

Appendix F

**Arborist Report for the
State Route 32 Widening Project:
State Route 99 to Yosemite Drive**

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for the
State Route 32 Widening Project:
State Route 99 to Yosemite Drive**

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Arborist Report for the State Route 32 Widening Project: State Route 99 to Yosemite Drive

Purpose and Scope

The City of Chico (City) is planning to widen State Route (SR) 32 between SR 99 to the west and Yosemite Drive to the east. This arborist report documents existing tree resources, potential project effects on tree resources, and recommendations for avoidance, minimization, and mitigation of potential effects. Appendix A of this report identifies tree resources at the project site, trees to be removed, and reason for removal.

Project Description

The widening of SR 32 would provide additional capacity needed to accommodate approved and planned development on and near the SR 32 corridor between SR 99 and Yosemite Drive. The proposed project would widen and improve approximately 2.6 miles of SR 32, beginning at SR 99 at the west end of the project corridor and extending east past Yosemite Drive. The project would widen the highway to include a median and four lanes, with most of the widening to the north within existing state right-of-way. As the project approaches Bruce Road, the widening would likely become more symmetrical around the centerline, with most of the widening to the north and some widening to the south. The project would extend four lanes past Yosemite Drive and would then taper back to two lanes east of Yosemite Drive.

Three design options that involve different sound barrier materials and one design option that involves a higher sound barrier are evaluated in this report. Design Options A1–A3 involve the use of different materials for the sound barrier. Design Option A4 involves construction of a higher barrier. Location Options B1 and B2 entail extension of the sound barrier.

Sound Barrier Design Option A1: Pre-Cast Concrete Wall

Under Option A1, a 6-foot-high pre-cast concrete wall (measured from the existing grade at the Caltrans ROW/private property line) would be constructed at the proposed sound barrier locations shown in Figures A-1a–f (see Appendix A of this report). The wall would be placed within Caltrans ROW, adjacent to the private property line. Each modular panel of pre-cast concrete is approximately 5–8 feet long by approximately 2 feet wide.

Sound Barrier Design Option A2: Concrete Block Wall

Under Option A2, 6-foot-high concrete sound walls would be constructed within the Caltrans right-of-way, adjacent to the private property lines, at all proposed locations shown in Figures A-2a–f. The concrete block wall would have greater impacts than the pre-cast concrete wall the block wall because it would be constructed of full size sections of wall that would require access for heavy equipment for installation thereby requiring more tree removal.

Sound Barrier Design Option A3: Wooden Fence

Under Option A3, a 6-foot-high wooden fence would be built within the residential properties at the proposed locations shown in Figures A-3a–f.

Sound Barrier Design Option A4: 8-Foot High Barrier

Under this option, an 8-foot-high barrier, rather than a 6-foot-high barrier would be constructed, measured from the existing ground elevation at the residential property lines, using one of the materials described above. For the purposes of this report, it is assumed that this option would have the same impacts as 6-foot high barriers.

Sound Barrier Location Option B1: Extend Barrier East of Forest Avenue to El Monte Avenue on North Side of SR 32

Option B1 is located on the north side of SR 32 east of Forest Avenue to El Monte Avenue. See Figures A-1e–f, A-2e–f, and A-3e–f (Appendix A of this report).

Sound Barrier Location Option B2: Extend Barrier East of Fir Street on North Side of SR 32

Option B2 is located on the north side of SR 32 between Fir Street and approximately SR 32 station 111+00. See Figures A-1a-b, A-2a-b, and A-3a-b (Appendix A of this report).

Project Location

The SR 32 widening project is located between the SR 99 southbound exit ramp to the west and Yosemite Drive to the east in the City of Chico, Butte County. SR 32 crosses SR 99 and is a two- to four-lane, east-west highway providing connections between Interstate 5 to the west and Chico and rural communities to the north and east of Chico. Through the project area, SR 32 transitions from west to east as a one-way city couplet (East 8th Street and East 9th Street) to a four-lane state highway to a two-lane state highway west of Forest Avenue and extending past Yosemite Drive.

Native oaks and landscape tree species are present in the project area (Appendices A and B). Native oak species include valley oak (*Quercus lobata*) and interior live oak (*Quercus wislizenii*). Landscape tree species consist primarily of ornamental species that are not native to California. Some of the trees surveyed occur on private property adjacent to the project area. Additional information pertaining to tree resources is provided in subsequent sections of this arborist report and in Appendices A and B.

Regulatory Thresholds

The City has a tree preservation ordinance in place that protects tree resources and a standard mitigation measure for sites containing oak trees.

City of Chico Tree Preservation Ordinance

The City Tree Preservation Ordinance (Chico Municipal Code, Chapter 16.66) defines a “tree” or “trees” as the following.

- Any live woody plant having a single perennial stem of 24 inches or more in diameter, or multistemmed perennial plant greater than 15 feet in height having an aggregate circumference of 40 inches or more, measured at four feet six inches above adjacent ground.
- Tree or trees required to be preserved as part of an approved building permit, grading permit, demolition permit, encroachment permit, use permit, tentative or final subdivision map.

- Tree or trees required to be planted as a replacement for unlawfully removed tree or trees.
- “Tree” or “trees” does not mean Ailanthus, Chinese tallow, privet, or box elder.

City of Chico Standard Mitigation Measure for Sites Containing Oak Trees

All native oak trees over six inches diameter at breast height (dbh) on the project site shall be preserved to the maximum extent practical.

Methods of Survey

Tree surveys were performed between East 8th Street (Station 100+00) and the easternmost limit of proposed fence/sound barrier mitigation (approximately Station 149+00). Tree resources were previously inventoried by Gallaway Consulting, Inc., and the results on the inventory were provided in the Natural Environmental Study (November 2006). Mark Thomas & Company, Inc., subsequently prepared a tree removal plan as part of the construction document set (June 2008). ICF Jones & Stokes arborists assessed previously surveyed trees and surveyed additional tree resources not previously surveyed using standard professional practices on September 3, 2008. All trees were assessed that have potential for impacts from three basic mechanisms resulting from construction activities: removal, canopy impacts, and root zone impacts.

Tree Removal

Tree removal would be required to facilitate placement or construction of a project feature. For this project, the removal mechanisms include:

- roadway improvements,
- clear recovery zone (CRZ) removals,
- wooden fence construction,
- pre-cast concrete wall construction, and
- concrete block wall construction.

The following assumptions were used to determine if trees would be removed.

Roadway Improvements

- All trees occurring within the footprint of proposed roadway, bridge, or sidewalk improvements would be removed.

- All trees occurring within the fill soil placement limit would be removed.
- All trees occurring outside of the fill soil placement limit that would not require immediate removal, but where a significant amount of grading or fill placement would occur within the drip line.

Clear Recovery Zone

- All trees occurring with the CRZ, as shown on Appendix A, would be removed.

Pre-Cast Concrete Wall Construction

- It is assumed that fewer trees could be removed if the pre-cast concrete wall were constructed rather than the concrete block wall. All trees occurring within the footprint of wall would be removed. Trees whose root zones would be significantly impacted or whose canopy would require significant canopy pruning to construct the wall would also be removed.
- Trees on private property or on the Caltrans right-of-way whose root zones would be significantly impacts or whose canopy would require significant canopy pruning to construct the wall.

Concrete Block Wall Construction

- All trees located between the block wall and SR 32 that were not removed for roadway improvements or the CRZ would be removed for sound barrier construction. It is assumed that sound barrier construction within the Caltrans right-of-way would require the removal of all trees to provide adequate work areas to operate heavy equipment and to construct the wall.
- Trees on private property or on the Caltrans right-of-way, whose root zones would be significantly impacts or whose canopy would require significant canopy pruning to construct the wall.

Wooden Fence Construction

- Several trees occur on or near the Caltrans right-of-way. It is assumed that most trees could be avoided with the wooden fence offset from the right-of-way and a non-linear fence alignment used to avoid some trees. For the purpose of this analysis, trees that are located on the right-of-way in the proposed project footprint were assumed to be removed. No trees would be removed for the installation of a wooden fence in Option area 1 or 2.

Canopy Impacts

Canopy impacts are associated with clearance for equipment during construction activities or to provide vertical clearance for future structures. For this project, the canopy pruning mechanisms include roadway improvements, concrete sound barrier construction, and wooden fence construction. The following assumptions were used to determine if trees would require pruning.

Roadway Improvements

- Limbs overhanging the roadway, bridge, or sidewalk construction areas from trees located within the right-of-way or on private property would be pruned to facilitate equipment access.

Clear Recovery Zone

- Limbs overhanging the CRZ from trees located within the right-of-way or on private property would be pruned if the limbs would affect access within the CRZ or if limbs require pruning to remove other trees within the CRZ.

Concrete Block Wall Construction

- It is assumed that all trees within the right-of-way would be removed. Limbs overhanging the concrete sound barrier construction area from trees located on private property would be pruned if the limbs would affect sound barrier construction. The number of trees to be pruned and the extent of pruning on individual trees will be finalized based on the construction methods and final sound barrier design.

Pre-Cast Concrete Wall Construction

- It is assumed that fewer trees within the right-of-way would be removed than from construction of the concrete block wall. Limbs overhanging the pre-cast concrete wall construction area from trees located within the right-of-way and on private property would be pruned if the limbs would affect sound wall construction. The number of trees to be pruned and the extent of pruning on individual trees will be finalized based on the construction methods and final sound barrier design.

Wooden Fence Construction

- It is assumed that many of the trees located between the CRZ limit and the right-of-way would be preserved. Limbs overhanging the wooden fence construction area from trees located within the right-of-way and on private property would be pruned if the limbs would affect wooden fence construction. The number of trees to be pruned and the extent of pruning on

individual trees will be finalized based on the final placement and design of the wooden fence and the construction methods.

Root Zone Impacts

Root zone impacts include damage to structural support or feeder roots during grading or trenching activities. For this project, the canopy pruning mechanisms include roadway improvements, concrete sound barrier construction, and wooden fence construction. The following assumptions were used to determine if root zone impacts would occur.

Roadway improvements

- Work would occur within the drip line of some trees located outside of the construction areas. Project effects to the root zone may include soil disturbance, fill placement, or compaction for equipment operation. Most of these trees are located within the Caltrans right-of-way.

Clear Recovery Zone

- Work would occur within the drip line of some trees located outside of the CRZ. Project effects to the root zone may include soil disturbance, fill placement, or compaction from equipment operation. Most of these trees are located within the Caltrans right-of-way.

Pre-Cast Concrete Wall Construction

- Work would occur within the drip line of some trees preserved within the right-of-way or trees located on private property. Project effects to the root zone may include soil disturbance due to sound wall footing excavation or compaction from equipment operation.

Concrete Block Wall Construction

- It is assumed that all trees within the right-of-way would be removed. Work would occur within the drip line of some trees located on private property. Project effects to the root zone may include soil disturbance due to sound barrier footing excavation or compaction from equipment operation.

Wooden Fence Construction

- It is assumed that many of the trees located between the CRZ limit and the right-of-way would be preserved. Work would occur within the drip line of some trees located within the right-of-way or on private property. Project

effects to the root zone may include soil disturbance due to post hole excavation or compaction from equipment operation.

Gallaway Consulting Tree Survey Methods

The initial tree survey was based on a preliminary design and focused on project construction-related effects, specifically roadway improvement and CRZ tree removals. The wooden fence and concrete sound barrier features had not been developed at the time of the initial survey and therefore trees within the right-of-way or on private property that would be affected by these sound barrier features were not evaluated.

Each tree was assigned an individual number and a flexible, aluminum tree tag, with the identification number debossed on the tag was nailed to each tree. Several of the tags had fallen off since the time of the original survey and have not been replaced. The assessment criteria and recorded data, presented in Appendix B, included:

- identification of the species;
- dbh (diameter at 4.5 feet above the ground surface);
- assessment of canopy dripline diameter; and
- assessment of health and vigor.

ICF Jones & Stokes Tree Survey Methods

The primary focus of the September 2008 was to assess potential effects related to project construction and mitigation-related features. Because the mitigation-related features were not assessed during the initial tree surveys an additional 114 were identified in the right-of-way and on private property that would be affected by either construction- or mitigation-related project actions.

Each tree was assigned an individual number. Additional trees surveyed by ICF Jones & Stokes arborists were not given tree tags; however the position of each tree was recorded using a hand-held GPS receiver. The assessment criteria and recorded data, presented in Appendix B, included:

- identification of the species;
- dbh (diameter at 4.5 feet above the ground surface); and
- probability and mechanism of impact.

Survey Results

The location of existing tree resources and trees to be affected by project implementation are shown in Appendix A. Specific information pertaining to each tree is provided in Appendix B.

The impact assessment is based on the best available information on the project design. The survey results and the effects on tree resources resulting from each project action are summarized in Tables 1–5 located at the end of this report. Each summary table identifies impacts, by dbh category, to native oak trees and all other trees, including ornamental trees.

Table 1 summarizes the tree removal, canopy pruning and root zone impacts associated with roadway improvement activities. Table 2 summarizes the tree removal, canopy pruning and root zone impacts associated with tree removal within the CRZ. Table 3 summarizes the tree removal, canopy pruning and root zone impacts associated with pre-cast concrete wall construction. Table 4 summarizes the tree removal, canopy pruning and root zone impacts associated with the block concrete wall construction. Table 5 summarizes the tree removal, canopy pruning and root zone impacts associated with wooden fence construction.

The impacts due to roadway improvements and CRZ would occur regardless of the sound barrier mitigation option selected. Tree impacts associated with either the pre-cast concrete block wall, concrete block wall or wooden fence are additive to the impacts identified in Tables 1 and 2.

Summary of Tree Resources in the Project Area

There are a total of 455 native and ornamental trees on the project area including 233 valley oak (*Quercus lobata*), 17 interior live oak (*Quercus wislizenii*), and 205 ornamental trees. Chinese pistache (*Pistacia chinensis*) and coast redwood (*Sequoia sempervirens*) are the most common ornamental species accounting for 32% and 30% of the ornamental species, respectively.

Valley oaks include 23 trees with a dbh of 24 inches or greater and 159 trees with a dbh of between 6 and 23 inches. The combined dbh of all valley oaks is 2,938 inches.

Interior live oaks include 11 trees with a dbh of 24 inches or greater and 1 tree with a dbh of between 6 and 23 inches. The combined dbh of all interior live oaks is 170 inches.

Ornamental trees include 83 trees with a dbh of 24 inches or greater. The combined dbh of these trees is 1,937 inches.

Summary of Impacts to Tree Resources in the Project Area

Impacts Due to Roadway Improvements

A total of 92 trees would be removed for roadway improvements; including 40 native oaks and 8 other trees with a dbh greater than 24 inches. Canopy pruning and root zone impacts would be required for 15 trees (Table 1). An additional 14 oak trees with a dbh less than 6 inches and an additional 30 ornamental trees with a dbh less than 24 inches would also be removed.

A total of 35 valley oaks with a dbh greater than 6 inches, with a combined dbh of 480 inches, would be removed (Table 1). Canopy pruning and root zone impacts would be required for 10 valley oaks (Table 1).

A total of 5 interior live oak with a dbh greater than 6 inches, with a combined dbh of 47 inches, would be removed. Canopy pruning and root zone impacts would be required for 2 interior live oaks (Table 1).

A total of 8 ornamental trees with a dbh greater than 24 inches, with a combined dbh of 259 inches, would be removed. Canopy pruning and root zone impacts would be required for 12 ornamental trees, all with a dbh of less than 24 inches (Table 1).

Impacts Due to Clear Recovery Zone

A total of 23 trees would be removed for CRZ. Canopy pruning and root zone impacts would be required for 27 trees (Table 2). No additional oak trees with a dbh less than 6 inches would be removed. An additional 12 ornamental trees with a dbh less than 24 inches would also be removed.

A total of 4 valley oaks with a dbh greater than 6 inches, with a combined dbh of 67 inches, would be removed (Table 2). Canopy pruning and root zone impacts would be required for an additional 4 valley oaks. No interior live oaks would be affected by CRZ.

A total of 7 ornamental trees with a dbh greater than 24 inches, with a combined dbh of 259 inches, would be removed. Canopy pruning and root zone impacts would be required for 23 ornamental trees (Table 2).

Impacts Due to Pre-Cast Concrete Wall Construction

Proposed Project Area

A total of 71 trees would be removed for pre-cast concrete wall construction in the proposed project area including 57 native oaks and 14 other tree species. Canopy pruning and root zone impacts would be required for an additional 35

trees (Table 3). A total of 41 valley oaks with a dbh greater than 6 inches, with a combined dbh of 597 inches, would be removed (Table 3). Canopy pruning and root zone impacts would be required for an additional 19 valley oaks.

A total of 1 interior live oak with a dbh greater than 6 inches would be removed. Canopy pruning and root zone impacts would not be required for any additional interior live oaks (Table 3).

A total of 3 ornamental trees with a dbh greater than 24 inches in diameter (112 total inches) would be removed. A total of 11 additional ornamental trees with a combine dbh of 116 inches would also be removed. Canopy pruning and root zone impacts would be required for an additional 15 ornamental trees (Table 3).

Location Option B1: Pre-Cast Concrete Wall

A total of 3 trees would be removed for the installation of a precast concrete wall construction in Option B1. Canopy pruning and root zone pruning would be required for 18 trees (Table 3). A total of 2 valley oak trees with a dbh greater than 6 inches, with a combined dbh of 27 inches, would be removed. Canopy pruning and root zone impacts would be required for 6 valley oaks.

No interior live oaks would be removed and 2 interior live oaks would require canopy pruning and root zone impacts.

No ornamental trees with a dbh greater than 24 inches in diameter would be removed. One ornamental tree with a 12-inch dbh would be removed. Canopy pruning and root zone impacts would be required for an additional 10 ornamental trees (Table 3).

Location Option B2: Pre-Cast Concrete Wall

A total of 2 trees would be removed for the installation of a precast concrete wall construction in Option B2. Canopy pruning and root zone pruning would be required for 5 trees (Table 3). A total of 1 valley oak trees with a dbh of 2 inches would be removed. Canopy pruning and root zone impacts would be required for 4 valley oaks.

No interior live oaks would be removed and no interior live oaks would require canopy pruning or root zone impacts.

No ornamental trees with a dbh greater than 24 inches in diameter would be removed. One ornamental tree with a 7-inch dbh would be removed. Canopy pruning and root zone impacts would be required for one additional ornamental tree (Table 3).

Impacts Due to Concrete Block Wall Construction

Proposed Project Area

A total of 118 trees would be removed for concrete sound wall construction in the proposed project area including 93 native oaks and 25 other tree species. Canopy pruning and root zone impacts would be required for an additional 31

trees (Table 4). A total of 72 valley oaks with a dbh greater than 6 inches, with a combined dbh of 1,041 inches, would be removed (Table 4). Canopy pruning and root zone impacts would be required for an additional 17 valley oaks.

A total of 1 interior live oak with a dbh of 15 inches would be removed. Canopy pruning and root zone impacts would not be required for any additional interior live oak (Table 4).

A total of 1 ornamental tree with a dbh of 27 inches would be removed. A total of 9 additional ornamental trees with a combine dbh of 94 inches would also be removed. Canopy pruning and root zone impacts would not be required for any additional ornamental trees (Table 4).

Location Option B1: Concrete Block Wall

A total of 18 trees would be removed for concrete sound wall construction in the Option 1 area including 8 native oaks and 10 other tree species. Canopy pruning and root zone impacts would be required for an additional 2 trees (Table 4). A total of 6 valley oaks with a dbh greater than 6 inches, with a combined dbh of 156 inches, would be removed (Table 4). Canopy pruning and root zone impacts would be required for an additional 2 valley oaks.

A total of 1 interior live oak with a dbh of 10 inches would be removed. Canopy pruning and root zone impacts would not be required for any additional interior live oak (Table 4).

A total of 10 ornamental trees with a combined dbh of 115 inches would be removed. None of these individual trees have a dbh greater than 24 inches. Canopy pruning and root zone impacts would not be required for any additional ornamental trees (Table 4).

Location Option B2: Concrete Block Wall

A total of 19 trees would be removed for concrete sound wall construction in the proposed project area including 9 native oaks and 10 other tree species. Canopy pruning and root zone impacts would be required for an additional 4 trees (Table 4). A total of 2 valley oaks with a dbh greater than 6 inches, with a combined dbh of 22 inches, would be removed (Table 4). Canopy pruning and root zone impacts would be required for an additional 4 valley oaks.

No interior live oak tree removals, canopy pruning, or root zone impacts would be required (Table 4).

A total of 1 ornamental tree with a dbh greater than 24 inches would be removed. An additional 9 ornamental trees with a combine dbh of 94 inches would also be removed. Canopy pruning and root zone impacts would not be required for any additional ornamental trees (Table 4).

Impacts Due to Wooden Fence Construction

Proposed Project Area

A total of 59 trees would be removed for wooden fence construction. Canopy pruning and root zone impacts would be required for 66 trees (Table 5).

A total of 36 valley oaks with a dbh greater than 6 inches, with a combined dbh of 519 inches, would be removed (Table 5). Canopy pruning and root zone impacts would be required for an additional 51 valley oaks.

A total of 1 interior live oak with a dbh greater than 6 inches would be removed. Canopy pruning and root zone impacts would be required for 1 interior live oak (Table 5).

A total of 2 ornamental trees with a dbh greater than 24 inches, with a combined dbh of 83 inches, would be removed. Canopy pruning and root zone impacts would be required for an additional 14 ornamental trees (Table 5).

Location Option B1: Wooden Fence

One tree would be removed for the installation of a wooden fence in Option area 1. Canopy pruning and root zone pruning would be required for 20 trees (Table 5).

No valley oak trees would be removed. Canopy pruning and root zone impacts would be required for 8 valley oaks.

No interior live oaks would be removed and 2 interior live oaks would require canopy pruning and root zone impacts.

No ornamental trees with a dbh greater than 24 inches in diameter would be removed. One ornamental tree with a 12-inch dbh would be removed. Canopy pruning and root zone impacts would be required for an additional 10 ornamental trees (Table 4).

Location Option B2: Wooden Fence

No trees would be removed for the installation of a wooden fence in Option area 2. Canopy pruning and root zone pruning would be required for 9 trees (Table 5). Canopy pruning and root zone impacts would be required for 7 valley oaks and 2 ornamental species.

Measures for Avoidance and Minimization of Impacts

Many potential project effects on trees are considered to be avoidable or feasible to be minimized. The following measures should be observed by the construction contractor and communicated and enforced by the City during project implementation.

- **Compensate for tree removal.** The City will compensate for the loss of protected trees through the preparation of a mitigation planting plan, including a species list and number of each species, planting locations, and maintenance requirements. Because the tree ordinance does not specify mitigation ratios for replacement plantings, compensation ratios will be developed in coordination with the City of Chico Urban Forester. Potential mitigation areas will be identified in coordination with the City of Chico Urban Forester.

Plantings would occur outside of the 30-foot-wide CRZ. Planted species will be based on those removed from the project area and will include primarily valley oak and interior live oak. Plantings will consist of cuttings taken from local plants, or plants grown from local material. Plantings will be monitored annually for three years or as required in the project permits. A minimum of 75% of the plantings will have survived at the end of the monitoring period for mitigation to be considered successful. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated until the survival criterion is met.

- **Enforce tree protection measures stipulated in the construction specifications.** The special provisions of the construction specifications will include prescriptive measures regarding tree resources. These specifications will be developed specifically for this project as a synthesis of City of Chico standards, as well as standards of arboriculture practice. Trees to be replaced will be replaced with 15-gallon sized trees.
- **Ensure all tree work is performed by a licensed tree service firm.** All tree work, including tree removal and pruning will be performed by a licensed tree service firm under the direction of a certified arborist. The cutting of roots greater than 2 inches in diameter will be performed under the direction of a certified arborist.
- **Place protection fencing.** Protection fencing will be installed around all trees to be retained. To the greatest extent feasible, protection fencing will be installed to demarcate, at a minimum, the drip line. If work will occur within the drip line the protection fencing will be installed to maximize the avoidance zone around the trunk.
- **Minimize or exclude vehicle traffic within the drip line of tree canopies.** To avoid the potential for soil compaction and subsequent damage to tree roots vehicle traffic within the drip line of tree canopies will be avoided or minimized to the greatest extent feasible. If vehicular or equipment access must occur within the drip line, it will be restricted to a temporary access road.

- **Minimize or avoid soil disturbance within the drip line of tree canopies.** To avoid the potential for root damage, grading or other soil disturbing activities will be minimized to the greatest practicable degree, particularly within the drip line of the tree canopies.
- **Minimize tree pruning.** Pruning will be required for equipment access and to facilitate construction activities. Pruning will be minimized to the greatest extent feasible. All tree pruning will be performed by a licensed, tree service firm under the direction of a certified arborist.
- **Site restoration following construction.** To avoid the potential for root damage within the drip line of the tree canopies, grading to restore site grades following construction will be minimized and performed under the direction of a certified arborist. These actions will help minimize damage to structural or feeder roots.
- **Cover undisturbed areas within the drip lines of trees to be protected with chip mulch.** Chip mulch from the removal of existing trees will be used to cover the area underneath the drip line of all trees to be protected within the construction area. The placement of mulch encourages new root growth closer to the trunks of trees and reduces moisture loss during the construction process.
- **Stump grinding.** Tree removal will be accompanied by stump grinding to remove roots when trees are adjacent to trees to be preserved, rather than pulling of the stumps, which disturbs the roots of preserved trees.

Table 1. Summary of Impacts Associated with Roadway Improvements

Tree Species	dbh	Existing Conditions		Roadway Improvements			
		Total Number of Trees	Total dbh Inches	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts
Valley Oak	6 inches or less	51	194	12	47	3	3
	6 to 23 inches	159	1,997	31	383	3	3
	24 inches or greater	23	747	4	97	4	4
	Total	233	2,938	47	527	10	10
Interior Live Oak	6 inches or less	5	19	2	9	0	0
	6 to 23 inches	11	127	5	47	1	1
	24 inches or greater	1	24	0	0	1	1
	Total	17	170	7	56	2	2
Other Species	Less than 24 inches	122	1,910	30	439	12	12
	24 inches or greater	83	1,937	8	259	0	0
	Total	205	3,847	38	698	12	12
Totals		455	6,955	92	1,281	24	24

Table 2. Summary of Impacts Associated with Clear Recovery Zone Tree Removal

Tree Species	dbh	Existing Conditions		Clear Recovery Zone			
		Total Number of Trees	Total dbh Inches	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts
Valley Oak	6 inches or less	51	194	0	0	0	0
	6 to 23 inches	159	1,997	3	29	3	3
	24 inches or greater	23	747	1	38	1	1
	Total	233	2,938	4	67	4	4
Interior Live Oak	6 inches or less	5	19	0	0	0	0
	6 to 23 inches	11	127	0	0	0	0
	24 inches or greater	1	24	0	0	0	0
	Total	17	170	0	0	0	0
Other Species	Less than 24 inches	122	1,910	12	179	13	13
	24 inches or greater	83	1,937	7	200	10	10
	Total	205	3,847	19	379	23	23
Totals		455	6,955	23	446	27	27

Table 3. Summary of Impacts Associated with Pre-Cast Concrete Wall Construction

Tree Species	dbh	Existing Conditions		Proposed Project Area				Location Option 1: Forest Avenue to El Monte Avenue				Location Option 2: East of Fir Street			
		Total Number of Trees	Total dbh Inches	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts
Valley Oak	6inches or less	51	194	14	51	9	9	0	0	1	1	1	2	3	3
	6 to 23inches	159	1,997	34	363	10	10	2	27	2	2	0	0	1	1
	24 inches or greater	23	747	7	234	0	0	0	0	3	3	0	0	0	0
	Total	233	2,938	55	648	19	19	2	27	6	6	1	2	4	4
Interior Live Oak	6 inches or less	5	19	1	3	0	0	0	0	0	0	0	0	0	0
	6 to 23 inches	11	127	1	15	1	1	0	0	1	1	0	0	0	0
	24 inches or greater	1	24	0	0	0	0	0	0	1	1	0	0	0	0
	Total	17	170	2	18	1	1	0	0	2	2	0	0	0	0
Other Species	Less than 24 inches	122	1,910	11	116	12	12	1	12	10	10	1	7	0	0
	24 inches or greater	83	1,937	3	112	3	3	0	0	0	0	0	0	1	1
	Total	205	3,847	14	228	15	15	1	12	10	10	1	7	1	1
Totals	455	6,955	71	894	35	35	3	39	18	18	2	9	5	5	

Table 4. Summary of Impacts Associated with Concrete Block Wall Construction

Tree Species	dbh	Existing Conditions		Proposed Project Area				Location Option 1: Forest Avenue to El Monte Avenue				Location Option 2: East of Fir Street			
		Total Number of Trees	Total dbh Inches	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts
Valley Oak	6inches or less	51	194	19	71	9	9	1	5	0	0	7	27	0	0
	6 to 23inches	159	1,997	63	757	6	6	4	56	0	0	2	22	4	4
	24 inches or greater	23	747	9	284	2	2	2	100	2	2	0	0	0	0
	Total	233	2,938	91	1,112	17	17	7	161	2	2	9	49	4	4
Interior Live Oak	6 inches or less	5	19	1	3	0	0	0	0	0	0	0	0	0	0
	6 to 23 inches	11	127	1	15	1	1	1	10	0	0	0	0	0	0
	24 inches or greater	1	24	0	0	0	0	0	24	0	0	0	0	0	0
	Total	17	170	2	18	1	1	1	34	0	0	0	0	0	0
Other Species	Less than 24 inches	122	1,910	22	227	10	10	10	115	0	0	9	94	0	0
	24 inches or greater	83	1,937	3	119	3	3	0	0	0	0	1	27	0	0
	Total	205	3,847	25	346	13	13	10	115	0	0	10	121	0	0
Totals	455	6,955	118	1,476	31	31	18	310	2	2	19	170	4	4	

Table 5. Summary of Impacts Associated with Wood Fence Construction

Tree Species	dbh	Existing Conditions		Proposed Project Area				Location Option 1: Forest Avenue to El Monte Avenue				Location Option 2: East of Fir Street			
		Total Number of Trees	Total dbh Inches	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts	Number of Trees to be Removed	dbh Inches to be Removed	Quantity with Canopy Pruning Impacts	Quantity with Root Zone Impacts
Valley Oak	6inches or less	51	194	10	32	2	2	0	0	1	1	0	0	5	5
	6 to 23inches	159	1,997	30	329	33	33	0	0	4	4	0	0	2	2
	24 inches or greater	23	747	6	190	17	17	0	0	3	3	0	0	0	0
	Total	233	2,938	46	551	52	52	0	0	8	8	0	0	7	7
Interior Live Oak	6 inches or less	5	19	1	3	0	0	0	0	0	0	0	0	0	0
	6 to 23 inches	11	127	1	15	1	1	0	0	1	1	0	0	0	0
	24 inches or greater	1	24	0	0	0	0	0	0	1	1	0	0	0	0
	Total	17	170	2	18	1	1	0	0	2	2	0	0	0	0
Other Species	Less than 24 inches	122	1,910	9	88	15	15	1	12	10	10	0	0	2	2
	24 inches or greater	83	1,937	2	83	2	2	0	0	0	0	0	0	0	0
	Total	205	3,847	11	171	17	17	1	12	10	10	0	0	2	2
Totals	455	6,955	59	740	70	70	1	12	20	20	0	0	9	9	

