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# 1. INTRODUCTION

The following Urban Forestry Standards (Standards) are the city's primary regulatory tool to provide for orderly protection of specified trees, to promote the health, safety, welfare, and quality of life for the residents of the city, to protect property values and to avoid significant negative impacts on adjacent properties. By ensuring preservation and protection through the following standards of care, these resources will remain significant contributions to the landscape, streets, and parks, and will continue to help define the unique character of Pacific Grove.

These Urban Forestry Standards establish specific technical standards and specifications necessary to implement the city's tree ordinance (Municipal Code Title 12), and to achieve the city's tree preservation goals.<sup>i</sup> These goals are intended to provide consistent care and serve as benchmark indicators to measure achievement in the following areas:

- Ensure and promote preservation of the existing tree canopy cover within the city limits.
- Provide standards of maintenance required for protected and city-owned trees.
- Provide a standardized content for tree reports required by the city.
- Establish criteria for determining when tree risk exceeds community tolerance thresholds and management strategies need to be implemented in order to preserve public health, safety and welfare.
- Provide standards for the replacement of trees that are permitted to be removed.
- Increase the survivability of trees during and after construction events by providing protection standards and best management practices.

## 1.1 REQUIRED PRACTICES

All of the Standards described in this chapter are required practices unless noted otherwise (e.g. "recommended"). These required practices are to be implemented by the property owner, project applicant, contractor or designee - and are the minimum standards by which the care of a Protected Tree is to be administered. These Required Practices are considered reasonable measures that are consistent with best management practices in the tree care industry and are intended to promote healthy, structurally sound trees.

In all such cases, the Community Development Department, Public Works or City Arborist, if justified by field conditions such as conflict with utilities or a public nuisance, has the discretion to modify or add to any condition, practice or standard mentioned within the Standards.

## 1.2 RECOMMENDED PRACTICES

The Recommended Practices identified in this chapter are not mandatory. It should be noted, however, that a recommended practice may be required if it is so specified within the 'conditions of approval' for a development project or mitigation for injury or disturbance.

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<sup>i</sup> Sections of this chapter were inspired by the City of Palo Alto's *Tree Technical Manual* (2001) for which the City of Pacific Grove is greatly appreciative. Other sources include the city's previous Tree Preservation and Protection ordinance (Chapter 12.16 of the Pacific Grove Municipal Code), professional input, and current best management practices.

In all cases, the Director of Community Development, Public Works or City Arborist, if justified by changing field conditions such as conflict with utilities, has the discretion to modify, re-designate or add to any condition, practice or standard mentioned within the Standards.

### 1.3 DEFINITIONS

Certain terms that are unique to the arboricultural or construction industry are defined to provide a uniform understanding of the terms and concepts used and mentioned in this document.

### 1.4 COASTAL ZONE STANDARDS

The Local Coastal Program (LCP) Land Use Plan policies apply to tree management practices in the Coastal Zone. The LCP Land Use Plan is an element of the City's General Plan. Development of this Urban Forest Management Plan is a recommended action of both the General Plan and the LCP Land Use Plan. Within the coastal zone area of the City, the LCP Land Use Plan shall take precedence over the General Plan and Urban Forest Management Plan where policies are similar or conflict. All development projects must take into consideration the LCP Land Use Plan as well as the UFMP requirements. If policies within this plan overlap or conflict, the policy that is the most protective of coastal resources shall take precedence.

The coastal zone of Pacific Grove contains several land habitats that are considered environmentally sensitive in the LCP Land Use Plan, including the shoreline pine forest/sand dune association and the pine/eucalyptus overwintering habitat of the Monarch butterfly. Policies in the LCP Land Use Plan that address the urban forest include, but are not limited to:

- Designing new development in the Asilomar Dunes area (bounded by Asilomar Avenue, Lighthouse Avenue, and the boundary of Asilomar State Park) to protect existing and restorable native dune plant habitats, as well as the native oaks and pine forest which stabilize the inland edge of the high dunes along Asilomar Avenue southwards from the vicinity of its intersection with Pico Avenue.
- Designing new development within the scenic forest-front area along Asilomar Avenue to minimize loss of native Monterey pine and oak forest, and to retain public views towards the inland face of the high dunes.
- Retaining the scenic native forest within Asilomar Conference Grounds, along Asilomar Avenue, and within the abandoned railroad right-of-way, shall, to the maximum feasible degree.
- Protecting, or, when necessary, replanting, landscape trees which contribute to the scenic views in the City's coastal zone.

### 1.5 ASSUMPTIONS AND LIMITING CONDITIONS

- No responsibility is assumed by the City of Pacific Grove for matters legal in character regarding these Standards. Any legal description that may be provided is assumed to be correct.
- Care has been taken to obtain reasonable information from reliable sources for these Standards.
- Visual aids within the Standards, such as sketches, diagrams, graphs, photos, are not necessarily to scale and should not be construed as engineered data for construction.
- These Standards have been crafted to conform to current standards of care, best management practices, evaluation and appraisal procedures, diagnostic and reporting techniques and sound arboricultural practices.

## 2. PACIFIC GROVE'S PROTECTED TREES

### 2.1 PACIFIC GROVE MUNICIPAL CODE

Title 12 protects specific trees on public or private property from removal or disfigurement. The Standards establishes procedures and standards for the purpose of encouraging the preservation of trees. Trees that fall within the following categories are considered "Protected Trees", and must be maintained in accordance with the standards and regulations described in this chapter. A permit from the Planning or Public Works Department is required prior to removal or alteration of a Protected Tree. Trees that are not in any of these categories may be maintained or removed without city review or approval.

#### 2.1.1 PROTECTED TREES

Trees of the most importance to the community, because of their species, heritage, location, significant benefits or other factor shall be designated in the community's interest as Protected Trees. In making this determination, the City recognizes that it is identifying a shared responsibility regarding these resources. Suitable species planted in appropriate sites benefit both the owner of the property they grow on and the community as a whole. All property owners – both public and private – share a common responsibility for management of the City's overall urban forest, with special reference to Protected Trees.

The following tree species are protected in the City of Pacific Grove. All Protected Trees that require a permit for alteration or removal are 6 inches or greater in diameter (36 inches in circumference measured at 54 inches above natural grade).

#### OAK

All Coast live oak (*Quercus agrifolia*)

The Coast live oak leaf (left) is oval-shaped with stiff prickly points.



#### CYPRESS


All Monterey cypress (*Cupressus macrocarpa*) and Gowen cypress (*Cupressus goveniana*)

Monterey cypress columnar or cone-shaped when young, but becomes broad and spreading with age. The bark is fibrous and rough. The leaves are lemon scented, bright green, scale-like, 2-5 mm long.




**PINE**

All Monterey pine (*Pinus radiata*) and Torrey pine (*Pinus torreyana*)

<p>The Monterey pine grows to between 15–30 m (49–98 ft) in height in the wild, but up to 60 m (200 ft) in cultivation in optimum conditions, with upward pointing branches and a rounded top. The leaves ('needles') are bright green, in clusters of three. The bark is fissured and dark grey to brown.</p>	
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**COAST REDWOOD**

All Coast redwood (*Sequoia sempervirens*)

<p>The "leaves" of the Coast redwood are needle-like and flat, measuring about half an inch long. The bark is quite thick, has a reddish color and quite fibrous.</p>	
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**2.1.2 MONARCH BUTTERFLY HABITAT TREES**

All trees growing in and within 100 yards of Monarch Grove Sanctuary and George Washington Park, defined as follows:

- Monarch Grove Sanctuary. That portion of land bordered on the east and west by Ridge Road and Grove Acre Avenue, respectively, on the south by Short Street, and on the north by the northerly boundary of assessor’s parcel numbers 006-361-30-031, -032, -033, and -034, extended from Grove Acre easterly to Ridge Road.
- George Washington Park. That portion of land bordered on the east and west by Alder Street and Melrose Avenue, respectively, on the north by Pine Avenue, and on the south by the imaginary extension of Junipero Avenue westerly from Alder to Melrose Avenue.

Pruning or removal of trees in designated Monarch Butterfly Habitat Trees shall be prohibited except as prescribed in the Monarch Grove Sanctuary management plan or upon a finding by the city council that such is necessary for proper maintenance of the site or for public health, safety or welfare.

Pruning or removal of trees in designated Monarch Butterfly Habitat Trees, or within 100 yards of any boundary of such site, shall be prohibited during the months of October through April unless deemed necessary by the city council for public health, safety or welfare, as required by City Code.

Private property owners surrounding the Monarch Grove Sanctuary are encouraged to plant trees to serve as windbreaks.

### **2.1.3 PUBLIC TREES**

All trees growing within the street right-of-way (publicly-owned), outside of private property. In some cases, property lines lie several feet behind the sidewalks. A permit from the Public Works Department is required prior to any work on or within the tree protection zone of a Public tree.

Standards to be followed in planting, maintaining, pruning, and removing trees on Public Property (other than street trees) include the following:

1. Planting shall occur at reasonably constant rates over time so as to ensure continual renewal of the urban forest.
2. The appropriate variety of tree species shall be planted, so as to ensure no single event (e.g., species-specific disease) can harm a large proportion of the urban forest.
3. Native trees shall be preferred, except where special circumstances warrant otherwise (e.g., a proportion of eucalyptus trees in the Monarch Sanctuary).
4. Best management practices shall be employed at all times. The standards to which the city adheres shall be as high as or higher than the standards that owners of private property within the city are expected to adhere.

### **2.1.4 DESIGNATED TREES**

All trees, when associated with a development project, that are specifically designated by the city to be saved and protected on a public or private property which is subject to discretionary development review; such as a variance, architectural review, site and design, subdivision, etc. Approval from the Community Development Department is required to remove a Designated Tree.

## 3. REMOVAL, REPLACEMENT AND PLANTING OF TREES

A Protected Tree may not be removed without city review and approval, except in certain emergencies. The purpose of city review is to verify that the removal is allowed under city regulations and requirements, and to prevent unnecessary tree removal. For standards related to High Risk Trees, see Section 5.2.

This section describes the type and size of tree required for replacement, and the planting techniques to be used. It also describes how to determine the replacement value of a tree that cannot be replaced in its original location, and the circumstances in which the city may require a bond, in the amount of the appraised value of the trees to be preserved, to be posted to assure the survival of trees during development projects.

The alteration (pruning) of any Protected tree that does not conform to the most current American National Standards Institute (ANSI) A-300 Standards or International Society of Arboriculture Best Management Practices shall require a City permit. This includes excessive pruning, topping or pruning that damages branch structure, crown shape and/or stability beyond repair.

### 3.1 TREE REMOVAL

#### 3.1.1 ALLOWABLE REMOVAL

A permit is required to remove or significantly prune a Protected Tree, except in emergency situations outlined in high risk trees (see below).

#### 3.1.2 TREE REMOVAL CRITERIA

Standards and criteria to be observed during tree removal and alteration are as follows:

1. A tree shall not be removed or substantially pruned for the primary purpose of securing or improving a view, for acquiring more sunlight or air, or to reduce litter.
2. A tree that serves as part of the windbreak system, or assists in drainage or the avoidance of soil erosion, or serves as a component of a wildlife habitat, is to be preserved if at all feasible.
3. No tree can be pruned to an extent that destroys its identity as a tree, unless conditions for removal exist.
4. Tree Condition criteria:
  - The tree is dead and in falling would conceivably strike a use area, personal/public property or a Protected tree.
  - The tree poses a high risk to the immediate area that cannot be mitigated through prescriptive treatments.
  - Tree Risk Assessment Level (defined in Section 5.2) is greater than 6 and alternative risk reduction treatments have been considered and are unable to be implemented including:
    - Risk reduction pruning
    - Cabling or bracing

- Propping
  - Relocating the target
  - The tree is irretrievably infested with insects that vector disease or result in mortality and may infect/attack adjacent trees that cannot be preventatively treated.
  - The tree is infected with Pitch Canker and crown damage exceeds 50% of total canopy volume.
5. Trees that are causing significant damage to hardscape (house foundations, driveways, retaining walls, patios etc.), utility service lines or infrastructure (streets, curb, sidewalk, storm drain etc) that cannot be mitigated with cost effective, low risk, remedial solutions (see Section 6.6 – Trees and Infrastructure).
  6. Trees identified as a nuisance and causing illness or emotional distress as verified by a Medical Doctor.
  7. Trees with high pollen counts that cause incurable allergies if verified by a Medical Doctor.
  8. Trees with heavy cones or fruit drop that cannot be reasonably cleaned or targets relocated.
  9. Trees in densely planted areas where thinning is the proper forestry practice.
  10. Healthy trees with equal sized trees or full appraised value as mitigation.
  11. Invasive species as identified by Landscape Trees for Pacific Grove, California Invasive Plant Council and/or the California Invasive Species Advisory Committee.
  12. The visual prominence and function of each tree on the site will be considered prior to a decision on the removal or alteration.
  13. The City Arborist may refer permit applications to the Natural Resources Commission for review and recommendation.
  14. Trees of unusually large size, high visibility, or extraordinary aesthetic quality may be required to be replaced by specimen trees as deemed appropriate by the City Arborist.
  15. All work done under a permit shall be performed according to the standards of the International Society of Arboriculture.

### **3.2 TREE REPLACEMENT**

In order to maintain and enhance current benefits and canopy coverage levels, replacement of removed trees shall be required to restore the size, benefits and functions of the removed tree(s).

At the discretion of the City Arborist, replacement tree planting may occur offsite, on public lands when lot size or the property owner does not support tree planting.

Required tree replacement may also be achieved by paying in-lieu fees to the Pacific Grove Tree Trust Fund.

Replacement trees species shall be selected from *Landscape Trees for Pacific Grove, A Guide to Selection, Planting and Care*, incorporated herein.

### **3.2.1 WHEN TREE REPLACEMENT IS REQUIRED**

The following conditions determine whether or not a protected or designated tree must be replaced:

#### **PROTECTED TREES**

If the city authorizes removal of a protected tree because it is dead, dangerous, or a nuisance, no tree replacement is required. In all other cases, the tree must be replaced.

#### **MONARCH BUTTERFLY HABITAT TREES**

See Section 12.16.100(2) of the Pacific Grove Municipal Code.

#### **PUBLIC TREES**

If the city authorizes removal of a Public Tree in connection with a development project or city funded improvement project, it shall specify the replacement requirements in the permit authorizing removal. In no case shall the replacement be less than the existing number of trees.

#### **DESIGNATED TREES**

When authorizing removal of a Designated Tree, the City Arborist shall require tree replacement if it is necessary or desirable to implement the intent of the original site design. The number and nature of the replacement trees will be determined by the City Arborist, taking into consideration the value of the tree removed and the site design.

### **3.2.2 TREE REPLACEMENT CRITERIA**

#### **TREE SPECIES AND PLACEMENT**

The right tree in the right place maximizes the net benefits to the property owner and community and minimizes the risks associated with trees. Inappropriate tree selection and placement is often the underlying cause for trees that become high risk, are prone to breakage, or develop recurring pest or disease problems. Inadequate planting sites are often responsible for poor tree growth and survival, or excessive hardscape damage.

#### **NUMBER OF TREES**

##### **Residential Properties**

The community benefits when properties -- both public and private -- share equitably in the burden of providing Protected Trees. Meeting the tree canopy coverage goals established in this UFMP applies to both public and private property owners. Thus, the following minimum standards are established as best representing the nature and scope of tree replacement:

**Table 5-1: Tree Canopy Coverage Goals for Residential Properties**

Lot Size (SF)	Upper Canopy Trees	Lower Canopy Trees
Up to 4,000	0-1	1-2
4,001-6,000	2	2-3
6,001-8,000	3	3-4
Over 8,000	As determined by the appropriate Review Authority	As determined by the appropriate Review Authority

Commercial Properties

One tree per 30 feet of frontage, with a minimum of two trees, if space is available.

These tree density-per-lot standards are intended to achieve a mixed, healthy forest, and may be adjusted by the City Arborist or Review Authority in individual circumstances, taking into consideration individual site constraints and opportunities.

Parking Lots

Three trees per 25 spaces or in conjunction with low impact development landscaping for stormwater management.

**OTHER CONSIDERATIONS**

While the above standard shall serve as a general threshold for tree replacement, the City Arborist shall determine the final tree replacement requirements (number, size, species and placement) based on the following factors and taking into consideration the needs of the property owner:

- The tree canopy coverage target as described in this UFMP
- Neighborhood, use or district objectives
- Existing canopy coverage on the lot
- Land use
- Lot size
- Available space
- Topography and soil conditions
- Stormwater management
- Viewshed protection
- Long-term health potential of the replaced tree
- Existing infrastructure and potential for adverse impacts
- Adjacent properties and uses
- Condition of the removed tree. Dead trees do not require replacement. Diseased or structurally unsound trees may be replaced at lower levels.

Native species are required as replacement trees on lots greater than 4,000 square feet. On lots less than 4,000 square feet, replacement tree species should be selected from the most recent

edition of the *Landscape Trees for Pacific Grove – A Guide to Selection, Planting and Care*. The replacement trees may be the same species or may be another species that is considered by the City Arborist to be more suitable for the location.

In order to maintain the existing coniferous tree cover, particularly in the area between Sunset Drive and Seventeen Mile Drive, replacement planting are required to be with pitch canker resistant Monterey pines if available and where feasible. Otherwise, Monterey cypresses and other species of pines as recommended by the City Arborist may be used.

### **3.2.3 ALTERNATIVES WHEN TREES CANNOT BE REPLACED ON SITE**

In some circumstances, crowding or other physical constraints make it impossible or undesirable to replace a tree on site. In that case, the value of the tree shall be determined using the most recent edition of the *Guide for Plant Appraisal* published by Council of Tree and Landscape Appraisers or the *Form for Northern California* established by the International Society of Arboriculture.

Once the value has been determined, that sum of money (an in-lieu fee) will be deposited in a city-maintained Tree Trust Fund to be used, as approved by the City Arborist: 1) to provide additional trees elsewhere on the site; 2) to add or replace Public trees or other public landscaping in the vicinity, 3) to add trees or other landscaping to other city property, 4) to assess and mitigate high-risk trees, 5) to execute tree replanting consistent with the goals and implementation strategies identified in this UFMP.

### **3.2.4 MAINTENANCE AND MONITORING OF REPLACEMENT TREES**

The City Arborist shall verify replacement trees have been replanted or in-lieu fees collected within 60 days of permit issuance or final project inspection, for development projects.

Locations of replacement tree plantings for both public and private properties shall be identified on map (in GIS) and input to the City Tree Inventory database by the City Arborist, or their designee.

To ensure the survivability, proper growth and maintenance in perpetuity of the replacement trees, success criteria is defined to meet an 100% survival rate, implemented as follows:

A qualified professional shall monitor the newly planted tree at six (6) month intervals for a period of five years.

- Tree health and growth rates will be assessed.
- Trees suffering poor growth rates or declining health will be identified.
- Invigoration treatments will be provided.
- Dead trees or trees in an irreversible state of decline will be replaced with the next larger container size.
- At the end of the five-year period the status of replacement plantings will be assessed to make certain that success criteria has been met and all mitigation trees planted are performing well.
- The “Qualified Professional” shall submit by annual monitoring reports to the City Arborist in order to verify replacement trees are viable.

### **3.2.6 TREE PLANTING IN NEW SUBDIVISIONS**

Before any street improvements in any new subdivision of real property in the city are accepted by the City Council, the applicant shall pay to the city the total cost for purchasing and planting of all trees to be planted along all streets. The value of the tree will be determined using the most recent edition of the *Guide for Plant Appraisal* published by Council of Tree and Landscape Appraisers.

After receipt of payment, the city will plant the trees at the proper time as determined by the City Arborist, but not more than 3 months following issuance of the final building permit.

### **3.2.7 PUBLIC TREES AND ADJACENT PRIVATE PROPERTY OWNERS**

Public Tree plantings will be considered first from the perspective of the people passing on or using the streets, the benefits to storm water management, the extension of pavement life as a result of the shade they provide, and from the other broader community benefits. Of secondary consideration is the enhancement, embellishment, or other benefits to the properties abutting the street.

No Public Tree shall be planted, topped, substantially pruned, transplanted, removed, or otherwise damaged, without the approval of Public Works Superintendent. Planting of Public Trees shall be in conformance with an approved landscaping street plan, where applicable.

The city is responsible for maintaining all Public Trees along city streets not planted by private property owners.

A property owner's responsibility for Public Tree maintenance of trees planted by the property owner includes irrigation, pruning, keeping the right-of-way planting area free from weeds, debris, or other obstructions inimical to public safety and/or contrary to the street tree plan, and otherwise maintain such areas in a neat, clean, and orderly manner.

Any person intending to use material for the planting of tarpaper, plastic, or other impermeable material over the ground, or the use of materials or chemicals intended to permanently sterilize the soil of these areas, shall seek out the advice and proper installation and/or application of these materials from an expert or consultant prior to planting.

Private property owners may remove any dead, high risk, or diseased tree not protected by this section, or device necessary for the protection thereof, from public streets along street frontages on or adjacent to their property.

## 4. TREE PROTECTION AND PRESERVATION DURING DEVELOPMENT

### 4.1 INTRODUCTION

The objective of this section<sup>ii</sup> is to preserve and protect existing trees by reducing negative construction impacts to a less than significant level. Trees vary in their ability to adapt to altered growing conditions. Mature trees have established stable biological systems in the preexisting physical environment. Disruption of this environment by construction activities interrupts the tree's physiological processes causing depletion of energy reserves and a decline in vigor, often resulting in the tree's death. Since construction impacts are cumulative and long term, this reaction may develop from one to twelve years or more after disruption. These standards define protocol to identify the condition of existing tree resources, distinguish trees suitable for preservation, inform design that retains and protects the maximum number of suitable trees, assess project impacts, preserve and protect trees during construction, maintain and monitor trees post construction.

These standards shall define criteria for tree protection to guide a construction project to insure that appropriate practices will be implemented in the field to eliminate negative impacts that may result from uninformed or careless acts, and preserve both trees and property values.

Typical negative impacts that may occur during construction include: mechanical injury to roots, trunk, or branches; soil compaction, which degrades the functioning roots, inhibits the development of new roots, and restricts drainage which desiccates roots and enables water mold fungi to develop; changes in existing grade which can cut or suffocate roots; alteration of the water table - either raising or lowering; microclimate change; exposing sheltered trees to sun or wind; and sterile soil conditions associated with stripping off topsoil. For these reasons it is imperative that the commitment to tree protection begins in the planning stages of a project.

These standards shall apply to all Protected Trees in the City of Pacific Grove. These standards do not apply to unprotected trees or trees previously approved for removal.

### 4.2 ASSESSMENT OF THE TREE RESOURCES

1. During the conceptual stages of a development project, prior to project design and submittal of a permit application, a Tree Resource Assessment shall be performed by a Qualified Professional. This Qualified Professional will be designated the Project Arborist for the duration of the project, from planning stages through final inspection. The Project Arborist should be familiar with the tree species affected and experienced with procedures necessary to construct the project. In the event the Project Arborist is desired to be replaced by the property owner or the City, the replacement arborist shall be approved by the City prior to replacement. All costs associated with the Project Arborist shall be borne by the applicant.
2. The initial Tree Resource Assessment is to be completed during the conceptual planning stage to inform the project design, prior to submittal of a permit application.
3. Trees that are suitable for preservation, with Risk Ratings less than 5 and capability to tolerate moderate construction impacts, should be considered for incorporation into the final project design.

<sup>ii</sup> This section was adapted from City of Palo Alto Tree Technical Manual and Trees and Development, Adapted from County of Monterey Tree Report Requirements, City of Monterey Tree Protection Guidelines, James P. Allen & Associates and City of Scotts Valley Municipal Code Section 17.44.

4. The project shall preserve, or mitigate for, the maximum number of suitable individual trees that exist on the site pre-development.
5. Tree Resource Assessment Report Requirements
6. Numerically tag, map and identify the location of individual trees on a site plan
7. Submit tree inventory table or spreadsheet, including the following information:
  - 7.1. Assigned tree number, corresponding to mapped location
  - 7.2. Common name
  - 7.3. Botanical name
  - 7.4. Tree Condition using an excellent/good/fair/poor rating system
  - 7.5. Health
  - 7.6. Structure
8. Preservation Suitability rating system evaluating tree health, structure, species characteristics, age and potential longevity.
  - 8.1. Trees with a "good" rating have adequate health and structure with the ability to tolerate moderate impacts and thrive for their safe, useful life expectancy.
  - 8.2. A "fair" rating indicates health or structural problems that have the ability to be corrected. They will require monitoring with an expectation that their lifespan will be shortened by construction impacts.
  - 8.3. Trees with a "poor" rating possess health or structural defects that cannot be corrected through treatment. Trees with poor suitability can be expected to continue to decline regardless of remedies provided. Species characteristics may not be compatible with redefined use of the area. Species which are non-native and unusually aggressive are considered to have a poor suitability rating.
9. Factors to be considered or included:
  - 9.1. Condition of root crown, base and roots
  - 9.2. Condition of trunk including decay, injury callusing or presence of fungus or spores.
  - 9.3. Condition of limbs and twigs (identify) including strength of crotches, amount of deadwood, whether excessive weight is borne by limbs, and need for trimming
  - 9.4. Condition and growth rate history including pest damage and diseases
  - 9.5. Leaf appearance
10. Describe the surrounding site, forest composition
11. Critical Root Zone (CRZ) extents will be determined and mapped - Individual tree root systems provide anchorage, absorption of water/minerals, storage of food reserves and synthesis of certain organic materials necessary for tree health and stability. The Critical Root Zone is the tree-specific amount of roots necessary to continue to supply these elements essential for this tree to stand upright and maintain vigor. This distance (CRZ) reflects the minimum measurement from the trunk required for the protection of the tree's root zone.
12. Construction activities proposed within these CRZ areas are subject to specific review and the implementation of recommended special treatments
13. Canopy extents will be mapped
14. Risk Rating will be determined per Section 5.2

15. A summary report shall be submitted to the Planning Division of the Community Development Department to be used to determine where improvements and utilities can be positioned to preserve or minimize impacts to suitable trees.
16. The Project Arborist shall work closely with the design team (architect, landscape architect, or project designer) prior to submittal of the permit application. Tree permits associated with development are reviewed and approved by the same Review Authority as for the related planning permit and processed concurrently.
17. Disclosure of Information Regarding Existing Trees: Any application for discretionary development approval, or for a building or demolition permit where no discretionary development approval is required, shall be accompanied by a statement by the property owner or authorized agent which discloses whether any Protected Trees exist on the property which is the subject of the application, and describing each such tree, its species, size, tree protection zone, and location. This requirement shall be met by including the information on plans submitted in connection with the application.
18. In addition, the location of all other trees on the site and in the adjacent public right-of-way which are within thirty feet of the area proposed for development, and trees located on adjacent property with canopies overhanging the project site, shall be shown on the plans, identified by species.
19. The city may require submittal of such other information as is necessary to further the purposes of this chapter including but not limited to photographs, and condition of the trees (e.g. structural deficiencies, disease, infrastructure impacts, etc.), as determined by a certified arborist.
20. Disclosure of information pursuant to this section shall not be required when the development for which the approval or permit is sought does not involve any change in building footprint nor any grading or paving.
21. Removal or alteration of a tree(s) is considered development activity when it is for the purposes of: (1) erecting or adding to a structure, including, but not limited to, fences, sheds, decks and retaining walls, (2) providing parking, (3) grading, trenching, or lot clearance, or (4) any other activity requiring a building permit or any discretionary land use entitlement.

#### **4.3 CONSTRUCTION IMPACT ANALYSIS**

1. Prior to issuance of a planning or building permit, the Project Arborist shall review grading, drainage, utility, building and landscape plans to determine impacts to individual trees.
2. Recommendations for alternative construction methods and preconstruction treatments shall be made.
3. Tree protection and preservation specifications including a protection-fencing plan shall be completed.
4. Mitigation requirements for trees removed due to construction impacts shall be determined.
5. The appraised value of trees to be preserved shall be calculated.

6. A Construction Impact Assessment Report, accompanied by a Tree Location Map/Preservation Plan, shall be submitted to the Planning or Building Division of the Community Development Department, depending on the permits required, and reviewed by the City Arborist.
7. All procedures recommended by the Project Arborist through review of planning or building permits shall be Conditions of Project Approval or delineated on construction drawings for the Building Permit.

#### **4.4 MINIMUM TREE PROTECTION STANDARDS DURING CONSTRUCTION**

1. All development projects shall adhere to the most current version of the "American National Standards Institute A-300 (Part 5) Management of Trees and Shrubs During Site Planning, Site Development and Construction".
2. To avoid beetle infestation, the lower six feet of Monterey pine trees scheduled for preservation shall be sprayed with an appropriate pesticide as recommended by a licensed pest control adviser.
- 3.
4. All improvement plans for the project shall include accurate trunk locations, Critical Root Zones (CRZ), and Canopy Extents of all trees, or groups of trees, to be preserved within the development area. Tree Protection measures, fencing locations, and Special Treatment Areas are to be clearly defined on approved architectural/site plans to be used in the field and to be on file with the Community Development Department.
- 5.
6. The Project Arborist shall verify, in writing with photo verification, that all preconstruction conditions have been met (tree fencing, erosion control, pruning, pre-construction treatments, etc.) and is in place. Written verification shall be submitted to, and approved by, the Building Division of the Community Development Department prior to any demolition, grading or building permit issuance.
- 7.
8. The demolition, grading, and underground contractors, construction superintendent, and other pertinent personnel are required to meet with the Project Arborist at the site prior to beginning work to review procedures, tree protection measures, and to establish haul routes, staging areas, contacts, watering requirements, etc.
- 9.
10. All tree protection measures recommended in the Tree Resource Evaluation/Construction Impact Analysis are to be clearly presented in the building plans.
- 11.
12. The City Arborist will inspect project specific Tree Protection measures.

#### **4.5 BONDING OF PROTECTED TREES**

- i. All Protected Trees on proposed development sites to be preserved shall be valued using Trunk Formula Method or Replacement Cost Method consistent with the national standards authored by the Council of Tree and Landscape Appraisers and published in the year

2000 by the International Society of Arboriculture in the *Guide for Plant Appraisal, Ninth Edition*.

- ii. The developer shall post a retention bond representing the appraised value of the trees to be preserved to be held in trust by the City of Pacific Grove until project completion. In the event project management fails to implement recommended procedures or damages trees, the contract cost of implementation of recommended tree preservation treatments, or appraised value of damage to these preserved trees, whichever is greater shall be determined by the Project Arborist. Monetary fines shall be assessed and deducted from the retention funds or bonds.

DRAFT

## 5. MANAGEMENT FRAMEWORK

This section assigns responsibility for the care and management of the urban forest resources and defines responsible parties/departments, assessment protocol and best management practices.

### 5.1 STANDARDS OF CARE

Trees growing in the City of Pacific Grove require regular inspection to identify needs, assess condition, potential risk factors and provide a Due Standard of Care.

The City Arborist shall maintain all trees growing on public lands in order to provide a Due Standard of Care.

Private property owners should engage a Qualified Professional to assess the condition of trees growing on their property.

Tree removal or maintenance required on public or private lands shall be performed by a company with a valid Pacific Grove Urban Forest Tree Care license.

All trees in the City of Pacific Grove, public or private shall be maintained in adherence to the most current versions of the following industry standards and practices:

- American National Standards Institute (ANSI) A-300
- International Society of Arboriculture, Best Management Practices

#### 5.1.1 CITY ARBORIST

The City shall hire a qualified professional City Arborist. This City Arborist will be responsible for the implementation of the Urban Forest Management Plan, including:

1. Promoting the value of trees within the community on both public and private properties.
2. Implementing the Tree Risk Management program and assessing and mitigating high-risk trees.
3. Managing the Urban Forestry Department (yet to be established).
4. Consulting with constituents on tree related matters.
5. Resolving (or administering the resolution of) tree related conflicts within the community.
6. Conducting public outreach and educational programs.
7. Overseeing the application of herbicides, pesticides and fungicides.
8. Managing the city tree inventory (yet to be compiled) to a "current" level.
9. Providing a Due Standard of Care (defined in Section 4.2) for all trees on public lands
10. Administration of the city Tree Ordinance.
11. Administer the tree permit process.
12. Maintaining all related records.
13. Producing reports when requested.
14. Giving presentations and submitting written reports to the City Manager, Natural Resources Commission and City Council.
15. Responding to tree related inquiries or requests for service.

Certification by the International Society of Arboriculture is the minimum qualification for this position. Preferred designations are:

- Certified Urban Forester, California Urban Forest Council
- Municipal Specialist, International Society of Arboriculture

A background in tree risk management, Urban Forestry and forest ecology is necessary.

### **5.1.2 URBAN FORESTRY DIVISION**

The city shall authorize a budgeted Division to Provide a Due Standard of Care to all trees on city owned lands, manage tree inventories and administer the Urban Forest Management Plan.

The City Arborist staff the Urban Forestry Division with qualified professionals capable of meeting objectives defined in the Urban Forest Management Plan with a combination of city staff, volunteer services, and private sector contracting.

### **5.1.3 QUALIFIED PROFESSIONAL**

The City Arborist shall compile and maintain a list of “Qualified Professionals” to review tree related issues and prepare and submit assessment reports when necessary.

The list of “Qualified Professionals” should be compiled through a review and screening process to determine experience, capability and demonstrated objective, unbiased behavior.

The “Qualified Professional” should possess resource specific skills and education to accurately opine on the issue at hand; if there is an assessment of a Native Monterey pine forest required, a forest ecologist may be the most “Qualified Professional.” If a risk assessment is required, an ISA Certified Arborist/Board Certified Master Arborist or an ASCA Registered Consulting Arborist may be the most “Qualified Professional.” If a timber harvest plan is required, a Registered Professional Forester is the most “Qualified Professional.”

A “Qualified Professional” shall possess credentials, degrees or qualifications that supports the resource specific skill required to adequately prepare and submit assessment reports such as:

- International Society of Arboriculture
  - Certified Arborist
  - Municipal Specialist
  - Board Certified Master Arborist
  - Certified Tree Risk Assessor
- American Society of Consulting Arborists
  - Registered Consulting Arborist
- Forest Ecologist

“Qualified Professionals” shall not be a principal or employee of a tree service or other contract service provider that has a vested interest or conflict of interest in the subject project.

### **5.1.4 PACIFIC GROVE URBAN FOREST TREE CARE LICENSE**

All companies performing tree related work that are not a governmental or non-profit organization conducting work in the City of Pacific Grove shall be licensed by the City to perform tree work for hire, including landscaping crews performing young tree pruning and planting of trees. Personnel performing tree pruning shall be ISA certified arborists, certified tree workers or those with parallel professional designations/registrations/certifications. In order to obtain a Tree Care License, applicants shall pay the annual license fee and sign an agreement to perform work according to

these Urban Forest Management Plan Urban Forestry Standards. Licensees shall provide proof of appropriate consumer protection standards such as workers compensation and liability insurance, business license, state contractors license and identification of company vehicles and other responsible practices for their constituency.

Pacific Grove Urban Forest Tree Care License shall be valid for 1 year (or more). The licensing fee and timeline shall be set by resolution of the City Council.

### **5.1.5 TREE INVENTORY**

The City shall compile and maintain an inventory of individual trees on all public lands. The inventory should be cataloged at a minimum by street trees, park trees, and facility trees segmentable by land use. The inventory shall objectively evaluate tree resources to aid in decision making for maintenance, planting, and budgeting.

The inventory should include a land use specific canopy analysis identifying current coverage levels. This baseline data will be used to determine existing canopy coverage, available planting sites and measure success of tree-growing objectives.

The inventory should include all vacant available planting sites, and should provide the data needed to calculate the costs and benefits of the community's tree resources.

The inventory should be updated and managed with the most recent information each time a tree is inspected or maintained.

The inventory should be developed as an online resource with mapping features depicting locations and specific information; attributes, weaknesses, age class, risk rating and photos. This can be used a community engagement and educational tool.

### **5.2 TREE RISK ASSESSMENT**

The City intends to meet or exceed all arboricultural industry standards including *American National Standards Institute A-300 (Part) 9 Draft 1 Version 1 Tree Risk Assessment a. Tree Structural Assessment*.

The Pacific Grove Community Defined Risk Threshold is any tree with assigned Failure Potential Ratings of 6 or greater.

The City Arborist shall administer the Tree Risk Assessment Program and achieve a Due Standard of Care through the implementation of this policy as follows:

The City Arborist shall update Policy #700-1 Hazard Tree Risk Management by the end of the year 2012.

Qualified Professionals trained in tree risk assessment shall perform systematic inspections of all trees on City lands on a determined cycle.

#### **5.2.1 LEVELS OF ASSESSMENT**

The level of assessment required for Tree Risk Rating shall be determined by prominence of weak structural conditions according to the following assessment criteria.

**Level 1 assessment** shall be a limited visual assessment of an individual tree or a population of trees near specified targets, such as along roadways or utility rights-of-way, to identify specified conditions or obvious defects. Assessment methodology shall be specified by the Qualified Professional.

**Level 2 assessment** shall include a 360-degree, ground-based visual inspection of the tree crown, trunk, trunk flare, above-ground roots, and site conditions around the tree in relation to targets. When sounding is specified, a mallet or equivalent tool should be used to detect large hollows and loose bark in the trunk, root collar, and above ground buttress roots. Use of hand tools, trowels, binoculars, or probes, shall not be precluded from a Level 2 assessment. An assessment should include the identification of conditions indicating the presence of structural defects.

**Level 3 assessment** shall include, but are not limited to, one or more of the following tree assessment methods:

- Aerial assessment of branch or stem defects;
- Drilling;
- Evaluation of target risk;
- Increment boring;
- Investigation of tree or site history related to possible or defined defects;
- Lean assessment;
- Probing;
- Pull testing;
- Radiation assessment (e. g. radar, x-ray, gamma ray);
- Resistance drilling;
- Sonic assessment;
- Sounding; and,
- Sub-surface root and/or soil assessment.

Risk levels shall be rated using the PNW International Society of Arboriculture (ISA) *Hazard Tree Evaluation* form following PNW ISA Tree Risk Assessment Program criteria. The *Hazard Tree Evaluation* rating system is based on three categories:

- |                               |               |
|-------------------------------|---------------|
| a. Failure potential          | 1 to 5 points |
| b. Size of the Defective Part | 1 to 3 points |
| c. Target Area                | 1 to 4 points |

Inspection results shall be documented within the City Tree Inventory. Risk levels that meet or exceed the Community Defined Risk Threshold of 6 shall be pro-actively managed using the following table:

## 5-2: Overall Risk Rating and Action Thresholds

*The Overall Risk Rating and Action Thresholds*

<b>Risk Rating</b>	<b>Risk Category</b>	<b>Interpretation and Implications</b>
3	Low 1	Insignificant - no concern at all.
4	Low 2	Insignificant - very minor issues.
5	Low 3	Insignificant - minor issues not of concern for many years yet.
6	Moderate 1	Some issues but nothing that is likely to cause any problems for another 10 years or more.
7	Moderate 2	Well defined issues - retain and monitor. Not expected to be a problem for at least another 5 - 10 years.
8	Moderate 3	Well defined issues - retain and monitor. Not expected to be a problem for at least another 1 - 5 years.
9	High 1	The assessed issues have now become very clear. The tree can still reasonably be retained as it is not likely to fall apart right away, but it must now be monitored annually. At this stage it may be reasonable for the risk manager/owner to hold public education sessions to inform people of the issues and prepare them for the reality that part or the entire tree has to be removed.
10	High 2	The assessed issues have now become very clear. The probability of failure is now getting serious, or the target rating and/or site context have changed such that mitigation measures should now be on a schedule with a clearly defined timeline for action. There may still be time to inform the public of the work being planned, but there is not enough time to protracted discussion about whether or not there are alternative options available.
11	High 3	The tree, or a part of it has reached a stage where it could fail at any time. <b>Action to mitigate the risk is required within weeks rather than months.</b> By this stage there is not time to hold public meetings to discuss the issue. Risk reduction is a clearly defined issue and although the owner may wish to inform the public of the planned work, he/she should get on with it to avoid clearly foreseeable liabilities.
12	Extreme	This tree, or a part of it, is in the process of failing. <b>Immediate action is required.</b> All other, less significant tree work should be suspended, and roads or work areas should be closed off, until the risk issues have been mitigated. This might be as simple as removing the critical part, drastically reducing overall tree height, or taking the tree down and cordoning off the area until final clean up, or complete removal can be accomplished. The immediate action required is to ensure that the clearly identified risk of harm is eliminated. For areas hit by severe storms, where many extreme risk trees can occur, drastic pruning and/or partial tree removals, followed by barriers to contain traffic, would be an acceptable first stage of risk reduction. There is no time to inform people or worry about public concerns. Clearly defined safety issues preclude further discussion.

The Table shown above outlines the interpretation and implications of the risk ratings and associated risk categories. This table is provided to inform the reader about these risk categories so that they can better understand any risk abatement recommendations made in the risk assessment report.

### 5.2.2 STUMPS, SNAGS AND SLASH MANAGEMENT

Stumps, snags (dead and topped trees with trunks remaining standing) and slash may provide food storage and nesting structures for wildlife.

Stumps, snags (dead and topped trees with trunks remaining standing) and slash should be left if they do not increase fire hazard, create a risk to public safety or disturb view sheds.

Snags should be left no taller than the distance to of a target; use area, structure that would be struck in the event the snag fell.

Snags should be assessed at regular intervals to determine risk levels and managed when risk levels exceed 6, the Community defined Risk Tolerance Threshold.

### 5.2.3 WILDLIFE PROTECTION

Tree pruning and removal activities shall take place outside of nesting periods or other timeframes that disrupt wildlife.

No trees shall be pruned or removed in or within 100 yards of Monarch Sanctuaries between the months of April and October.

When tree work is proposed in areas where wildlife is present, it may be necessary for a qualified professional to conduct a survey and determine if negative wildlife impacts would result from the proposed pruning/removal

### **5.2.4 FLAMMABLE FUEL MANAGEMENT**

Fuel management is the planned manipulation or reduction of living or dead vegetation to prevent the ignition of wildland fires and to reduce the spread and intensity of any wildfire.

The Rip Van Winkle Open Space area and southern and eastern boundaries of the Del Monte park district are identified as Very High Fire Hazard Severity Zone VHFHSZ by CalFire (see Figure 2-13).

The City of Pacific Grove Urban Forestry Department and private property owners shall manage flammable fuel loads on their respective properties per the guidelines provided below and CalFire *General Guidelines for Creating Defensible Space*.

#### **GRASSES**

1. Once annual grasses cure (beginning early to mid-June) they are to be maintained at or about 4 inches in length within the 100' fuel management zone.
2. Multiple grass mowing/cutting may be necessary following wet winters.
3. Technique used (mower v. weed eater) should be sensitive to slope and potential for erosion.

#### **TREES**

1. Within the 100' fuel management zone, remove from mature trees: all vines, dead branches and all live branches less than 3 inches to 8 feet above the ground.
2. Small trees and tree-form shrubs (to 15 feet) should be pruned-up 1/3 their height. The space between tree foliage and shrubs should be 3 times the height of the shrub. This can be accomplished by pruning the tree, shrub, or both.

#### **SHRUBS AND SHRUB PATCHES**

1. Shrubs and shrub patches located under the canopy of trees should not exceed 18 inches in height.
2. Dead limbs should be removed from shrubs.
3. Individual shrubs and shrub patches outside of the canopy of trees should be managed to allow for adequate horizontal spacing. Individual shrubs or grouping of shrubs should be maintained in a form so their diameter does not exceed 2 times their height.
4. Whenever possible it is recommended that Scotch Broom (*Genesta sp*) Coyote bush and invasive species be removed during the fuel management process to promote the restoration of native plant communities.

#### **DISPOSITION OF PRUNED VEGETATION**

1. The preferred option should be to chip the native plant material on site and use for mulch in the landscape or distribute in the open in key erosion prone areas. Chipped material can also be spread within the landscaped areas where appropriate to reduce compaction and rebuild soil biota.
2. The alternative option should be to haul plant material off site and dispose of properly. This procedure is required for non-native, invasive and disease affected material. These materials should be hand loaded onto a truck and tightly covered with tarps for transport and disposal off-site

## 6. GROWTH AND DEVELOPMENT OF THE PACIFIC GROVE URBAN FOREST

This section includes materials adapted from *Up by the Roots*, James Urban.

In order to develop trees that grow, reach maturity and provide maximum benefits, a comprehensive growing plan is necessary.

All tree growing elements in the City of Pacific Grove should adhere to the most current versions of *ANSI A-300 Standards and Landscape Trees for Pacific Grove, A Guide to Selection, Planting and Care*.

### 6.1 SITE SELECTION

A thorough site analysis should be performed for all proposed plantings on public and private lands.

1. Adequate below and above-ground space should be required for the space to be identified as an appropriate planting site. If there is insufficient space to allow the tree to grow to full size, a different site or a smaller growing tree species should be chosen.
2. Tree planting sites should allow adequate distance between the tree trunk and hardscape elements that may be damaged by root development. A general distance to maintain is 10 to 20 feet for mature trees.
3. Tree planting sites should contain adequate soil volumes to allow tree root growth. Below ground space requirements should be twice the area of the above ground canopy coverage extents.
4. Soils shall have sufficient drainage capabilities as verified by a simple percolation test; dig a hole 24 inches in depth, fill with water, and monitor the time it takes for the water to drain. If water moves from the hole into the surrounding soil at a rate less than two inches per hour or pools at the bottom of the whole, drainage capabilities are poor.
5. Trees planting sites in poorly draining soils shall be dug shallow, to a depth that equals two-thirds to one-half the height of the container. This results in a "mounded" type-planting site.
6. Irrigation water supply should be tested to ensure there are no toxic elements or high salt concentrations.

### 6.2 SPECIES SELECTION

Species planted in the City of Pacific Grove shall be selected from the *Landscape Trees for Pacific Grove, A Guide to Selection, Planting and Care*.

The Natural Resources Commission in partnership with the City Arborist, and knowledgeable community members shall update the *Landscape Trees for Pacific Grove, A Guide to Selection, Planting and Care* as needed.

Tree species selected shall respect land use and rebuild native systems where space allows. Native Monterey pine shall be the species of choice for reforestation Rip Van Winkle Open Space and some sections of George Washington Park. Species chosen for neighborhood districts shall meet

Community wide goals for diversity and lot size limitations (see Chapter 4 - Neighborhood Urban Forestry Initiatives)

### **6.3 NURSERY STOCK SELECTION**

The selection and procurement of high quality, nursery grown trees is of paramount importance in Growing the Urban Forest.

All nursery grown trees planted in the City of Pacific Grove shall adhere to criteria defined in *Guideline Specifications for Nursery Tree Quality* authored by The Urban Tree Foundation (see Appendix D)

### **6.4 TREE PLANTING**

Trees planted in the City shall adhere to the most current version of *American National Standards Institute (ANSI) A-300 (Part 6) Transplanting* (Tree Planting Cue card by the Urban Tree Foundation) and *Landscape Trees for Pacific Grove - A Guide to Selection, Planting, and Care* (see Appendixes C and D).

#### **6.4.1 SELECTING QUALITY TREES**

Planting quality trees begins by choosing vigorous, structurally sound trees from the nursery. Strong trees have straight roots, a thick trunk, and one central dominant leader growing straight to the top (Fig. 1) The root collar (the uppermost roots) should be in the top 2 inches of the root ball.

#### **6.4.2 DIGGING THE HOLE**

A firm flat-bottomed hole will prevent trees from sinking. Dig the hole only deep enough to position the root collar even with the landscape soil surface (Fig. 2) Use the rototiller or shovel to loosen soil in an area three times the size of the root ball. This loose soil promotes rapid root growth and quick establishment.

#### **6.4.3 INSTALLING THE TREE**

Remove soil and roots from the top of the root ball to expose the root collar; cut away any roots that grow over the collar (Fig. 3) Also cut any roots that circle or mat along the sides and bottom of the root ball (Fig. 4). The root collar should be even with the landscape soil after planting (see Fig. 3). Backfill with soil removed from the hole. Minimize air pockets by applying water and packing gently. Build a berm 4 inches tall around the planting hole to help force water through the root ball.

#### **6.4.4 STAKING**

Staking holds trees erect and allows the root ball to anchor. Secure the trunk at the point where the tree stands straight. A second stake tied directly to the trunk made of bamboo may be required to straighten the upper trunk.

#### **6.4.5 MULCHING**

A layer of organic mulch, such as leaf litter, shredded bark, or wood chips, helps protect tree roots from temperature extremes and conserves soil moisture. Mulch also helps prevent grass from competing with the tree for water and nutrients. The mulched area makes it easier to operate mowers and weed eaters without hitting the trunk and compacting soil. Apply mulch to a depth of 3 to 4 inches (slightly thinner on top of the root ball).

### 6.4.6 IRRIGATING

Consistent irrigation is critical for establishment. 1. Apply about 3 gallons irrigation per inch of trunk diameter to the root ball 2 or 3 times a week for the first growing season. 2. Increase volume and decrease frequency as the tree becomes established. 3. Weekly irrigation the second year and bimonthly irrigation the third year should be sufficient for establishment. 4. Once established irrigation requirements depend on species, climate and soil conditions. 5. Irrigation devises should be regularly checked for breaks and leaks.

### 6.4.2 AFTER PLANTING CARE

Aftercare is essential to ensure new plantings succeed and grow. Newly planted trees shall be monitored weekly for the first three months, monthly during the next years growth and then at six (6) month intervals for a period of five years or until they acclimate to their new environment.

### 6.4.7 PRUNING

Training young trees promotes structurally sound growth and overall tree health. Cut back or remove codominant stems (stems that compete with the central leader) to encourage growth in the central leader (below).

### 6.4.3 EARLY TRAINING PRUNING

1. Directing the growth of young trees is essential if mature trees are to perform properly in the landscape. Early training pruning will establish proper structure and form.
2. Shade trees that grow to be large should have one relatively straight central leader. Heading the tree is acceptable provided the central lead is retained.
3. Main branches should be well distributed along the central leader, not clustered together. They should form a balance crown appropriate for the cultivar or species.
4. The diameter of branches that grow from the central leader, or trunk, should be no larger than two-thirds (one-half is preferred) the diameter of the trunk measured just above the branch.
5. The largest branches should be free of bark that extends into the branch union, known as included bark (see A and B).
6. Temporary branches should be present along the lower trunk below the lowest main branch. These branches should be no larger than 3/8 inch in diameter. The trunk should be free of wounds, sunburned areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, cankers, or lesions. Properly made recent pruning cuts are acceptable.
7. The trunk caliper (thickness) and taper should be sufficient so that the tree remains vertical without a stake.
8. The root collar (the uppermost roots) should be within the upper 2 inches of the solid media (substrate). The root collar and the inside portion of the root ball should be free of defects, including circling, kinked, and stem grinding roots. You may need to remove soil near the root collar to inspect for root defects.
9. The tree should be well rooted in the soil media. Roots should be uniformly distributed throughout the container. The tree's structure and growth should be appropriate for the species or cultivar. When the container is removed, the root ball should remain intact. When the trunk is lifted, both the trunk and root system should move as one.

10. The root ball should be moist throughout at the time of inspection and delivery. The roots should show no signs of excess soil moisture as indicated by poor root growth, root discoloration, distortion, death, or foul odor. The crown should show no signs of moisture stressed as indicated by wilted, shriveled, or dead leaves or branch dieback.

## 6.5 TREE MAINTENANCE

Tree Maintenance in the City of Pacific Grove shall be performed to specifications written in accordance with American National Standards Institute (ANSI) A300 (Part 1) Tree Management Standards in accordance with International Society of Arboriculture Best management Practices.

Trees on Public Property and within the City Right of Way shall be pruned by the Urban Forestry Department to maintain a Due Standard of Care. Vertical clearance shall be maintained at a minimum height of 13'6" for all roads, streets throughways etc. Tree with a Risk Rating of 6 or greater shall be managed.

Trees on Private Property shall be pruned to maintain a Due Standard of Care at the expense of the Property owner.

## 6.6 TREES AND INFRASTRUCTURE

*Adapted from work By Jim Urban, Nina Bassuk and Jason Grabowsky.*

### 6.6.1 INTRODUCTION

Trees and hardscape/infrastructure elements are often in conflict when tree roots damage curbs, gutters, sidewalks, utility/drainage lines, foundations and retaining walls on both public and private properties. The most effective long-term planning strategy to avoid these conflicts is to dedicate larger planting sites for tree planting. Since a mature tree requires a minimum distance of 10 to 20 feet between the trunk and hardscape elements, this distance is impossible to maintain in streetscape settings. Soil conditions affect tree root trajectory and depth. The required compaction and site stabilization beneath roads and sidewalks creates a perfect environment for small roots to penetrate the concrete/asphalt and base material interface and grow to cause damage.

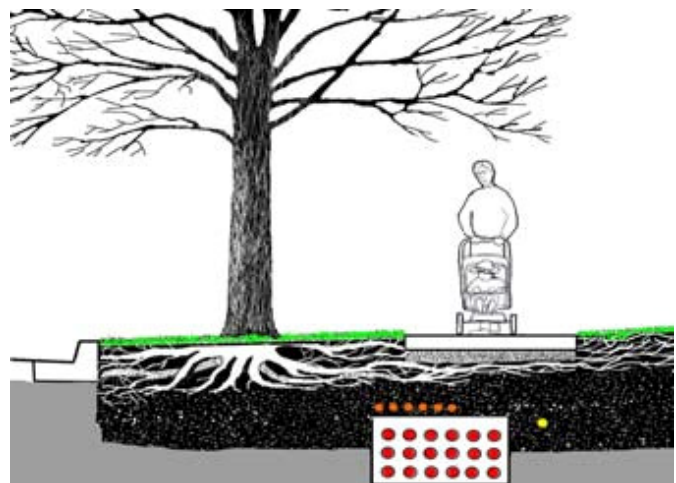
### 6.6.2 LOCATING TREES

Large scale trees planted on private property, public rights of way, in public parks and open space shall be positioned a proper distance from hardscape elements in order to decrease damage potential from root development.

A standard detail, depicted at the right will result in significant damage to the sidewalk, curb/gutter and street as the tree grows.

As the tree develops, roots grow toward and beneath the sidewalk and street.

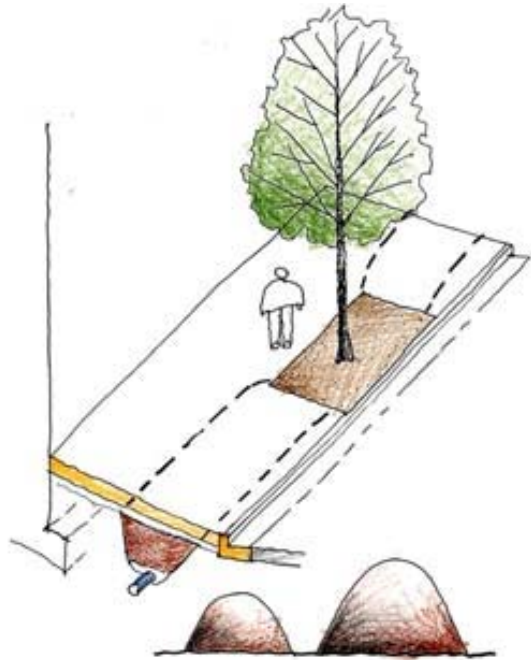
Street tree and right-of-way plantings near infrastructure shall be placed in locations



where root /soil volumes can be expanded below or to the side of infrastructure elements. Some of the methodologies available include planting in the easiest places first. Make use of the spaces that currently have the largest soil volumes.

Expand “root paths” by extending and deepening the soil trench, creating more soil volume or root growth. This increases soil volume from 115 cubic feet to 365 cubic feet, two and one half times the volume

Soil trenches can be extended and connect street trees to further develop “root paths.”



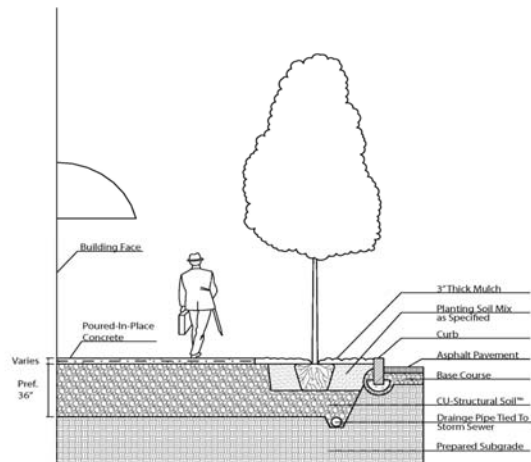
### 6.6.3 STRUCTURAL SOILS

Another innovative concept is Structural Soil (CU-Structural Soil) developed at Cornell University about 15 years ago.

The development of CU-Structural Soil was driven by the need for a load-bearing soil under pavement that can be compacted to 100% dry density (Proctor density or modified Proctor density) to bear the load of a pavement while allowing tree roots to grow through it. Previously, soils compacted to meet engineering specifications for load bearing restricted tree root growth.

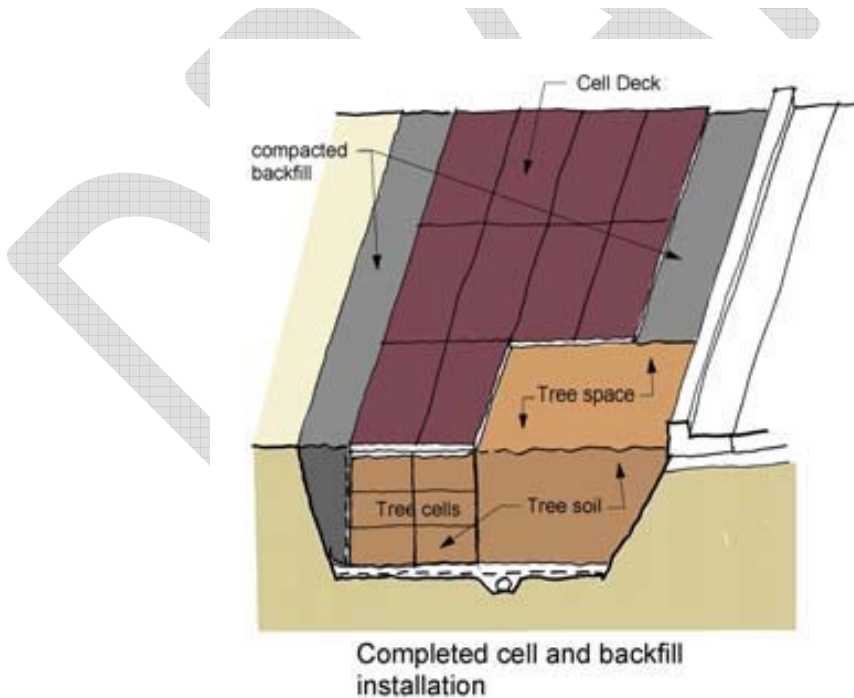
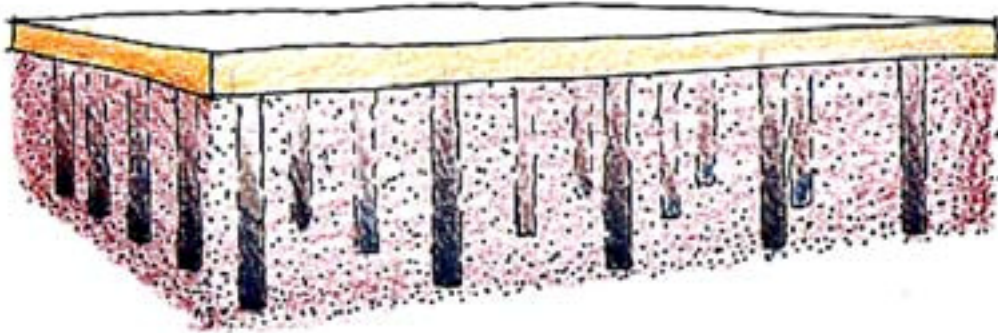
CU-Structural Soil is a mixture of crushed gravel and soil with a small amount of hydrogel to prevent the soil and stone from separating during the mixing and installation process. The keys to its success are the following: the gravel should consist of crushed stone approximately one inch in diameter, with no finer particles, to provide the greatest porosity. The soil needed to make structural soil should be loam to clay loam containing at least 20% clay to maximize water and nutrient holding capacity. The proportion of soil to stone is approximately 80% stone to 20% soil by dry weight, with a small amount of hydrogel aiding in the uniform blending of the two materials. This proportion insures that each stone touches another stone, creating a rigid lattice or skeleton, while the soil fills the large pore spaces that are created between the stone. This way, when compacted, any compactive load would be borne from stone to stone, and the soil in between the stones would remain uncompacted.

CU- Structural Soil requires, approximately 2 cubic feet of soil for every square foot of envisioned crown diameter. A 36” soil depth is recommended although several projects have been successful using as shallow as 24”. We would not recommend any less than 24”. CU-Structural Soil has an available water holding capacity between 7% and 12% depending on the level of compaction. This is equivalent to a loamy sand or sandy loam. (See the table below for soil volume recommendations). Because of its well-drained nature, trees that prefer well-



drained soils do best in CU- Structural Soil. Depending on the stone type used to make it, the pH of the soil may be affected (e.g. limestone vs. granite). Good tree selection practices and establishment procedures should be used with CU- Structural Soil as would be done with any tree installation. It is important to maximize the water infiltration through the pavement to replenish CU- Soil as with any soil. This feature serves a dual purpose to expand stormwater infiltration functions and decrease hardscape damage.

Another system is a structural cell configuration that is engineered to support above ground elements while increasing soil volume by 80%.



### 6.6.4 STRATEGIES TO REDUCE INFRASTRUCTURE DAMAGE POTENTIAL

Adapted from *Strategies to Reduce Infrastructure Damage Potential*, Costello and Jones

Alternative design methods to reduce tree/infrastructure conflicts include:

1. Curving sidewalks
2. Pop-outs
3. Reconfigured sidewalk alignment
4. Monolithic sidewalks
5. Increasing Right of Way
6. Build root paths, narrow trenches installed in compacted sub-grad material filled with root friendly material to encourage rooting
7. Root channels, directing root growth to areas of larger soil volume
8. Elimination of Sidewalks
9. Narrower Streets
10. Tree Islands
11. Bridges and Ramps
12. Lowered sites
13. Gravel layer between roots and concrete
14. Concrete with extra reinforcement/Thicker slabs
15. Pervious concrete promotes deeper rooting
16. Recycled rubber sidewalk panels
17. Root control diversion barriers

### 6.6.5 TREES AND INFRASTRUCTURE, REMEDIAL TREATMENTS

Once damage to infrastructure elements occurs, there are alternatives to tree removal including:

1. Grinding pavement to eliminate uplifted that cause trip hazards
2. Root pruning and the installation of root control diversion barriers
3. Mudjacking, lifting and resetting concrete slabs
4. Alternative materials for walkways that are either: thinner, modular, re-usable, easily replaced, and don't require complete root removal beneath the material

## 7. TREE REPORTS

### 7.1 INTRODUCTION

An arborist report is needed for development projects and tree removal permits. The report must be prepared by a certified arborist for the applicant and submitted to the city for the purpose of providing accurate information and opinion regarding the condition, welfare, maintenance, preservation or value of a protected or designated tree.

### 7.1.1 WHEN A WRITTEN REPORT IS REQUIRED

Generally, there are two circumstances in which tree reports are required: 1) when a tree removal permit is sought, and 2) to complete and verify a site plan, assess tree impacts and establish tree protection for property development when within the tree protection zone of a protected or designated tree.

### 7.1.2 WHO MAY PREPARE THE REPORT

The tree report is to be prepared by a certified arborist retained by the applicant or property owner. This person shall possess a current ISA certification, be a member of the American Society of Consulting Arborists; or a member of good standing in another nationally recognized tree research, care, and preservation organization.

## 7.2 TYPES OF REPORTS

There are four types of reports, each of which are discussed below, namely:

1. Letter Report
2. Tree Survey Report
3. Tree Protection and Preservation Report
4. Tree Appraisal

### 7.2.1 LETTER REPORT

A brief format is acceptable for removal and development related activities (described below), and can generally be used for assessing one or two trees. The report is to be on letterhead stationery of the individual preparing the report, including their ISA Certification number.

#### REMOVAL

For a tree removal, not in connection with a property development, the report shall provide information and determination whether the tree is dead, High risk or constitutes a nuisance under the Pacific Grove Municipal Code Section 12.16.X.

#### DEVELOPMENT

For development on a single family residential lot (not a subdivision), the report shall also clearly indicate whether or not any Protected or Designated tree is so close to the building area or building footprint that it will be killed or permanently injured by disturbance. The report must make specific recommendations to protect and preserve the tree during the course of construction consistent with the specifications within these Standards.

#### SUBMITTAL REQUIREMENTS

##### Standard information

All letter reports shall contain the following information:

- Arborist name and certification number;
- Purpose of the report and for whom;
- Site address; date of the inspection(s);
- A to-scale diagram of the tree(s) location;

- Accurate size of the trunk diameter (measurement taken at 54-inches above natural grade);
- Perimeter of leaf canopy;
- Proximity to structures;
- Condition of the tree health (and/or decay presence);
- Condition of the tree structure;
- Imminent danger of failing (ISA Hazard Rating, see High risk Trees, above);
- Interface with utility services;
- Conclusion and recommendation(s);
- Photographs (encouraged); and,
- Tree protection instructions (if applicable).
- 

#### Specific Situations

Other conditions may require the following additional information on an as needed basis if requested by the reviewing city staff: tree protection plans; appraised value (see Tree Appraisal, below); and any other supporting information, photographs, diagrams, etc. that may be necessary.

#### **7.2.2 TREE SURVEY REPORT**

A more extensive Tree Survey Report is required for all development projects except those identified above (Letter Report). The Tree Survey Report shall inventory all trees that are greater than 4-inches in diameter (measured at 12-inches above natural grade) on site, including trees to be removed, relocated and retained on the property (including trees on neighboring properties that overhang the project site) and all Public trees in the right-of-way within 30-feet of the project site. In addition to the information required in a Letter Report, the Tree Survey Report shall also include an inventory of the trees, site plan, appraised value (see Appraisals, below) of the trees and any other information pertinent to the project.

#### **SUBMITTAL REQUIREMENTS**

##### Items to include:

All Tree Survey Reports shall contain all items required for a Letter Report (identified above) as well as the following information:

- Cover letter;
- Title page;
- Table of contents (if necessary);
- Date of the inspection(s);
- Site plan (showing each tree location by number that correlates with the tree inventory on plans;
- A separate list of all Protected Trees with location numbers;
- Tree inventory data (include tree species, size, health, structure, etc. for all trees on the project site, including those to be removed (tables may be used);

- Condition of the trees (include information with respect to health, structure, decay, imminent danger of falling, existing property lines, structures and utility services);
- The monetary value that each tree contributes to the real estate value of the property shall be determined and listed separately. The formula used should be noted (see Tree Appraisal, below); and,
- Conclusion, recommendation(s) and ratings for suitability for preservation.

If necessary, other supporting information, photographs, diagrams, etc. may be required or provided.

### **7.2.3 TREE PROTECTION AND PRESERVATION PLAN**

All Protected or Designated Trees to be retained on a development site shall be shown on approved sets of civil, building and landscape plans and shall be protected during the construction process. A Tree Protection and Preservation Plan submitted for review by the Community Development Department and the City Arborist is required when trees to be saved may be injured by disturbance.

The Tree Protection and Preservation Plan shall assume compliance with the standards described in this UFMP (see Protection of Trees During Construction, above). In addition, the following submittal information must be included in the report:

#### **SUBMITTAL REQUIREMENTS**

##### Disclosure of All Trees On and Near the Site

The property owner or designee shall provide accurate information to the project arborist to develop the tree protection measures and to enable accurate recommendations to insure their survival. This site plan shall accurately show the surveyed location, species, size of trunk and leaf canopy; show the tree protection zone of any neighboring trees that may overhang the site and Public trees that are within 30 feet on each side of the project. Failure to show a tree on the plans and later determined to be affected by construction may require the work to stop until mitigation can be agreed upon by the property owner and the city.

##### Final Improvement Plans

In addition to the above information, final improvement plans shall include and show the following information: show the tree protection zone of any tree to be retained and the protective fencing around the protected zone of each tree or group of trees (to be clearly identified as such on all plans as a bold-dashed line); permeable paving located within the tree protection zone area; approved utility pathways; grade changes; surface and subsurface drainage and aeration systems to be used; walls, tree wells, retaining walls and grade change barriers, both temporary and permanent; landscaping and irrigation within tree protection zone of trees.

### **7.3 TREE APPRAISAL**

Landscape value may contribute from seven to 20 percent of the real estate property value. An individual tree has an inherent value to the real estate that can be determined by an appraisal prepared by a certified arborist.

An appraisal is a process for determining a monetary opinion of the value of a tree as it relates to either the property, a group of trees and/or the immediate community. A qualified certified

arborist is required to determine this value, and must exercise good and fair judgment by adjusting the basic value by the tree's condition and location.

The certified arborist must prepare the appraisal by using the most current edition of the 'Guide for Plant Appraisal', published by the Council of Tree and Landscape Appraisers.

There are two methods to determine tree value; 1) the Replacement Method, based upon the size and availability of the replacement tree or, 2) the Trunk Formula Method, if the tree cannot be replaced (e.g. not sufficient room on site or it is too large to replace). In all cases, the type of formula used must be identified.

### **7.3.1 THE REPLACEMENT COST METHOD**

This method applies to smaller trees with a trunk size up to 4 inches in diameter or, 48 inch box size trees replaceable. The appraised value is determined by combining: price quote + transportation + planting + other costs and applying the condition and location value to the tree. The sum of these is the appraised replacement cost.

### **7.3.2 THE TRUNK FORMULA METHOD**

This method applies to trees that are too large for practical replacement (transplanting) and shall be appraised by: determining the basic tree value and adjusting this value by a condition and location ratings. The appraised value shall be determined by using the most recent edition of the 'Guide for Plant Appraisal', published by the Council of Tree and Landscape Appraisers.

The Trunk Formula or Replacement Method Forms for Northern California established by the International Society of Arboriculture must be used to compute the appraised value. All trees with a stem larger than 4 inches in diameter when measured at 12 inches above natural grade shall be calculated in this manner.

## Appendix D

DRAFT

# Tree Quality Cue Card

Shade trees that grow to be large should have one relatively straight central leader. Heading the tree is acceptable provided the central leader is retrained.

Desirable



Desirable



Not desirable



Main branches should be well distributed along the central leader, not clustered together. They should form a balanced crown appropriate for the cultivar or species.

Desirable



Not desirable



The diameter of branches that grow from the central leader, or trunk, should be no larger than two-thirds (one-half is preferred) the diameter of the trunk measured just above the branch.

Desirable



Not desirable

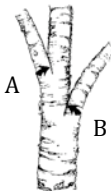


The largest branches should be free of bark that extends into the branch union, known as included bark (see A and B).

Desirable



Not desirable



Temporary branches should be present along the lower trunk below the lowest main branch. These branches should be no larger than 3/8 inch in diameter.

Desirable

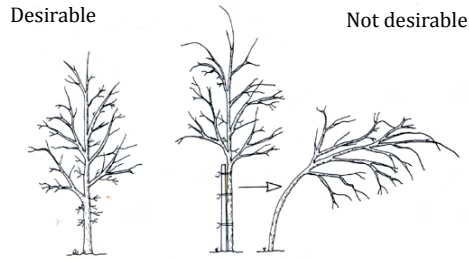


Not desirable

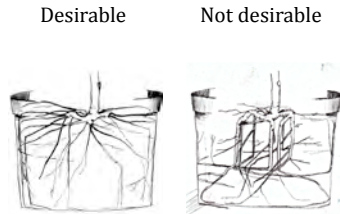


The trunk should be free of wounds, sunburned areas, conks (fungal fruiting bodies), wood cracks, bleeding areas, signs of boring insects, cankers, or lesions. Properly made recent pruning cuts are acceptable.

The trunk caliper (thickness) and taper should be sufficient so that the tree remains vertical without a stake.



The root collar (the uppermost roots) should be within the upper 2 inches of the soil media (substrate). The root collar and the inside portion of the root ball should be free of defects, including circling, kinked, and stem girdling roots. You may need to remove soil near the root collar to inspect for root defects.



The tree should be well rooted in the soil media. Roots should be uniformly distributed throughout the container. The tree's structure and growth should be appropriate for the species or cultivar. When the container is removed, the root ball should remain intact. When the trunk is lifted, both the trunk and root system should move as one.

The root ball should be moist throughout at the time of inspection and delivery. The roots should show no signs of excess soil moisture as indicated by poor root growth, root discoloration, distortion, death, or foul odor. The crown should show no signs of moisture stress as indicated by wilted, shriveled, or dead leaves or branch dieback.

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# Tree Planting Cue Card

**Selecting quality trees:** Planting quality trees begins by choosing vigorous, structurally sound trees from the nursery. Strong trees have straight roots, a thick trunk, and one central dominant leader growing straight to the top (Fig. 1). The root collar (the uppermost roots) should be in the top 2 inches of the root ball.



Figure 1. Quality tree ready for planting.

**Digging the hole:** A firm, flat-bottomed hole will prevent trees from sinking. Dig the hole only deep enough to position the root collar even with the landscape soil surface (Fig. 2). Use a rototiller or shovel to loosen soil in an area three times the size of the root ball. This loose soil promotes rapid root growth and quick establishment.

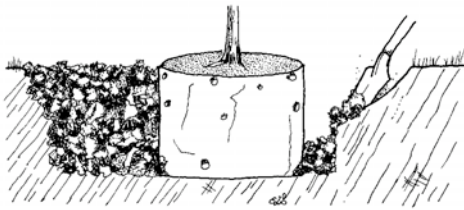


Figure 2. Loosening soil in a large area around the root ball allows for rapid root growth and quick establishment.

**Installing the tree:** Remove soil and roots from the top of the root ball to expose the root collar; cut away any roots that grow over the collar (Fig. 3). Also cut any roots that circle or mat along the sides and bottom of the root ball (Fig. 4). The root collar should be even with the landscape soil after planting (see Fig. 3). Backfill with soil removed from the hole. Minimize air pockets by applying water and packing gently. Build a berm 4 inches tall around the planting hole to help force water through the root ball.

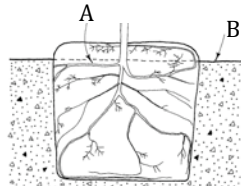


Figure 3. Remove soil and roots growing over the root collar (A) and place collar level with soil surface (B).

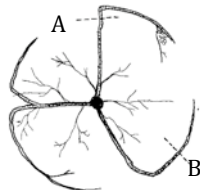
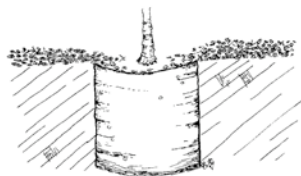


Figure 4. Cut roots at (A) to form new roots that grow away from the trunk. Do not cut roots at (B), since the root defects will regrow.

**Staking:** Staking holds trees erect and allows the root ball to anchor. Secure the trunk at the point where the tree stands straight. A second stake tied directly to the trunk made of bamboo may be required to straighten the upper trunk.

**Mulching:** A layer of organic mulch, such as leaf litter, shredded bark, or wood chips, helps protect tree roots from temperature extremes and conserves soil moisture. Mulch also helps prevent grass from competing with the tree for water and nutrients. The mulched area makes it easier to operate mowers and weed eaters without hitting the trunk and compacting soil. Apply mulch to a depth of 3 to 4 inches (slightly thinner on top of the root ball).

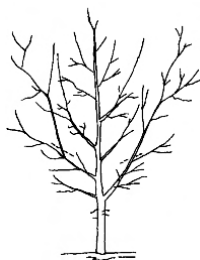


**Irrigating:** Consistent irrigation is critical for establishment.

1. Apply about 3 gallons irrigation per inch of trunk diameter to the root ball 2 or 3 times a week for the first growing season.
2. Increase volume and decrease frequency as the tree becomes established.
3. Weekly irrigation the second year and bimonthly irrigation the third year should be sufficient for establishment.
4. Once established irrigation requirements depend on species, climate and soil conditions.
5. Irrigation devices should be regularly checked for breaks and leaks.

**Pruning:** Training young trees promotes structurally sound growth and overall tree health. Cut back or remove codominant stems (stems that compete with the central leader) to encourage growth in the central leader (below).

Before Pruning



After Pruning



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