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Consulting Arborist & Horticulturist



ARBORIST REPORT

Project:

Cupertino Civic Center Master Plan & Parking Garage Conceptual Planning
Cupertino Civic Center, Torre, Rodrigues & Pacific Drive, Cupertino, California

Property Owner:

City of Cupertino

Prepared for:

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JANUARY 2, 2015

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Cover photo: corner of Rodrigues and Torre Avenues. The tree row of **Chinese pistache trees #101-116** is visible. All photos in this report were taken by D. Ellis between December 23, 2014 and January 2, 2015.



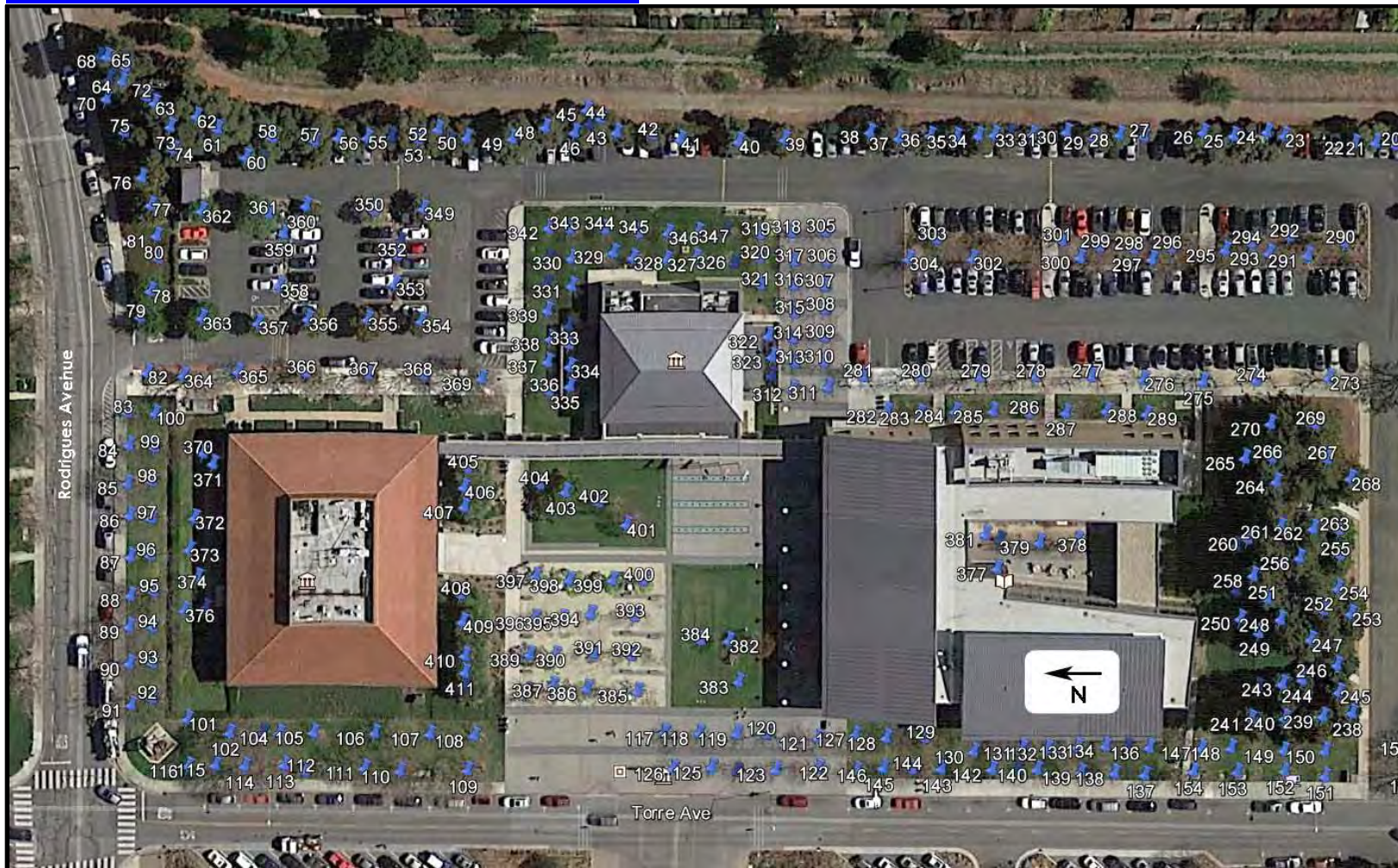
TREE MAP #1 COMPLETE COMPLEX



Note that separate, larger copies of the Tree Maps in this report have also been provided as .PDF files, along with an online interactive .KMZ file.



TREE MAP #2 NORTH COMPLEX



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TREE MAP #3 SOUTH COMPLEX





SUMMARY

BRIEF DESCRIPTION OF THE PROJECT

A master plan is being developed for the renovation of the Cupertino Civic Center. A new parking structure may be part of the renovation.

PLANS/DOCUMENTS REVIEWED

- Aerial map of the site, no date, presumed 2012, that includes numbered tree locations (#1 through #395) that corresponds to a database of the existing trees on the site, updated in 2012.

BRIEF DESCRIPTION OF THE TREES

There are 412 trees on the project site. These trees are described in the *Complete Tree Table* (Table 1) beginning on page 9. No *Tree Disposition Recommendations* (e.g. *Save, Remove or Debatable*) are provided in this report because construction plans have not yet been developed. The tree *Preservation Suitability* ratings and *Tree Root Protection Distances* will be helpful to the project planners and architects however, in deciding which trees to retain and how far improvements should be located from these trees, during the design process. Out of the 412 evaluated trees:

- **Two-hundred, sixty-four (264) trees are classified as having “Excellent”, “Good” or “Fair/Good” preservation suitability.** These are the better trees on the site, and those that are most worthy of retaining or transplanting. These trees comprise 64% of the total tree population on the site.
- **Eighty-two (82) trees are classified as having “Fair” preservation suitability.** These are “so-so” trees and I do not recommend going through too much trouble to retain them. They make up 20% of the trees on the site.
- **Sixty-four (64) trees are classified as having “Fair/Poor”, “Poor” or “Unacceptable” preservation suitability.** I would not put any effort into retaining any of these trees, which are the remaining 16% of the trees on the site.



As the construction plans for the project are developed I recommend that I review these plans and produce additional reports describing the expected impact of construction on those trees that will remain. I can also work with the architects to reduce construction impacts to trees where possible. I can eventually prepare a *Final Arborist Report* listing trees to remain, trees to be removed and *Tree Protection Specifications* for those trees that will remain.

SPECIES COMPOSITION & NUMBER

There are 17 species of trees growing on the site, as indicated in Table 2 below:

Species	Total number of Trees	Percentage of total
Chinese pistache, <i>Pistacia chinensis</i>	149	36.2%
black acacia, <i>Acacia melanoxylon</i>	76	18.4%
honey locust, <i>Gleditsia triacanthus inermis</i>	44	10.7%
coast redwood, <i>Sequoia sempervirens</i>	33	8.0%
deciduous flowering pear, <i>Pyrus calleryana</i>	28	6.8%
cherry, flowering. <i>Prunus x yedoensis</i> 'Akebono'	15	3.6%
river birch, <i>Betula nigra</i>	15	3.6%
Brazilian pepper, <i>Schinus terebinthefolius</i>	12	2.9%
European olive, <i>Olea europaea</i>	8	1.9%
camphor tree, <i>Cinnamomum camphora</i>	6	1.5%
crape myrtle, <i>Lagerstroemia indica</i>	5	1.2%
★ Calif. sycamore, <i>Platanus racemosa</i>	4	1.0%
★ coast live oak, <i>Quercus agrifolia</i>	4	1.0%
red maple, <i>Acer rubrum</i>	4	1.0%
sawleaf zelkova, <i>Zelkova serrata</i>	4	1.0%
Marina hybrid madrone, <i>Arbutus</i> 'Marina'	3	0.7%
★ black walnut, <i>Juglans californica hindsii</i>	2	0.5%
Total Trees	412	100.0%

★ Indicates species native to the immediate area.



TREE CONDITION

Most of the trees on site have good vigor and fair or fair/good structure. The main tree problems noted were:

- **Chinese pistache trees:** **girdling roots**¹ and **multiple attachments** of **scaffold branches**.
- **Honey locust:** many are infected with a trunk **canker** disease that appears to be worsening on these relatively young trees; so their prognosis is probably not good.
- **Black acacias** adjacent to the parking lot: branch breakage over the parking lot, root damage to curb and asphalt where planting area is narrow and tree trunks are close to pavement.
- **Coast redwoods:** probable suffering from drought stress
- **Many other tree species:** lack of young tree training pruning, leading to structural defects that are easily correctable now on young trees, but more difficult on older, larger trees.
- **Too low planting of some trees**, e.g. Chinese pistache, flowering cherries, honey locusts in lawns, trees in the gold fines plaza in near the Library on Torre Avenue. Some of these trees look like they are planted in "bowls". This could lead to **root rot disease** in the future.
- **Staff parking lot:** trees planted in narrow island planters are or are likely to cause significant pavement damage.

You may contact me for help with the above problems, which is beyond the scope of my work for this tree survey and arborist report.

¹ Terms **highlighted** at their first occurrence in this report are explained in the [Glossary](#) on pages 42 through 44.



RECOMMENDATIONS

1. **Which trees to retain?** Try to design around and retain as many of trees as possible with “Good” and “Fair/Good” preservation suitability ratings. Trees with “Fair” preservation suitability should be saved when possible, but I don’t recommend making a significant effort to save them. No effort should be made to retain trees with “Fair/Poor” or “Poor” preservation suitability. Trees recommended for further evaluation by the arborist should be evaluated in greater detail if they may remain. If no further evaluation will be performed on these trees then it is probably best to remove these them for reasons of safety.
2. **I should review all site-based plans for this project:** Improvements will cause trees to be impacted and/or removed. Examples of important plans to review are: the Existing and Proposed Site Plan, Demolition, Construction Staging, Erosion Control, Grading & Drainage, Underground Utilities, Landscaping & Irrigation, Building Elevations & Sections, Roof Plan and Construction & Landscape Details showing improvements that may impact trees. Plans reviewed by the arborist should be full-size, to-scale and with accurately located tree trunks and canopy driplines relative to proposed improvements. Scale should be 1:20 or 1:10.
3. **As a part of the design process, try to keep proposed improvements (and any additional over-excavation or work area beyond the improvement) as far from tree trunks and canopies as possible.** $5 \times DBH^2$ or the dripline of the tree, whichever is greater, should be used as the minimum distance for any soil disturbance to the edge of the trunk. $3 \times DBH$ should be considered the absolute minimum distance from any disturbance to the tree trunk on one side of the trunk only, for root protection. Farther is better, of course. For disturbances on multiple sides of the trunk, then $5 \times DBH$ or greater should be used, and farther is also better here. Tree canopies must also be taken into consideration when designing around trees. Don’t forget the minimum necessary working margin around improvements as you locate those improvements. Disturbance usually comes much closer to trees than the lines shown on the plans!
4. **New landscaping and irrigation can be as much or more damaging to existing trees than any other type of construction.** The same tree root protection distances recommended for general construction should also be observed for new landscaping. Within the root protection zone it is usually best to limit landscape changes to a 3 to 4-inch depth of coarse organic mulch such as wood or bark chips or tree trimming chippings spread over the soil surface. The environment around existing trees should be changed very carefully or not at all – please consult with me regarding changes in the landscape around existing trees and/or have me review the landscape and irrigation plans for this project.
5. **Custom Tree Protection Specifications should be prepared** for any existing trees on this site that will be saved. I have not prepared such specifications at this time because it is too early in the planning process and we do not know which trees will be saved.

² $3 \times$ & $5 \times DBH$: See page 34 for an explanation of these calculations which are used to estimate root protection distances for trees.



6. **Construction or landscaping work done underneath the dripline of existing trees should preferably be done by hand**, taking care to preserve existing roots in undamaged condition as much as possible and cutting roots cleanly by hand when first encountered, when those roots must be removed. A **qualified consulting arborist** (the **project arborist**) should be hired to monitor tree protection and supervise all work underneath the dripline of trees. This also applies to trees on neighboring properties whose canopies overhang the work site.
7. **Trees remaining after adjacent trees are removed** should be re-evaluated by the project arborist.
8. **General Tree Maintenance:**
 - a. **The root collars and lower trunks of a few of the trees were obscured from view by vegetation.** Such portions of the tree should be uncovered and the tree re-evaluated by the arborist.
 - b. **Do no unnecessary pruning, fertilization or other tree work.** Pre-construction pruning should be limited to the absolute minimum required for construction clearance. A **qualified tree service** should be hired to provide such pruning.



APPENDIX

TABLE 1 COMPLETE TREE TABLE

This Table is continued through page 29. Data fields in the Table are explained on pages 30 to 32.

Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
1		<i>Acacia melanoxylon</i> , black acacia	15.4	35*25	80	60	Fair/Good	Black acacia trees #1-18 are adjacent to the grass playing field, and so pavement damage is not a concern with these trees.	4	6	12
2		black acacia	19	45*30	90	70	Good		5	8	19
3		black acacia	12.6	45*25	70	40	Fair/Poor	OK if kept in grove , as are other black acacias in this tree row with Fair preservation suitability.	3	5	9
4		black acacia	10.3	45*25	90	50	Fair		3	4	8
5		black acacia	12	40*20	80	50	Fair		3	5	9
6		black acacia	10	30*20	80	60	Fair/Good		3	4	8
7		black acacia	13	45*18	80	60	Fair	There is a significant crook in the trunk where a previous co-dominant leader broke out.	3	5	10
8		black acacia	16.4	50*40	90	40	Fair/Poor		4	7	12
9		black acacia	1,1,1	12*5	80	40	Fair/Poor	A stump sprout with 3 sucker trunks. Could make a good tree if 2 suckers removed and tree maintained as single trunk. Tree number tag is 12 inches above the ground due to small trunk size.	3	4	5
10		black acacia	3,3	17*7	80	40	Fair/Poor	Same as previous except number tag is at normal height on trunk.	3	4	5
11		black acacia	5	25*12	85	80	Good		3	4	5
12		black acacia	14.9	45*25	80	50	Fair		4	6	11
13		black acacia	13.3	35*30	85	60	Fair/Good		3	6	10
14		black acacia	13.8	40*30	90	40	Fair/Poor	A large co-dominant scaffold branch failed on the creek side.	3	6	10



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
15		black acacia	15	40*20	70	20	Poor	Two large scaffold branch failures and resultant wound on trunk, which leans toward creek.	4	6	11
16		black acacia	14	40*30	70	40	Fair/Poor	A past large scaffold branch failure and resultant trunk wound.	4	6	10
17		black acacia	5	40*15	60	60	Fair		3	4	5
18		black acacia	16	45*30	75	40	Fair/Poor		4	7	12
19		black acacia	14.8	40*25	70	50	Fair	This tree is the first tree in this black acacia tree row with its trunk adjacent to pavement (the parking lot) and also a portion of its canopy over the parking lot, as do subsequent black acacias through #43. The planting area in which these trees are located is narrow -- with tree trunks very close to the pavement - - often less than 12 inches from the curb. Pavement damage and branch breakage over the parking lot is a concern for these trees.	4	6	11
20		black acacia	12	30*18	60	50	Fair/Poor		3	5	9
21	94	black acacia	8.7	18*10	0	0	Unacceptable	Large car impact wound at trunk base.	3	4	7
22	93	black acacia	11	26*20	70	40	Fair/Poor		3	5	8
23	92	black acacia	4	16*6	40	20	Poor		3	4	5
24	91	black acacia	8.6	30*18	70	50	Fair		3	4	6
25		black acacia	15.5	35*35	80	50	Fair	Trunk close to curb and contacting cars.	4	6	12
26		black acacia	11	35*25	75	40	Fair/Poor		3	5	8
27		black acacia	9.2	22*22	80	70	Fair		3	4	7
28	87	black acacia	5.9	18*10	40	40	Poor		3	4	5
29		black acacia	7.2	20*15	50	60	Fair		3	4	5
30	85	black acacia	9	25*20	60	45	Fair/Poor	Large scaffold tear wound parking lot side.	3	4	7
31		black acacia	2	13*4	70	60	Fair	This tree is a sucker growing from an old large root of a previous tree that was removed.	3	4	5
32	83	black acacia	4.3	18*10	80	70	Fair	Another stump sprout.	3	4	5

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Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
33	82	black acacia	8.7	40*18	80	50	Fair/Poor	Tree topped in the past and leans. Roots causing significant pavement damage. This is another stump sprout tree.	3	4	7
34	81	black acacia	13.8	45*25	70	60	Fair	Basal trunk wound (caused by cars) and significant curb and pavement damage.	3	6	10
35	80	black acacia	8.9	25*16	85	50	Fair/Poor	Major car-caused trunk wound and pavement damage. This tree looks like it is a sucker growing from a previously removed tree.	3	4	7
36	79	black acacia	8.8	22*22	60	50	Fair/Poor		3	4	7
37		black acacia	12.9	35*25	50	50	Fair/Poor		3	5	10
38		black acacia	10.1	37*22	70	60	Fair	Trunk wound from car, and curb damage caused by roots.	3	4	8
39		black acacia	12.3	35*35	70	60	Fair	Curb damage caused by roots.	3	5	9
40		black acacia	10.9	42*25	75	60	Fair		3	5	8
41		black acacia	2.5	16*5	75	60	Fair	Stump sprout tree.	3	4	5
42		black acacia	9.7	22*18	80	70	Fair		3	4	7
43		black acacia	7.4	16*12	70	45	Fair/Poor	Long trunk canker; probably from a previous wound.	3	4	5
44		black acacia	17 (3.5)	25*25	75	50	Fair	From here on the planting area for black acacia trees #44 through #60 is wider than previous black acacias #19 - 43. In this larger planting area most of the black acacia trees are farther back from pavement than previous black acacias #19 - 43, so pavement damage is not as much of a problem.	4	7	13
45		black acacia	10.3	28*20	60	60	Fair		3	4	8
46		black acacia	8.6	16*10	60	20	Poor	The back (creek) side of the trunk is largely decayed.	3	4	6
47	39	black acacia	11.6	28*22	80	60	Fair/Good		3	5	9
48	38	black acacia	10.2, 6	35*25	60	40	Fair/Poor	Edge of trunk 4 feet from curb.	3	6	10
49	37	black acacia	17.4	40*30	80	60	Fair/Good	Edge of trunk 5.5 feet from curb.	4	7	13
50		black acacia	15.2	28*25	70	50	Fair	Edge of trunk 8 feet from curb.	4	6	11

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Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
51	34	black acacia	10.7	30*22	70	50	Fair	Edge of trunk 8 feet from curb.	3	4	8
52	33	black acacia	11.4	38*20	70	50	Fair	Edge of trunk 8 feet from curb.	3	5	9
53	32	black acacia	12.3	25*18	60	40	Poor	A previous tree fell on this tree and its canopy is not severely leaning.	3	5	9
54	30	black acacia	12.8	35*25	60	60	Fair		3	5	10
55	29	black acacia	11.1	28*12	0	0	Unacceptable		3	5	8
56	38	black acacia	12.1	30*30	80	60	Fair/Good	Trunk below scaffolds at 3 feet includes 2 sub-trunks of about 18 inches in diameter each.	3	5	9
57		black acacia	9.8, 7, 7.5, 8.5 (4)	25*25	90	50	Fair	More like a large shrub.	5	9	16
58		black acacia	12.7	35*25	60	40	Fair/Poor	Some dead lower branches due to shading.	3	5	10
59	90	black acacia	18.9	38*30	75	50	Fair		5	8	19
60	89	black acacia	15.5	40*30	60	60	Fair		4	6	12
61	23	black acacia	17	50*20	60	40	Fair/Poor	Leans 20 degrees toward creek. Black acacias #61 through 75 are located in a "forest-like" area between the parking lot and Rodrigues Avenue. I saw many people walking on a foot worn trail through this area. Many of the black acacia trees here are suckers or seedlings from other, older acacia trees.	4	7	13
62		black acacia	20	60*40	70	50	Fair	The canopy of this black acacia as well as all subsequent black acacia trees through #75 do not overhang the parking lot.	5	8	20
63		black acacia	4,2	22*15	70	50	Fair/Poor	Sucker from a nearby larger tree.	3	4	5
64		black acacia	8.4	25*15	70	40	Poor	Topped underneath overhead power lines.	3	4	6
65		black acacia	13.8, 8	60*30	80	50	Fair		4	7	13
66		black acacia	3.8	35*10	60	50	Fair/Poor	Too close to other trees, and in general this area is overcrowded with trees.	3	4	5
67		black acacia	4	30*12	70	50	Fair/Poor	Same as previous.	3	4	5

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					Vigor	Structure			3xDBH	5xDBH	OTZ
68		black acacia	6.5	40*20	80	50	Fair	Multi-trunk stump sprout tree.	3	4	5
69		black acacia	7,6,6,5,4	25*18	80	40	Fair/Poor	A stump sprout tree from a previous 2 foot tall stump with octopus-like form.	4	8	14
70	93	black acacia	6.4	30*18	70	50	Fair		3	4	5
71	94	black acacia	3.4	16*9	70	50	Poor	Shaded understory tree only 3 feet from black acacia #70.	3	4	5
72	87	black acacia	17.2	45*35	70	60	Fair		4	7	13
73	88	black acacia	14.8	50*30	80	40	Poor	<i>Ganoderma conk</i> (fruiting body of a wood decay fungus) at root collar; tree could fall into parking lot.	4	6	11
74	86	black acacia	8.3, 3.5, 3	38*22	90	40	Fair/Poor	Smaller two trunks are suckers from the larger tree/trunk.	3	5	9
75	85	black acacia	6.1, 3.5	40*18	80	50	Fair		3	4	5
76	83	<i>Schinus terebinthefolius</i> , Brazilian pepper	7.2	28*20	70	40	Fair/Poor	Topped.	3	4	5
77	82	Brazilian pepper	11.3	25*25	90	50	Fair		3	5	8
78	96	Brazilian pepper	9.2	20*22	80	60	Fair/Good		3	4	7
79	95	Brazilian pepper	8.4	20*20	80	50	Fair		3	4	6
80		<i>Pyrus calleryana</i> , Pear - deciduous flowering	1.5	12*5	60	50	Fair	Unsure of vigor due to deciduous state. Planted too close to tree #78.	3	4	5
81		Pear - deciduous flowering	3	16*8	80	60	Fair/Good		3	4	5
82	99	Pear - deciduous flowering	4	18*10	80	60	Fair/Good		3	4	5
83		<i>Pistacia chinensis</i> , Chinese pistache	7.2	20*22	80	60	Fair/Good		3	4	5
84		Chinese pistache	9.2	20*20	70	60	Fair/Good		3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
85		Chinese pistache	10.8	25*25	85	60	Good		3	5	6
86		Chinese pistache	7.7	20*20	85	60	Good		3	4	5
87		Chinese pistache	3	22*9	80	60	Good		3	4	5
88		Chinese pistache	5	18*18	85	60	Good	Has a one-inch girdling root.	3	4	5
89		Chinese pistache	12.2	20*25	90	60	Good		3	5	9
90		Chinese pistache	9.5	25*20	85	60	Good		3	4	5
91		Chinese pistache	9.1	30*25	80	60	Good		3	4	5
92		Chinese pistache	9.3	30*25	85	60	Good		3	4	5
93		Chinese pistache	8.3	22*22	80	70	Good		3	4	5
94		Chinese pistache	4.2	17*12	75	60	Fair/Good		3	4	5
95		Chinese pistache	8	30*25	90	60	Good	One potential girdling root is visible.	3	4	5
96		Chinese pistache	6.5	25*20	80	60	Good	A small potential girdling root is visible. Girdling roots unfortunately seem to be common on these Chinese pistache trees.	3	4	5
97		Chinese pistache	5.2	18*16	75	50	Fair/Good		3	4	5
98		Chinese pistache	5.2	8*3	60	50	Fair	Structure could be improved with pruning. Number tag is on stake, due to small trunk size.	3	4	5
99		Chinese pistache	7.3	25*22	80	60	Good		3	4	5
100		Chinese pistache	7.5	18*20	80	60	Good		3	4	5
101		Chinese pistache	6.8	20*20	80	60	Good		3	4	5
102		Chinese pistache	13.8	35*30	90	60	Good		3	6	10
103		Chinese pistache	8.6	30*22	85	70	Good		3	4	5
104		Chinese pistache	5.7	18*15	80	60	Good		3	4	5
105		Chinese pistache	4.7	16*14	80	50	Fair/Good		3	4	5
106		Chinese pistache	10.4	28*30	90	60	Good		3	4	5
107		Chinese pistache	8.1	18*22	80	60	Good		3	4	5
108		Chinese pistache	8	20*18	80	60	Good		3	4	5
109		Chinese pistache	11.3	20*22	85	60	Good		3	5	6



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
110		Chinese pistache	12.3	35*30	90	70	Good	Some girdling roots visible.	3	5	9
111		Chinese pistache	9.2	28*22	85	60	Good		3	4	5
112		Chinese pistache	9.5	28*30	90	60	Good		3	4	5
113		Chinese pistache	6.5	18*20	85	50	Fair/Good		3	4	5
114		Chinese pistache	9.3	25*25	80	40	Fair/Poor	Large scaffold failure tear wound down the trunk.	3	4	5
115		Chinese pistache	11	32*30	85	60	Good		3	5	6
116		Chinese pistache	7.1	18*20	80	60	Good		3	4	5
117		Chinese pistache	7.3	22*20	85	60	Good	Chinese pistache trees #117 - 126 are planting in 5x5 foot square cutout planters in pavement, with tree grates.	3	4	5
118		Chinese pistache	6.5	22*20	80	60	Good	Root collar touching tree grate.	3	4	5
119		Chinese pistache	6	20*20	80	70	Good		3	4	5
120		Chinese pistache	5.6	22*18	85	60	Good		3	4	5
121		Chinese pistache	6.6	22*25	90	60	Good	Trunk contacting tree grate.	3	4	5
122		Chinese pistache	7.2	22*25	85	60	Good	Trunk contacting tree grate.	3	4	5
123		Chinese pistache	6.4	20*18	75	60	Good		3	4	5
124		Chinese pistache	6.3	20*16	80	70	Good		3	4	5
125		Chinese pistache	4.7	18*16	70	60	Good		3	4	5
126		Chinese pistache	6.1	18*20	80	75	Good		3	4	5
127		Chinese pistache	5.8	22*22	85	70	Good	This and subsequent Chinese pistache trees through #151 are located in a lawn area.	3	4	5
128		Chinese pistache	6.5	22*22	90	60	Good		3	4	5
129		Chinese pistache	6.6	25*22	100	60	Good		3	4	5
130		Chinese pistache	4.9	20*22	85	50	Fair/Good		3	4	5
131		Chinese pistache	6.2	30*25	100	60	Good		3	4	5
132		Chinese pistache	6	28*25	100	60	Good		3	4	5
133		Chinese pistache	6.3	28*22	90	70	Good		3	4	5
134		Chinese pistache	4.5	25*20	90	60	Good		3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
135		Chinese pistache	4.8	25*20	80	70	Good		3	4	5
136		Chinese pistache	6.1	28*22	90	70	Good		3	4	5
137		Chinese pistache	6.7	20*20	85	70	Good		3	4	5
138		Chinese pistache	3.8	16*10	75	60	Good		3	4	5
139		Chinese pistache	5.1	20*18	85	70	Good		3	4	5
140		Chinese pistache	5.9	18*22	85	70	Good		3	4	5
141		Chinese pistache	5.5	20*20	80	70	Good		3	4	5
142		Chinese pistache	5.4	20*20	85	60	Good		3	4	5
143		Chinese pistache	4.8	16*18	85	70	Good		3	4	5
144		Chinese pistache	5.3	22*20	85	50	Fair/Good		3	4	5
145		Chinese pistache	6.6	20*22	90	60	Good		3	4	5
146		Chinese pistache	5.3	16*16	80	60	Good		3	4	5
147		Chinese pistache	5.9	22*22	100	60	Good		3	4	5
148		Chinese pistache	3.9	20*18	85	60	Good		3	4	5
149		Chinese pistache	3.5	17*12	85	60	Good		3	4	5
150		Chinese pistache	3.1	13*10	60	60	Fair/Good		3	4	5
151		Chinese pistache	3.8	18*15	80	60	Good	Several of these Chinese pistache trees in the lawn are planted too deeply; as in a shallow bowl/depression.	3	4	5
152		Chinese pistache	4.9	20*20	80	70	Good		3	4	5
153		Chinese pistache	5.2	20*16	85	70	Good		3	4	5
154		Chinese pistache	6.1	25*20	85	60	Good		3	4	5
155		Chinese pistache	10.6	30*35	85	75	Good		3	4	5
156	74	Chinese pistache	10.7	40*35	85	60	Good	Some small girdling roots visible.	3	4	5
157	76	Chinese pistache	10.2	40*30	85	70	Good		3	4	5
158		Chinese pistache	11	40*30	80	60	Good	Some girdling roots visible.	3	5	6
159		Chinese pistache	9.5	35*30	80	60	Good	Some girdling roots visible.	3	4	5
160		Chinese pistache	8.5	35*25	85	60	Good		3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
161		Chinese pistache	9.8	35*25	80	60	Good		3	4	5
162		Chinese pistache	8.4	35*25	85	60	Good		3	4	5
163		Chinese pistache	6.5	30*22	80	60	Good		3	4	5
164		Chinese pistache	7.5	30*22	85	60	Good		3	4	5
165		Chinese pistache	8.3	35*25	85	60	Good		3	4	5
166		Chinese pistache	8.3	30*25	80	60	Good		3	4	5
167		Chinese pistache	8.1	35*22	90	50	Fair/Good		3	4	5
168		Chinese pistache	8	40*25	80	70	Good		3	4	5
169		Chinese pistache	8.3	30*20	80	70	Good		3	4	5
170		Chinese pistache	7.1	30*22	70	60	Fair/Good	This tree is located in the lawn at the corner of Torre Avenue and Pacific Drive. There is a lot of foot traffic resulting in soil compaction and dead lawn grass around this tree.	3	4	5
171		Chinese pistache	9.2	30*30	80	60	Good		3	4	5
172		Chinese pistache	10.9	28*25	85	50	Fair	Prominent girdling roots and also co-dominant scaffolds with included bark .	3	5	6
173		Chinese pistache	7.3	22*20	70	50	Fair		3	4	5
174		Chinese pistache	9.5	28*30	85	60	Fair/Good	Many small girdling roots visible.	3	4	5
175		Chinese pistache	8.6	28*22	80	70	Good	Small girdling roots visible.	3	4	5
176		Chinese pistache	8	22*28	80	75	Good		3	4	5
177		Chinese pistache	7.5	25*22	85	60	Good		3	4	5
178		Chinese pistache	6.3	20*18	80	60	Good		3	4	5
179		Chinese pistache	8.6	30*22	80	60	Good	Some girdling roots visible. In general, these Chinese pistache trees all have multiple attachments of scaffold branches and girdling roots; whether or not the girdling roots are visible.	3	4	5
180		Chinese pistache	8.6	22*25	80	50	Fair/Good	Large scaffold branch failure and resultant wound.	3	4	5
181		Chinese pistache	9.2	30*22	85	50	Fair/Good	Potential girdling roots.	3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
182	77	Chinese pistache	7.8	28*20	80	70	Good		3	4	5
183	75	Chinese pistache	10	35*25	85	60	Good		3	4	5
184	73	Chinese pistache	9.5	35*30	90	50	Fair/Good	Girdling roots and a small tight vertical scaffold crotch with included bark.	3	4	5
185	72	Chinese pistache	9.8	35*30	85	60	Good		3	4	5
186		Chinese pistache	10	28*22	85	40	Fair/Poor	A large scaffold branch failure and tear down the trunk took out half the diameter of the trunk.	3	4	5
187		Chinese pistache	7.3	30*20	70	40	Fair/Poor		3	4	5
188		Chinese pistache	8.8	35*22	70	50	Uncertain	This tree may have some dead branches (because see abnormal peeling bark) but the buds growing from these branches look normal. The tree may have also partially uprooted; one side of the root plate is abnormally high and exposed. Recommend further investigation in late Spring/Summer.	3	4	5
189		Chinese pistache	6.7	30*25	80	60	Good		3	4	5
190		Chinese pistache	7	20*20	70	50	Fair/Good		3	4	5
191		Chinese pistache	9.9	35*22	85	60	Good		3	4	5
192		Chinese pistache	7.6	35*25	85	60	Good		3	4	5
193		Chinese pistache	11.5	35*40	90	60	Good		3	5	6
194		Chinese pistache	8.4	30*22	70	60	Good		3	4	5
195		Chinese pistache	7.3	20*20	70	50	Fair/Poor	The tree leans toward the street -- it looks like this is caused by girdling roots.	3	4	5
196		Chinese pistache	5.8	20*18	60	60	Fair/Good		3	4	5
197		Chinese pistache	9.3	20*22	80	70	Good		3	4	5
198		Chinese pistache	8.7	30*22	80	60	Good		3	4	5
199		Chinese pistache	8.3	30*25	80	60	Good		3	4	5
200		Chinese pistache	9.2	30*22	80	60	Good		3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
201		Chinese pistache	9.5	30*25	70	60	Good	Definite girdling roots including a 2 to 3-inch diameter root that could be cut.	3	4	5
202		Chinese pistache	6.7	30*25	80	60	Good		3	4	5
203		Chinese pistache	6.2	22*2	80	60	Good		3	4	5
204		Chinese pistache	7.1	22*20	80	60	Good		3	4	5
205		Chinese pistache	7.3	28*25	85	60	Good		3	4	5
206		Chinese pistache	8.3	30*22	85	60	Good		3	4	5
207		Chinese pistache	8.9	30*25	85	70	Good		3	4	5
208		Chinese pistache	7.4	25*22	75	70	Good		3	4	5
209		Chinese pistache	7	22*2	80	50	Fair/Good		3	4	5
210		Chinese pistache	7.4	30*22	70	60	Good		3	4	5
211		Chinese pistache	8	25*20	70	60	Fair/Good		3	4	5
212		Chinese pistache	10.1	32*30	90	50	Fair/Good		3	4	5
213		Chinese pistache	5.2	25*22	70	60	Good		3	4	5
214		Chinese pistache	10.8	32*28	80	50	Fair/Good		3	5	6
215		Chinese pistache	10.4	35*30	85	60	Good		3	4	5
216		Chinese pistache	8.5	28*22	60	60	Fair/Good	Some definitely dead branches with detached bark.	3	4	5
217		Chinese pistache	8.3	22*25	100	60	Good		3	4	5
218		Chinese pistache	5.7	22*20	70	60	Uncertain	Unsure about vigor -- see some peeling of bark on branches.	3	4	5
219		Chinese pistache	7.5	30*25	85	60	Good	Definite girdling roots.	3	4	5
220		Chinese pistache	6.2	18*20	80	70	Good		3	4	5
221		Chinese pistache	7.9	28*22	85	60	Good		3	4	5
222		Chinese pistache	8.5	22+28	85	60	Good		3	4	5
223		Chinese pistache	8.4	25*22	70	60	Good		3	4	5
224		<i>Juglans californica hindsii</i> ,	24.7	35*50	80	50	Fair/Good	This is an old, leaning tree with a prominent crook in the trunk and a cavity and decay at this point due to a previous leader that was removed or failed. This	6	10	31



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
		black walnut						walnut is probably an old orchard tree remnant. It is doing surprisingly well in the lawn area that was planted around it. This is a neat old tree that kids like to climb on. I saw one small clump of mistletoe in the canopy.			
225		black walnut	23.2	42*35	80	60	Fair/Good	Another old tree; probably an orchard remnant. A scaffold branch removal wound has left a relatively small area of decay on the trunk. Large surface roots in the lawn have been repeatedly shaved by lawn mowers. This tree as well, is doing surprisingly well for its location in a lawn.	6	10	29
226	56	Pear - deciduous flowering	7.2	35*18	90	50	Fair/Good	Multiple attachments of crowded upright branches in most of the pears on this site.	3	4	5
227		Pear - deciduous flowering	8.8	30*22	85	60	Good		3	4	5
228		Pear - deciduous flowering	5.6	25*16	80	60	Good		3	4	5
229	60	Pear - deciduous flowering	6.3	28*183	90	70	Good		3	4	5
230	63	Chinese pistache	10.1	35*25	80	45	Fair	Several long sunscald cankers due to past branch removals.	3	4	5
231	64	Chinese pistache	8.3	22*20	80	70	Good		3	4	5
232	65	Chinese pistache	8.4	30*20	90	60	Good		3	4	5
233	66	Chinese pistache	7.1	18*20	85	60	Good		3	4	5
234	67	Chinese pistache	9.2	28*25	90	60	Good		3	4	5
235	68	Chinese pistache	10.6	32*28	80	60	Good	I saw a few branches where bark has flaked off. There is profuse sap flow down one side of the trunk; unsure of the cause.	3	4	5
236	69	Chinese pistache	9.2	28*25	100	60	Good	Several girdling roots growing over surface roots.	3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
237	70	Chinese pistache	6.2	18*16	80	60	Good		3	4	5
238		<i>Sequoia sempervirens</i> , coast redwood	16	45*22	60	70	Fair/Good	Coast redwoods #238 - 270 constitute a large grove of trees on the south side of the library building.	4	7	8
239		coast redwood	22.5	60*22	80	80	Good		6	9	17
240		coast redwood	21	60*20	80	80	Good		5	9	16
241		coast redwood	21.2	58*22	60	70	Fair		5	9	16
242		coast redwood	16.1	55*18	80	80	Good		4	7	8
243		coast redwood	9.4	40*16	80	75	Good		3	4	5
244		coast redwood	16.5	60*22	75	80	Good		4	7	8
245		coast redwood	9.1	30*18	50	60	Fair		3	4	5
246		coast redwood	17.1	45*22	60	60	Fair		4	7	8
247		coast redwood	23.3	60*22	60	70	Fair		6	10	17
248		coast redwood	24.8	60*25	70	70	Fair/Good		6	10	19
249		coast redwood	4.7	8*12	55	60	Fair		3	4	5
250		coast redwood	24.2	60*22	70	70	Fair/Good		6	10	18
251		coast redwood	20.7	45*20	70	60	Fair/Good		5	9	16
252		coast redwood	18.8	50*22	60	70	Fair		5	8	14
253		coast redwood	19.2	45*22	50	70	Fair		5	8	14
254		coast redwood	6.8	28*15	70	75	Fair/Good		3	4	5
255		coast redwood	10.4	40*16	70	75	Fair/Good		3	4	5
256		coast redwood	15.5	55*16	60	60	Fair		4	6	7
257		coast redwood	21.4	60*22	70	70	Fair/Good		5	9	16
258		coast redwood	14	60*18	60	60	Fair	An inner grove tree.	4	6	7
259		coast redwood	17.9	55*18	70	60	Fair/Good		4	7	8
260		coast redwood	16	50*18	60	70	Fair/Good		4	7	8
261		coast redwood	19.9	50*20	55	60	Fair		5	8	15
262		coast redwood	12.4	45*20	70	80	Fair/Good		3	5	6



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
263		coast redwood	19.8	60*18	60	50	Fair		5	8	15
264		coast redwood	19.6	55*20	60	50	Fair		5	8	15
265		coast redwood	23.3	65*25	60	60	Fair		6	10	17
266		coast redwood	20.9	60*22	50	50	Fair/Poor		5	9	16
267		coast redwood	22.4	55*22	50	50	Fair/Poor		6	9	17
268		coast redwood	23.4	60*25	55	60	Fair		6	10	18
269		coast redwood	24.7	65*25	50	60	Fair		6	10	19
270		coast redwood	27.7	60*25	50	60	Fair		7	12	21
271	62	Pear - deciduous flowering	17	35*30	80	60	Fair/Good		4	7	8
272	55	black acacia	4.9	18*15	90	50	Poor	The roots of this tree will soon break a 4-foot wide island planter in the parking lot, as well as surrounding pavement.	3	4	5
273		Pear - deciduous flowering	8.1	20*18	85	70	Good		3	4	5
274		Pear - deciduous flowering	5.5	18*10	85	70	Good		3	4	5
275		Pear - deciduous flowering	9.7	25*20	85	60	Fair/Good		3	4	5
276		Pear - deciduous flowering	6.3	18*15	85	60	Fair/Good		3	4	5
277		Pear - deciduous flowering	8	25*18	85	70	Good		3	4	5
278		Pear - deciduous flowering	9.1	25*22	85	70	Good		3	4	5
279		Pear - deciduous flowering	10.8	30*25	90	70	Good		3	5	6
280		Pear - deciduous flowering	9.6	25*22	85	70	Good		3	4	5

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Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
281		Pear - deciduous flowering	8.6	22*20	85	70	Good		3	4	5
282		<i>Prunus x yedoensis</i> 'Akebono' cherry, flowering	6.3 (4)	20*12	85	70	Good	Flowering cherries #282 - 289 are all sunken into low planting "bowls" in the lawn area. Expect root rot disease in the future.	3	4	6
283		cherry, flowering	6 (4)	20*20	85	60	Fair/Good		3	4	5
284		cherry, flowering	7.9 (3.5)	20*20	90	70	Good		3	4	8
285		cherry, flowering	6.7 (3.5)	20*20	80	70	Good		3	4	6
286		cherry, flowering	6 (4)	16*12	80	60	Good		3	4	5
287		cherry, flowering	9.3 (4)	22*22	90	80	Good/Excellent		3	4	9
288		cherry, flowering	8.2 (4)	20*20	90	80	Good/Excellent		3	4	8
289		cherry, flowering	7.5 (4)	20*20	85	75	Good		3	4	7
290	54	<i>Betula nigra</i> , river birch	7.2	35*25	90	50	Fair/Good		3	4	5
291	53	river birch	7.2 (4)	40*22	90	70	Good		3	4	5
292	52	river birch	9	30*25	90	60	Fair/Good		3	4	7
293	51	river birch	10	35*22	90	70	Good		3	4	8
294	50	river birch	9.5 (4)	40*28	90	70	Good		3	4	7
295	49	river birch	8.1	40*25	90	60	Fair/Good		3	4	6
296	48	river birch	7	40*25	90	70	Good		3	4	5
297	47	river birch	6.7	45*30	85	60	Good		3	4	5
298	46	river birch	7.5	35*25	90	70	Good		3	4	5
299	45	river birch	7.5	35*25	90	70	Good		3	4	5
300	44	river birch	9.6 (4)	40*30	90	70	Good		3	4	7
301	43	river birch	7.8	40*25	90	60	Good		3	4	5
302	42	river birch	7.1	40*25	90	70	Good		3	4	5
303	41	river birch	7.4 (3.5)	35*22	90	70	Good		3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
304	40	river birch	8.6	40*30	90	80	Good/Excellent		3	4	6
305		<i>Gleditsia triacanthos inermis</i> , honey locust	4.5	16*18	90	70	Good	Honey locust trees #305 - 318 are planted in 5x5-foot square cutout planters in pavement, with tree grates.	3	4	5
306		honey locust	4	18*18	90	70	Good		3	4	5
307		honey locust	3.4	16*10	80	70	Good		3	4	5
308		honey locust	3.5	16*12	85	60	Good		3	4	5
309		honey locust	3.4	16*10	80	70	Good		3	4	5
310		honey locust	3.5	18*12	80	60	Good		3	4	5
311		honey locust	4.2	18*18	85	60	Good		3	4	5
312		honey locust	4.3	20*18	80	80	Good		3	4	5
313		honey locust	3.7	17*15	80	60	Good		3	4	5
314		honey locust	3.7	16*14	80	55	Fair	Large scaffold branch tear down trunk.	3	4	5
315		honey locust	3.5	16*12	80	60	Good		3	4	5
316		honey locust	3	16*10	80	60	Good		3	4	5
317		honey locust	3.8	16*18	80	60	Fair/Good		3	4	5
318		honey locust	4.4	18*20	85	50	Fair	Large trunk wound and canker; may recover.	3	4	5
319		honey locust	4.6	18*20	90	70	Good	Honey locust #319 - 321 and 325 - 348 are planted in a lawn area. Most of the trees are planted low, in a "bowl". Weeds often fill the bowl and cover the root collar. Many of the trees have a trunk canker disease which should be sampled and diagnosed by a plant pathology lab. Most of the cankers are on the south side of the trunk, but some are on the north side. Many of these cankers may be predisposed by sunscald, but there is more going on here than just sunscald.	3	4	5
320		honey locust	3.6	18*16	80	50	Fair	Large trunk canker.	3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
321		honey locust	3.8	18*16	90	50	Fair	Trunk canker beginning.	3	4	5
322		honey locust	3.6	16*14	80	65	Good	Honey locusts #322 - 324 are located in 5x5-foot square planters in pavement with a tree grate, in a courtyard.	3	4	5
323		honey locust	3.3	16*15	80	70	Good		3	4	5
324		honey locust	3.5	18*16	80	70	Good		3	4	5
325		honey locust	3.8	18*14	85	60	Fair	This tree and subsequent honey locust trees through #348 are located in the same lawn area as #321-319. This tree (#325) has a canker on the south side of the trunk.	3	4	5
326		honey locust	4.2	18*16	80	50	Fair	Canker involves scaffold branches as well as trunk.	3	4	5
327		honey locust	3.4	15*10	70	45	Fair/Poor	Canker on multiple sides of trunk.	3	4	5
328		honey locust	3.4	18*12	70	45	Fair/Poor	Multiple numerous trunk cankers.	3	4	5
329		honey locust	3.6	18*14	80	60	Good		3	4	5
330		honey locust	3.7	18*15	60	40	Fair/Poor	Extensive trunk cankers.	3	4	5
331		honey locust	3.4	15*12	80	70	Good		3	4	5
332		honey locust	3.5	17*15	80	65	Good		3	4	5
333		honey locust	4.5	15*12	70	60	Fair	Trunk cankers small now, but will probably worsen.	3	4	5
334		honey locust	3.3	17*14	80	70	Good	Honey locust trees #334-336 in located in a bare soil planting area (no lawn) in a courtyard.	3	4	5
335		honey locust	3.5	18*16	85	65	Good		3	4	5
336		honey locust	3.8	18*16	85	70	Good		3	4	5
337		honey locust	3	16*12	80	60	Fair/Good	One bleeding spot on the lower trunk.	3	4	5
338		honey locust	3.4	16*12	85	60	Good		3	4	5
339		honey locust	3.7	15*12	70	55	Fair	Trunk cankers beginning.	3	4	5
340		honey locust	4	18*12	70	60	Fair	Trunk cankers.	3	4	5
341		honey locust	3.6	16*10	70	60	Fair		3	4	5
342		honey locust	3.4	12*8	70	60	Fair	Trunk cankers starting.	3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
343		honey locust	4.1	14*11	75	50	Fair/Poor	Large trunk cankers.	3	4	5
344		honey locust	3.4	18*12	70	50	Fair/Poor	Large trunk cankers.	3	4	5
345		honey locust	3.2	16*12	70	60	Fair	Trunk cankers.	3	4	5
346		honey locust	3.5	18*15	70	50	Fair/Poor	Large trunk cankers.	3	4	5
347		honey locust	2.9	16*8	70	50	Fair/Poor	Large trunk cankers.	3	4	5
348		honey locust	4.1	18*15	75	60	Fair	Trunk cankers	3	4	5
349	16	Brazilian pepper	8.9	20*18	80	70	Fair	This tree is planted in a 4-foot wide island planter with only minor root damage to the curb at this time.	3	4	7
350		Brazilian pepper	7.3	18*20	40	40	Poor	Canopy sparse. Large car wound to lower trunk, with decay.	3	4	5
351	1480	Pear - deciduous flowering	6	25*16	80	60	Fair/Good		3	4	5
352	13	Pear - deciduous flowering	5	18*10	80	40	Fair/Poor		3	4	5
353	12	Pear - deciduous flowering	2.1	10*6	60	40	Fair/Poor		3	4	5
354	11	<i>Cinnamomum camphora</i> , camphor tree	7.2	16*20	80	70	Fair/Poor	Located in 4-foot wide island planter (too large-growing a tree species for such a location).	3	4	7
355	10	camphor tree	10	20*22	90	50	Fair/Poor	Same as previous.	3	4	10
356	9	Brazilian pepper	10.5	15*16	70	70	Fair/Good	Foliage slightly chlorotic.	3	4	8
357	8	Brazilian pepper	5.9	16*14	75	60	Fair/Good		3	4	5
358	7	Pear - deciduous flowering	2.5	16*6	60	50	Fair		3	4	5
359	6	Pear - deciduous flowering	5.4	22*16	80	50	Fair/Good		3	4	5
360	5	Brazilian pepper	5.8	10*14	90	50	Fair	Flat-topped canopy.	3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
361	4	Brazilian pepper	16.1	22*25	60	50	Fair/Poor	Sparse canopy. Too large-growing for the 4-foot wide island planter although no pavement damage yet.	4	7	16
362	3	Brazilian pepper	7.4	18*22	70	60	Fair/Good		3	4	5
363	1	Brazilian pepper	14.4	18*22	100	60	Fair/Poor	Same as previous, but significant damage to curb and pavement caused by roots.	4	6	11
364	22	Pear - deciduous flowering	13.1	35*30	80	60	Fair/Good		3	5	10
365	21	Pear - deciduous flowering	13.4	30*25	85	60	Fair/Good		3	6	10
366	20	Pear - deciduous flowering	13.1	32*30	85	50	Fair/Good		3	5	10
367	19	Pear - deciduous flowering	15.1	35*30	85	40	Fair/Poor	Large scaffold failure wound on trunk, plus a few small girdling roots.	4	6	11
368	19	Pear - deciduous flowering	14.5	40*35	70	60	Fair/Good		4	6	11
369	17	Pear - deciduous flowering	17.1	35*35	90	40	Fair/Poor		4	7	13
370		cherry, flowering	1	10*4\$	70	50	Fair	Basal trunk wound.	3	4	5
371		cherry, flowering	1	10*4	70	70	Fair/Good		3	4	5
372		cherry, flowering	7	10*15	70	40	Fair/Poor	Large trunk canker wound with decay.	3	4	7
373		cherry, flowering	3.4	8*3	20	20	Poor	A commemorative plaque reads, "Nancy's Tree".	3	4	5
374		cherry, flowering	3.9 (3)	6*10	70	60	Fair/Good		3	4	5
375		cherry, flowering	5.4 (2)	8*12	50	50	Fair/Poor	Many branch cankers and galls.	3	4	5
376		cherry, flowering	0.75	8*6	60	60	Fair		3	4	5
377		<i>Lagerstroemia indica</i> , crape myrtle	2.9	22*12	80	80	Good		3	4	5
378		crape myrtle	3.9	22*16	85	70	Good		3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
379		crape myrtle	2.9	22*12	80	60	Good		3	4	5
380		crape myrtle	2.7	22*10	80	70	Good		3	4	5
381		crape myrtle	2.7	22*9	80	70	Good	Behind a locked gate, so unable to place number tag on trunk, or view tree from all sides.	3	4	5
382		<i>Zelkova serrata</i> , sawleaf zelkova	6.7	20*18	90	40	Fair/Poor		3	4	5
383		<i>Arbutus</i> 'Marina', Marina hybrid madrone	0.75 (4)	6*1.5	70	60	Fair/Good	A newly planted tree. Multiple attachments of scaffold branches should be corrected through young tree training pruning.	3	4	5
384		sawleaf zelkova	4.3	16*12	70	50	Fair	Multiple attachments of scaffold branches. One 1.5 inch diameter girdling root.	3	4	5
385		<i>Platanus racemosa</i> , Calif. sycamore	7.3	40*22	70	60	Fair/Good		3	4	5
386		Calif. sycamore	7.3	40*22	75	70	Fair/Good		3	4	5
387		Calif. sycamore	5	30*18	75	70	Fair/Good		3	4	5
388		Calif. sycamore	7	35*25	85	80	Good		3	4	5
389		<i>Quercus agrifolia</i> , coast live oak	7.2	18*16	60	70	Fair/Good		3	4	5
390		coast live oak	2.3	15*5	50	60	Fair	Planted in a deep "bowl", as our many of the trees in this gold fines plaza.	3	4	5
391		coast live oak	4.9	16*12	60	60	Fair		3	4	5
392		coast live oak	4.9	15*10	40	70	Fair	This tree was planted with its root ball too high! This may have something to do with its low vigor rating.	3	4	5
393		<i>Acer rubrum</i> , red maple	4.2	22*15	90	80	Good		3	4	5
394		red maple	4.9	20*16	80	70	Good		3	4	5



Tree #	Alt #	Species & Common Name	Trunk Diam.	Size	CONDITION		Preservation Suitability	Notes	TREE ROOT PROTECTION DISTANCES		
					Vigor	Structure			3xDBH	5xDBH	OTZ
395		red maple	4.2	22*18	80	60	Fair/Good		3	4	5
396		red maple	5.3	25*12	85	50	Fair/Poor	Long sunscald trunk cankers on the west side.	3	4	5
397		camphor tree	6.5	16*20	60	50	Fair	A few dead branches.	3	4	6
398		camphor tree	5.5	18*16	70	60	Fair/Good		3	4	5
399		camphor tree	4.2	15*12	70	60	Fair/Good		3	4	5
400		camphor tree	5.1	14*12	70	50	Fair		3	4	5
401		sawleaf zelkova	7	22*20	100	40	Fair/Poor	Crowded multiple attachments of scaffold branches -- like a broom.	3	4	5
402		sawleaf zelkova	6.9	25*22	85	40	Fair	Same as previous, although not quite as bad.	3	4	5
403		Marina hybrid madrone	6.8	16*15	60	60	Fair		3	4	5
404		Marina hybrid madrone	8.2	18*22	85	60	Fair/Good		3	4	6
405		<i>Olea europaea</i> , olive, European	5.8, 6.5, 7.3	20*25	90	70	Good		3	6	10
406		olive, European	5.8, 6.2, 6.8	20*20	85	80	Good		3	5	10
407		olive, European	2.0, 2.1, 3.2, 3.8	12*12	100	70	Good		3	4	5
408		olive, European	10.9, 1.2, 2.1, 3.8, 3.9	16*14	100	60	Fair/Good		4	7	12
409		olive, European	8.0, 8.9	20*22	100	75	Good		3	5	10
410		olive, European	4.9, 6.2, 6.8	20*20	85	70	Good		3	5	9
411		olive, European	4.5, 7.0, 6.8	20*20	90	70	Good		3	5	10
412		olive, European	5.0, 5.2, 7.0	18*18	85	60	Fair/Good	Some sunscald cankers on upper side of scaffold branches.	3	5	9

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EXPLANATION OF TREE TABLE DATA COLUMNS:

- 1) **Tree Number** (the field tag number of the existing tree). Each existing tree in the field is tagged with a 1.25 inch round aluminum number tag that corresponds to its tree number referenced in the arborist report, Tree Map, Tree Protection Specifications and any other project plans where existing trees must be shown and referenced. I have used the same numbers as were shown in the aerial map of the site which corresponds to the previous tree database for the site, provided to me by the City of Cupertino.
- 2) **Alt. Number:** (Alternate Number) a numbered tree tag that had been placed on the tree prior to the survey, in addition to the tag number that is referenced in this report (first column on the left in the Tree Tables).
- 3) **No Tag:** if a tree's number is underlined, this means that I did not place a number tag on the trunk because it was too difficult to access, or the tree trunk was too small to nail into.
- 4) **Tree Name and Type:**
Species: The *Genus* and *species* of each tree. This is the unique scientific name of the plant, for example *Quercus agrifolia* where *Quercus* is the Genus and *agrifolia* is the species. The scientific names of plants can be changed from time to time, but those used in this report are from the most current edition of the *Sunset Western Garden Book* (2012) Sunset Publishing Corporation. The scientific name is presented at its first occurrence in the Tree Table, along with the regional common name. After that only the common name is used.
- 5) **Trunk diameter:** Tree trunk diameter in inches "at breast height" (DBH) measured at 4.5 feet above ground level. This is the forestry and arboricultural standard measurement height that is also used in many tree-related calculations. It is also the trunk diameter measurement height required by the City of Cupertino. For multi-trunk trees, trunk diameter is measured for the largest trunk and estimated for all smaller trunks. A number in parentheses (3) after the trunk diameter(s) indicates that it was not possible to measure the trunk at 4.5 feet (due to tree architecture) and so the diameter was measured at this alternate height (in feet), which reflects a more realistic trunk diameter for the tree.
- 6) **Size:** tree size is listed as height x width in feet, estimated and approximate and intended for comparison purposes.
- 7) **Condition Ratings:** Trees are rated for their *condition* on a scale of *zero to 100* with zero being a dead tree and 100 being a perfect tree (which is rare – like a supermodel in human terms). A 60 is "average" (not great but not terrible either). There are two components to tree condition – **vigor** and **structure**, and each component is rated separately. Averaging the two components is not useful because a very low rating for either one could be a valid reason to remove a tree from a site -- even if the other component has a high rating. Numerically speaking for each separate component:

100 is equivalent to *Excellent* (an 'An' academic grade), **80** is *Good* (B), **60** is *Fair* (C), **40** is *Poor* (D), **20** is *Unacceptable* (F) and **0** is *dead*.



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- 8) Relative to the scope of work for this report, tree Condition has been rated but not explained in detail and recommendations for the management of tree condition have not been included. The tree owner may contact Deborah Ellis for additional information on tree condition and specific recommendations for the general care of individual trees relative to their condition.

- 9) The *Condition* of the tree is considered relative to the tree species and present or future intended use of the site to provide an opinion on the tree’s Preservation Suitability Rating (i.e. “Is this tree worth keeping on this site, in this location, as explained in Table 3 below. This is based upon the scenario that the tree is given enough above and below-ground space to survive and live a long life on the site. Ratings such as “Fair/Good” and “Fair/Poor” are intermediate in nature. The Preservation Suitability rating is not always the same as the Condition Rating because (for example) some trees with poor condition or structure can be significantly improved with just a small amount of work – and it would be worthwhile to keep the tree if this were done.

Table 3 Preservation Suitability Rating Explanation

Excellent	Such trees are rare but they have unusually good health and structure and provide multiple functional and aesthetic benefits to the environment and the users of the site. These are great trees with a minimum rating of “Good” for both vigor and structure. Equivalent to academic grade ‘A’.
Good	These trees may have some minor to moderate structural or condition flaws that can be improved with treatment. They are not perfect but they are in relatively good condition and provide at least one significant functional or aesthetic benefit to the environment and the users of the site. These are better than average trees equivalent to academic grade ‘B’.
Fair	These trees have moderate or greater health and/or structural defects that it may or may not be possible to improve with treatment. These are “average” trees – not great but not so terrible that they absolutely should be removed. The majority of trees on most sites tend to fall into this category. These trees will require more intensive management and monitoring, and may also have shorter life spans than trees in the “Good” category. Retention of trees with moderate suitability for preservation depends upon the degree of proposed site changes. Equivalent to academic grade ‘C’.
Poor	These trees have significant structural defects or poor health that cannot be reasonably improved with treatment. These trees can be expected to decline regardless of management. The tree species themselves may have characteristics that are undesirable in landscape settings or may be unsuitable for high use areas. I do not recommend retention of trees with low suitability for preservation in areas where people or property will be present. Equivalent to academic grade ‘D’.
None	These trees are dead and/or are not suitable for retention in their location due to risk or other issues. In certain settings however, (such as wilderness areas, dead trees are beneficial as food and shelter for certain animals and plants including decomposers. Equivalent to academic grade ‘F’.



- 10) **Notes:** This may include any other information that would be helpful to the client and their architects and contractors within the scope of work for this report, such as a more detailed explanation of tree condition or expected construction impact.
- 11) **Tree Protection Distances** (See page 34).
- a) **Root Protection:**
 - i) **3 and 5xDBH:** Both the 3 and 5xDBH distances are listed for each tree. For multi-trunk trees 100% of the DBH of the largest trunk is added to 50% of the DBH for all other trunks in order to compute the operational DBH to use for these the Tree Protection Distance calculations. For practical purposes, the minimum 3xDBH distance is 3 feet and the minimum 5xDBH distance is 4 feet. If disturbance cannot be kept at least 3 feet from the trunk of a tree, the tree should normally be removed.
 - ii) **OTPZ (Optimum Tree Protection Zone):** This is calculated as per the text, *Trees & Development*, Matheny et al., International Society of Arboriculture, 1998. This method takes into account tree age and the particular tree species tolerance of root disturbance. Because it may not be possible to maintain the OPTZ distance recommended for trees on many projects due to crowded site conditions, the Arborist may omit this requirement and list only the 3 and 5xDBH distances.
 - b) **Canopy Protection:** Additional space beyond root zone protection distances may be necessary for canopy protection.

SUPPORTING INFORMATION

PURPOSE & USE OF REPORT

This survey and report was required by the City of Cupertino as a part of the planning process for this project. The purpose of the report is to identify and describe the existing trees on site - - their size, condition and suitability for preservation. The audience for this report is the City of Cupertino and their project architects and others that are working on the Master Plan Project for the Civic Center and Parking Garage. The goal of this report is to preserve existing trees on site that are in acceptable condition, are good species for the area and will fit in well with the proposed new use of the site.

METHODOLOGY

I performed a **basic evaluation** of the subject trees between December 16 and 31, 2014. Tree characteristics such as form, weight distribution, foliage color and density, wounds and indicators of decay were noted. Surrounding site conditions were also observed. Evaluation procedures were taken from:



- *Guide for Plant Appraisal*, 9th edition, 2000, authored by the Council of Tree and Landscape Appraisers (CTLA) and published by the International Society of Arboriculture (ISA).
- *Species Classification and Group Assignment* published by the Western Chapter of the International Society of Arboriculture (WCISA), 1992.

The above references serve as industry professional standards for tree and landscape evaluations.

The trees were tagged in the field with metal number tags that correspond with the tree numbers referenced in this report and on the Tree Map. There are a few trees I was not able to tag, and these are indicated in the Tree Table. I measured the trunk diameter of each tree with a diameter tape at 4.5 feet above the ground (DBH), which is also the required trunk diameter measurement height of the City of Cupertino. DBH is used calculate tree protection distances and other tree-related factors. I estimated the tree's height and canopy spread. Tree *Condition* (structure and vigor) was evaluated and I also recorded additional notes for trees when significant. Tree species and condition considered in combination with the current or (if applicable) proposed use of the site yields the *Tree Preservation Suitability* rating. The major groupings of trees were photographed with a digital camera. Some of these photos are included in this report, but all photos are available from me by email if requested.

OBSERVATIONS

SITE CONDITIONS

The Cupertino Civic Center complex is a beautiful site that is heavily landscaped. Landscape maintenance is of a high level. Site topography is mainly level. Sun exposure for the trees varies from full to partly shaded, depending upon proximity to existing buildings and to other trees.



TREE PROTECTION DISTANCES

3 TO 5 X DBH

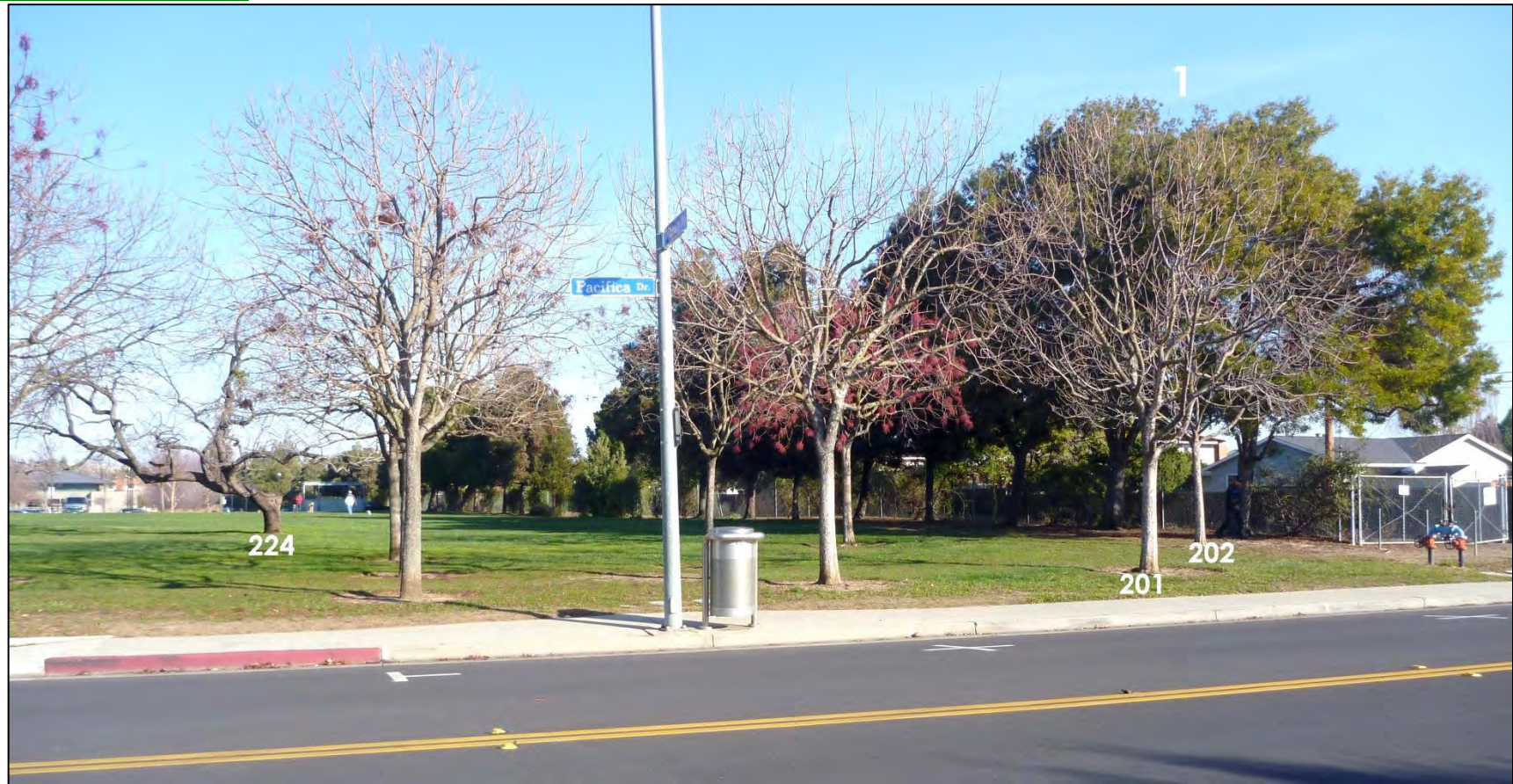
No one can estimate and predict with absolute certainty how far a soil disturbance such as an excavation must be from the edge of the trunk of an individual tree to affect tree stability or health at a low, moderate or severe degree -- there are simply too many variable involved that we cannot see or anticipate. 3xDBH however, is a reasonable "rule of thumb" minimum distance (in feet) any excavation should be from the edge of the trunk *on one side of the trunk*. This is supported by several separate research studies including (Smiley, Fraedrich, & Hendrickson 2002, Bartlett Tree Research Laboratories. *DBH* is trunk "diameter at breast height" (4.5 feet above the ground). This distance is often used during the design and planning phases of a construction project in order to estimate root damage to a tree due to the proposed construction. It tends to correlate reasonably well with the *zone of rapid taper*, which is the area in which the large *buttress roots* (main support roots close to the trunk) rapidly decrease in diameter with increasing distance from the trunk. For example, using the 3X DBH guideline an excavation should be no closer than 4.5 feet from the trunk of an 18-inch DBH tree. Such distances are guidelines only, and should be increased for trees with heavy canopies, significant leans, decay, structural problems, etc. It is also important to understand that in actual field conditions we often find that much less root damage occurs than was anticipated by the guidelines. 3xDBH may be more of an aid in preserving tree stability and not necessarily long-term tree health. 5X DBH or greater is the "preferred" minimum distance which should be strived for, and this distance or greater should probably be used when there are multiple trenches on more than one side of the trunk. The roots beyond the zone of rapid taper form an extensive network of long, rope-like roots one to two inches in diameter. These woody perennial roots are referred to as *transport roots* because they function primarily to transport water and minerals. Maintaining a 5xDBH tree protection zone or greater around a tree will preserve more of these transport roots, which will have less of an impact on tree health than if the excavation were closer to the trunk.

OTPZ (OPTIMUM TREE PROTECTION ZONE)

OTPZ is the distance in feet from the trunk of the tree, all around the tree, that construction or other disturbance should not encroach within. If this zone is respected, then chances of the tree surviving construction disturbance are very good. This method takes into account tree age, DBH and the particular species tolerance to root disturbance. Although there are no scientifically based methods to determine the minimum distance for construction (for example, root severance) from trees to assure their survival and stability, there are some guidelines that are often used in the arboricultural industry. The most current guideline comes from the text, Trees & Development, Matheny et al., International Society of Arboriculture, 1998. The tree protection zone calculation method in this text was used to obtain the OTPZ's provided in this report. Due to the crowded, constrained nature of many building sites it is often not be possible to maintain the OPTZ distance recommended for many of the trees -- therefore I have also listed alternate distances of 3 and 5X DBH (*see paragraph above*).



TREE PHOTOS



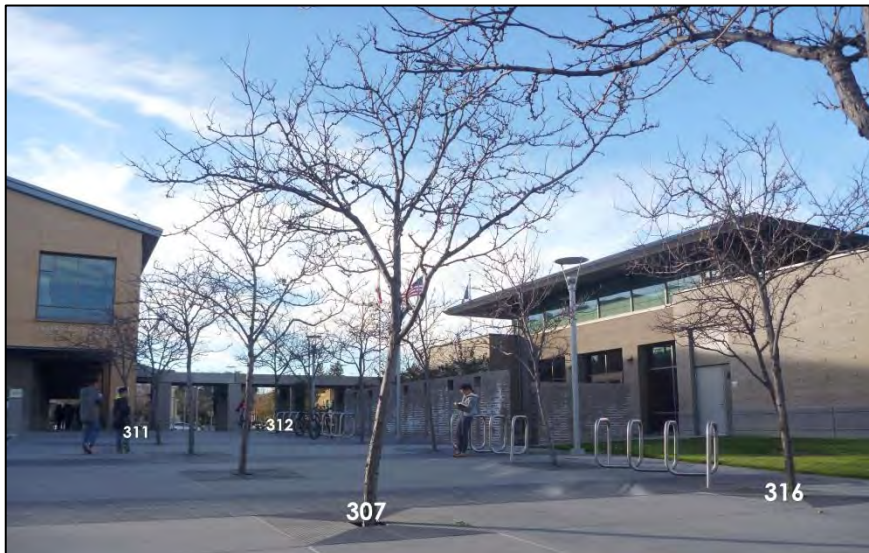
Pacifica Drive (foreground) with the creek perimeter at right. Tree numbering begins with the row of black acacia trees starting with **tree #1**. In the foreground is a double row of Chinese pistache trees including **trees #201 and 202**. Old **black walnut #224** is in the background at left.



The corner of Pacifica Drive (right, foreground) with Torre Avenue to the left. The triple row of Chinese pistache trees is visible, with trees #186, 187 and 215 labeled.



Rodrigues Avenue looking toward Torre Avenue to the right (not visible in photo). **Black acacia #69** is labeled, as is **Brazilian pepper #79** and **Chinese pistache #83**.



Upper Left: the grove of **coast redwoods #238-270** on the south side of the Library building.

Upper Right: **river birch trees #290 - 304** planted in a bioswale in the Library parking lot.

Lower Left: **honey locust trees #307 - 316** on the east side of the Library.

Lower Right: I am pointing to a trunk canker on a honey locust tree trunk.



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ASSUMPTIONS & LIMITATIONS

- 1) **Tree locations** were originally from the City of Cupertino (via the aerial map showing numbered tree locations that I was provided). When I began the tree survey in the field however, I found that most of the tree number tags were missing, and the number tags did not match Cupertino's list of trees. I therefore did not use Cupertino's map or tree list, and conducted a new tree survey marking tree locations with a handheld GPS unit. I also tagged all trees with new number tags, but noted any old number tags as "Alternate numbers" in the Tree Table. Old number tags were removed from the trees.
- 2) **The Condition Ratings for deciduous trees that are out of leaf (because they have shed their leaves for winter dormancy) are estimated.** More accurate condition ratings for these trees can be obtained after they have fully leafed out (usually mid-May through September). Deciduous trees on this site that were completely leafless or in the process of shedding their leaves during my evaluation are listed below:

black walnut, <i>Juglans californica hindsii</i>
Calif. sycamore, <i>Platanus racemosa</i>
cherry, flowering. <i>Prunus x yedoensis</i> 'Akebono'
Chinese pistache, <i>Pistacia chinensis</i>
crape myrtle, <i>Lagerstroemia indica</i>
deciduous flowering pear, <i>Pyrus calleryana</i>
honey locust, <i>Gleditsia triacanthos inermis</i>
river birch, <i>Betula nigra</i>
red maple, <i>Acer rubrum</i>
sawleaf zelkova, <i>Zelkova serrata</i>

- 3) **A Basic Evaluation of the subject trees described in this report was performed between December 16 and 31, 2014 for the purpose of this report.** A basic evaluation is a visual evaluation of the tree from the ground, without climbing into the tree or performing detailed tests such as extensive digging, boring or removing samples. This is an initial screening of the tree after which the evaluator may recommend that additional, more detailed examination(s) be performed if deemed necessary.



- 4) **A few trees had their root collars and or lower trunks covered with soil, vegetation or debris** and were obstructed from view when I conducted my tree evaluation. The obstructions should be removed and I should re-examine these previously covered areas.
- 5) **The Arborist should review all site-based plans for this project relative to potential tree impacts, including plans not yet prepared and plans that are revised.** Plans reviewed by the arborist should be full-size, to-scale and with accurately located tree trunks and canopy driplines relative to proposed improvements. Scale should be 1:20 or 1:10.
- 6) **Any information and descriptions provided to me for the purpose of my investigation in this case and the preparation of this report are assumed to be correct.** Any titles and ownerships to any property are assumed to be good and marketable. I assume no responsibility for legal matters in character nor do I render any opinion as to the quality of any title.
- 7) **The information contained in this report covers only those items that were examined** and reflects the condition of those items at the time of inspection.
- 8) **Loss or removal of any part of this report** invalidates the entire report.
- 9) **Possession of this report, or any copy thereof,** does not imply right of publication for use for any purpose by any person other than to whom this report is addressed without my written consent beforehand.
- 10) **This report and the values represented herein represent my opinion.** My fee is in no way contingent upon the reporting of a specified value or upon any finding or recommendation reported.
- 11) **This report has been prepared in conformity with generally acceptable appraisal/diagnostic/reporting methods and procedures** and is consistent with practices recommended by the International Society of Arboriculture and the American Society of Consulting Arborists.
- 12) **My evaluation of the trees that are the subject of this report is limited to visual examination of accessible items without dissection, excavation, probing or coring.** There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.
- 13) **I take no responsibility for any defects in any tree's structure.** No tree described in this report has been climbed and examined from above the ground, and as such, structural defects that could only have been discovered have not been reported, unless otherwise stated. Structural defects may also be hidden within a tree, in any portion of a tree. Likewise, root collar excavations and evaluations have not been performed unless otherwise stated.
- 14) **The measures noted within this report are designed to assist in the protection and preservation of the trees mentioned herein, should some or all of those trees remain, and to help in their short and long term health and longevity.** This is not however; a guarantee that any of these trees may not suddenly or eventually decline, fail, or die, for whatever reason. Because a significant portion of a tree's roots are usually far beyond its dripline, even trees that are well protected during construction often decline, fail or die. Because there may be hidden defects within the root system, trunk or branches of trees, it is possible that trees with no obvious defects can be subject to failure without warning. The current state of arboricultural science does not guarantee the accurate detection and prediction of tree defects and the risks associated with trees. There will always be some level of risk associated with trees, particularly large trees. It is impossible to guarantee the safety of any tree. Trees are unpredictable.



I certify that the information contained in this report is correct to the best of my knowledge, and that this report was prepared in good faith. Thank you for the opportunity to provide service again. Please call me if you have questions or if I can be of further assistance.

Sincerely,

Deborah Ellis, MS.

Consulting Arborist & Horticulturist

Certified Professional Horticulturist #30022

ASCA Registered Consulting Arborist #305

I.S.A. Board Certified Master Arborist WE-457B



Enclosures:

- Tree Maps #1, 2 and 3 as .PDF files
- Tree Map of the complete complex as KMZ file
- Tree Table (partial) as Microsoft Excel file



GLOSSARY

1. **Arborist, Qualified Consulting:** must be either an International Society of Arboriculture (ISA) Board-Certified Master Arborist or an American Society of Consulting Arborists (ASCA) Registered Consulting Arborist that has sufficient knowledge and experience to perform the specific work required.
2. **Arborist, Project:** The arborist who is appointed to be in charge of arborist services for the project. For most construction projects that work will include inspection and documentation of tree protection fencing and other tree protection procedures, and being available to assist with tree-related issues that come up during the project.
3. **Basic Evaluation (of trees):** A visual evaluation of the tree from the ground, without climbing into the tree or performing detailed tests such as extensive digging, boring or removing samples. This is an initial screening of the tree after which the evaluator may recommend that additional, more detailed examination(s) be performed.
4. **Canker:** an area of dead bark. A localized lesion on a stem or branch, often sunken in appearance, commonly associated with a wound, decay or death of internal tissues. Cankers often extend beyond the extent of an original infection or wound, killing surrounding previously healthy tissue. If decay is present and spreads into the wood, a very weak area is created because both the inner and outer growth rings are affected. Internal decay can sometimes spread outward killing bark and new wood tissue – this is called a *canker rot*.
5. **Chlorosis/chlorotic:** chlorosis is a plant symptom exhibited abnormally yellow colored foliage. Such foliage is described as *chlorotic*. This symptom can have many causes such as lack nutrients, diseases or high soil salinity.
6. **Co-dominant** refers to two leaders, branches or trunks that arise at the same point on a tree and are about the same diameter. This is an undesirable structural defect that is a weak point in the tree. Co-dominant stems typically lack the overlapping tissue present in a branch or trunk collar, which may be why trees with this defect split so easily. Included bark between members also reduces the strength of the union. It is best that branches or trunks originate with space between them, or if they arise at the same point that they be of different sizes. Co-dominant leaders can often be corrected (one leader removed) when trees are young.
7. **Conk:** the fruiting body (reproductive structure) of a wood decay fungus, from which spores are released. It usually assumes a “shelf-like” orientation when growing from the side of a trunk or branch. On top of roots, conks often assume a flat or “tabletop” shape. Conks are often a sign that extensive decay has already occurred within the wood.
8. **Crooks** are unnatural bends or sharp angles in branches or trunks caused by the removal of other attached branches or trunks; often with a vertical growing side branch at the end. This concentrates weight at the end of the branch, and also over some inevitable decay from a pruning wound.
9. **Deciduous:** a plant that sheds all its leaves at a specific time of the year, usually during the winter when the weather is cold. As opposed to “evergreen” which are plants that retain their leaves in living condition all year long, never dropping all their leaves at once.
10. **Dripline:** the area under the total branch spread of the tree, all around the tree. Although tree roots may extend out 2 to 3 times the radius of the dripline, a great concentration of active roots is often in the soil directly beneath this area. The dripline is often used as an arbitrary “tree protection zone”.



11. **Gall:** An irritation caused by insects, nematodes, disease organisms such as fungi, environmental insults and unknown factors can cause these swellings or tumor-like growths on the leaves, fruit, twigs, trunks or roots of plants. When located on a woody plant such as a tree, galls can reduce the strength of that part. Tissue growth within galls is disorganized, thin-celled and generally weaker.
12. ***Ganoderma applanatum*** is a fungus that causes a heart rot or decay of live and dead trees. It can also attack and kill a wide variety of trees, from conifers to hardwoods. The fungus colonizes wounds, kills the sapwood of some tree species, and causes decay of both sapwood and heartwood in roots, butts and trunks. The fungus can spread vegetatively through natural root grafting as well. Columns of decaying wood extend as far as 15 feet above and below the fruiting bodies (conks) on trunks. In the roots the fungus is usually restricted to within 3 feet of the soil line. The conks (the shelf-like fruiting bodies that emerge from the tree) are usually found near ground level or on the lower part of the trunk, and often on an old wound. Destruction of the sapwood over time leads to the decline or failure of the tree. Because diseased trees often break or fall before death, the only overt indicator of disease in most standing trees is the conk.
13. **Girdling roots** are roots that grow circularly around the trunk (rather than away from the trunk) and compress the trunk or other roots, constricting the growth of these parts. Circling roots grow similarly, but they do not (or have not yet) restricted growth. Girdling roots can inhibit the flow of water and nutrients by “choking” vascular elements in the trunk or other roots, and they can also cause whole-tree failures at the root collar.
14. **Grove:** is a group of trees that located close together that shelter each other from wind and the elements, having “knit” canopies. If of the same species, there is usually root grafting between trees, which lends support from the ground, as well as water and mineral sharing. Removal of one or some grove members could cause remaining members to be unstable due to a reduction of previous shelter. Grove trees often have asymmetrical canopies when viewed as individuals.
15. **Included bark** is bark sandwiched between adjacent branches, a branch and the trunk, or two or more trunks, often appearing as a seam. In contrast, a normal attachment will have a ridge of bark protruding upwards and a continuous wood connection between adjacent members. An included bark branch or trunk attachment is weaker than a normal attachment. As branches or trunks with included bark grow, they expand in diameter, squeezing the bark along the seam. This may kill some portion of the included bark. When this occurs, a wound response is initiated. As a consequence, cracks can be generated, leading to breakage. Such defects can often be completely removed when a tree is young (e.g. the offending members equal or less than 2 inches in diameter). Older, larger cuts (such as 6 inches in diameter or more) could cause decay to spread into the remaining member, which is undesirable. In these cases it may be best to thin one member (usually the smaller member) by 25% to slow its growth and ultimate size.
16. **Leader:** the primary terminal shoot or trunk of a tree.
17. **Mistletoe** is a parasitic plant that reproduces by seeds covered with a sticky material and usually spread by birds. There are several species of mistletoe that attack different species of host plants, mainly trees. An otherwise healthy tree can tolerate a few mistletoes, but individual branches on the tree may be killed. Plants infected with mistletoe can suffer from reduced vigor or become stunted.
18. **Multiple trunks (leaders) or branch attachments** are a common structural defect in many tree species such as ash and flowering pear. In this condition, more than one branch or trunk originates at the same point. These attachments are not as strong as well-spaced branches or trunks, particularly if included bark between them that prevents a solid wood connection.
19. **Root collar:** The junction between trunk and roots at the base of the trunk, normally just above the soil surface. This area is critical to whole-tree health and stability. Buttress roots important in whole-tree stability emerge from the root collar.



20. **Root rot disease** is caused by wet, poorly aerated soil conditions. Degradation of roots (root rot) and sometimes the lower trunk (crown rot) ensues on weakened, susceptible plant species not adapted to such a soil environment. Opportunistic plant root pathogens (such as water mold fungi) are often the secondary cause of the problem. Root rot is a particular problem among drought tolerant plants that are not adapted to frequent irrigation during our normally rain-free months, such as many of our California native plants. The problem is often worsened in fine-textured heavy clay soils that retain water more than do the coarser, fast-draining soils such as occur in the natural environment of many of our native plants.
21. **Scaffold branch**: a primary structural branch arising from the trunk of a tree. Usually the largest and often the lowest branches of the tree.
22. **Stump sprout trees** are the result of a tree trunk being cut down to a short stump close to the ground. If the tree survives, it sends out many small shoots (suckers) from around the cut stump. Some of these suckers may survive and grow to become significant trunks. These trunks are spaced very close together and usually have included bark between them, which reduces the strength of their union. Such trunks are prone to failure. Stump sprout trees can be very structurally unsound, particularly as they become large and old. There is often a great deal of decay associated with the mother stump, which can also reduce mechanical stability.
23. **Sub trunks**: smaller trunks originating from a larger trunk below.
24. **Suckers** are secondary upright shoots arising from the roots or root collar (junction between roots and trunk) of a tree, or below the graft union. On a grafted tree the suckers (originating from the *stock* which includes the roots), are often not the same plant species as the *scion* (the grafted, desirable aboveground part). Suckers can be a nuisance in landscape situations. In nature however, suckers can serve to keep a tree alive after fire or mechanical damage that kills or removes the aboveground part of the tree.
25. **Sunscald** is the death of bark, and sometimes the underlying wood, due to the heat of the sun. This often occurs when over-pruning removes a large amount of foliage, newly exposing previously sheltered tissue.
26. **Topping** is the practice of indiscriminately cutting back large diameter branches of a mature tree to some predetermined lower height; to reduce the overall height of the tree. Cuts are made to buds, stubs or lateral branches not large enough to assume the terminal role. Reputable arborists no longer recommend topping because it is a particularly destructive pruning practice. It is stressful to mature trees and may result in reduced vigor, decline and even death of trees. In addition, branches that regrow from topping cuts are weakly attached to the tree and are in danger of splitting out. Large topping cuts may have significant decay associated with them, which weakens the branch as well as the attachment of any secondary branches attached nearby. Topping may be useful however, for immediately reducing the risk of a high risk tree that will soon be removed.
27. **Tree Service, Qualified**: A tree service with a supervising arborist who has the minimum certification level of ISA (International Society of Arboriculture) Certified Arborist, in a supervisory position on the job site during execution of the tree work. The tree service shall adhere to the most current of the following arboricultural industry tree care standards:
 - *ANSI A300 Pruning Standards*. (Covers tree care methodology).
 - *ANSI Z133.1 Safety Requirements for Arboricultural Operations*. (Covers safety).
 - *Best Management Practices, Tree Pruning*. *International Society of Arboriculture*.