Deborah Ellis, MS

Consulting Arborist & Horticulturist

Service since 1984

Erwin Ordonez
Town of Los Gatos Community Planning Department
110 E. Main Street
Los Gatos, CA 95031

September 24, 2014

Re: 341 Bella Vista Avenue, Review of 9/5/14 Revised Plans relative to Existing Tree Protection

Dear Erwin:

My last Arborist Report for this project is dated October 28, 2013. For this current report I reviewed the following 9/5/14 plan sheets, which are new to me for this project:

- C1 Demolition
- C2 Grading & Drainage
- C3 Site Logistics & Construction Management
- C4 Hillside Exceptions

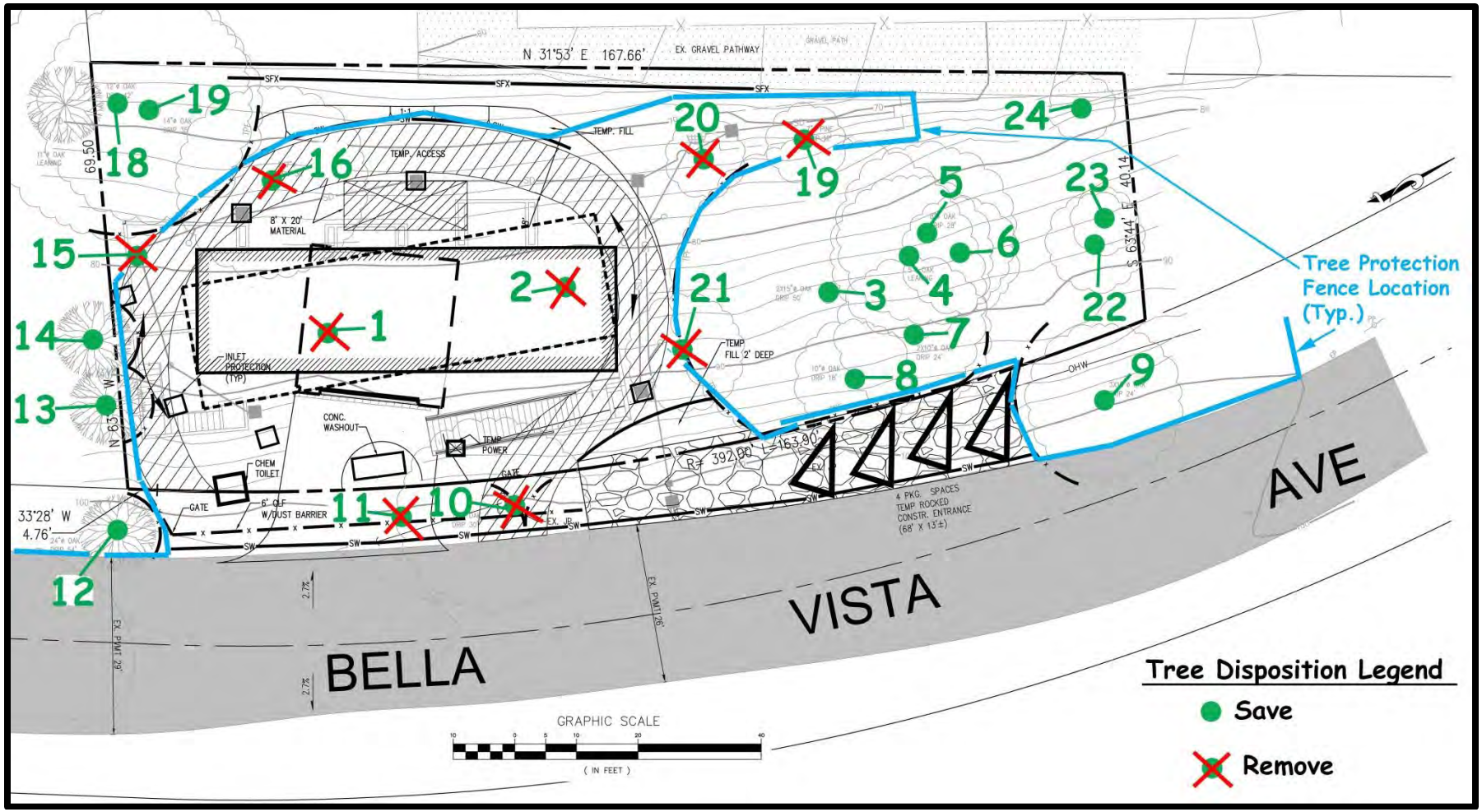
Based upon these plans:

- The following 7 protected trees will be removed: **#1, 2, 10, 11, 15, 19, and 21**.
- The following 3 trees of less than protected size will be removed: **#4, 16 and 20**.
- The following 14 protected trees will be saved and protected: **#3, 5, 6, 7, 8, 9, 12, 14, 14, 17, 18, 22, 23 and 24.**
    - Of the above 14 trees, **#12, 13 and 14** are on neighboring property to the south.

The **Tree Map** on the next page shows the updated disposition of the trees, and each tree is also identified and described in the **Tree Table** on pages 3 and 4.

A **Discussion** of the project in terms of existing tree retainment is on page 5.

Recommendations are provided on pages 6 through 9.



Tree Map (see Notes, page _).

Tree Table (continued on the next page)

* Not a protected tree

Tree #	Common Name	TRUNK DIAM. (In. @ 3 ft.)	Preservation Suitability	SIZE (Height x Width in feet)	Expected Construction Impact	Action	Reason	Notes
01	**coast live oak**	**20,18,9, 14,12,22**	**Fair/Good**	45x50	**Severe**	**Remove**	**Construction**	**Within proposed house.**
02	**coast live oak**	**48**	**Fair/Good**	50x50	**Severe**	**Remove**	**Construction**	**Within proposed house.**
03	coast live oak	22,24	Fair/Poor	50x50	Low	Save	Overall Condition	
***04**	**almond**	**5**	**None**	4x4	**Low**	**Remove**	**Dead**	
05	coast live oak	11	Fair	22x12	Low	Save		
06	coast live oak	9	Fair	20x10	Low	Save		
07	coast live oak	12, 10	Fair/Poor	30x18	Low	Save		
08	coast live oak	11	Fair	20x16	Low/Moderate	Save		
09	coast live oak	9,11,13,13	Fair	20x30	Low/Moderate	Save		
10	**coast live oak**	**16**	**Fair/Good**	30x18	**Severe**	**Remove**	**Construction**	**Within construction access road.**
12	coast live oak	33	Fair/Poor	30x45	Moderate	Save		
13	valley oak	11	Poor	40x25	Moderate/Severe	Save	Neighbor's tree	
14	coast live oak	4	Poor	9x9	Moderate/Severe	Save	Neighbor's tree	
15	**coast live oak**	**5,7,11,18**	**Fair**	40x30	**Severe**	**Remove**	**Construction**	**Within proposed access road and patio.**
***16**	**olive**	**3,3,5,9**	**Fair/Poor**	25x20	**Severe**	**Remove**	**Construction**	**Within proposed access road and patio.**
17	coast live oak	19	Fair/Good	50x30	Low/Moderate	Save		
18	coast live oak	12	Fair/Poor	20x20	Low	Save		

Tree Table (continued from the previous page)

Tree #	Common Name	TRUNK DIAM. (In. @ 3 ft.)	Preservation Suitability	SIZE (Height x Width in feet)	Expected Construction Impact	Action	Reason	Notes
19	**Canary Island pine**	**13**	**Fair**	60x18	**Severe**	**Remove**	**Construction**	
***20**	**almond**	**5,4**	**Poor**	28x15	**Moderate/Severe**	**Remove**	**Construction, Overall Condition**	**Within a few feet of overflow pump well and several underground pipes requiring trenching.**
21	**coast live oak**	**5**	**Fair**	18x16	**Moderate/Severe**	**Remove**	**Construction**	**Within 10 feet of house wall, and closer to several underground pipes.**
22	coast live oak	8	Fair/Good	20x12	Low	Save		
23	coast live oak	4,4	Fair	18x15	Low	Save		
24	coast live oak	8	Fair	18x16	Low	Save		

End of Table

Notes on Tree Map and Tree Table:

1. The plan sheet used for the Tree Map is the *Site Logistics & Construction Management Plan*, sheet C-3. All of the proposed improvements shown on the 9/5/14 C-Sheets (C1-4) are not shown on this plan, so it may not be obvious why a particular tree is shown to be removed. Read the "Action" and "Notes" column in the Tree Table to find out why a particular tree is listed to be removed.

2. The *Trunk Diameter, Size* and *Condition* ratings in the *Tree Table* are from my last evaluation of the trees and the site on October 24, 2013. I did however, ride by the site last week to take a brief look around. The site and the condition of the trees do not seem to have changed appreciably since my October 2013 evaluation.

Discussion about this Project in General, from an Existing Tree Preservation Perspective:

This is a very difficult site to design and build a house on! I am impressed with the effort that has been put into this project from an existing tree retention perspective. It is inevitable that some trees will need to be removed in order to place a house on the lot. Reducing the number of houses from two to one has made it possible to keep the Northern portion of the lot undisturbed as green space, which is certainly of benefit to the neighborhood.

There are few more trees that will need to be removed than are indicated on the C-3 plans. The reason for this is that not all improvements have been shown on all plans, and a few necessary tree removals were missed because of this. The current tree removal list in this report is a compilation of all improvements on all of the C-3 sheets. Most of the trees that will be removed except for **trees #1, 2 and 10** have been rated as having "Fair" or less preservation suitability, so the majority of trees that will be removed are not good specimens.

Because the steepness of the slope on the property and the complexity of construction, additional damage to trees may occur than is anticipated from this, my most current review of the plans. On the other hand, it is also possible that some trees may be damaged to a lesser extent than I have estimated. Part of tree protection on this project will involve dealing with site and tree conditions as they come up. We are going to have to do the best that we can in terms of tree protection, given the difficult nature of this site. Commitment and cooperation from the property owner, the project architects and the general contractor will be necessary for successful tree protection. The involvement of a project arborist[1] that will be on site frequently to monitor and assist in tree protection is essential.

The temporary access road through the site will cause some damage to the trees. This access road is necessary however, because equipment and materials have to enter and move around the site somehow. How much damage this road will cause to trees is difficult to accurately predict until this road is actually under construction. Some root damage, both direct (physical damage to roots due to vehicle or equipment impact) and indirect (soil compaction) is inevitable. Root damage can be reduced by using the smallest equipment possible (e.g. small bobcat backhoe, versus standard full-size equipment) and spreading a protective layer of gravel on the roadway path. Post construction remediation of soil compaction can be attempted via methods such as water jetting followed by mulching, although it is always best to avoid compaction in the first place. Damage to tree canopies and trunks is possible as well, although trunk damage should be preventable with proper tree protection fencing placed as far from the tree trunks as possible. Damage to canopies (branches) is possible and could be reduced by using the smallest equipment possible and knowing the height of the equipment and clearance needed for its travel, followed by careful construction clearance pruning.

[1] Terms highlighted at their first occurrence in this report are explained in the Glossary on pages 10 and 11.

I looked through some of the 9/12/13 plans, including sheet A-1.0, **Tree Canopy Coverage Area Studies**. Canopy coverage of the entire property is listed as 40%. This seems low, based upon the aerial photos on this same sheet. I looked at the property in Google Earth™ and found the most recent image which is dated 2/20/14. There are many shadows in the 2/20 image, which could cause an over-estimation of canopy cover. The second most recent Google Earth image is 4/2013, which is somewhat better (in terms of fewer shadows) but this is not the image included on plan sheet A-1.0. The plan pictures are good and seem to be taken at about noon so there are few or no shadows. In any case however, I think the canopy cover is greater than closer to 70% although this is a rough estimate and I did not perform any graphic analyses. I would like to know how the 40% canopy cover was calculated.

The trees on this site grow in a tight grove fashion; nearly covering the site with their canopies. It is going to be difficult to estimate the loss in canopy cover after trees to be removed are gone. I recommend we wait until those trees have indeed been removed and then re-assess the remaining canopy cover and whether or not any tree replanting is warranted here. The site is really overcrowded with trees. Many trees do not have good individual structure due to crowding and shading by neighboring trees. When existing trees are removed adjacent trees should be re-assessed as they may not be stable due to the greater exposure and reduced shelter.

Recommendations:

1. **Remove the following 10 trees**: **#1, 2,4,10, 11, 15, 16, 19, 20 and 21.**

2. **Save and protect the following 14 trees**: **#3, 5, 6, 7, 8, 9, 12, 13, 14, 17, 18, 22, 23 and 24.**

3. **For those trees that will be retained on the site, follow the *Town of Los Gatos General Tree Protection Directions*.** A separate copy of these Directions is attached and must be incorporated into the project final plans. Additional tree protection information is also available from Deborah Ellis if necessary. Remove the *Tree Protective Notes* on plan sheet C-3 and replace them with the Town's Directions. In the Tree Protection Details next to the Notes on sheet C-3 omit the trunk wrapping drawing because all trees will be fenced off from construction. Trunk wrapping should only be used when trees will not otherwise be fenced off from construction.

4. **Note the revised location for tree protection fencing** on the *Tree Map* in this report.

5. **An on-site supervising project arborist will be essential for this project.** A qualified consulting arborist (the project arborist) should be hired to monitor tree protection and supervise all work underneath the dripline of trees. This also applies to trees on neighboring properties whose canopies overhang the work site. Construction or landscaping work done underneath the dripline of existing trees should be done by hand to the extent possible, taking care to preserve existing roots in undamaged condition as much as possible and cutting roots cleanly by hand when first encountered, when those roots must be removed.

6. **For temporary access road construction**: use the smallest equipment possible, such as a small bobcat versus larger, standard-size heavy construction vehicles. Prior to bringing these vehicles on site, know their height and width of the equipment so that a qualified tree service can provide construction clearance pruning to allow for vehicle and equipment access while avoiding tree branch breakage. The access road should be as narrow as possible. Prior to access road construction, remove any trees to be removed, and large shrubs within the access road path. Then mow the pathway area if necessary, using a flail mower and cutting all vegetation down to a height of 6 inches or less. Cut vegetation may be left within the path area if it will not interfere with the geotectile fabric (next). After mowing, lay down an appropriate geotectile fabric product over the roadway path. The fabric should extend 12 – 18 inches beyond the sides of the access road. Then spread a 6-inch thick layer of 1/5 – 2-inch base rock material within the roadway path, on top of the geotectile fabric. Dump the rock, spread it and drive on it with a front-end loader bucket attached to a bobcat, and then repeat the process until the roadway has been completed, always keeping the backhoe on the gravel. Then spread a 6-inch layer of organic mulch material (wood or bark chips or tree trimming chippings) on top of the rock. All vehicles should then remain on the gravel/mulch within the access road. Minor alterations to this method may occur; but the goal is to establish a roadway that is suitable for construction vehicles but significantly reduces soil compaction by those vehicles.

7. **Equipment and material storage: all storage must take place in areas where the building itself or pavement outside the building (e.g. driveway, patios) will be constructed**. There shall be no storage within tree protection zones. Vehicles may not park on the project site except for within these areas or on the gravel-covered access road.

8. **If the current design is revised or additional improvement plans are prepared, as part of the design process, try to keep improvements (and any additional over-excavation or work area beyond the improvement) as far from tree trunks and canopies as possible.** *5xDBH* or the dripline of the tree, whichever is greater, should be used as the minimum distance for any soil disturbance to the edge of the trunk. *3xDBH* should be considered the absolute minimum distance from any disturbance to the tree trunk on one side of the trunk only, for root protection. Farther is better, of course. For disturbances on multiple sides of the trunk, then 5xDBH or greater should be used, and farther is also better here. Tree canopies must also be taken into consideration when designing around trees. Don't forget the minimum necessary working margin around improvements as you locate those improvements. Disturbance usually comes much closer to trees than the lines shown on the plans!

9. **The Town's Consulting Arborist should review all site-based plans for this project:** Additional improvements not shown on plans that were not reviewed may cause additional trees to be impacted and/or removed. Therefore the tree dispositions (*Save or Remove*) listed in this report may change if and when additional plans for this project are reviewed, or if plans that I have reviewed are revised. Plans reviewed by the arborist should be full-size, to-scale and with accurately located tree trunks and canopy driplines relative to proposed improvements. Scale should be 1:20 or 1:10.

10. **This site contains many oaks that are native to the immediate area** (coast live oak, *Quercus agrifolia* and valley oak, *Q. lobata*). All or most of these oaks are probably of natural growth. These tree species fares best with no irrigation during the normal dry months of the year. The best treatment of the ground beneath the canopies of native oaks is nothing but their own natural leaf and twig litter mulch. Exceptions to the general rule of irrigation restriction include during the winter in extended drought periods, as temporary compensation for root loss due to construction, and for newly planted trees during their 2 to 3 year establishment period after installation. Native oak species are often killed due to inappropriate landscaping that is installed around them; mostly commonly landscaping that requires frequent irrigation such as lawns or other high water-use plants. Large drought tolerant trees such as native oaks can become dangerous when exposed to frequent irrigation, especially close to their trunks. California native oaks that are treated in this manner may contract root rot diseases and fall over at the roots; often causing great damage and personal injury I there are targets in their vicinity such as homes, cars and people. It is important to landscape correctly around our native oaks; e.g. summer dry. I have attached a publication entitled *Living among the Oaks,* to assist in best managing the oaks on the property.

11. **Neighboring trees**: whose canopies overhang the project site must receive tree protection in the same manner as existing trees to remain on the project site; for example tree protection fencing and signage. The general contractor shall fence off the ground surface underneath the dripline of these trees as much as possible in order to avoid damaging branches and compacting the soil beneath the canopy. If pruning is necessary in order to avoid branch breakage, the general contractor shall hire a qualified tree service to perform the minimum necessary construction clearance pruning. Neighboring trees that require protection are: **#12, 13 and 14**.

12. **The remaining trees on site should be re-evaluated** after surrounding trees are removed.

13. **General Tree Maintenance:**
    a. **The root collars and lower trunks of some of the trees were obscured from view by vegetation, excess soil or other covering**. Such portions of the tree should be uncovered and the tree re-evaluated by the arborist.

b. **Do no unnecessary pruning, fertilization or other tree work**. Pre-construction pruning should be limited to the absolute minimum required for construction clearance. Some pre-construction clearance pruning will be necessary for this project. A qualified tree service should be hired to provide such pruning.

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I certify that the information contained in this report is correct to the best of my knowledge, and that this report was prepared in good faith. Thank you for the opportunity to provide service again. Please call me if you have questions or if I can be of further assistance.

Sincerely,

Deborah Ellis, MS.
Consulting Arborist & Horticulturist
Certified Professional Horticulturist #30022
ASCA Registered Consulting Arborist #305
I.S.A. Board Certified Master Arborist WE-457B

Enclosures:

- *Living among the Oaks – a Management Guide for Landowners.* Johnson. University of California Cooperative Extension, Natural Resources Program. No date.
- Los Gatos General Tree Protection Directions. Aug. 7, 2014.
- Los Gatos Tree Protection Sign Template (for tree protection signs to be placed on tree protection fencing)

Glossary:

1. **5xDBH** (3 to 5 X DBH): No one can estimate and predict with absolute certainty how far a soil disturbance such as an excavation must be from the edge of the trunk of an individual tree to effect tree stability or health at a low, moderate or severe degree -- there are simply too many variable involved that we cannot see or anticipate. 3xDBH however, is a reasonable "rule of thumb" minimum distance (in feet) any excavation should be from the edge of the trunk on one side of the trunk. This is supported by several separate research studies including (Smiley, Fraedrich, & Hendrickson 2002, Bartlett Tree Research Laboratories). DBH is trunk "diameter at breast height" (4.5 feet above the ground). This distance is often used during the design and planning phases of a construction project in order to estimate root damage to a tree due to the proposed construction. It tends to correlate reasonably well with the zone of rapid taper, which is the area in which the large buttress roots (main support roots close to the trunk) rapidly decrease in diameter with increasing distance from the trunk. For example, using the 3X DBH guideline an excavation should be no closer than 4.5 feet from the trunk of an 18-inch DBH tree. For trees with multiple trunks, an adjusted DBH is often calculated using 100% of the largest trunk plus 50% of the remaining smaller trunks. Such distances are guidelines only, and should be increased for trees with heavy canopies, significant leans, decay, structural problems, etc. I will generally not recommend a root protection distance of less than 3 feet for any tree, even very small trees. It is also important to understand that in actual field conditions we often find that much less root damage occurs than was anticipated by the guidelines. 3xDBH may be more of an aid in preserving tree stability and not necessarily long-term tree health. 5X DBH or greater is the "preferred" minimum distance which should be strived for, and this distance or greater should probably be used when there are multiple trenches on more than one side of the trunk. The roots beyond the zone of rapid taper form an extensive network of long, rope-like roots one to two inches in diameter. These woody perennial roots are referred to as transport roots because they function primarily to transport water and minerals. Maintaining a 5xDBH tree protection zone or greater around a tree will preserve more of these transport roots, which will have less of an impact on tree health than if the excavation were closer to the trunk.
2. **Dripline**: the area under the total branch spread of the tree, all around the tree. Although tree roots may extend out 2 to 3 times the radius of the dripline, a great concentration of active roots is often in the soil directly beneath this area. The dripline is often used as an arbitrary "tree protection zone".
3. **Grove**: is a group of trees that located close together that shelter each other from wind and the elements, having "knit" canopies. If of the same species, there is usually root grafting between trees, which lends support from the ground, as well as water and mineral sharing. Removal of one or some grove members could cause remaining members to be unstable due to a reduction of previous shelter. Grove trees often have asymmetrical canopies when viewed as individuals.
4. **Project Arborist: The arborist who is appointed to be in charge of arborist services for the project.** That arborist shall also be a *qualified consulting arborist* (either an International Society of Arboriculture (ISA) Board-Certified Master Arborist or an American Society of Consulting Arborists (ASCA) Registered Consulting Arborist) that has sufficient knowledge and experience to perform the specific work required. For most construction projects that work will include inspection and documentation of tree protection fencing and other tree protection procedures, and being available to assist with tree-related issues that come up during the project.

5. **Qualified Consulting Arborist:** must be either an International Society of Arboriculture (ISA) Board-Certified Master Arborist or an American Society of Consulting Arborists (ASCA) Registered Consulting Arborist that has sufficient knowledge and experience to perform the specific work required.
6. **Qualified Tree Service**: A tree service with a supervising arborist who has the minimum certification level of ISA (International Society of Arboriculture) Certified Arborist, in a supervisory position on the job site during execution of the tree work. The tree service shall adhere to the most current of the following arboricultural industry tree care standards:
   - ANSI A300 Pruning Standards. (Covers tree care methodology).
   - ANSI Z133.1 Safety Requirements for Arboricultural Operations. (Covers safety).
   - Best Management Practices, Tree Pruning. International Society of Arboriculture
7. **Root collar**: area at the base of the trunk (usually flared) where the roots and trunk merge; also called the root flare or root crown of the tree or shrub. Buttress roots (the main support roots of the tree) originate here and are often visible for a short distance above the ground. The root collar is critical to whole-tree health and stability.
8. **Root rot disease** is caused by wet, poorly aerated soil conditions. Degradation of roots (root rot) and sometimes the lower trunk (crown rot) ensues on weakened, susceptible plant species not adapted to such a soil environment. Opportunistic plant root pathogens (such as watermold fungi) are often the secondary cause of the problem. Root rot is a particular problem among drought tolerant plants that are not adapted to frequent irrigation during our normally rain-free months, such as many of our California native plants. The problem is often worsened in fine-textured heavy clay soils that retain water more than do the coarser, fast-draining soils such as occur in the natural environment of many of our native plants.
9. **Summer Dry**: Our native oak species are adapted to our "summer dry" climate. When the soil in their root system is kept moist during our normally dry months, these oaks are predisposed to attack by fungal root rot pathogens that are usually present in our soils. Therefore it is important to keep irrigation as far from the tree trunk (preferably beyond the mature dripline) as possible. The best landscape treatment underneath native oaks is non-compacted soil covered with a 3 to 4-inch depth of oak wood, leaf and twig litter (the tree's natural litter). Keep this mulch 6 to 12 inches away from the root collar (junction of trunk and roots). An exception to the no summer water rule would be newly planted oaks (for the first 2 to 3 years after planting, until they are "established") and also during droughts that occur during the normal rainy season.
10. **Water Jet**: (water probe, water needle, root feeder, hydrojet, etc.) is a hand-held metal probe, usually ½ to ¾ of an inch in diameter, with small side holes near the pointed tip end. The device is attached to a hose and the probe end with the holes is inserted into the ground by pushing on two perpendicular side handles at the top of the instrument. Water flows out of the holes horizontally, and a hole is also made vertically into the ground by the probe. The end result is the creation of vertical and horizontal tunnels filled with water and soft soil slurry. Water jetting probably does not increase soil aeration (diffusion of air through the soil), but it can help circumvent difficult water penetration of compacted, sealed soils or soil – especially on slopes. The probe creates voids in the soil that can more easily be penetrated by future irrigation and rain. The soft slurry created by the water jetting is also highly conducive to fine root growth. Contact D. Ellis for specific water jet instructions and to companies that can provide this work.