



Tree Assessment

**Juliana Way
Moss Beach CA**

Prepared for:
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May 2015



Tree Assessment

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Introduction and Overview

Verde Design is designing a new landscape for the proposed development of a property at the intersection of Juliana Way and Vallemar Street in Moss Beach CA. The site is currently undeveloped. HortScience, Inc. was asked to assess the health and structural condition of existing trees and summarize their potential to be retained in the new landscape.

This report presents the following information:

1. Evaluation of tree health and structural condition.
2. Assessment of tree suitability for preservation.

Survey Methods

Trees were surveyed in May 2015. Each tree larger than 6" in diameter was visually assessed from the ground and evaluated as follows:

1. Identifying the tree as to species.
2. Attaching a numerically coded metal tag on the trunk of each tree.
3. Recording the tree's location on a map.
4. Measuring the trunk diameter at a point 54" above grade.
5. Evaluating the health and structural condition using a scale of 0 – 5 where 0 = dead, 1 = poor and 5 = excellent.
6. Comment on presence of defects in structure, insects or diseases and other aspects of development.
7. Assess tree suitability for preservation as high, moderate or Low.
8. Identify arboricultural treatments to reduce the likelihood of failure and improve tree health, structure, stability and longevity.

Description of Trees

Forty-four (44) trees were evaluated: 41 Monterey cypress (*Hesperocyparis macrocarpa*) and 3 Monterey pine (*Pinus radiata*). Trees appeared to have been planted but it is possible that smaller trees arose as chance seedlings. Neither Monterey cypress nor Monterey pine is native to San Mateo County.

Cypresses were not uniformly distributed across the site but were found in several groups:

- #153 – 160 formed an irregular line running from east to west, parallel to Juliana St. In addition to the standing trees, there were numerous stumps in between existing cypresses (Photo 1). Stumps lean towards Juliana St., suggesting that trees failed in that direction and were then cut off.

Photo 1. Looking west at trees #155, 156 and 157. Juliana St. is on the left.

Cypresses in this group were generally single-stemmed with trunk diameters between 6" (#154) and 37" (#157). Most trees were in fair condition. Exceptions included #153 which was 18" and good.

Trees #156 and 160 were in poor condition. Trees #160 had failed at the base and was laying on the ground.



- #162 – 177 formed a well-defined row on the south side of the property. Trees had been planted close together and were mature in development. Crowns were very asymmetric (Photo 2). On the west, low branches ran along the ground for some distance from the trunk. On the east, no low branches were present leaving trunks exposed to the top of the trees. On the south, trees #162, 163 and 164 had numerous failed but still green branches laying on the ground.



Photo 2. Crowns of cypresses #163 – 177 were very asymmetric. Left: west side. Right: east side.

Tree structure was characterized by 2 or more stems that arose near the base of the trunk. Stems varied widely in orientation, ranging from vertical to sharply leaning from the base to bowed almost flat. Branch failures were common. Eleven trees were in poor condition while #166, 173, 174, 175 and 178 were fair.

- #179 – 188 formed a second row on the north side of the property (Photo 3). Trees were farther apart than in the group above but as mature in development. Low branches had been removed leaving numerous pruning wounds and high canopies of foliage. Six trees were in poor condition while #179, 180, 183 and 186 were fair.

Photo 3. Looking southwest along trees #179 – 188. Tree #188 leans to the southeast (red arrow).



- Cypresses #161, 189, 178, 193 and 194 were large mature trees growing alone rather than in a group (Photo 4, following page). As a result, trees were shorter but crowns were much larger. This group ranged from a single stem (#189) to codominant stems (#193) to multiple stems arising near the base (#161, 178, 194). Tree #178 had the largest single stem of any cypress on the site: 54". Condition was poor for #189, 193, 194 but fair for #161 and 178. Trees #178, 193, 194 had been pruned to clear the overhead/adjacent electrical lines.

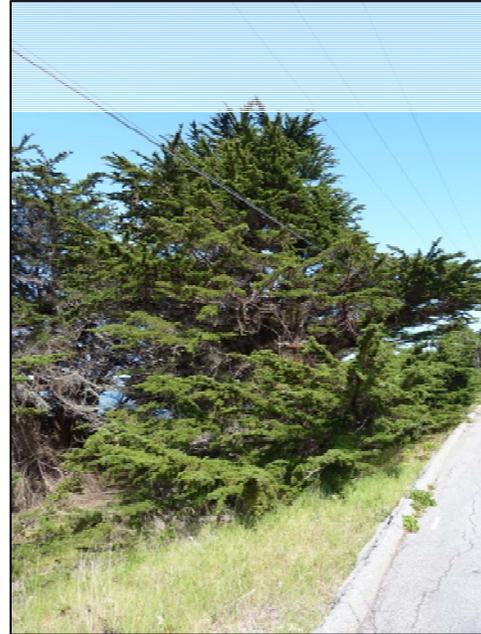


Photo 4. Above: looking east at cypress #161. Right: looking north along Vallemar St. at cypress #178. Note numerous low branches in the foreground.

- #190, 191, 195 were small trees (7"). Trees #190 and 191 were in poor condition; #195 was fair.

Monterey pines #150, 151 and 152 were located on Vallemar St. near the intersection with Juliana. Trees were small with diameters between 9" and 13". All were in poor condition having been topped to clear the overhead electrical lines. Trees #152 had failed at the base and laying on the ground.

Description of individual trees is found on the enclosed **Tree Assessment Form**. Tree locations are found on the **Tree Assessment Map**. Both are included as **Attachments**

San Mateo County has several regulations regarding trees:

- A Significant tree has a trunk diameter of 12" or greater measured at 54" above grade. Based on my measurements of the trees 37 Monterey cypresses and 2 Monterey pines met this criterion.
- An Indigenous tree is one that is known to occur naturally in San Mateo County. Neither Monterey cypress nor Monterey pine are indigenous to the County.
- A Heritage tree may be designated by the Board of Supervisors or meet certain criteria of size and species. None of the trees at the site appear to have Heritage status.

Suitability for Preservation

Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment and perform well in the landscape. Our goal is to identify trees that have the potential for long-term health, structural stability and longevity. Evaluation of suitability for preservation considers several factors:

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- **Tree health**
Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees. Twenty-four (24) of the 41 cypresses were in poor condition.
 - **Structural integrity**
Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely.
 - **Species response**
There is a wide variation in the response of individual species to construction impacts and changes in the environment. Monterey pine and Monterey cypress are intolerant of construction impacts.
 - **Tree age and longevity**
Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change. Trees were generally mature in development.
 - **Species invasiveness**
Species which spread across a site and displace desired vegetation are not always appropriate for retention. This is particularly true when indigenous species are displaced. The California Invasive Plant Inventory Database (<http://www.cal-ipc.org/paf>) lists species identified as having being invasive. Moss Beach is part of the Central West Floristic Province. Neither Monterey cypress nor Monterey pine are noted as having invasive potential.

Each tree was rated for suitability for preservation based upon its age, health, structural condition and ability to safely coexist within a development environment (Table 1).

Table 1. Tree suitability for preservation. Juliana Way. Verde Design. Moss Beach CA.

High	Trees with good health and structural stability that have the potential for longevity at the site. None of the trees was rated as having high suitability for preservation.
Moderate	Trees in fair health and/or possessing structural defects that may be abated with treatment. Trees in this category require more intense management and monitoring, and may have shorter life-spans than those in the "high" category. Monterey cypress #178 and 195 were rated as having moderate suitability for preservation.

Table 1, continued. Tree suitability for preservation. Juliana Way. Verde Design. Moss Beach CA.

Low	Trees in poor health or possessing significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Thirty-nine (39) Monterey cypresses and 3 Monterey pines were rated as having low suitability for preservation.
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We consider trees with high suitability for preservation to be the best candidates for preservation. We do not generally recommend retention of trees with low suitability for preservation. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

Monterey cypress

The species is widely planted throughout coastal California and other area of the world. It is native to several small locations along the central coast. The species is well-adapted to coastal conditions of strong winds, moderate temperatures, summer fog and salt spray.

Monterey cypress is moderately long-lived. The oldest documented cypress was estimated to be 284 years. Most trees can be considered mature at 100 years. Growth rates in youth are fast, up to 2' per year in good growing condition.

The species is widely available from nurseries and found in many landscape settings. Survival rates are dependent upon after-care but can be high. Monterey cypress does not, however, transplant well.

The species is also intolerant of construction impacts such as root severance and grade change. Adequate protection and avoiding injury during construction are the keys to preservation during development. I know of no mitigation treatments that can be successfully applied to injured trees.

Within its native range, there are few insect or disease problems.

Branch and trunk failures are common. Most failures occur during periods of high wind and rain.

Tree Preservation Guidelines

Plans for development of subject property have not yet been prepared. Based on my observations and assessment, I suggest that some areas have better potential for preservation than others.

Under normal circumstances, the best opportunities for tree preservation are trees with high suitability for preservation. No trees with high suitability for preservation were located on the site. Only Monterey cypress #178 and 195 had moderate suitability for preservation. The key messages from this finding are: 1) trees had significant structural effects that predispose them to failure and 2) Monterey cypress requires a large tree protection zone. Based on my observations, any development should remain outside the dripline at a minimum. It would not be appropriate to place homes or grading within the dripline of any mature cypress.

Trees could be pruned to remove failed and structurally weak branches and stems. Support systems in the form of cables and braces may enhance tree structure by providing additional support. Trees could also be pruned to reduce the size of the canopy, particularly for branches that grow along the ground.

The following are recommendations for design and construction phases that will assist in successful tree preservation.

Design recommendations

1. Verify the location and tag numbers of all trees. Include trunk locations and tag numbers on all plans.
2. Allow the Consulting Arborist the opportunity to review project plans, including but not limited to, site, grading, drainage and landscape plans
3. Use only herbicides safe for use around trees and labeled for that use, even below pavement.
4. Design irrigation systems so that no trenching will occur within the **TREE PROTECTION ZONE**.

Pre-construction and demolition treatments and recommendations

1. Establish a **TREE PROTECTION ZONE** around each tree to be preserved. For design purposes, the **TREE PROTECTION ZONE** shall be the dripline of 1' for every 1" of trunk diameter whichever is larger. No grading, excavation, construction or storage of materials shall occur within that zone.
2. Install protection around all trees to be preserved. Stack and secure hay bales 6' high around tree trunks. As an alternative, employ 6' chain link with posts sunk into the ground. No entry is permitted into a tree protection zone without permission of the project manager.
3. Trees to be removed shall be felled so as to fall away from **TREE PROTECTION ZONE** and avoid pulling and breaking of roots of trees to remain. If roots are entwined, the consultant may require first severing the major woody root mass before extracting the trees, or grinding the stump below ground.

4. Trees to be retained will require pruning to provide clearance and/or correct defects in structure. All pruning is to be performed by an ISA Certified Arborist or Certified Tree Worker and shall adhere to the latest editions of the ANSI Z133 and A300 standards as well as the ISA Best Management Practices for Tree Pruning. Pruning contractor shall have the C25/D61 license specification. I've enclosed general pruning guidelines.

Tree protection during construction

1. Prior to beginning work, the contractors working in the vicinity of trees to be preserved are required to meet with the Consulting Arborist at the site to review all work procedures, access routes, storage areas and tree protection measures.
2. Any grading, construction, demolition or other work that is expected to encounter tree roots should be monitored by the Consulting Arborist.
3. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.
4. Fences have been erected to protect trees to be preserved. Fences are to remain until all site work has been completed. Fences may not be relocated or removed without permission of the project manager.
5. Any additional tree pruning needed for clearance during construction must be performed by a qualified arborist and not by construction personnel.
6. All trees shall be irrigated on a schedule to be determined by the Consulting Arborist. Each irrigation shall wet the soil within the **TREE PROTECTION ZONE** to a depth of 30".

Summary

I assessed the health and structural condition of 44 trees including 41 Monterey cypress and 3 Monterey pine. Cyprresses were generally mature in development. Growing conditions ranged from specimen trees growing in the open to crowded rows. It seems likely that trees were installed to serve as a wind-break. Tree form and structure generally reflected growing conditions. Trees in the open had larger crowns, often with foliage to the ground. Trees in crowded rows tended to have asymmetric canopies as well as leaning and bowed stems.

History of management varied but consisted almost exclusively of pruning. The northern row of trees had been pruned many years ago to remove low branches. The southern row had a similar treatment only on the east, not on the west. As a result, trees in the southern row had wide canopies consisting of low branches that grew along the ground for some distance. This did not occur in the northern row. Cyprresses #178 and 194 also had large sections of the canopy growing along the ground.

Trees have a strong history of failure. A number of cyprresses along Juliana St. appear to have failed at the base and were removed. Most of the trees in this area leaned to the south, southeast and southwest. I expect more tree failures will occur in the future.

Elsewhere all large trees experienced numerous branch failures. This is not unusual in Monterey cypress. What is so striking with the assessed trees was the number of failures, which reduced trees such as #162 and 163 to little more than collapsed trees. Branches failed by near the base of the trunk as well as high in the crown.

The most striking thing about the assessed trees was how beautiful they appeared from a distance and how poorly they were structured when viewed up close. The rows of trees possess great visual appeal, particularly on the south. But individual trees were in poor condition.

HortScience, Inc.



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ATTACHMENTS

Tree Pruning Guidelines

Tree Assessment Form

Tree Assessment Map



Tree Pruning Guidelines

Juliana Avenue
Moss Beach CA

Qualifications

An I.S.A. (International Society of Arboriculture) Certified Arborist or Tree Worker is to be present at all times during pruning. Arborist must have a State of Calif. Contractor's License for Tree Service (C61-D49) and provide proof of workman's compensation and general liability insurance.

Objectives

The following is the primary objective:

1. Clean the crown of dead, dying, diseased, broken or otherwise structurally unsound branches to 2" diameter class.
 2. Reduce the length of long-heavy branches by up to 25%.
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Specifications

1. All pruning shall be in accordance with the most recent editions of the *Best Management Practices for Pruning* (International Society of Arboriculture) and the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300).
 2. Interior branches shall not be stripped out.
 3. No more than 20% of live foliage shall be removed from any tree at any one time.
 4. Trees shall not be climbed with spurs.
 5. Branch removal or reduction cuts (thinning cuts) are to be employed rather than heading cuts. Trees shall not be topped or headed back.
 6. Pruning operations shall be conducted in a manner that does not damage surrounding understory plants and structures.
 7. All branches and brush shall be removed from the site.
 8. Work area shall be hand-raked and restored to pre-pruning condition.
 9. Vehicles and equipment such as chain saws will be serviced and fueled only on paved surfaces, not on turf or other landscape material.
 10. While in the tree, the arborist shall perform an aerial inspection to identify any defects in structure that require treatment. Any additional work needed shall be reported to the property owner.
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