

APPENDIX E

Tree Survey and Impact Report

Prepared for:

Kaiser Permanente
NFS Capital Projects, East Bay
1100 San Leandro Boulevard, Suite 200
San Leandro, CA 94577-1595

**WEST BROADWAY MEDICAL SERVICES BUILDING
TREE SURVEY REPORT**

MacArthur and Broadway

Oakland, CA

Date: February 23, 2006

Prepared by:

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ASSIGNMENT

Arborist was requested to survey all trees on the site and provide recommendations for treatment in conjunction with the construction of medical building and parking garage.

INTRODUCTION

This report provides information on 28 trees that were surveyed in and around the proposed construction site. The project will cover most of the land that is within the streets of MacArthur Blvd., Broadway, Manila and 38th Street in Oakland. The largest portion of the site was previously occupied by a car dealership.

Data was recorded on tree species, size and condition. Recommendations are provided that address tree removal and tree protection.

SUMMARY

A total of 27 trees were surveyed on and adjacent to the project site. Eleven (11) of the 27 trees surveyed are located on the project site. All of these trees are to be removal.

Twelve (12) of the trees are City of Oakland street trees. Ten of the City trees are located on Manila and two trees are located on Broadway at MacArthur Blvd.

The last four trees (#'s 24, 25, 26, & 27) are on private residences inside of the block. These trees should not be impacted. Only tree #27, the ginkgo tree is exposed to the site along the back driveway. The table below provides a summary of the trees by ownership.

Tree Owner	Number Trees	Number to be Removed	Number at Risk
Kaiser Permanente	11	11	0
City of Oakland	12	3	4
Private Residences	4	0	1

6

Tree Removal - Fourteen (14) trees are recommended for removal.

- City Trees - Four (4) Raywood Ash trees #'s (4, 5 & 8) are being removed to accommodate the construction project on the Manila side. Tree #1 could be retained and protected but would be better replaced due to the poor condition.
- Trees Located on Project Site – All eleven (11) trees located on the project site will be removed. The largest of the trees recommended for removal are the four (4) Arizona Cypress trees and the three (3) Blue Gum Eucalyptus trees. Safety concerns and old age are the primary reasons for the recommended removal of these trees. There is one stump from a eucalyptus tree that was removed at an earlier time. The Big Leaf Maple, also located under the eucalyptus trees must be removed to accommodate the creek restoration project. Three additional trees recommended for removal on the project site include a Cherry Plum, an Australian Cordyline and a Xylosma. All are of little significance.



Trees to be Retained

1. Trees on Project Site – All Kaiser owned trees located within the project site will be removed.
2. City of Oakland Trees – The remaining nine City trees on Manila and Broadway will be retained. London Plane trees #16 and #17 on Broadway will pose the greatest difficulty. These trees will be adversely impacted by clearance pruning and soil intrusion. Protection measures are required for the crown and roots. Special techniques are required for trenching in the area of these trees. Depending upon the nature of construction activity on Manila, Raywood Ash trees #'s 1 & 19 may require some protection as well.
3. Private Trees – The four private trees surveyed are not expected to be impacted by the project. These trees were included in the survey only to assure that all trees in the area are acknowledged. Only tree #27, the ginkgo growing close to the back driveway, is within impact distance.

SITE DESCRIPTION

The proposed project site is set within the area bordered by Broadway and Manila on the east and west sides, and MacArthur Blvd. and 38th Street on the south north sides. The site was previously occupied by a car dealership and covered with structures, cement and asphalt.

On Manila, Raywood Ash trees have been planted as street trees. The trees are located under high-voltage power lines and have developed poor structure due to the line clearance pruning.

Near the center of the block, a short section of the creek emerges from an underground pipe for approximately 150 feet before reentering the pipe. Along this section of open creek are three large Blue Gum Eucalyptus trees, a Big Leaf Maple and a cherry plum.

WORK DESCRIPTION

The project proposes to construct medical buildings and associated parking on the site. Major construction and large equipment will be used.

DISCUSSION OF TREE RECOMMENDED TO BE RETAINED

London Plane Trees #16 & #17 – These two City trees will be difficult to retain but it is possible they could survive the construction impact. Treatments and procedures for working around these trees have been provided. Much depends upon where the roots of these trees are located.



Table 1. TREE SURVEY DATA

The table below provides information about the individual trees surveyed. Tree locations are provided in Appendix 1, Tree Location Map. Trees 1 thru 17 have metal tags attached. Trees 18 thru 27 are identified by size species and the Tree Location Map.

Tree No.	Species	DBH Inch	Health	Structure	Action	Comments
1	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	14	Fair	Poor	Protect	CITY TREE, poor condition, recommend removal
2	Arizona Cypress (<i>Cupressus glabra</i>)	21	Poor	Poor	R	Lean
3	Arizona Cypress (<i>Cupressus glabra</i>)	10, 12, 14, 12	Fair	Hazard	R	Multi stem, included bark.
4	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	9	Poor	Poor	R	CITY TREE, remove and replace
5	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	9	Fair	Poor	R	CITY TREE, remove and replace
6	Arizona Cypress (<i>Cupressus glabra</i>)	10, 12, 9	Fair	Hazard	R	Lean, uplifted soil on side away from lean. Included bark.
7	Arizona Cypress (<i>Cupressus glabra</i>)	18, 18	Fair	Poor	R	Codominant, included bark.
8	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	13	Fair	Poor	R	CITY TREE, remove and replace
9	Blue Gum Eucalyptus (<i>Eucalyptus globules</i>)	11	Fair	Poor	R	Lean at 45 degree. Main stem has been removed
10	Blue Gum Eucalyptus (<i>Eucalyptus globules</i>)	76	Fair-Good	Poor	R	Extremely large, over 100 feet tall.
11	Big Leaf Maple (<i>Acer macrophyllum</i>)	22	Good	Fair-Poor	R	Conflict with creek restoration. Decay at base. Leans over creek.
12	Blue Gum Eucalyptus (<i>Eucalyptus globules</i>)	42	Fair-Good	Poor	R	Multi stemmed, Large tree.
13	Cherry Plum (<i>Prunus cerasifera</i>)	6, 6, 4, 4	Poor-Fair	Poor	R	Much dieback due to shade.
14	Xylosma (<i>Xylosma congestum</i>)	8	Good	Fair	R	
15	Australian Cordyline (<i>Dracaena australis</i>)	7	Fair	Fair	R	Little value
16	London Plane (<i>Platanus x acerifolia</i>)	15	Good	Good	Protect	CITY TREE, Close to proposed structure.
17	London Plane (<i>Platanus x acerifolia</i>)	16	Good	Good	Protect	CITY TREE, Close to proposed structure.
18	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	17.5	Good	Fair	No Impact	City Tree, out of project area
19	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	12.5	Fair	Poor	No Impact	City Tree, out of project area
20	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	14	Fair	Poor	No Impact	City Tree, out of project area
21	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	8.5	Poor	Poor	No Impact	City Tree, out of project area. Shaded by oak tree #25.
22	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	8.5	Fair	Poor	No Impact	City Tree, out of project area
23	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	15.5	Fair	Fair-Poor	No Impact	City Tree, out of project area
24	Coast Live Oak (<i>Quercus agrifolia</i>)	18	Good	Good	No Impact	Private Tree, out of project area. 3780
25	Coast Live Oak (<i>Quercus agrifolia</i>)	31	Good	Good	No Impact	Private Tree, out of project area. 3780
26	Atlantic Cedar (<i>Cedrus atlantica</i>)	14	Good	Fair	No Impact	Private Tree. Out of project area. 3776
27	Ginkgo (<i>Ginkgo biloba</i>)	16	Good	Good	No Impact	Private tree, out of project area



TREES TO BE REMOVED

Trees recommended for removal include three (3) City of Oakland street trees and eleven (11) trees located on the project site. This section notes the trees recommended for removal and the reasons for the removal.

City trees to be removed

- Raywood Ash Trees (4, 5, & 8) – The three trees are located in a parkway planting in the middle of the block on Manila. They will be removed to accommodate the project. The trees have poor structure and are in poor health as a result of power line clearance pruning.

Trees on project site to be removed

- Arizona Cypress Trees (2, 3, 6 & 7) - Four large Arizona Cypress trees are located along Manila Ave... All four trees are over-mature and structurally problematic. Other defects noted are significant branch dieback, weak stem attachments and signs of possible root failure on one tree.
- Eucalyptus trees (9, 10 & 12) – These trees are located along the creek. Two are quite large. The third is what remains of a larger tree previously cut. The trees are considered to be unsafe in the new surroundings. The two larger eucalyptus trees have multi stem dominance and narrow angles of stem attachment. There is a stump of a fourth eucalyptus tree that has been cut down some years previously. The grading planned for the east side of these trees will likely cause root loss and increase the liability associated with the trees.
- Big Leaf Maple tree #11 – The Big Leaf Maple tree is crowing close to the creek. The tree will be removed to accommodate a creek restoration project.
- Trees (13, 14 & 15) – Tree #13, the cherry plum is located along the open section of creek. This is a poor specimen tree and is in conflict with the native Big Leaf Maple. Trees #14 and #15 are the Australian Cordyline and the Xylosma. Both are in conflict with the construction plans and of little value.

TREE PROTECTION

London Plane Trees #'s 16 & 17 – Tree protection measures are described on page 6. Mitigation treatments are described in Appendix 3, *Terms and Definitions*. Mitigation treatments may include the use of compost tea, sugar solutions, radial trenching, core venting and the structural soil.



TREE PRESERVATION GUIDELINES

The two London Plane trees owned by the City are the only trees of any serious concern. The adverse impacts on these trees will be significant. The tree protection activities are described below.

Pruning – Both London Plane trees will require clearance pruning. All pruning is to be in accordance with PRUNING STANDARDS, published by Western Chapter, International Society of Arboriculture. (Appendix 2)

The pruning will be directed by the project arborist with prior approval by the Oakland City Arborist.

Trunk and Scaffold Protection - Protection is from mechanical damage.

- Wrap Trunk and All Exposed Limbs with Plastic Fencing – Trunk and limbs should be wrapped to a thickness of 2 inches with orange plastic construction fencing.
- Use 2x4 inch Boards – Boards are strapped to the trunk and scaffold branches in locations where damage is most likely.
- Straw Bales – Extra trunk protection can be provided by strapping from one to four straw bales around the base of the tree. The bales are placed on end.

Root Protection – Activities affecting the roots of the two London Plane trees are the structure foundation, excavation for the street light and sidewalk replacement.

- Allow Sidewalk Pavement to Remain if Possible – The best root protection that can be provided is to allow the cement sidewalk to remain until the end of construction activity.
- Surface Root and Soil Protection – If the cement is removed the treatment for all exposed areas within 15 feet of the base of either tree must be protected. This requires a 12 inch layer of wood chips with 1 1/8 inch plywood on top of the wood chips.
- Excavation – Excavation within 15 feet of the base of either plane tree is to be under supervision of the project arborist. Excavation in this area is to be by hand digging or with the use of a tool commonly referred to as the “air spade”¹.

Tree Protection Activities

¹ **Air Spade** – Common term used to refer to a method of removing soil from around tree roots by the use of air pressure to minimize root damage. Generally requires a compressor with the minimum capacity of 150 cubic feet per minute (cfm). Requires pre-wetting of the soil for best results.



Completion of Tree Protection – All designated tree protection measures will be in place and approved by the project arborist prior to the beginning of construction activity.

Pre-Construction Meeting - Personnel working on site should be provided an orientation to tree preservation measures and rules by the arborist assigned to monitor tree preservation.

Monitoring Tree Health and Stability - The need and frequency of such inspections and mitigation will be determined by the extent the trees are compromised during pruning and construction.

Tree Protection to Remain During Construction – None of the tree protection measures are to be removed until construction activity is complete without approval of project arborist.

Health Mitigation – Tree health mitigation treatments designated will depend upon the level of pruning and root loss that occurs. Possible activities could include water application, the use of compost or compost tea and sugar water solution application. Procedures known as radial trenching and core venting can be used as can structural soils. Descriptions of these terms can be found in Appendix 3, Terms and Definitions.

Pest Management Program – Health monitoring will determine if there are any serious problems with the London Plane trees. Potential problems including Powdery Mildew, anthracnose and sycamore scale. The presence of such pathogens and pests are an indication of low energy reserves (poor health). If pathogens or insects are found to be present at a damaging level, appropriate measures can be prescribed for control until the tree's natural resistance returns.

END REPORT

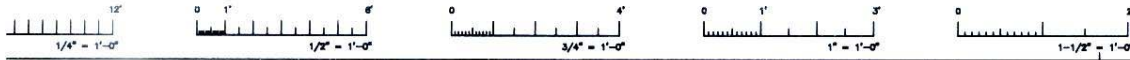
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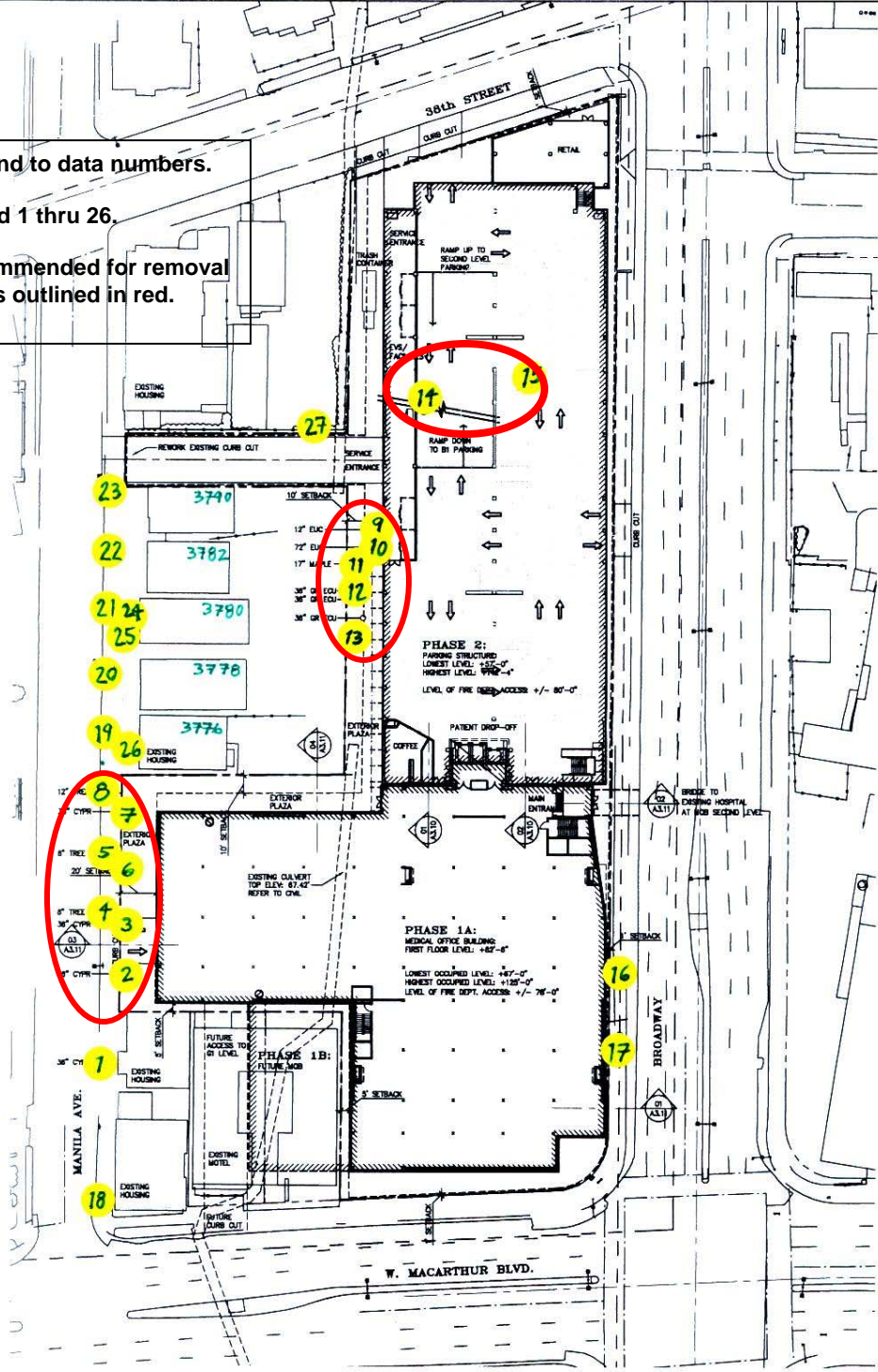


TREE LOCATION MAP

APPENDIX 1



Numbers correspond to data numbers.
Trees are numbered 1 thru 26.
The 14 trees recommended for removal are within the areas outlined in red.



COMMONLY USED ARBORIST TERMS AND DEFINITIONS

Abatement - Reduction in hazard, either by treatment of tree or removal of target.

Adventitious Root - Root tissue that develops from newly organized meristems, sometimes associated with fill and/or stem decay.

Air Spade – Common term used to refer to a method of removing soil from around tree roots by the use of air pressure to minimize root damage. Generally requires a compressor with the minimum capacity of 150 cubic feet per minute (cfm). Requires pre-wetting of the soil for best results.

Branch - A secondary shoot or stem arising from the main stem of trunk.

Branch Bark Ridge - A ridge of bark in a branch crotch that marks where branch and trunk tissue meet and often extends down the trunk.

Branch collar - Wood that forms around a branch attachment, frequently more pronounced below the branch. The branch collar is used to identify the correct location of all thinning cuts.

Canopy- The part of the crown composed of leaves and small twigs.

Cavity- An open wound, characterized by the presence of decay and resulting in a hollow structure

Codominant - A situation where a tree has two or more stems which are of equal diameter and relative amounts of leaf area. Trees with codominant primary scaffolding stems are inherently weaker than stems, which are of unequal diameter and size.

Crown – The portion of the tree that bears foliage.

DBH Diameter at Breast Height (measured at 4 1/2 feet above soil grade). DBH is required for determining tree value. Multi stemmed trees require diameters for each stem. In addition, the stem diameter must be factored by the relative crown ratio of the stem.

Defect – A fault or weakness in a tree support system.

Dripline- The width of the crown, as measured by the lateral extent of the foliage.

Fill - In construction, adding soil to raise existing grade. Raising the soil grade around trees reduces the amount of gas exchange and results in reduced soil oxygen levels.

Host – A tree that harbors an insect or disease.

Included Bark or Embedded Bark (EB) - This describes a pattern of development at branch junctions where bark is turned inward rather than pushed out (Synonym—embedded bark); contrast with branch bark ridge. More closely described as a ‘V,’ and not a ‘U’ or ‘L’ shape attachment (generally, the wider the angle of attachment the stronger is the attachment.) Stems with included bark more prone to failure.

Lateral - A branch or twig growing from a parent branch or stem in a horizontal direction from the parent stem.

Leader- A dominant upright stem, usually the main trunk.

Lean- Departure from vertical of the stem, beginning at or near the base of the trunk.

Mulch- Any material such as straw, sawdust, leaves, plastic film,, and loose soil that is spread on the surface of the soil to protect the soil and plant roots from the effects of raindrops, soil crusting, freezing, and evaporation

Radial Trenching – A method used to mitigate and replace soil inside the tree root protection zone. Soil is removed from trenches that are 8-12 inches wide and 18-36 inches deep. Trenches are excavated in direct lines toward the base of the tree using air spade, hydraulic excavation or hand careful hand excavation. Backfill can be amended soil, structural soil, a mix of sand and compost, or any combination deemed to be appropriate for the situation.

Root Collar - The junction between the root of a plant and its stem, often indicated by the trunk flare.

Rootcrown - Same as Root Collar.

Root Plate – A circle around the tree that represents the critical area where root cutting will compromise the structural stability of the tree. The root plate is equal to a radial distance from the base of the tree equal to three times the tree diameter (*DBH*). Whenever healthy trees fail due to extreme soil saturation and/or high gusting winds, the root plate is generally visible rootball, where the roots fail.

Roots - An organ of a tree that serves to maintain mechanical support, to provide water and essential elements from the soil through absorption, and to store energy reserves.

Saturation- In soil moisture, the condition in which both macro- and micropores are filled with water.

Scaffold - A large limb that is or will be part of the permanent branch structure of a tree.

Structural Soil – Also known as “gap graded soil”. A mix of rock and soil that is used to provide support for hardscape without eliminating soil air space.

Target - People or property potentially affected by a tree failure.

Thinning Cut - The removal of a branch at its origin or cutting it or the leader to a lateral large enough to assume the terminal role.

Vertical Core Venting – A that procedure that creates vertical holes, usually about 2-inches in diameter, that extend down through compacted soil. The holes can be from 18-inches to over 3-feet deep. Holes are spaced from 6-inches to 2-feet depending upon the site soil conditions. Holes are crated with an augur, water jet or using an air spade.

Water Jet - A procedure that uses high-pressure water and a probe to create air passages in the soil. Primary reason for use is mitigation for compacted soil. Water Jet can be used in conjunction with liquid fertilization only when soil and leaf tissue analysis indicate nutrient limitation.

Wound - An opening that is created when the tree’s protective bark covering is penetrated, cut, or removed, injuring or destroying tissue. Pruning a live branch creates a wound, even when the cut is properly made.

END LIST

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**KAISER OAKLAND MEDICAL CENTER MASTERPLAN
PRELIMINARY TREE SURVEY REPORT**

Oakland, CA

Date: November 1, 2005

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ASSIGNMENT

It was requested that arborist survey all trees within the areas specified and record data on tree species, size, condition and location.

INTRODUCTION

This report provides preliminary tree survey information about the trees in three additional areas that have not yet been surveyed in the area of the Kaiser facility at MaCarther and Broadway in Oakland.

Because planning is not yet complete, tree removal and tree preservation are not discussed. The final tree survey report will address these issues.

The three areas surveyed are as follows:

- Area 1 included all trees within the main Kaiser facility and adjacent City of Oakland street. The area is bordered by the streets of Broadway, McArthur, Howe and on 38th Street. The 38th Street perimeter is completed by private residences bordering the Kaiser facility.
- Area 2 is the property that is adjacent to the Caltrans, Freeway 580 property and lies between Piedmont Ave. and Broadway.
- Area 3 includes all trees planted on the Caltrans Freeway 580 right of way that are on the north side of the freeway between Piedmont Ave. and Broadway.

SUMMARY OF INFORMATION

A summary of the information for each of the three areas is provided. A listing of the individual tree data can be found in Appendix 1. Appendix 2 provides a tree location map.

AREA 1

This area contains most of the existing Kaiser medical buildings. Trees are located around the perimeter and within the hospital complex. The survey data lists 128 tree locations. Locations #88 and # 105 both have multiple pittosporum counted as one. The survey identified 24 City of Oakland street trees that are located on all four sides of this area.

Thirty-six different tree species were identified in area 1. The four most numerous species are Calleryana Pear, Coast Live Oak, Swamp Myrtle and African Fern Pine.

Most trees were in stable to good condition. Thirteen trees were listed as either poor or fair-poor health. Many of the trees would benefit from some proper pruning.



A summary of the data is provided in the table below.

Species	Common Name	# of Trees	# City Trees	Comments
<i>Acacia melanoxylon</i>	Blackwood Acacia	1	1	In poor condition
<i>Acer palmatum</i>	Japanese Maple	5		
<i>Acer rubrum</i>	Red Maple	7	6	Most are City street trees located on 38 th St.
<i>Arbutus X 'Marina'</i>	Hybrid Strawberry Tree	1		
<i>Aurucaria heterophylla</i>	Norfolk Island Pine	2		
<i>Cercis canadensis</i>	Eastern Redbud	1		
<i>Cunninghamia lanceolata</i>		1		In container
<i>Cupressus sempervirens</i>	Italian Cypress	6		
<i>Dodonaea viscosa</i>	Coffee Bush	1		
<i>Ensete ventricosum</i>	Bannana	2		
<i>Fagus sylvatica</i>	Beech	2		
<i>Feijoa sellowiana</i>	Pineapple Guava	2		
<i>Juniperus chinensis 'chinensis'</i>	Hollywood Juniper	1		
<i>Ligustrum lucidum</i>	Glossy Privett	2		Undesirable species.
<i>Liquidambar styraciflua</i>	Sweet Gum	7		
<i>Magnolia soulangiana</i>	Saucer Magnolia	2		
<i>Malus sp.</i>	Crabapple	3		
<i>Picea brewerana</i>	Brewer's Spruce	1		
<i>Pinus mugo</i>	Mugo Pine	2		
<i>Pinus pinea</i>	Italian Stone Pine	1		Grew from seed
<i>Pittosporum eugenioides</i>	Pittosporum	13		
<i>Pittosporum tobira</i>	Pittosporum	10		
<i>Pittosporum undulatum</i>	Victorian Box	1		
<i>Platanus x acerifolia</i>	London Plane	4	4	
<i>Podocarpus gracilior</i>	African Fern Pine	9		
<i>Prunus ceracifera</i>	Cherry Plum	1		
<i>Prunus sp.</i>	Flowering Cherry	6		
<i>Pyrus calleryana</i>	Calleryana Pear	19	10	Primarily street trees on Howe
<i>Quercus agrifolia</i>	Coast Live Oak	15	4	
<i>Quercus suber</i>	Cork Oak	2		
<i>Robinia pseudoacacia</i>	Black Locust	3		
<i>Salix lasiolepis</i>	Creek Willow	1		
<i>Syzygium paniculatum</i>	Eugenia	1		
<i>Trachycarpus fortunei</i>	Windmill Palm	1		
<i>Tristania laurina</i>	Swamp Myrtle	10		
<i>Washingtonia robusta</i>	Mexican Fan Palm	1		



AREA 2

Area 2 is located on private property between Broadway and Piedmont adjacent to Freeway 580. A total of fourteen trees were identified within the properties. There were no City street trees in this area.

Table 2 below provides the number of trees and species.

Latin Name	Common Name	# Trees	Comments
<i>Acer palmatum</i>	Japanese Maple	1	
<i>Diospyros kaki</i> 'Fuyu'	Persimmon	1	In pavement
<i>Eriobotrya japonica</i>	Loquat	1	In pavement
<i>Eucalyptus nicolii</i>	Nichols Peppermint Gum	1	
<i>Magnolia grandiflora</i>	Southern Magnolia 'Russet'	6	
<i>Podocarpus gracilior</i>	African Fern Pine	1	
<i>Prunus sp.</i>	Plum	1	In pavement
<i>Sequoia sempervirens</i>	Coast Redwood	1	
<i>Washingtonia robusta</i>	Mexican Fan Palm	1	75 feet tall

AREA 3

Area 3 is on Caltrans property on the north side of Freeway 580, between Broadway and Piedmont Ave. All trees belong to Caltrans. Most trees are located between 2 and 4 feet from the fence line.

Table 3 below provides tree species and numbers for the Caltrans trees.

Latin Name	Common Name	# Trees	Comments
<i>Acacia melanoxyton</i>	Blackwood Acacia	1	
<i>Acer negundo</i>	Box Elder	1	In pavement
<i>Quercus agrifolia</i>	Coast Live Oak	1	
<i>Sequoia sempervirens</i>	Coast Redwood	25	fair to poor health

END REPORT

- Appendix 1 Tree survey information
- Appendix 2 Tree location map



TREE SURVEY DATA FOR KAISER HOSPITAL OAKLAND

AREA 1 TREES

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
1	Platanus x Acerifolia	12	30	2	2	city tree
2	Platanus x Acerifolia	12	30	2	2	city tree
3	Platanus x Acerifolia	9	30	2	2	city tree
4	Platanus x Acerifolia	15	30	2	2	city tree
5	Quercus suber	18	30	3	3	remove Rhodadendron under
6	Quercus agrifolia	21	30	2	3	
7	Prunus ceracifera	6,6,6,5,4	20	2	3	
8	Quercus suber	21	35	3-4	3	some oozing
9	Liquidambar styraciflua	25	55	3	3	endweight
10	Liquidambar styraciflua	28	55	3	4	messy structure
11	Fagus sylvatica	3,3,4,5,5	20	2	3	5' from liquidambar
12	Prunus sp. (cherry)	4,3.5	10	3	3	
13	Syzygium paniculatum	2	15	2	3	
14	Pinus m. mugo	5 cal.	8	2	3	
15	Pinus m. mugo	5 cal.	8	3-4	3	
16	Picea brewerana	6 cal.	8	3	3	
17	Quercus agrifolia	14	15	3-4	3	city tree
18	Quercus agrifolia	8	10	4	3-4	city tree
19	Quercus agrifolia	7	15	3-4	3	city tree
20	Quercus agrifolia	9	15	3-4	3	city tree
21	Fagus sylvatica	4, 4, 3	15	3	3	aphids, 5" from lliquidambar
22	Liquidambar styraciflua	27.5	60	3	3	
23	Juniperus chinensis chinensis	3.5	10	3	3	
24	Liquidambar styraciflua	21	55	3	3-4	codominant
25	Liquidambar styraciflua	27	55	3	3	
26	Liquidambar styraciflua	17	50	3	3	
27	Podocarpus gracilior	12	30	3	4	
28	Podocarpus gracilior	5, 5.5	30	3	4	
29	Podocarpus gracilior	9, 6	30	3	4	

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
30	Liquidambar styraciflua	23.5	60	3	3	
31	Ensete ventricosum	n/a	20	3	2	
32	Persea americana	9	15	3	3	
33	Podocarpus gracilior	14.5	50	2	2-3	
34	Podocarpus gracilior	19	50	2	4	codominant, embedded bark
35	Acer palmatum	7 cal.	15	3-4	3-4	aphids
36	Malus sp.	3	15	3	3-4	
37	Magnolia soulangiana	7.5	20	3	3	
38	Prunus sp. (flowering cherry)	9	20	3	3	
39	Dodonaea viscosa	3.5	15	3	3	
40	Podocarpus gracilior	23.5	55	2	3-4	codominant, embedded bark
41	Persea americana	13.5	35	3	3	
42	Feijoa sellowiana	6, 4	10	3-4	3	
43	Feijoa sellowiana	6, 4, 3	10	3-4	3	
44	Ligustrum lucidum	21	35	2	3	
45	Pittosporum undulatum	10,6,11,3,4,	35	2-3	4	embedded bark (many)
46	Podocarpus gracilior	12	20	2	4	
47	Podocarpus gracilior	8	25	2	4	
48	Cunninghamia lanceolata	5, 6	15	2	3-4	under awning
49	Podocarpus gracilior	3	15	2	2	under awning, container
50	Pyrus calleryana	10	20	3	3	large basal wound, outgrown metal grate
51	Pyrus calleryana	8	25	3	3	city tree, EB, some fireblight
52	Pyrus calleryana	7	20	4	3	
53	Pyrus calleryana	5	20	4	3-4	city tree
54	Pyrus calleryana	7	20	4	3	
55	Pyrus calleryana	11	30	2	4	city tree, codom., EB, grate
56	Pyrus calleryana	7	20	3	3	grate
57	Pyrus calleryana	5	15	4	4	city tree
58	Pyrus calleryana	7	20	3	3	
59	Pyrus calleryana	8	25	3	4	city tree
60	Pyrus calleryana	8.5	20	3	3	city tree
61	Pyrus calleryana	3	15	3-4	3	city tree
62	Pyrus calleryana	6	20	2	2	city tree
63	Pyrus calleryana	8	20	2-3	3-4	city tree, EB
64	Pyrus calleryana	6.5	15	2-3	4	city tree, codom.

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
65	Cupressus sempervirens	2.5	20	2	3	remove stake
66	Pyrus callereyana	4.5	20	2	3	
67	Prunus sp. (flowering cherry)	2	10	3	3	
68	Cupressus sempervirens	2.5	20	2	2	
69	Magnolia soulangiana	1.5 cal.	5	4	3	has not grown
70	Prunus sp. (flowering cherry)	2	8	3	3	
71	Cupressus sempervirens	2, 2	20	2-3	3	
72	Pyrus callereyana	8	20	2	2	
73	Prunus sp. (flowering cherry)	2	8	2	2	
74	Cupressus sempervirens	3	20	2	2	
75	Pyrus callereyana	8.5	20	2	3-4	codom., EB
76	Cupressus sempervirens	1, 1	10	3	3	
77	Prunus sp. (flowering cherry)	2	8	3	3-4	
78	Pyrus callereyana	8	20	2	3	
79	Cupressus sempervirens	1.5	10	3	3	
80	Tristania laurina	3" multi	20	3	3	
81	Pinus pinea	3	10	2	2	remove
82	Tristania laurina	5" multi	15	3	3	
83	Tristania laurina	4" multi	15	3	3	
84	Tristania laurina	3" multi	15	3	3	
85	Tristania laurina	3" multi	15	3	3	
86	Tristania laurina	3" multi	15	3	3	
87	Tristania laurina	3" multi	15	3	3	
88	Pittosporum eugeniodes		15	3	3	
89	Acer palmatum	9" cal	15	3	3	codom., EB
90	Acer palmatum	12" cal	15	3	3	
91	Acer palmatum	6.5" cal	15	3	3	
92	Washingtonia robusta	n/a	2' clear	3	3	
93	Tristania laurina	4,4,3,3	20	3	3	
94	Tristania laurina	4,4,3,3,3	20	3	3	
95	Tristania laurina	4" multi	20	3	3	
96	Acer rubrum	4.5	20	3	3	city tree
97	Acer rubrum	5	20	3	3	city tree
98	Acer rubrum	4.5	20	3	3	city tree
99	Acer rubrum	5	20	3	3	city tree

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
100	Acer rubrum	4	20	3	3	city tree
101	Acer rubrum	6	20	3	3	
102	Ligustrum lucidum		15	3	3	
103	Acer rubrum	7	25	2	2	city tree
104	Acer palmatum	8" cal.	20	3	3	
105	Pittosporum tobira and eugeniodes		15	3	3	
106	Malus sp.	4,4	15	3	3	
107	Ensete ventricosum	12	10	3	3	
108	Trachycarpus fortunei	8	8	3	3	
109	Aurucaria heterophylla	2	8	3	3	
110	Cercis canadensis	2	10	3	3	
111	Aurucaria heterophylla	5	15	3	3	
112	Malus sp.	3	10	3	3	
113	Arbutus marina	7	20	3	3	
114	Robinia pseudoacacia	10, 10	40	3	4	
115	Acacia melanoxylon	17, 18	40	3	4	
116	Quercus agrifolia	10, 12	20	3	3	hedged
117	Robinia pseudoacacia	12	35	3	3	
118	Quercus agrifolia	6	15	2	2	
119	Robinia pseudoacacia	10	20	3	4	many root sprouts
120	Quercus agrifolia	18	30	2	2	
121	Quercus agrifolia	11,6	25	3	3	
122	Quercus agrifolia	12	30	3	3	codom.
123	Quercus agrifolia	5	25	3	2	
124	Quercus agrifolia	7, 9, 9	25	3	3-4	codom., EB
125	Quercus agrifolia	12	20	3	3	
126	Quercus agrifolia	11.5	25	3	4	embedded bark
127	Quercus agrifolia	3	10	3	3	
128	Salix lasiolepis	6" multi	15	2-3	2-3	

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
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AREA 2 TREES

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
1	Washingtonia robusta	75' clear				
2	Eriobotrya japonica	8.5	25	2-3	2	growing from cement
3	Diospyros kaki	4	10	2-3	3	growing from cement
4	Prunus	7,5,5	20	4	4	growing from cement, declining
5	Eucalyptus nicolii	14	25	3	3	
6	Magnolia sp.	4	15	3	3	
7	Magnolia sp.	4	15	3	3	
8	Magnolia sp.	4	15	3	3	
9	Magnolia sp.	4.5	15	3	3	
10	Magnolia sp.	4.5	15	3	3	
11	Magnolia sp.	3.5	15	3	3	
12	Sequoia sempervirens	4	15	3	3	
13	Acer palmatum	6" cal.	10	3	4	
14	Podocarpus gracilior	6	20	3	3	

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
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AREA 3 TREES CALTRANS R.O.W.

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
1	Quercus agrifolia	4	8	4	3	in corner
2	Sequoia sempervirens	16,7	45	3-4	3	
3	Sequoia sempervirens	17,17	70	3	3	all redwoods spaced at 10'
4	Acer ningundo	7	15	3	4	
5	Sequoia sempervirens	30	70	3	3	
6	Sequoia sempervirens	24	75	3	3	
7	Sequoia sempervirens	12	70	3	3	
8	Sequoia sempervirens	26	60	3	3	
9	Sequoia sempervirens	35	70	3	3	
10	Sequoia sempervirens	14,12,4	50	3	3	
11	Sequoia sempervirens	14,17	50	3	3	
12	Sequoia sempervirens	20	50	3	3	
13	Sequoia sempervirens	23	60	3	3	
14	Sequoia sempervirens	27	60	3	3	
15	Sequoia sempervirens	19	50	3	3	
16	Sequoia sempervirens	10	30	3	3	
17	Sequoia sempervirens	25	50	3	3	stump on sputh side of sidewalk
18	Sequoia sempervirens	14,5	45	3	3	
19	Sequoia sempervirens	13,6	45	4	3	top dead
20	Sequoia sempervirens	16	40	3	3	
21	Sequoia sempervirens	20	45	4	3	top dead
22	Sequoia sempervirens	18	45	3	3	
23	Sequoia sempervirens	10,14	40	4	3	top dead
24	Sequoia sempervirens	19	50	3	3	
25	Sequoia sempervirens	18,13	30	3	3	
26	Sequoia sempervirens	21,5	30	3	3	lean, topped
27	Sequoia sempervirens	15,14	30	3	3	topped
28	Acacia melanoxylon	32	45	3	H	significant decay, EB, hazardous structure

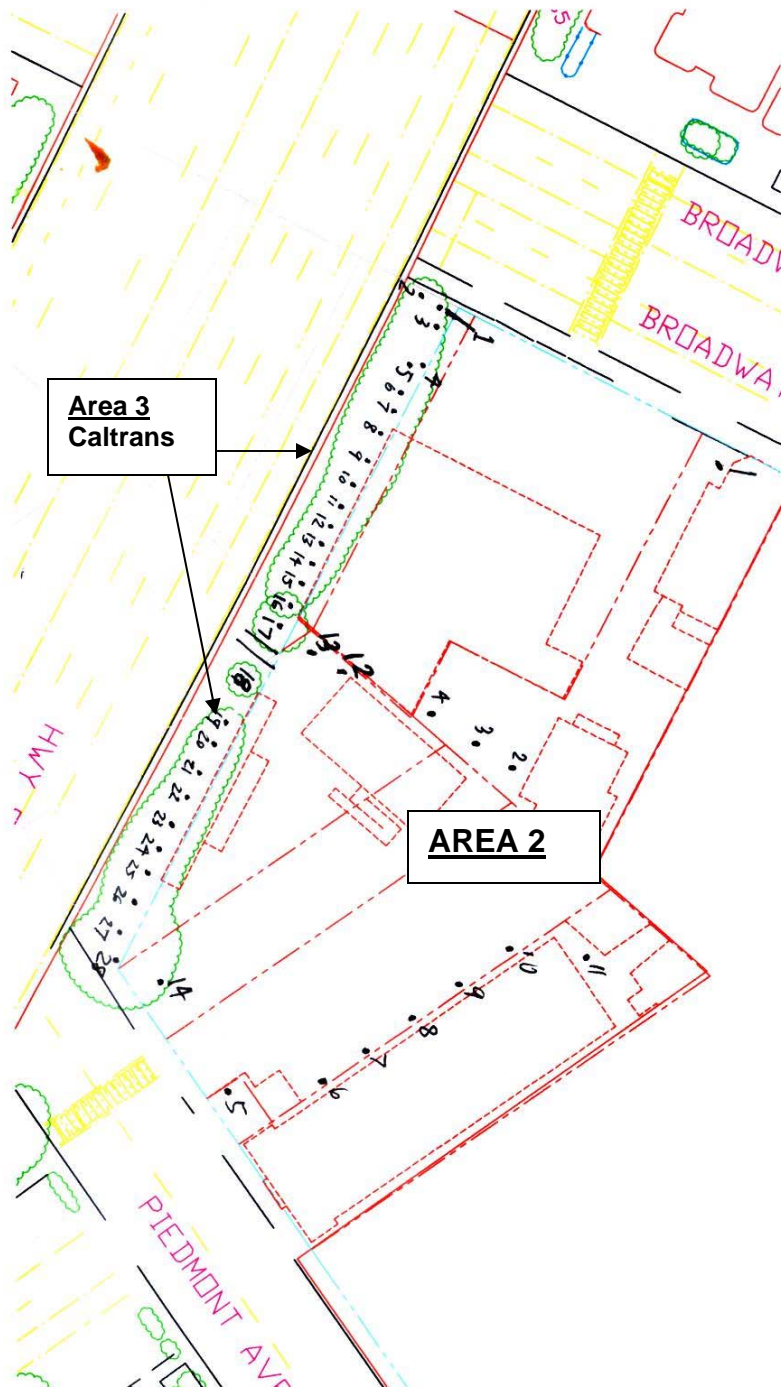
TREE LOCATION MAPS

Area 1



Area 2 and Area 3

The location map below shows locations of trees in area



Prepared for:

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KAISER OAKLAND MEDICAL CENTER (OMC)

TREE IMPACT REPORT

Oakland, CA

Date: February 24, 2006

Prepared by:

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Assignment: Arborist was requested to provide information regarding the removal of “Protected Trees” as defined by City of Oakland Ordinance (Title 12, Chapter 12.36). It was also requested that a listing of trees that may be adversely impacted by the proposed construction projects.

Project Description

Nine areas around the current Kaiser Permanente hospital at MacArthur and Broadway are proposed for construction in the Master Plan document in Exhibit B. This document discusses trees located on or close to four of those sites (#'s 2,4,7 & 8). Trees on sites that are directly adjacent to the sites have been included in the survey data. These include City of Oakland, Caltrans and private residence trees.

The trees were surveyed and the results provided in two previous reports. Trees on Sites 2, 4 & 8 were originally surveyed for the Nov. 1, 2005 report. This survey lists the trees but does not discuss project impacts. Trees on Site 7 are detailed in the report for the West of Broadway Medical Services Building. Trees in this area were surveyed in March of 2005. This report has been updated to reflect project changes and is now dated 2/23/06. Data from the two reports was utilized in the report that follows.

SUMMARY

There are a total of 89 trees on the four construction sites that qualify as “protected trees” under City of Oakland tree ordinance. A total of 47 “protected trees” will be removed. A total of 42 “protected trees” may be impacted by construction activities. It appears that 13 of the Coast Redwoods located on Caltrans property may not survive due to excess loss of structural roots. Protection of the Caltrans trees is discussed below.

Table 1.

Table below provides the numbers of “protected trees” that are located in four sites that are proposed for construction activity.

SITE	OWNER	NUMBER OF PROTECTED TREES	Protected Trees removed or adversely impacted by construction	Protected Trees potentially impacted by construction
Site 2	Kaiser	26	12	14
Site 2	City	9	0	9
Site 4	Kaiser	0	0	0
Site 4	Caltrans	27	13 ¹	14
Site 7	Kaiser	6	5	1
Site 7	City	6	4	2
Site 8	Kaiser	13	13	0
Site 8	City	2	0	2
Totals		89	47	42

¹ Due to the closeness of the root system to the proposed construction, the trees on Caltrans property may be adversely impacted despite efforts to protect the roots as described below.



DISCUSSION OF INDIVIDUAL SITES AND TREES.

Information provided in this section is from tree surveys conducted earlier. The identification numbers of the tree correspond to locations on the site plan. Only trees that qualify as “protected trees” as defined by City of Oakland Ordinance 12.36.020 are listed.

A list of all trees on and adjacent to Sites 2, 4 & 8 can be found in Appendix 1 of the Nov. 1, 2005 report entitled KAISER OAKLAND MEDICAL CENTER MASTERPLAN, PRELIMINARY TREE SURVEY REPORT dated November 1, 2005.

Data on all trees located on and adjacent to Site 7 can be found in the report entitled WEST BROADWAY MEDICAL SERVICES BUILDING TREE SURVEY REPORT, revised February 23, 2006.

Column Heading Descriptions

- **#** - Corresponds to the number located on the site plan.
- **Species** – Tree species.
- **DBH (in.)** – Tree diameter in inches measured at 54 inches above the average soil grade. More than one number in this column indicates multi-stems.
- **Ht.** – Tree height to the nearest 5 feet.
- **Hlth** – Tree health. Some data provides a rating. Numbers correspond to the following: 1- excellent, 2-good, 3-stable or fair, 4- poor, and 5- dead or dying.
- **Str.** – Tree Structure classification is as follows: 1- excellent, 2-good, 3-fair, 4-poor, 5-hazardous

• KAISER PROJECT SITE 2

Project Site 2 is located on the site of the current hospital. This site has trees belonging to both Kaiser and the City of Oakland. Tree numbers correspond to numbers on site plan. There are 35 “protected trees” in this area.

Table 3.

Site 2 Protected Trees to be removed.

Twelve trees classified as “Protected Trees” by the City of Oakland will be removed

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
5	Quercus suber	18	30	3	3	
7	Prunus ceracifera	6,6,6,5,4	20	2	3	
8	Quercus suber	21	35	3-4	3	some oozing
9	Liquidambar styraciflua	25	55	3	3	end weight
10	Liquidambar styraciflua	28	55	3	4	messy structure
11	Fagus sylvatica	3,3,4,5,5	20	2	3	5' from liquidambar



12	Prunus sp. (cherry)	4,3.5	10	3	3	
22	Liquidambar styraciflua	27.5	60	3	3	
40	Podocarpus gracilior	23.5	55	2	3-4	codominant, embedded bark
41	Persea americana	13.5	35	3	3	
45	Pittosporum undulatum	5,8,10,6,11,3,4,4,3	35	2-3	4	embedded bark (many)
46	Podocarpus gracilior	12	20	2	4	

Table 4.

Site 2 Protected Trees at Risk from Construction Impact

#	Species	DBH (in.)	Ht.	Hlth.	Str.	Notes
1	Platanus x Acerifolia	12	30	2	2	city tree
2	Platanus x Acerifolia	12	30	2	2	city tree
3	Platanus x Acerifolia	9	30	2	2	city tree
4	Platanus x Acerifolia	15	30	2	2	city tree
6	Quercus agrifolia	21	30	2	3	
17	Quercus agrifolia	14	15	3-4	3	city tree
18	Quercus agrifolia	8	10	4	3-4	city tree
19	Quercus agrifolia	7	15	3-4	3	city tree
20	Quercus agrifolia	9	15	3-4	3	city tree
24	Liquidambar styraciflua	21	55	3	3-4	codominant
25	Liquidambar styraciflua	27	55	3	3	
26	Liquidambar styraciflua	17	50	3	3	
27	Podocarpus gracilior	12	30	3	4	
28	Podocarpus gracilior	5, 5.5	30	3	4	
29	Podocarpus gracilior	9, 6	30	3	4	
30	Liquidambar styraciflua	23.5	60	3	3	
32	Persea americana	9	15	3	3	
33	Podocarpus gracilior	14.5	50	2	2-3	
34	Podocarpus gracilior	19	50	2	4	codominant, embedded bark
38	Prunus sp. (flowering cherry)	9	20	3	3	
44	Ligustrum lucidum	21	35	2	3	
50	Pyrus callereyana	10	20	3	3	large basal wound, outgrown metal grate
55	Pyrus callereyana	11	30	2	4	city tree, codom., EB, grate



KAISER PROJECT SITE 4

Project site 4 covers all trees in the area bordered by Broadway, MacArthur Bl., Piedmont Ave. and Freeway 580. Caltrans trees are discussed separately.

Kaiser Trees

There are 14 trees belonging to Kaiser on site 4. None qualify as "Protected Trees" and all trees will be removed.

Caltrans Trees

This site does impact 28 trees located along Freeway 580 on Caltrans property. Twenty-seven of the trees would qualify as "Protected Trees". Of those trees, 25 are Coast Redwood. The numbers of trees listed to be saved or impacted in this area are considered to be preliminary.

The three non redwood trees are a small Coast Live Oak, a small Box Elder and an old Blackwood Acacia that is considered to be structurally unsound. All three are growing on the property line and likely developed from seedlings.

The redwood tree spacing is generally 10 feet on center. Most redwood trees are in stable health with five in poor health. Because of the proximity of many of the Caltrans trees to the proposed structure, special treatments will be required. The table below provides information on the root plate radius and the distance to the back of shoring for the parking structure. The range of distance behind the property line where roots will be cut is based upon suggestions provided below that deal with treatments and care of the trees.

Impacted Trees on Caltrans Site

Preliminary determination of trees with potential adverse impacts due to construction activities was based upon the distance between the base of the tree and the back of shoring for the adjacent garage, and the diameter (DBH) of the individual trees. Larger trees require a larger radius of root protection.

Initial determination of trees likely to be affected is based upon the relationship between the radius of the primary root plate (3 times the tree diameter) and the distance to the back of shoring. Two scenarios are presented in the last two columns of Table 5. Any final determination of tree impacts will be based upon observation of the actual roots that are severed. Trees # 18 thru #27 are not expected to be impacted due to greater setback.

It appears that 13 of the Coast Redwood trees have the potential to be adversely impacted. It is yet uncertain as to the exact location of the soldier piles and shoring. The shoring location may range from a 6 inch setback from the fence line, to a 30 inch



setback from the fence line. Trees that suffer significant root loss will require special treatments.

Table 5.

Caltrans Trees - Listed as "Save" and "Possible impact" in last column.

#	Species	DBH (in.)	Ht.	Hlth	Str.	Dist. from base to Fence (feet)	Root Plate (radius) (feet)	30 inch setback from fence line	6 inch setback to back from fence line
1	Quercus agrifolia	4	8	4	3	0	1'	Save	Save
2	Sequoia sempervirens	16,7	45	3-4	3	10'	4.5'	Save	Save
3	Sequoia sempervirens	17,1 7	70	3	3	3.5'	6'	Save	Possible impact
4	Acer ningundo	7	15	3	4	0'	1.75'	Save	Possible impact
5	Sequoia sempervirens	30	70	3	3	4'	7.5'	Possible impact	Possible impact
6	Sequoia sempervirens	24	75	3	3	3.5'	6'	Save	Possible impact
7	Sequoia sempervirens	12	70	3	3	4.5'	3'	Save	Save
8	Sequoia sempervirens	26	60	3	3	4'	6.5'	Save	Possible impact
9	Sequoia sempervirens	35	70	3	3	2'	9'	Possible impact	Possible impact
10	Sequoia sempervirens	14,1 2,4	50	3	3	1.5'	4.5'	Possible impact	Possible impact
11	Sequoia sempervirens	14,1 7	50	3	3	2.5'	5.5'	Possible impact	Possible impact
12	Sequoia sempervirens	20	50	3	3	3'	5'	Save	Possible impact
13	Sequoia sempervirens	23	60	3	3	2.25'	6'	Possible impact	Possible impact
14	Sequoia sempervirens	27	60	3	3	2'	6.75'	Possible impact	Possible impact
15	Sequoia sempervirens	19	50	3	3	2.25'	4.75'	Save	Possible impact
16	Sequoia sempervirens	10	30	3	3	3.5'	2.5'	Save	Save
17	Sequoia sempervirens	25	50	3	3	3'	5.25'	Save	Possible impact
18	Sequoia sempervirens	14,5	45	3	3	4.5'	3.75'		Save
19	Sequoia sempervirens	13,6	45	4	3	3.75'	5'		Save
20	Sequoia sempervirens	16	40	3	3	4.25'	4'		Save
21	Sequoia sempervirens	20	45	4	3	4'	5'		Save
22	Sequoia sempervirens	18	45	3	3	3.5'	4.5'		Save
23	Sequoia sempervirens	10,1 4	40	4	3	4.25'	4.25'		Save
24	Sequoia sempervirens	19	50	3	3	4.75'	4.75'		Save
25	Sequoia sempervirens	18,1 3	30	3	3	4.5'	5.5'		Save



#	Species	DBH (in.)	Ht.	Hlth	Str.	Dist. from base to Fence (feet)	Root Plate (radius) (feet)	30 inch setback from fence line	6 inch setback to back from fence line
26	Sequoia sempervirens	21,5	30	3	3	2.5'	5.5'		Save
27	Sequoia sempervirens	15,1 4	30	3	3	3.25'	5'		Save
28	Acacia melanoxyton	32	45	3	H	0'	8'	Hazard Removal recommended	No Action

KAISER PROJECT SITE 7 (West of Broadway)

Construction site is on the west side of Broadway. Kaiser and City trees will be impacted. Area 7 has 15 "protected trees"

Table 6.

Site 7 Protected Tree Removal

Tree No.	Species	DBH Inch	Health	Structure	Comments
2	Arizona Cypress (<i>Cupressus glabra</i>)	21	Poor	Poor	Lean
3	Arizona Cypress (<i>Cupressus glabra</i>)	10, 12, 14, 12	Fair	Hazard	Multi stem, included bark.
4	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	9	Poor	Poor	City Street Tree
5	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	9	Fair	Poor	City Street Tree
6	Arizona Cypress (<i>Cupressus glabra</i>)	10, 12, 9	Fair	Hazard	Lean, uplifted soil on side away from lean. Included bark.
7	Arizona Cypress (<i>Cupressus glabra</i>)	18, 18	Fair	Poor	Codominant, included bark.
8	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	13	Fair	Poor	City Street Tree
11	Big Leaf Maple (<i>Acer macrophyllum</i>)	22	Good	Fair-Poor	Decay at base. Lean.
13	Cherry Plum (<i>Prunus cerasifera</i>)	6, 6, 4, 4	Poor-Fair	Poor	Much dieback due to shade.

Table 7.

Site 7 Protected Trees to be Impacted

1	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	14	Fair	Poor	City Street Tree
16	London Plane (<i>Platanus x acerifolia</i>)	15	Good	Good	City Tree, Close to proposed structure.
17	London Plane (<i>Platanus x acerifolia</i>)	16	Good	Good	City Tree
19	Raywood Ash (<i>Fraxinus oxycarpa</i> 'Raywood')	12.5	Fair	Poor	City Street Tree



KAISER PROJECT SITE 8

Area 8 is at the corner of area 2 and the numbers refer to both areas. There are 15 “protected trees” in this construction area.

Table 8.

Site 8 Tree Removals

#	Species	DBH	Ht.	Hlth.	Str.	Notes
107	Ensete ventricosum	12	10	3	3	
116	Quercus agrifolia	10, 12	20	3	3	hedged
117	Robinia pseudoacacia	12	35	3	3	
118	Quercus agrifolia	6	15	2	2	
119	Robinia pseudoacacia	10	20	3	4	many root sprouts
120	Quercus agrifolia	18	30	2	2	
121	Quercus agrifolia	11,6	25	3	3	
122	Quercus agrifolia	12	30	3	3	codom.
123	Quercus agrifolia	5	25	3	2	
124	Quercus agrifolia	7, 9, 9	25	3	3-4	codom., EB
125	Quercus agrifolia	12	20	3	3	
126	Quercus agrifolia	11.5	25	3	4	embedded bark
128	Salix lasiolepis	6" multi	15	2-3	2-3	

Table 9.

Site 8 Protected Trees Impacted

#	Species	DBH	Ht.	Hlth.	Ht.	Notes
114	Robinia pseudoacacia	10, 10	40	3	4	City Street Tree
115	Acacia melanoxylon	17, 18	40	3	4	City Street Tree



Procedures for Root Cutting and Health Mitigation Treatments

This section primarily addresses the needs of the Coast Redwood Trees that are located on Caltrans property adjacent to the proposed parking structure on Site 4.

Trenching – A mechanical trenching machine is recommended for this procedure. Trench should be 4-6 inches wide and 3 feet deep. The trench is located 6 inches beyond the location of the final bank cut.

Open the Trench for Assessing Root Loss – The trench can be widened by use of a backhoe or other such equipment. After the trench is opened, arborist will inspect root loss, make an assessment and provide recommendations accordingly.

Root Pruning – All work in this operation is by hand. The bank is cut back an additional 6 inches to the predetermined location. All roots are cleanly cut.

Cover Bank and Exposed Roots – The exposed roots and bank are covered with 4 layers of burlap or other acceptable material and an outer layer of geotextile fabric. The burlap is used to a depth of 3 feet.

Health Mitigation – Health mitigation treatments will be prescribed based upon the site conditions and level of adverse impact suffered. Best results are achieved when health mitigation is administered prior to the time of the adverse impact. Possible treatments are listed below:

Mulch – Mulching will prevent soil compaction.

Install Water System – A temporary water system must be installed on the side of the trees where roots were lost.

Compost and Compost Tea – Compost and compost tea supply many nutrients and micronutrients.

Sugar Solution – A sugar-water solution made up of 30 grams of sugar per liter of water may be used immediately after root cutting. The solution is applied at the rate of one liter per square meter of soil surface area.

Remove Asphalt – As is possible, the asphalt in the parking facility should be removed to expand the soil surface area available for gas exchange and water infiltration.

Soil and Leaf Tissue Analysis – Before the addition of any fertilizer the needs of the trees must be determined. General procedure would be to collect three composite soil samples and three tissue samples for laboratory analysis.

Monitor Trees – Trees will require regular health monitoring until the trees are determined to be in stable health. Monitoring will be for insects, disease and soil moisture conditions. Tree monitoring is expected to continue for 3-5 years after the completion of construction. During this time, the arborist providing the monitoring may elect to provide additional health mitigation treatments.



Tree Protection Guidelines

The tree protection guidelines are designated to protect the trees from construction injury. Trees are damaged by mechanical injury and soil disturbance or compaction.

Current Fence Remains in Place - The best protection for the trees is to allow the current chain-link fencing to remain in place.

Protection of Main Stem - Protect vulnerable areas by securing 2x4 boards to the main upright stem(s) of the trees where possible injury could occur. Project arborist or Caltrans arborist will direct the placement.

Root Protection – Arborist will supervise all activities that impact roots including utility trenching or other activities within the designated tree root protection zone. Root cutting should not be a factor for the trees at the east end of the row. However, soil compaction is a serious concern. Tree roots are protected by 12 inches of wood chips with either metal plates or 1 1/8 inch plywood placed on top in critical root areas. Arborist will direct placement of root protections.

END

