lower oxygen levels. This forces roots to grow closer to the surface. Water in the form of rain or irrigation, has a significant effect on soil oxygen levels. As water penetrates the soil it displaces carbon dioxide pushing it out of the soil while at the same time drawing oxygen in. Other than natural rainfall, native oaks do not need to be irrigated. Exceptions to this rule include active construction sites and periods of severe drought. Prior to and during construction, stress to protected trees may be reduced by periodic irrigation particularly during the summer months of July, August, and September. During periods of drought, it may be appropriate to supplement natural rainfall by irrigating oaks during the spring and early fall. Irrigation should be deep and infrequent, and it should be kept 10 feet away from the trunk and root collar, particularly when sprinkler systems are used.

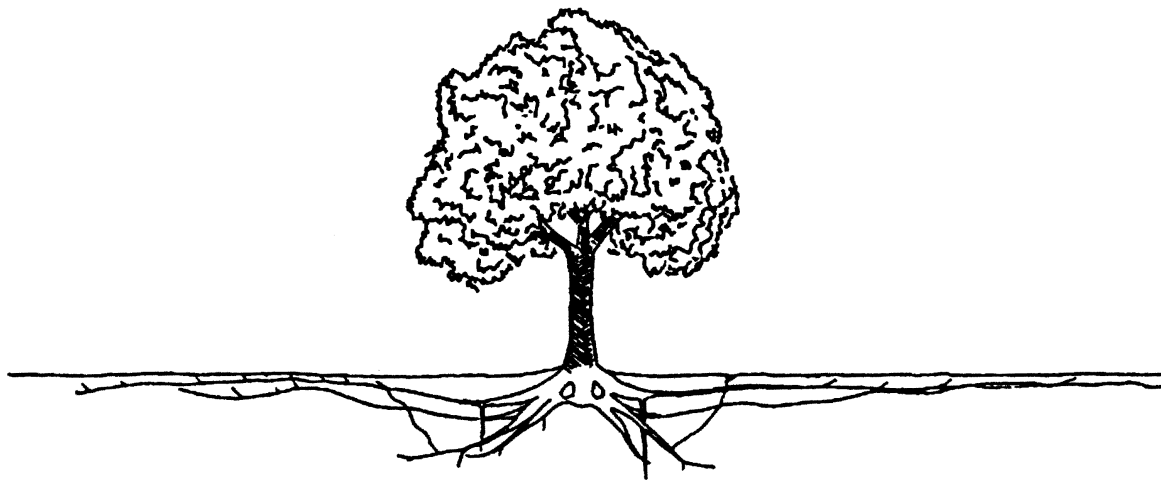


Figure 11