SIERRA NEVADA ARBORISTS

KLEINFELDER, INC.

DEL PASO PARK PROJECT SITE
City of Sacramento, California

PROPOSED WATER AND SEWER PLAN
IMPACT ASSESSMENT

SIERRA NEVADA ARBORISTS
EDWIN E. STIRTZ
ISA Certified Arborist #WE0510A

916-652-0568
916-652-3366 Fax

6120 Brace Road
Loomis, CA 95650

Submitted by:

Edwin E. Stirtz, Consulting Arborist
ISA Certified Arborist WE-0510A
Member, American Society of Consulting Arborists
SIERRA NEVADA ARBORISTS

August 28, 2006

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SIERRA NEVADA ARBORISTS

August 28, 2006

Ms. Jennifer Moore
KLEINFELDER, INC.
3077 Fite Circle
Sacramento, California 95827

Re: ***Proposed Water and Sewer Plan Plan Impact Assessment:***
Del Paso Park Project Site -- City of Sacramento, California

Dear Ms. Moore:

On August 22, 2006, I received a copy of the aerial Proposed Water and Sewer Plan dated May, 2006, for the Del Paso Park project site located in the City of Sacramento, California. These plans include a schematic layout for the two proposed auto dealerships and associated parking/drive areas, as well as the extension of Fulton Avenue and off-site detention basin. Along with these plans Sierra Nevada Arborists was asked to prepare an assessment of impacts which may be sustained by the trees on site from the depicted construction activities. Based upon our recent discussions and my review of the Proposed Water and Sewer Plan dated May, 2006, I have prepared and transmit to you for further handling an Inventory Summary and Impact Assessment which augments the data contained in our Initial Arborist Report and Inventory Summary dated May 23, 2006. This Impact Assessment identifies those trees which will require removal to facilitate the activities depicted on the Proposed Water and Sewer Plan. In addition, the Impact Assessment documents those trees which will be retained within the project area and sustain encroachment from the activities depicted on the referenced plan.

SUMMARY AND IMPACT ASSESSMENT

Removals

My plan review indicates that 64 trees totaling 1,086 aggregate diameter inches will require removal due to defects, compromised health and/or structural instability noted at the time of our initial field inventory effort or to facilitate the activities depicted on the Proposed Water and Sewer Plan. The trees which have been recommended for removal due to noted defects, compromised health and/or structural instability or will require removal to facilitate the depicted construction activities are highlighted in green within the accompanying Inventory Summary and Impact Assessment. For quick reference, the trees which have been recommended for removal are briefly summarized in the following table:

6120 Brace Road ◆ Loomis, CA 95650 ◆ 916-652-0568 ◆ 916-652-3366 Fax

Heritage Trees – 11 trees totaling 288 aggregate diameter inches

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT	
						STRUCTURE	VIGOR
11	Blue Oak	*(Quercus douglasii)*	6, 6	12	16	Fair	Fair
13	Blue Oak	*(Quercus douglasii)*	5, 7	12	16	Poor to fair	Fair
15	Coast Live Oak	*(Quercus agrifolia)*		13	22	Fair	Fair
16	Interior Live Oak	*(Quercus wislizenii)*	7, 8, 9, 9, 13, 15	61	32	Poor to fair	Fair
17	Interior Live Oak	*(Quercus wislizenii)*	10, 13	23	35	Fair	Fair
20	Blue Oak	*(Quercus douglasii)*	4, 7	11	13	Fair	Fair
32	Blue Oak	*(Quercus douglasii)*		37	40	Poor	Poor to fair
57	Blue Oak	*(Quercus douglasii)*		32	28	Poor to fair	Poor to fair
60	Arizona Ash	*(Fraxinus velutina)*		33	31	Fair	Poor
64	Blue Oak	*(Quercus douglasii)*		27	27	Poor	Poor to fair
65	Blue Oak	*(Quercus douglasii)*		27	28	Poor to fair	Fair

As we have discussed, the City of Sacramento Tree Protection Ordinance defines a "Heritage Tree" as:

- Any tree of any species with a trunk circumference of one hundred inches or more (i.e. 31.82" DBH)[1], which is of good quality in terms of health, vigor of growth and conformity to generally accepted horticultural standards of shape and location for its species;

- Any native *Quercus* species, *Aesculus californica* (California Buckeye) or *Platanus racemosa* (California Sycamore) having a circumference of thirty-six inches or greater (i.e. 11.45" DBH) when a single trunk, or a cumulative circumference of thirty-six inches or greater when a multi-trunk;

- Any tree thirty-six inches in circumference or greater in a riparian zone. The riparian zone is measured from the center line of the water course to thirty feet beyond the high water line; or

- Any tree, grove of trees or woodland trees designated by resolution of the City Council to be of special historical or environmental value or of significant community benefit.

Sacramento Municipal Code, Title 12, Chapter 12.64: Heritage Trees.

[1] "Diameter at breast height" has been calculated by use of the following formula: circumference measured four and one-half feet above ground level divided by 3.142.

All of the trees in the above-referenced table meet the species and size criteria of a "Heritage Tree". However, some of these trees have structure and/or vigor ratings which are "poor" or "poor to fair" based upon observed characteristics noted in the trees during our initial site visit(s). These notable characteristics are fully documented in the accompanying Inventory Summary and Impact Assessment. Based upon these observed characteristics some of these trees ***may*** be exempt from the definition of a "Heritage Tree" (i.e., "any trees of any species ... which is of good quality in terms of health, vigor of growth and conformity to generally accepted horticultural standards...")

Non-Heritage Trees – 53 trees totaling 798 aggregate diameter inches

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT	
						STRUCTURE	VIGOR
3	Chinese Elm	*(Ulmus parvifolia)*		16	23	Fair	Fair
4	Chinese Elm	*(Ulmus parvifolia)*		15	31	Fair	Fair
5	American Elm	*(Ulmus americana)*		10	19	Fair	Fair
6	American Elm	*(Ulmus americana)*		9	14	Poor to fair	Fair
7	American Elm	*(Ulmus americana)*	9, 9	18	21	Fair	Fair
8	American Elm	*(Ulmus americana)*		10	18	Fair	Fair
9	American Elm	*(Ulmus americana)*		14	22	Fair	Fair
10	American Elm	*(Ulmus americana)*	8, 11, 12	31	24	Poor to fair	Fair
12	Blue Oak	*(Quercus douglasii)*	2, 5	7	10	Fair	Fair
14	Blue Oak	*(Quercus douglasii)*	2, 4	6	15	Poor to fair	Fair
18	American Elm	*(Ulmus americana)*	10, 21	31	24	Poor to fair	Fair
19	Interior Live Oak	*(Quercus wislizenii)*		8	28	Fair	Fair
31	Silver Maple	*(Acer saccharinum)*		24	28	Fair	Fair
33	Arizona Ash	*(Fraxinus velutina)*		14	18	Poor	Poor
43	Arizona Ash	*(Fraxinus velutina)*		20	18	Poor	Fair
53	Coast Live Oak	*(Quercus agrifolia)*		6	11	Fair	Fair
54	American Elm	*(Ulmus americana)*		8	13	Poor	Fair
55	Arizona Ash	*(Fraxinus velutina)*		16	17	Poor	Fair
56	Arizona Ash	*(Fraxinus velutina)*		18	20	Poor to fair	Poor to fair
58	Arizona Ash	*(Fraxinus velutina)*		18	21	Poor	Poor to fair
59	Arizona Ash	*(Fraxinus velutina)*		21	24	Fair	Fair
61	Western Hackberry	*(Celtis occidentalis)*		9	16	Fair	Fair
62	Western Hackberry	*(Celtis occidentalis)*		9	11	Poor to fair	Fair
63	Western Hackberry	*(Celtis occidentalis)*		8	14	Fair	Fair
66	Arizona Ash	*(Fraxinus velutina)*		26	27	Poor to fair	Poor to fair
67	Western Hackberry	*(Celtis occidentalis)*		20	36	Fair	Fair
68	Arizona Ash	*(Fraxinus velutina)*		21	30	Poor to fair	Poor to fair
69	Arizona Ash	*(Fraxinus velutina)*		17	22	Fair	Fair
70	Arizona Ash	*(Fraxinus velutina)*		18	28	Fair	Poor to fair
71	Beefwood	*(Casuarina sp.)*		12	17	Fair	Fair

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT	
						STRUCTURE	VIGOR
72	Beefwood	*(Casuarina sp.)*		7	16	Fair	Fair
73	Beefwood	*(Casuarina sp.)*		10	14	Fair	Fair
74	Arizona Ash	*(Fraxinus velutina)*		22	27	Poor	Fair
75	Arizona Ash	*(Fraxinus velutina)*		22	20	Fair	Poor to fair
78	Beefwood	*(Casuarina sp.)*	14, 15	29	24	Fair	Fair
79	Beefwood	*(Casuarina sp.)*		9	12	Fair	Fair
80	Beefwood	*(Casuarina sp.)*		11	15	Fair	Fair
81	Zelcova	*(Zelcova serrata)*		14	26	Poor to fair	Fair
82	Modesto Ash	*(Fraxinus velutina 'modesto')*		24	40	Poor to fair	Fair
83	Raywood Ash	*(Fraxinus oxycarpa)*		15	17	Fair	Fair
84	Beefwood	*(Casuarina sp.)*		14	10	Fair	Fair
86	Modesto Ash	*(Fraxinus velutina 'modesto')*		25	40	Poor to fair	Fair
TREES FOUND WITHIN LEAD SHOT SURFACE DEPOSITS AREA							
87	Chinese Elm	*(Ulmus parvifolia)*		13	21	Fair	Fair
88	Chinese Elm	*(Ulmus parvifolia)*		15	26	Poor to fair	Fair
89	Chinese Elm	*(Ulmus parvifolia)*		13	22	Fair	Fair
91	Chinese Elm	*(Ulmus parvifolia)*		14	25	Fair	Fair
92	Chinese Elm	*(Ulmus parvifolia)*		10	15	Fair	Fair
93	Chinese Elm	*(Ulmus parvifolia)*		15	23	Fair	Poor to fair
96	Chinese Elm	*(Ulmus parvifolia)*		10	16	Fair	Fair
97	Zelcova	*(Zelcova serrata)*		8	12	Fair	Fair
98	Zelcova	*(Zelcova serrata)*		7	13	Fair	Fair
99	Beefwood	*(Casuarina sp.)*		17	25	Fair	Fair
100	Raywood Ash	*(Fraxinus oxycarpa)*		14	23	Fair	Poor to fair

Encroachments

The trees which will sustain impacts from the improvement activities depicted on the Proposed Water and Sewer Plan have been separately documented within the accompanying Impact Assessment. The perceived impacts are rated as either "minor", "moderate" or "significant" as further defined within the Definitions and Ratings page of this Report, and general and specific recommendations have been provided for each tree which will be affected by the depicted construction activities to help reduce adverse impacts of construction on the retained trees, where possible, to a less than significant level. It is my understanding that grading plans for the project area have not yet been finalized. When those improvement plans are refined and finalized they should be reviewed by an ISA Certified Arborist to assess the nature and extent of impacts which will be sustained by the retained trees from those additional improvement activities.

Finally, we draw your attention again to Tree Nos. 23, 40, 77 and 85 which will be retained within the project area and again note that these trees currently exhibit characteristics which require further evaluation (i.e. root collar excavation and inspection or aerial inspection and evaluation) or periodic monitoring to assess the trees' ongoing structural integrity. For ease of reference, these "precautionary trees" have again been separately highlighted in yellow within the accompanying Inventory Summary and Impact Assessment. At this time we have not recommended the removal of these trees since development plans have not yet been finalized. It is strongly recommended that further analysis and/or evaluation of these trees and others with conditional ratings which are less than "Fair" be performed by an ISA Certified Arborist prior to making final development decisions, especially if the trees are planned for retention and structures and/or pedestrian activities will occur within their fall zone. At this time we recommend that these trees be periodically monitored and thoroughly inspected by an ISA Certified Arborist to keep abreast of the trees' changing conditions and to assess the trees' ongoing structural integrity and potential for hazard in a developed environment.

GENERAL COMMENTS AND ARBORIST'S DISCLAIMER

As you know, a tree permit should be obtained from the City of Sacramento approving contemplated improvement activities within the project area. All terms and conditions of the tree permit are the sole and exclusive responsibility of the project applicant. It should also be noted that prior to final inspection the City *may* require written verification from an ISA Certified Arborist certifying the approved removal activities and/or implementation of the mitigation measures outlined for the retained trees on the site. Sierra Nevada Arborists cannot provide written Certification of Compliance unless we have been provided with a copy of the ***approved*** improvement plans and applicable permits and are on site to monitor and observe regulated activities during the course of construction. Therefore, it will be necessary for the project applicant to notify Sierra Nevada Arborists well in advance (at least 72-hours prior notice) of any regulated activities which are scheduled to occur on site so that those activities can be properly monitored and documented for compliance certification.

This assessment of impacts should not be viewed by the client or any regulatory agency as a consent or concurrence regarding the contemplated improvement activities. Rather, it is an interpretation of the impacts which will be sustained by the trees on site based upon the activities depicted on the Proposed Water and Sewer Plan to assist others in making final development decisions. Clients and the regulatory agency may choose to accept or disregard the recommendations and analysis of the arborist, or to seek additional advice; therefore, it is understood that final decisions regarding development and improvement activities rest with the client and/or the applicable regulatory agency.

Lastly, implementation of the recommendations provided within this report will help to reduce adverse impacts of construction on the retained trees, where possible, to a less than significant level. However, implementation of these recommendations should not be viewed as a guarantee or warranty against the trees' ultimate demise and/or failure in the future. Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of the trees and ***attempt to reduce the risk of living near trees***. Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. There are some inherent risks with trees that cannot be predicted with any degree of certainty, even by a skilled and experienced arborist. People who choose to develop wooded property are accepting a certain level of risk from unpredictable tree related hazards such as toppling in storms, limbs falling and fires that may damage their property at some time in the future. Since trees are living organisms conditions are often hidden within the tree and below ground and their condition may change at any time. Arborists cannot guarantee that a tree will be healthy and/or safe under all circumstances or for a specific period of time. Likewise remedial treatments cannot be guaranteed. Trees can be managed but they cannot be controlled. To develop land and live near trees is to accept some degree of risk and the only way to eliminate all risk associated with trees is to eliminate all of the trees. ***An entity who develops land and builds structures with a tree in the vicinity should be aware of this Arborists' Disclaimer and be further advised that the developer assumes the risk that a tree could at any time suffer a branch and/or limb failure, blow over in a storm and/or fail for no apparent reason which may cause bodily injury or property damage***. Sierra Nevada Arborists cannot predict acts of nature including, without limitation, storms of sufficient strength which can take down even a seemingly healthy tree. The information contained within this report is true to the best of the author's knowledge and experience as of the date it was prepared; however, certain conditions may exist which only a comprehensive, scientific, investigation might reveal which should be performed by other consulting professionals. Neither this author nor Sierra Nevada Arborists has assumed any responsibility for liability associated with the trees on or adjacent to this project site, their future demise and/or any damage which may result therefrom.

Thank you for allowing Sierra Nevada Arborists to assist you with this phase of the project. Please feel free to give me a call if you have any questions or require additional information.

Sincerely,

Edwin E. Stirtz
ISA Certified Arborist WE-0510A
Member, American Society of Consulting Arborists

EES:ks
Enclosures

KLEINFELDER, INC.
DEL PASO PARK PROJECT SITE
City of Sacramento, California

INVENTORY SUMMARY AND IMPACT ASSESSMENT

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	PERCEIVED IMPACTS	RECOMMENDATIONS
						ROOT CROWN	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR			
1	Chinese Elm	*(Ulmus parvifolia)*		15	28	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; no encroachment currently depicted	Clean out crown
2	Chinese Elm	*(Ulmus parvifolia)*		12	17	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; no encroachment currently depicted	Clean out crown
3	Chinese Elm	*(Ulmus parvifolia)*		16	23	Fair	Fair	Fair	Fair	Fair	Fair	Measured at 3' above grade; forks at 4' and 5' above grade	Will require removal to facilitate grading	
4	Chinese Elm	*(Ulmus parvifolia)*		15	31	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	
5	American Elm	*(Ulmus americana)*		10	19	Fair	Fair	Fair	Fair	Fair	Fair	Measured at 3' above grade; forks at 4' above grade; trunk bends east	Will require removal to facilitate grading	
6	American Elm	*(Ulmus americana)*		9	14	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Callusing trunk wounds, various locations; minor interior decay; above average amount of deadwood	Will require removal to facilitate grading	
7	American Elm	*(Ulmus americana)*	9, 9	18	21	Fair	Fair	Poor to fair	Fair	Fair	Fair	Above average amount of deadwood	Will require removal to facilitate grading	
8	American Elm	*(Ulmus americana)*		10	18	Fair	Fair	Fair	Fair	Fair	Fair	One-sided east	Will require removal for remediation area	
9	American Elm	*(Ulmus americana)*		14	22	Fair	Fair	Poor to fair	Fair	Fair	Fair	Above average amount of deadwood	Will require removal for remediation area	
10	American Elm	*(Ulmus americana)*	8, 11, 12	31	24	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Weak primary crotches	Will require removal for remediation area	
11	Blue Oak	*(Quercus douglasii)*	6, 6	12	16	Fair	Fair	Fair	Fair	Fair	Fair	Branching one-sided east	Will require removal to facilitate road grading	
12	Blue Oak	*(Quercus douglasii)*	2, 5	7	10	Fair	Fair	Fair	Fair	Fair	Fair	Slightly above average amount of deadwood	Will require removal to facilitate road grading	
13	Blue Oak	*(Quercus douglasii)*	5, 7	12	16	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Trunks bend east; somewhat suppressed	Will require removal to facilitate road grading	
14	Blue Oak	*(Quercus douglasii)*	2, 4	6	15	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Larger trunk bends southeast; suppressed	Will require removal to facilitate road grading	
15	Coast Live Oak	*(Quercus agrifolia)*		13	22	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road grading	
16	Interior Live Oak	*(Quercus wislizenii)*	7, 8, 9, 9, 13, 15	61	32	Poor to fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Root crown partially buried, primarily on the west side, to approximately 1' above grade; callusing trunk wounds, various locations, with minor interior decay; severe pruning on southeasterly stems	Will require removal to facilitate road grading	
17	Interior Live Oak	*(Quercus wislizenii)*	10, 13	23	35	Fair	Fair	Poor to fair	Fair	Fair	Fair	Moderate to severe pruning on south side	Will require removal to facilitate road grading	
18	American Elm	*(Ulmus americana)*	10, 21	31	24	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Callusing trunk wounds, west side, 4' and 8' above grade; minor to moderate interior decay; above average amount of deadwood	Will require removal to facilitate road grading	
19	Interior Live Oak	*(Quercus wislizenii)*		8	28	Fair	Fair	Fair	Fair	Fair	Fair	Trunk bends southwest	Will require removal to facilitate road grading	
20	Blue Oak	*(Quercus douglasii)*	4, 7	11	13	Fair	Fair	Fair	Fair	Fair	Fair	Measured at 3' above grade; forks again at 4' and 5' above grade	Will require removal to facilitate road grading	
21	Blue Oak	*(Quercus douglasii)*		15	20	Fair	Fair	Fair	Fair	Fair	Fair	***TAG ATTACHED TO ADJACENT TELEPHONE POLE; DIAMETER ESTIMATED AT APPROXIMATELY 2' ABOVE GRADE; TREE IS LOCATED BEHIND CHAIN LINK FENCE*** ; trunk forks again at 4' to 5' above grade; slightly above average amount of deadwood	Located off site; will sustain minor encroachment for parking lot construction	Clean out crown
22	Valley Oak	*(Quercus lobata)*		13	18	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; will sustain minor encroachment for parking lot construction	Clean out crown
23	Interior Live Oak	*(Quercus wislizenii)*		8	9	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Embedded chain link in lower trunk from grade to approximately 5' above grade	Located off site; no encroachment currently depicted	Cut chain link at trunk; clean out crown; ***recommend annual inspection by an ISA Certified Arborist***
24	Blue Oak	*(Quercus douglasii)*		19	20	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; will sustain minor encroachment for parking lot construction	Clean out crown
25	Arizona Ash	*(Fraxinus velutina)*		7	15	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; no encroachment currently depicted	Clean out crown
26	Interior Live Oak	*(Quercus wislizenii)*	2, 2, 3	7	8	Fair	Fair	Fair	Fair	Fair	Fair		No encroachment currently depicted	Clean out crown

KLEINFELDER, INC.
DEL PASO PARK PROJECT SITE
City of Sacramento, California
INVENTORY SUMMARY AND IMPACT ASSESSMENT

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	PERCEIVED IMPACTS	RECOMMENDATIONS
						ROOT CROWN	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR			
27	Interior Live Oak	*(Quercus wislizenii)*	5, 8	13	16	Fair	Fair	Fair	Fair	Fair	Fair	***TAG ATTACHED TO LIMB; DIAMETERS ESTIMATED AT 3' ABOVE GRADE; TREE LOCATED BEHIND CHAIN LINK FENCE***; tree forks again at 4' above grade; leans southeast; branching one-sided southeast	Located off site; no encroachment currently depicted	Clean out crown
28	Interior Live Oak	*(Quercus wislizenii)*		10	20	Fair	Fair	Fair	Fair	Fair	Fair	***DIAMETER ESTIMATED; TREE LOCATED BEHIND CHAIN LINK FENCE***; trunk leans southeast; branching one-sided southeast	Located off site; no encroachment currently depicted	Clean out crown
29	Interior Live Oak	*(Quercus wislizenii)*		16	25	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Attached northerly stem is dead; trunk leans south; slightly above average amount of deadwood	Will sustain moderate encroachment for parking lot construction	Clean out crown
30	Blue Oak	*(Quercus douglasii)*	4, 5	9	11	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Embedded chain link in lower trunk at approximately 4' above grade; callusing wounds on primary limbs with minor to moderate internal decay	No encroachment currently depicted	Cut chain link at trunk; clean out crown
31	Silver Maple	*(Acer saccharinum)*		24	28	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate parking lot grading	
32	Blue Oak	*(Quercus douglasii)*		37	40	Poor	Poor	Poor to fair	Poor to fair	Poor	Poor to fair	Basal cavity, east side, to 1' above grade exposing moderate to significant interior decay and hollowing; trunk cavity on north side approximately 8' above grade with moderate interior decay and hollowing; additional trunk wounds 10' to 15' above grade, primarily on east side; trunk leans east; wounds and cavities on primary scaffold limbs; above average amount of deadwood; somewhat sparse foliage	Will require removal to facilitate parking lot grading; ***previously recommended for removal by arborist due to noted defects***	
33	Arizona Ash	*(Fraxinus velutina)*		14	18	Fair	Poor	Poor	Poor	Poor	Poor	Trunk cavity, north side, 2' to 4' above grade; significant interior decay and hollowing; excessive amount of deadwood; sparse foliage	Will require removal to facilitate parking lot grading; ***previously recommended for removal by arborist due to noted defects***	
34	Interior Live Oak	*(Quercus wislizenii)*	5, 6, 13	24	25	Fair	Fair	Fair	Fair	Fair	Fair	Trunk leans south	Located off site; will sustain minor encroachment for parking lot construction	Clean out crown
35	Interior Live Oak	*(Quercus wislizenii)*	14, 17	31	30	Fair	Fair	Poor to fair	Fair	Fair	Fair	Trunks lean east and west; branching primarily one-sided south; above average amount of deadwood	Will sustain moderate encroachment for parking lot construction	Clean out crown
36	Arizona Ash	*(Fraxinus velutina)*	4, 5	9	14	Fair	Fair	Fair	Fair	Fair	Fair		No encroachment currently depicted	Clean out crown
37	Valley Oak	*(Quercus lobata)*		6	11	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; no encroachment currently depicted	Clean out crown
38	Almond	*(Prunus sp.)*		6	16	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Trunk leans south; suppressed; ivy growing on lower trunk; above average amount of deadwood	Will sustain minor encroachment for parking lot construction	Remove ivy from trunk; clean out crown
39	Interior Live Oak	*(Quercus wislizenii)*	6, 6, 9	21	15	Fair	Fair	Fair	Fair	Fair	Fair	Ivy growing on lower trunk	Will sustain minor encroachment for parking lot construction	Remove ivy from trunk; clean out crown
40	Blue Oak	*(Quercus douglasii)*		45	38	Unknown	Poor to fair	Fair	Fair	Poor to fair (?)	Fair	Root crown covered by dense growth of weeds/ivy; trunk cavity, southwest side, approximately 6' to 8' above grade; active bee hive within cavity; moderate internal decay and hollowing suspected; additional trunk wounds, various locations, throughout crown	Located off site; will sustain minor encroachment for parking lot construction	***Remove weeds/ivy from root crown; perform root collar excavation and inspection; perform aerial inspection; provide further recommendations regarding viability for retention following root collar and aerial inspections***
41	Coast Live Oak	*(Quercus agrifolia)*		10	14	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; will sustain minor encroachment for parking lot construction	Clean out crown
42	Coast Live Oak	*(Quercus agrifolia)*		9	13	Fair	Fair	Fair	Fair	Fair	Fair		Located off site; will sustain minor encroachment for parking lot construction	Clean out crown

KLEINFELDER, INC.
DEL PASO PARK PROJECT SITE
City of Sacramento, California
INVENTORY SUMMARY AND IMPACT ASSESSMENT

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	PERCEIVED IMPACTS	RECOMMENDATIONS
						ROOT CROWN	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR			
43	Arizona Ash	*(Fraxinus velutina)*		20	18	Poor to fair	Poor	Poor to fair	Fair	Poor	Fair	Callusing basal/trunk cavity, southeast side, to 7' above grade; significant interior decay and hollowing; above average amount of deadwood		***Recommend removal due to noted defects***
44	Blue Oak	*(Quercus douglasii)*		7	9	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Embedded chain link in lower trunk from grade to 1' above grade; slightly above average amount of deadwood	Located off site; no encroachment currently depicted	Cut chain link at trunk; clean out crown
45	Interior Live Oak	*(Quercus wislizenii)*	5, 6, 6, 8	25	17	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Embedded chain link in lower trunk 0.5' to 2' above grade	Located off site; will sustain minor encroachment for parking lot construction	Cut chain link at trunk; clean out crown
46	Blue Oak	*(Quercus douglasii)*	5, 6	11	12	Fair	Fair	Fair	Fair	Fair	Fair	Growing adjacent to Tree No. 45	Located off site; no encroachment currently depicted	Clean out crown
47	Blue Oak	*(Quercus douglasii)*		12	13	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Embedded chain link in lower trunk from grade to 4' above grade	Located off site; no encroachment currently depicted	Cut chain link at trunk; clean out crown
48	Coast Live Oak	*(Quercus agrifolia)*		10	14	Fair	Fair	Fair	Fair	Fair	Fair		Will sustain minor encroachment for parking lot construction	Clean out crown
49	Coast Live Oak	*(Quercus agrifolia)*		7	11	Fair	Fair	Fair	Fair	Fair	Fair		No encroachment currently depicted	Clean out crown
50	Coast Live Oak	*(Quercus agrifolia)*		10	16	Fair	Fair	Fair	Fair	Fair	Fair		Will sustain minor encroachment for parking lot construction	Clean out crown
51	Blue Oak	*(Quercus douglasii)*		13	22	Fair	Fair	Fair	Fair	Fair	Fair	Trunk leans east	No encroachment currently depicted	Clean out crown
52	Interior Live Oak	*(Quercus wislizenii)*		32	30	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Embedded chain link in lower trunk from grade to 3' above grade; callusing trunk wounds, north side, 1' to 2' above grade; minor interior decay	Located off site; no encroachment currently depicted	Cut chain link at trunk; clean out crown
53	Coast Live Oak	*(Quercus agrifolia)*		6	11	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road grading	
54	American Elm	*(Ulmus americana)*		8	13	Fair	Poor	Poor to fair	Fair	Poor	Fair	Tree has been topped at 5' above grade; only two branches remain	Will require removal to facilitate road grading; ***previously recommended for removal by arborist due to noted defects***	
55	Arizona Ash	*(Fraxinus velutina)*		16	17	Poor	Poor	Poor to fair	Fair	Poor	Fair	Basal/trunk cavity to 7' above grade, northeast side; significant interior decay and hollowing	Will require removal to facilitate parking lot construction; ***previously recommended for removal by arborist due to noted defects***	
56	Arizona Ash	*(Fraxinus velutina)*		18	20	Poor to fair	Poor to fair	Poor	Poor to fair	Poor to fair	Poor to fair	Callusing basal/trunk wounds, various locations, with minor to moderate internal decay; excessive amount of deadwood; sparse foliage	Will require removal to facilitate parking lot construction	
57	Blue Oak	*(Quercus douglasii)*		32	28	Fair	Poor to fair	Poor to fair	Poor to fair	Poor to fair	Poor to fair	Callusing trunk wound, northwest side, 7' to 9' above grade; minor to moderate interior decay; above average amount of deadwood; sparse foliage	Will require removal to facilitate parking lot construction	
58	Arizona Ash	*(Fraxinus velutina)*		18	21	Poor to fair	Poor	Poor to fair	Fair	Poor	Poor to fair	Basal/lower trunk cavity, southwest side, to 3' above grade; significant interior decay and hollowing; above average amount of deadwood	Will require removal to facilitate parking lot construction; ***previously recommended for removal by arborist due to noted defects***	
59	Arizona Ash	*(Fraxinus velutina)*		21	24	Fair	Fair	Poor to fair	Fair	Fair	Fair	Above average amount of deadwood	Will require removal to facilitate parking lot construction	
60	Arizona Ash	*(Fraxinus velutina)*		33	31	Fair	Fair	Poor	Poor	Fair	Poor	Excessive amount of deadwood; sparse foliage	Will require removal to facilitate parking lot construction; ***previously recommended for removal by arborist due to noted defects***	
61	Western Hackberry	*(Celtis occidentalis)*		9	16	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal for pad grading	
62	Western Hackberry	*(Celtis occidentalis)*		9	11	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Tree has been severely pruned at approximately 7' to 8' above grade	Will require removal for pad grading	
63	Western Hackberry	*(Celtis occidentalis)*		8	14	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal for pad grading	
64	Blue Oak	*(Quercus douglasii)*		27	27	Poor	Poor	Poor	Poor to fair	Poor	Poor to fair	Basal cavities, all sides; sounding indicates lower trunk is hollow; trunk cavity approximately 10' above grade, east side, with significant interior decay and hollowing; additional trunk wounds, various locations, with moderate interior decay; excessive amount of deadwood; sparse foliage	Will require removal for pad grading; ***previously recommended for removal by arborist due to noted defects***	

KLEINFELDER, INC.
DEL PASO PARK PROJECT SITE
City of Sacramento, California
INVENTORY SUMMARY AND IMPACT ASSESSMENT

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	PERCEIVED IMPACTS	RECOMMENDATIONS
						ROOT CROWN	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR			
65	Blue Oak	*(Quercus douglasii)*		27	28	Poor to fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Exposed and wounded buttress and lateral roots; callused and callusing trunk wounds, various locations; minor to moderate interior decay; wounds on primary scaffold limbs	Will require removal to facilitate parking lot construction	
66	Arizona Ash	*(Fraxinus velutina)*		26	27	Fair	Poor to fair	Poor to fair	Poor to fair	Poor to fair	Poor to fair	Callusing trunk wounds, various locations; minor interior decay; above average amount of deadwood; sparse foliage	Will require removal to facilitate parking lot construction	
67	Western Hackberry	*(Celtis occidentalis)*		20	36	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate parking lot construction	
68	Arizona Ash	*(Fraxinus velutina)*		21	30	Fair	Poor to fair	Poor to fair	Poor to fair	Poor to fair	Poor to fair	Callusing trunk wound, west side, 2' to 5' above grade; minor interior decay; above average amount of deadwood; somewhat sparse foliage	Will require removal to facilitate road construction	
69	Arizona Ash	*(Fraxinus velutina)*		17	22	Fair	Fair	Poor to fair	Fair	Fair	Fair	Above average amount of deadwood	Will require removal to facilitate road construction	
70	Arizona Ash	*(Fraxinus velutina)*		18	28	Fair	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Above average amount of deadwood; somewhat sparse foliage	Will require removal to facilitate road construction	
71	Beefwood	*(Casuarina sp.)*		12	17	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road construction	
72	Beefwood	*(Casuarina sp.)*		7	16	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road construction	
73	Beefwood	*(Casuarina sp.)*		10	14	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road construction	
74	Arizona Ash	*(Fraxinus velutina)*		22	27	Poor	Poor	Poor to fair	Fair	Poor	Fair	Callusing basal/lower trunk cavity, southwest side, to 5' above grade; significant interior decay; above average amount of deadwood	Will require removal to facilitate road constructin; ***previously recommended for removal by arborist due to noted defects***	
75	Arizona Ash	*(Fraxinus velutina)*		22	20	Fair	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Above average amount of deadwood; sparse foliage	Will require removal to facilitate road construction	
76	Arizona Ash	*(Fraxinus velutina)*		29	32	Fair	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Above average amount of deadwood; somewhat sparse foliage	Will sustain minor encroachment for road construction	Fertilize via subsurface liquid soil injection; clean out crown
77	Raywood Ash	*(Fraxinus oxycarpa)*		21	25	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Weak primary crotches; above average amount of deadwood	No encroachment currently depicted	Clean out crown; ***recommend annual inspection by an ISA Certified Arborist***
78	Beefwood	*(Casuarina sp.)*	14, 15	29	24	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road construction	
79	Beefwood	*(Casuarina sp.)*		9	12	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road construction	
80	Beefwood	*(Casuarina sp.)*		11	15	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road construction	
81	Zelcova	*(Zelcova serrata)*		14	26	Fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Measured at 1' above grade; forks again at 2', 3' and 4' above grade; trunks suppressed	Will require removal to facilitate road construction	
82	Modesto Ash	*(Fraxinus velutina 'modesto')*		24	40	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Fair	Weak primary crotches; above average amount of deadwood	Will require removal to facilitate road construction	
83	Raywood Ash	*(Fraxinus oxycarpa)*		15	17	Fair	Fair	Poor to fair	Fair	Fair	Fair	Above average amount of deadwood	Will require removal to facilitate road construction	
84	Beefwood	*(Casuarina sp.)*		14	10	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate road construction	
85	American Elm	*(Ulmus americana)*		27	33	Poor to fair	Fair	Poor to fair	Fair	Poor to fair	Fair	Exposed and wounded buttress and lateral roots, all sides; above average amount of deadwood	Will sustain minor encroachment for road construction	***Perform root collar excavation and inspection; provide further recommendations regarding viability for retention following root collar inspection***
86	Modesto Ash	*(Fraxinus velutina 'modesto')*		25	40	Poor to fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Exposed and wounded buttress and lateral roots, primarily on the north and west sides; trunk wound 1' to approximately 10' above grade, northwest side, with exposed and splintered wood	Will require removal to facilitate road construction; ***previously recommended for removal by arborist due to noted defects***	
TREES FOUND WITHIN LEAD SHOT SURFACE DEPOSITS AREA														
87	Chinese Elm	*(Ulmus parvifolia)*		13	21	Fair	Fair	Fair	Fair	Fair	Fair	Measured at 2' above grade; forks at 3' above grade	Will require removal to facilitate grading	
88	Chinese Elm	*(Ulmus parvifolia)*		15	26	Poor to fair	Poor to fair	Fair	Fair	Poor to fair	Fair	Past partial root system failure; trunk leans northwest	Will require removal to facilitate grading	
89	Chinese Elm	*(Ulmus parvifolia)*		13	22	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	
90	Giant Sequoia	*(Sequoia dendron gigantum)*		25	11	Fair	Fair	Fair	Fair	Fair	Fair	Slightly above average amount of deadwood	No encroachment currently depicted	Clean out crown
91	Chinese Elm	*(Ulmus parvifolia)*		14	25	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	

KLEINFELDER, INC.
DEL PASO PARK PROJECT SITE
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INVENTORY SUMMARY AND IMPACT ASSESSMENT

TREE#	COMMON NAME	SPECIES	MULTI-STEMS (inches)	TOTAL DBH (inches)	DLR (feet)	CONDITIONAL ASSESSMENT						NOTABLE CHARACTERISTICS	PERCEIVED IMPACTS	RECOMMENDATIONS
						ROOT CROWN	TRUNK	LIMBS	FOLIAGE	STRUCTURE	VIGOR			
92	Chinese Elm	*(Ulmus parvifolia)*		10	15	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	
93	Chinese Elm	*(Ulmus parvifolia)*		15	23	Fair	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Above average amount of deadwood; slightly sparse foliage	Will require removal to facilitate grading	
94	Monterey Pine	*(Pinus radiata)*		32	28	Fair	Fair	Poor to fair	Fair	Fair	Fair	Above average amount of deadwood	No encroachment currently depicted	Clean out crown
95	Giant Sequoia	*(Sequoia dendron gigantum)*		13	8	Fair	Fair	Fair	Fair	Fair	Fair		No encroachment currently depicted	Clean out crown
96	Chinese Elm	*(Ulmus parvifolia)*		10	16	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	
97	Zelcova	*(Zelcova serrata)*		8	12	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	
98	Zelcova	*(Zelcova serrata)*		7	13	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	
99	Beefwood	*(Casuarina sp.)*		17	25	Fair	Fair	Fair	Fair	Fair	Fair		Will require removal to facilitate grading	
100	Raywood Ash	*(Fraxinus oxycarpa)*		14	23	Fair	Fair	Poor to fair	Poor to fair	Fair	Poor to fair	Above average amount of deadwood; somewhat sparse foliage	Will require removal to facilitate grading	

TOTAL INVENTORIED TREES = 100 Trees (1,665 aggregate diameter inches)
TOTAL REMOVALS = 64 Trees
PRECAUTIONARY TREES HIGHLIGHTED FOR REFERENCE

GENERAL PRESERVATION RECOMMENDATIONS

The following information is provided in an effort to protect those trees which may be impacted by construction within the project site. It should be noted that these recommendations are generic in nature. As plans are developed and refined, a more detailed evaluation of tree impacts and/or removals should be made by an ISA Certified Arborist. At that time specific preservation recommendations may be made for individual trees within the project site.

MITIGATIVE OVERVIEW

In order to afford the greatest potential for tree preservation during construction, there are general guidelines to provide this protection. The critical root zone area for a tree should include the dripline radius measurement taken from the tree trunk to the tip of the farthest reaching branch. In some circumstances, such as with a one-sided tree, this measurement could be somewhat skewed. In these situations, the Project Arborist should determine the critical root zone area. Generally, encroachments should be held to no more than 20% of the critical root zone area where potential root damage could be moderate or significant. In limited situations, encroachment exceeding 20% of the critical root zone area may be possible provided that potential root damage is not severe. The critical root zone area should be fenced prior to any activities on the site and the protective fencing should remain in place throughout the course of construction activities.

Canopy impacts can also pose a detriment to preserved trees. Frequently overlooked are conflicts between low-hanging tree branches and necessary clearance beneath a tree for construction equipment or home building purposes. Canopy impacts should also be maintained at 20% or less.

GRADING MITIGATIVE MEASURES

Grade Cuts.

Cuts within a dripline of a tree should be maintained at less than 20% of the critical root zone area. Grade cuts should be supervised by the Project Arborist and any damaged roots encountered should be root pruned and properly treated as soon as possible after excavation. Cut faces which will be exposed for more than 2-3 days during cool temperatures or 1 day during warm weather should be covered with dense burlap fabric and watered to maintain soil moisture at least on a daily basis (or possibly more frequently during summer months) or as directed by the Project Arborist.

Grade Fills.

Fill materials less than 1 foot in depth and encroaching less than 20% into the critical root zone area should not require special mitigative measures. Should fills exceed 1 foot in depth up to 20% of the critical root zone area, aeration systems installed as directed by the Project Arborist may serve to mitigate the presence of the fill materials.

Should it be necessary to build fill materials on two or three sides of a tree the use of retaining walls may reduce encroachment and the degree of fill beneath the tree. It is critical to provide for drainage away from the critical root zone area of the tree -- particularly when considering heavy winter rainfalls. Overland releases and subterranean drains dug outside the critical root zone area and tied directly to the main storm drain system are two possible options.

Structure Encroachment.

In some cases it may be necessary for a proposed structure to encroach into the critical root zone area. Again, this encroachment should be maintained at less than 20%. In this situation, a slab foundation with an aeration system installed beneath the slab and footings excavated by hand may provide adequate root protection. Where tree roots tend to be shallow, even a hand-excavated footing can be detrimental. In this situation, a "post-tension" type slab may minimize root damage. If it is necessary for encroachment to exceed 20%, raised floor construction with a grade-beam type foundation footing may be a viable option.

When evaluating encroachment from a proposed structure the structure height and tree branch conflicts are critical to evaluate in order to ensure that no more than 20% of the tree's canopy requires removal.

STREET AND UTILITY MITIGATION MEASURES

Generally, impacts from street construction alone are less of an impact than those occurring with dry and wet utility construction. Often it is very difficult or impossible to effectively preserve a tree with more than 30% of its critical root zone area falling within the PUE/street.

Dry Utilities.

Since dry utilities are typically located behind the curb and gutter and/or sidewalks, where applicable, they fall within the closest proximity to trees preserved outside of the roadway. The dry utilities tend to be shallow, within the top 5 feet of the soil profile. Unfortunately, in this

region that is also typically where tree roots are found. Where possible, dry utilities should be routed on the opposite side of the street from tree locations. This would require more street crossings than normally planned; however, impacts to trees would be greatly lessened. In some circumstances, hand digging the utilities through critical root zone areas may be an option. Since the dry utility profile is usually 3-4 in depth and includes multiple conduits or plumbing due to the various utilities, boring beneath the critical root zone area is not usually effective.

Wet Utilities.

The greatest conflicts with wet utilities typically arise from deep sanitary sewers or storm drains. Soil conditions and safety concerns often require than trench openings at ground level be quite large. Therefore, the storm and sewer locations must be carefully considered. In some circumstances where a particularly valuable tree may be impacted by wet utilities boring may be an option. Since water main construction tends to be more shallow than storm drains or sewers, and flow lines are not as critical, boring can often be most effective in preserving tree roots.

Streets/Hardscape.

Should the street construction sections be 18" or less, the percentage of encroachment into the critical root zone area may be able to exceed 20%. If this is possible, determinations cannot be made until an accurate evaluation of the root system profiles on the site has been completed. It is impossible to preserve roots within the street section profile. Further, the construction of the street alters the gaseous exchange and oxygen to the tree's root system. In some circumstances aeration systems may mitigate a small portion of these impacts.

Hardscape (concrete slabs, walkways, etc.) should be minimized within the critical root zone area. Grade cuts in excess of 12" should be avoided. In some circumstances aeration systems may be required to reduce root system stress.

CONCLUSION

In an effort to minimize tree removals in the early phases of a project a category for potential tree removals should be established. This category would include those trees which are located in areas that would expose them to moderate or significant encroachments and/or construction impacts. As construction occurs and construction staking is installed assessment of impacts are much more accurate than those based simply on plan review. At that time, determinations by the Project Arborist prior to construction and following staking may result in preservation of trees which may have previously appeared to require removal on the plans.

DEFINITIONS AND RATINGS

Within this report you will find the following information defined as follows:

Tree Number:	Corresponds to aluminum tag attached to the tree.
Species Identification:	Scientific and common species name.
Diameter ("DBH"):	This is the trunk diameter as measured at breast height (industry standard 4.5 feet above ground level).
Dripline radius ("DLR")	Measurement of the tree's dripline from the trunk to the farthest most branch tip.
Root Crown:	Assessment of the root crown area located at the base of the trunk of the tree at soil level.
Trunk:	Assessment of the tree's main trunk from ground level generally to the point of the primary crotch structure.
Limbs:	Assessment of both smaller and larger branching, generally from primary crotch structure to branch tips.
Foliage:	Tree's leaves.
Overall Condition:	Describes overall condition of the tree in terms of structure and vigor.
Dripline Environment:	Describes area directly beneath the tree (growing environment).
Recommendation:	Specific maintenance requirements.
(?):	Occasionally some portion of the tree may be obscured from visual inspection due to the presence of dense climbing vines such as ivy, etc. which, during the course of inspection for the preliminary arborist report, prevented an evaluation with certainty. In these cases, should a tree with an (?) be significant and in a location where it may be preserved on site, it would be prudent to remove any obstructions and perform further evaluation.

Structure and Vigor Ratings:

GOOD - A tree in this category has no trunk or root crown cavities or injuries; there is no indication of hollowness; no foreign objects are embedded in its structure; the root crown is above grade; there is no decay present except for small stubs; the structure is strong; the trunk is tapers; the bark thickness is normal; there is no fluxing; no fungus is evident; there is a below average amount of dead limbs and twigs present which is normal for the size and age of the species; there is no co-dominant branching present; there are no large callused areas and any small callusing present is vigorous and intact; there are no abnormally heavy insect infestations; the growth rate is and has been average or above; limb weight is not excessive; buds are normal size and viable; the leaf size, color, and density is normal or better; and barring any unforeseen negative effects, the life expectancy should exceed thirty years.

FAIR - There is no decay or indications of large hollow areas in the large limbs, root crown, or trunk; a few small callused-over foreign objects, e.g., nails, may be present, the structure is strong; no fungus is evident other than small saprophytes on exposed wood; some small, callusing injuries may be present, some small limbs may be dead and decaying but callus is forming at their base; some excessive limb weight may exist; there may be some minor fluxing; the amount of dead limbs and twigs present is within the normal range; some large callused areas may be present; some small cavities and areas of decay may be present; the growth rate is average or slightly below average; and some leaf size, color, and density may vary.

POOR - Significant cavities, dead areas, and decay may be present; the tree is actually defective; fungus fruiting bodies may be present; the amount of dead limbs and twigs is far above normal; major co-dominant branching with embedded bark may be present; buds are small and some may not be viable; leaves may be below average size and may be abnormal in color; significant pest damage may be present; and the predicted structural life and/or viability is less than ten years.

The ratings "good to fair" and "fair to poor" are used to describe trees that fall between the described major categories and have elements of both.

Encroachment Ratings:

MINOR - No anticipated long-term negative effects

MODERATE – Potential long-term negative effects

SIGNIFICANT – Probable long-term negative effects

Maintenance Recommendations:

CROWN CLEAN OUT: This shall consist of the removal of all dead, dying, diseased, interfering, objectionable, obstructing, and weak branches, as well as selective thinning to lessen wind resistance.

SUBSURFACE LIQUID FERTILIZATION INJECTION/DEEP ROOT FERTILIZATION (D.R.F.): A method employed to induce vigor and stimulate new root growth. This is used as a means of feeding a large tree, as well as deep watering at the same time. Water soluble fertilizers are mixed in water and hydraulically pumped with a probe into the ground, delivering water and nutrients directly to the root zone, allowing for uptake from the tree. In this way, vigor can be improved and new root growth stimulated.