Protected Tree Report:
Tree Survey, Encroachment, Protection and Mitigation

2235 N. Santa Anita Ave.
Sierra Madre, CA 91024

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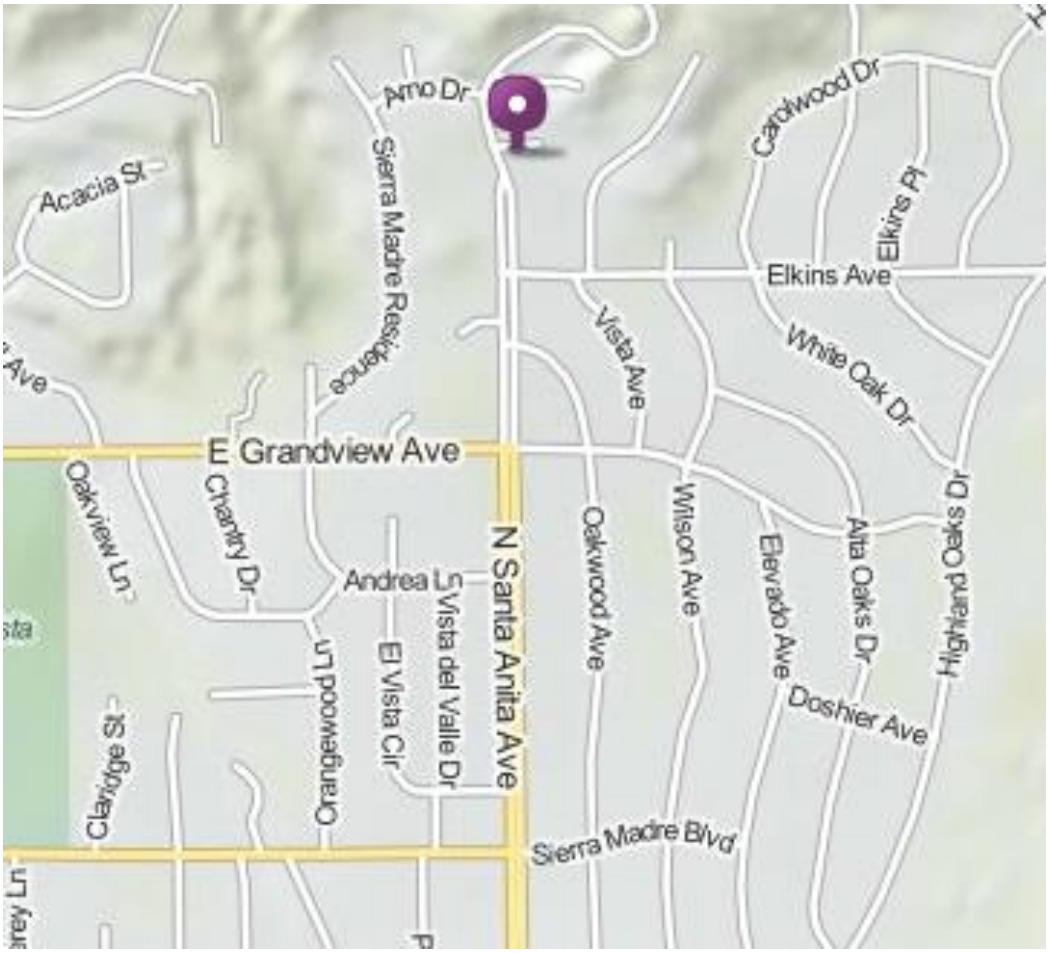
SUMMARY OF DATA

Total number of live Protected Trees on property	6
Total number of off-site Protected Trees with canopies (driplines) encroaching onto the property	0
Total number of street trees located in front of the property	1
Total number of live Protected Trees to be preserved	6
Total number of live Protected Trees to be removed	0
Total number of Protected Trees to be impacted by construction within dripline	3
Total number of proposed mitigation trees to be planted on site	0

BACKGROUND & PURPOSE

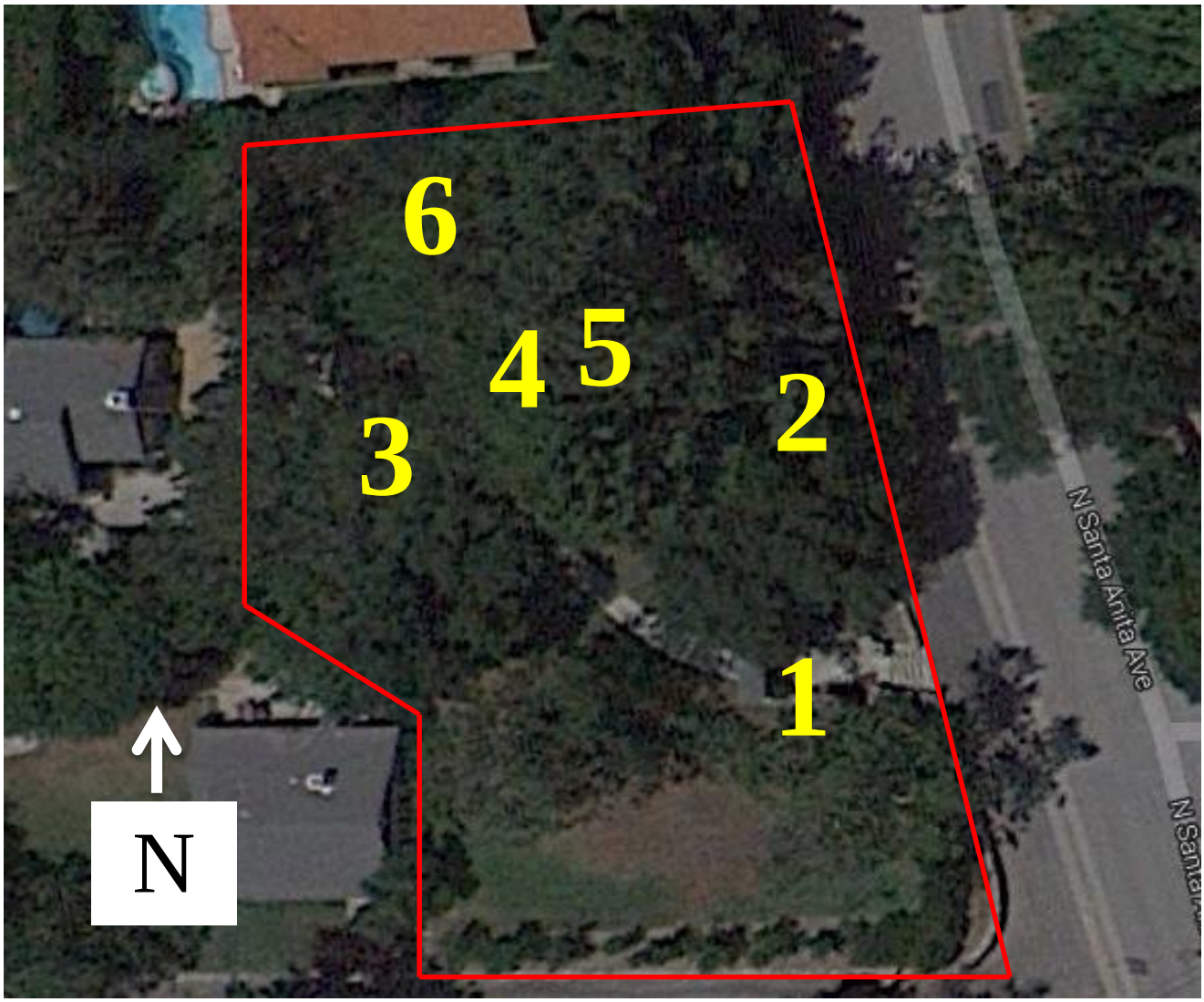
I was retained by the architect, Mr. Philip Chan, of PDS, Inc. to be the arborist of record for the redevelopment of the property at 2235 Santa Anita Avenue in Sierra Madre. There are six Protected Trees located on the property and the proposed construction may impact these trees. My first assignment was to prepare a report for the Protected Trees by examining the subject trees and analyze the proposed building plans. This report will serve to both notify the City of Sierra Madre, Tree Advisory Commission and Planning Department of the extent of the potential impacts as well as to inform the builder of the proper protection measures which must be taken in order to preserve the trees. As part of my preparation for this report I made a site visit to the property on April 21, 2014. I met with Mr. Chan at that time to discuss the proposed construction plans as they relate to the preservation of the protected trees.

PROJECT LOCATION, DESCRIPTION & PROTECTED TREE SURVEY



The property is located at 2235 Santa Anita Ave. It is north of Grandview Avenue, and just south of Arno Drive.

The property does not have a home on it, but has retaining walls, fences and a flat cleared area for a building pad. The existing landscape very minimal, with several trees and drought tolerant shrubs that are maintained. All of the specimen trees, including the Protected Trees, are in good health and condition. The landscape will be redesigned with new hardscape, irrigation, lighting and plant material; and all of the specimen trees will be incorporated into the new landscape.



Aerial view and approximate boundary lines of property (red). Driplines of Protected Trees illustrated in yellow.(photo courtesy of Google Maps)

CITY OF SIERRA MADRE TREE ORDINANCE
12.20.110 Sec. D - Permit procedure

Construction shall not be done in a manner which negatively affects the growth or health potential of a tree required to be preserved. To improve the chances for long term survival of such trees, the following protection standards shall apply:

1. All cut, fill and/or building foundations shall be located at least three times the affected tree's diameter from the outside edge of the trunk of any tree scheduled for preservation and/or from any tree on adjacent properties, unless, because of the species affected, a lesser distance is adequate, as may be determined by the tree expert. No material stockpiling, storage, placement of excavated soils or other changes in grade shall occur within the dripline of any tree, either temporarily, during construction or permanently.

2. All trees scheduled for preservation shall have the ground area surrounding the trunk, for which areas maintenance and protection is necessary during construction for the purpose of tree preservation, conspicuously designated by durable semi-permanent means. Such area shall be located outside the tree's dripline, if possible, and shall be designated prior to the start of construction. In no event shall the outer limits of the designated area be located closer than five feet from the outside edge of the trunk unless a lesser distance is determined adequate by the tree expert. Designated areas shall not be used for vehicle parking, shall be maintained in a natural condition, and not compacted.

3. In order to avoid unnecessary damage to the root system of trees, the applicant will be required to submit a utility trenching pathway plan to the department of public works for review and approval prior to issuance of a building permit. The plan must depict all systems to be placed below ground including but not limited to the following systems: storm and runoff drains; sewers; gas lines; electrical, cable television and telephone lines; and water mains. Additionally, the plan must show all lateral lines serving the proposed construction and any proposed irrigation system. The plan must include trees accurately located on the project site as well as an accurate plotting of their root zones. The plan should be developed considering the following guidelines:

    a. The trenching pathway plan should avoid the root zone of any protected tree.

    b. In cases where alternative routes are not available, tunneling under roots shall be used for all underground lines such as utility and drain lines in order to preserve roots two inches or larger in diameter. All tunneling shall be performed under the on-site supervision of the tree expert.

    c. Wherever possible underground lines shall be combined in the fewest possible trenches.

    d. Where it is possible to avoid some encroachment into root zones, the design must minimize the extent of such encroachment. The tree expert may require that these encroachments and mitigation measures be documented in a supplemental report prepared by an arborist.

4. No more than one-third of the root feeding zone of oak trees scheduled for preservation may be allowed to be damaged by new development, unless it can be demonstrated by an arborist, to the satisfaction of the city, that a greater area of the root feeding zone can be involved without damaging the tree.

5. Root feeding zone damage to other species shall be as allowed by the city tree expert. The tree advisory commission shall request technical assistance to determine standards for other tree species common to Sierra Madre, such report to be made available to the public at City Hall and the city library.

6. All approved construction work within the root zone of trees scheduled for preservation shall observe the following minimum tree protection practices:

    a. Hand trenching shall be done at point of grade cuts closest to the trunk to expose the location of major roots, i.e., two inches in diameter or larger. Major roots shall be cut only with permission of the tree expert. In cases where rock or unusually dense soil prevents hand trenching, mechanical equipment may be approved; provided, that work inside the dripline is closely supervised by the city tree expert to prevent tearing or other damage to major roots.

    b. Where root cutting is permitted, exposed major roots shall be cut with a saw. Major roots shall not be ripped by construction equipment.

    c. Absorbent tarp or heavy cloth fabric shall be placed over new grade cuts and secured by stakes. Two to four inches of compost or woodchip mulch shall be spread over the tarp to prevent soil moisture loss. The organic covering material and tarp shall be thoroughly wetted twice per week to insure constant moisture levels until backfilling occurs.

    d. Trimming of branches shall be done with a saw, cut clean and performed according to standards of the International Society of Arboriculture. No tree sealant shall be used on cuts.

    e. Decks located above the root zone of trees scheduled for preservation shall be of post and beam construction to reduce the need for root pruning or removal.

    f. On-grade patios or paving that cover more than one-third of the root feeding zone of oak trees shall be constructed of permeable materials that allow aeration and water penetration.

    g. Planting and weed control beneath trees scheduled for preservation shall take into consideration the watering requirements of such trees, so as to prevent damage from over or under watering or other adverse affects on the health of the trees. Planting beneath native oak trees should be of special concern and should generally be avoided. (Installing lawn or other plantings that requires frequent watering insure a slow death for oak trees due to their sensitivity to over watering and susceptibility to oak root fungus.)

TREE SURVEY

TREE SURVEY FOR 0 MARIPOSA AVENUE, SIERRA MADRE						
TREE #	SPECIES	DBH (Inches)	GRADE based on health, form and esthetics	HEALTH	FORM	ESTHETICS
1	*P. racemosa*	26	1	Good	Good	Good
2	*Q. agrifolia*	29	1	Good	Good	Good
3	*Q. agrifolia*	16	2	Good	Fair	Good
4	*Q. agrifolia*	15	2	Good	Fair	Good
5	*Q. agrifolia*	17	2	Good	Fair	Good
6	*Q. agrifolia*	20	1	Good	Good	Good

Tree #'s correspond to the location plotted on all plans included in this report. Trees with trunks located off-site but with encroaching canopies are indicated with (os). Trunk diameter (DBH) was measured at a standard height according to the Guide to Plant Appraisal, 9th Edition. Numerical Grade Rating was derived from the Sierra Madre Tree Commission's Mitigation Guide for Protected Trees.

FIELD OBSERVATIONS & DESIGN ANALYSIS

Refer to Site Plan located in pocket at back of this report, Tree Characteristics and Health Matrix on page 6, Construction Impacts Matrix on page 7 and Photos in Appendix A, page 10.

Tree #1 – 26" *Platanus racemosa*: The foundation of the new home will encroach. The home has been designed around two sides of the tree and the foundation will come as close as 11 feet from the trunk on the south and 18 feet on the west sides of the trunk. The existing rock and concrete entry will remain and a concrete walkway will be extended from this entry to connect with the front entry to the house. This walkway will come within six feet of the trunk on the north side. No pruning of the live crown will be required to complete the project.

Tree #2 – 29" *Quercus agrifolia*: Encroachments will occur primarily from the installation of a new driveway and driveway entry on the south side of the trunk; and minimally from the foundation of the new home. The driveway entry will be built within the area located between the curb and existing garden wall, so will not require any excavation into the rootzone. Very light grading of a few inches will be required to

install the driveway and the required grading will occur at least 12 feet from the trunk on its south side, which is a distance that is equal to five times the trunk diameter. The driveway's surface will be interlocking pavers set on compacted sand.

The foundation of the new home encroaches within the dripline on the west side and will come as close as 18 feet from the trunk.

Some crown raising and reduction pruning will be required to allow for vehicle clearance on the driveway and to accommodate the roofline of the house. One 6-inch branch removal cut and one 4-inch reduction cut will be required. All other cuts will be two inches in diameter or less. No more than 10% of the tree's total live crown will be removed to accomplish the pruning objectives.

Tree #3 – 16" *Quercus agrifolia*: The foundation of the new home will encroach the dripline on the south and east sides, 5 feet and 12 feet from the trunk respectively. The tree is located just behind an existing retaining wall, which appears to be very substantial. This retaining wall has most likely restricte root growth beyond it so will act as an excellent buffer against impacts from the rootzone encroachment.

The tree has very few lower branches and it is possible the the home can be built without pruning; however if any pruning is required it will be contained to reduction cuts less than two inches in diameter and less than 10% removal of the tree's total live crown.

Tree #4 – 15" *Quercus agrifolia*: This tree is located on the slope above the retaining wall. No dripline encroachments will occur. The existing area within the dripline will remain as it is, which is a naturalized and non-irrigated area.

Tree #5 – 17" *Quercus agrifolia*: No encroachments or impacts will occur, similar to Tree #4

Tree #6 – 20" *Quercus agrifolia*: No encroachments or impacts will occur, similar to Trees #4 and #5. The existing property line fence located in the dripline will remain.

OBSERVATIONS

This chart includes all Protected Trees which are either located on or off-site (os) but encroaching over the property. It provides physical data collected from field observations. The trees have been surveyed and numbers correspond to the Site Plans included in this report.

TREE CHARACTERISTICS & HEALTH MATRIX

CHARACTERISTICS												HEALTH											
		SIZE			FORM		CROWN CLASS			AGE CLASS			FOLIAGE DENSITY			SHOOT GROWTH			WOUND DEFENSE			VIGOR CLASS		
TREE NUMBER	SPECIES	TRUNK DIAMETER (INCHES)	APPROXIMATE HEIGHT (FEET)	AVERAGE SPREAD (FEET)	SYMMETRIC	ASYMMETRIC	DOMINANT	CO-DOMINANT	SUPPRESED	YOUNG	MATURE	OVERMATURE	NORMAL	SPARSE	DISEASE OR INSECT DAMAGE PRESENT	AVERAGE	POOR	TWIG DIEBACK	NORMAL	POOR	WOOD DECAY	GOOD	POOR	ROOT / OTHER ROT
1	Platanus racemosa	26	45	45		X	X				X		X			X			X			X		
2	Quercus agrifolia	29	40	60	X		X				X		X			X			X			X		
3	Quercus agrifolia	16	40	35		X		X			X		X			X			X			X		
4	Quercus agrifolia	15	40	30		X		X			X		X			X			X			X		
5	Quercus agrifolia	17	40	30		X		X			X		X			X			X			X		
6	Quercus agrifolia	20	40	35	X			X			X		X			X			X			X		

ANALYSIS

This section includes all Protected Trees which are either located or encroaching on the property. It provides data collected from the analysis of construction plans. The tree has been surveyed and numbers correspond to the Site Plans included in this report.

CONSTRUCTION IMPACTS MATRIX

	TREE SPECIES	SIZE & CONDITION		ROOTZONE IMPACTS								REQUIRED PRUNING OF LIVE CROWN				
TREE NUMBER		TRUNK DIAMETER (DBH)	CONDITION	Sides of tree where excavation (six inches or deeper) will occur	Sides where excavation impacts are buffered by existing infrastructure	**Excavation will remain a distance of at least 10 X DBH from trunk**	**Excavation will remain a distance of at least 3 X DBH from trunk**	**Excavation will encroach the root plate (3 X DBH) from trunk**	**Removal or Relocation**	Additional light grading less than 6" deep to occur within dripline	Estimated % of total root mass to be removed or severed	**No Pruning Required**	**Pruning not to exceed 10%**	**Pruning not to exceed 30%**	Number of cuts larger than 3" in diameter required	Diameter of cuts for branch removals
1	Platanus racemosa	26	Good	S,W	-					Yes	<30				0	N/A
2	Quercus agrifolia	29	Good	S	-					Yes	<20				2	4, 6
3	Quercus agrifolia	16	Good	S,E	S,E					No	<10				0	N/A
4	Quercus agrifolia	15	Good	S	S					No	0				0	N/A
5	Quercus agrifolia	17	Good	S	S					No	0				0	N/A
6	Quercus agrifolia	20	Good	S	S					No	0				0	N/A

FINDINGS

As with many construction projects, soil compaction is the most preventable impact that will need to be monitored in order to provide reliable protection and long-term preservation of the trees. Since roots are distributed in the top several inches of soil, it is important to keep in mind that roots require air just as much as they require water and nutrients for proper growth and survival. Compaction of the pore or air space in the soil eliminates the soil's structure and it's conduciveness for root growth. To prevent unnecessary soil compaction protective fences and/or haul route roadbed material must be installed around the protected trees before any demolition occurs. The goal is to enclose the largest possible amount of space underneath the tree so that the heavy equipment required for grading and construction can be routed away from root zones. The recommended fence and protective material placements for the phases of the project is drawn on the Protective Fencing Plan in Appendix C of this report.

Pruning may be necessary on Tree #3 for roofline clearance. Pruning cuts can be made to industry standards and of tolerable sizes to allow for complete callous formation and healing. Less than 5% of the live canopy will be removed. All necessary pruning should be done during the summer months

MITIGATION

The six Protected Trees have been appraised at a total value of $81,800 (See worksheets in Appendix F) Appraisals were performed by using the trunk formula method of the Guide to Plant Appraisal, ninth edition.

According to the city's published Mitigation Guide for Protected Trees the following would apply to a tree on the property that is killed or severely injured:

Tree #1: (> 24" Grade 1 tree) The mitigation ratios for replacement trees would be determined by the Tree Advisory Commission or Commission-appointed expert should any damage occur.

Tree #2: (23"-24" Grade 1 tree) The mitigation ratios for replacement trees would be determined by the Tree Advisory Commission or Commission-appointed expert should any damage occur.

Tree #3: (15"-16" Grade 2 tree) Three 24" boxed, nursery grown native oak trees.

Tree #4: (15"-16" Grade 2 tree) Three 24" boxed, nursery grown native oak trees.

Tree #5 (16"-17" Grade 2 tree) Four 24" boxed, nursery grown native oak trees.

Tree #6 (19"-20" Grade 1 tree) Six 24" boxed, nursery grown native oak trees.

FURTHER RECOMMENDATIONS

- Refer to Appendix B for the Protected Tree Construction Impact Guidelines, and the Oak Tree Care and Maintenance in Appendix D for general preservation measures that should be taken during and after construction

- Prior to grading the contractor and consulting arborist shall meet on site to make sure fences are properly placed and installed and to review the goals for the tree protection plan. **The primary locations of the protective fences during the construction phase shall be set at the edges of the proposed work and are drawn in orange on the Protective Fencing Plan included in Appendix C.**

- Fence locations will be altered during construction to allow for the required work in the fenced protection zone; however, the actual protection zone extends five feet beyond the dripline of the canopy. **All work done within a minimum distance of five feet outside the driplines shall be monitored by the consultant.**

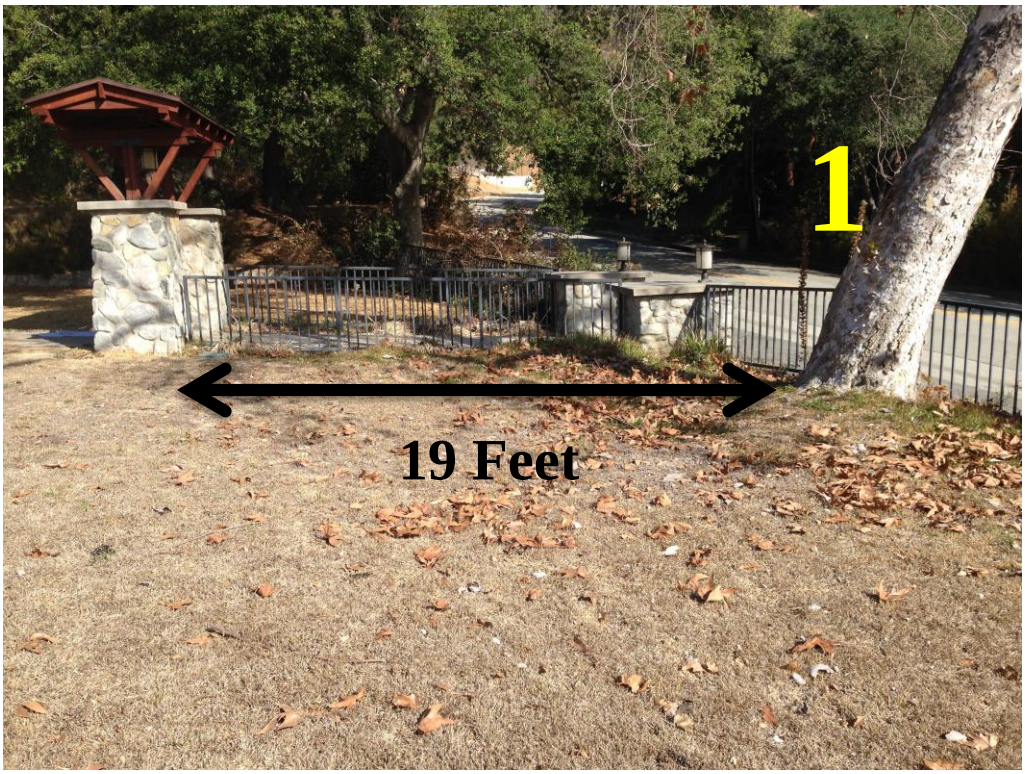
- The new driveway area will be graded to create the primary haul route into the property. The haul route area located within the dripline of Tree #2 shall be covered with 6 inches of chipped bark mulch and covered with commercial grade steel road or logging mats.

- Maintain the fences throughout the completion of the project. No staging of materials or equipment or washing-out is to occur within the fenced protected zones. No altering of the fence or entry into the fenced zone is permitted without the consultant's written approval.

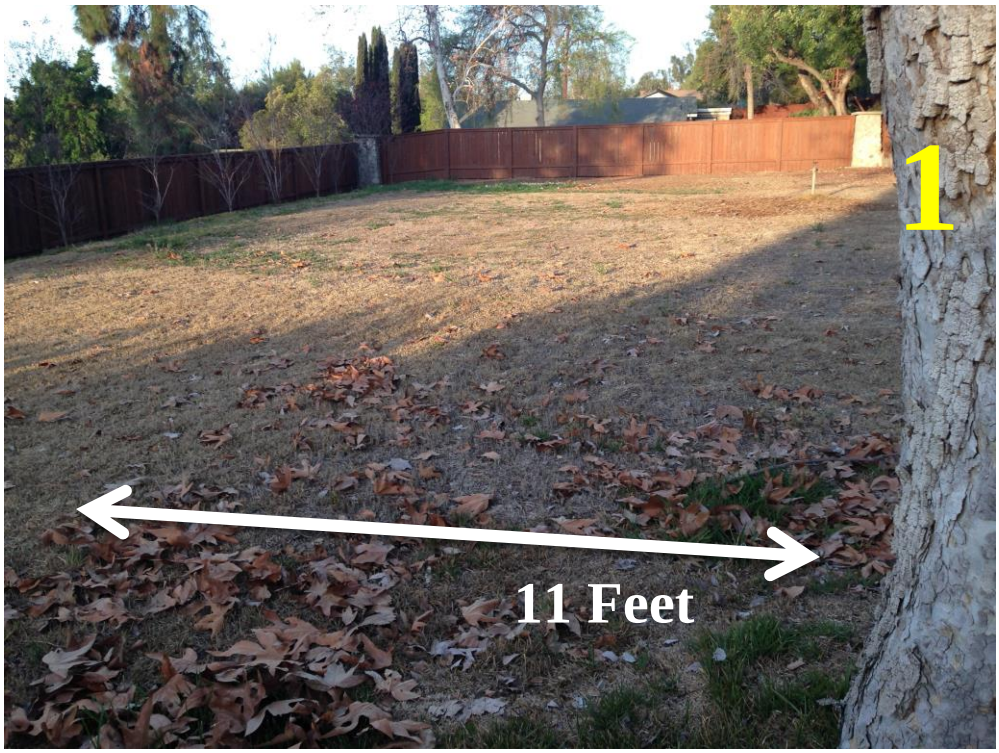
- All trenching required within the driplines of Protected Trees for underground utilities shall be done with the use of an air knife in order to preserve significant roots and allow for pipes and conduit to be tunneled underneath these roots.

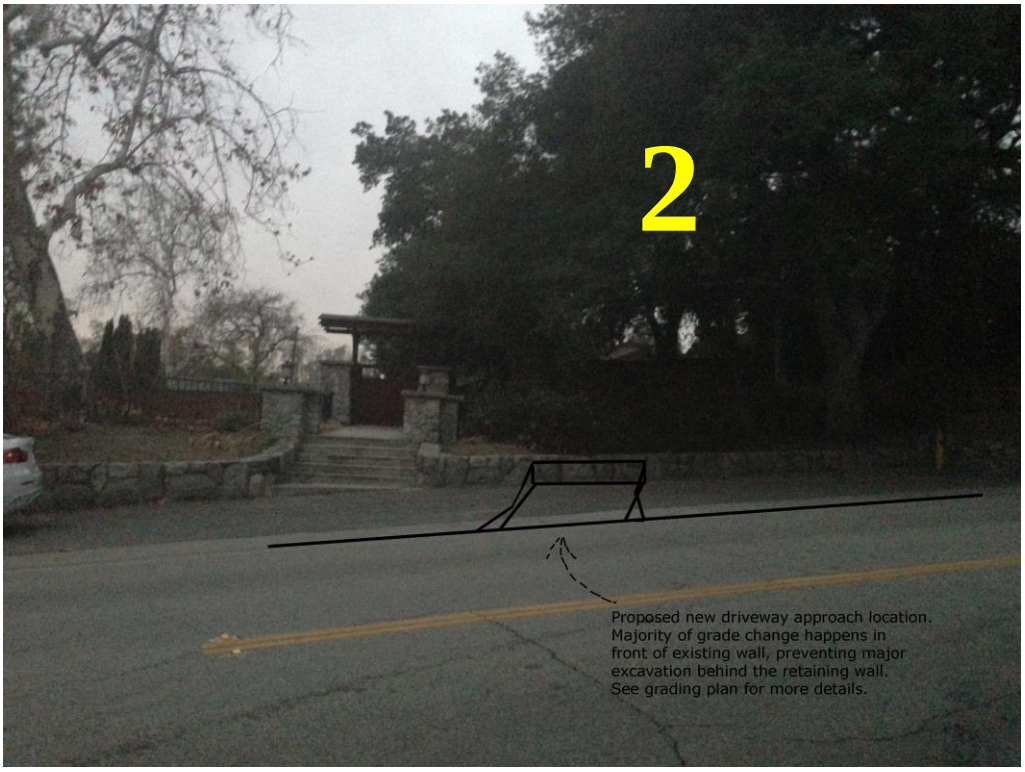
- If any injury whatsoever should occur to a Protected Tree or any other preserved tree, call the consulting arborist immediately. Timeliness is critical to being able to provide the best mitigation treatment for injuries.

APPENDIX A – Photos



ABOVE: Looking north towards Tree #1. The foundation will be located 19 feet from the trunk on its west side. BELOW: Looking west. The foundation will come as close as 11 feet on the north side of the trunk.

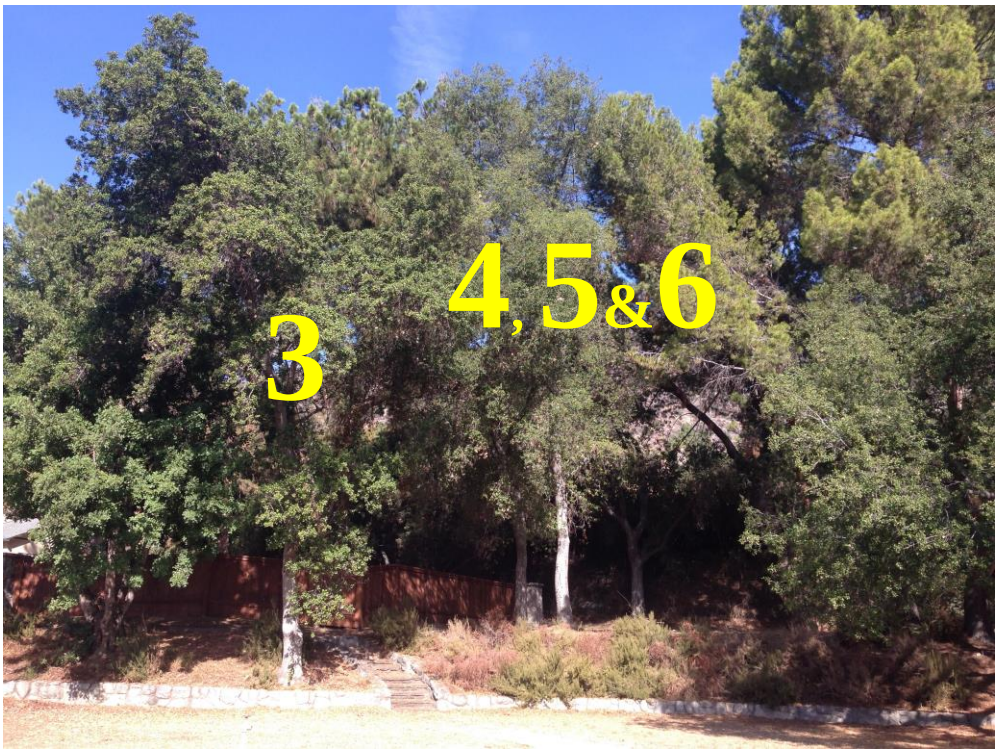




ABOVE: Looking west at Tree #2 from the street. A driveway approach will be built 13 feet from the trunk on its south side. The majority of the grade change for this approach will occur outside of the front garden wall. BELOW: Looking east. Once the grade for the driveway entry is achieved the driveway area will be built near grade with interlocking pavers set on a compacted sand base.

ABOVE: Tree #2 will need some crown raising type pruning over the driveway to accommodate the vehicle clearance. BELOW: A 6 inch removal cut of a loin's tailed branch will be required. Another 4 inch reduction cut will also be required

PHOTO: The new house will be built 5 feet from the trunk of Tree #3. It is located on a slope behind a rock retaining wall. Some slight crown raising will be required to accommodate the new roofline clearance.



ABOVE: Trees #3-#6 are located on a slope above the large flat pad where the home will be built. BELOW: The four trees are contained behind a very substantial rock retaining wall. The footing of this wall has acted as a root barrier and will be a good buffer against rootzone impacts during construction.

ABOVE: No rootzone impacts will occur on Trees #4, #5 and #6. The area will remain naturalized and non-irrigated. BELOW: The property line fences near Tree #6 will remain.

APPENDIX B - Protected Tree Construction Impact Guidelines

Size and Distribution of Tree Roots – Taken from Arboriculture, Integrated Management of Landscape Trees Shrubs and Vines. Harris, R.W., Clark, J.W., Matheny N.P. Prentice Hall 2004.

Roots of most plants, including large trees, grow primarily in the top meter (3 ft) of soil (see figure below). Most plants concentrate the majority of their small absorbing roots in the upper 150 mm (6 in.) of soil if the surface is protected by a mulch or forest litter. In the absence of a protective mulch, exposed bare soil can become so hot near the surface that roots do not grow in the upper 200 to 250 mm (8 to 10 in.). Under forest and many landscape situations, however, soil near the surface is most favorable for root growth. In addition, roots tend to grow at about the same soil depth regardless of the slope of the soil surface.

Although root growth is greatly influenced by soil conditions, individual roots seem to have an inherent guidance mechanism. Large roots with vigorous tips usually grow horizontally. Similar roots lateral to the large roots grow at many angles to the vertical, and some grow up into the surface soil. However, few roots in a root system actually grow down.

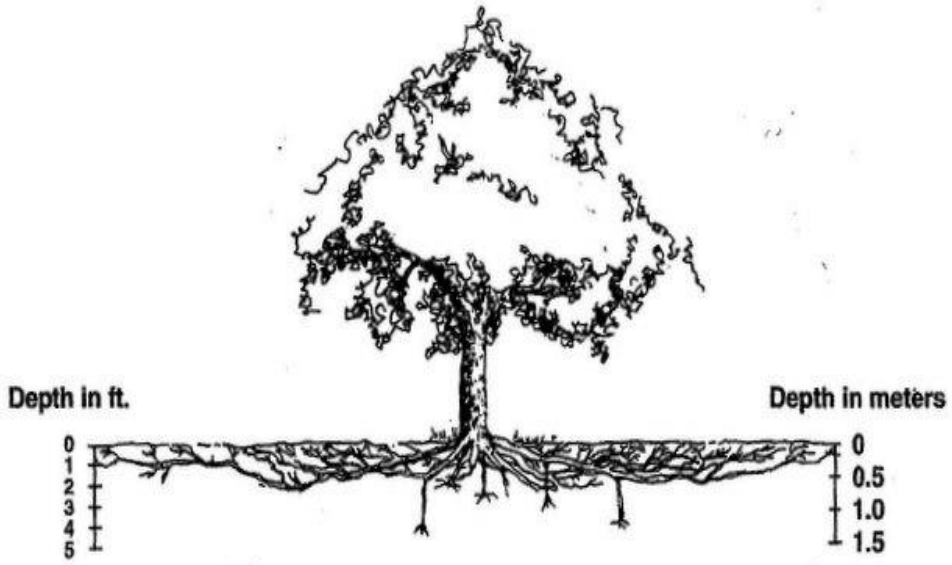


FIGURE In mature trees, the taproot is either lost or reduced in size. The vast majority of the root system is composed of horizontally oriented lateral roots.

The importance of soil

Soil supports and anchors tree roots and provides water, minerals and oxygen. Furthermore, soil is a habitat for soil microorganisms that enhance root function. A soil's ability to sustain tree growth is largely determined by its texture, structure (bulk density), organic matter, water and mineral content, salinity, aeration, and soil-microbe abundance and diversity.

Soil physical properties

Soil texture – the relative proportion of sand, silt and clay, is important because it affects water – and nutrient-holding capacity, drainage and aeration (gaseous diffusion). Soil structure is the arrangement of individual soil particles into clumps (aggregates). The net result is the formulation of larger voids between the aggregates which serve as channels for gaseous diffusion, movement of water and root penetration. Unfortunately, soil aggregates are readily destroyed by activities that compact the soil (increase bulk density). When this occurs, gaseous exchange, permeability, drainage and root growth are restricted.

The influence of the organic matter content of soil properties is quiet significant. Its decomposition by soil organisms releases substances that bind soil particles into larger granules, which improves both soil aeration, and drainage. In essence, the breakdown of organic matter improves water – and nutrient-holding capacity and reduces bulk density. Furthermore, it is the primary source of nitrogen and a major source of nitrogen and a major source of phosphorus and sulfur. Without organic matter soil organisms could not survive and most biochemical processes in the soil would cease.

Soil aeration, the movement and the availability of oxygen, is determined by both soil texture and structure. In general, compacted and finer soils, due to a higher proportion of small pore spaces (micropores), tend to drain slowly and hold less air than coarser, sandy, or well-structured find soils. Water retained in the small pores displaces oxygen and inhibits gaseous diffusion.

The availability of soil water is largely determined by the size of the pore spaces between the soil particles and the larger aggregates in which water is held. Most of the water in the larger pore spaces drains readily due to gravitational forces. A relatively thin film of water, which is readily available to plant roots, remains following drainage. Much of water held within the smaller pore spaces resists uptake by plant roots because it is held tightly on the soil surfaces.

Plant roots require an adequate supply of oxygen for development. Injury or dysfunction results when oxygen availability drops below a critical level. Root respiration is the first process to be restricted, followed by disruptions in growth, metabolism, nutrient and water uptake, and photosynthesis. Furthermore, the accumulation of high levels of carbon dioxide, produced by the roots during respiration can also impair root function. Reduced soil aeration resulting from soil compaction, flooding, excess irrigation, or impervious pavement favors the development of crown rot (Phytophthora root disease). It also inhibits mycorrhizal fungi that enhance water and nutrient uptake and resist root pathogens.

The forest floor under a canopy in most undeveloped forests and woodland settings is typically covered by a layer of fallen leaves and other woody debris. It is usually cool, shady, well-aerated, and relatively moist – conditions that favor normal root growth. When the natural leaf litter is removed and when a tree's lower canopy is pruned up to provide

clearance, the absorbing roots in the upper few inches of the soil experience higher soil temperatures and increased desiccation due to direct exposure to sunlight.

Minimizing the Effects of Construction and Development on Tree Root Systems

Activities that injure roots or adversely affect the root zone should be avoided or kept as far from the trunk as possible. Design changes or alternative building practices that avoid or minimize construction-related impacts should be considered and proposed when applicable.

Soil Compaction

Soils are intentionally compacted under structures, sidewalks, reads, parking areas, and load-bearing fill to prevent subsidence, and to prevent soil movement on slopes. Although unintentional, soil within the root zone of trees is often compacted by unrestricted foot traffic, parking of vehicles, operation of heavy equipment, and during installation of fill. Compaction destroys the soil's natural porosity by eliminating much of the air space contained within it. It leaves the soil hard and impenetrable; and largely unfavorable for root growth. The soil's natural porosity, which allows for water movement and storage, gaseous exchange, and root penetration, is greatly reduced. Consequently, root growth and tree health suffer. Soil compaction is best managed by preventing it. Bulk density is used to describe a soil's porosity, or the amount of space between soil particles and aggregates. High bulk densities indicate a low percentage of total pore space.

Pavement

Paving over the root systems of trees is another serious problem because it reduces the gaseous diffusion and soil moisture. Most paving materials are relatively impervious to water penetration and typically divert water away from a tree's root zone. Cracks and expansion joints do, though, allow for some water infiltration into the soil below. Of greater concern, is the loss of roots from excavation to achieve the required grade, and the necessary compaction to prevent subsidence. Once the soil surface is compacted, a base material is then added and compacted as well. With that done, the surface can then be paved. Thus, pavement within the root zones of trees can damage roots and create unfavorable soil conditions. One alternative to minimize pavement impacts is to consider placing the pavement on the natural grade over a layer of minimally compacted base material. To reduce sub-grade compaction, consider using reinforced concrete or asphalt over a goetextile blanket to help stabilize the soil. On-grade patios or paving that covers more than one-third of the tree protection zone (TPZ) should be constructed using permeable materials that allow aeration and water penetration. Soil inder permeable surfaces should not be compacted to more than 80 percent.

Excavation and root pruning

Excavation within the root zones of trees should be avoided as much as possible. The extent of root pruning (selective) or cutting (non-selective) should be based on the species growth characteristics and adaptive traits, environmental conditions, age, health, crown size, density, live crown ration and structural condition of the tree. The timing of the root pruning or cutting is another important consideration. Moderate to severe root loss during droughts or particularly hot periods can cause serious water-deficit injury or death.

When root pruning/ cutting is unavoidable, roots should be pruned or cut as far from the trunk as possible. Cutting roots on more than one side of a tree should also be avoided. Root cutting extending more than half-way around a tree should generally be no closer than about 10 times the trunk diameter. Recommended distances range from as little as 6 times trunk diameter (DBH) for young trees to 12 times trunk diameter for mature trees. The size of the TPZ should, however, be increased for over mature and declining trees and species that are sensitive to root loss.

The minimum distance from the trunk that roots can be cut on one side of the tree without destabilizing it, is a distance equal to about three times the diameter (DBH) of the trunk. Roots severed within that distance provide little or no structural support. Root pruning or cutting distances from the trunk should be greater for trees that lean and/ or those growing on shallow or wet soil.

In cases where the proposed grading will adversely affect trees designated for retention, special attention should be given to proper root pruning and post-construction care for injured trees. Where structural footings are required for foundations, retaining walls, etc., and roots larger than 2 inches in diameter will be impacted, consider design changes or alternative building methods.

When excavation within 5 times trunk diameter is unavoidable, roots greater than 1 ½ inches in diameter should be located prior to excavation and then pruned to avoid unnecessary damage. Hand-digging or use of a hydraulic or pneumatic soil excavation tool is the least disruptive way to locate roots for pruning. Although mechanical root pruners make clean cuts, they are non-selective. A backhoe bucket, dozer blade or trencher will typically pull, rip or shatter the larger root, causing additional damage toward the tree. Once the roots that interfere with the structure being built, e.g., foundations, footings, retaining wall, curbs, etc., are exposed, they should then be cut perpendicular to their long axis using a hand-saw, 'carbide-tipped chainsaw' or sharp ax, depending on size. Roots that are pruned in this manner typically regenerate new roots from near the cut. Roots exposed by excavation should be protected from exposure to sun and desiccation. Exposed roots that can not be covered with soil by the end of the day should be covered with moistened burlap or similar material.

Roots can generally be cut in a non-selective manner when excavating near of beyond the dripline. Ripped, splintered or fractured portions of roots however, should be re-cut. The damaged portion should be removed using sharp tools. The cut should be flat across the root with the adjacent bark intact. Wound dressings should not be applied to pruned or damaged roots except when recommended for disease, insect or sprout control.

The best approach to avoid water-deficit injury following root loss during the growing season is to provide ample irrigation. Irrigation should be considered prior to, during, and after root pruning. Watering schedules should also consider local soil conditions, climate, topography, time of year, species adaptability, extent of root pruning and tree health. If possible, irrigate the tree 7 to 10 days prior to excavation so that there is an adequate reservoir of soil water. Water can be delivered to large construction sites via water-tank trucks and applied directly to affected trees or stored nearby in plastic tanks. On relatively flat terrain, a 6 to 8 inch soil berm at the tree's dripline should be constructed to act as a watering basin. On steep terrain, soaker hoses should be used. They can be placed across the slope or spirally around the

trunk, from about six feet away to the dripline. In addition, a two to four inch layer of wood chip mulch should be applied to as much of the root zone as possible to retard soil water loss.

Pruning foliage to compensate for root loss is not supported by scientific research and likely to result in slower recovery. Fertilization to stimulate root growth is generally unwarranted and may be counterproductive.

Trenching within the Tree Protection Zone

Trenching for underground utilities should be routed around the TPZ. When this is unavoidable, trenching within the TPZ should be done by 'hand' or using a pneumatic or hydraulic soil excavation tool, carefully working around larger roots. Roots larger than 1 ½ inches in diameter should not be cut. Dig below these roots to route utilities or install drains. A combination of tools can also produce satisfactory results, for example, a skillful backhoe operator under the arborist's supervision can dig down several inches at a time and detect larger roots by 'feel' (resistance). At that point, as assistant can expose the root and dig around it. In this manner, the backhoe can then continue extending the trench though the TPZ. Tunneling (boring) through the TPZ is the preferable alternative. For most large trees, tunneling depth should be at least 36 inches. Tunneling should begin at the edge of the TPZ, but no closer than a distance equal to one foot of clearance for each inch of tree DBH. Tunnels should also be offset to either side of the trunk. For trenching that extends only part way into TPZ, consider trenching radially to the tree trunk, as this is less harmful than tangential trenching. All trenches made within the TPZ should be backfilled as quickly as possible to prevent root and soil desiccation.

Managing Root Injured Trees

Root-pruned trees should be monitored for symptoms of water-deficit injury for a specified period following root pruning. Irrigation should be considered prior to, during, and after root pruning. Irrigation schedules should consider local soil conditions, climate, topography, time of year, species tolerance, extent of root pruning and tree health.

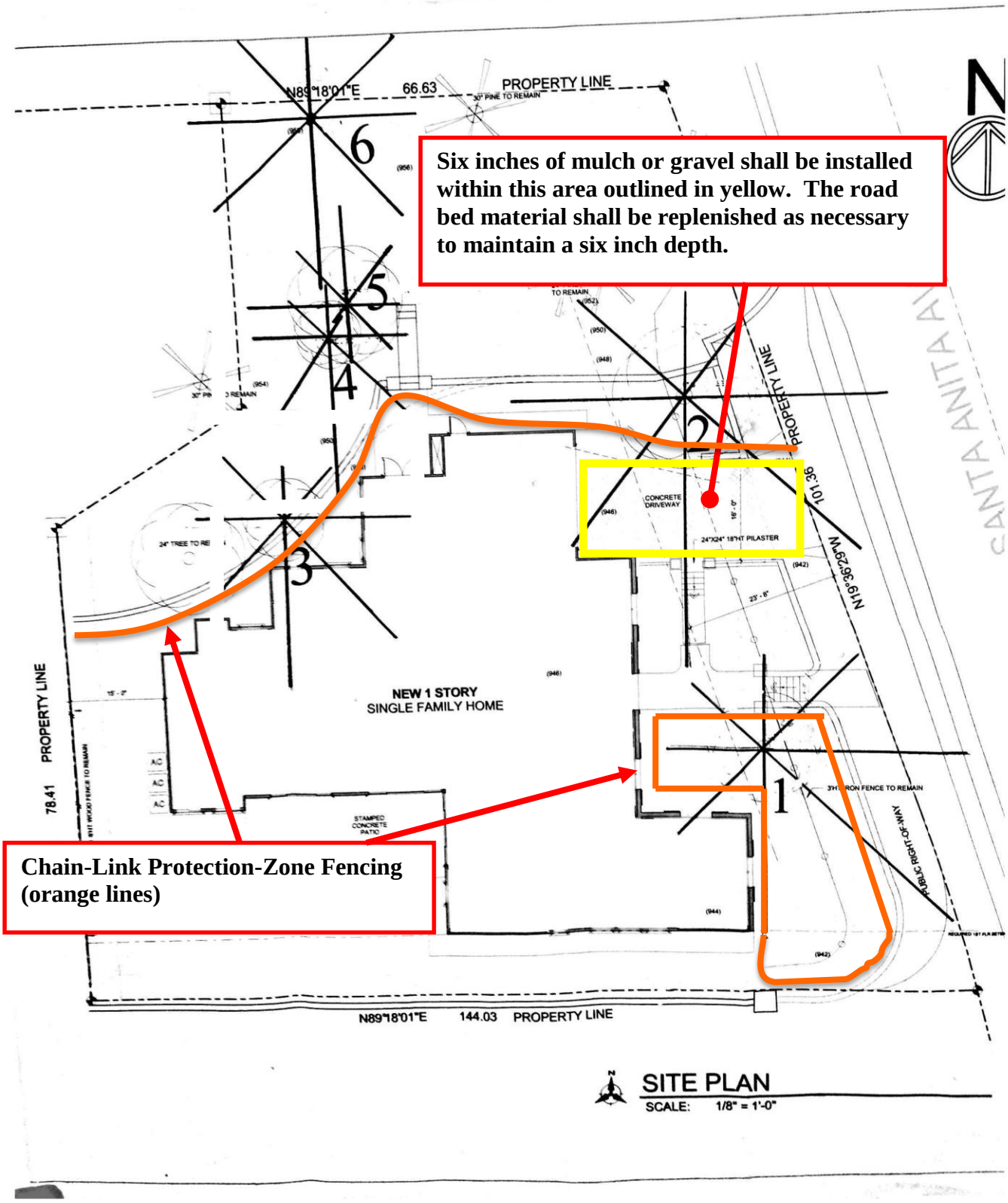
Grade Change: Fill Soil

Fill soil placed within the root zones of trees can have an adverse effect, particularly if the soil is compacted to support a structure or pavement. Soil compaction reduces aeration and water infiltration. Fill soil, die to textural changes, can also prevent water from penetrating the original soil layer below where the roots are. Furthermore, soil placed against the root crown and lower trunk can lead to root disease problems, especially if the soil near the trunk remains moist during the summer from irrigation. Alternatives to placing fills over roots zones shall be considered and proposed as appropriate.

FURTHER REFERENCE - Post Construction Care

Proper Cultural Care as well as useful information regarding plant species that work well underneath oaks and physiological characteristics of native oak trees is provided in the Oak Tree Care and Maintenance Guide provided by the County of Los Angeles Fire Department, Environmental Review Unit (Appendix E).

APPENDIX C - Protective Fencing Plan



APPENDIX D – Oak Tree Care and Maintenance
Provided by the County of Los Angeles Fire Department, Environmental Review Unit

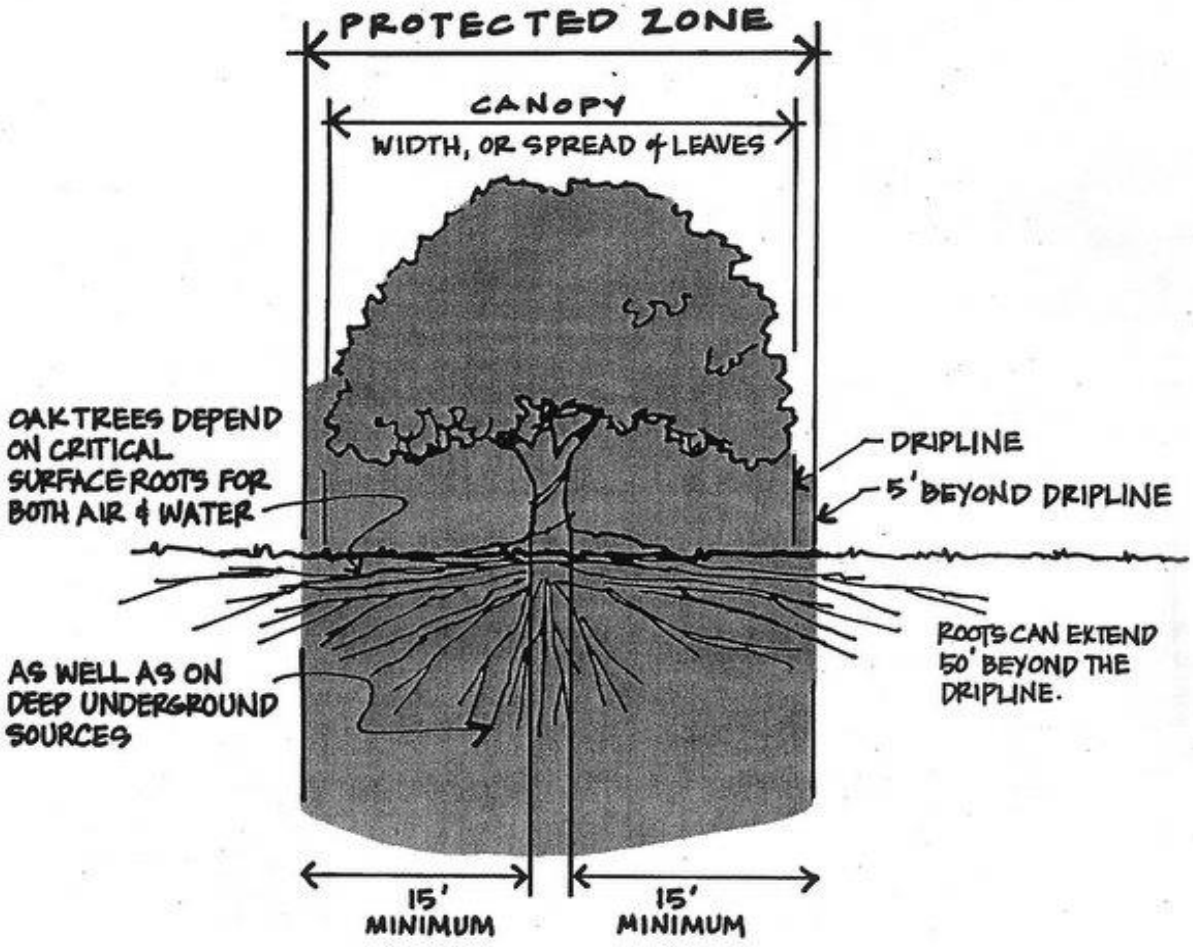
THE PROTECTED ZONE

The ***protected zone*** defines the area most critical to the health and continued survival of an oak tree. Oaks are easily damaged and very sensitive to disturbances that occur to the tree or in the surrounding environment.

The root system is extensive but surprisingly shallow, sometimes radiating out as much as 50 feet beyond the spread of the tree leaves, or canopy. The ground area at the outside edge of the canopy, referred to as the *dripline*, is especially important: the tree obtains most of its surface water and nutrients here, and conducts an important exchange of air and other gases.

The protected zone is defined in the Oak Tree Ordinance as follows:

> "The Protected Zone shall mean that area within the dripline of an oak tree and extending there from to a point at least 5 feet outside the dripline or 15 feet from the trunk, whichever distance is greater."



CONSTRUCTION ACTIVITY WITHIN THE PROTECTED ZONE

Changes in Grade

Any change in the level of soil around an oak tree can have a negative impact. The most critical area lies within 6' to 10' of the trunk: no soil should be added or scraped away. Water should drain away from this area and not be allowed to pond so that soil remains wet at the base.

Retaining walls designed to hold back soil above or below an existing tree should avoided if at all possible, especially within the protected zone. These types of structures cause critical areas at the dripline to be buried, or require that major roots be severed. Water trapped at the base of the tree could lead to root rot or other impacts, and to the decline and premature death of a highly valued landscape tree.

Construction activities outside the protected zone can have damaging impacts on existing trees. Underground water sources can be cut off due to falling water tables, or drainage may be disrupted.

Trenching

Digging of trenches in the root zone should be avoided. Roots may be cut or severely damaged, and the tree can be killed.

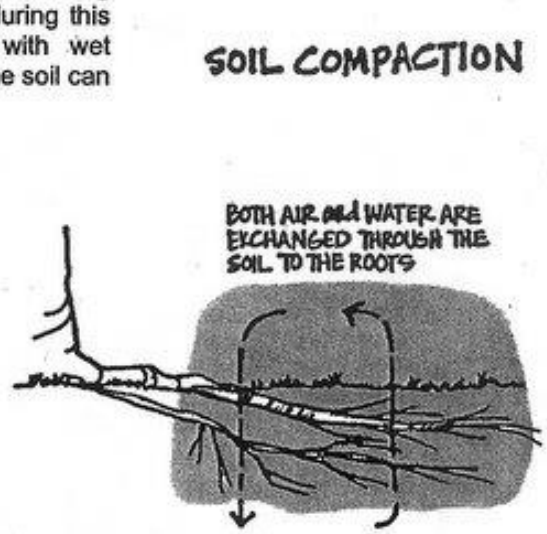
If trenches must be placed within the protected zone, utilities can be placed in a conduit, which has been bored through the soil, reducing damage to the roots. Insist that as many utilities as allowed be placed in a single trench, instead of the common practice of digging a separate trench for each individual line.

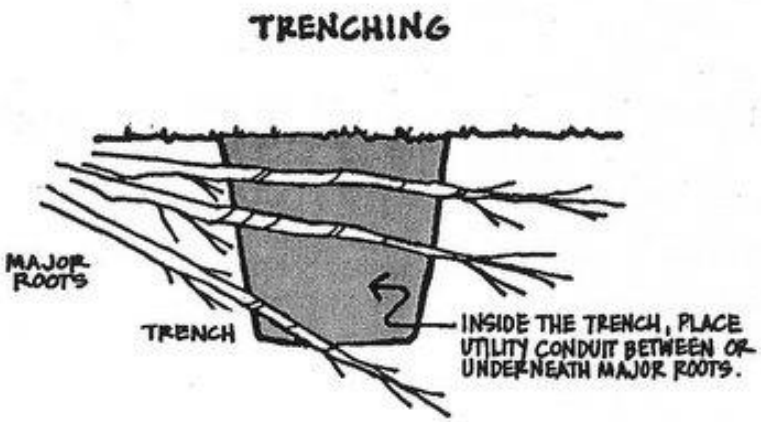
Trenching can also be accomplished using hand tools or small hand held power equipment to avoid cutting roots. Any roots exposed during this work should be covered with wet burlap and kept moist until the soil can be replaced.

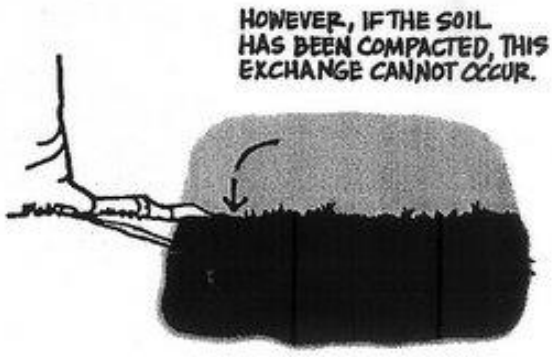
Soil Compaction and Paving

The roots depend upon an important exchange of both water and air through the soil within the protected zone. Any kind of activity that compacts the soil in this area blocks this exchange and can have serious long-term negative effects on the tree.

If paving material must be used, some recommended surfaces include brick paving with sand joints, or ground coverings such as wood chips (note the advantages of natural materials for providing nutrients under *mulching*).







MAINTENANCE

Watering

The key is prevention – **do not over water**. Improper watering is often overlooked as the cause of tree death because it can take years for the damage to show. Once the tree shows obvious signs of decline, it is often too late to correct the problem.

The seasonal weather pattern for this region is one of dry summers and winter rain. Oak trees are naturally drought tolerant and adapted to this cycle. If the tree is vigorous and thriving it should not require **any** additional water.

If the natural source of surface or underground water has been altered, some supplemental water may be necessary, but proceed with caution. The goal of any watering schedule for oak trees should be to supplement natural rainfall and it should occur only when the tree would normally receive moisture. This might be in the winter, if rains are unusually late, or in spring if rainfall has been below normal levels.

Over watering, especially during the summer months, causes a number of problems which can lead to decline and eventual death of the tree. It creates ideal conditions for attacks of Oak Root Fungus by allowing the fungus to breed all year. In addition, both evergreen and deciduous oaks grow vigorously in the spring and naturally go dormant in the summer. Extra water only encourages new tip growth which is subject to mildew. Oaks need this period of rest.

Newly planted oaks may need supplemental watering during their first few summers. After they become established water should be applied according to the previous guidelines.

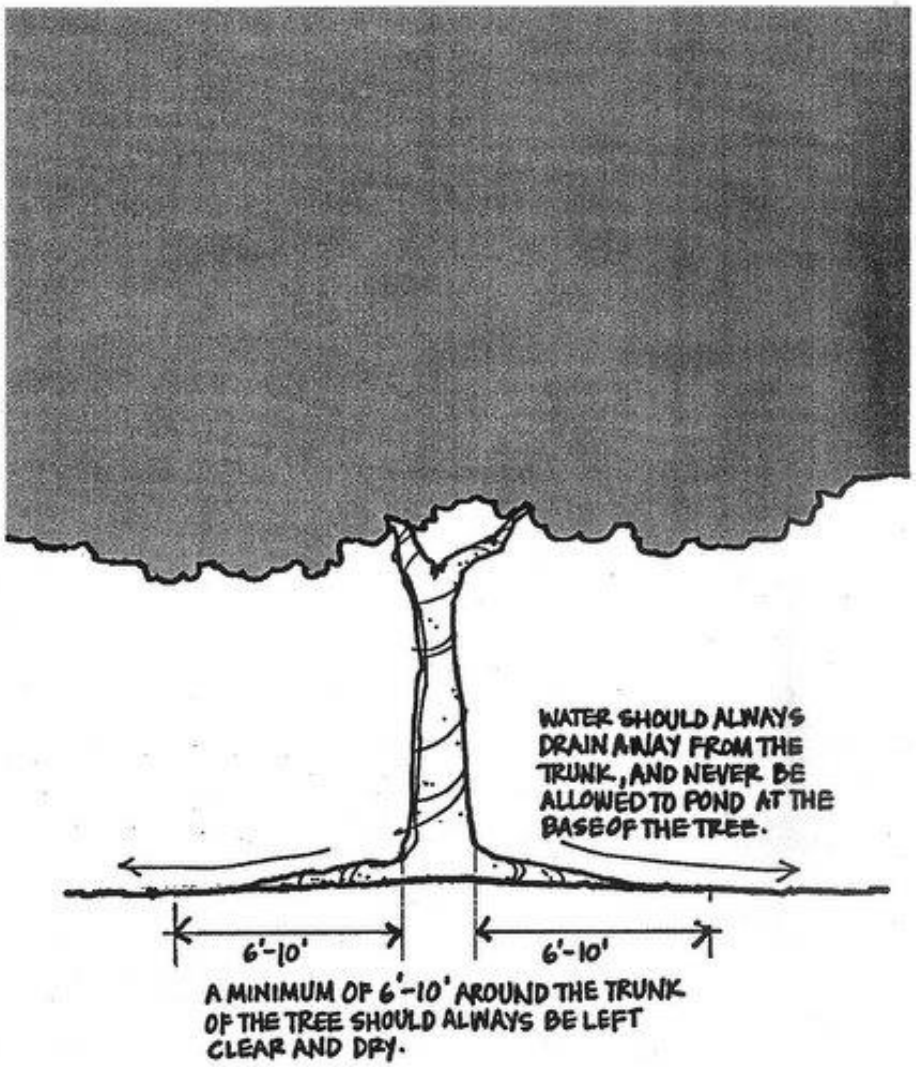
Pruning

For oak trees the periodic removal of dead wood during periods of tree dormancy should be the only pruning needed. Any cutting of green wood opens scars that could allow the entry of organisms or disease.

Before pruning obtain the advice of a certified arborist or other professional and consult the local city or county where the tree is located to find out what regulations apply. Pruning of both live and dead wood can sometimes require a permit.

Mulching

Leaf litter from the tree is the best mulch and should be allowed to remain on the ground within the protected zone. Crushed walnut shells or wood chips can be used, but the oak leaves that drop naturally provide the tree with a source of nutrients. Avoid the use of packaged or commercial oak leaf mulch which could contain Oak Root Fungus. Redwood chips should not be used due to certain chemicals present in the wood.



Disease and Pests

Trees that are stressed, especially because of improper watering practices, are prone to certain diseases and attacks by pests.

The most damaging of these diseases is the Oak Root Fungus *Armillaria mellea*. Occurring naturally in the soil, the fungus thrives under wet conditions and dies back in the summer when soils dry out. This is why summer watering of oaks can be a deadly practice. As noted in the watering guidelines, wet soil in the summer allows the fungus to grow all year. As the population grows, their natural food sources are depleted and they begin feeding on oak tree roots. The fungus does not require an open wound in the tree to gain entry.

Indications of the fungus include:

- die back of branches or tips.
- honey colored fungus at or near the root crown.
- white fan-like fungus between wood and bark.
- the presence of black, shoestring-like growths in the soil.

Once the tree begins to show obvious signs of infection treatment is generally ineffective. The best treatment is to *avoid* the conditions that lead to Oak Root Fungus infections.

Pit Scale, Oak Moth, and other pests: any significant changes in leaf color, branch die back, presence of black sooty materials on leaves or other changes should be noted. Seek the advice of a professional forester, arborist, farm advisor or other expert before the application of any pesticides on an oak tree.

Planting Underneath Oaks

The natural leaf litter is by far the best ground cover within the protected zone. If plants must be placed, the following guidelines should be followed:

There should be no planting within a minimum 6 to 10 feet of the trunk.

Avoid plants that require any supplemental water once established.

Choose plants suited for "dry shade." Those listed in the box below offer some good choices. To see some examples of how these plants have been used under oaks refer to the Additional Resources section on the following page.

PLANTS TO CONSIDER:

Plant Name	Description
Arctostaphylos densiflora 'Howard McMinn' Manzanita	3' high, 6' wide. Toughest of available forms. Whitish-pink flowers.
Arctostaphylos edmundsii Little Sur Manzanita	1-2' high, 4-5' wide. Tolerant of full shade.
Arctostaphylos hookeri Monterey Carpet Manzanita	1-2' high, spreading to 12' wide by rooting branches. White to pink flowers.
Ceanothus griseus horizontalis Carmel Creeper	Less than 2 1/2' tall, low & creeping. Clusters of small blue flowers.
Heuchera spp. Coral Bells	2-4' mound. Flowers on an upright stem 2-3" high and spotted with red or pink.
Mahonia aquifolium compacta Oregon Grape	2-4' high, spreading by underground roots. Bright yellow flower clusters.
Ribes viburnifolium Evergreen or Catalina Currant	2-3' high, spreading to 12' wide. Flowers pink to red in small clusters.

NOTES:

Before deciding on plants, check a source such as the *Sunset Western Garden Book* to determine which plants will grow in your area.

When choosing shade tolerant plants, consider that the ground under the south side of the tree will get more sunlight while the northern side will tend to remain more deeply shaded.

APPENDIX E - Tree Appraisals

The Trunk Formula Method was used to appraise the values of both Protected Oak Trees. This method of appraisal is defined in the Council of Tree and Landscape Appraisers Guide for Plant Appraisal, Ninth Edition. Input variables including Species Rating, Replacement Tree Size and Unit Tree Cost were derived from the most recent regional information published by the Western Chapter of the International Society of Arboriculture Species rating of 100% is due to the protected status of the trees within the city. Installation Cost was determined by averaging three verbal quotes given by three local landscape contractors: Valley Crest Tree Service in Sylmar, Boething Treeland in Woodland Hills, and Picture Perfect Landscape in Monrovia.

Subjective data inputted by the appraiser for condition were determined by the trees appearing to be in good condition from a visual inspection. Location rating was determined by the site being located in a upscale neighborhood within the surrounding community; the trees contribute as providing shade, supporting wildlife and aesthetic value; their placements are good in providing shade and being located on the perimeter of the property to allow for the maximum amount of open space.

APPRAISAL SUMMARY

TREE #1: 26” Western Sycamore	$22,400
TREE #2: 29” Coast Live Oak	$29,400
TREE #3: 16” Coast Live Oak	$5,200
TREE #4: 16” Coast Live Oak	$6,400
TREE #5: 16” Coast Live Oak	$7,900
TREE #6: 16” Coast Live Oak	$10,500

LOCATION: 2235 Santa Anita Ave. TREE #: 1

Field Observations

1. **Species** Platanus racemosa

2. **Condition** 80 %

3. **Trunk Diameter** 26 inches

4. **Location** 80 % = (Site 80 % + Contribution 80 % + Placement 80 %) ÷ 3

Regional Plant Appraisal Committee and/or Appraiser-Developed or Modified Information

5. **Species** rating 100 %

6. **Replacement Tree Size**: (Diameter) 5.5 inches

(Trunk Area) 23.75 inches^2

7. **Replacement Tree Cost** (regional info.) $ 1500

8. **Installation Cost** $ 2000

9. **Installed Tree Cost** (#7 + #8) $ 3500

10. **Unit Tree Cost** (regional info.) $ 62 per inch^2

Calculations by appraiser using Field and Regional information

11. **Appraised Trunk Area:** (diameter^2 x 0.785) 531 inches^2

12. **Appraised Tree Trunk Increase** = 507.25 inches^2

[appraised Trunk area (#11) 531 - replacement tree trunk area (#6) 23.75]

13. **Basic Tree Cost** = $ 34,950

[trunk area increase (#12) 507.25 x Unit Tree Cost (#10) 62 + Installed Tree Cost (#9) 3500]

14. **Appraised Value** = $ 22,400

[Basic Tree Cost (#13) 34,950 x Species rating (#5) 100 x Condition (#2) 80 x Location (#4) 80]

if the appraised value is $5000 or more the value is rounded to the nearest $100; if it is less, it is rounded to the nearest $10

LOCATION: 2235 Santa Anita Ave. TREE #: 2

Field Observations

1. **Species** *Quercus agrifolia*, coast live oak

2. **Condition** 80 %

3. **Trunk Diameter** 30 inches

4. **Location** 80 % = (Site 80 % + Contribution 80 % + Placement 80 %) ÷ 3

Regional Plant Appraisal Committee and/or Appraiser-Developed or Modified Information

5. **Species** rating 100 %

6. **Replacement Tree Size**: (Diameter) 5.5 inches

(Trunk Area) 23.75 inches^2

7. **Replacement Tree Cost** (regional info.) $ 1500

8. **Installation Cost** $ 2000

9. **Installed Tree Cost** (#7 + #8) $ 3500

10. **Unit Tree Cost** (regional info.) $ 62 per inch^2

Calculations by appraiser using Field and Regional information

11. **Appraised Trunk Area:** (diameter^2 x 0.785) 707 inches^2

12. **Appraised Tree Trunk Increase** = 683.25 inches^2

[appraised Trunk area (#11) 707 - replacement tree trunk area (#6) 23.75]

13. **Basic Tree Cost** = $ 45,862

[trunk area increase (#12) 683.25 x Unit Tree Cost (#10) 62 + Installed Tree Cost (#9) 3500]

14. **Appraised Value** = $ 29,400

[Basic Tree Cost (#13) 45,862 x Species rating (#5) 100 x Condition (#2) 80 x Location (#4) 80]

if the appraised value is $5000 or more the value is rounded to the nearest $100; if it is less, it is rounded to the nearest $10

LOCATION: 2235 Santa Anita Ave. TREE #: 3

Field Observations

1. **Species** Quercus agrifolia, coast live oak

2. **Condition** 60 %

3. **Trunk Diameter** 16 inches

4. **Location** 60 % = (Site 80 % + Contribution 50 % + Placement 50 %) ÷ 3

Regional Plant Appraisal Committee and/or Appraiser-Developed or Modified Information

5. **Species** rating 100 %

6. **Replacement Tree Size**: (Diameter) 5.5 inches

(Trunk Area) 23.75 inches^2

7. **Replacement Tree Cost** (regional info.) $ 1500

8. **Installation Cost** $ 2000

9. **Installed Tree Cost** (#7 + #8) $ 3500

10. **Unit Tree Cost** (regional info.) $ 62 per inch^2

Calculations by appraiser using Field and Regional information

11. **Appraised Trunk Area:** (diameter^2 x 0.785) 201 inches^2

12. **Appraised Tree Trunk Increase** = 177.25 inches^2

[appraised Trunk area (#11) 201 - replacement tree trunk area (#6) 23.75]

13. **Basic Tree Cost** = $ 14,490

[trunk area increase (#12) 177.25 x Unit Tree Cost (#10) 62 + Installed Tree Cost (#9) 3500]

14. **Appraised Value** = $ 5,200

[Basic Tree Cost (#13) 14,490 x Species rating (#5) 100 x Condition (#2) 60 x Location (#4) 60]

if the appraised value is $5000 or more the value is rounded to the nearest $100; if it is less, it is rounded to the nearest $

LOCATION: 2235 Santa Anita Ave. TREE #: 4

Field Observations

1. **Species** Quercus agrifolia, coast live oak

2. **Condition** 70 %

3. **Trunk Diameter** 15 inches

4. **Location** 70 % = (Site 80 % + Contribution 50 % + Placement 80 %) ÷ 3

Regional Plant Appraisal Committee and/or Appraiser-Developed or Modified Information

5. **Species** rating 100 %

6. **Replacement Tree Size**: (Diameter) 5.5 inches

(Trunk Area) 23.75 inches^2

7. **Replacement Tree Cost** (regional info.) $ 1500

8. **Installation Cost** $ 2000

9. **Installed Tree Cost** (#7 + #8) $ 3500

10. **Unit Tree Cost** (regional info.) $ 62 per inch^2

Calculations by appraiser using Field and Regional information

11. **Appraised Trunk Area:** (diameter^2 x 0.785) 177 inches^2

12. **Appraised Tree Trunk Increase** = 153.25 inches^2

[appraised Trunk area (#11) 177 - replacement tree trunk area (#6) 23.75]

13. **Basic Tree Cost** = $ 13,002

[trunk area increase (#12) 153.25 x Unit Tree Cost (#10) 62 + Installed Tree Cost (#9) 3500]

14. **Appraised Value** = $ 6,400

[Basic Tree Cost (#13) 13,002 x Species rating (#5) 100 x Condition (#2) 70 x Location (#4) 70]

if the appraised value is $5000 or more the value is rounded to the nearest $100; if it is

LOCATION: 2235 Santa Anita Ave. TREE #: 5

Field Observations

1. **Species** Quercus agrifolia, coast live oak

2. **Condition** 70 %

3. **Trunk Diameter** 17 inches

4. **Location** 70 % = (Site 80 % + Contribution 50 % + Placement 80 %) ÷ 3

Regional Plant Appraisal Committee and/or Appraiser-Developed or Modified Information

5. **Species** rating 100 %

6. **Replacement Tree Size**: (Diameter) 5.5 inches

(Trunk Area) 23.75 inches^2

7. **Replacement Tree Cost** (regional info.) $ 1500

8. **Installation Cost** $ 2000

9. **Installed Tree Cost** (#7 + #8) $ 3500

10. **Unit Tree Cost** (regional info.) $ 62 per inch^2

Calculations by appraiser using Field and Regional information

11. **Appraised Trunk Area:** (diameter^2 x 0.785) 227 inches^2

12. **Appraised Tree Trunk Increase** = 203.25 inches^2

[appraised Trunk area (#11) 227 - replacement tree trunk area (#6) 23.75]

13. **Basic Tree Cost** = $ 16,102

[trunk area increase (#12) 203.25 x Unit Tree Cost (#10) 62 + Installed Tree Cost (#9) 3500]

14. **Appraised Value** = $ 7,900

[Basic Tree Cost (#13) 16,102 x Species rating (#5) 100 x Condition (#2) 70 x Location (#4) 70]

if the appraised value is $5000 or more the value is rounded to the nearest $100; if it is

LOCATION: 2235 Santa Anita Ave. TREE #: 6

Field Observations

1. **Species** Quercus agrifolia, coast live oak

2. **Condition** 70 %

3. **Trunk Diameter** 20 inches

4. **Location** 70 % = (Site 80 % + Contribution 50 % + Placement 80 %) ÷ 3

Regional Plant Appraisal Committee and/or Appraiser-Developed or Modified Information

5. **Species** rating 100 %

6. **Replacement Tree Size**: (Diameter) 5.5 inches

(Trunk Area) 23.75 inches^2

7. **Replacement Tree Cost** (regional info.) $ 1500

8. **Installation Cost** $ 2000

9. **Installed Tree Cost** (#7 + #8) $ 3500

10. **Unit Tree Cost** (regional info.) $ 62 per inch^2

Calculations by appraiser using Field and Regional information

11. **Appraised Trunk Area:** (diameter^2 x 0.785) 314 inches^2

12. **Appraised Tree Trunk Increase** = 290.25 inches^2

[appraised Trunk area (#11) 314 - replacement tree trunk area (#6) 23.75]

13. **Basic Tree Cost** = $ 21,496

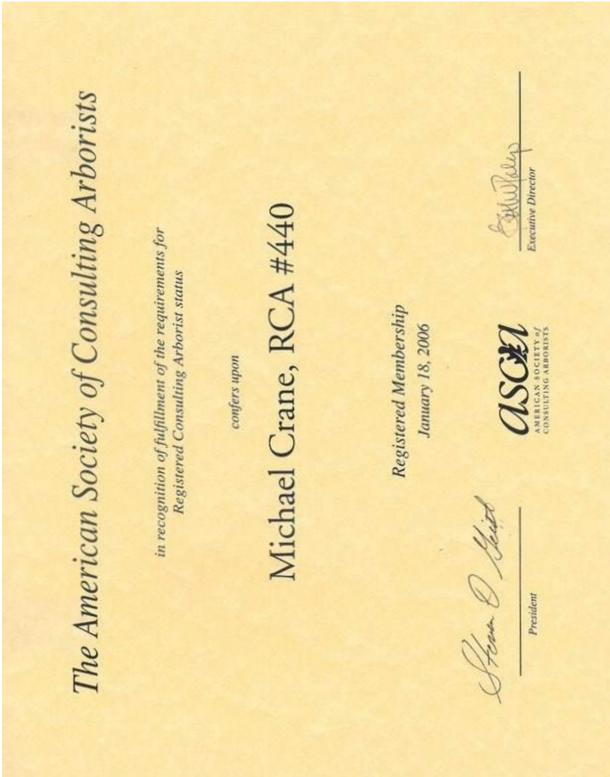
[trunk area increase (#12) 290.25 x Unit Tree Cost (#10) 62 + Installed Tree Cost (#9) 3500]

14. **Appraised Value** = $ 10,500

[Basic Tree Cost (#13) 21,496 x Species rating (#5) 100 x Condition (#2) 70 x Location (#4) 70]

if the appraised value is $5000 or more the value is rounded to the nearest $100; if it is

AUTHOR'S CURRENT CREDENTIALS


The American Society of Consulting Arborists

in recognition of fulfillment of the requirements for Registered Consulting Arborist status

confers upon

Michael Crane, RCA #440

Registered Membership
January 18, 2006

President

ASCA AMERICAN SOCIETY of CONSULTING ARBORISTS

Executive Director


International Society of Arboriculture

Board Certified Master Arborist

Michael J. Crane

Having successfully completed the requirements established by the Certification Board of the International Society of Arboriculture, the above named is hereby recognized as an ISA Board Certified Master Arborist.

Certification Board, Chair
International Society of Arboriculture

Jim Skiera, Executive Director
International Society of Arboriculture

WE-6643B
Certificate Number

Nov 9, 2006
Certified Since

Dec 31, 2015
Expiration Date


ISA QUALIFICATIONS

International Society of Arboriculture™

Tree Risk Assessment Qualification

Michael J Crane

Having successfully completed the requirements established by the Certification Board of the International Society of Arboriculture,™ the above named is hereby recognized as holding the ISA Tree Risk Assessment Qualification.

Chair, Certification Board
International Society of Arboriculture

Jim Skiera, Executive Director
International Society of Arboriculture

December 31, 2015
Expiration Date


dpr DEPARTMENT OF PESTICIDE REGULATION
LICENSING/CERTIFICATION PROGRAM

AGRICULTURAL PEST CONTROL ADVISER LICENSE

DATE OF ISSUE
01/01/2013

VALID THROUGH
12/31/2014

PCA 75893 ABCDEFG

MICHAEL J CRANE
PO BOX 51122
PASADENA CA 91115

CERTIFICATION OF PERFORMANCE

I, Michael Crane, certify that:

- I have personally inspected the tree(s) and the property referred to in this report and have stated my findings accurately.
- I have no current or prospective interest in the vegetation or the property that is the subject of this report and have no personal interest or bias with respect to the parties involved.
- The analysis, opinions, and conclusions stated herein are my own and are based on current scientific procedures and facts.
- My analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted arboricultural practices.
- No one provided significant professional assistance to me, except as indicated within the report.
- My compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party not upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.

I further certify that I am a member in good standing of the American Society of Consulting Arborists and the International Society of Arboriculture. I have been involved in the field of Horticulture in a full-time capacity for a period of more than 15 years.

Signed: _____

Registered Consulting Arborist #440; American Society of Consulting Arborist
Board Certified Master Arborist #WE 6643B; International Society of Arboriculture
Licensed California Agricultural Pest Control Adviser #AA08269

Date: February 13, 2014