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# ARBORIST REPORT AND TREE PROTECTION PLAN

10046 Bianchi Way, Cupertino CA 95014  
July 2023





Arborist Report & Tree Protection Plan for  
10046 Bianchi Way  
Cupertino, California 95014

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July 2023

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**Notice of Disclaimer**

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## Summary

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In June of 2023, Davey Resource Group (DRG) was contracted by Mike Wilson of MKI Builders to conduct a tree inventory and develop a tree protection plan as well as planting recommendations for the trees in the area of impact on the property at 10046 Bianchi Way in Cupertino, CA. The request was made to assess the current condition of the trees and establish a protection plan based on the findings, then to develop a planting plan that would enhance the site with the trees that are appropriate for the space but will provide the best value over time.

On July 6, 2023, an International Society of Arboriculture (ISA) Certified and TRAQ Qualified Arborist (Elizabeth Lanham, WE-#9234A) from Davey Resource Group evaluated six (6) trees that may be impacted by development. The trees were assessed by their location, size, current condition, health, structure, and form. The current site plan was used to estimate the construction footprint in relation to the critical root zones (CRZ) of the trees to help guide construction and to reduce potential impacts on the trees. Current plans include the demolition of two existing multi-family dwellings for the construction of seven townhouses, a driveway, and walkways. Tree information is summarized as follows:

- Eight (8) trees were assessed, consisting of seven (7) distinct species; these consist of black walnut (*Juglans nigra*), Coast live oak (*Quercus agrifolia*), common fig (*Ficus carica*), glossy privet (*Ligustrum lucidum*), Hollywood juniper (*Juniperus chinensis*), Italian cypress (*Cupressus sempervirens*), and Monterey cypress (*Hesperocyparis macrocarpa* - 2 trees; one on neighboring property). Three (3) trees had previously been removed and were reported as fern pine (*Afrocarpus gracilior* - 2 trees), and Victorian box (*Pittosporum undulatum* - one tree)
- The inventory encompasses the trees that may be impacted by the proposed construction that fit Cupertino tree ordinance section 14.18 - Protected Trees
- Three (3) trees were in good condition, one (1) in fair condition, and four (4) trees were in poor condition.
- Tree height approximations ranged from 10 to 45 feet.
- Tree diameters at four and a half feet above grade/breast height (DBH) ranged from 14 inches on a single-trunked Monterey cypress to 38.5 inches on a multi-trunked Coast-live oak.
- Seven (7) trees are recommended for removal under the current plans - trees 1, 5, 6, 7, 8, 9, and 10.
  - Per the Cupertino protected tree ordinance section 14.18.110, trees 1, 5, 6, 9, and 10 require a permit for removal.
  - Based on the Replacement Tree Guidelines chart provided in section 14.18.160, the replacement ratio will be eighteen (18) 24" box trees box tree or nine (9) 36" box trees. The in-lieu fees for tree #9 are based on the tree appraisal value using the guidelines in the 10th Edition Guide for Plant Appraisal by the Council of Tree and Landscape Appraisers
  - Due to both observational and scientific evidence that the smallest tree planted is the most likely to be successful, the project Arborist recommends using 24-inch box trees onsite. However due to the high-density nature of the project, no more than ten plantings of strategically selected climate-adapted, drought-compatible, native, and regionally appropriate trees
  - Planting recommendations are provided as an additional map. See Appendix B for details.
  - The replacement value for the additional 8 - 24-inch box trees is recommended to be \$400 a tree (following the values in the Menlo Park municipal code, which provides recommendations) or \$3,200. Tree #9's in lieu calculation was determined to be \$24,250, for a combined total of \$27,450.
- The neighboring Monterey pine is recommended for retention; tree protection measures are provided.

This report focuses on tree protection recommendations for tree preservation and provides the CRZs and SRZs of these trees for planning purposes. DRG has provided general site preservation recommendations based on the provided construction plans. Arborist monitoring of construction is required whenever work is performed within the drip line of significant trees. Trenching must be done by hand or with pneumatic air spade excavation tools. The trees identified for preservation should be monitored by a Certified Arborist at the end of construction and ongoing as needed.

# Introduction

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## Background

Current plans for new construction at 10046 Bianchi Way in Cupertino include the demolition of the two existing multi-family homes, followed by the construction of seven new townhouses with newly dug foundations, driveway access, and newly installed walkways. The site will comprise structures and mostly hardscape, with a 5-10 foot green belt around the premises, and small front yards (approximately 6 ft at the narrowest measure). All trees over 4 inches in diameter on the property and adjacent properties that may be impacted by the proposed construction were assessed and evaluated for impacts in accordance with Cupertino tree ordinance sections 14.18.050, 060, 200, and 210.

## Assignment

The arborist visually assessed each tree on the site, and the required tree data were collected using a portable tablet device. Following data collection, specific tree preservation plan elements were calculated that identified each tree's critical and structural root zones (CRZ and SRZ) to better ensure survivability during the planned development. This report establishes the condition of the trees and canopy within the project area. The trees were visually assessed, and photo documented so that changes in condition can be evaluated if needed. Planting recommendations were developed by reviewing the proposed development plans, City of Cupertino BMPs and ordinances, and industry BMPs regarding resilient tree species for the region.

## Limits of the Assignment

Many factors can limit specific and accurate data when performing evaluations of trees, their conditions, and the potential for failure or response to site disturbances. No soil or tissue testing was performed. All observations were made from the ground on July 6, 2023, and no soil excavation to expose roots was performed. The most recent development plans were available to determine potential construction impacts. The determinations and recommendations presented here are based on current data and conditions that existed at the time of the evaluation and cannot be a predictor of the ultimate outcome for the evaluated trees in the future. No physical inspection of the upper canopy, sounding, resistance drilling, or other technologies were used in the evaluation of the trees.

## Purpose and Use of Report

The purpose of this report is to provide a summary inventory of all trees within the project area of impact, including an assessment of the current condition and health, as well as providing a tree protection plan and planting recommendations for all evaluated trees/canopies that may be impacted by construction plans. The findings in this report can be used to make informed decisions on design planning and guide the trees' long-term care. This report and detailed tree protection plan can also be submitted to the City of Cupertino for permitting purposes.

# Observations

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## Methods

A visual inspection was used to develop the findings, conclusions, and recommendations found in this report. Data collection included measuring the diameter of significant trees at approximately 54 inches above grade (DBH), height estimation, a visual assessment of tree condition, structure, and health, and a photographic record. A rating percentage (0-100%) was assigned for each tree's health, structure, and form, and the lowest percentage was used as the overall tree condition.

## Site Observations

The project site is located in the City of Cupertino on Bianchi Way, just South of Stevens Creek Blvd. The parcel is a privately owned lot with two existing multi-family houses, connected by an exterior breezeway structure. The lot is 14,975 square feet and the maximum allowable is 8.57 units. The property is on level ground. Only trees impacted by the construction that met ordinance criteria for protection were assessed.

## Tree Observations

Eight (8) trees were assessed, consisting of seven (7) distinct species; these consist of black walnut (*Juglans negra*), Coast live oak (*Quercus agrifolia*), common fig (*Ficus carica*), glossy privet (*Ligustrum lucidum*), Hollywood juniper (*Juniperus chinensis*), Italian cypress (*Cupressus sempervirens*), and Monterey cypress (*Hesperocyparis macrocarpa* - 2 trees; one on neighboring property). Three (3) trees had previously been removed and could not be observed by the arborist. These were reported as fern pine (*Afrocarpus gracilior* - 2 trees), and Victorian box (*Pittosporum undulatum* - one tree), and are only included as part of this report because they are on the survey. Please note that these are included in the tree calculations.

The trees are mostly mature, and tree condition ratings were good for three (3) trees, fair for one (1) tree, and poor for four (4) trees. Tree diameters ranged from 14 inches for a single-trunked Monterey cypress to 38.5 inches for a multi-trunked Coast live oak with an average of 20.4 inches. Tree heights ranged from 10 feet to 45 feet, with an average height of 27.5 feet.

A map of tree locations can be found in Appendix A. Tree photographs can be found in Appendix C and a complete Tree Inventory and Condition Assessment can be found in Appendix D.

## Root Zone Calculations

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The trunk diameters of the assessed trees are often used to determine the Critical Root Zone (CRZ). The CRZ is considered the ideal preservation area for a tree. It can be calculated by adding 1 foot of radius for every inch of trunk diameter measured at 4.5 feet from grade/breast height (DBH). For example; a tree with a DBH of 10 inches has a calculated CRZ radius of 10 feet from the trunk. The CRZ represents the typical rooting area required for tree health and survival. As this project is located in the City of Cupertino, CRZ was substituted with the city standard of the circular area around a tree with a radius measured to the nearest foot of the tree's longest dripline to determine the Tree Protection Zone (TPZ) as seen in Table 1 according to Cupertino's ordinance 14.18 APPENDIX A: STANDARDS FOR THE PROTECTION OF TREES DURING GRADING AND CONSTRUCTION OPERATIONS. Some impact (25% or less) within this zone is typically acceptable for average to good-condition trees with basic mitigation/stress reduction measures. Construction activities should not occur within the TPZ of any tree to be retained. This includes but is not limited to the storage of materials, parking of vehicles, contaminating soil by washing out equipment, (concrete, paint, etc.), or changing soil grade.

The structural root zone was calculated using a commonly accepted method established by Dr. Kim Coder in *Construction Damage Assessments: Trees and Sites*.<sup>1</sup> In this method, the root plate size (i.e. pedestal roots, zone of rapid taper area, and roots under compression) and limit of disruption based upon tree DBH is considered as a minimum distance that any disruption should occur during construction. A significant risk of catastrophic tree failure exists if structural roots within this given radius are destroyed or severely damaged. The SRZ is the area where minimal or no disturbance should occur without arborist supervision. The TPZ and SRZ for the surveyed trees are listed in Appendix B, Table 2.

## Conclusion and Recommendations

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Based on visual evaluations and the impacts of the proposed development, all trees have the ability to be impacted. The following recommendations will minimize the impacts as much as possible.

- Trees 1, 6, 7, 8, and 9 are within the footprint of the proposed construction and will require removal.
- Trees 5 and 10 are both in poor condition and the impact of the demolition and construction on the CRZ of the trees will be too significant, requiring these trees to be removed as well.

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<sup>1</sup> Dr. Kim D. Coder, University of Georgia June 1996

- Per the Cupertino protected tree ordinance section 14.18.110, trees 1, 5, 6, 9, and 10 require a permit for removal
- Tree 11 is on the neighboring property and will require tree protection as well as a monitoring schedule during construction.
- Tree 11 TPZ fencing should be installed to encompass as much of the TPZ that overhangs the subject property. If the neighbors agree, it is recommended that TPZ fencing fully encompass the tree and extend onto the property where the tree is located.
- Arborist monitoring must be performed when removal of the existing driveway occurs, as well as during excavation and compaction for the new driveway. All excavation within the CRZ must be hand-dug or performed by air spade with the project arborist on site, and the arborist must approve the pruning of roots over 2 inches. Any roots uncovered or pruned must be wrapped in damp burlap that will be kept moist until the roots are able to be covered over with soil.
- TPZ fencing should be 6 feet in height and constructed of chain link fencing. The fencing may be moved within the dripline if directed by the project arborist or City Arborist but cannot be moved to within 2 feet of the trunk. Fence posts should be 2-inch in diameter and galvanized, and installed 2 feet below grade. Posts may be movable rather than below grade if instructed by the City Arborist and may not be spaced more than 10 feet apart. Signs must be posted stating: “TREE PROTECTION FENCE - DO NOT MOVE OR REMOVE WITHOUT APPROVAL FROM CITY/PROJECT ARBORIST. NO STORING OF MATERIALS OR MACHINERY.” The fence may not be moved without authorization from the project arborist or City Arborist.
- TPZ fencing must be in place before any equipment is on-site and must remain in place for the entirety of the project and only be removed, temporarily or otherwise, with the approval of a Certified Arborist while activities are directly supervised, and replaced immediately after.
- Monitoring of the tree protection specifications by an ISA Certified Arborist or ASCA Registered Consulting Arborist is required at monthly intervals. A corresponding monitoring letter should be provided to the project confirming the results of the project monitoring.
- No material shall be stored, nor concrete basins washed, or any chemical materials or paint stored within the TPZ of trees, and no construction chemicals or paint should be released into landscaped areas, as these can be toxic to trees and contaminate the soil.
- After construction is complete, the property owner should monitor the trees for at least one year and contact a Certified Arborist to inspect if any lean, limb die-back, leaf drop, or foliage discoloration develops.

### **Considerations for Tree #9 - The Coast Live oak (*Quercus agrifolia*)**

Tree 9 is at the back property line. It is pushing the good neighbor fence and has caused damage to the parking lot of the church on the other side of the fence from the subject property. Due to the location of this tree directly on the property line, this tree appears to be a volunteer that was allowed to mature over time.

The planned construction is scheduled to have excavation within less than 7 ft of this tree’s trunk, putting trenching right through the middle of the 17 ft SRZ, which is the area of the root zone, which cannot be disturbed due to severe risk of health or structural impacts (see Root Zone Calculations section for more details), and well into the 38.5 ft CRZ, which is the area where minimal disturbance should take place. *Quercus agrifolia* has a low tolerance for root damage, and an impact this severe is likely to be catastrophic to the health and/or structure of this tree, contributing to an untimely decline or tree failure. Without making significant plan changes, which will affect the density usage of this parcel, retaining this tree is not advised. Even with design changes, the tree will need to undergo significant root pruning, which may still affect the health and structure, but also is likely to result in reaction growth of new roots that will damage the hardscape and foundations of the new homes, leading to costly repairs and the removal of this tree within as few as five to ten years. Removal of tree 9 is recommended.

Since the DBH of this tree is above 36”, in-lieu fees will be calculated for this tree using the trunk formula method as described in the 10th edition of the Guide for Plant Appraisal by the Council of Tree and Landscape Appraisers. The basic formula is as follows:

$$\text{Unit Tree Cost} \times \text{Condition Rating (\%)} \times \text{Functional Limitations (\%)} \times \text{External Limitations (\%)}$$

The basic tree cost is the sum of the installed tree cost and the cost of the difference between the adjusted trunk area and the replacement tree size (appraised tree size increase multiplied by unit tree cost). Size was measured as trunk cross-sectional area (square inches), calculated by  $0.785 \times (\text{DBH})^2$ ; where a circular cross-section was assumed.

Species size and cost data were obtained from the ISA Western Chapter Species Classification for Landscape Tree Appraisal (2004). The Western rating was used. No nursery group data were used as the Basic Tree Cost was calculated using the above formula(s). Unit tree cost was determined to be \$175. The condition rating was based on field observations already described. The functional and external limitation ratings were based on field and aerial imagery observations. The basic functional replacement tree cost was then calculated by multiplying the functional replacement tree cross-section area by the unit tree cost. The depreciated functional replacement tree (calculated using the basic functional replacement cost, the overall condition rating (%), the functional limitations rating (%), and the external limitations rating (%)) is then calculated, then rounded to provide the rounded replacement cost.

Tree #	Botanical Name	Condition	External Limitations (%)	Functional Limitations (%)	Total Appraisal Cost (\$)	Rounded Total Appraisal Cost (\$)
9	<i>Quercus agrifolia</i>	Good (61-80%)	75%	50%	\$24,249	<b>\$24,250</b>

## Recommended Planting Palette

Appendix B shows the location and species of trees recommended for planting as part of the new planting plan. While Cupertino has a guideline of Callery pears as street trees in this neighborhood, these trees are poorly structured, susceptible to fireblight, and in some regions, are considered invasive species. This leads to a lengthy and painstaking maintenance process that may result in specimens with limb failures, with pest and disease issues, and that is not contributing to a long-term resilient urban forest for Cupertino. For this reason, the project arborist suggests using *Cornus nutallii x florida* ('Eddies White Wonder' dogwood) as the replacement street tree species. These trees will have beautiful white spring flowers, but are climate and drought-adapted, and do not have any pervasive pest and disease issues, nor do they have similar invasive properties. As an ornamental species, *Parkinsonia aculeata* (Jerusalem thorn) has been selected. This showy and drought-tolerant tree will provide beautiful color, but stay hearty for the climate even if it were to become 5-10 degrees F warmer on average. Finally, *Quercus douglasii* (blue oak) was selected as the property shade tree. These native slow growers will develop a large canopy over time but will provide enough time for maintenance to be able to take place to train the trees into an appropriate structure so that they will not negatively impact the condition of the buildings. Pruning of these trees can take place in a thoughtful, planned, judicious manner, as it would likely be 75 or more years before these trees would begin to damage the structures if left unmaintained.

Each tree should have a dedicated bubbler for its establishment and should receive approximately 1.5-2 gallons of water per inch of trunk diameter per week based on soil absorption levels. This value should be adjusted during the rainy season accordingly. The soil should be moist but should not be maintained soggy, as these trees are adapted for dryer climates. Care should be taken not to overwater the oaks during the summer months, as they are accustomed to a naturally Mediterranean climate and expect dryer conditions. Soil moisture should be maintained in the basins of the newly planted trees with a 3-4 inch layer of mulch. being sure to keep the trunk flares clear of mulch for proper airflow, and mulching to the trees' dripline wherever possible.

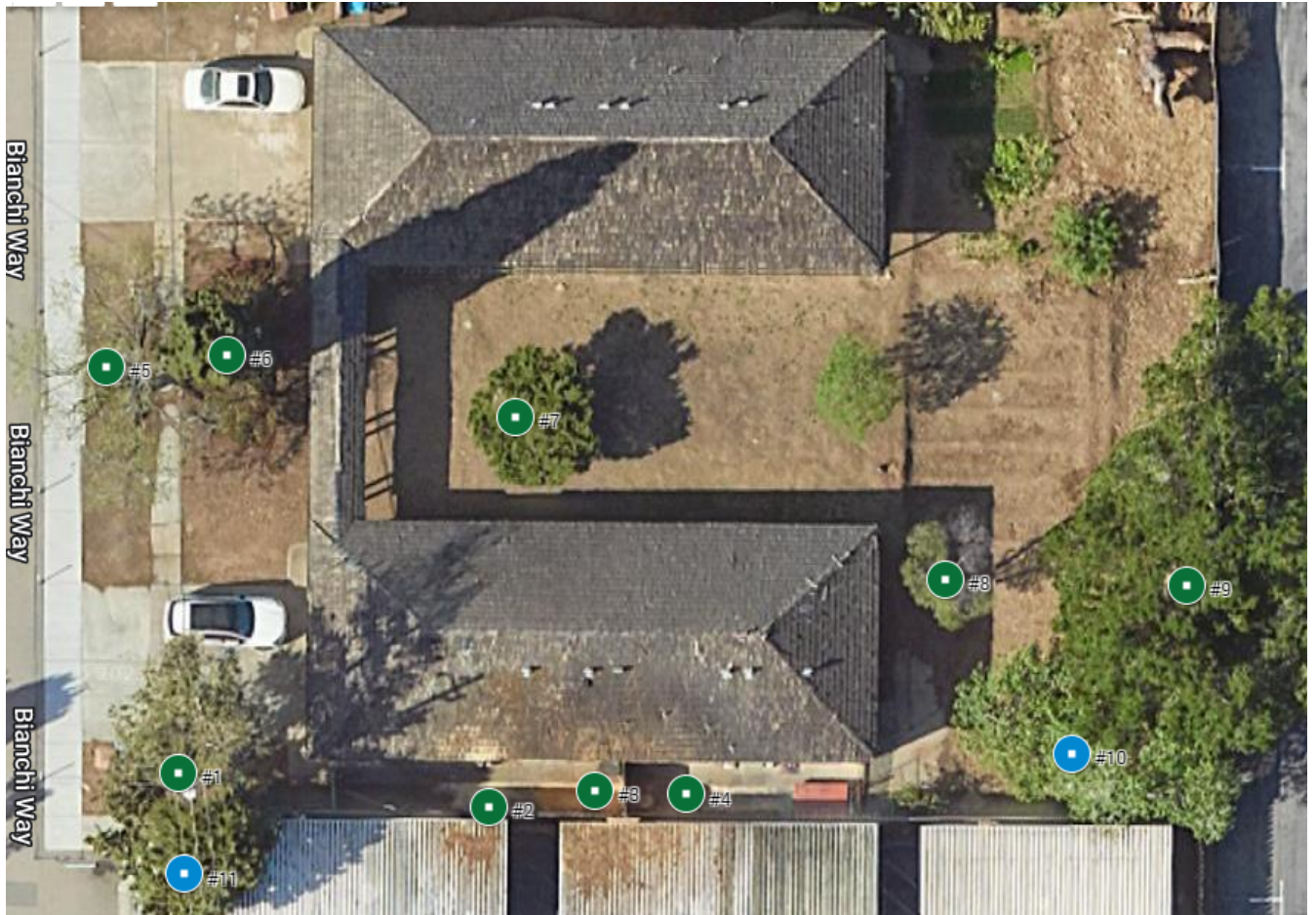
The planting plan shows 10 new trees to be planted on site. While 36-gallon trees would be the quickest way to accomplish the City's planting standards, the project arborist recommends planting 24-inch box trees. Both observational (throughout this arborist's 17-year career) and scientific (University of Arizona; Jim Downer) evidence



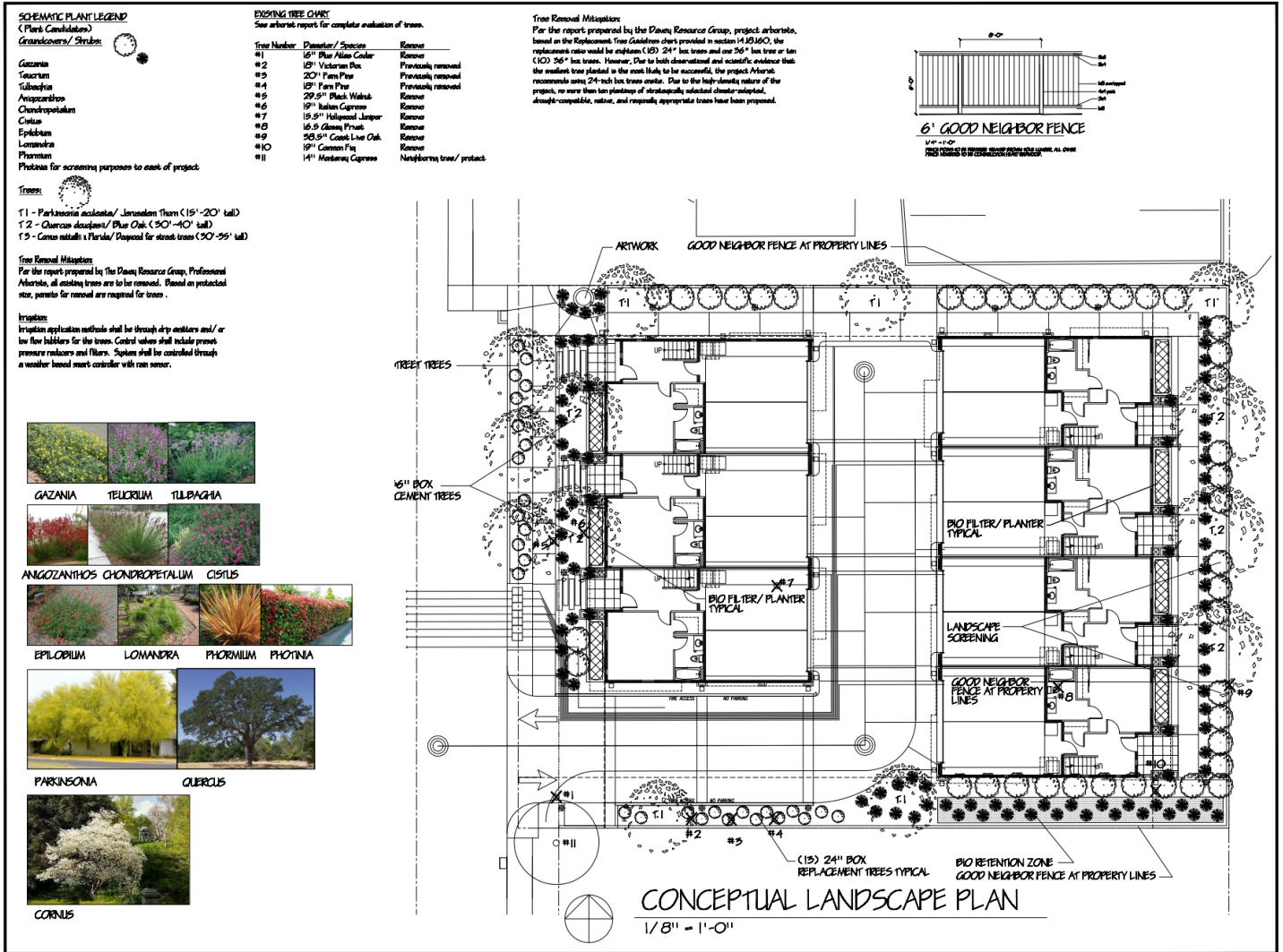
supports that on a five-year or less timeline, no difference can be observed between a 15-gallon tree and a 36-inch box tree in regard to their size, but the 36-inch box tree adds additional costs to the project and often has poor root structure that cannot be remedied due to being in either its 15-gallon container or 24-inch box too long. The smaller the tree, the faster it will usually develop, as it is under less stress than a larger transplanted tree. Since the City does not offer 15-gallon as a replacement size, the project arborist recommends that the smallest size option of 24-inch boxes be allowed for the replacement trees. Based on the Replacement Tree Guidelines chart provided in section 14.18.160, the replacement ratio will be eighteen (18) 24" box trees box tree or nine (9) 36" box trees. The in-lieu fees for tree #9 are based on the tree appraisal value using the guidelines in the 10th Edition Guide for Plant Appraisal by the Council of Tree and Landscape Appraisers. The replacement value for the additional 8 - 24-inch box trees is recommended to be \$400 a tree (following the values in the Menlo Park municipal code, which provides recommendations) or \$3,200. Tree #9's in lieu calculation was determined to be \$24,250, for a combined total of \$27,450.

## Appendix A – Location Map

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# Appendix B – Planting Map



Planting plan recommendations

## Appendix C – Tree Photos

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Sample set. Additional photos are available upon request.



**Photo 1. Tree #1 is a Monterey cypress in poor condition that will be removed for the project**



**Photo 2. Tree #5 is in poor condition and will be removed for the project.**



**Photo 3. Tree #6 is in goof condition, but is in the footprint of the proposed project and will require removal**



**Photo 4. Tree #7 is in good condition but is in the footprint of the planned construction and will require removal**



**Photo 5. Tree #8 is in poor condition and will be removed as part of the project**





**Photo 6. Tree #9, located on the property line, will have significant construction impacts and requires removal**



**Photo 7. Tree #10 is a poor-condition fig tree in partial failure that will be removed as part of the project**



**Photo 8. Tree #11, the neighboring Monterey cypress is in fair condition and will require tree protection**

## Appendix D – Tables

**Table 1. Tree Inventory and Root Zones**

Tree #	Stems	DBH (in.)	Common Name	Botanical Name	Height (ft)	Canopy (ft)	SRZ (Radius in ft)	CRZ (Radius in ft)
1	1	16	Monterey cypress	<i>Hesperocyparis macrocarpa</i>	40	27	7	13.5
2	1	18	Victorian box	<i>Pittosporum undulatum</i>	n/a	n/a	n/a	n/a
3	1	20	Fern pine	<i>Afrocarpus gracilior</i>	n/a	n/a	n/a	n/a
4	1	18	Fern pine	<i>Afrocarpus gracilior</i>	n/a	n/a	n/a	n/a
5	3	29.5	Black walnut	<i>Juglans negra</i>	30	40	13	20
6	1	19	Italian cypress	<i>Cupressus sempervirens</i>	45	12	9	6
7	2	15.5	Hollywood juniper	<i>Juniperus chinensis</i>	10	18	7	9
8	5	16.5	Glossy privet	<i>Ligustrum lucidum</i>	15	12	7	6
9	2	38.5	Coast live oak	<i>Quercus agrifolia</i>	35	50	17	25
10	1	19	Common fig	<i>Ficus carica</i>	25	36	9	18
11	1	14	Monterey cypress	<i>Hesperocyparis macrocarpa</i>	20	24	6	12

**Table 2. Condition Assessment June 2023**

Tree #	Common Name	Health (%)	Structure (%)	Form (%)	Ordinance Size (Y/N)	Removal Proposed (Y/N)	Notes
1	Monterey cypress	50%	45%	35%	Y	Y	Girdling Roots, Root Damage/Decay, Co-Dominant Stems, Small Deadwood (1-2"), Low Vigor, Stressed, Overhead Utilities, Driveway damage ~3 inches
2	Victorian box	n/a	n/a	n/a	n/a	REMOVED	
3	Fern pine	n/a	n/a	n/a	n/a	REMOVED	
4	Fern pine	n/a	n/a	n/a	n/a	REMOVED	
5	Black walnut	45%	35%	35%	Y	Y	Trunk Decay, Co-Dominant Stems, Small Deadwood (1-2"), Stressed, Branch Decay, Gopher issues, cavity at base
6	Italian cypress	75%	65%	65%	Y	Y	Buried Root Collar, Included Bark/Weak Union, Co-Dominant Stems, Small Deadwood (1-2"), Insect/Disease Problem, Sidewalk lift of about 2 inches
7	Hollywood juniper	75%	75%	75%	N	Y	Co-Dominant Stems, Small Deadwood (1-2")
8	Glossy privet	35%	45%	40%	N	Y	Buried Root Collar, Included Bark/Weak Union, Co-Dominant Stems, Large Deadwood (3"+), Small Deadwood (1-2"), Severe Decline, Branch Decay
9	Coast live oak	80%	65%	70%	Y	Y	Buried Root Collar, Included Bark/Weak Union, Co-Dominant Stems, Large Deadwood (3"+), Small Deadwood (1-2"), Branch Decay
10	Common fig	85%	30%	30%	Y	Y	Trunk Decay, Included Bark/Weak Union, Co-Dominant Stems, Broken Limbs, Tree has already failed
11	Monterey cypress	80%	60%	60%	N	N	Small Deadwood (1-2"), Overhead Utilities

