ABACUS
CONSULTING ARBORISTS

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Preliminary Arborist Report
and Protected Tree Inventory

For the project of:

John Adams Academy

1 Sierragate Plaza
Roseville, CA

Prepared at the Request of:

Cody Carpino
Williams + Paddon Architects + Planners, Inc.

Project Located in:

City of Roseville, CA

March 23, 2017

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Executive Summary:

Cody Carpino of Williams + Paddon Architects + Planners, Inc. contacted Abacus Consulting Arborists to inventory and evaluate the protected trees and produce an Arborist Report as the end product. The property is parcel John Adams Academy, located at 1 Sierragate Plaza in Roseville, California.

Nicole Harrison, ISA Certified Arborist #WE-6500AM, TRAQ, of Abacus Consulting Arborists was on site March 16th, 2017; providing species identification, number of trunks, measurements of DBH and canopy, field condition notes, recommended actions, ratings, and locations of protected native trees.

There are Two (2**)** trees on this property that qualify as protected trees as defined by the City of Roseville municipal code, Title 19, Article IV, Chapter 19.66 Tree Preservation.

None of the protected trees are Excellent (It is rare that a tree qualifies in this category.)

One (1) of the protected trees is Good. Arborist rating 4.

One (1) of the protected trees is Fair to good. Arborist rating 3

None of the protected trees are Fair. Arborist rating 3

None of the protected trees are Fair to Poor. Arborist rating 2

None of the protected trees are Poor. Arborist rating 1.

See Chart B – Inventory of Trees for specific information on each tree.

The other, non-protected, species onsite include London Plane, *Platanus acerifolia*, American Sweetgum, *Liquidambar styraciflua*, and Holly Oak, *Quercus ilex*. Many of these trees may be suitable for preservation but were not evaluated on site or addressed in this report.

Listed within this report is the “General Recommendations” section. All of these recommendations must be followed for all trees to be saved onsite and any offsite trees within 25’ of the property line.

Assignment:

Pursuant to your request, **ABACUS** has completed an inventory of all the trees located on-site. We provided on-site tagging, as well as species identification, number of stems, measurements of DBH and canopy, field condition notes, recommended actions, and ratings. The property is located at 1 Sierragate Plaza in Roseville, California.

Observations:

Nicole Harrison, *Project Manager & ISA Certified Arborist #WE-6500AM, TRAQ*, evaluated all protected trees that met the requirements of the Roseville Municipal Code, Title 19, Chapter 19.66 Tree Preservation. The fieldwork was performed on March 16, 2017.

The protected trees (on-site) tagged by Abacus Consulting Arborists have a numbered tag, placed on each one that is 1-1/8" x 1-3/8", green anodized aluminum, "acorn" shaped, and labeled with 1/8" pre-stamped tree number and attached with a natural colored aluminum 10d (3") nail, installed at approximately 6 feet above ground level on the approximate north side of the tree unless otherwise indicated in the report. The tag should last ~10 – 20+ years depending on the species, before it is enveloped by the trees' normal growth cycle.

Tree Location Map, attached as Appendix A, and all of the other information within this report is by Abacus Consulting Arborists.

Tree Site Map for development project is by others.

Chart B in this report is an inventory on the trees. The following terms, and ***Chart A*** will further explain our findings on ***Chart B*** and the trees in question.

Species of trees is listed by our local and correct common name and botanical name by genus (capitalized) and species (lower case). Oaks frequently cross-pollinate and hybridize, but the identification is towards the strongest characteristics.

 # Stems refers to the quantity of trunks or stems of a tree that have a significant connection. If one stem or trunk were to be removed, it would cause decay to harm an adjoining stem, making it one tree. All stems must be of the same species. (Also see "Tree SIZE Expressed by Trunk Diameter" at the end of this report)

DBH (diameter breast high) is normally measured at 4'6" (above the average ground height for "Urban Forestry"), but if that varies then the location where it is measured is noted here. A Swedish caliper [1] was used to measure the DBH for trees less than 26" in diameter and a steel diameter tape[2] for trees greater than 26"Ø.

Canopy radius is the measured distance of the farthest extent of the crown composed of leaves and small twigs. This measurement further defines the Critical Root Zone (CRZ) or Protection Zone (PZ), which is a circular area around a tree with a radius equal to a tree's largest dripline plus 1', according to the Roseville Municipal Code. Our canopy measurement is the longest dripline measurement *from the center point of the tree*.

City of Roseville Rating is pursuant to Title 19, Chapter 19.66 Tree Preservation of the Roseville Municipal Code as information to be included in the Arborist Report.

[1] A large wooden sliding adjustable thickness gauge calibrated in 1/16" increments.

[2] Diameter Tape is used to figure the tree's diameter, by measuring the circumference, whereon the inches are pre-multiplied by 3.14 or π (π called pi) and shown to produce the diameter of the tree directly on the tape.

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) as in Chart A. The rating was done in the field at the time of the measuring and inspection. The scale is as follows:

Chart A – Tree Ratings Description

Arborist Ratings			Roseville Ratings, 19.66.050 B.1.
No problem(s)	Excellent	**5**	Excellent
No apparent problem(s)	Good	**4**	Good
Minor problem(s)	Fair	**3**	Fair to Good
Major problem(s)	Poor	**2**	Fair to Poor
Extreme problem(s)	Hazardous	**1**	Poor
Dead	Dead	**0**	Dead

There is a very important line drawn between a tree rated a **3** and a **2**. A tree rated **3**, **4**, or **5** is a tree to be preserved, and a tree rated **0**, **1**, or **2** is recommended for removal. On the following tree list **BLACK** marks are field notes and action items on trees that are to remain, and **RED** are trees that are recommended for removal. Trees rated a **2** may be retained but only if the recommendations are followed, otherwise the tree should be removed.

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: explain why the tree should be removed or preserved. If it is to remain and be preserved the tree may need some form of work to limit future liability from partial or total failure. Lower deadwood may not be an immediate problem, but the same size wood at a much higher location on the trees could be dangerous and might cause a minor injury to a fatal blow if the branch failed.

Glossary:

Co-Dominant Leader: Stems or trunks of the tree that are equal in size and relative importance.

Critical Root Zone: The canopy is the farthest extent of the crown composed of leaves and small twigs. This measurement further defines the CRZ, which is a circular area around a protected tree with a radius equal to a tree's largest dripline radius. The roots of a tree grow minimally within this canopy measurement and have been found growing 2 to 3 times beyond the farthest branches.

Included Bark: A sharp "V" crotch, usually less than a 45° angle of attachment, between 2 branches where the bark is kept between two narrowly joined branches and the bark is continually turned inward, rather than being pushed out. It is a common point for potential massive structural failure and this hazard can be minimized with properly installed and maintained cabling, bolting or bracing.

Epicormic Growth: Shoots that arise from latent buds along the trees trunk or mature branches. This growth is usually a sign that the tree has undergone a stressful period.

Narrow Angle Branch Attachment: A sharp "V" crotch, usually less than a 45° angle of attachment. Included bark is explained above and is common in branches with narrow attachments. In addition, these branches may not be attached to the trunk as well as others with wider angles of attachment, and can fail more frequently depending on the size of the branch.

Remove Dead Wood: All dead wood to be removed over 3" in diameter and if over 2" in diameter when above 25', as this is a potential hazard for people under these limbs and a future health problem for the tree.

TBR: To Be Removed: Tree to be removed due to health and/or structural reasons. Removal should be done carefully as to not harm the surrounding trees, branches, and/or trunks above or roots below ground. Do NOT rip out or push over the tree stumps if they are near other trees that are to be preserved. Cut them off close to ground level and leave the stumps and roots to decay, unless they are located within a proposed foundation or area to be paved/concrete surfaced.

Unbalanced Canopy: Either the trunk is leaning and/or the canopy is phototropic and overly heavy on one side.

Compass Points: These are the standard 16 points of the compass as aligned with Geographic North or True North. In our area, True North (TN) is adjusted for declination 14°49' to the west of Magnetic North (MN).

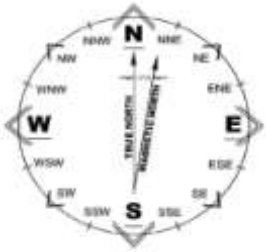


Chart B – Inventory of Trees

Tag	Species Common Name	Species Botanical Name	DBH	Canopy radius in feet	Notes	Actions	Roseville Tree Rating	Arborist Rating
1484	Blue Oak	Quercus douglasii	7	11	Slope, codominant at 8' wide, good leaf surface	Prune for good structure - space limbs	Good	4
1485	Blue Oak	Quercus douglasii	6	14	Poor structure at 7' - previously topped?, good leaf surface	Prune for good structure over 3 years, do not remove more than 15% of leaf surface in any one year	Fair to Good	3

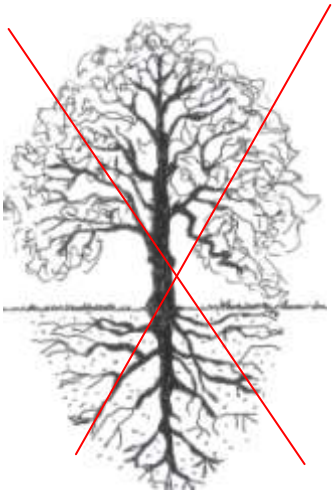
Testing & Analysis:

A Level 2 – Basic Visual Assessment was performed in accordance with the International Society of Arboriculture's best management practices. This assessment level is limited to the observation of conditions and defects which are readily visible. No laboratory or chemical testing and analysis was performed, only ground level observations.

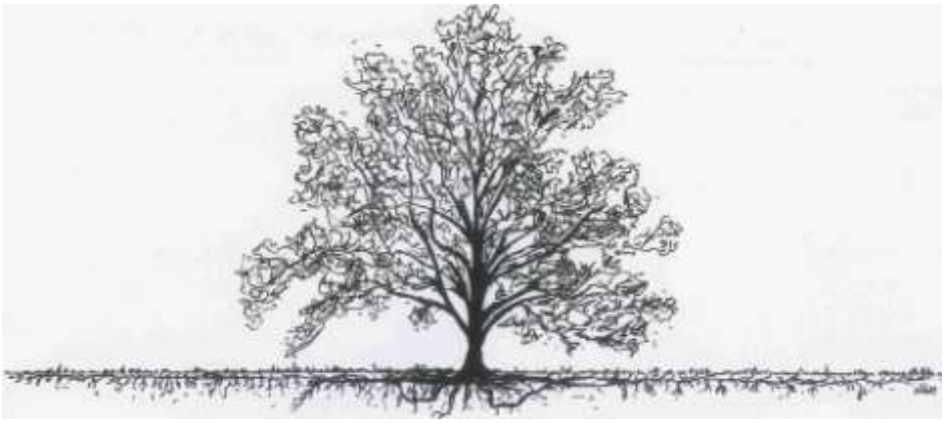
Discussion:

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

Pruning Trees for Good Structure

Many of the structural issues common in trees can be eliminated early in the life of a tree through proper pruning resulting in significantly reduced failure risk levels and substantial savings in pruning costs. Additionally, the risk of branch failure associated with poor structure in middle aged trees can be significantly reduced with correctional pruning. Large, mature trees with structural faults generally cannot be corrected, however, regular and appropriate structural pruning can reduce the risk of failure.

According to Ed Gilman in Pruning Strategies[3] structural pruning is:

1. Development and maintenance of a dominant central leader;
2. Prevention of temporary limbs (below the permanent crown) from getting too large;
3. Optimal spacing of main branches along the dominant trunk;
4. Prevention or suppression of included bark;
5. Reduction of heavy or over extended branches, or those with defects; and
6. Encouragement of growth in the portion of the tree to be dominant through reduction or removal of other portions.

Native Oaks

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.

Conclusion:

There are Two (2**)** trees on this property that qualify as protected trees as defined by the City of Roseville municipal code, Title 19, Article IV, Chapter 19.66 Tree Preservation.

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[3] Western Arborist, Winter 2015 Volume 41 Number 4, publication by International Society of Arboriculture

General Recommendations:

1) Follow all of the recommendations in the action column of ***Chart B*** immediately.

2) All trees to be saved shall have their root zones and trunk(s) protected with a four (4') foot high orange or yellow plastic, high visibility exclusionary fence surrounding the trees' root zone. The fence shall be staked 10'o.c. maximum spacing, with 5' steel "T" posts, 2" x 2" square or 2"+ ∅ wood posts. The exclusionary area shall be under the tree's branched canopy and extend out to the tree's longest dripline radius plus one foot, as a circle. Where new construction will be within the Protected Root Zone, the fencing shall be 4' away from the footings, and extend around the rest of the canopy of the tree from that point. The fencing shall be maintained and not removed until the completion of construction. The fencing shall completely surround the Protected Root Zone and not be "U" shaped or open at any point. Whenever possible, include as many trees that are to be saved into one fenced exclusionary Protected Root Zone. The fencing plan will be completed once the developer decides on driveway, utility, and structure placement.

3) As soon as the concrete is poured and the forms are stripped, backfill the footings and stem walls. The protected trees nearby that are to remain should be watered to the point of soil saturation.

4) Care must also be continued after the construction is over to select the right plants to live under and near the native oaks. Watered lawns and any frequent summer watering near California oaks will not mix well over a long period. This will cause the oaks to perish due to *Armillaria mellea* (oak root fungus). The demise of the native oaks due to *Armillaria mellea* may take 5 – 20 years. Oaks should live 200 - 300 years.

5) To help control root damage, utility-trenching paths are to be established away from the roots and branches of the oaks that are to remain.

6) Soil compaction shall be avoided by maintaining the exclusionary Protected Root Zone fencing, keeping material storage, people, portable outhouses, vehicles, and dogs out of this area.

7) Soil contamination shall be avoided by eliminating chemical dumping on the property that may infiltrate into the Protected Root Zone. **No**: washing, dumping, or contaminating the site including but not necessarily limited to the following: concrete from tools or trucks, paint materials, sheetrock mud or stucco materials, other chemicals, solvents, herbicides, etc. Limestone gravel should not be used as base material or for drain rock as it will change the pH to be more alkaline, and may harm the native oaks.

8) Do not nail, tie, screw, or fasten any signs, braces, etc. to the trees that are to remain.

9) The cut and fill material excavated from or added to the lot can kill an oak by removing too many roots, drying or wetting the soil or by suffocating the roots with too much soil. Care must be taken with the added soil as well as with the actual excavation. Roots need air as much as they need water to survive and for the whole tree to live and to flourish. If fill material is needed, properly designed aeration/ventilation systems made to protect the trees and allow for the fill material can be installed.

10) When deciding on a pruning arborist, inquire about a chipper and require them to utilize the chipped branches of the trees to be removed or pruned. The chips are to be used under the oaks that are to remain, as mulch in the Protected Root Zone. Other mulch may be used of arborist type woodchips (4 – 6" deep), but not redwood or cedar bark.

11) When the recommended pruning is completed, it is only advisable if a qualified ISA Certified Arborist is on site. No cutting of live wood over 2"∅ shall be made. All cutting, pruning, trimming, cabling, guying, bracing, and lightning protection systems shall conform to the most current standards of the American National Standards Institute (ANSI). The current ANSI Tree Care Standards are A300 (Parts 1-4) 2000 to 2002 (copies at: www.ansi.org). The BMPs are "Best Management Practices", as companion publications to the ANSI Tree Care Standards, printed by the International Society of Arboriculture (copies at: www.isa-arbor.com). The BMP booklets explain the details of the ANSI Tree Care Standards and how to follow them correctly. Pruning of branches under 3" in diameter should be made with sharp hand tools: pruners, loppers, and/or handsaws, not chainsaws.

These important details will greatly increase the likelihood of survival for your protected trees.

ABACUS
CONSULTING ARBORISTS

3/20/2017

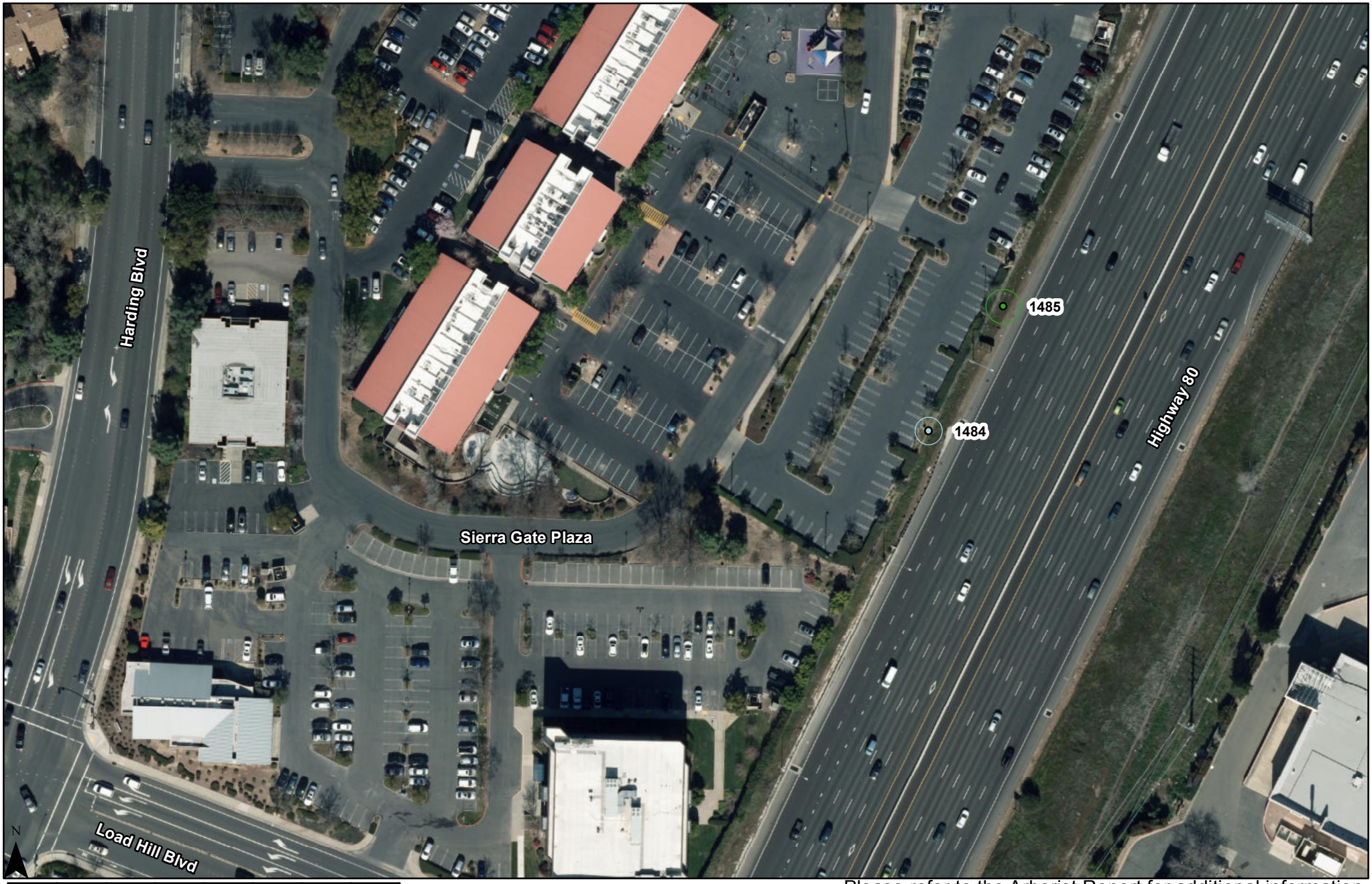
John Adams Academy

in

City of Roseville, California

Tree Rating
- 3 Fair - Minor Problems
- 4 Good - No Apparent Problems

Tree Canopy
- 3 Minor Problems
- 4 No Apparent Problems



0 0.015 0.03 0.06 Miles

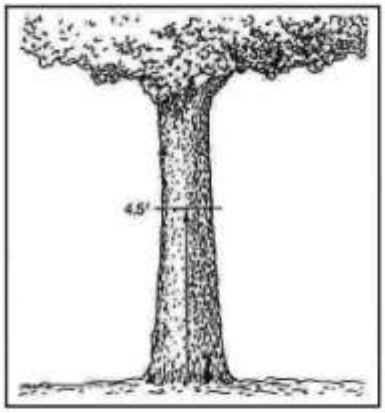
Please refer to the Arborist Report for additional information.
Tree locations are an approximate.
Aerial- ESRI (2016)

Tree Size Expressed by Trunk Diameter

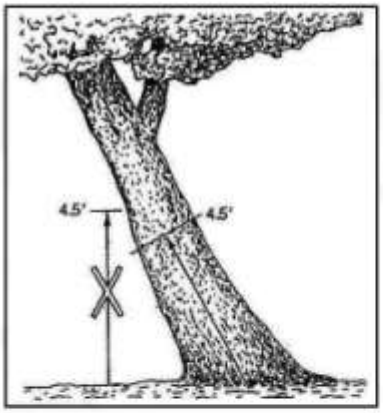
Tree SIZE Expressed by Trunk Diameter

"The height at which the trunk diameter of a tree is measured depends upon its size. The American Standard for Nursery Stock (ANSI, 1990) state that measurements shall be taken 6 inches (15 cm) above the ground for trunk diameters up to and including 4 inches (10 cm). Larger trees (assumed, but not stated, to be of transplantable size) are to be measured at 12 inches (30 cm). Trees normally considered too large to transplant are to be measured 4.5 feet [4'-6" is also called diameter breast high or dbh] (1.4 m) above the ground. Trees, like conifers, which have branches below 4.5 feet should be measured at a height that most effectively represents the size of the tree." The diameter is calculated by first measuring the circumference divided by 3.14 (π called pi) or by using a "diameter tape" whereon the inches are multiplied by π and shown to produce the diameter directly.

This is the dbh standard for measurement as shown in figure 4-2.



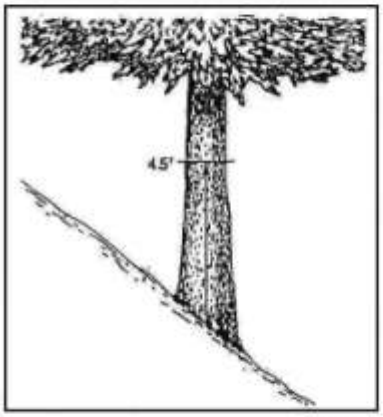
Figures 4-2. Trees with fairly straight, upright trunks with the lowest branch arising on the trunk higher than 6 feet (1.8 m) above the ground should be measured at 4.5 feet (1.4 m).

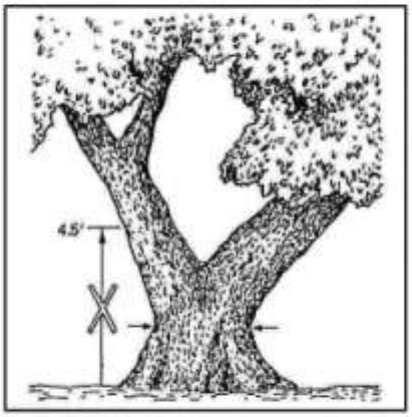


Figures 4-3 (top) and 4-4 (bottom). In each case, the trunk circumference should be measured at right angles to the trunk 4.5 feet (1.4 cm) along the center of the trunk axis so the height is the average of the s hortest and longest sides of the trunk.

There are some exceptions to the dbh standard as shown in the figures 4-3, 4-4, 4-5 & 4-6.

Figure 4-6. In a multi-stem tree, measure the trunk circumference of each trunk at 4.5 feet (1.4 m) above the ground. The area of each trunk is determined and then added together to obtain a trunk area that is representative of the size of the tree and each of the stems contribute its proportionate share to the canopy.





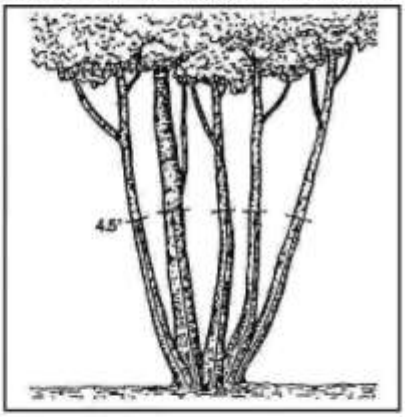


Figure 4-5. When low branches preclude measuring the trunk at 4.5 feet (1.4 m) measure the smallest circumference below the smallest branch. In this example, an alternative would be to determine the sum of the cross-sectional areas of the two stems measured about 12 inches (30 cm) above the crotch; then average the sum of the two branch areas and the smallest cross-sectional area below the branches. This may give a better estimate of tree size. Record the height of measurement(s) and the reasons the height or those heights were chosen.

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Tree SIZE Expressed by Trunk Diameter

Scale: NTS | **Drawing: TSE**

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Disclosure, Assumptions and Disclaimer

1) I, Nicole Harrison, *ISA Certified Arborist WE-6500AM,* with "**ABACUS**", did personally inspect the site and investigated the tree(s) as mentioned in this report and I performed all aspects of this report unless noted otherwise in the report.

2) We have neither financial interest in the tree work that may or may not be done, nor financial interest in the property where the tree(s) is (are) located unless noted within the report.

3) All opinions and recommendations expressed herein this report are ours solely. We have used our specialized education, knowledge, training and experience to examine the tree(s) and to make our opinions and recommendations to enhance the beauty, health and longevity, with an attempt to reduce the risk of who and/or what is near these trees. We cannot guarantee or warranty that a tree will not be healthy or safe under all circumstances, nor for a specific period of time or that problems may not arise in the future.

4) Our report with its opinions and recommendations are limited to the tree(s) inspected.

5) We attempt to be cognizant of the whole scope of a project, but many matters are beyond the scope of our professional consulting arborist services such as: exact property boundaries, property ownership, site lines, easements, codes, covenants & restrictions (CC&Rs), disputed between neighbors, and other issues.

6) We rely on the information disclosed to us and assume the information to be complete, true, and accurate.

7) The inspection is limited to visual examination of accessible items of the tree(s), from the ground unless otherwise noted, without excavation, probing, boring, or dissection, unless noted otherwise. Only information covered in this report was examined, and reflects the condition of those inspected items at that specific time.

8) Clients may choose to accept or disregard these opinions and recommendations of the arborist or to seek additional advice.

9) This report is copyrighted. Any modification or partial use shall nullify the whole report. Do not copy without written permission. This report is for the client and the client's assignees.

10) Sketches, diagrams, graphs, drawings, and photographs within this report are intended as visual aids and are not necessarily to scale, and should not be construed as engineering or architectural detail, reports or surveys.

11) We shall not attend or give a deposition and/or attend court by reason of this report unless fees are contracted for in advance, according to our standard fee schedule, adjusted yearly, for such services as described.

Signed: 

Arborist Report by:

ABACUS