California Tree and Landscape Consulting, Inc.

September 25, 2019

Seiss Wagner - Architect
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Via Email: seiss1@mac.com

PRE-DEVELOPMENT ARBORIST REPORT & TREE INVENTORY

RE: 3945 48th Avenue, 039-0041-004, jurisdiction of Sacramento County, California

Executive Summary:

Seiss Wagner, on behalf of the property owner, contacted California Tree and Landscape Consulting, Inc. to inventory and evaluate the trees on the site for purposes of evaluating the impacts to the trees from the proposed development plans by JTS Engineering Consultants, Inc. for the project dated September 13, 2019[1]. The property is located at 3945 48th Avenue in Sacramento, California, and is subject to the jurisdiction of Sacramento County. See Supporting Information Appendix A –Tree Location Map.

Gordon Mann, ISA Certified Arborist #WE-0151AM, was on site September 5th, 2019. A total of 20 trees were evaluated on this property or on the neighboring parcels for the proposed development. None of the trees are protected by the Sacramento County Tree Preservation ordinance, 19.12.

Tree Species **Protected: None**	**Trees Inventoried**	**Trees on the Site**	**Protected by Sacramento County Tree Preservation, 19.12[2]**	**Trees Proposed for Removal**	**Trees impacted by the proposed development and requiring special protection measures**
Non-Protected:					
Landscape species (Blue Gum)	20	20	0	16	4
Total	**20**	**20**	**0**	**16**	**4**

See Appendices for specific information on each tree and additional preservation requirements and/or development restrictions

[1] Preliminary Grading Plan, Sheet C1

[2] Tree preservation pursuant to the zoning code at Sacramento County includes alternate protection standards for non-native species, mitigation trees previously planted, and commercial and/or multifamily residential landscapes. Trees not indicated within this report as 'protected' by the native oak tree preservation ordinance may still require permitting for removal. In addition, trees along the street could be considered street trees and protected.

Methods

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

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. Additional limiting factors, such as blackberries, ivy, poison oak, and/or debris piled at the base of a tree can inhibit the visual assessment.

Tree Location: The GPS location of each tree was collected using the ESRI's ArcGIS collector application on an Apple iPhone or Samsung. The data was then processed in ESRI's ArcMap by Julie McNamara, M.S. GISci, to produce the tree location map.

Tree Measurements: 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. A swedish caliper was used to measure the DBH for trees less than 32" in diameter or less and a steel diameter tape for trees greater than 32". A Stanley laser distance meter was used to measure distances. Canopy radius measurements may also have been estimated due to obstructions, such as steep slopes or other trees.

Terms

Field Tag #	The pre-stamped tree number on the tag which is installed at approximately 6 feet above ground level on the north side of the tree.
Old Tag #	If additional field tags are found on the trees and are legible, they are listed here.
Species	The species of a tree 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.
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 in the next column "measured at"
Measured at	Height above average ground level where the measurement of DBH was taken
Canopy radius and Protection Area	The farthest extent of the crown composed of leaves and small twigs. Most trees are not evenly balanced. This measurement represents the longest extension from the trunk to the outer canopy. The dripline measurement is from the center point of the tree and is shown on the Tree Location Map as a circle. This measurement further defines the protection zone and can indicate if pruning may be required for development. Sacramento County specifies this measurement as the required 'Protected Root Zone'
Critical Root Zone	The radius of the critical root zone is a circle equal to the trunk diameter inches converted to feet and factored by tree age, condition and health pursuant to the industry standard. Best Management Practices: Managing Trees During Construction, the companion publication to the Approved American National Standard, provides guidance regarding minimum tree root protection zones for long term survival. In instances where a tree is multi-stemmed the protected root zone is equal to the extrapolated diameter (sum of the area of each stem converted to a single stem) factored by tree age, condition and health.

Arborist Rating

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.

Arborist Ratings			Sacramento County Ratings
No problem(s)	Excellent	**5**	Excellent
No apparent problem(s)	Good	**4**	Good
Minor problem(s)	Fair	**3**	Fair
Major problem(s)	Fair to Poor	**2**	Declining
Extreme problem(s)	Poor	**1**	Severe Decline
Dead	Dead	**0**	Dead

Rating #0: This indicates a tree that has no significant sign of life.
Rating #1: The problems are extreme. This rating is assigned to a tree that has structural and/or health problems that no amount of work or effort can change. The issues may or may not be considered a dangerous situation.
Rating #2: The tree has major problems. If the option is taken to preserve the tree, its condition could be improved with correct arboricultural work including, but not limited to: pruning, cabling, bracing, bolting, guying, spraying, mistletoe removal, vertical mulching, fertilization, etc. If the recommended actions are completed correctly, hazard can be reduced and the rating can be elevated to a 3. If no action is taken the tree is considered a liability and should be removed.
Rating #3: The tree is in fair condition. There are some minor structural or health problems that pose no immediate danger. When the recommended actions in an arborist report are completed correctly the defect(s) can be minimized or eliminated.
Rating #4: The tree is in good condition and there are no apparent problems that a Certified Arborist can see from a visual ground inspection. If potential structural or health problems are tended to at this stage future hazard can be reduced and more serious health problems can be averted.
Rating #5: No problems found from a visual ground inspection. Structurally, these trees have properly spaced branches and near perfect characteristics for the species. Highly rated trees are not common in natural or developed landscapes. No tree is ever perfect especially with the unpredictability of nature, but with this highest rating, the condition should be considered excellent.

Notes: Provide notable details about each tree which are factors considered in the determination of the tree rating including: (a) condition of root crown and/or roots; (b) condition of trunk; (c) condition of limbs and structure; (d) growth history and twig condition; (e) leaf appearance; and (f) dripline environment. Notes also indicate if the standard tree evaluation procedure was not followed (for example - why dbh may have been measured at a location other than the standard 54"). Additionally, notes will list any evaluation limiting factors such as debris at the base of a tree.

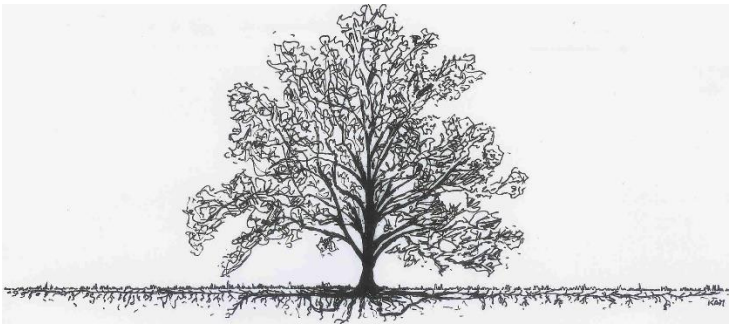
Discussion

Trees need to be protected from normal construction practices if they are to remain healthy and viable on the site. Our recommendations are based on experience and the County ordinance requirements to enhance tree longevity. This requires their root zones remain intact and viable despite the use of heavy equipment to install foundations, driveways, underground utilities, and landscape irrigation systems. Simply walking and driving on soil can have serious consequences for tree health. Tree Protection measures should be incorporated into the site plans in order to protect the trees.

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. The correct root structure of a tree is in the drawing below. All plants' roots need both water and air for survival. Poor canopy development or canopy decline in mature trees after development is often the result of inadequate root space and/or soil compaction.



The reality of where roots are generally located

Pruning Mature Trees for Risk Reduction and/or Development Clearance

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

Pruning causes an open wound in the tree. Trees do not "heal" they compartmentalize. It is far better to use more small cuts than a few large cuts as small pruning wounds reduce risk while large wounds increase risk. Any wound made today will always remain, but a healthy tree, in the absence of decay in the wound, will 'cover it' with callus tissue. Large, old pruning wounds which did not close with callous tissue often have advanced decay. These wounds are a likely failure point. Mature trees with large wounds have a high risk of failure.

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

Arborist Classifications

There are different types of Arborists:

Tree Removal and/or Pruning Companies: These companies may be licensed by the State of California to do business as a tree removal company, but they do not necessarily know anything about trees biology.

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

ISA Certified Arborist: An International Society of Arboriculture Certified Arborist is someone who has trained, met the qualifications for application, and been tested to have specialized knowledge of trees. You can look up certified arborists at the International Society of Arboriculture website: isa-arbor.org.

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

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Attachments

Appendix 1 – Tree Location Map/Development Site Plan
Appendix 2 – Tree Data
Appendix 3 – General Development Guidelines

Bibliography

International Society of Arboriculture. (2015). *Glossary of Arboricultural Terms.* Champaign: International Society of Arboriculture.
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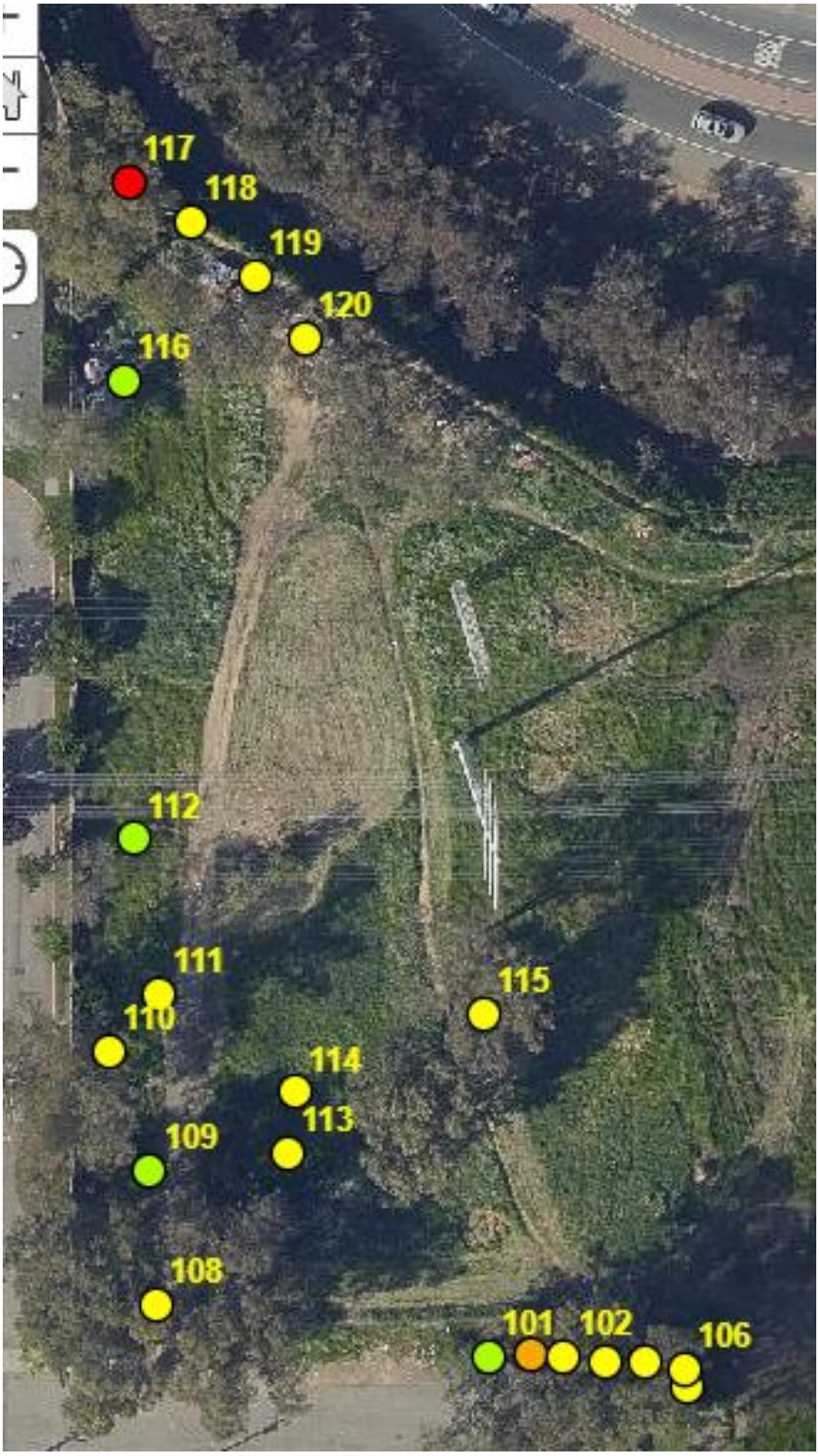
APPENDIX 1 – MAP OF THE PROPERTY SHOWING TREE LOCATION



Appendix 2 – Tree Data

Field Tag #	Protected By Code	Species Common Name	Species Botanical Name	DBH	Measured at	Canopy Radius	Arborist Rating	Development Status	Notes
101	Street Tree?	Blue Gum	*Eucalyptus globulus*	18	54	25	3 Fair - Minor Problems	Proposed for Removal	along street, slightly buried flare, lean SW at 15', 1-sided crown SW
102	Street Tree?	Blue Gum	*Eucalyptus globulus*	34	12	31	2 Major Structure or Health Problems	Proposed for Removal	basal decay, laterals cut at 3', 1 SW leader 22", 1 10" sprout S side of trunk, codom at 8', medium crown density
103	Street Tree?	Blue Gum	*Eucalyptus globulus*	42	12	39	2 Major Structure or Health Problems	Proposed for Removal	slightly buried flare, 5 leaders at 2', topped leaders at 3', 5 codoms, 7, 11, 12, 23, & 6. 5 stems lean outward, have crooks. medium crown density
104	Street Tree?	Blue Gum	*Eucalyptus globulus*	36	6	28	1 Extreme Structure or Health Problems	Proposed for Removal	out of order, 2nd tree, topped at 2', 8 leaders less than 12", 2 E dead, low crown density
105	Street Tree?	Blue Gum	*Eucalyptus globulus*	15, 12	24	17	2 Major Structure or Health Problems	Proposed for Removal	slightly buried flare, 4 leaders at base, 2 cut at 2', 15&12 stems remain, vertical growth, low crown density
106	Street Tree?	Blue Gum	*Eucalyptus globulus*	18, 17, 16, 8	54	36	2 Major Structure or Health Problems	Proposed for Removal	likely trunk sprouts, old stump at 2', 4 stems 18,17,16,8, vertical growth, slight lean S, medium crown density
107	No	Blue Gum	*Eucalyptus globulus*	18.7	54	22	2 Major Structure or Health Problems	Proposed for Removal	codom at base, large stem codom at 10', suppressed growth S, 1-sided crown, medium crown density
109	No	Blue Gum	*Eucalyptus globulus*	24	54	28	3 Fair - Minor Problems	Proposed for Removal	slightly buried base, swollen base, 2nd stem cut at 2', slight lean 15 deg SW, most of crown SW, codom at 10', medium crown density

Field Tag #	Protected By Code	Species Common Name	Species Botanical Name	DBH	Measured at	Canopy Radius	Arborist Rating	Development Status	Notes
110	No	Blue Gum	*Eucalyptus globulus*	24, 23, 14	12	42	2 Major Structure or Health Problems	Proposed for Removal	normal flare, 3 leaders at 2' - 24,23,14, included bark, 1-sided suppressed crown to W, cut old W stem at 2', some stem decay SW stem, medium crown density
111	No	Blue Gum	*Eucalyptus globulus*	19	54	28	2 Major Structure or Health Problems	Proposed for Removal	trunk damage 0-7' E side >50% circumference, 1-sided crown SW, lean 10 deg SW self correcting, tip dieback, thin crown density
112	No	Blue Gum	*Eucalyptus globulus*	7	54	11	3 Fair - Minor Problems	Proposed for Removal	codom at base, E stem cur at 3', remaining stem typical vase, good crown density, growing along side high voltage transmission lines
113	No	Blue Gum	*Eucalyptus globulus*	49	6	37	2 Major Structure or Health Problems	Proposed for Removal	normal flare, 7 remaining stem sprouts at 2', 20,13,13,13,11,12,11,11, most of crown to SW, medium crown density
114	No	Blue Gum	*Eucalyptus globulus*	16, 12	54	25	2 Major Structure or Health Problems	Proposed for Removal	swollen flare, broken stem N 2', topped stem SW 3', codom at 3,5', incl bark, 1-sided crown N, medium crown density; 3 stems to the N ~10' o.c. with small sprouts <4"
115	No	Blue Gum	*Eucalyptus globulus*	37	12	26	2 Major Structure or Health Problems	Proposed for Removal	recessed flare, 3 leaders at 3', 20,16,13, each leader slight lean outward 15 deg, 1-sided crown, medium crown density
116	No	Blue Gum	*Eucalyptus globulus*	7	54	10	3 Fair - Minor Problems	Proposed for Removal	vertical growth, cut logs at base, medium crown density
117	No	Canary Island Pine	*Pinus canariensis*	23	54	0	0 Dead	Proposed for Removal	dead, broken top, bark off 1-7'

APPENDIX 3
GENERAL PRACTICES FOR TREE PROTECTION

Definitions

Root zone: The roots of trees grow fairly close to the surface of the soil, and spread out in a radial direction from the trunk of tree. A general rule of thumb is that they spread 2 to 3 times the radius of the canopy, or 1 to 1 ½ times the height of the tree. It is generally accepted that disturbance to root zones should be kept as far as possible from the trunk of a tree.

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

Methods Used in Tree Protection:

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

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

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

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

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

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

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

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

Where tree trunks are within 3' of the construction area, place 2" by 4" boards vertically against the tree trunks, even if fenced off. Hold the boards in place with wire. Do not nail them directly to the tree. The purpose of the boards is to protect the trunk, should any equipment stray into the RPZ.

Elevate Foliage: Where indicated, remove lower foliage from a tree to prevent limb breakage by equipment. Low foliage can usually be removed without harming the tree, unless more than 25% of the foliage is removed. Branches need to be removed at the anatomically correct location in order to prevent decay organisms from entering the trunk. For this reason, a contractor who is an ISA Certified Arborist should perform all pruning on protected trees.[4]

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

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

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

[4] International Society of Arboriculture (ISA), maintains a program of Certifying individuals. Each Certified Arborist has a number and must maintain continuing education credits to remain Certified.

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

Monitoring Tree Health During and After Construction: The Project Arborist should visit the site at least twice a month during construction to be certain the tree protection measures are being followed, to monitor the health of impacted trees, and make recommendations as to irrigation or other needs. After construction is complete, the arborist should monitor the site monthly for one year and make recommendations for care where needed. If longer term monitoring is required, the arborist should report this to the developer and the planning agency overseeing the project.

Appendix 4 – Site Photographs