



# California Tree and Landscape Consulting, Inc.

July 14, 2022

Planning Partners

Via Email: [mwilson@e-planningpartners.com](mailto:mwilson@e-planningpartners.com)

## PRELIMINARY ARBORIST REPORT & TREE INVENTORY

**RE:** 512 & 603 Sutter Street, Folsom, California

### EXECUTIVE SUMMARY

Planning Partners contacted California Tree and Landscape Consulting, Inc. to document the trees on the property for a better understanding of the existing resource and any potential improvement obstacles that may arise. Planning Partners requested an arborist report and tree inventory suitable for submittal to the City of Folsom. This is a Preliminary Arborist Report and Tree Inventory for the initial filing of plans to develop the property. The property is located at 512 & 603 Sutter Street, Folsom, California. (See Supporting Information – Tree Inventory Map.)

Tyler Thomson, ISA Certified Arborist #WE-12751A, visited the property on June 6, 2022, to provide species identification, measurements of DBH and canopy, field condition notes, recommended actions, ratings, and approximate locations for the trees. A total of 34 trees were evaluated on this property, of which 15 are protected trees according to the City of Folsom Tree Preservation Ordinance. The multi-trunk trees have diameters for each individual stem in the multi-stem column and the aggregate total in the DSH column. When the removal/mitigation plan is prepared, the aggregate DSH shall be changed to the extrapolated DSH per the Folsom Tree Preservation Ordinance. The dripline radius measurements are presented as the TPZ, and the tree conditions are provided in the numerical rating format per the City of Folsom requirements.

**TABLE 1 – 512 Sutter Street**

Tree Species	Trees Inventoried	Trees on the Site <sup>1</sup>	Protected Trees on the Site	Trees Proposed for Removal	Total Proposed for Retention
<b>Protected Trees:</b>					
Valley Oak, <i>Quercus lobata</i>	4	4	4	0	TBD
<b>Non-protected Trees:</b> Ailanthus, Chinese Photinia, London Plane, Pecan, Silk	9	8	0	0	TBD
<b>TOTAL</b>	<b>13</b>	<b>12</b>	<b>4</b>	<b>0</b>	<b>TBD</b>

<sup>1</sup> CalTLC is not a licensed land surveyor. Tree locations are approximate and we do not determine tree ownership. Trees which appear to be on another parcel are listed as offsite and treated as the property of that parcel. The historical policy at the City of Folsom is to allow a 10% encroachment into the root zone of a neighboring tree. The root zone is calculated using the canopy radius plus 1'. Site design should consider this restriction.

TABLE 1 - 603 Sutter Street

Tree Species	Trees Inventoried	Trees on the Site <sup>2</sup>	Protected Trees on the Site	Trees Proposed for Removal	Total Proposed for Retention
<b>Protected Trees:</b>					
Blue Oak, <i>Quercus douglasii</i>	4	4	4	0	TBD
Interior Live Oak, <i>Quercus wislizeni</i>	4	4	4	0	TBD
Valley Oak, <i>Quercus lobata</i>	3	3	3	0	TBD
<b>Non-protected Trees:</b> Ailanthus, Chinese Photinia, London Plane, Pecan, Silk	10	9	0	0	TBD
<b>TOTAL</b>	<b>21</b>	<b>20</b>	<b>11</b>	<b>0</b>	<b>TBD</b>

## ASSIGNMENT

Perform an examination of the site to document the presence and condition of trees protected by the City of Folsom Tree Preservation Ordinance. All trees protected by the City of Folsom are included in the inventory. Prepare a report of findings.

## METHODS

Appendix 2 in this report is the detailed inventory and recommendations for the trees. The following terms and Table A – Ratings Descriptions will further explain our findings.

The protected trees evaluated as part of this report have a numbered tag that was placed on each one that is 1-1/8" x 1-3/8", green anodized aluminum, "acorn" shaped, and labeled: CalTLC, Auburn, CA with 1/4" pre-stamped tree number and Tree Tag. They are attached with a natural-colored aluminum 10d nail, installed at approximately 6 feet above ground level on the approximate north side of the tree. The tag should last ~10-20+ years depending on the species, before it is enveloped by the trees' normal growth cycle.

## TERMS

**Species** of trees is listed by our local common name and botanical name by genus and species.

**DBH** (diameter breast high) is normally measured at 4'6" (54" above the average ground, height but if that varies then the location where it is measured is noted here. A steel diameter tape was used to measure the trees.

**Canopy radius** is measured in feet. It is the farthest extent of the crown composed of leaves and small twigs measured by a Stanley digital distance meter. This measurement often defines the Critical Root Zone (CRZ) or Protection Zone (PZ), which is a circular area around a tree with a radius equal to this measurement.

<sup>2</sup> CalTLC is not a licensed land surveyor. Tree locations are approximate and we do not determine tree ownership. Trees which appear to be on another parcel are listed as offsite and treated as the property of that parcel. The historical policy at the City of Folsom is to allow a 10% encroachment into the root zone of a neighboring tree. The root zone is calculated using the canopy radius plus 1'. Site design should consider this restriction.

**Actions** listed are recommendations to improve health or structure of the tree. Trees in public spaces require maintenance. If a tree is to remain and be preserved, then the tree may need some form of work to reduce the likelihood of failure and increase the longevity of the tree. Preservation requirements and actions based on a proposed development plan are not included here.

**Arborist Rating** is subjective to condition and is based on both the health and structure of the tree. All of the trees were rated for condition, per the recognized national standard as set up by the Council of Tree and Landscape Appraisers and the International Society of Arboriculture (ISA) on a numeric scale of 5 (being the highest) to 0 (the worst condition, dead). The rating was done in the field at the time of the measuring and inspection.

**Table A – Ratings Descriptions**

No problem(s)	5	excellent
No apparent problem(s)	4	good
Minor problem(s)	3	fair
Major problem(s)	2	poor
Extreme problem(s)	1	hazardous, non-correctable
Dead	0	dead

Rating #0: This indicates a tree that has no significant sign of life.

Rating #1: The problems are extreme. This rating is assigned to a tree that has structural and/or health problems that no amount of work or effort can change. The issues may or may not be considered a dangerous situation.

Rating #2: The tree has major problems. If the option is taken to preserve the tree, its condition could be improved with correct arboricultural work including, but not limited to: pruning, cabling, bracing, bolting, guying, spraying, mistletoe removal, vertical mulching, fertilization, etc. If the recommended actions are completed correctly, hazard can be reduced and the rating can be elevated to a 3. If no action is taken the tree is considered a liability and should be removed.

Rating #3: The tree is in fair condition. There are some minor structural or health problems that pose no immediate danger. When the recommended actions in an arborist report are completed correctly the defect(s) can be minimized or eliminated.

Rating #4: The tree is in good condition and there are no apparent problems that a Certified Arborist can see from a visual ground inspection. If potential structural or health problems are tended to at this stage future hazard can be reduced and more serious health problems can be averted.

Rating #5: No problems found from a visual ground inspection. Structurally, these trees have properly spaced branches and near perfect characteristics for the species. Highly rated trees are not common in natural or developed landscapes. No tree is ever perfect especially with the unpredictability of nature, but with this highest rating, the condition should be considered excellent.

**Notes** indicate the health, structure and environment of the tree and explain why the tree should be removed or preserved. Additional notes may indicate if problems are minor, extreme or correctible.

**Remove** is the recommendation that the tree be removed. The recommendation will normally be based either on poor structure or poor health and is indicated as follows:

- Yes H - Tree is unhealthy
- Yes S - Tree is structurally unsound

## RECOMMENDED REMOVALS

At this time, no trees on the property have been recommended for removal.

## DISCUSSION

Trees need to be protected from normal construction practices if they are to remain healthy and viable on the site. Our recommendations are based on experience, and City ordinance requirements, so as to enhance tree longevity. This requires their root zones remain intact and viable, despite heavy equipment being on site, and the need to install foundations, driveways, underground utilities, and landscape irrigation systems. Simply walking and driving on soil has serious consequences for tree health.

Following is a summary of Impacts to trees during construction and Tree Protection measures that should be incorporated into the site plans in order to protect the trees. Once the plans are approved, they become the document that all contractors will follow. ***The plans become the contract between the owner and the contractor, so that only items spelled out in the plans can be expected to be followed. Hence, all protection measures, such as fence locations, mulch requirements and root pruning specifications must be shown on the plans.***

## RECOMMENDATIONS: SUMMARY OF TREE PROTECTION MEASURES

Hire a Project Arborist to help ensure protection measures are incorporated into the site plans and followed. The Project Arborist should, in cooperation with the Engineers and/or Architects:

- Identify the Root Protection Zones on the final construction drawings and show the placement of tree protection fencing pursuant to the arborist's recommendation or county requirements.
- The project arborist should review the final construction drawings prior to submittal and identify the impacts to each tree and recommend actions to increase the likelihood of long-term survival post construction.
- The project arborist should inspect the fencing prior to grading and/or grubbing for compliance with the recommended protection zones.
- The project arborist should directly supervise the clearance pruning, irrigation, fertilization, placement of mulch and chemical treatments.
- All stumps within the root zone of trees to be preserved shall be ground out using a stump router or left in place. No trunk within the root zone of other trees shall be removed using a backhoe or other piece of grading equipment.
- Prior to any grading, or other work on the site that will come within 50' of any tree to be preserved, irrigation will be required from April through September and placement of a 4-6" layer of chip mulch over the protected root zone of all trees that will be impacted. Chips should be obtained from onsite materials and trees to be removed.
- Clearance pruning should include removal of all the lower foliage that may interfere with equipment PRIOR to having grading or other equipment on site. The Project Arborist should approve the extent of foliage elevation and oversee the pruning to be performed by a contractor who is an ISA Certified Arborist.
- Clearly designate an area on the site outside the drip line of all trees where construction materials may be stored, and parking can take place. No materials or parking shall take place within the root zones of protected trees.
- Any and all work to be performed inside the protected root zone fencing shall be supervised by the project arborist.
- Trenching inside the protected root zone shall be by a hydraulic or air spade, placing pipes underneath the roots, or boring deeper trenches underneath the roots.
- Include on the plans an Arborist inspection schedule to monitor the site during (and after) construction to ensure protection measures are followed and make recommendations for care of the trees on site, as needed.

General Tree protection measures are included as Appendix 3. These measures need to be included on the Site, Grading, Utility and Landscape Plans. A final report of recommendations specific to the plan can be completed as part of, and in conjunction with, the actual plans. This will require the arborist working directly with the engineer and architect for the project. If the above recommendations are followed, the amount of time required by the arborist for the final report should be minimal. This will require the arborist working directly with the engineer and architect for the project. If the above recommendations are followed, the amount of time required by the arborist for the final report should be minimal.

Report Prepared by:



Edwin E. Stirtz, Consulting Arborist  
International Society of Arboriculture  
Certified Arborist WE-0510A  
ISA Tree Risk Assessment Qualified  
Member, American Society of Consulting Arborists

Enc.: Appendix 1 – Tree Location Map  
Appendix 2 – Tree Data  
Appendix 3 – General Practices for Tree Protection



359 Nevada Street, Suite 201  
Auburn, CA 95603

1. The project architect for this project is California Tree & Landscape Consulting. The primary contact information is Nadeia Nasser, (909) 395-0100. The project architect may be contacted at any time during the project. The project architect will be responsible for all contractor payments and if and when additional requests occur or are required by the jurisdiction, the project architect will be responsible for providing the necessary information to the jurisdiction and personnel required when a final letter of approval is required by the jurisdiction.

2. The project architect shall request the excruciating root protection drawing be installed by the contractor to an agreed upon schedule. The project architect shall request the recommended protection zones. Additionally, the project architect shall inspect the drawing at the onset of each phase of construction. The root protection zone for trees is the project architect's responsibility. The project architect shall be responsible for the protection of each tree. Note: "steep" is not an acceptable location for installation of a new tree.

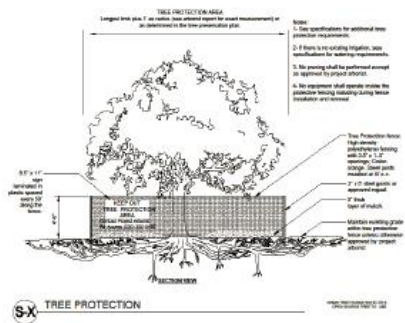
3. The project architect shall directly supervise any clearing, grading, grading, irrigation, fertilization, planting of stock and/or chemical treatments. If clearance pruning is required, the project architect shall supervise the pruning. The project architect shall ensure the pruning to be performed by a contractor who is a ISA Certified Arborist. The project architect shall ensure the pruning is done in a manner that will not cause the tree to become unstable. The project architect shall ensure the pruning is done in a manner that will not cause the tree to become unstable.

4. No work within the root protection zone of any trees shall be removed using a backhoe or other type of grading equipment.

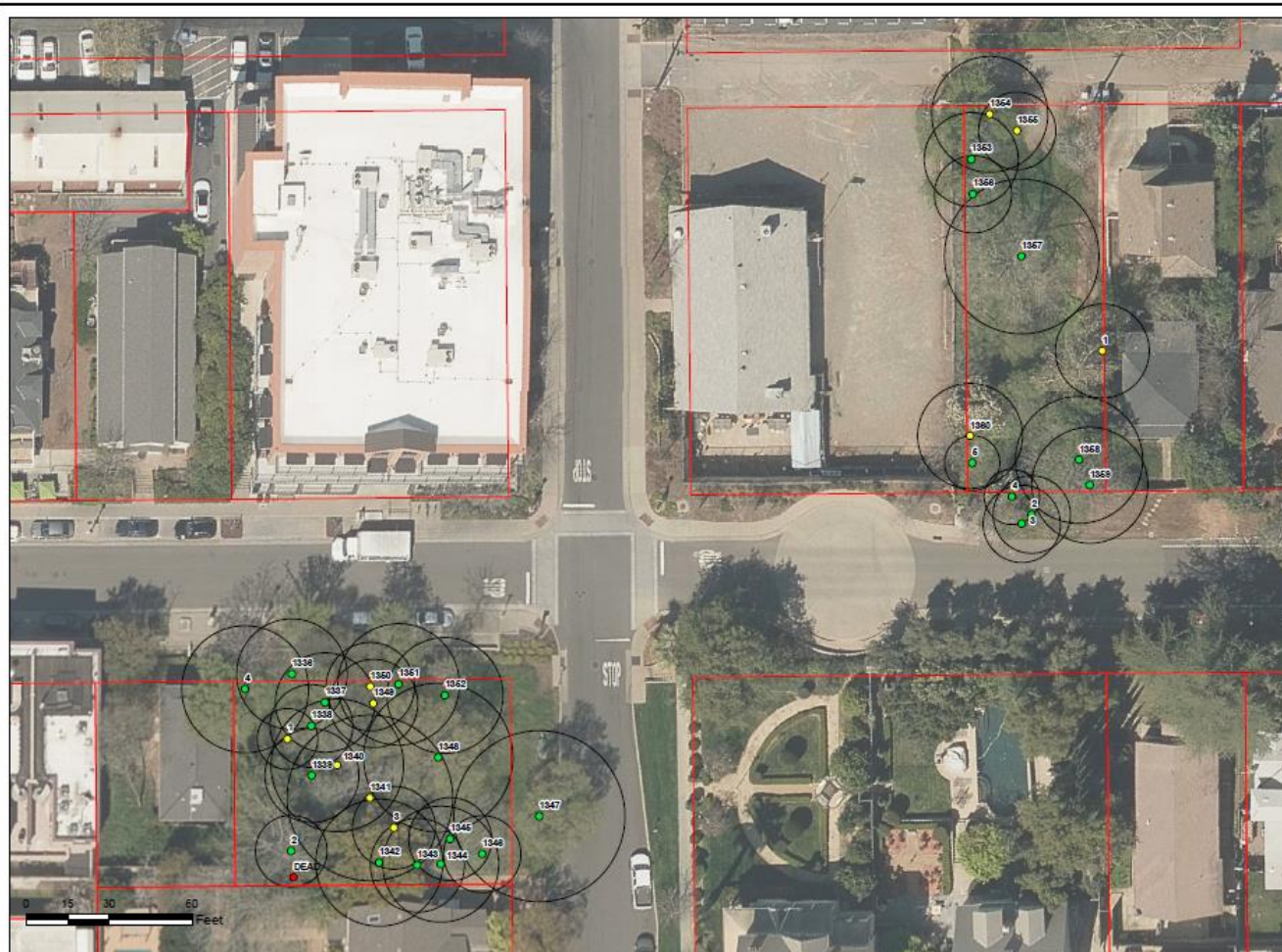
5. Once the root protection zone is established, it is the responsibility of the contractor to ensure that construction materials may be stored, and parking can take place. No materials or parking shall take place within the protection zones of any trees on site. The project architect shall be responsible for the protection of the trees. The project architect shall ensure that the root protection zone is established and that the contractor is aware of the root protection zone. The project architect shall ensure that the contractor is aware of the root protection zone.

6. Treeing, if required, inside the protected root zone shall be approved and/or supervised by the project architect and may be required to be performed by hand, with a hydraulic or air spade, or other method which will place no pressure on the roots without the use of the root zone.

7. The root protection zone for trees is specified in the "schematic" and in Appendix 2 in the attached project information. The project architect shall be responsible for the protection of the trees. Note: "steep" is not an acceptable location for installation of a new tree.



**S-X** TREE PROTECTION



>Tree locations are approximate and were collected using apple IOS products.  
>Property line information was downloaded from Sacramento County on 06/15/2022.



Sheet No.  
TPP 1.0

612 and 803 Sutter Street  
Folsom, Sacramento County, CA

Date: 8/16/2022

## APPENDIX 2 – TREE DATA

Field Tag #	Old Tag #	Protected By Code	Offsite	Common Name	Botanical Name	Multi-Stems	DSH	Measured At	Canopy Radius	TPZ	Arborist Rating	Field Notes	Site	Recommendations
1		No	Yes	London Plane	<i>Platanus × acerifolia</i>		17	54	17	18	2 Major Structure or Health Problems	Offsite, touching fence. Extensive branch dieback. Low vigor.	512 Sutter	None at this time.
2		No	No	Ailanthus	<i>Ailanthus sp.</i>		7.5	54	14	15	3 Fair - Minor Problems	Located in the street Right of Way? Good base, structure and vigor.	512 Sutter	None at this time.
3		No	No	Ailanthus	<i>Ailanthus sp.</i>	6.5,6	12	54	14	15	3 Fair - Minor Problems	Located in the street Right of Way? Good base, structure and vigor.	512 Sutter	None at this time.
4		No	No	Chinese Photinia	<i>Photinia serratifolia</i>	3,3	6	54	10	11	3 Fair - Minor Problems	Codominant at grade. Good vigor.	512 Sutter	None at this time.
5		No	No	Ailanthus	<i>Ailanthus sp.</i>		5	54	10	11	3 Fair - Minor Problems	Good base, structure and vigor. Grows next to retaining wall.	512 Sutter	None at this time.
1353		Yes	No	Valley Oak	<i>Quercus lobata</i>		13	54	17	18	3 Fair - Minor Problems	Good base. Fair/poor structure. Topped on west side for powerlines. Good foliage health. Fair overall vigor.	512 Sutter	None at this time.
1354		Yes	No	Valley Oak	<i>Quercus lobata</i>	11,8	19	54	21	22	2 Major Structure or Health Problems	Good base. Codominant at 1'. Canopy topped for powerlines directly above tree. Poor structure. High amount of small dead branches. Damaged foliage. Low vigor.	512 Sutter	None at this time.

Field Tag #	Old Tag #	Protected By Code	Offsite	Common Name	Botanical Name	Multi-Stems	DSH	Measured At	Canopy Radius	TPZ	Arborist Rating	Field Notes	Site	Recommendations
1355		Yes	No	Valley Oak	<i>Quercus lobata</i>		7	54	14	15	2 Major Structure or Health Problems	Swollen base, with closed wounds. Topped for powerlines. Poor structure. Low vigor.	512 Sutter	None at this time.
1356		Yes	No	Valley Oak	<i>Quercus lobata</i>		8.5	54	14	15	3 Fair - Minor Problems	Good base, structure and vigor.	512 Sutter	None at this time.
1357		No	No	Pecan	<i>Carya illinoensis</i>		19	54	28	29	3 Fair - Minor Problems	Good base, structure and vigor. Long lateral branches west.	512 Sutter	None at this time.
1358		No	No	Ailanthus	<i>Ailanthus sp.</i>		15	54	23	24	3 Fair - Minor Problems	Good base, structure and vigor.	512 Sutter	None at this time.
1359		No	No	Silk	<i>Albizia julibrissin</i>	9,7,6	22	54	21	22	3 Fair - Minor Problems	Multi-stem at grade. Fair structure. Good foliage health. Good vigor.	512 Sutter	None at this time.
1360	925	No	No	Ailanthus	<i>Ailanthus sp.</i>		12	54	19	20	2 Major Structure or Health Problems	30% dead bark on base. 40% dead bark on trunk south. Fair structure. Fair/low vigor.	512 Sutter	None at this time.

TOTAL INVENTORIED TREES = 13 trees (162 aggregate diameter inches)
<b>TOTAL RECOMMENDED REMOVALS = None</b>
Rating (0-5): 2=4 trees; 3=9 trees
<b>City Protected Trees = 4 trees (47.5 aggregate diameter inches)</b>

Field Tag #	Old Tag #	Protected By Code	Offsite	Common Name	Botanical Name	Multi-Stems	DSH	Measured At	Canopy Radius	TPZ	Arborist Rating	Field Notes	Site	Recommendations
1		No	No	Prunus	<i>Prunus sp.</i>		6	12	11	12	2 Major Structure or Health Problems	Good base. Crowded codominant stems rubbing. Understory structure. Fair vigor.	603 Sutter	None at this time.
2		No	No	Privet	<i>Ligustrum</i>		7.5	54	13	14	3 Fair - Minor Problems	Good base, structure and vigor.	603 Sutter	None at this time.

Field Tag #	Old Tag #	Protected By Code	Offsite	Common Name	Botanical Name	Multi-Stems	DSH	Measured At	Canopy Radius	TPZ	Arborist Rating	Field Notes	Site	Recommendations
3		No	No	Plum	<i>Prunus domestica</i>		7	12	15	16	2 Major Structure or Health Problems	Mature small diameter shoots at grade. High amount of epicormic shoots. High amount of small dead branches. Poor structure. Low vigor.	603 Sutter	None at this time.
4		No	Yes	Ailanthus	<i>Ailanthus sp.</i>		14	12	23	24	3 Fair - Minor Problems	Multi-stem at 2'. Good structure and vigor.	603 Sutter	None at this time.
1336	23777	Yes - Street	No	Blue Oak	<i>Quercus douglasii</i>		12	54	20	21	3 Fair - Minor Problems	Good base, structure and vigor. Crowded codominant stems at 8'. Leans slightly north over Sutter Street.	603 Sutter	None at this time.
1337		Yes	No	Interior Live Oak	<i>Quercus wislizeni</i>		11	54	18	19	3 Fair - Minor Problems	Good base, structure and vigor. Leans slightly north.	603 Sutter	None at this time.
1338		Yes	No	Interior Live Oak	<i>Quercus wislizeni</i>		10	54	15	16	3 Fair - Minor Problems	Good base, structure and vigor. Small low dead branches.	603 Sutter	None at this time.
1339	906	Yes	No	Blue Oak	<i>Quercus douglasii</i>		9.5	54	17	18	3 Fair - Minor Problems	Good base, structure and vigor. Codominant at 15'. Small low dead branches.	603 Sutter	None at this time.
1340	23775	Yes	No	Valley Oak	<i>Quercus lobata</i>		12	54	24	25	2 Major Structure or Health Problems	Slightly swollen base. Codominant at 14' with visible elevated seam below codominant union. Moderate/heavy lean north. Poor stem taper. Good foliage health. Fair vigor.	603 Sutter	None at this time.

Field Tag #	Old Tag #	Protected By Code	Offsite	Common Name	Botanical Name	Multi-Stems	DSH	Measured At	Canopy Radius	TPZ	Arborist Rating	Field Notes	Site	Recommendations
1341	915	No	No	Pecan	<i>Carya illinoensis</i>		14	54	30	31	2 Major Structure or Health Problems	Good base. Unbalanced trunk, takes 90-degree turn north at 10', then corrects back upward at 12'. Branch dieback in canopy. Fair/low vigor.	603 Sutter	None at this time.
1342	23773	No	No	Camphor	<i>Cinnamomum camphora</i>		27	12	23	24	3 Fair - Minor Problems	Good base. Multi-stem at 5'. Fair structure, rubbing canopy stems. Moderate branch dieback in canopy. Good vigor.	603 Sutter	None at this time.
1343		No	No	Pecan	<i>Carya illinoensis</i>		7	54	17	18	3 Fair - Minor Problems	Multi-stem at grade. Closing 6" wound in multi-stem union. Good structure and vigor.	603 Sutter	None at this time.
1344		No	No	Pecan	<i>Carya illinoensis</i>	7,6,5	18	54	21	22	3 Fair - Minor Problems	Multi-stem at grade. Stems lean heavy east. Good vigor.	603 Sutter	None at this time.
1345	919	No	No	Pecan	<i>Carya illinoensis</i>		5.5	54	15	16	3 Fair - Minor Problems	Fair base, structure and vigor.	603 Sutter	None at this time.
1346	920	No	No	Pecan	<i>Carya illinoensis</i>		6	54	14	15	3 Fair - Minor Problems	Fair base, structure and vigor.	603 Sutter	None at this time.
1347		Yes - Street	No	Valley Oak	<i>Quercus lobata</i>		19	54	31	32	3 Fair - Minor Problems	Good base, structure and vigor. Vine growing into mid canopy east.	603 Sutter	None at this time.
1348		Yes	No	Valley Oak	<i>Quercus lobata</i>		17	54	27	28	3 Fair - Minor Problems	Slightly swollen base. Good trunk. Good canopy structure. Good vigor.	603 Sutter	None at this time.

Field Tag #	Old Tag #	Protected By Code	Offsite	Common Name	Botanical Name	Multi-Stems	DSH	Measured At	Canopy Radius	TPZ	Arborist Rating	Field Notes	Site	Recommendations
1349		Yes	No	Interior Live Oak	<i>Quercus wislizeni</i>	8,5	13	54	16	17	2 Major Structure or Health Problems	Growing on slope. Partially buried root collar. Swollen codominant union. Codominant at 1'. Fair structure, crossing, touching canopy stems. Sparse foliage. Fair vigor.	603 Sutter	None at this time.
1350	908	Yes	No	Interior Live Oak	<i>Quercus wislizeni</i>		7	54	16	17	2 Major Structure or Health Problems	Fair structure, crossing, touching canopy stems. Sparse foliage. High amount of small dead branches. Low vigor.	603 Sutter	None at this time.
1351		Yes	No	Blue Oak	<i>Quercus douglasii</i>		12	54	22	23	3 Fair - Minor Problems	Good base. Leans slightly north over Sutter Street. High amount of small dead branches. Good canopy structure. Fair vigor.	603 Sutter	None at this time.
1352		Yes	No	Blue Oak	<i>Quercus douglasii</i>		9.5	54	21	22	3 Fair - Minor Problems	Swollen base, small closing wounds on base and trunk. Leans north. Good structure and vigor.	603 Sutter	None at this time.

TOTAL INVENTORIED TREES = 21 trees (243 aggregate diameter inches)

**TOTAL RECOMMENDED REMOVALS = None**

Rating (0-5): 2=6 trees; 3=15 trees

**City Protected Trees = 11 trees (131 aggregate diameter inches)**

## APPENDIX 3 – GENERAL PRACTICES FOR TREE PROTECTION

### Definitions

Root zone: The roots of trees grow fairly close to the surface of the soil, and spread out in a radial direction from the trunk of tree. A general rule of thumb is that they spread 2 to 3 times the radius of the canopy, or 1 to 1½ times the height of the tree. It is generally accepted that disturbance to root zones should be kept as far as possible from the trunk of a tree.

Inner Bark: The bark on large valley oaks and coast live oaks is quite thick, usually 1" to 2". If the bark is knocked off a tree, the inner bark, or cambial region, is exposed or removed. The cambial zone is the area of tissue responsible for adding new layers to the tree each year, so by removing it, the tree can only grow new tissue from the edges of the wound. In addition, the wood of the tree is exposed to decay fungi, so the trunk present at the time of the injury becomes susceptible to decay. Tree protection measures require that no activities occur which can knock the bark off the trees.

### Methods Used in Tree Protection:

No matter how detailed Tree Protection Measures are in the initial Arborist Report, they will not accomplish their stated purpose unless they are applied to individual trees and a Project Arborist is hired to oversee the construction. The Project Arborist should have the ability to enforce the Protection Measures. The Project Arborist should be hired as soon as possible to assist in design and to become familiar with the project. He must be able to read and understand the project drawings and interpret the specifications. He should also have the ability to cooperate with the contractor, incorporating the contractor's ideas on how to accomplish the protection measures, wherever possible. It is advisable for the Project Arborist to be present at the Pre-Bid tour of the site, to answer questions the contractors may have about Tree Protection Measures. This also lets the contractors know how important tree preservation is to the developer.

Root Protection Zone (RPZ): Since in most construction projects it is not possible to protect the entire root zone of a tree, a Root Protection Zone is established for each tree to be preserved. The minimum Root Protection Zone is the area underneath the tree's canopy (out to the dripline, or edge of the canopy), plus 10'. The Project Arborist must approve work within the RPZ.

Irrigate, Fertilize, Mulch: Prior to grading on the site near any tree, the area within the Tree Protection fence should be fertilized with 4 pounds of nitrogen per 1000 square feet, and the fertilizer irrigated in. The irrigation should percolate at least 24 inches into the soil. This should be done no less than 2 weeks prior to grading or other root disturbing activities. After irrigating, cover the RPZ with at least 12" of leaf and twig mulch. Such mulch can be obtained from chipping or grinding the limbs of any trees removed on the site. Acceptable mulches can be obtained from nurseries or other commercial sources. Fibrous or shredded redwood or cedar bark mulch shall not be used anywhere on site.

Fence: Fence around the Root Protection Zone and restrict activity therein to prevent soil compaction by vehicles, foot traffic or material storage. The fenced area shall be off limits to all construction equipment, unless there is express written notification provided by the Project Arborist, and impacts are discussed and mitigated prior to work commencing.

No storage or cleaning of equipment or materials, or parking of any equipment can take place within the fenced off area, known as the RPZ.

The fence should be highly visible, and stout enough to keep vehicles and other equipment out. I recommend the fence be made of orange plastic protective fencing, kept in place by t-posts set no farther apart than 6'.

In areas of intense impact, a 6' chain link fence is preferred.

In areas with many trees, the RPZ can be fenced as one unit, rather than separately for each tree.

Where tree trunks are within 3' of the construction area, place 2" by 4" boards vertically against the tree trunks, even if fenced off. Hold the boards in place with wire. Do not nail them directly to the tree.

The purpose of the boards is to protect the trunk, should any equipment stray into the RPZ.

**Elevate Foliage:** Where indicated, remove lower foliage from a tree to prevent limb breakage by equipment. Low foliage can usually be removed without harming the tree, unless more than 25% of the foliage is removed. Branches need to be removed at the anatomically correct location in order to prevent decay organisms from entering the trunk. For this reason, a contractor who is an ISA Certified Arborist should perform all pruning on protected trees.<sup>3</sup>

**Expose and Cut Roots:** Breaking roots with a backhoe, or crushing them with a grader, causes significant injury, which may subject the roots to decay. Ripping roots may cause them to splinter toward the base of the tree, creating much more injury than a clean cut would make. At any location where the root zone of a tree will be impacted by a trench or a cut (including a cut required for a fill and compaction), the roots shall be exposed with either a backhoe digging radially to the trunk, by hand digging, or by a hydraulic air spade, and then cut cleanly with a sharp instrument, such as chainsaw with a carbide chain. Once the roots are severed, the area behind the cut should be moistened and mulched. A root protection fence should also be erected to protect the remaining roots, if it is not already in place. Further grading or backhoe work required outside the established RPZ can then continue without further protection measures.

**Protect Roots in Deeper Trenches:** The location of utilities on the site can be very detrimental to trees. Design the project to use as few trenches as possible, and to keep them away from the major trees to be protected. Wherever possible, in areas where trenches will be very deep, consider boring under the roots of the trees, rather than digging the trench through the roots. This technique can be quite useful for utility trenches and pipelines.

**Protect Roots in Small Trenches:** After all construction is complete on a site, it is not unusual for the landscape contractor to come in and sever a large number of "preserved" roots during the installation of irrigation systems. The Project Arborist must therefore approve the landscape and irrigation plans. The irrigation system needs to be designed so the main lines are located outside the root zone of major trees, and the secondary lines are either laid on the surface (drip systems), or carefully dug with a hydraulic or air spade, and the flexible pipe fed underneath the major roots.

Design the irrigation system so it can slowly apply water (no more than ¼" to ½" of water per hour) over a longer period of time. This allows deep soaking of root zones. The system also needs to accommodate infrequent irrigation settings of once or twice a month, rather than several times a week.

**Monitoring Tree Health During and After Construction:** The Project Arborist should visit the site at least twice a month during construction to be certain the tree protection measures are being followed, to monitor the health of impacted trees, and make recommendations as to irrigation or other needs. After construction is

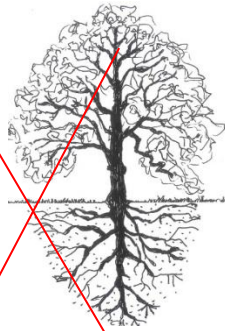
---

<sup>3</sup> International Society of Arboriculture (ISA), maintains a program of Certifying individuals. Each Certified Arborist has a number and must maintain continuing education credits to remain Certified.

complete, the arborist should monitor the site monthly for one year and make recommendations for care where needed. If longer term monitoring is required, the arborist should report this to the developer and the planning agency overseeing the project.

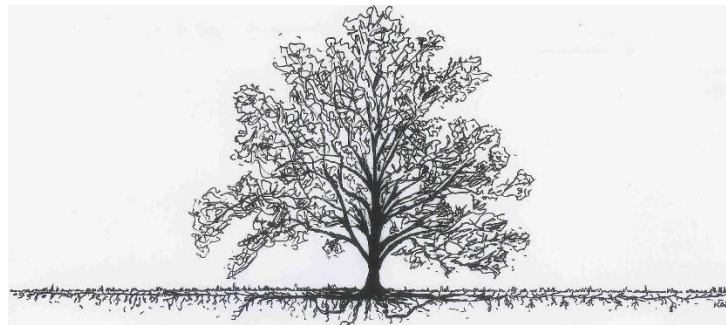
### Root Structure

The majority of a tree's roots are contained in a radius from the main trunk outward approximately two to three times the canopy of the tree. These roots are located in the top 6" to 3' of soil. It is a common misconception that a tree underground resembles the canopy (see Drawing A below). The correct root structure of a tree is in Drawing B. All plants' roots need both water and air for survival. Surface roots are a common phenomenon with trees grown in compacted soil. Poor canopy development or canopy decline in mature trees is often the result of inadequate root space and/or soil compaction.



Drawing A

Common misconception of where tree roots are assumed to be located



Drawing B

The reality of where roots are generally located

## Structural Issues

Limited space for canopy development produces poor structure in trees. The largest tree in a given area, which is 'shading' the other trees is considered Dominant. The 'shaded' trees are considered Suppressed. The following picture illustrates this point. Suppressed trees are more likely to become a potential hazard due to their poor structure.

Dominant Tree

Growth is upright

Canopy is balanced by limbs and foliage equally

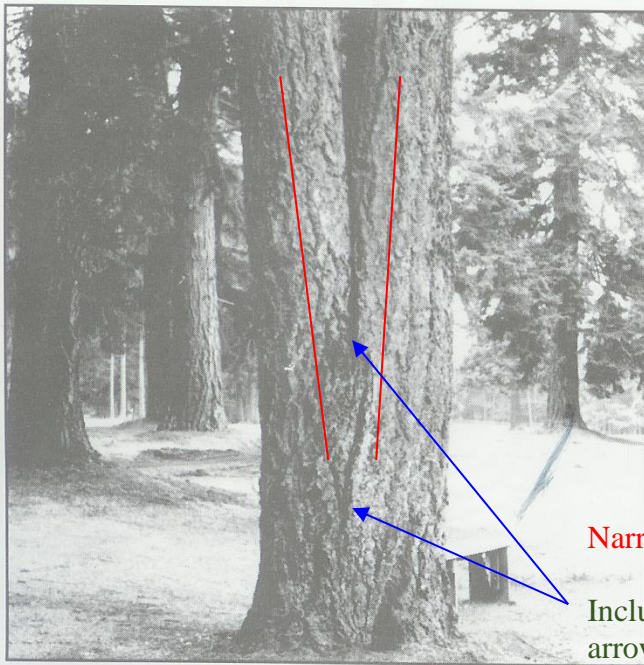


Suppressed Tree

Canopy weight all to one side

Limbs and foliage grow away from dominant tree

Co-dominant leaders are another common structural problem in trees.



The tree in this picture has a co-dominant leader at about 3' and included bark up to 7 or 8'. Included bark occurs when two or more limbs have a narrow angle of attachment resulting in bark between the stems – instead of cell to cell structure. This is considered a critical defect in trees and is the cause of many failures.

Narrow Angle

Included Bark between the arrows

Figure 6. Codominant stems are inherently weak because the stems are of similar diameter.

Photo from [Evaluation of Hazard Trees in Urban Areas](#) by Nelda P. Matheny and James R. Clark, 1994 International Society of Arboriculture

## Pruning Mature Trees for Risk Reduction

There are few good reasons to prune mature trees. Removal of deadwood, directional pruning, removal of decayed or damaged wood, and end-weight reduction as a method of mitigation for structural faults are the only reasons a mature tree should be pruned. Live wood over 3" should not be pruned unless absolutely necessary. Pruning cuts should be clean and correctly placed. Pruning should be done in accordance with the American National Standards Institute (ANSI) A300 standards. It is far better to use more small cuts than a few large cuts as small pruning wounds reduce risk while large wounds increase risk.

Pruning causes an open wound in the tree. Trees do not "heal" they compartmentalize. Any wound made today will always remain, but a healthy tree, in the absence of decay in the wound, will 'cover it' with callus tissue. Large, old pruning wounds with advanced decay are a likely failure point. Mature trees with large wounds are a high failure risk.

Overweight limbs are a common structural fault in suppressed trees. There are two remedial actions for overweight limbs (1) prune the limb to reduce the extension of the canopy, or (2) cable the limb to reduce movement. Cables do not hold weight they only stabilize the limb and require annual inspection.



Photo of another tree – not at this site.

Normal limb structure

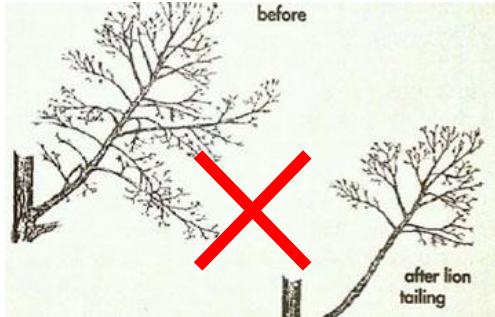
Over weight, reaching limb with main stem diameter small compared with amount of foliage present



Photo of another tree – not at this site

Lion's – Tailing is the pruning practice of removal of “an excessive number of inner and/or lower lateral branches from parent branches. Lion's tailing is not an acceptable pruning practice” ANSI A300 (part 1) 4.23. It increases the risk of failure.

Pruning – Cutting back trees changes their natural structure, while leaving trees in their natural form enhances longevity.



### Arborist Classifications

There are different types of Arborists:

Tree Removal and/or Pruning Companies. These companies may be licensed by the State of California to do business, but they do not necessarily know anything about trees;

Arborists. Arborist is a broad term. It is intended to mean someone with specialized knowledge of trees but is often used to imply knowledge that is not there.

ISA Certified Arborist: An International Society of Arboriculture Certified Arborist is someone who has been trained and tested to have specialized knowledge of trees. You can look up certified arborists at the International Society of Arboriculture website: [isa-arbor.org](http://isa-arbor.org).

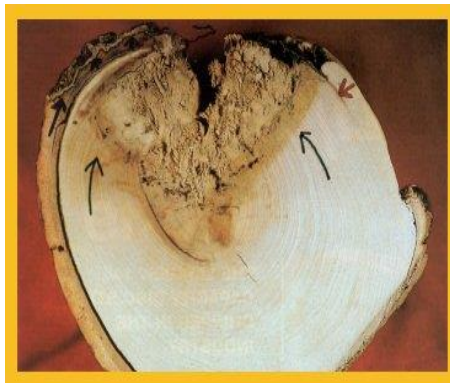
Consulting Arborist: An American Society of Consulting Arborists Registered Consulting Arborist is someone who has been trained and tested to have specialized knowledge of trees and trained and tested to provide high quality reports and documentation. You can look up registered consulting arborists at the American Society of Consulting Arborists website: <https://www.asca-consultants.org/>

## Decay in Trees

**Decay (in General):** Fungi cause all decay of living trees. Decay is considered a disease because cell walls are altered, wood strength is affected, and living sapwood cells may be killed. Fungi decay wood by secreting enzymes. Different types of fungi cause different types of decay through the secretion of different chemical enzymes. Some decays, such as white rot, cause less wood strength loss than others because they first attack the lignin (causes cell walls to thicken and reduces susceptibility to decay and pest damage) secondarily the cellulose (another structural component in a cell walls). Others, such as soft rot, attack the cellulose chain and cause substantial losses in wood strength even in the initial stages of decay. Brown rot causes wood to become brittle and fractures easily with tension. Identification of internal decay in a tree is difficult because visible evidence may not be present.



According to Evaluation of Hazard Trees in Urban Areas (Matheny, 1994) decay is a critical factor in the stability of the tree. As decay progresses in the trunk, the stem becomes a hollow tube or cylinder rather than a solid rod. This change is not readily apparent to the casual observer. Trees require only a small amount of bark and wood to transport water, minerals and sugars. Interior heartwood can be eliminated (or degraded) to a great degree without compromising the transport process. Therefore, trees can contain significant amounts of decay without showing decline symptoms in the crown.



additional cells. The weakest of the vertical wall. Accordingly, decay progression inward at large are more than one pruning cut trunk of the tree, the likelihood of decay progression and the associated structural loss of integrity of the internal wood is high.

Compartmentalization of decay in trees is a biological process in which the cellular tissue around wounds is changed to inhibit fungal growth and provide a barrier against the spread of decay agents into the barrier zones is the formation of while a tree may be able to limit pruning cuts, in the event that there located vertically along the main

## Oak Tree Impacts

Our native oak trees are easily damaged or killed by having the soil within the Critical Root Zone (CRZ) disturbed or compacted. All of the work initially performed around protected trees that will be saved should be done by people rather than by wheeled or track type tractors. Oaks are fragile giants that can take little change in soil grade, compaction, or warm season watering. Don't be fooled into believing that warm season watering has no adverse effects on native oaks. Decline and eventual death can take as long as 5-20 years with poor care and inappropriate watering. Oaks can live hundreds of years if treated properly during construction, as well as later with proper pruning, and the appropriate landscape/irrigation design.