Tree Survey and Arborist Report

for an approximate 6.4-acre Site
Located at 500 W. Collins Ave.
In the City of Orange, California, County of Orange

Prepared for: **Brookfield Properties**
Contact: Adam Schmid, Vice President, Development
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ISA Certified and ASCA Registered Consulting Arborist

Report Date: August 25, 2023 (Revised September 27, 2023)

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SECTION 1: EXECUTIVE SUMMARY

This arborist survey has been performed at the request of Brookfield Properties for a proposed industrial development in the City of Orange, California, within the County of Orange. The proposed project includes an industrial building with associated infrastructure, parking and landscaping.

The field survey associated with this report was performed on August 10, 2023. Subject trees were tagged with aluminum tags, containing a unique number and assessed. As part of this assessment, details of each tree were recorded, documenting their species, stature, health, local environment as well as conditions in which they occur. In all, 47 trees were assessed, comprised of four distinct species. The two most prominent species surveyed were Canary Island Pine (*Pinus canariensis*) and Crape myrtle (*Lagerstroemia indica*), composing 78.7% of the total tree population. Within the site, only the western sycamores (*Platanus racemosa)* are native. No other trees within the property are expected to qualify as having a special status based on the City's Municipal Code.

The subject trees appear to be regularly maintained, but several show indications of neglect and disease. In addition, many trees onsite pose a risk due to their proximity to power lines running through their canopies; this is isolated to the stand of trees along the southern boundary. Due to stem damage, stress and disease, six trees (12.8%) are in decline, necessitating their removal. The remaining 41 trees are healthy or potentially treatable and can be preserved as part of the proposed project.

The City of Orange's Municipal Code (see Section 2.6 below) outlines provisions and guidelines for tree removal, installation, preservation, and maintenance within the City; this is especially important when considering street or public-interest trees within the City. All trees that are intended for removal as part of a project require a removal permit and must be approved by the Planning Director. The Director must also approve final mitigation involving the number of trees being replaced as well as the tree species and size of the specimens.

SECTION 2: BACKGROUND

2.1 - Project Location and Description

The project site (site) is located at 500 w. Collins Ave.; it is 1.8-miles east of the 57 FWY and 1.5 miles north of the 22 FWY in City of Orange, CA, in the County of Orange (see Figure 1 below). The proposed project includes the improvement of approximately 6.4-acres to include an industrial development with associated hardscaping, infrastructure and landscaping.

2.2 - Site and Vicinity Characteristics

The elevation of the site is approximately 180 feet above mean sea level, and the terrain is relatively flat. For the vicinity, the Sunset Zone is 22, and the USDA Hardiness zone is 10b.

The geological basement rock is described as moderately to well-consolidated silt, sand, and gravel deposits from the Pleistocene period (0.258-0.0117 MYA). As indicated below, *one* distinct soil series occurs within the site boundary; this soil series is described by the Natural Resource Conservation Service (NRCS) as alluvium, derived from granite (see Table 1 below).

Table 1. Soils on Site

Map Unit Symbol	Map Unit Name	Acres	Percent
168	**168—Modjeska gravelly loam, 0 to 2 percent slopes** **Setting** • *Landform: Alluvial fans* **Typical profile** • *H1 - 0 to 14 inches: gravelly loam* • *H2 - 14 to 63 inches: very cobbly loam* • *H3 - 63 to 71 inches: very gravelly loamy sand*	6.4	100.0%
Totals for Area of Interest		**6.4**	**100.0%**

The site is completely developed with buildings for office space and industrial use. As seen on the plates on the front cover, the remaining space is dedicated to parking and is landscaped with native and non-native plant and tree species.

2.2.1 - Urban Forest

Typically, the term urban forest refers to all trees within a densely populated area; this includes trees within cities located in parks, streetways, easements, private property etc. within a community or urban forest. In this capacity, trees provide many benefits, as they help to reduce air and water pollution, alter heating and cooling costs, reduce storm runoff, increase real estate values, provide habitat for plants and animals, and increase the quality of life for the community.

Implementing trees of various size, shape, and species serve many vital functions to the community and wildlife, contributing to spatial complexity, species richness as well as abundance. Many municipalities promote approved tree lists comprised of hardy species that thrive and reduce the threat of failure in harsh environments. Integrating carefully selected native species can also serve the community well, and also enriches the experience, promoting an environment better suited to the resident avian and butterfly population.

The project site is a very small component of the urban forest that makes up the inland community within Southern California. Within the site, there is a lack of species diversity with the stand is primarily composed (78.7%) of only two species. In addition, 14.9% of the trees within the site are California natives. The site does provide good scaffolding with trees of various shapes and sizes.

2.3 - Assignment and Scope of Survey

CalPacific Sciences (CPS) was assigned to conduct a tree survey and health assessment of all trees within the project area. The survey was performed to identify the various tree species found within the project boundary, assess their health, and provide insight as to which trees may be retained as part of the planned improvement. A *limited* health assessment was performed cataloging the health and stature parameters of each tree onsite. This included, but was not limited to; recording total diameter at breast height (DBH), canopy spread, tree height, apparent disease/decay, other signs of potential hazard, and pest damage. A limited (visual only) risk assessment was also conducted keeping public safety in mind. All documentation in this report is in compliance with standards and requirements published by the International Society of Arboriculture (ISA). This report includes recommendations and mitigation measures meant to satisfy all applicable ordinances and permit guidelines.

2.4 - Survey Method and Health Assessment

Prior to the field survey, the City of Orange's website was accessed to review specific tree protection guidelines. An aerial photograph was used as a visual guide during the assessment. A handheld Global Positioning System (GPS) device (Garmin GPSMAP 66sr) and GPS-enabled smartphone with digitized project boundaries were used to identify the location of each subject tree; these data were exported into GIS for periodic illustration and presentation over aerial photographs. Unless otherwise dictated by the local regulation, trees with a DBH of $\geq$5 inches were included in this assessment. The crown-width was measured using a Bosch laser device or estimated by pacing, and the height of each subject tree was visually estimated using a tangent height gauge. These data were recorded on field sheets, and associated aluminum numeric tags were affixed to trees on the north side at BH for later reference.

Tree status (relative condition, stature, and health) was conducted by ISA certified and ASCA registered consulting arborist/biologist, George Wirtes from ground level with the aid of binoculars. As indicated earlier, no invasive procedures were performed. Visual characteristics were recorded on field sheets, and twig/leaf samples as well as digital photographs were taken as needed to assure accurate identification. Overall health and general appearance of each tree was numerically rated (Health/General Appearance Rating - 1-Good, 2-Fair, 3-Poor, 4-Decline/dead) based on the conditions. Tree stature was also assessed in relation to the tree species shape (lean, scaffolding, offset canopy mass, etc.) with the rating as follows: 1-Good, 2-Fair, 3-Poor, 4-hazardous. Other conditions were also considered such as fence lines, utilities, competing canopies, grade cuts/slope, etc.

2.5 - Hazard Risk Assessment

The International Society of Arboriculture (ISA) recommends a Hazard Assessment be included with arborist reports. Such an assessment is an important component of any report and is critical if trees are to be located near public areas such as parks, walkways, residences, and buildings. This tree assessment includes a ***limited*** *Level 2 Basic Risk Assessment* as defined by ISA Best Management Practices. *This assessment was limited and did not include tools to detect internal decay. A level 3 assessment of many*

trees onsite is recommended to assure public safety, especially in high traffic areas (see section 4.3.2 below). Level 2 (visual only) assessments are limited to evaluating trees and obvious signs of defects such as:

- Dead or broken structures
- Cracks
- Weakly attached branches and co-dominant stems
- Missing or decayed wood
- Unusual tree architecture or distribution
- Obvious loss of root support

A risk rating is assigned to each tree based on its defects, aesthetics, apparent health, location and the nearby targets (people or property). In this context, risk refers to consequences and likelihood of failure and impacting a target. As defined by ISA The ratings are defined below:

1. *Low* - Low-risk category applies when consequences are negligible, and likelihood is unlikely, or consequences are minor, and likelihood is somewhat likely.
2. *Moderate* - Moderate risk situations are those for which consequences are minor and likelihood is very likely or likely or likelihood is somewhat likely, and the consequences are significant or severe.
3. *High* - High-risk situations are those for which consequences are significant and likelihood is very likely or likely or Consequences are severe, and likelihood is likely.
4. *Extreme* - The extreme risk category applies in situations in which failure is imminent and there is a high likelihood of impacting the target and the consequence of the failure is severe. The tree risk assessor should recommend that mitigation measures be taken as soon as possible.

It is impossible to maintain a tree free of risk. A tree is considered hazardous when it has a structural defect that predisposes it to failure, and it is located near a target.

- A target is person or property that may sustain potential injury or property damage if a tree or a portion of a tree fails.
- Target areas include sidewalks, walkways, roads, vehicles, structures, playgrounds, or any other area where people are likely to gather.
- Structurally sound and healthy trees may also be hazardous if they interfere with utilities, roadways, walkways, and sidewalks, or if they obstruct motorist vision.
- Common hazards include dead and diseased trees, dead branches including bark, stubs from topping cuts, broken branches (hangers), multiple leaders, tight-angled crotches, and an unbalanced crown. Evaluation of risk is as follows: 1-Good, 2-Fair, 3-Poses risk, and 4-Hazardous.

2.6 - Local Tree Regulation (City of Orange Municipal Code)

The City of Orange has several provisions within its Municipal Code (Code or MC) relating to tree preservation and protection, most of which pertain to undeveloped property and public property within the City. Several key provisions are provided below, but this list is NOT all-inclusive and further reading is recommended.

2.6.1 - City of Orange Tree Preservation Intent and Purpose (Sections 12.32.010)

The primary purpose of this provision is to regulate the removal and destruction of trees from undeveloped and public interest property as those terms are defined in the Code (MC Sections 12.32.040 and 12.32.050).

The primary concern of the City is the regulation of large-scale tree removal from undeveloped property in that large parcels of undeveloped acreage are more likely to have a vast number of trees, the removal of which is more likely to have an adverse effect upon the surrounding environment.

2.6.2 - Removal of Trees Prohibited Without a Permit (Section 12.32.030)

It is unlawful for any person, firm, partnership, corporation or other legal entity whatever, to destroy or remove any tree as defined in the Code (MC Section 12.32.020) from undeveloped or public interest property as defined in Code without a permit. In addition, to "destroy" a tree means to cut or mutilate a tree in such a manner as to destroy its character as live vegetation.

2.6.3 - Historical Trees (Section 12.32.060)

Historical trees are those which, by virtue of their origin, size, uniqueness and/or national or regional rarity, are now or are likely to be of historical value. Trees so classified may be, but are not limited to those on a master list compiled and maintained by the Community Services Department and approved by resolution of the City.

2.7 - Limitations and Exceptions of Assessment

This survey was conducted in a manner that draws upon past education, acquired knowledge, training, experience, and research. It was conducted to the greatest extent feasible, and although the information gathered reduces risk of tree failure/decline, it does not fully remove it.

California has a Mediterranean climate, and the costal environment provides excellent growing conditions for many floral species from all over the world. Trees mostly flower and fruit in the spring and fall months revealing characteristics that aid in their identification. Trees may not exhibit such features due to factors related to their health, vigor, reproduction strategy, etc. There is a potential (albeit small) for a tree species to be misidentified. Drawing clues from the leaves (shape and position), bark, tree morphology, and any other structures (inflorescence, fruit, etc.), every effort was made to provide a conclusive species name to the greatest degree possible.

No invasive diagnostic testing was performed during this assessment. The survey associated with this Arborist Report was *visual only* in nature and did not include soil sampling, root excavation, trunk coring/drilling or any other invasive procedure. The determinations of damage due to pest infestation and decay were made solely on outward appearance and inspection of the tree structures. Not all tree defects may be readily visible from the ground or apparent at the time of the survey, especially during rain events when the wood is wet. Epiphytic growth can also obscure defects on the stem and in the canopy of a tree.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Internal or heartwood decay can be present and significant while showing little outward indication of wood rot internally. Trees are living organisms subject to attack by disease, insects, fungi and other forces of nature. Many aspects of tree health and environmental conditions are often not detectable (internal decay, poor root

anchoring, etc.). Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time.

The statements made in this report do not consider the effects of climate/wind extremes, vandalism, or accident (whether physical, chemical, or fire). In addition, this area is known to have periodic, high velocity Santa Ana winds from transient high-pressure ridges. CPSC cannot, therefore, accept any liability in connection with these factors, or where prescribed work is not carried out in a correct and professional manner in accordance with current ISA good practice. The authority of this report ceases at any stated time limit within it, after one year from the date of the survey (if none stated), when any site conditions change, or after pruning (or other activity) not specified in this report.

The goal of this survey is to *recommend measures* to limit risk exposure while enhancing the beauty and health of each tree onsite. Given the location of the trees with frequent targets, bias was given to limiting risk exposure within the new development moving forward.

Consulting arborist are *not* risk managers nor responsible for tree removal or preservation. They make recommendations based on several factors, including (but not limited to) tree health and public safety. Clients may choose to accept or disregard the recommendations contained within this report, or seek additional advice. ***To live near trees is to accept some degree of risk. The only way to eliminate all risk is to remove all trees onsite***.

SECTION 3: SUBJECT TREES AND OBSERVATIONS

During the site survey, specific measurements and parameters of all trees onsite were recorded on tree assessment worksheets; these data have been transferred into the table in Appendix A at the end of this document. In all, 47 trees consisting of four distinct species were assessed (see Figure 2 below). A tree species matrix is also provided in Appendix A below, characterizing each tree species observed onsite. The age of the trees onsite ranged from immature to mature and the health ranged from rigorous to decline.

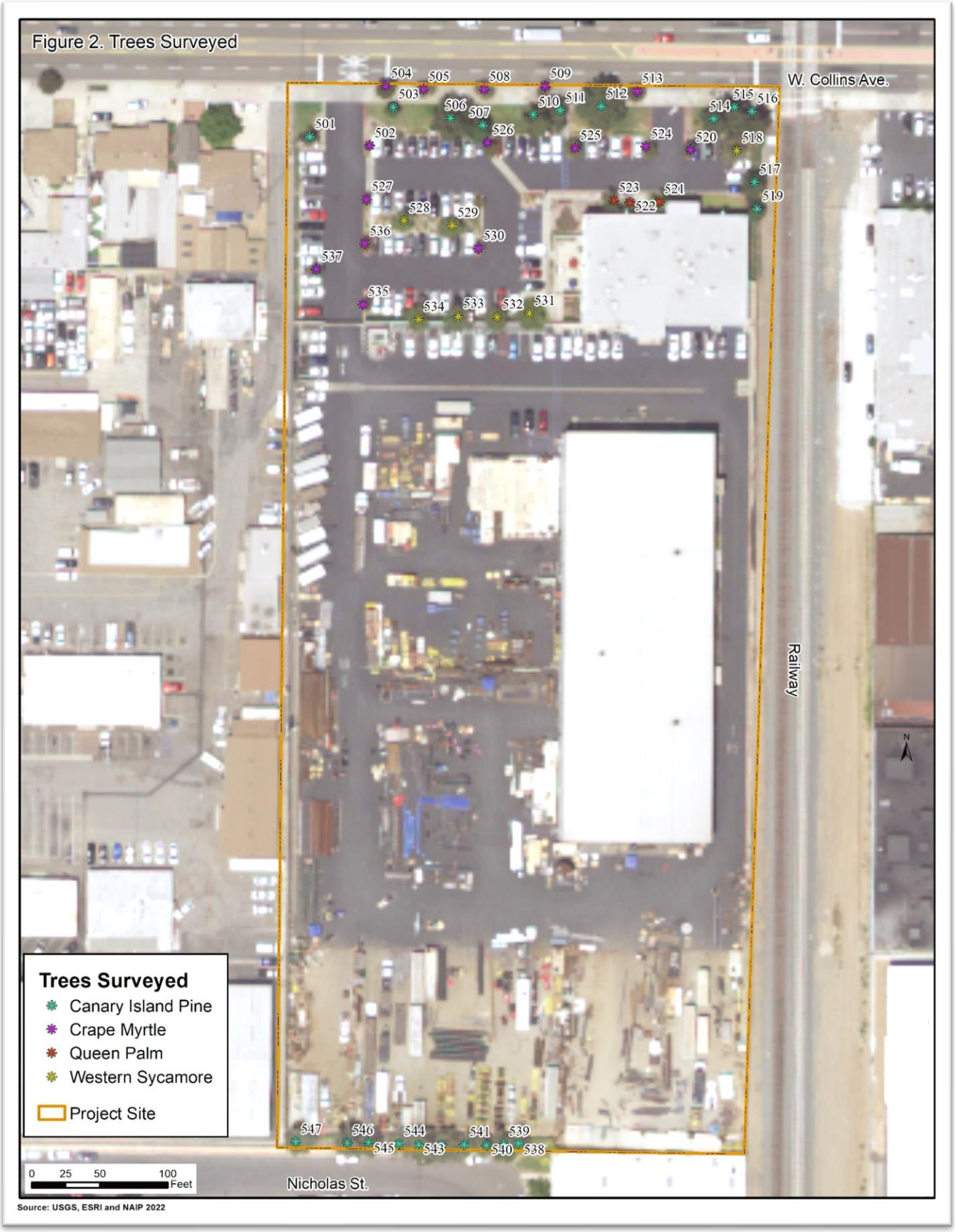
Figure 2. Trees Surveyed
W. Collins Ave.
Railway
Nicholas St.
N
Trees Surveyed
Canary Island Pine
Crape Myrtle
Queen Palm
Western Sycamore
Project Site
0 25 50 100 Feet
Source: USGS, ESRI and NAIP 2022

3.1 - Species Assessment

During the survey, tree assessments were conducted according to general ISA and City requirements; GPS waypoints were recorded as were specific details of each tree. The tree species represented onsite are characterized in detail below (as well as their count), and a comprehensive table of each tree present is provided in Appendix A of this report. In general, the species onsite were appropriate for the location.

Species	Characteristics	Qty
Western Sycamore * *Platanus racemosa*	This species is from the Platanaceae (plane tree) family and is a riparian, California native tree that tolerates extreme heat and wind. Its form is erect or spreading and requires ample growing space. Its form is oval, rounded or umbrella shape. It has deciduous foliage. Height: 30 - 80 feet. Width: 20 - 50 feet. Growth Rate: 36 Inches per Season. Longevity Greater than 150 years. This species prefers exposure of full sun to partial shade with moist to dry soil. It tolerates clay, loam or sand textured soil. It is susceptible to leaf miner, scales and spider mites, anthracnose, oak root rot, phytophthora, mistletoe, *Apignomonia venata* and root rot. Its branch strength is rated as medium and its root damage potential is rated as moderate.	7
This majestic, native tree is planted within the planters of the parking lot. The stand exhibits signs of distress that includes exfoliating bark, sap exudation, and cankers.		
Crape Myrtle *Lagerstroemia indica*	The Crape Myrtle tree is native to China and is a commonly used single or multi-trunk tree. Is from the Lythraceae (loosestrife family). It is commonly used as in the urban setting in Southern California for its flowering, foliage, and bark features. Erect or Spreading with a Low Canopy. Has Deciduous foliage. Height: 25 feet. Width: 25 feet. Growth Rate: 24 Inches per Year. Longevity 50 to 150 years. Exposure Full Sun. Moist to Dry Soil. Drought tolerant. Clay, Loam or Sand Texture. Branch Strength Rated as Medium. Root Damage Potential Rated as Low. Susceptible to Aphids, Powdery Mildew and Sooty Mold.	15
Queen Palm *Syagrus romanzoffiana*	The queen palm (also known as Cocos palm), is a palm native to South America. This species has evergreen foliage and grows to a height of 50 feet and a width of 20 - 30 feet. It can grow 24 or more inches per year. The longevity of this species is 50 to 150 years. Leaves are referred to as fronds and remain green throughout the year. Sunset zones 12, 13, 15 - 17 and 19 - 24; H1, H2. USDA hardiness zones 10 - 11. This tree prefers full sun and well-drained soil composed of clay, loam or sand texture. This species is tolerant to salinity lending itself to good seaside tolerance near the coast. This species is resistant to Texas root rot. Susceptible to scales and spider mites, butt rot, armillaria and root rot.	3
These trees appeared to be installed too close to the adjacent building often resulting in significant canopy contact.		
Canary Island Pine** *Pinus canariensis*	Native to Canary Islands of Spain in the Atlantic Ocean, the Canary Island pine is a species of gymnosperm in the conifer family *Pinaceae*. It is a large, evergreen tree Columnar or Conical in Shape. Height: 50 - 80 feet. Width: 20 - 35 feet. Its growth Rate is 36 Inches per Year and its longevity is 50 to 150 years. The flowers of this tree are Inconspicuous. It is also monoecious having separate male and female flowers on the same tree. Its cones are brown growing as large as 3 inches.	22

	It thrives best in Sunset Zones 8, 9, and 12 – 24 and USDA Hardiness Zones 9 - 10. It tolerates exposure Full Sun to Partial Shade in Moist to Dry Soil. It is a drought tolerant tree. It can grow in loam or sand texture soil with highly acidic to highly alkaline soil pH. It is a subtropical pine and does not tolerate low temperatures or hard frost. It is resistant to verticillium. Susceptible to aphids, beetle borers and spider mites, armillaria, phytophthora, root rot, sooty mold and pitch canker. Its root damage potential rated as moderate and branch strength rated as medium. This tree attracts birds and squirrels and is resistant to oak root fungus.	
Many of these trees along the southern boundary have utilities running through their canopies. This creates a potential hazard that should be addressed.		
* California native tree species ** Cal-IPC (California Invasive Plant Council) invasive tree species		

Source: UFEI 2023

3.2 - Observations

During the field survey, observations were documented pertaining to disease, structural defects, and other notable instances. The situations described below were noted onsite, these potentially contributed to hazardous conditions, tree decline, poor growth form, etc.

3.2.1 - Survey Photographs

The plates below illustrate many of the situations noted above and are merely representative of what was documented during the site assessment.

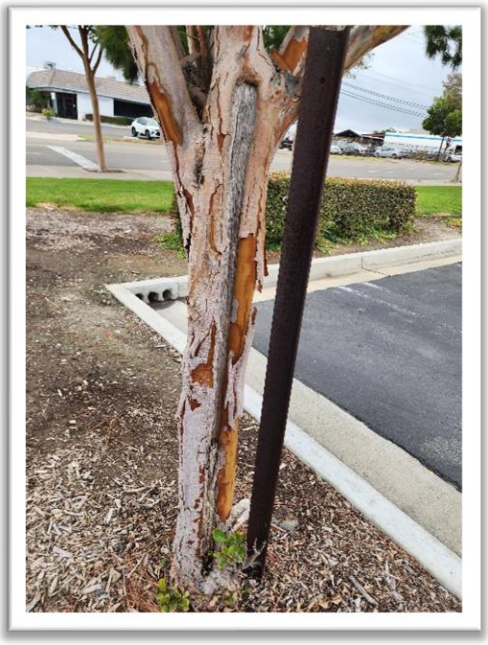

Plate 1. This is a view of a long longitudinal canker within the stem of a tree (#502).

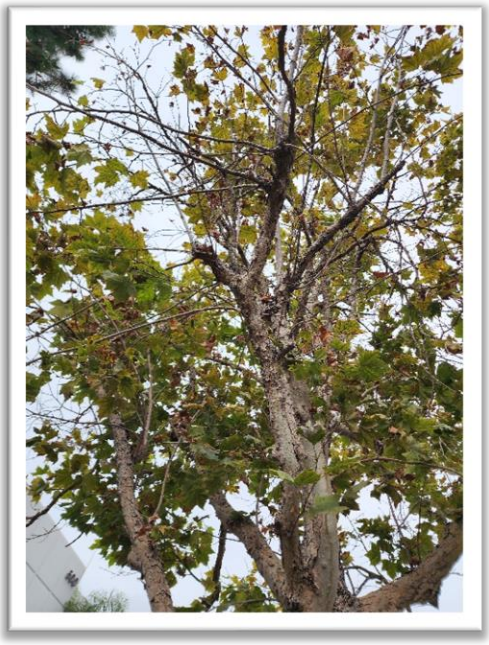

Plate 2. This is a view of significant deadwood within the upper canopy of a tree (#518).

Plate 3. This is a view of a tree with a lean (#503).

Plate 4. This is a view of large, unclosed branch cuts (#506).

Plate 5. This is a view of a massive tree with a lean and what appears to be resultant soil lift within the root crown (#512).

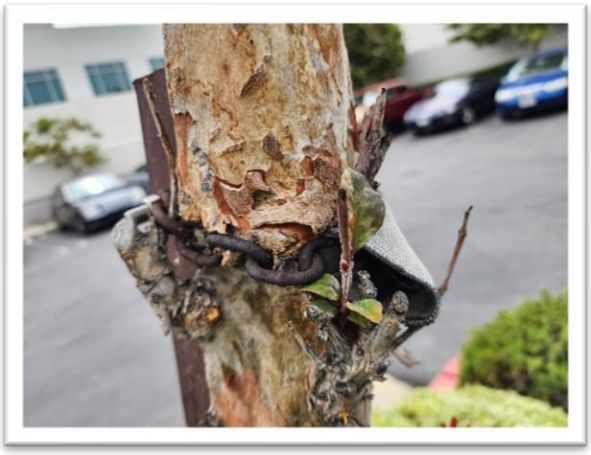

Plate 6. This is a view of an embedded chain (#530).

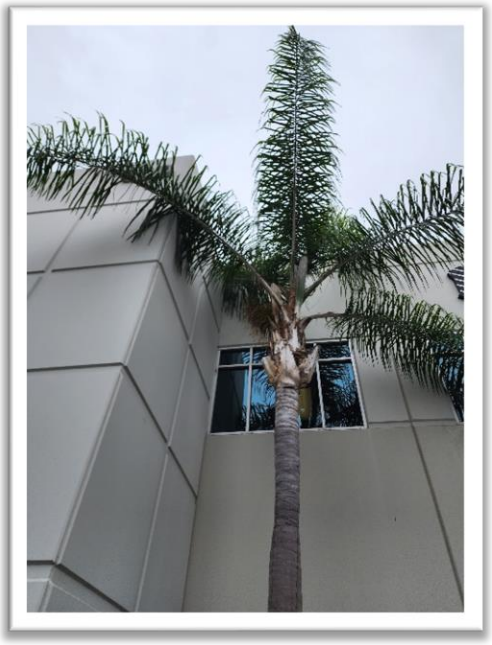

Plate 7. This is a view of a tree canopy in contact with a nearby structure (#521).

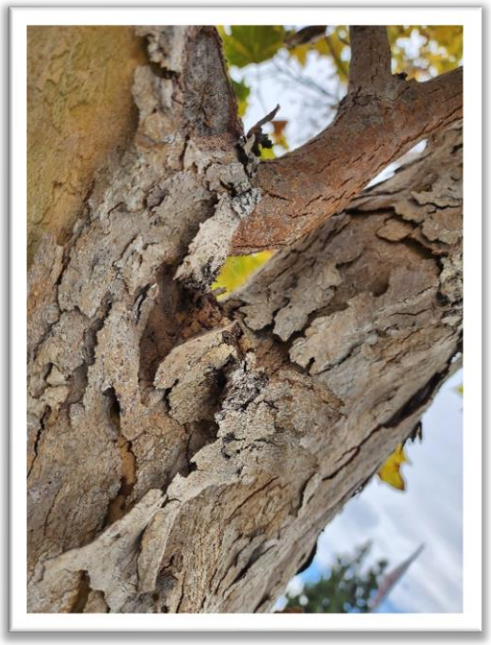

Plate 8. This is a view of exfoliating bark (#529).

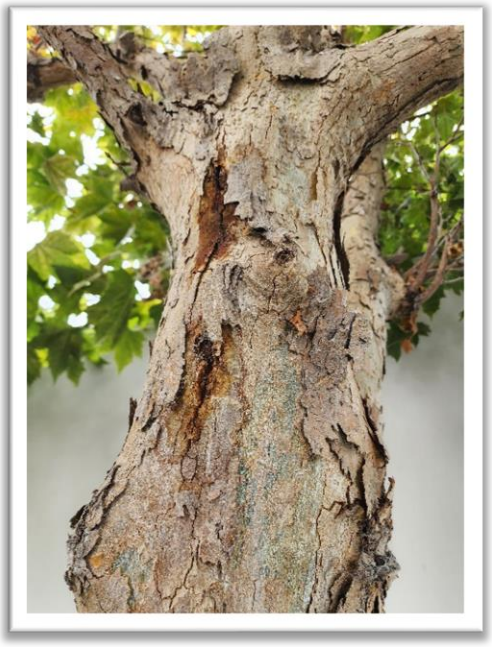

Plate 9. This is a view of exuding cankers (#532).

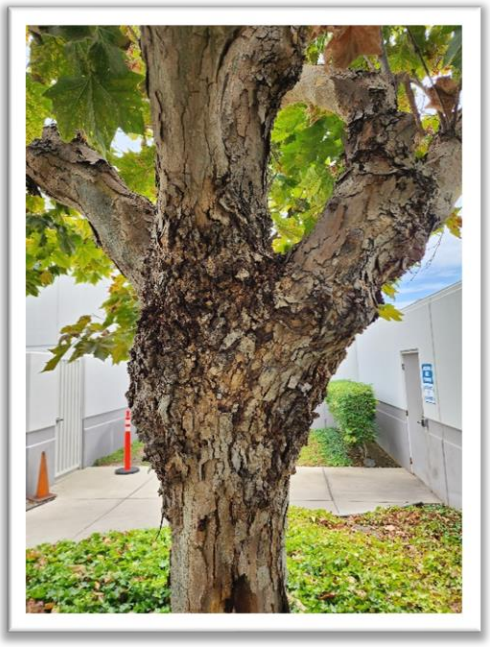

Plate 10. This is a view of a diseased callus wood (#530).

Plate 11. This is a view of exuding cankers (#534).

Plate 12. This is a view of a codominant stem (#547).

Plate 13. This is a view of an epiphytic English ivy and indication of overwatering (#534).

Plate 14. This is a view of a wire strangling a stem and impeding cambial nutrient flow (#535).

Plate 15. This is a view of trees installed within close proximity of a nearby building (#534).

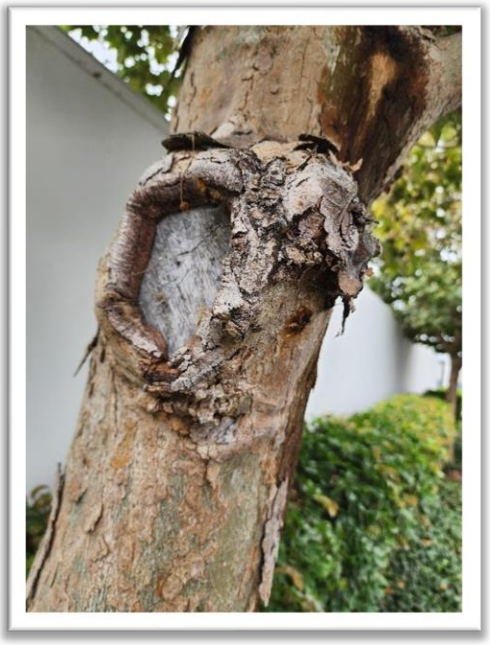

Plate 16. This is a large unclosed branch cut with localized decay and nearby stained wood (#538).

Plate 17. This is a view of utilities running through the canopy of nearby trees (southern boundary).

SECTION 4: DISCUSSION AND RECOMMENDATIONS

4.1 - Conclusion

As part of this assessment, details of each tree were recorded, documenting their species, stature, health, local environment as well as conditions in which they occur. In all, 47 trees were assessed, comprised of four distinct species. The two most prominent species assessed were Canary Island Pine (*Pinus canariensis*) and Crape myrtle (*Lagerstroemia indica*), composing 78.7% of the total tree population. Of the species assessed, only the western sycamores (*Platanus racemosa*) are native. No other trees within the site are expected to qualify as special status trees based on the City's Municipal Code.

The trees are mostly adequately maintained, but several show indications of neglect and disease. In addition, many trees onsite pose a risk due to their proximity to power lines running through their canopies; this is isolated to the stand of trees along the southern boundary. Due to stem damage, stress and disease, six trees (12.8%) are in decline, necessitating their removal. The remaining 41 trees are healthy or potentially treatable and can be preserved as part of the proposed project.

4.2 - Discussion

The trees within the property are generally located within planters of the northern parking lot as well as along the southern boundary. Although the trees are maintained, structural supports were left in place as the trees grew resulting in growth tissue encasing the supports, or the localized presence of diseased or decay within the affected tree stems. In addition, the western sycamores are native trees and are used nicely within the landscaping. Unfortunately, they are not thriving and further analysis is needed to treat them. Over-watering is suspected, but other environmental conditions may persist. Finally, utilities run though the canopies of the trees along the southern boundary. If left unaddressed, the situation may pose a risk to nearby people and property.

4.3 - Recommendations

4.3.1 - Tree Removal and Replacement

Recommended mitigation for special-status, native, and other living tree removal is replanting in accordance with the City's Municipal Code (see Section 2.6 above), following the attainment of a removal permit (if necessary). It is recommended that a mitigation ratio of 2:1 (with 24-in. boxed and 15-gallon) containered trees be used with local, quality native and non-native nursery tree stock. However, newly installed tree species must be in accordance with any City-approved species list (if applicable). Deviation from the aforementioned recommendation is at the discretion of the City's Planning Director.

4.3.2 - Trees Preserved

Removal of living, native and non-native trees may result a biological impact. If it is decided to preserve any trees onsite, an ongoing maintenance and monitoring are recommended; this is to ensure public safety

and minimize liability due to potential tree failure. In addition, tree protection measures must be made to assure all tress preserved within the site (or adjacent to) will be adequately protected during construction activity (see Appendix B below). Strategic pruning compliant with ISA standards must be performed to subordinate non-primary, codominant stems, and canopy deadwood should be removed. Regular care and maintenance are recommended according to ISA standards.

It is also recommended that several trees onsite be evaluated and treated, if preserved. A more detailed evaluation of specific trees is warranted in the event of their retention going forward; this is especially important with the western sycamores within the property. They have the potential to recover if treated and adverse environmental conditions (i.e., over-watering, soil drainage, etc.) are addressed.

4.3.3 - Migratory Bird Treaty Act

Pursuant to the Migratory Bird Treaty Act (MBTA) and CDFG Code, removal of any trees, shrubs, or any other potential nesting habitat should be conducted outside the avian nesting season. The nesting season generally extends from early February through August, but can vary slightly from year to year based upon seasonal weather conditions.

SECTION 5: QUALIFICATIONS OF ARBORIST

Mr. Wirtes is a Certified Arborist (CH-08084) with the International Society of Arboriculture (ISA) and is a Registered Consulting Arborist (#738) with the American Society of Consulting Arborists. Originally ISA certified in November of 2005, Mr. Wirtes is also Tree Risk Assessment Qualification (TRAQ) certified, and has conducted numerous tree assessments for residential, industrial, and commercial properties involving oak and other tree species. Most notably, Mr. Wirtes has assessed properties with as many as 550 trees, and has created an oak regeneration, desert native plant and Joshua tree management plans. He regularly performs tree surveys within Riverside, San Bernardino, Orange as well as Los Angeles Counties. Mr. Wirtes' education includes a Bachelor of Science in Biology and a Master of Science in Environmental Science from California State University at Fullerton.

I certify that the details stated herein this report are true and accurate:

George Wirtes, MS, RCA #738
ISA Certified Arborist, CH-08084

SECTION 6: REFERENCES

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Appendix A - Tree Species Observed

Note - This tree survey details recorded below are meant to characterize the trees within the property based on a limited "visual only" evaluation (see Section 2.7 above). The goal was to accumulate enough data to make a judgment as to what role, if any, the existing trees may have in the proposed project.

KEY	Health Rating: 1= Good, 2 = Fair, 3 = Poor, 4 = Dying/Immanent Hazard	Structural/Stature Rating: 1 – Good, 2- Fair, 3- Potential Hazard 4- Imminent Hazard	Risk of Failure: 1 – Improbable, 2- Possible, 3 – Probable, 4 - Imminent

Tree Tag #	Species	DBH (inches) 1st Stem	2nd Stem	3rd Stem	4th Stem	5th Stem	6th Stem	Total	Height (feet)	Canopy Width (feet) (North on top)	Canopy Cover (sq ft)	Health	Structure	Risk	Recommendation
501	Canary Island Pine	15						15	47	12 / 9 / 10 / 10	330	2	2	2-3	Preserve
Near utilities, good form and vigor, trim clear of utility lines															
502	Crape Myrtle	6.5						6.5	23	7 / 8 / 7 / 8	177	3-4	2	2-3	Remove
In decline, stem cankers															
503	Canary Island Pine	12						12	38	12 / 10 / 8 / 9	298	2	3	2	Remove
Lean, increased liability risk, re-evaluate to keep															
504	Crape Myrtle	7.5						7.5	28	11 / 11 / 10 / 9	330	2-3	2	2	Preserve
Exfoliating bark, distressed															
505	Crape Myrtle	8						8	21	7 / 8 / 9 / 8	201	3	2	2-3	Remove
Burl at base, in decline, poor prognosis															
506	Canary Island Pine	23						23	50	17 / 16 / 13 / 15	730	2-3	2	2	Preserve
Multiple large branch cuts, droopy foliage															
507	Canary Island Pine	23						23	58	14 / 11 / 16 / 17	660	2	2	2	Preserve
Good form and vigor															
508	Crape Myrtle	7						7	19	9 / 9 / 10 / 9	269	2-3	2	2	Preserve
Mechanical damage															
509	Crape Myrtle	5						5	17	9 / 8 / 7 / 5	165	2	2	2	Preserve
Fair form and vigor, epicormic shoots															
510	Canary Island Pine	19						19	60	10 / 14 / 9 / 12	397	2	2	2	Preserve
Good form and vigor, competing canopy															
511	Canary Island Pine	17						17	61	9 / 10 / 8 / 15	346	1-2	2	2	Preserve
Good form and vigor															
512	Canary Island Pine	33						33	52	22 / 17 / 20	1134	2	3	3	Remove
Large specimen, increased liability, lean, lifted soil on south side, re-evaluate to keep															

										17					
513	Crape Myrtle	7.5						7.5	26	10	330	1-2	2	2	Preserve
Good form and vigor, planted with nursery container intact…likely girdled roots present and well as poor root development										11 9 11					
514	Canary Island Pine	21						21	49	11	380	2	2	2	Preserve
Good form and vigor										12 8 13					
515	Canary Island Pine	20						20	66	11	363	2	2	2	Preserve
Good form and vigor										10 11 11					
516	Canary Island Pine	21						21	69	10	510	1-2	2	2	Preserve
Good form and vigor										13 16 12					
517	Canary Island Pine	16						16	69	9	452	1-2	2	2	Preserve
Good form and vigor										15 12 12					
518	Western Sycamore	8						8	36	12	471	2-3	2	2	Preserve
Distressed, re-evaluate and treat to preserve										14 9 14					
519	Canary Island Pine	13						13	35	9	314	2	2	3	Preserve
Against target (building), prune										9 12 10					
520	Crape Myrtle	5						5	23	6	143	2	2	2	Preserve
Distressed, re-evaluate and treat to preserve										8 6 7					
521	Queen Palm	10						10	34	10	165	2	2-3	2-3	Preserve
Good form and vigor, next to target										10 4 5					
522	Queen Palm	16						16	26	6	189	2	2-3	2-3	Preserve
Good form and vigor, next to target										10 10 5					
523	Queen Palm	15						15	29	10	240	2	2-3	2-3	Preserve
Good form and vigor, next to target										10 10 5					
524	Crape Myrtle	5						5	21	6	123	2	2	2	Preserve
Good form and vigor										7 6 6					
525	Crape Myrtle	5						5	24	7	201	2	2	2	Preserve
Good form and vigor										7 8 10					
526	Crape Myrtle	6						6	24	7	201	2	2	2	Preserve
Good form and vigor										8 7 10					
527	Crape Myrtle	5						5	20	7	123	2	2	2	Preserve
Good form and vigor										6 6					

										6					
528	Western Sycamore	7						7	23	8		254	2-3	2	2	Preserve
Good form and vigor, indications of stress noted (exfoliating bark)										10	9				
										9					
529	Western Sycamore	6.6						6.6	22	10		269	3	2-3	2	Preserve
Fair form and vigor, rope strangling lower stem, exfoliating bark, remove rope										10	9				
										8					
530	Crape Myrtle	4.5						4.5	14	3		95	3	2-3	2-3	Remove
Embedded brace and chain										6	7				
										6					
531	Western Sycamore	8						8	25	11		638	3	2	2	Remove
Exfoliating bark, cankers, distressed										15	19				
										12					
532	Western Sycamore	7						7	27	8		298	2-3	2	2	Preserve
Exuding sap, exfoliating bark										13	9				
										9					
533	Western Sycamore	8.5						8.5	28	9		254	2-3	2	2	Preserve
Exuding sap and exfoliating bark, re-evaluate and treat										9	9				
										9					
534	Western Sycamore	8						8	26	8		254	2-3	2	2	Preserve
Exuding sap and exfoliating bark, re-evaluate and treat										10	9				
										9					
535	Crape Myrtle	6						6	15	5		104	2-3	2	2	Preserve
Strangled by wire, mechanical damage, remove wires and treat										6	6				
										6					
536	Crape Myrtle	4.5						4.5	16	6		123	2	2	2	Preserve
Good form and vigor										6	7				
										6					
537	Crape Myrtle	6						6	19	7		165	2	2	2	Preserve
Good form and vigor										7	7				
										8					
538	Canary Island Pine	15						15	46	14		363	2-3	2	2	Preserve
Fair form and vigor										8	10				
										11					
539	Canary Island Pine	20						20	47	14		491	2-3	2	2	Preserve
Good form and vigor, competing canopy										10	10				
										16					
540	Canary Island Pine	12						12	44	12		214	2	2	2	Preserve
Good form and vigor, competing canopy										7	6				
										8					
541	Canary Island Pine	13						13	44	15		397	2	2	2	Preserve
Fair form and vigor, utilities in canopy										7	7				
										16					
542	Canary Island Pine	19						19	55	11		415	2-3	2	2	Preserve
Fair form and vigor										8	8				

										19					
543	Canary Island Pine	23						23	56	15		531	2	2	2	Preserve
Good form and vigor										10	8					
										19						
544	Canary Island Pine	14						14	41	15		283	2	2	2	Preserve
Good form and vigor										8	6					
										9						
545	Canary Island Pine	18						18	44	13		380	2	2	2	Preserve
Codominant stems with included bark, re-evaluate and brace										6	8					
										17						
546	Canary Island Pine	19						19	56	12		531	1-2	2	2	Preserve
Good form and vigor										14	8					
										18						
547	Canary Island Pine	26						26	44	15		829	3	2	2	Preserve
Codominant stems with included bark, re-evaluate and brace										16	16					
										18						

Appendix B –Tree Protection during Construction

Construction activity near trees pose a great risk due to many factors. It is very important to reduce disturbance impacts to existing trees during construction activity associated with a development project. Older trees are less tolerant to root crown disturbance, either from damaged roots or compacted soils. Damage to structural roots can greatly cause harm and structural instability to trees and cause them to fail. The main stresses and risks of construction include:

- Soil compaction
- Lack of water or changes in the site hydrology
- Change of grade in the root zone
- Physical damage to tree roots and stem structure
- Dumping of potentially toxic construction wastes
- Dust
- Human error

Given this, the following Best Management Practices (BMPs) are recommended to mitigate adverse effects stemming from construction and to preserve the health and vigor of the trees onsite.

The successful implementation of a project requires effective communication regarding protective measures in place and a willingness by everyone involved to follow the guidelines presented. Prior to groundbreaking activity, a pre-construction meeting should be held with the project arborist, supervisor, work crew, and other parties associated with the project that may be involved in the various stages of the project. The guidelines and BMPs can be presented at this time and handouts given to the work crews.

Tree Protection Zone (TPZ)

A tree protection zone should be established and clearly marked for all trees. A TPZ is meant to protect the tree's limbs, trunk and roots from construction damage by discouraging the storage of materials beneath the tree's canopy, accidental releases of chemicals, and the accidental breakage or damage of tree structures. The TPZ should extend one foot from the face of the trunk for each inch in trunk diameter (measured at a height of 4.5 feet), with a minimum of 2 feet. The TPZ should be extended to 1.5 feet per inches DBH for sensitive or overmature trees. A tree's Critical Root Zone (CRZ) includes the area in which the significant structural roots, critical to the tree's structural integrity, are located. To the extent feasible, it is advisable for the construction crew to refrain from working within the CRZ.

In areas where feasible, the following measures are recommended to protect the trees.

1. Protective fencing should be placed at the outer edge of the TPZ.
2. Protective fencing must be erected so that it is visible and structurally sound enough to deter construction equipment, foot traffic, and the storing of equipment under tree canopies.
3. Signs should be posted on the fencing around trees notifying contractors of the fines for dumping. Oil from construction equipment, cement, concrete washout, acid washes, paint, and solvents are toxic to tree roots.

4. If it is not feasible to operate outside of the TPZ and CRZ, an arborist or biological monitor should be consulted to assess the situation and explore methods that will result in minimal adverse impact to the nearby tree.
5. If work must be performed within or near the TPZ, soil compaction must be mitigated by the addition of 4" of mulch or other similar material in the immediate vicinity of the work being performed.
6. Construction creates large amounts of dust. Trees to be preserved will need to be kept clean. Dust reduces photosynthesis within the leaves of trees. During periods of extended drought, wind or grading, trunks, limbs and foliage should be sprayed with water to remove accumulated construction dust. Strict dust control measures must be implemented during construction to minimize this impact, and an occasional rinsing with a solution of water and insecticidal soap will help control pests.
7. Many trees in the appendix are noted to have poor health or structural issues. Strategic pruning may be required to limit hazardous conditions to the construction crew; this is at the discretion of the project arborist or supervisor. All pruning should be performed by an ISA Certified Arborist or ASCA Consulting Arborist.
8. Supplemental irrigation is recommended if a tree appears stressed or under irrigated. Irrigation should be designed to wet the soil within the Tree Protection Zone to the depth of the root zone and to replace that water once it is depleted. Light, frequent irrigation should be avoided.