Appendix C

Tree Evaluation Report

Tree Evaluation Report

For: Proposed Palmyra Cemetery Site

741 Palmyra Street, Orange

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Introduction

Project Description and Background

Ridge Landscape Architects is providing landscape design for a proposed cemetery in the City of Orange. The property is now occupied by a vacant recreation building and an open field sheltered by a windrow of mature red gum eucalypts. There are no street trees adjoining this property and none included in this report. The existing structure will be removed or remodeled and some of the trees will be removed. The whole property and trees were examined on August 19 and 20, 2020, and all trees over 4-inch caliper are included in this report. Representative photographs of the trees and present conditions are enclosed.

Assignment

Arborgate Consulting, Inc. was retained by Ridge Landscape Architects to review and provide an arboricultural evaluation of 130 trees' health and condition, professional opinions on necessary clearances and protection. This report is provided for submission to the City of Orange consideration.

Aerial View of Site

⇦ North

Findings

General Conditions Affecting the Trees' Health

The overall site adjoins the Santiago Creek and Santiago Creek Trail and Bikepath. The Bikepath is fenced off and separated from this site. The site is also fenced and kept locked.

Most of the site is unused and none of it is occupied. The more "agricultural" north portion is in fallow condition and had no crops growing currently or recently. The recreation building is boarded up and the playground fenced and locked. The trees appear to be unmaintained. No demolition, grading and other site work had yet begun anywhere on site at the time of my inspection. In the more recent history of the site soil has been deposited in piles and around the base of the windrow trees.

Over all parts of the site there are 130 trees of reportable size, none were noted on the adjoining properties, except just to the west along the bicycle trail. Seventy-three of the trees are eucalypts, and all but two of the eucalypts are red gums. There are nine pines, and all but two are Aleppo pines. There are eight sycamores, and all but one are European sycamores. There 21 oaks, all but three are coast live oaks. There are eight pepper trees, all but one are California peppers. Most of the rest are Mexican fan palms, Ficus, or jacarandas.

The red gums in the "agricultural" north part are untrained and unmaintained. Old pipes, chain link fence and other debris has been left behind by the former occupants.

The trees on the south end are of mixed species, but mostly California pepper, European sycamores, Ficus, oaks and pines. Lacking any recent irrigation, most of the more riparian trees are in decline.

Matrix of Tree Observations

Following this table is an explanation of the codes used in the comments column. Health and structure grades are like school grades: A= excellent; B= good; C = okay; D = poor or declining; and F = dead or close to it. An "m" preceding an abbreviation means a minor condition.

Tag#	Species	DBH	Ht	Spr	Health	Structure	Comments
1	Eucalyptus camaldulensis	10	50	15	F	F	Dead
2	Eucalyptus camaldulensis	28 @ 3'	95	45	C-	D	Cod deep TOP brks DL lerps TB
3	Eucalyptus camaldulensis	18+7	95	40	C-	C-	Cod deep Sp Db lerps TB
4	Eucalyptus camaldulensis	8.5	35	15	D	C	Deep Sp Db lerps TB
5	Eucalyptus camaldulensis	5+23+5	95	50	C-	C	Deep Sp Db lerps TB
6	Eucalyptus camaldulensis	5	30	15	F	F	Dead 1s
7	Eucalyptus camaldulensis	26	80	35	C-	C-	1s deep cod lerps TB
8	Eucalyptus camaldulensis	5	18	16	D	D	Top dead Db Sp lerps TB
9	Eucalyptus camaldulensis	22	95	45	C	C	Cod deep Sp lerps TB
10	Eucalyptus camaldulensis	14+15	55	35	D	D	Cod Db Sp epi lerps TB
11	Eucalyptus camaldulensis	21	50	30	C	C-	2long DLT Sp deep lerps TB
12	Eucalyptus camaldulensis	19	95	50	C-	C	Db deep m2long lerps TB
13	Eucalyptus camaldulensis	14+10	50	22	D	C-	1s cod inc topd epi deep lerps TB
14	Eucalyptus camaldulensis	9	50	18	B	B	In fence, FC lerps
15	Eucalyptus camaldulensis	16	65	40	C-	C-	Deep Sp DLS lerps TB
16	Eucalyptus camaldulensis	31	95	70	C-	C-	Cod Sp DLS 2long lerps TB
17	Eucalyptus camaldulensis	21	90	60	C-	D	Cod topd Sp DLS lerps TB
18	Eucalyptus camaldulensis	46"b	95	60	C-	C	Cod inc Sp lerps TB
19	Eucalyptus camaldulensis	24	90	45	C-	C-	60° lean, lrg cut, Sp deep lerps TB
20	Eucalyptus camaldulensis	16 @ 2'	45	25	D	D	Cod DLT Cr Db Sp deep lerps TB
21	Eucalyptus camaldulensis	15	45	30	C-	C-	1s Cod CrS Cr Db Sp deep lerps TB
22	Eucalyptus camaldulensis	20+14	90	45	C-	C-	Cod inc Sp CrS 2long lerps TB

Tag#	Species	DBH	Ht	Spr	Health	Structure	Comments
23	Eucalyptus camaldulensis	5	16	10	D	D	Cod deep CrS DLT Db Sp lerps TB
24	Eucalyptus camaldulensis	21 @ 4'	90	40	D	D	Cod Sp Db lerps TB
25	Eucalyptus camaldulensis	17	90	45	D	D	mT-Bow Sp Db Cr deep lerps TB
26	Eucalyptus camaldulensis	21	90	45	C-	D	1s Leans ovr school yard, deep Sp Db lerps TB
27	Eucalyptus camaldulensis	22	95	30	C-	C-	Cod Sp Db lerps TB
28	Eucalyptus camaldulensis	32	85	60	C-	D	Cod DLS CrS 2long lerps TB
29	Eucalyptus camaldulensis	16	40	45	C-	D	Big cut of cod limb, Xing 1s Sp Db lerps TB
30	Eucalyptus camaldulensis	4+14+5	50	30	D	D	Db top, Sp HAZ B-epi lerps TB
31	Eucalyptus camaldulensis	16	75	25	D	D	Top dead 1s, cut of cod limb, DLT B-epi lerps TB
32	Eucalyptus camaldulensis	16	50	25	C-	C-	Cod DLT 1s of cod cut lerps TB
33	Eucalyptus camaldulensis	12	35	20	D	D	Top dead, cod DLS Sp lerps TB
34	Eucalyptus camaldulensis	22	90	30	C-	C-	Cod, new leaves chlor, 1s CrS Sp lerps TB
35	Eucalyptus camaldulensis	16	55	30	C-	D	Cod Db B-epi DLS Sp lerps TB
36	Eucalyptus camaldulensis	17	90	30	C-	C-	Cod Sp DLS Sp deep lerps TB
37	Eucalyptus camaldulensis	14	45	26	D	D	1s cod Sp Db DLS deep lerps TB
38	Eucalyptus camaldulensis	38	100	45	C-	C-	Cod inc Sp lerps TB
39	Eucalyptus camaldulensis	26	95	45	C-	C-	Cod inc Xing 1s Sp lerps TB
40	Eucalyptus camaldulensis	14	35	35	C-	C-	T-bow cover school mDb lerps TB
41	Eucalyptus camaldulensis	40"b	90	50	C-	C-	Cod Sp Db 2long lerps TB
42	Eucalyptus camaldulensis	8	28	10	C-	C-	Cr Sup DLT lerps
43	Eucalyptus camaldulensis	29	95	45	C-	C-	Cod DLS Sp mDb 2long lerps TB
44	Eucalyptus camaldulensis	32+13	100	50	C-	C-	Cod against & Cr#45 DLS lerps TB
45	Eucalyptus camaldulensis	17	80	40	C-	C-	Cod Sup Cr#44 1s Sp lerps TB
46	Eucalyptus camaldulensis	21	100	50	C-	C-	Cod deep topd@12' Sup lerps TB
47	Eucalyptus camaldulensis	20	90	45	C-	C-	1s 2long Sp, cod top lerps TB
48	Washingtonia robusta	12'th	12	12	A	A	Weed Sup
49	Eucalyptus camaldulensis	22	70	25	C-	C	Sp high head lerps TB

Tag#	Species	DBH	Ht	Spr	Health	Structure	Comments
50	Washingtonia robusta	11'th	11	11	B	A	Weed Sup
51	Eucalyptus camaldulensis	10"b	28	10	C-	C-	Cod sup DLT lerps TB
52	Eucalyptus camaldulensis	48	100	50	C-	C-	1s 2long cod DLS lerps TB
53	Eucalyptus camaldulensis	8+8	60	30	C	C-	1s cod mSp lerps
54	Cupaniopsis anacardioides	12 @ 4'	24	20	B	C-	Cod inc, 2 many trunks
55	Platanus x acerifolia	4 @ 7"ea	40	30	B	C	1s fill mistletoe
56	Quercus agrifolia	8	20	18	A	B	good
57	Quercus suber	7	20	14	A	B	Cod mfill
58	Quercus agrifolia	7	20	14	A	B	mXing
59	Quercus agrifolia	7	20	18	B	B	Cod Cr#60 mSp
60	Pinus halepensis	10	55	20	A	C	Cr pepper
61	Pinus halepensis	7	30	19	B	B	Leans out Cr#62
62	Pinus halepensis	6	30	18	C	B	Leans out Cr#61
63	Pinus halepensis	9	22	20	B	D	Bow'd over street, Cr pepper
64	Quercus agrifolia	6	15	15	A	B	Cod fill
65	Quercus agrifolia	5	15	15	B	B	Xing
66	Quercus agrifolia	6	20	18	B	B	Cr#68 NC deep
67	Platanus x acerifolia	9	27	22	C	C	Cod Xing Sp Cr#66
68	Quercus agrifolia	10	30	28	B	B	Fill cod Cr#66
69	Quercus agrifolia	3	10	8	C	C-	Sup cod deep
70	Pinus halepensis	17	45	25	A	C	Cod leans TO 1s
71	Platanus racemosa	6	45	20	B	B	Tinj Cr#70
72	Quercus agrifolia	14 @ 3'	45	32	B	C	1s cod inc CrS Cr#70 & 71
73	Quercus agrifolia	5	28	12	B	B	Cr#72 & 74
74	Quercus agrifolia	10	20	22	A	C	Deep cod inc Cr#75
75	Pinus halepensis	12+12	50	40	B	C-	Cod inc leans, pale
76	Quercus agrifolia	5	14	20	B	C-	Cod sup

Tag#	Species	DBH	Ht	Spr	Health	Structure	Comments
77	Pinus eldarica	9	40	20	C-	C-	Cod Cr#78 Sp
78	Pinus eldarica	12	50	24	B	B	Deep Cr#77
79	Platanus x acerifolia	17	60	35	B	C	1s cut of cod base
80	Pinus halepensis	9	24	22	B	D	1s pale Sh crk@B 45°lean
81	Quercus agrifolia	13 @ 2'	24	24	B	C-	Cod inc CrS fill
82	Quercus agrifolia	9 @ 3'	24	22	B	C	Cod inc
83	Platanus x Acerifolia	15	40	40	C-	C	2long Sp mDb
84	Schinus molle	14	60	35	A	B	1sRF leans
85	Schinus molle	18	60	40	B	D	Root sprung, wall damage, cod inc
86	Quercus lobata	1	50	35	B	C-	Leans Xing cod
87	Quercus lobata	4	20	18	B	C	Cod inc 1s leans Cr#88
88	Quercus agrifolia	8	24	20	B	C-	Cod Xing Cr#87
89	Jacaranda mimosifolia	4	14	14	B	C-	Cod inc CrS fill
90	Quercus agrifolia	10	20	30	A	C	Cod inc, CalTrans'?
91	Schinus molle	18+20	40	55	B	C	1T on ground, 2long
92	Platanus x Acerifolia	13+13	50	50	C	C	2long cod Sp
93	Platanus x Acerifolia	11 @ 1'	28	24	C-	D	FC Dk Db cod deep Sp
94	Platanus x Acerifolia	11"b	28	26	C	C	FC mDb cod deep Sp
95	Washingtonia robusta	60'th	60'th	11	B	A	Weed
96	Washingtonia robusta	65'th	65'th	11	B	A	Weed
97	Washingtonia robusta	40'th	40'th	11	B	A	Weed, big skirt
98	Washingtonia robusta	50'th	50'th	10	C	A	Weed
99	Schinus terebinthifolius	10"b	15	15	C	C	Pale
100	Ficus elastica 'decora'	12 @ 3'	22	25	A	C	Cod inc Hd
101	Eucalyptus polyanthemos	18+10	70	60	B	B	Cod mLean cod
102	Eucalyptus polyanthemos	13	35	26	B	D	1s T-bow cod FC DL Xing epi deep
103	Quercus agrifolia	10	15	16	C	C-	OP Sp cod Hd epi

Tag#	Species	DBH	Ht	Spr	Health	Structure	Comments
104	Morus alba	3 @ 5"ea	25	25	B	D	Cod inch Xing leans
105	Schinus molle	9+9+9+6	30	30	C	C-	Cod in Sp
106	Schinus molle	20"b	30	40	B	C	2long cod Cr#105 fill lerps TB
107	Eucalyptus camaldulensis	6	37	40	B	C-	Cod inc leans lerps TB
108	Eucalyptus camaldulensis	6+3	25	9	B	C-	Cod fill lerps TB
109	Eucalyptus camaldulensis	6+3	25	9	B	C-	Cod fill lerps TB
110	Eucalyptus camaldulensis	30	80	50	B	C	2long cod EH lerps
111	Eucalyptus camaldulensis	10+7	45	50	C-	C-	1s cod lean DL TO Sp lerps TB
112	Eucalyptus camaldulensis	14	45	35	D	D-	1s cod Cr#113 Sp Db deep lerps TB
113	Eucalyptus camaldulensis	12	38	25	D	C-	1s Db cod Cr#112 Sp deep lerps TB
114	Eucalyptus camaldulensis	5+3.5	27	22	C-	C-	Cod Db Sp Cr#113 deep lerps TB
115	Eucalyptus camaldulensis	18	80	25	D	C	1s Db Sp Cr#114 deep lerps TB
116	Eucalyptus camaldulensis	21	90	50	D	C-	1s Sp cod 2long Db deep lerps TB
117	Eucalyptus camaldulensis	18	90	55	C-	C-	1s leans cod 2long Db Sp deep lerps TB
118	Eucalyptus camaldulensis	12	75	30	D	D	1s Db deep Sp lerps TB
119	Eucalyptus camaldulensis	16+14	90	50	D	D	1s leans deep Sp lerps TB
120	Eucalyptus camaldulensis	20	90	50	C-	C-	Cod Db Sp lerps TB
121	Eucalyptus camaldulensis	10	35	20	C-	C-	Cod Db epi Cr#122 lerps TB
122	Eucalyptus camaldulensis	14	50	40	C-	D	1s leans T-bow Db Sp epi deep Cr#121 lerps TB
123	Eucalyptus camaldulensis	26	90	45	D	C	1s cod Db Sp deep Cr#122 lerps TB
124	Eucalyptus camaldulensis	15+18	50	50	B	C	Cod DLS 2long lerps TB
125	Ficus microcarpa 'Nitida'	21	40	45	B	C	Lt Sh
126	Ficus microcarpa 'Nitida'	19	40	48	B	C	Lt Sh CrS
127	Eucalyptus camaldulensis	17	60	30	C	C	Cod Cr#126 Sp lerps TB
128	Quercus agrifolia	5	11	8	C-	D-	Topd Hd leans deep epi
129	Jacaranda mimosifolia	4+4+4	16	12	B	C-	Cod inc
130	Schinus molle	11	28	20	B	C	Cod

Tag#	Species	DBH	Ht	Spr	Health	Structure	Comments
131	Schinus molle	9+9	28	32	B	C	Cod inc

Key to Abbreviations

1s = one-sided
1sRF = one-sided root flare
2long= too long
Brks = breaks
Cod = codominant
Cr = crowded, Cr#x = crowds tree number
Crk = cracked
CrS = crowded scaffolds
Db = dieback
Dk = decay
DL = dogleg branching
DLS = dogleg scaffold limb
Epis = epicormic shoots
FC = flush cut
Hd = headed
Horiz-T = horizontal trunk
Inc = included bark
Lt = lion-tailed
OL = over-lifted (high headed)
Sh = shallow roots
Sp = sparse
TO = torn out limb
Tinj = trunk injury
T-bow = bowed trunk
Top'd = topped
Xing = crossing limbs
B = base, e.g. DkB = decayed base
R = root, e.g. R-epis=root shoots
S = scaffold limb
T = trunk, e.g.
TB = tortoise beetles
Xing = crossing limbs

Site Tree Health and Condition

There are two general areas to this site: the north section with all the red gums; and the south section with most of the other trees. The north area has been very disrupted grading wise for at least several years. Fill from some other site appears to have been dumped randomly around this area. Many of the trees have a foot or more of fill over their root crown. There are also a number of small seedling eucalypts sprouting in the more central part of the north area. There are old pipes of different types, chain-link fence and other debris scattered over this area. Some debris may be under the piles of soil. This site may have been a YMCA Recreation facility. Older images show what appears to have been a BMX race track in this area, but there are no signs of it now.

Two different species of eucalypts occur on the property, though only one is found in the north portion, the red gum, *Eucalyptus camaldulensis*. There are 71 red gums, nearly all of which are in the windrow that wraps around the north and east sides. Due to crowding and pest infestation, none were really healthy or structurally good specimens. Being crowded together in a windrow, they reach out in odd directions for light. Windrow trees have their roots intertwined and depend on each other for protection and support. Also, all the red gums are infested by redgum lerp psyllids, and have been chewed up by tortoise beetles.

Two Silver Mountain gums are near each other by the recreation building. Both are near the building and may need to be removed if the building is removed. One is healthy and in fair structural condition, but the other is in very poor condition. The lerp psyllids and tortoise beetles have not bothered this species.

There are two jacarandas, *Jacaranda mimosifolia*,. Both are young and have good health, but they are one-sided and codominant. They could be trained into better structural condition over 2 to 3 years of time.

There are two rubber trees and two Indian laurels. Both species have handled the drought conditions well. The Indian laurels are behind the building. Their health is good, but it looks like they were pruned to facilitate climbing by lion-tail pruning, i.e. stripping out the inner branch work and foliage. The rubber trees are both healthy, but poor pruning has left them less than attractive.

Most of the oaks are healthy, and most are young enough to benefit from professional training. However, two were severely headed back. Even the valley oaks and one cork oak are in good health. The surprising number of native coast live oaks seems to indicate a volunteer planting effort. Most will need more room to develop to their true potential.

The sycamores, European and California, are in declining health. They both need more water than they have been getting recently. Despite the dry conditions, their health is generally better than their structure.

There are two species of pines on site, Aleppo pines, *Pinus halepensis,* and Afghan pines, Pinus *eldarica*. Both are found along the south edge of the site. The Aleppo pines always have a wider range of structural problems, pest problems and root problems. In this setting they have done better than the Afghan pines, because they are not as crowded. Both of the two Afghan pines are sparse and have marginal health. The Aleppo pines are leaning, codominant, and one is severely bowed out over the street.

The 7 California peppers, *Schinus molle*, are mostly in the lower area, around the play area and the south edge. They are in fair to good health, but have codominant trunks with included bark. Without early training their growth tends to be erratic and low branching. To have any value to the new cemetery, they will need to be pruned up for better clearance.

Suitability for Cemetery Conditions by Species

Red gum, *Eucalyptus camaldulensis*,– tolerates turf conditions well, but honey dew dripping by lerp psyllids may be a long-term issue. Removal of intermediate trees can sacrifice the stability of the adjoining trees. Will require large amounts of pruning to remove dead limbs and shorten overly long limbs. Removal is recommended.

Silver Mountain gum, *Eucalyptus polyanthemos*,– a good species, until a lerp psyllid is introduced that likes this species. Branching may be erratic in turf. Not recommended for turf.

Rubber tree, *Ficus elastica 'decora'*,– this is a large growing species with large aggressive roots, especially in turf. Not recommended for turf here.

Indian laurel, *Ficus microcarpa 'Nitida'*, - this is a large growing species with large aggressive roots, especially in turf. It is subject to Cuban laurel thrip, gall wasps, Ficus eye-spot midge, Ficus psyllid and Ficus leaf-rolling psyllid. Recently the number of pests have increased significantly. We will see how long Indian laurel remains a popular landscape tree. Not recommended for turf here, unless it is well away from hardscape and utilities.

Jacaranda, *Jacaranda mimosifoli*a, – due to its beautiful flowers, jacarandas will probably always be popular. They tolerate turf culture well, but tend to be more surface rooted and need to be pruned more often in turf. Using several here is reasonable.

Fruitless mulberry, *Morus alba*,– there is only one, but it is not a good tree for such a site as this. They need frequent pruning, are decay prone, grow quickly, shallow rooted and eventually can become quite large. Not recommended for turf here.

Afghan pine, *Pinus eldarica*,– of the two pine species on site, this is the better one for a cemetery, but both specimens are in poor health and condition. Remove the ones here.

Aleppo pine, *Pinus halepensis*,– in this area and in turf Aleppo pines tend to grow in unpredictable forms. This is a desert species, and in more desert like settings it has a more predictable upright form. Not recommended for turf here.

California sycamore, *Platanus racemosa*,– this is the faster growing of the two Platanus species here. Being a riparian species, they tolerate turf conditions. However, this species is the favorite for the Polyphagous shot-hole borer (PSHB), but PSHB does seem to prefer individual sycamores in wetter conditions. It is also a known host for the three fungus strains vectored by the borer. Not recommended here.

Platanus x Acerifolia, European sycamore – This type is also susceptible to the borer. It does well in turf conditions. Both types are tolerant of root disturbance in the winter. Using several here is reasonable.

Coast live oak, *Quercus agrifolia*,– If raised under irrigated conditions and the percolation is adequate, this species can tolerate lawn conditions and is tolerant of root disturbance in the winter. Not as commonly infested by PSHB as sycamores. But it is also a known host for the three fungal strains vectored by the borer. Using several here is reasonable.

Valley oak, *Quercus lobata*,– If raised under irrigated conditions and the percolation is adequate, this species can tolerate lawn conditions and is tolerant of root disturbance in the winter. This species is also susceptible to the borer. It is also a known host for the three fungus strains vectored by the borer. Using several here is reasonable. Southern live oak would be better.

Cork oak, *Quercus suber*,– The cork oak may be more susceptible to water mold diseases in turf conditions. This species is also susceptible to the borer. It is also a known host for the three fungus strains vectored by the PSHB. Using one or two here is reasonable. Southern live oak would be better.

California pepper, *Schinus molle*,– While this species seems to grow well in turf, but it can grow too well and fall apart due to weaker, rank growth. Not recommended for turf here

Brazil pepper, Schinus terebinthifolius,– is one of the world's most invasive weed trees. It is not recommended for turf conditions.

Washingtonia robusta, Mexican fan palm – is another weed species. In fact it looks like all those along the east edge of the site are growing where birds "dropped" their seeds. This species grows well in turf conditions and non-turf conditions. It is the least expensive palm species, so much so that it is usually cheaper to buy new ones than to try to save ones on site.

Botanic name / Common name Cross-Reference

Botanical name	Common name	Count
Eucalyptus camaldulensis	Red gum	71
Eucalyptus polyanthemos	Silver Mt. gum	2
Ficus microcarpa Nitida	Indian laurel	2
Ficus elastica Decora	Rubber tree	2
Jacaranda mimosifolia	Jacaranda	2
Morus alba	Fruitless mulberry	1
Pinus eldarica	Afghan pine	2
Pinus halepensis	Aleppo pine	7
Platanus x Acerifolia	European sycamore	7
Platanus racemosa	California sycamore	1
Quercus agrifolia	Coast live oak (off site)	18
Quercus lobata	Valley oak	2
Quercus suber	Cork oak	1
Schinus molle	California pepper	7
Schinus terebinthifolius	Brazil pepper	1
Washingtonia robusta	Mexican can palm	6

Discussion

Construction Accommodations

Considering the planned development, the trees at the site now are not situated in patterns that are useful in a typically arranged cemetery. The eucalypts cannot be transplanted. There will be many opportunities across the cemetery grounds and around the perimeter to plant replacement trees. That will be more attractive and complementary to the gathering points and structures of the new site use. The typical cemetery development pattern will include a substantial tree canopy both for aesthetics as well as comfort in the Orange County climate.

Red gums are the most common tree on this site. There is a total of 71 spread over the north part of the site. One cause of their poor condition was that they had almost no training or maintenance pruning. Nearly all are in terrible condition. Very few are recommended to remain, but to keep them, removal of the tangle of fallen limbs and surrounding trees may be too difficult to expect them to come out without more damage. Then they will need good crown restoration pruning done over the next few years. Very few tree services seem to understand this process, but it is possible. So retaining any of them would be costly, risky, and their location does not suit the new land use plan.

No trees will be transplanted. Few have sufficient quality and health to justify the risk and expense. There is no known place to store trees on site during grading and no room to work around them unless the work is done in phases. Preserving these trees by transplanting them is not practical or cost effective, unless it saves a useful tree for a good place on site, which is very

unlikely to apply to any of these trees. Transplanted trees lose about 90 percent of their roots and take years to recover, if they ever do. In my experience planting new, young, better suited trees of appropriate species, would provide the better solution. In just a few years newly established trees, appropriately trained and cared for, will be full and useful to the site and to the community.

Soil Conditions and Replacement Trees

Turf is the primary "ground cover" in a cemetery. Native oaks can tolerate this to a degree, when they start in turf, which maybe the case here. However, established oaks do not tolerate turf being planted in their root zones once they have matured in a more natural setting. None of the trees on site would be considered to be in a natural condition. Sycamores would be a more tolerant species for growing under turf conditions, but now in this region they are under a severe attack by the polyphagous shot-hole borer. There are lists of recommended lawn trees, and such trees should be used for this site. However, even working with trees from those lists, the turf should be kept well back from the trunks, preferably outside the dripline. The only two constrains for a Muslim cemetery this consultant is aware of are, orientation toward Mecca, and no cremation allowed.

Within the scope of this report there is no soil testing included. Top soil is a great asset for any new landscape. However, the top soil in the north area of the site is covered. Where possible the top soil should be exposed and the original grade restored around trees designated to remain. Top soil should remain on top. It takes decades for subsoils to weather sufficiently to function even nearly as well as the topsoil that was originally here. Having been covered over for years, the organic and biological benefits of usual topsoil will be reduced to an unknown degree. To aid in selection of the new landscape trees the soil should be tested by an agronomic laboratory. If topsoil will be exposed, protected and stockpiled, it can be tested now. If not, it should be tested after grading and the tree list amended as needed based on the soil test results.

There may be a large number of trees removed, but hopefully not taken to the land fill. Organic matter in the soil helps buffer salts, returns most elements to the ground for use by the new trees, and is a basis of a healthy soil biological web that helps protect and feed the new trees. If the existing trees and tree debris can be fed through a large tub-grinder, this resource can be composted, save dump fees, and help the new landscape trees and shrubs as a surface mulch. Despite common warnings about eucalyptus based mulch being allelopathic, this has been proven false by recent research.

Recommendations

Specific Recommendations

1. Red gums are 53 of the131 trees on site, but were recommended for removal. As such a large proportion of the total, this recommendation should be discussed further to decide to treat them for psyllids, and if that is allowed next to a school yard and seasonal water course. Also the amount of pruning that is needed should be considered. In addition, being large trees, they will have large protection zones where trenching for water lines could make them unstable.
2. Remove the designated existing trees in the matrix below.
3. Rip and remove the roots from the formerly treed areas. If there are signs of disease, take them to the dump.
4. Check percolation rates at various depths, and look for the existence of a “plow pan” in the top three feet of soil.
5. Chose new turf tolerant tree species for site landscaping, and chose a deep rooted, more drought tolerant turf variety.
6. Remove the fill soil over the north part of the site.
7. Stockpile top soil as necessary and possible where the grade will be changed.
8. Tub-grind existing trees and tree debris. Stockpile and turn the piles to compost the mulch to kill off possible disease and weeds. Apply mulch 2-3” deep to the soil surface below new trees or existing trees to remain. Where possible mulch should extend to the dripline.

Tree Preservation Specifications

1. Protection Barrier: A protection barrier shall be installed around the tree or trees to be preserved. The barrier shall be constructed of durable fencing material, such as chain-link fencing. The barrier shall be placed as far from the base of the tree(s) as possible, at least 1-foot per inch of trunk diameter and beyond the drip-line. The fencing shall be maintained in good repair throughout the duration of the project, and shall not be removed, relocated, or encroached upon without permission of the arborist involved.

2. Storage of Materials: There shall be NO storage of materials or supplies of any kind within the area of the protection barriers. Concrete and cement materials, block, stone, sand and soil shall not be placed within the drip-line of the tree.

3. Fuel Storage: Fuel storage shall NOT be permitted within 150 feet of any tree to be preserved. Refueling, servicing and maintenance of equipment and machinery shall NOT be permitted within 150 feet of protected trees.

4. Debris and Waste Materials: Debris and waste from construction or other activities shall NOT be permitted within protected areas. Wash down of concrete or cement handling equipment, in particular, shall NOT be permitted within 150 feet of protected trees.

5. Planting near Trees Designated for Protection: Any digging within designated protection zones shall done using supersonic air (AirSpade or AirKnife) directly as the digging medium, by means of a nozzle, whose nominal rated input pressure (available from manufacturer's literature) must not exceed 130 psig (pounds per square inch at gage) unless otherwise approved. Nozzles designed for input above 130 psig can damage fine roots and are not recommended. Air compressors rated between 100 to 125 psig recommended.

6. Grade Changes: Any grade changes proposed should be approved by a Registered Consulting Arborist before construction begins, and precautions taken to mitigate potential injuries. Grade changes can be particularly damaging to trees. Even as little as two inches of fill can cause the death of a tree. Lowering the grade can destroy major portions of a root system.

7. Damages: Any tree damages or injuries should be reported to the project arborist as soon as possible. Severed roots shall be pruned cleanly to healthy tissue, using proper pruning tools. Broken branches or limbs shall be pruned according to International Society of Arboriculture Pruning Guidelines and ANSI A-300 Pruning Standards.

8. Preventive Measures: Before construction begins, irrigation and fertilization of the affected trees is recommended to improve tree vigor and health. Soil analysis testing should be completed to assure fertilization with the appropriate fertilizer products. Pruning of the tree canopies and branches should be done at the direction of the project arborist to remove any dead or broken branches, and to provide the necessary clearances for the construction equipment.

Pruning Recommendations

After specific plans are made for tree removal and retention. Specifications need to be prepared for the pruning of all trees to remain. Many trees will need clearance pruning and safety pruning. Trees that have not been maintained in year may now have structural defects that create increased risk for site visitors. Overall specifications will be guided by American National Standards Institute A300, part 1, which recommends specifications be prepared for each tree pruned. The types of pruning allowed and not allowed remain fairly constant through all tree species and conditions. Such non-allowed pruning would include topping, most heading, flush cuts, and over-pruning.

Specifications will list the maximum cut size, volume of pruning allowed, and what the purpose of the pruning is.

Pruning in the right season is important. Generally, palms and subtropical trees are pruned in late spring or early summer.

Conifers and deciduous cool season trees are pruned in winter. Most flowering trees are best pruned right after flowering.

The amount of pruning trees tolerate depends on their species and health. The specifications need to deal with this on a tree-by-tree basis.

For the north part of the site, removal of fill soil around existing trees is especially important. However, test several areas to get an understanding of how much roots have grown up into the fill. Adjustments may be needed to keep root damage to a minimum, but tolerable level. Heathy trees will tolerate more root loss. Due to the severe pest infestation, the red gums are not especially healthy. Eucalyptus as a genus do not tolerate root disturbance well. This is one more reason they are recommended for removal.

Not knowing the exact grading plans, planting plans or hardscape plans, the above recommendations assume no conflict. Where there is a conflict make a good effort to preserve the few trees recommended for preservation or change the plans to accommodate the trees.

Matrix of Recommendations

Height and spread are estimated. Trunk diameter was measured using a Biltmore stick or calipers.

Tag#	Species	DBH	Ht	Spread	Clearance radius	Health	Structure	Disposition
1	Eucalyptus camaldulensis	10	50	15	n/a	F	F	Remove
2	Eucalyptus camaldulensis	28 @ 3'	95	45	28	C-	D	Remove
3	Eucalyptus camaldulensis	18+7	95	40	20	C-	C-	Remove
4	Eucalyptus camaldulensis	8.5	35	15	8.5	D	C	Remove
5	Eucalyptus camaldulensis	5+23+5	95	50	24	C-	C	Remove
6	Eucalyptus camaldulensis	5	30	15	n/a	F	F	Remove
7	Eucalyptus camaldulensis	26	80	35	26	C-	C-	Remove
8	Eucalyptus camaldulensis	5	18	16	5	D	D	Remove
9	Eucalyptus camaldulensis	22	95	45	22	C	C	Remove
10	Eucalyptus camaldulensis	14+15	55	35	21	D	D	Remove
11	Eucalyptus camaldulensis	21	50	30	21	C	C-	Remove
12	Eucalyptus camaldulensis	19	95	50	19	C-	C	Remove
13	Eucalyptus camaldulensis	14+10	50	22	18	D	C-	Remove
14	Eucalyptus camaldulensis	9	50	18	9	B	B	Remove
15	Eucalyptus camaldulensis	16	65	40	16	C-	C-	Remove
16	Eucalyptus camaldulensis	31	95	70	31	C-	C-	Remove
17	Eucalyptus camaldulensis	21	90	60	21	C-	D	Remove
18	Eucalyptus camaldulensis	46"b	95	60	39	C-	C	Remove
19	Eucalyptus camaldulensis	24	90	45	24	C-	C-	Remove
20	Eucalyptus camaldulensis	16 @ 2'	45	25	15	D	D	Remove

Tag#	Species	DBH	Ht	Spread	Clearance radius	Health	Structure	Disposition
21	Eucalyptus camaldulensis	15	45	30	15	C-	C-	Remove
22	Eucalyptus camaldulensis	20+14	90	45	24	C-	C-	Remove
23	Eucalyptus camaldulensis	5	16	10	5	D	D	Remove
24	Eucalyptus camaldulensis	21 @ 4'	90	40	21	D	D	Remove
25	Eucalyptus camaldulensis	17	90	45	17	D	D	Remove
26	Eucalyptus camaldulensis	21	90	45	21	C-	D	Remove
27	Eucalyptus camaldulensis	22	95	30	22	C-	C-	Remove
28	Eucalyptus camaldulensis	32	85	60	32	C-	D	Remove
29	Eucalyptus camaldulensis	16	40	45	16	C-	D	Remove
30	Eucalyptus camaldulensis	4+14+5	50	30	16	D	D	Remove
31	Eucalyptus camaldulensis	16	75	25	16	D	D	Remove
32	Eucalyptus camaldulensis	16	50	25	16	C-	C-	Remove
33	Eucalyptus camaldulensis	12	35	20	12	D	D	Remove
34	Eucalyptus camaldulensis	22	90	30	22	C-	C-	Remove
35	Eucalyptus camaldulensis	16	55	30	16	C-	D	Remove
36	Eucalyptus camaldulensis	17	90	30	17	C-	C-	Remove
37	Eucalyptus camaldulensis	14	45	26	14	D	D	Remove
38	Eucalyptus camaldulensis	38	100	45	38	C-	C-	Remove
39	Eucalyptus camaldulensis	26	95	45	26	C-	C-	Remove
40	Eucalyptus camaldulensis	14	35	35	14	C-	C-	Remove
41	Eucalyptus camaldulensis	40"b	90	50	34	C-	C-	Remove
42	Eucalyptus camaldulensis	8	28	10	8	C-	C-	Remove
43	Eucalyptus camaldulensis	29	95	45	29	C-	C-	Remove

Tag#	Species	DBH	Ht	Spread	Clearance radius	Health	Structure	Disposition
44	Eucalyptus camaldulensis	32+13	100	50	35	C-	C-	Remove
45	Eucalyptus camaldulensis	17	80	40	17	C-	C-	Remove
46	Eucalyptus camaldulensis	21	100	50	21	C-	C-	Remove
47	Eucalyptus camaldulensis	20	90	45	20	C-	C-	Remove
48	Washingtonia robusta	12'th	12	12	3	A	A	Remove
49	Eucalyptus camaldulensis	22	70	25	22	C-	C	Remove
50	Washingtonia robusta	11'th	11	11	3	B	A	Remove
51	Eucalyptus camaldulensis	10"b	28	10	8.5	C-	C-	Remove
52	Eucalyptus camaldulensis	48	100	50	48	C-	C-	Remove
53	Eucalyptus camaldulensis	8+8	60	30	11	C	C-	Remove
54	Cupaniopsis anacardioides	12 @ 4'	24	20	14	B	C-	Remove
55	Platanus x Acerifolia	4 @ 7"ea	40	30	14	B	C	Remove
56	Quercus agrifolia	8	20	18	4	A	B	Remain
57	Quercus suber	7	20	14	4	A	B	Remain
58	Quercus agrifolia	7	20	14	4	A	B	Remain
59	Quercus agrifolia	7	20	18	4	B	B	Remain
60	Pinus halepensis	10	55	20	10	A	C	Remove
61	Pinus halepensis	7	30	19	8	B	B	Remain
62	Pinus halepensis	6	30	18	7	C	B	Remove
63	Pinus halepensis	9	22	20	n/a	B	D	Remove
64	Quercus agrifolia	6	15	15	3	A	B	Remain
65	Quercus agrifolia	5	15	15	3	B	B	Remain
66	Quercus agrifolia	6	20	18	3	B	B	Remain

Tag#	Species	DBH	Ht	Spread	Clearance radius	Health	Structure	Disposition
67	Platanus x Acerifolia	9	27	22	9	C	C-	Remove
68	Quercus agrifolia	10	30	28	5	B	B	Remain
69	Quercus agrifolia	3	10	8	2	C	C-	Remove
70	Pinus halepensis	17	45	25	17	A	C	Remove
71	Platanus racemosa	6	45	20	6	B	B	Remain
72	Quercus agrifolia	14 @ 3'	45	32	8	B	C	Remain
73	Quercus agrifolia	5	28	12	3	B	B	Remain
74	Quercus agrifolia	10	20	22	5	A	C	Remain
75	Pinus halepensis	12+12	50	40	18	B	C-	Remove
76	Quercus agrifolia	5	14	20	3	B	C-	Remove
77	Pinus eldarica	9	40	20	n/a	C-	C-	Remove
78	Pinus eldarica	12	50	24	9	B	B	Remain
79	Platanus x Acerifolia	17	60	35	13	B	C	Remain
80	Pinus halepensis	9	24	22	n/a	B	D	Remove
81	Quercus agrifolia	13 @ 2'	24	24	7	B	C-	Remove
82	Quercus agrifolia	9 @ 3'	24	22	5	B	C	Remain
83	Platanus x Acerifolia	15	40	40	12	C-	C	Remove
84	Schinus molle	14	60	35	11	A	B	Remain
85	Schinus molle	18	60	40	14	B	D	Remove
86	Quercus lobata	10	50	35	5	B	C-	Remove
87	Quercus lobata	4	20	18	3	B	C	Remove
88	Quercus agrifolia	8	24	20	4	B	C-	Remove
89	Jacaranda mimosifolia	4	14	14	4	B	C-	Remove

Tag#	Species	DBH	Ht	Spread	Clearance radius	Health	Structure	Disposition
90	Quercus agrifolia	10	20	30	5	A	C	Remain
91	Schinus molle	18+20	40	55	21	B	C	Remove
92	Platanus x Acerifolia	13+13	50	50	18	C	C	Remove
93	Platanus x Acerifolia	11 @ 1'	28	24	n/a	C-	D	Remove
94	Platanus x Acerifolia	11"b	28	26	10	C	C	Remove
95	Washingtonia robusta	60'th	60'th	11	3	B	A	Remove
96	Washingtonia robusta	65'th	65'th	11	3	B	A	Remove
97	Washingtonia robusta	40'th	40'th	11	3	B	A	Remove
98	Washingtonia robusta	50'th	50'th	10	3	C	A	Remove
99	Schinus terebinthifolius	10"b	15	15	9	C	C	Remove
100	Ficus elastica 'decora'	12 @ 3'	22	25	10	A	C	Remove
101	Eucalyptus polyanthemos	18+10	70	60	20	B	B	Remain?
102	Eucalyptus polyanthemos	13	35	26	n/a	B	D	Remove
103	Quercus agrifolia	10	15	16	7	C	C-	Remove
104	Morus alba	3 @ 5"ea	25	25	7	B	D	Remove
105	Schinus molle	9+9+9+6	30	30	17	C	C-	Remain
106	Schinus molle	20"b	30	40	15	B	C	Remain
107	Eucalyptus camaldulensis	6	37	40	6	B	C-	Remove
108	Eucalyptus camaldulensis	6+3	25	9	7	B	C-	Remove
109	Eucalyptus camaldulensis	6+3	25	9	7	B	C-	Remove
110	Eucalyptus camaldulensis	30	80	50	30	B	C	Remove
111	Eucalyptus camaldulensis	10+7	45	50	12	C-	C-	Remove
112	Eucalyptus camaldulensis	14	45	35	14	D	D-	Remove

Tag#	Species	DBH	Ht	Spread	Clearance radius	Health	Structure	Disposition
113	Eucalyptus camaldulensis	12	38	25	12	D	C-	Remove
114	Eucalyptus camaldulensis	5+3.5	27	22	6	C-	C-	Remove
115	Eucalyptus camaldulensis	18	80	25	18	D	C	Remove
116	Eucalyptus camaldulensis	21	90	50	21	D	C-	Remove
117	Eucalyptus camaldulensis	18	90	55	18	C-	C-	Remove
118	Eucalyptus camaldulensis	12	75	30	12	D	D	Remove
119	Eucalyptus camaldulensis	16+14	90	50	22	D	D	Remove
120	Eucalyptus camaldulensis	20	90	50	20	C-	C-	Remove
121	Eucalyptus camaldulensis	10	35	20	10	C-	C-	Remove
122	Eucalyptus camaldulensis	14	50	40	14	C-	D	Remove
123	Eucalyptus camaldulensis	26	90	45	26	D	C	Remove
124	Eucalyptus camaldulensis	15+18	50	50	23	B	C	Remove
125	Ficus microcarpa 'Nitida'	21	40	45	15	B	C	Remain
126	Ficus microcarpa 'Nitida'	19	40	48	14	B	C	Remain
127	Eucalyptus camaldulensis	17	60	30	17	C	C	Remove
128	Quercus agrifolia	5	11	8	3	C-	D-	Remain
129	Jacaranda mimosifolia	4+4+4	16	12	8	B	C-	Remain
130	Schinus molle	11	28	20	8	B	C	Remain
131	Schinus molle	9+9	28	32	10	B	C	Remain

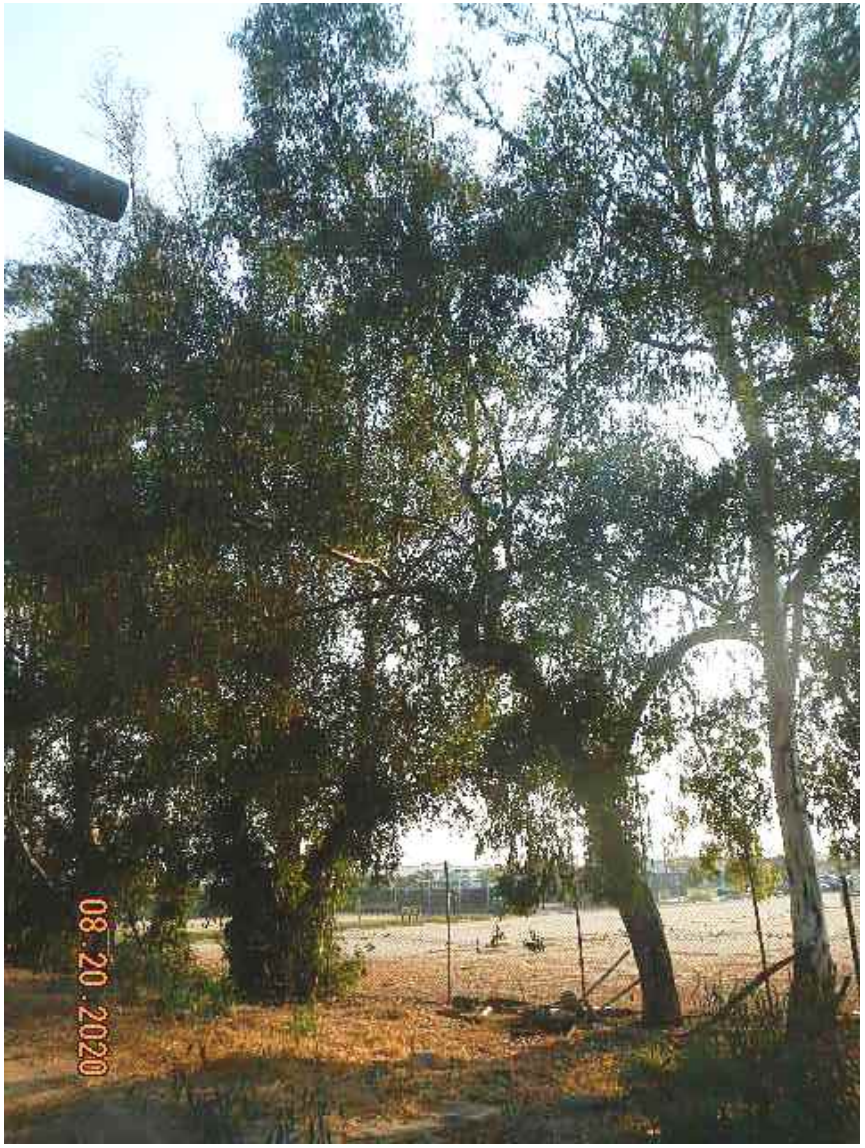
Photographic Documentation

North edge of the site.

Trees #108 to 110

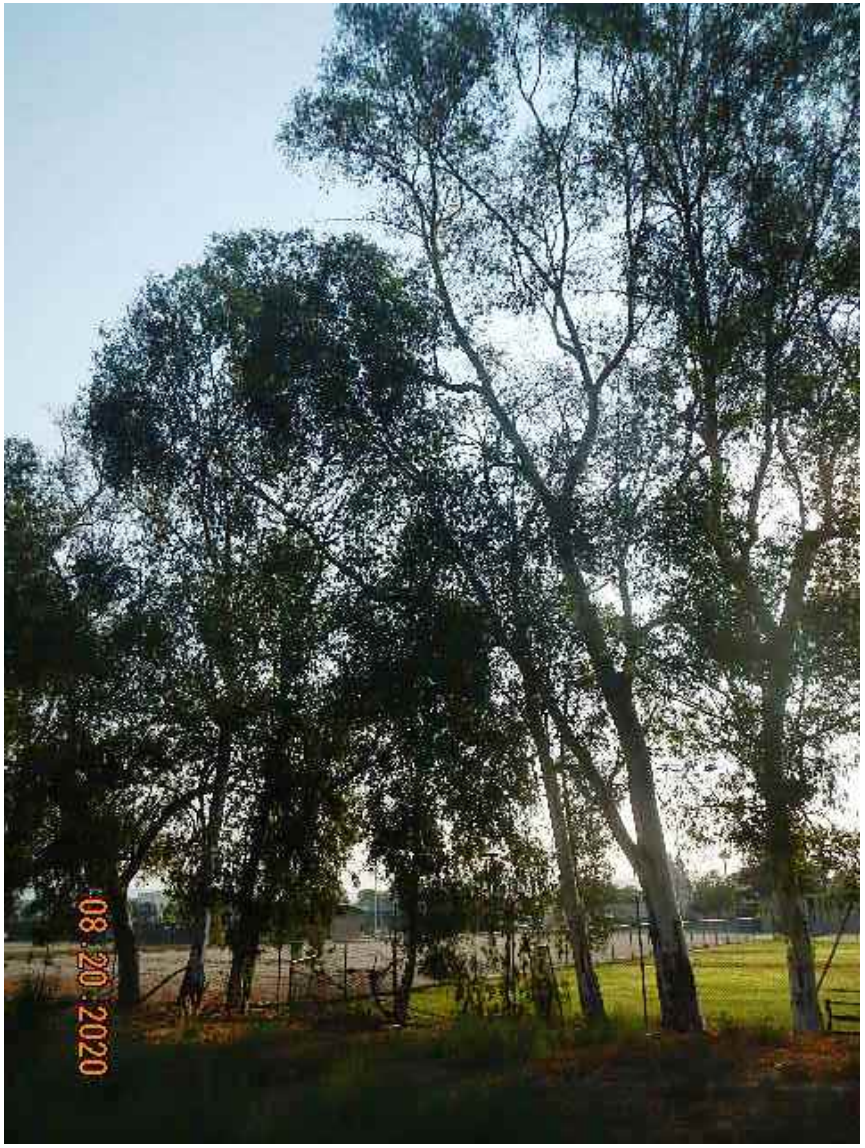
Trees #1 to 6 (left to right)

Note split and lack of normal root flare.



Trees #6 to 10 (left to right)

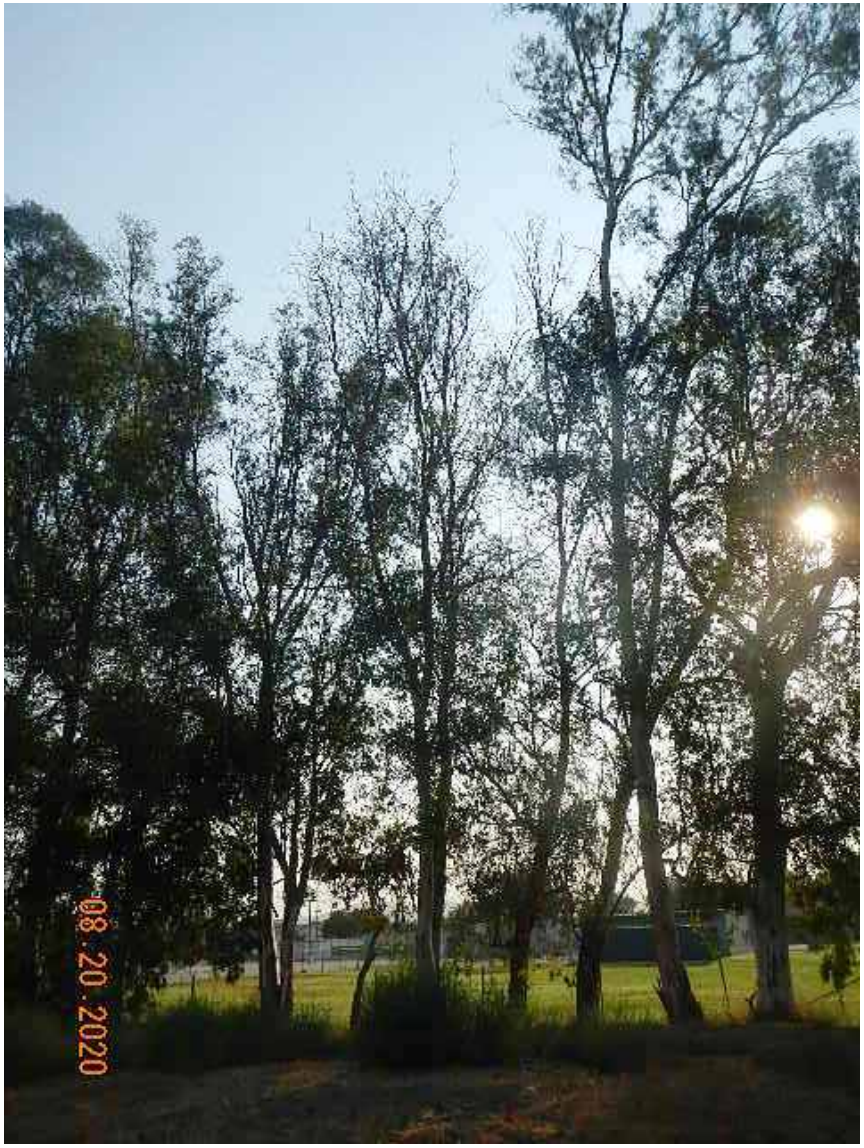
Tree #14



Trees #11 to 17 (left to right)

Trees #10 to 18 (left to right)

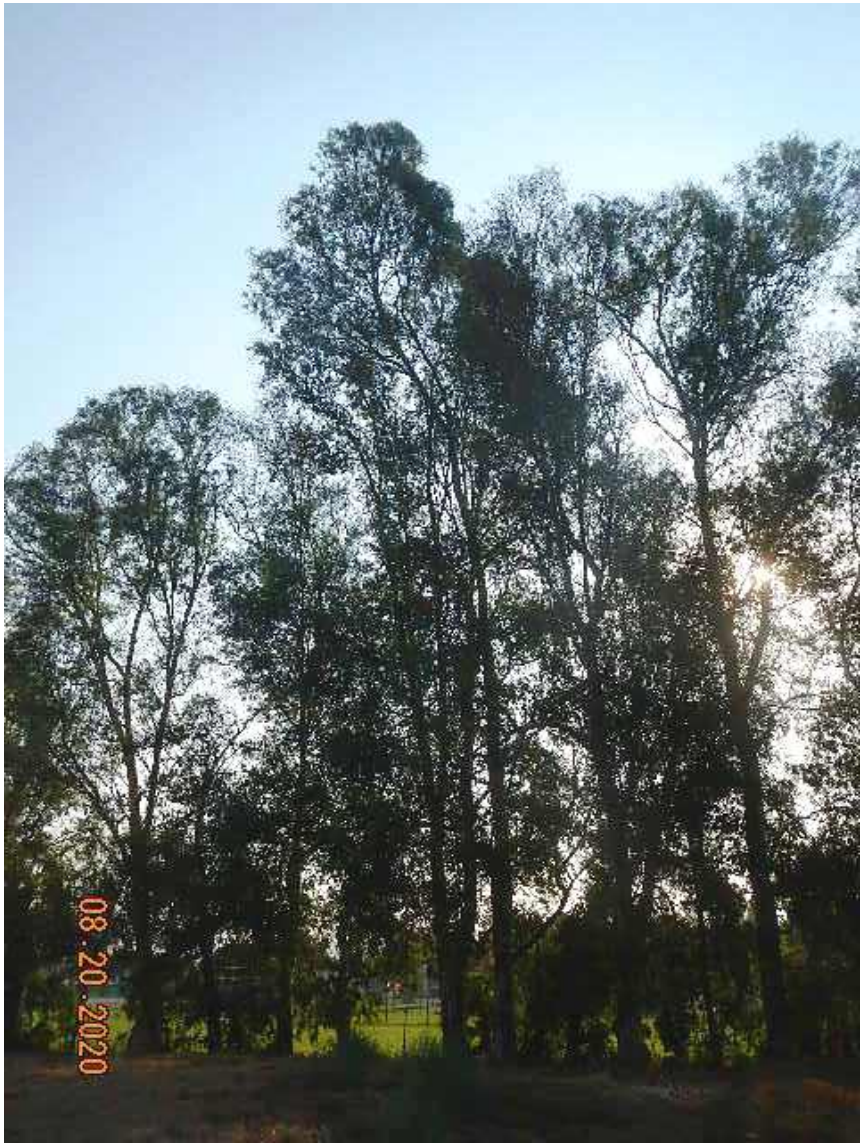
Trees #19 to 2617 (left to right)



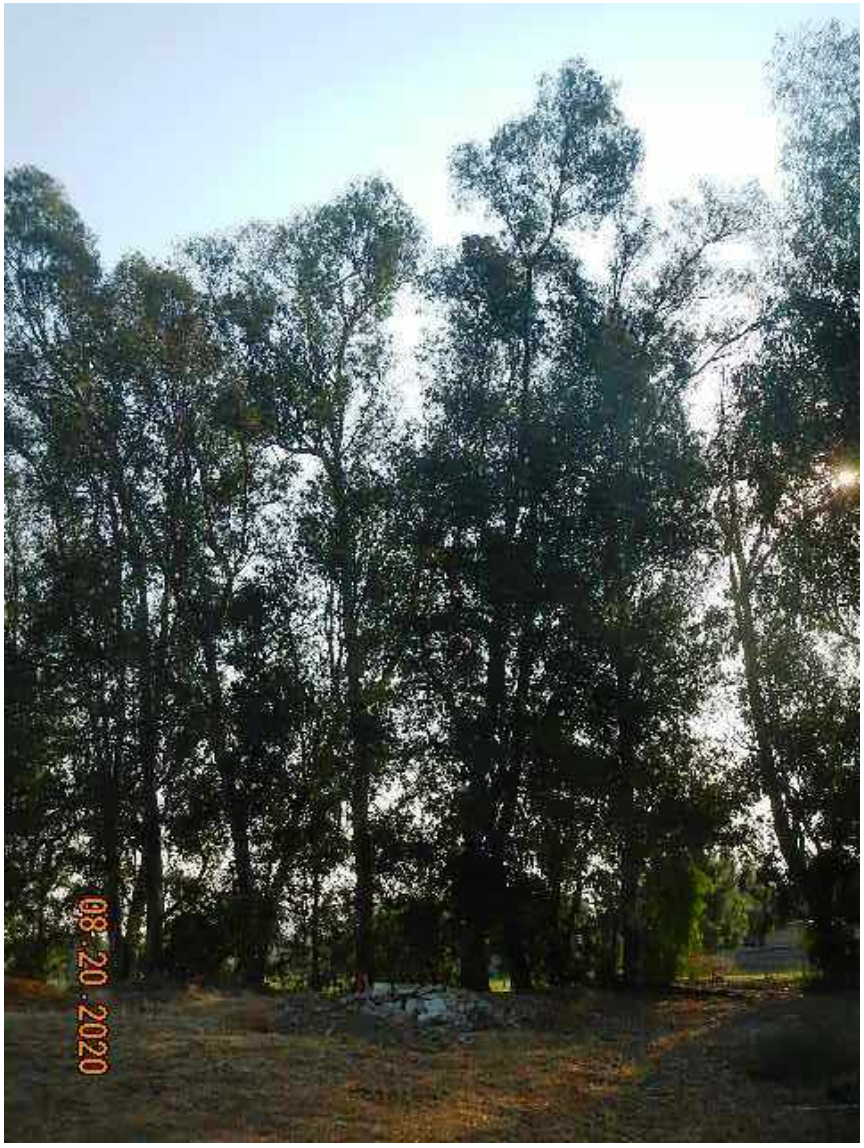
Trees #26 to 32 (left to right)

Trees #26 to 34 (left to right)

Trees #33 to 43 (left to right)



Trees #33 to 41 (left to right)

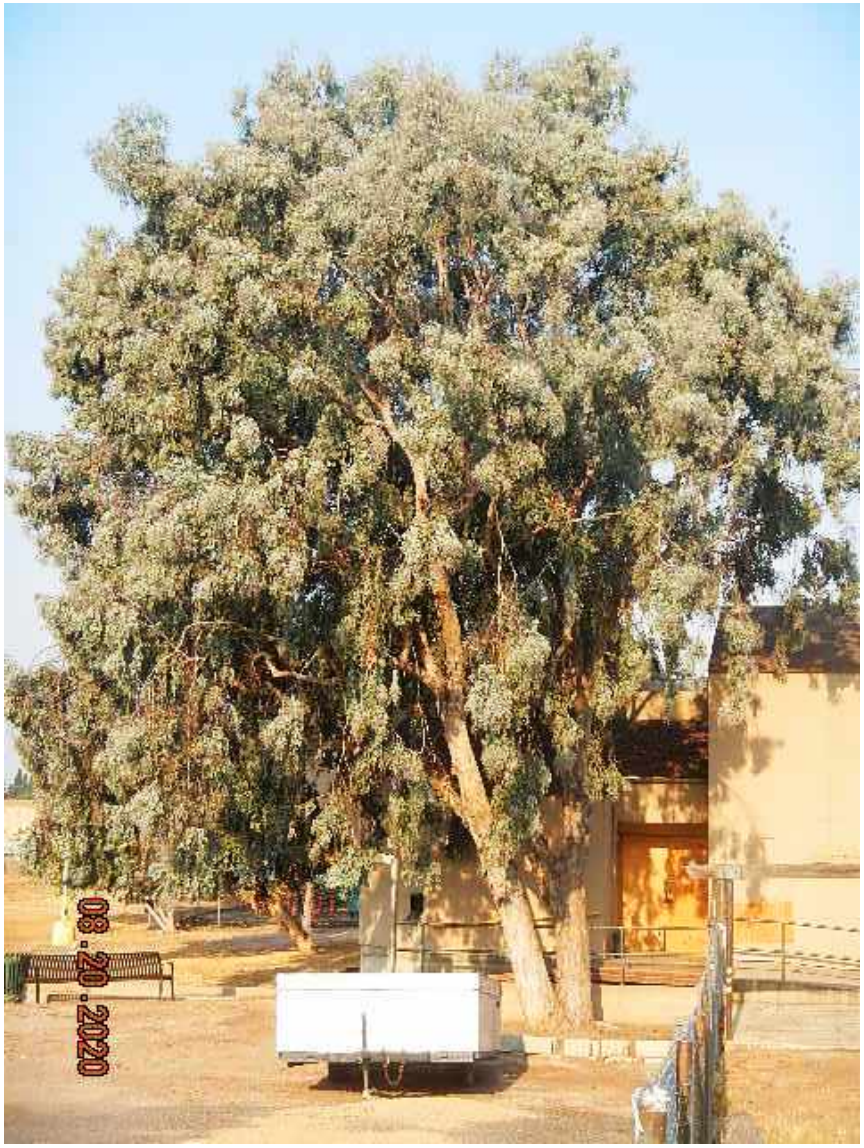


Trees #41 to 48 (left to right)

Trees #49 to 52 (left to right)

Trees #53 to 54(left to right)

Red gum #107



Silver Mt. gum #101

Silver Mt. gum #102

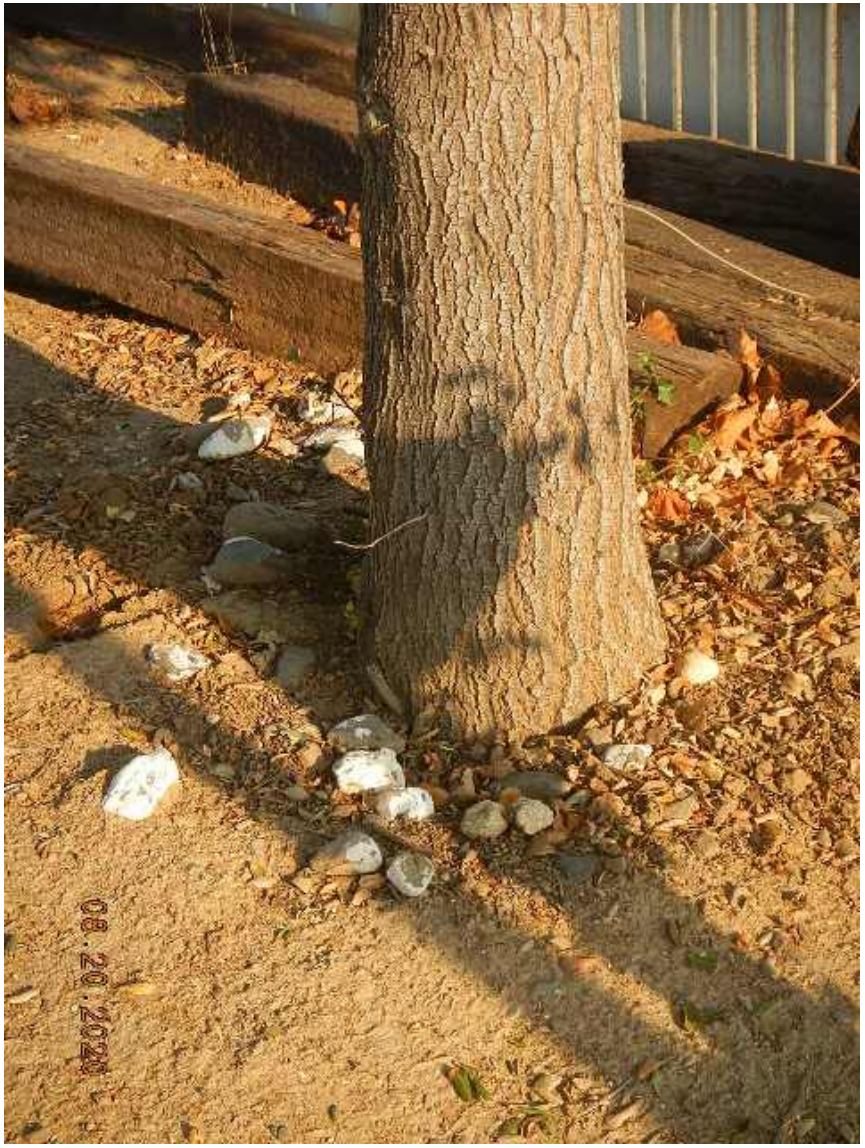
Mexican fan palms #48 & 50

Overall group of red gums in north area

Note lerp psyllids and tortoise beetle feeding.

Base of carrotwood #54

South gate at Palmyra – oak #56 at right



Base of oak #58 – note lack of basal flare.

London plane tree #55

Cork oak #57

Fruitless mulberry #104

Oak #64 at right to London plane #67 at left

California peppers #130 & 131. Aleppo pines behind.

Oaks #65 and 66 to sycamore #71 (left to right)

Crowded row of trees along south edge.

Peppers #84 & 85 – note block wall behind. Valley oak #86 at right.

Valley oak #86 & 87 at right

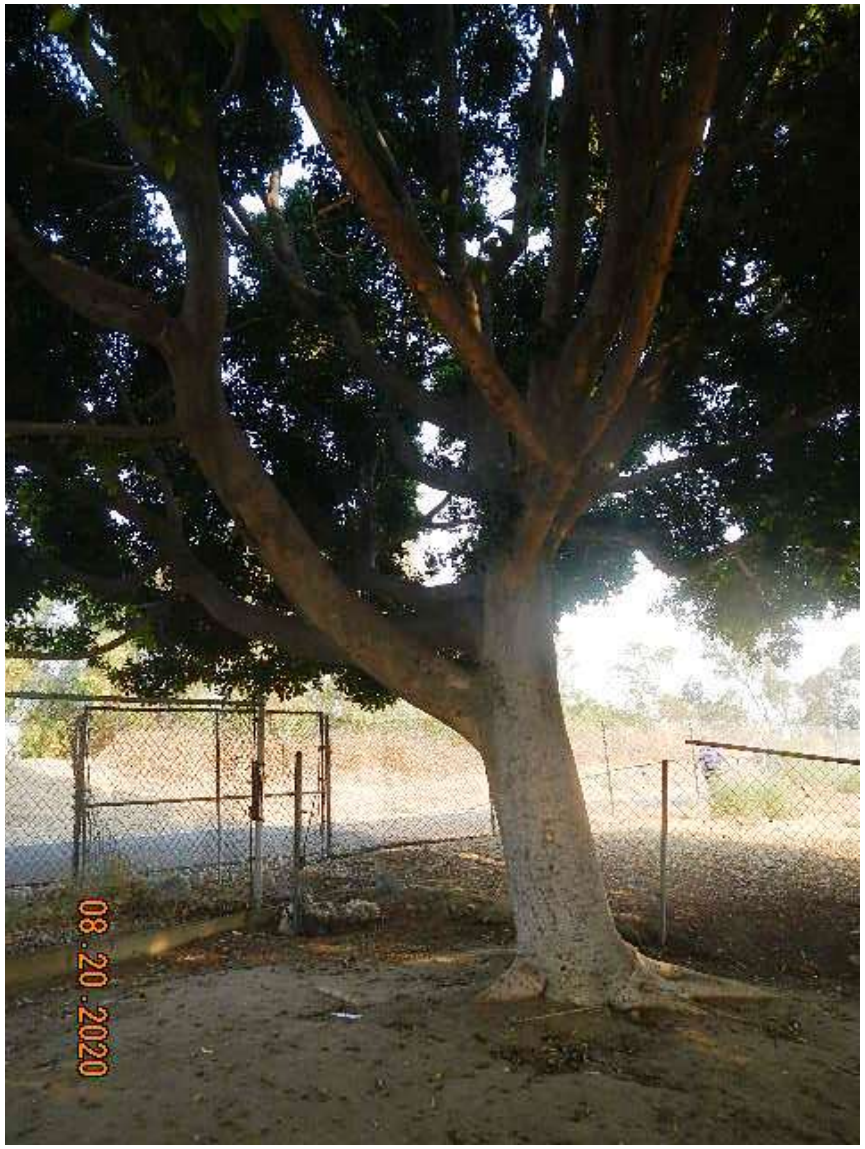
Jacaranda #89 left, oak #90 (belongs to CalTrans?) and pepper #91 at right

London planes #92, 93 and 94, left to right.

Trees #103 to 106 below playground.

Jacaranda #129

Oak #128



Ficus #125

Ficus #126

Oak #103

Red gum #124

Red gum 124 left, Ficus #125 & 126 middle, and red gum #127 at right.

Mexican fan palms #95 to 98 + Brazil pepper #99

Rubber tree #100

Disclaimer

Since Arborgate Consulting may not have direct review or supervision of demolition or construction as it takes place, we must remind you that there are certain risks involved. Trees are living, dynamic organisms that respond to changes in their environment, sometimes quickly and sometimes slowly. Working around trees in this condition will be risky. Be certain that what ever tree services is hired has workers compensation insurance.

Good, current information on tree preservation has been applied. A complete risk assessment was not requested or performed. Weather, winds and the magnitude and direction of storms are not predictable and a failure may still occur despite the best application of high professional standards. Future maintenance will also affect the trees' health and stability and is not under the supervision or scrutiny of this consultant. This consultant does not assume liability for any tree failures involved with this property.

Appendix

A. Resume

B. Glossary

C. Tree Map (attached)

A. Resume

GREGORY W. APPLEGATE, ASCA

Registered Consulting Arborist #365

PROFESSIONAL REGISTRATIONS:

American Society of Consulting Arborists Registered Consulting Arborist #365
International Society of Arboriculture, Certified Arborist Number WE-0180a
International Society of Arboriculture, Tree Risk Assessment Qualified

EXPERIENCE:

Mr. Applegate is an independent consulting arborist. He has been in the horticulture field since 1963, providing professional arboricultural consulting since 1984 within both private and public sectors. His expertise includes appraisal, tree preservation, diagnosis of tree growth problems, construction impact mitigation, environmental assessment, expert witness testimony, hazard evaluation, pruning programs, species selection and tree health monitoring.

Mr. Applegate has consulted for insurance companies, major developers, theme parks, homeowners, homeowners' associations, landscape architects, landscape contractors, property managers, attorneys and governmental bodies.

Notable projects on which he has consulted are: Disneyland, Disneyland Hotel, DisneySeas-Tokyo, Disney's Wild Animal Kingdom, the New Tomorrowland, Disney's California Adventure, Disney Hong Kong project, Knott's Berry Farm, J. Paul Getty Museums, Tustin Ranch, Newport Coast, Crystal Court, Newport Fashion Island Palms, Bixby Ranch Country Club, Playa Vista, Laguna Canyon Road and Myford Road for The Irvine Company, MTA Expo and Purple Lines, MWD-California Lakes, Paseo Westpark Palms, Loyola-Marymount campus, Cal Tech, Cal State Long Beach, Pierce College, The Irvine Concourse, UCI, USC, UCLA, LA City College, LA Trade Tech, Riverside City College, Crafton Hills College, MTA projects, and the State of California review of the Landscape Architecture License exam (re: plant materials)

EDUCATION:

Bachelor of Science in Landscape Architecture, California State Polytechnic University, Pomona 1973
ASCA Arboricultural Consulting Academy, Arbor-Day Farm, Kansas City 1995, #3 graduate
Continuing Education Courses in Arboriculture required to maintain Certified Arborist status and for ASCA membership

PROFESSIONAL AFFILIATIONS:

American Society of Consulting Arborists (ASCA), Registered Member
American Society of Landscape Architects (ASLA), Full Member
International Society of Arboriculture (ISA), Regular Member
California Tree Failure Report Program, UC Davis, Participant
Street Tree Seminar (STS), Associate Member

COMMUNITY AFFILIATIONS:

SoCalif ASLA visibility committee	1980-82
Landscape Arch. License Exam prep, Instructor, Cal Poly Pomona	(1986-90)
American Institute of Landscape Architects, LA Chapter Board of Directors	(1980-82)
California Landscape Architect Student Scholarship Fund-Chairman	(1985)
International Society of Arboriculture-Examiner-tree worker certification	(1990)
ASCA, Industry definitions committee and A3G committee	2009-2010
ASCA web site, west coast tree question responder	(2007 and continuing)
Guest lecturer at UCLA, Cal Poly, Saddleback College, & Palomar Junior College	

B. Glossary

Allelopathy a biological phenomenon by which an organism produces one or more biochemicals that influence the germination, growth, survival, and reproduction of other organisms.

ANSI-A300 American National Standards Institute performance standards for the care and maintenance of trees, shrubs and other woody plants. Copies are available from International Society of Arboriculture bookstore 888-ISA-TREE

ANSI-Z60-1 American National Standards Institute standards sizing and describing trees, shrubs and other nursery stock.

Appraisal Plant appraisal - The act or process of developing an opinion of a defined value or defined cost. This may apply to plants, landscape elements, or services. (per Council of Tree and Landscape Appraisers)

Arboricultural Pertaining to the awareness, care, evaluation, identification, growing, maintenance, management, planting, selection, treatment, understanding, valuation and so forth of trees and other woody plants and their growing environments, particularly in shade and ornamental (non-crop/commodity) settings.

Arboriculture The selection, cultivation, and care of trees, vines, and shrubs.

Arborist A person possessing the technical competence through experience and related training to provide for or supervise the management of trees or other woody plants in a landscape setting.

ASCA The American Society of Consulting Arborists, Inc. a professional society, as described in its by-laws.

Bark Tissue on the outside of the vascular cambium. Bark is usually divided into inner bark - active phloem and aging and dead crushed phloem - and outer bark.

Basal flare Most trees have a rapid increase in diameter as the trunk meets the soil line or root crown. This area is associated with both trunk and root tissue.

Caliper Diameter of a tree trunk. Larger trees are usually measured at 4½ feet (see DBH) Trees with calipers 4 inches and below are measured at 6 inches above grade(ANSI Z60-1-1990) Trees above 4 inches, but still transplantable are measured at 12 inches above grade.

Canopy The live, foliage-bearing part of a tree.

Codominant Leaders equal in size and relative importance, developed from 2 apical buds at the top of a stem. Each codominant stem is an extension of the stem below it. There are no branch collars or trunk collars at the bases of codominant stems.

Compaction	(Soil Compaction) The compression of soil, causing a reduction of pore space and an increase in the bulk density of the soil. Tree roots cannot grow in compacted soil.
Crotch	The union of two or more branches; the axillary zone between branches.
Crown	The upper portions of a tree or shrub, including the main limbs, branches, and twigs.
Crown reduction	Reducing the size of the canopy using thinning versus heading cuts. Should not exceed 20 to 25 percent branch removal.
Crown restoration	Restoration of natural and/or structurally sound form to a tree which has been previously topped, headed or damaged. (synonym – crown restructure pruning)
Cultivar	A unique form or type propagated through selective breeding and maintained for specific purposes and retains those attributes in further propagation. An acronym for "cultivated variety"; cultivars can be naturally occurring plants, but usually have been cultivated with specific desirable characteristics in appearance and/or resilience. Maybe a field selection or a horticultural variety that has originated and persisted under cultivation. Usually enclosed in single quotes after the genus and species names.
DBH	Diameter of the trunk, measured at breast height or 54 inches above the average grade. See caliper.
Decay	Progressive deterioration of organic tissues, usually caused by fungal or bacterial organisms, resulting in loss of cell structure, strength, and function. In wood, the loss of structural strength.
Decline	Progressive reduction of health or vigor of a plant.
Deep ripping	Sub-soiling. - Cultivating below normal plow or roto-tiller depth.
Dog-leg	crooked or bent like a dog's hind leg.
Epicormic	Epi - upon; cormic – stem. Branches that are upon the stem, i.e. sprouting from either dormant buds in the cambial zone, or from buds sprung anew from ray traces. Epicormic shoots are a sign that energy reserves have been lowered.
Excurrent	Referring to crowns having a strong central leader.
Foliage	The live leaves or needles of the tree; the plant part primarily responsible for photosynthesis.
Flush cut	Pruning technique in which both branch and stem tissue are removed, generally considered poor practice
Full skirt	Dead fronds retained on palms trunks to near the ground.

Girdling root	A root that partially or entirely encircles the trunk and/or buttress roots, which could restrict growth and downward movement of photosynthate and/or water and nutrients up.
Ground cover	Plants, usually herbaceous, used to spread, stay low and cover ground. They are usually not suited for foot traffic and do not usually need to be mowed and as such are distinguished from lawns. Any relatively low-growing plant. Can be Herbaceous or Woody.
Heading	Pruning techniques where the cut is made to a bud, weak lateral branch or stub.
Included bark	The pattern of development at branch junctions where bark is turned inward rather than pushed out forming a branch bark ridge. Bark embedded within the crotch between a branch and the trunk or between two or more stems that prevents the formation of a normal branch bark ridge. This often occurs in branches with narrow-angled attachments or branches resulting from the loss of the leader. Such attachments are weak and subject to splitting out.
Lion-tailing	The removal of all, or a great deal of, the inner branches and/or watersprouts from the crown of a tree. Lion's Tailing is not an acceptable pruning practice, see ANSI A-300.10.1.7.
Live crown ratio	The relative proportion of green crown to overall tree height.
Mature	Plant will respond to flower-inducing conditions, in contrast with juvenile.
Mulch	Substances spread on top of the ground to conserve water, protect against erosion, retain moisture, and protect the roots of trees from heat, cold or drought. The substances are typically organic, such as compost, manure or bark chips.
Narrow crotch	for eucalyptus a branch angle of less than 15 degrees – for other trees a branch angle less than 30 degrees.
Native	A plant that grows naturally in a particular country, state, or region, and is neither introduced through planting, nor naturalized.
Over pruned	removal of more than 10 to 30 percent, depending on health, species and time of year – often evidenced by formation of epicormic shoots.
Over-lifted	removing more than the lower one third of scaffold limbs.
Palm	A tropical or subtropical monocotyledonous tree or shrub, usually having a woody, unbranched trunk and large, evergreen, fan or feather-shaped leaves at the top.
Pencil	In palms, declining health resulting in diminishing trunk diameter.

Percolation	The downward movement of water through soil.
Root crown	Area at the base of a tree where the roots and stem merge (synonym - root flare)
Root system	The portion of the tree containing the root organs, including buttress roots, transport roots, and fine absorbing roots; all underground parts of the tree.
Root zone	The area and volume of soil around the tree in which roots are normally found. May extend to three or more times the branch spread of the tree, or several times the height of the tree.
Root sprung	the roots are compromised by being pulled out of the ground on the side opposite a lean. (USDA Danger Tree pub)
Scaffold limb	Primary structural branch of the crown.
Species	Taxonomic classification below genus.. 1. A group of plants with common characteristics or consistent differences in morphology, ecology or reproductive behavior, distinct from others of the same genus. 2. The basic unit in plant taxonomy; the Latin binomial consisting of the genus and specific epithet; it is both singular and plural.
Stress	"Stress is a potentially injurious, reversible condition, caused by energy drain, disruption, or blockage, or by life processes operating near the limits for which they were genetically programmed." Alex Shigo
Suppressed	Trees which have been overtopped and whose crown development is restricted from above. They usually occupy the understory and grow slowly.
Topping	Pruning technique to reduce height - heading of large branches.
Value	The relative worth, merit, or importance of a thing, expressed as a single point, a range, or a relationship to a benchmark.
Wound	Any injury, which induces a compartmentalization response.

Tree Map

Attached separately

Verification of Current Registration and Certifications

The American Society
of
Consulting Arborists

in recognition of fulfillment of the requirements for

Registered Consulting Arborist® status

confers upon

Gregory W. Applegate, RCA #365

Registered Membership

Dr. James R. Clark, RCA #357
President

Beth W. Palys, FASAE,CAE
Executive Director

INTERNATIONAL SOCIETY OF ARBORICULTURE
TREE RISK ASSESSMENT QUALIFICATION

Gregory W. Applegate

Having successfully completed the requirements established by
the International Society of Arboriculture, the above named
is hereby recognized as ISA Tree Risk Assessment Qualified.

ISA QUALIFICATIONS ™

Kevin Martlage
Director of Professional Development
International Society of Arboriculture

11 Feb 2013
Issue Date

Jim Skiera, Executive Director
International Society of Arboriculture

30 Sep 2022
Term of Validity End Date

Certification

I, Gregory W. Applegate, certify to the best of my knowledge and belief:

That the statements of fact contained in this report, are true and correct. That the report analysis, opinions, and conclusions are limited only the reported assumptions and limiting conditions, and are my personal unbiased professional analysis, opinions and conclusions.

That I have no present or prospective interest in the vegetation that is the subject of this report, and I have no personal interest or bias with respect to the parties involved.

That my compensation is not contingent upon the reporting or a predetermined outcome that favors the cause of the client, or the attainment of stipulated result.

That my analysis, opinions, and conclusions were developed, and this report has been prepared, in conformity with the standards of ASCA and customary arboricultural practice.

That I have made a personal inspection of the plants that are the subject of this report. No one provided significant professional assistance to the person signing this report.

Arborgate Consulting, Inc.
Gregory W. Applegate, ASCA_____ Date: 8/27/2020
Registered Consulting Arborist #365
Certified Arborist #WE-0180a