

8.0 Appendices

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DRP TREE PRESERVATION POLICY

Purpose

The purpose of the Tree Preservation Policy is to establish a regulatory tool to provide orderly protection of specified trees, protect their value, and avoid significant negative impacts to the ecosystem. The Policy regulates protection of trees in four categories: Trees Protected by LA City Ordinances, Heritage Trees, Special Habitat Value Trees, and all other Common Park Trees.

Trees Protected by LA City Ordinances:

The current City of Los Angeles Ordinance protects coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), or any other tree of the oak genus indigenous to California measuring eight inches or more in diameter, four and half feet above the ground level at the base of the tree. The Board of Public Works must issue a permit before any alterations to protected trees are made that could cause them to be damaged, relocated or removed. Pruning also requires a permit and must comply with the Oak Tree Pruning Standards set forth by the Western Chapter of the International Society of Arboriculture. Illegal pruning or willful damage to any protected oak tree can result in a \$10,000 fine and/or 6 months in jail. If the tree poses an immediate threat to life or public safety, the DRP Arborist has the discretion to modify this process, maintaining proper documentation, including digital photographs. Oak trees identified as dead by the DRP Arborist can be removed without a permit.

Heritage Trees:

Heritage trees are individual trees of any size or species that are specifically designated as heritage because of their historical, commemorative, or horticultural significance. The list of designated Heritage Trees remains open for new designations and provides useful information to DRP staff regarding the importance of their actions while planning activities near heritage trees. Since Heritage Trees are protected trees, recommendations from the DRP Arborists must be obtained before any alterations to the protected trees is made that may cause the tree to become damaged, relocated, or removed. The General Manager of DRP or his/her designee must approve the recommendation before any action proceeds. Pruning also can cause irreversible damage to the tree and must be in compliance with the ISA Tree Pruning Guidelines. Pruning must be performed under supervision of an ISA certified staff only. If the tree poses an immediate threat to life or public safety, the Arborist of the Forestry Division may compromise the process, if proper documentation, including digital photographs, is kept. Heritage trees identified as dead by the DRP Arborist will be removed and recorded into the designated Heritage Trees list. The Heritage Trees list can be obtained from Regional Headquarters Office and the Forestry Division.

Special Habitat Value Trees:

After more than a century of development, the native and indigenous landscape throughout the City has changed significantly. Special habitat value trees, because of decreasing numbers and their fragility in an urban setting, are particularly noteworthy here.

- California native trees provide habitat for state or federally protected animal species.
- California native trees that are located in the Pacific Flyway are important to thousands of migratory birds each spring and fall during migration season.
- Native trees provide a foundation for a healthy ecosystem

The following California native trees are protected in this group: California sycamore (*Platanus racemosa*), California bay (*Umbellularia californica*), box-elder (*Acer negundo* 'Californica'), big leaf maple (*Acer macrophyllum*), California walnuts (*Juglans californica* and *J. hindsii*), toyon (*Heteromeles arbutifolia*), native cherry trees (*Prunus ilicifolia*, *Prunus lyonii*), cottonwood (*Populus fremontii*, *P. trichocarpa*), and native willow trees (*Salix hindsiana*, *S. laevigata*, *S. lasiandra*, *S. lasiolepis*). Additional species may be included in this group with respect to their species habitat value.

Special Habitat Value Trees are protected trees. Before any alterations to protected trees are made that may cause them to be damaged, relocated, or removed, a recommendation for action must be obtained from the DRP Arborists. The recommendation, which outlines measures to protect and preserve and in some circumstances remove, must be approved by the General Manager of DRP or his/her designee before any action proceeds. Some forms of pruning also can cause irreversible damage to trees and must be in compliance with the ISA Tree Pruning Guidelines. Pruning must be performed under supervision of ISA certified staff only. If the tree poses an immediate threat to life or public safety, the DRP Arborist may intervene, maintaining documentation and digital photos. Special Habitat Value trees identified as dead by the Forestry Arborist will be removed and recorded into the Forestry Work Order System.

Common Park Trees

Most City parks contain mature exotic trees that have great value beyond the shade they provide to park users. They are a scenic resource to surrounding neighborhoods and their removal or disfigurement by extreme pruning for construction clearance or other reasons diminishes the value of the urban forest and often provokes public protest. Some trees have not been designated under a protected group of trees but still provide aesthetic, sentimental, economical, and environmental value.

Appendix A

The large number of trees in our parks has a significant cooling effect on the urban environment in Los Angeles, where tree canopy represents only 25% of the land. Every tree in our City parks is recognized as a valuable asset and must be protected. The TREE CARE MANUAL provides guidelines for protecting trees during construction and offers suggestions and alternative technical solutions to avoid damages to trees. The Department's Regional Head is responsible for seeing that the Maintenance, Recreation, and Construction staff follows and implements tree preservation and protection practices outlined in the TREE CARE MANUAL.

Oak Trees - Los Angeles Municipal Code Section 46.00

Sec. 46.00. Oak Tree Regulations.

No oak tree may be relocated or removed except as provided in Article 7 of Chapter I or Article 6 of Chapter IV of this Code. The term "removal" shall include any act which will cause an oak tree to die, including but not limited to acts which inflict damage upon the root system or other part of the tree by fire, application of toxic substances, operation of equipment or machinery, or by changing the natural grade of land by excavation or filling the drip line area around the trunk. (Added by Ord. No. 153,478, Eff. 4/12/80.)

Sec. 46.01. Definition.

"Oak Tree" means Valley Oak (*Quercus lobata*) and California Live Oak (*Quercus agrifolia*), or any other tree of the oak genus indigenous to California which measures eight inches or more in diameter, four and one-half feet above the ground level at the base of the tree. This definition shall not include the Scrub Oak (*Quercus dumosa*) or any oak tree grown or held for sale by a licensed nursery, or trees planted or grown as a part of a tree planting program. (Added by Ord. No. 153,478, Eff. 4/12/80.)

Sec. 46.02. Requirements for Permits.

No person shall relocate or remove any oak tree, as that term is defined in Section 46.01, where said oak tree is located on a lot larger than one acre in size and is not regulated pursuant to Article 7 of Chapter I of this Code, without first having applied for and obtained a permit from the Board of Public Works or its designated officer or employee, except as otherwise provided herein.

An application for a permit shall indicate, in a manner acceptable to the Board of Public Works, by number on a plot plan, the location of each oak tree, and shall identify each oak tree proposed to be retained, relocated or removed. If any grading is proposed which may affect such a tree, a copy of the grading permit plan shall be submitted with the application.

(a) Exemptions.

The Board of Public Works shall exempt from and not require issuance of a permit for the relocation or removal of an oak tree where said Board is satisfied that:

1. The proposed relocation or removal of the oak tree has been approved by the Advisory agency pursuant to Article 7 of Chapter I of this Code, or has been approved by the Advisory Agency prior to the effective date of this Code Section; or
2. The land upon which the oak tree is located has been the subject of a determination by the City Planning Commission, the City Council, a Zoning

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Administrator or the Board of Zoning Appeals prior to the effective date of this Code Section, the appeal period established by this Code with respect to said determination has expired, the determination is still in effect, and pursuant thereto the oak tree's removal would be permissible; or

3. A building permit has been issued for any property prior to the effective date of this Code Section and is still in effect with respect to the property under consideration and its implementation would necessitate such removal or relocation.

(b) Board Authority.

The Board of Public Works may grant a permit for the relocation or removal of an oak tree, unless otherwise provided herein or unless said tree is officially designated as an Historical Monument or as part of an Historic Preservation Overlay Zone, if said Board determines that the removal of the oak tree will not result in an undesirable, irreversible soil erosion through diversion or increased flow of surface waters which cannot be mitigated to the satisfaction of the City; and

1. It is necessary to remove the oak tree because its continued existence at said location prevents the reasonable development of the subject property; or

2. The oak tree shows a substantial decline from a condition of normal health and vigor, and restoration, through appropriate and economically reasonable preservation procedures and practices, is not advisable; or

3. Because of an existing and irreversible adverse condition of the oak tree, the tree is in danger of falling, notwithstanding said tree having been designated an Historical Monument or as part of an Historic Preservation Overlay Zone; or

4. The presence of the oak tree interferes with utility services and roadways within or without the subject property and the only reasonable alternative to the interference is the removal of the tree; or

5. It has no apparent aesthetic value which will contribute to the appearance and design of the surrounding properties, or is not located with reference to other trees or monuments in such a way as to acquire a distinctive significance at said location.

(c) Additional Authority.

The Board of Public works or its authorized officer or employee may:

1. Require as a condition of a grant of permit for the relocation or removal of an oak tree, that the permittee replace said tree within the same property

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boundaries by at least two oak trees of a variety included within the definition set forth in Section 46.01 of this Code, in a manner acceptable to the Board. Each replacement tree shall be at least a 15-gallon, or larger, specimen in size, measuring one inch or more in diameter one foot above the base, and be not less than seven feet in height measured from the base. The size and number of replacement trees shall approximate the value of the tree to be replaced

2. Permit oak trees of a lesser size or trees of a different species to be planted as replacement trees, if replacement trees of the size and species otherwise required pursuant to this Code are not available. In such event, a greater number of replacement trees may be required.

3. Permit an oak tree to be moved to another location on the property, provided that the environmental conditions of said new location are favorable to the survival of the tree and there is a reasonable probability that the tree will survive.

Sec. 46.03. Permit Conditions.

(Added by Ord. No. 153,478, Eff. 4/12/80.)

- (a) A permit issued pursuant to this article shall (1) specify and approve the location or locations to which said tree may be relocated, (2) designate the species, number, and size of any replacement tree or trees, and (3) set forth any other conditions or requirements deemed necessary by the Board of Public Works, or its authorized officer or employee, to implement the provisions of this article.
- (b) It shall be a misdemeanor for any person to fail or refuse to comply with, or to willfully violate, any condition or requirement imposed in a permit issued pursuant to this article.

Sec. 46.04. Fees.

(Amended by Ord. No. 165,675, Eff. 5/11/90.)

A fee shall be charged for issuance of any permit pursuant to this article which permits the removal or relocation of five or less oak trees. Any permit for the removal or relocation of more than five such trees shall require an additional fee for each additional unit of five or fewer trees.

The fees herein shall be determined and adopted in the same manner as provided in Section 12.37-I, 1 of the Los Angeles Municipal Code for establishing fees.

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Sec. 46.05. Appeal. (Added By Ord. No. 153478, Eff. 4/12/80.)

In the event an application for a permit under this article is denied, the applicant shall be notified of such denial in writing, said applicant's right to file an appeal with the Board of Public Works, the time limits, and other requirements for the filing of said appeal.

No appeal shall be considered by the Board unless said appeal has been filed with the Board no greater than 10 days after the date said notice of denial is mailed.

The Board shall conduct a hearing within 30 days after receiving an appeal, and shall render a written decision approving, conditionally approving, or disapproving the issuance of the permit applied for.

Appendix C

**ANSI A300 (Part 1)-2001 Pruning – American National Standard Institute
Standard for Tree care Operations – Tree, Shrub, and Other Wood Plant
Maintenance – Standard Practices.**

The publication can be obtained from the International Society of Arboriculture (ISA), P.O. BOX3129, Champaign, IL 61826-3129

Phone: (217)355-9411, Fax: (217)355-9516

Order toll-free 1-888-ISA-TREE

www.isa-arbor.com

Appendix D

Best Management Practices, TREE PRUNING. Companion publication to the **ANSI A300 Part 1: Tree, Shrub, and Other Wood Plant Maintenance – Standard Practices, Pruning.**

The publication can be obtained from the International Society of Arboriculture (ISA), P.O. BOX3129, Champaign, IL 61826-3129

Phone: (217)355-9411, Fax: (217)355-9516

Order toll-free 1-888-ISA-TREE

www.isa-arbor.com

Appendix E

ANSI Z133.1-2000 – American National Standard Institute Standard for Arboricultural Operations – Pruning, Repairing, Maintaining, and Removing trees and Cutting Brush – Safety Requirements.

The publication can be obtained from the International Society of Arboriculture (ISA), P.O. BOX3129, Champaign, IL 61826-3129

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**CITY OF LOS ANGELES
DEPARTMENT OF RECREATION AND PARKS
CODE OF SAFE PRACTICE
FORESTRY DIVISION**

1. Employees shall follow all safety rules and regulations established by Federal, State, and local Government. Employees shall report any unsafe condition or practice immediately to their supervisor.
2. All employees shall be given accident prevention instruction at least every ten working days.
3. Any employee known to be under the influence of illegal drugs or alcohol shall be removed from the job site and reported immediately to supervision.
4. Horseplay, scuffling or other acts which can have an adverse effect on employee safety shall be prohibited.
5. Supervisors shall ensure that employees engaged in tree work shall be instructed in a set of safe operating rules. Employees shall be trained and instructed in the hazards involved in their job assignments, including proper use of equipment.
6. Each work location where tree trimming, tree repairing or removal is to be done, shall be under the direction of a qualified tree worker
7. Employees shall be instructed to ensure that all protective guards and devices are in place.
8. When removing a tree, the work area shall be clear to prevent injury and provide escape. A notch and back cut shall be used when removing a tree over 10 inches in diameter.
9. No employee shall knowingly be permitted to work if that employee's ability is impaired by fatigue or illness and might unnecessarily cause injury to other employees.
10. No employee shall operate power equipment that requires specific training and certification unless they have been trained and possess the current certification for that equipment.
11. No employee shall operate a motor vehicle without a current California Driver-license for the class of vehicle assigned. All accidents involving City vehicles shall be reported immediately to supervision and the Police Department
12. All on the job injuries shall be reported immediately to your supervisor no matter how slight.

13. Prior to climbing the tree, the tree shall be visually inspected to determine the safest method of entry into the tree. Employee shall be trained in the identification of poisonous plants and harmful animals.
14. An employee is responsible for inspecting all hand and power tools before the start of each shift. Any damaged or defective hand or power tools shall be removed from the job immediately and tagged out of service.
15. Rotary drum or disk-type brush chippers shall be fed from the side of the center line, operators shall immediately turn away from the feed table when brush is taken into the equipment.
16. Employees shall never place hands, arms feet, legs, or any part of their body on the feed table while a brush chipper is in operation. Materials such as stones, nails, or sweeping shall be feed into the brush chipper.
17. Power saw engines shall be stopped when carrying for a distance greater than 100 feet or on slippery surfaces or heavy underbrush. Saw engines shall be stopped for all cleaning, refueling and adjustments.
18. All personal protective equipment such as head, hand, face and hearing shall be worn at all times when required. All tree workers' saddles and ropes shall be inspected daily.
19. Employees engaged in tree maintenance or removal in the proximity to electrical equipment and conductors, shall consider all such equipment energized at all times.
20. When working aloft, employees shall wear an approved tree worker's saddle and tie-in with an approved safety strap or rope.
21. Employees shall be instructed to give an audible warning before a limb is dropped or tree is felled. Tree workers shall never carry tools while climbing.
22. Employees shall maintain a safe working distance from other employees when using power tools, and shall not drop or throw tools from trees unless a warning has been given and the ground area is clear of personnel.
23. Supervisors shall establish rescue procedures and provide training in first-aid, cardiopulmonary resuscitation (CPR) and aerial rescue.
24. Chopping tools shall be swung away from the feet, legs, and body. Chopping tools shall not be driven as wedges or used to drive metal wedges.
25. The employee shall work from the uphill side whenever possible when doing limbing or bucking.

MODEL TREE PRESERVATION SPECIFICATIONS
VERSION 1.4 - 5/16/03

These specifications shall be made a part of all construction documents. They were developed in order to protect all trees that have either direct or indirect encroachment into their driplines during construction within City parks.

A Recreation and Parks Arborist shall be invited to the Job Start Meeting and also notified 48-hours prior to construction. Contact Teresa Prosciewicz (213) 485-6547 or Steve Dunlap (213) 485-4826.

GENERAL REQUIREMENTS

1. No equipment is to be operated or parked under a tree, nor is any material to be stored within the dripline of a tree or leaned against a tree trunk. Do not pile or compact soil within a dripline.
2. In areas of construction, protect soil surface from traffic compaction with 3" of mulch or overlapping 3/4" plywood sheets.
3. No surface irrigation shall be installed within the dripline of a tree.
4. All work shall be in accordance with the City of Los Angeles DRP Tree Preservation Policy.
5. No chemical herbicides are to be used within 100 ft. of a tree's dripline.
6. Do not nail grade stakes or anything else to trees.
7. Encroachment from paving or structures within the dripline of a tree shall be permitted only with written authorization from the Department's Arborist. No encroachment within 10' of a tree trunk will be permitted under any circumstances.
8. Do not strip topsoil around trees. Any vegetation to be removed should be removed by cutting at ground level rather than pulling out by equipment.
9. Use a pneumatic drill to excavate under woody roots larger than 2" in diameter. Do not cut any root larger than 2" diameter. If roots must be severed, cuts are to be made by an arborist and soil backfilled immediately.

TYPICAL WORK PROCEDURES

All work around any existing oak trees and all trees designated to remain and to be protected shall follow this work procedures program. This program has been developed to minimize the impacts to each tree and protect them from unscheduled damage.

1. All work within a tree's root zone shall follow the DRP Tree Care Manual.
2. The extent of all work affecting any protected tree shall be staked by field survey and reviewed with the Recreation and Parks Arborist prior to construction.
3. A Recreation and Parks Arborist shall approve any pruning of protected trees prior to the start of construction.

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4. Hand dig the vertical trench at the final cut line and to the final grade; cleanly cut roots behind torn ends. There is no need to apply any kind of pruning seal, since roots will form their own internal barriers to decay.
5. Type I, II, or III tree protection fencing shall be constructed at the limit of approved work to protect the trees from unauthorized damage. It shall remain in place until landscape work commences.
6. No further work within the root zone shall be done beyond that which was approved without obtaining written approval from the Recreation and Parks Arborist, prior to proceeding.
7. The area within the chain link fence shall not be used for material or equipment storage, or parking during construction.
8. During construction, the impacted trees should be closely monitored for symptoms of shock. The contractor should be prepared to provide temporary water to irrigate and if needed, wash dust from foliage. Irrigation should wet the top 2-3 feet of soil to replicate similar volumes and normal seasonal distribution. Contact a Recreation and Parks Arborist if a decline in tree condition is noted.
9. Recreation and Parks Arborists Teresa Prosciewicz (213) 485-6547 and Steve Dunlap (213) 485-4826 are available to answer any general questions regarding trees in parks.

DAMAGES

If a tree designated to remain is removed or irreversibly damaged as determined by the Recreation and Parks Arborist, a contractor may be required to install a replacement tree matching in size, quality and variety, using an contractor designated by the Recreation and Parks Arborist. If an acceptable replacement tree is not available, the contractor may be required to pay damages to the City for the value of the damaged tree in accordance with the guidelines set forth in the Guide for Plant Appraisal, 9th Edition, using the Trunk Formula Method.

IMPLEMENTATION

Please direct questions about construction adjacent to oak trees to Steve Davis, Landscape Architect, Planning and Construction (213) 485-7507. The qualifications of Oak tree consultants shall also be reviewed prior to report preparation. If tree removals are requested, the Street Tree Division reviews applications and passes their recommendations to The Board of Public Works for action. If pruning is required, contact Steve Dunlap, Tree Surgeon Supervisor III, at Central Service Yard, (213) 485-6547.

Appendix H

Matheny, N.P. and Clark, J.R. 1998. *Trees and Development. A Technical Guide to Preservation of Trees During Land Development*. International Society of Arboriculture. Champaign, IL. Exponent Publisher Inc. Hagerstown, IN.

The publication can be obtained from the International Society of Arboriculture (ISA), P.O. BOX3129, Champaign, IL 61826-3129

Phone: (217)355-9411, Fax: (217)355-9516

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TREE PROTECTION SUMMARY and INSTRUCTIONS

HOW TO PREVENT DAMAGE TO TREES DURING CONSTRUCTION

Land development is a complex process and even more challenging when trees are involved. Construction is one of the greatest causes of tree decline and death in urban areas.

The long-term goal of the Forestry Division is urban forest sustainability. The Division seeks to maintain social, recreational, ecological and economic functions of trees and their benefits over time. Stewardship of naturally occurring and planted trees is a central element in forest sustainability. Concerns integral to a sustainable urban forest are tree health and structure, preservation during development and redevelopment, species and site selection, quality of planting stock, standards of performance, maintenance practices in our parks, and recycling.

Tree protection should not begin subsequent to construction. If preservation measures are delayed or ignored until construction begins, the trees may be destined to fail. Since in most cases construction affects to trees cannot be completely eliminated, the goal for our parks planners and designers is to keep injury to trees to a minimum and allow building projects to proceed at the same time.

Successful tree preservation occurs when designers, construction personnel, and project managers are committed to tree preservation. All members of the project team must be familiar with the rudimentary aspects of tree growth and development in order to understand the relationship between tree survival and construction practices.

Myths about how trees grow:

For example, above ground parts of trees is not a “mirror” of what lies below ground. In actuality, typically four to eleven large roots radiate from the base of a tree’s trunk. These “buttress” roots extend from the root crown and sometimes are visible when the trunk flares away from the root crown or collar. These large roots decrease in taper rapidly and branch repeatedly so that at distances of ten feet or more from the trunk they are about ½ inch in diameter or smaller.

These roots grow horizontally through the soil and depending on the tree can extend 40 feet or more beyond the branch tips. These smaller roots are primarily responsible for water and mineral absorption. There can be hundreds of roots in a cubic inch of soil—thus any removal of soil or root severance forces a tree to compromise its physiological processes to sustain the loss.

Appendix I

All trees cannot and should not be preserved. Trees that are structurally unstable, in poor health, or unable to survive effects of construction become a liability to the project and should be removed. A realistic tree preservation program acknowledges that conflicts between trees and development may sometimes result in the removal of some trees and recognizes the detrimental effect to the project and community when trees die after construction is completed.

Successful tree preservation occurs when construction impacts to trees are minimized or avoided altogether. The challenge is to determine when impacts will be too severe for the tree to survive, not only in the short term, but also in the long term. There are no quantitative methods to calculate this critical level. Determining the optimum tree protection zone provides a guideline, although trees often survive and flourish with smaller protection areas.

The following are the three guiding principles for tree preservation:

- The acknowledgement that not all trees are in excellent health or have good structural stability.
- Tree preservation cannot be the responsibility of the Forestry staff alone. Each development participant must understand that his or her activities and decisions influence the success of tree preservation efforts.
- The ability of an arborist to cure construction injury is very limited, so the focus of preservation efforts is the *prevention* of damage.

Following the above principles will increase the chance for success and reduce the possibility that trees will die.

The Forestry Division conforms to the International Society of Arboriculture guidelines and would like to extend our knowledge in the field of forestry for protecting the urban forest from preventable damage. Many times, destruction of trees can be easily avoided if information on tree protection reaches the appropriate staff. Furthermore, we would like to extend an offer to meet with your staff to carefully review these guidelines.

Attached you will find instructions regarding the prevention of damage to trees during construction. These have been designed to be used by planning, construction, and maintenance staff.

If you have any questions or to schedule training for your staff, please call the Forestry Office at (213) 485-6547.

INSTRUCTIONS HOW TO PREVENT TREES FROM DAMAGE DURING CONSTRUCTION

An arborist should be called in as a consultant to the construction site before any work is started. The arborist will recommend the removal of trees that are not likely to survive construction activities regardless of the scope of work.

In general, the contractor is responsible for preventing trees from damage. The construction and maintenance staff must make the best effort to avoid unnecessary activities within the dripline of trees.

- **FENCES** Construction fences shall be erected around trees that are to remain. The fences should be placed as far from the trunk as possible in order to protect the above ground portion of the trees as well as the root system.
- **STORING AND PILING** Leaning objects against tree trunks and piling soil over the root zone is prohibited.
- **PRUNING** Pruning for vertical clearance of buildings, traffic, and construction equipment shall be performed by an arborist only, and not by construction or maintenance personnel.
- **COMPACTION** Driving equipment and walking within the dripline causes soil compaction and is a serious cause of tree decline and death, and usually manifests long after construction is complete. Fences around trees reduce unnecessary traffic. If traffic cannot be avoided, it is recommended to spread a 6-12 inch thick layer of mulch to reduce compaction. As an added precaution, placing large plywood sheets over the mulch can disperse weight.
- **EXCAVATION** Excavation causes major damage to trees. Digging and trenching should be planned ahead to minimize the root loss. When roots must be severed, clean cuts shall be made and sealed by an arborist. The soil shall then be backfilled immediately to minimize drying of the roots.
- **TREE MAINTENANCE** Abruptly terminating regular tree maintenance is another cause for tree decline. Provide supplemental irrigation to replicate similar volumes and normal season distribution.

TREE REMOVAL PROCEDURE

All park trees are valuable assets of the Department of Recreation and Parks. The steps listed below have been developed to have the least effect on park property when it is necessary to remove a tree. These steps must be adhered to at all times:

STEP ONE: Submit a Tree Removal Request to Forestry Division when:

- 1) A tree is confirmed to be dead by the Park Maintenance Supervisor (PMS).
- 2) A tree is diseased or damaged and the PMS determines that it poses a safety hazard.
- 3) A tree is determined to be an obstacle to infrastructure repairs or causes impairment to a park function.
- 4) Other reasons as determined by the Senior Park Maintenance Supervisor (SPMS).

STEP TWO: Provide Detailed Information

- 1) Contact Forestry Division at (213) 485-4826.
- 2) Indicate what "protection category" the tree is in: *Tree Protected by LA City Ordinances*, *Heritage Tree*, *Special Habitat Value Tree*, or *Common Park Trees*.
- 3) Provide a Project Outline that includes a timeline and the proposed work necessary to be done within the tree's dripline.

STEP THREE: Forestry Division Actions

- 1) Evaluation of the Tree Removal Request
- 2) Confirmation of tree's protection category
- 3) Inspection and evaluation of the tree with appropriate staff
- 4) Discussion of alternatives and recommendations
- 5) All information is entered into the Forestry Work Order System

STEP FOUR: Obtain Final Approval for Removal of Tree

- 1) For trees that are protected by L.A. City Ordinance, Forestry Division personnel will contact the Department of Public Works and initiate the process necessary to obtain a tree removal permit.
- 2) For *Heritage* or *Special Habitat Value Trees*, the Forestry Arborist makes a recommendation to the General Manager for removal. The General Manager or designee must make the final approval before the tree can be removed.
- 3) For a *Common Park Tree*, the Forestry Arborist may recommend removal.

STEP FIVE: Hazardous Tree Removal Procedures

During routine tree removal operations, forestry staff may determine that a tree must be removed for safety or other reasons. Staff members should:

- 1) Contact the Tree Surgeon Supervisor III and explain the situation.
- 2) The TSS III will contact all appropriate DRP staff to obtain further instructions and final approval before authorizing the tree to be removed.
- 3) **EXCEPTION TO THE RULE:** If any park tree poses an immediate life threatening emergency or safety hazard, the Forestry Division Arborist may bypass the regular procedure and authorize removal of the tree. Detailed documentation will be required; including digital photos of the tree, before and after the hazard has been mitigated.

STEP SIX: Notification Protocol for Large Scale Tree Removal

- 1) Forestry Division and Region personnel must follow established Notification Protocol when informing the public, local government officials, organizations, and department representatives about large scale tree removal projects.

NOTIFICATION PROTOCOL FOR LARGE SCALE TREE REMOVAL PROJECTS AT LOS ANGELES CITY PARKS

1. The Forestry Division will notify the Superintendent of the respective Regions, Concessions Unit Manager regarding concessions, and Director of Public Relations regarding public information, as soon as the project is identified but no later than three weeks prior to tree removal.
2. The Forestry Division will notify the aforementioned parties of the scheduled removal dates at least two weeks prior to the commencement of the project.
3. The Regions will inform the appropriate Council Offices and the impacted Community Organizations, including the Park Advisory Boards, immediately on notification by Forestry.
4. The Forestry staff will post notices of "intent to remove" on each tree targeted for removal at least one week prior to the start of the project.

INFORMATION

Park Name

**SECTIONS OF THIS
PARK WILL BE
CLOSED**

**ON *Dates: from - to*
DUE TO DEAD
TREE REMOVALS**

**SORRY FOR THE
INCONVENIENCE**

**FOR MORE INFORMATION PLEASE CALL:
(213) 485-6547 or (213) 485-4826
City of Los Angeles, Department of Recreation and Parks**



TREE HAZARD EVALUATION FORM

All sections of this form must be fully completed.

Site/Address: _____
 Map/Location: _____
 Owner: public _____ private _____ unknown _____ other _____
 Date: _____ Arborist: _____ ISA#: _____
 Arborist's Signature: _____

HAZARD RATING:

_____	+	_____	+	_____	=	_____
Failure Potential		Size of part		Target Rating		Hazard Rating
_____ Immediate action needed						
_____ Needs further inspection						
_____ Dead tree						

TREE CHARACTERISTICS

Tree #: _____ **Species:** _____
DBH: _____ **# of trunks:** _____ **Height:** _____ **Spread:** _____
Form: generally symmetric minor asymmetry major asymmetry stump sprout stag-headed
Crown Class: dominant co-dominant intermediate suppressed
Live crown ratio: _____% **Age Class:** young semi-mature mature over-mature/senescent
Pruning History: crown cleaned excessively thinned topped crown raised pollarded crown reduced flush cuts cabled/braced
 none multiple pruning events **Approx. dates:** _____
Special Value: specimen heritage/historic wildlife unusual street tree screen shade indigenous protected by gov. agency

TREE HEALTH

Foliage Cover: normal chronic necrotic **Epicormics?** Y N **Growth obstructions:**
Foliage Density: normal sparse **Leaf size:** normal small stakes wire/ties signs cables
Annual shoot growth: excellent average poor **Twig Dieback?** Y N curb/pavement guards
Woundwood development: excellent average poor none other _____
Vigor class: excellent average fair poor
Major pests/diseases: _____

SITE CONDITIONS

Site Character: residence commercial industrial park open space natural woodland/forest
Landscape type: parkway raised bed container mound lawn shrub border wind break
Irrigation: none adequate inadequate excessive trunk wetted
Recent site disturbance? Y N construction soil disturbance grade change line clearing site clearing
% dripline paved: 0% 10-25% 25-50% 50-75% 75-100% **Pavement lifted?** Y N
% dripline w/fill soil: 0% 10-25% 25-50% 50-75% 75-100%
% dripline grade lowered: 0% 10-25% 25-50% 50-75% 75-100%
Soil problems: drainage shallow compacted droughty saline alkaline acidic small volume disease center history of fail
 clay expansive slope _____ aspect: _____
Obstructions: lights signage line-of-site view overhead lines underground utilities traffic adjacent veg. _____
Exposure to wind: single tree below canopy above canopy recently exposed windward, canopy edge area prone to windthrow
Prevailing wind direction: _____ Occurrence of snow/ice storms never seldom regularly

TARGET

Use Under Tree: building parking traffic pedestrian recreation landscape hardscape small features utility lines
Can target be moved? Y N **Can use be restricted?** Y N
Occupancy: occasional use intermittent use frequent use constant use

Appendix L

TREE DEFECTS

ROOT DEFECTS:

Suspect root rot: Y N Mushroom/conk/bracket present: Y N ID: _____

Exposed roots: severe moderate low Undermined: severe moderate low

Root pruned: _____ Root area affected: _____% Buttress wounded: Y N When: _____

Restricted root area: severe moderate low Potential for root failure: severe moderate low

LEAN: _____ deg. From vertical natural unnatural self-corrected Soil heaving: Y N

Decay in plane of lean: Y N Roots broken: Y N Soil cracking: Y N

Compounding factors: _____ Lean severity: severe moderate low

CROWN DEFECTS: Indicate presence of individual defects and rate their severity (s=severe, m=moderate, l=low)

DEFECT	ROOT CROWN	TRUNK	SCAFFOLDS	BRANCHES
Poor taper				
Bow, sweep				
Codominants/forks				
Multiple attachments				
Included bark				
Excessive end weight				
Cracks/splits				
Hangers				
Girdling				
Wounds/seam				
Decay				
Cavity				
Conks/mushrooms/bracket				
Bleeding/sap flow				
Loose/cracked bark				
Nesting hold/bee hive				
Deadwood/stubs				
Borers/termites/ants				
Cankers/galls/burls				
Previous failure				

HAZARD RATING

Tree part most likely to fall: _____

Inspection period: _____ annual _____ biannual _____ other _____

Failure Potential + Size of Part + Target Rating = Hazard Rating

_____ + _____ + _____ = _____

Failure potential: 1-low; 2-medium; 3-high; 4-severe

Size of part: 1 - <6" (15 cm); 2 - 6-18" (15-45 cm);

3 - 18-30" (45-75 cm); 4 - > 30" (75 cm)

Target rating: 1 - occasional use; 2 - intermittent use;

3 - frequent use; 4 - constant use

HAZARD ABATEMENT

Prune: remove defective part reduce end weight crown clean thin raise canopy crown reduce restructure shape

Cable/Brace: _____ Inspect further: root crown decay aerial monitor

Remove tree: Y N Replace? Y N Move Target: Y N Other: _____

Effect on adjacent trees: none evaluate

Notification: owner manager governing agency Date: _____

COMMENTS

**POLICIES FOR THE INSTALLATION AND PRESERVATION
OF LANDSCAPING AND TREES ON PUBLIC PROPERTY
Of Recreation and Parks Department**

Adopted by City Council, September 21, 1971; amended January 10, 1972 (Council File Nos. 70-1899; 132989 S-1 & S-2; and 145282 S-1)

1. GENERAL OBJECTIVES

The urban forest is recognized as a vital infrastructure system essential to the quality of life in the City of Los Angeles. Tree canopy and landscaping are important factors in every neighborhood, enhancing aesthetics, mitigating the heat island effect, improving air quality, reducing stormwater runoff, providing economic, psychological and sociological benefits to all inhabitants. Therefore, planting new trees, which will develop broad canopies, as well as the preservation of mature tree canopy, and landscaping shall be considered to be a priority on all public property.

2. PROPOSED IMPROVEMENT PROJECTS

All proposed improvement projects shall be planned to *provide* the optimum *tree cover* and landscaping required for conformance to the above general objectives. This shall apply to all improvement projects undertaken by the City, by other public agencies, or by the private sector.

Trees and landscaping shall be provided in or adjacent all parkways, on slopes adjacent streets, in isolated land remnants, in or adjacent all street frontages abutting public buildings or structures, in median and traffic islands, and on the grounds of public buildings.

In addition, priority shall be given to shading hardscape features such as parking lots, roofs, plazas, etc. An adequate number of trees shall be planted so that 50% of the parking stall area in parking lots will be shaded within ten years. The only exception is to be when a conflicting use is planned, and implementation is to be within the next 10 years.

During construction, if any portion of construction, its lay down areas, or its staging areas affects existing landscaping, detailed guidelines for tree preservation and protection during construction shall be implemented.

3. FINANCIAL RESPONSIBILITY

The installation of landscaping and trees which provide wide-spread general benefits to the public—may be paid for by the City, except that landscaping, other than trees, in parkway areas is generally provided by the abutting property owners. The benefiting property owners, community groups, or other parties may pay for landscaping and trees in parks.

4. AUTHORITY AND RESPONSIBILITY

a. Within the Recreation and Parks land

The Recreation and Parks Department is responsible for approving and maintaining trees and landscaping in all Recreation and Parks properties.

The Recreation and Parks' Planning and Construction Division is responsible for the preparation of improvement plans for landscaping and park tree installation within Recreation and Parks land.

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b. Adjacent Public Buildings and within Their Grounds, Including Parking Lots

The *Department of General Services* has *primary* responsibility for the landscaping and trees related to public buildings, their grounds *and parking lots* as well as the public ways immediately contiguous thereto, and for the preparation of related improvement plans.

5. REMOVAL

The cutting down or removal of structurally sound trees by City forces, or by private parties under contract with the City, shall be prohibited.

Unless necessitated by urgent reasons of safety, imminent death of the tree, *requirements of individual trees*, or to permit the installation of a greatly needed public facility, existing trees located on public property shall not be removed. Before removal of existing trees is approved, a detailed investigation of all possible alternatives so as to salvage the trees shall be made. Such alternates shall include, but are not limited to, the following:

- a. *Developing*, especially for streets, sidewalks, *and other hardscape, power and communications lines*, storm drains, and sewers.
- b. Jogging roadway alignments from one side of the right of way to the other to *avoid* existing *mature* trees.
- c. Relocating tree to an acceptable nearby location, where appropriate.
- d. Placing sidewalks immediately adjacent the roadway when location adjacent the property line causes interference with trees.
- e. *Relocating* proposed buildings or other structures, including their structural elements, to avoid interference with existing trees.

The cutting down or removal of sound trees is further prohibited between the hours of 6 p.m. and 7 a.m. and on any Saturday, Sunday, or legal holiday except emergencies.

Whenever the removal of five or more trees or any outstanding tree specimen, especially a large, historical or significantly handsome tree is proposed, the following procedure shall be followed:

The *Councilmember* of the respective district, the Planning and Construction Division, the Forestry Division, the General Manager of the Recreation and Parks Department, and *Community Forest Advisory Committee (CFAC)* shall be consulted regarding possible alternatives.

6. REPLACEMENT OF TREES

Whenever trees are removed, the existing trees' aggregate diameter, measured at breast height (D.B.H., or 4.5-feet above the ground; multi-trunk trees are to be measured immediately below the lowest trunk) shall be replaced at an equal or greater rate of caliper of new trees. Each one-inch D.B.H. of existing tree shall be replaced with a minimum one-inch caliper new tree. Replacement trees shall have a minimum caliper of ¼-inch. For example, a single-trunk tree whose D.B.H. is 9 inches may be replaced with 36 trees of ¼-inch caliper, or with 3 trees of 3-inch caliper. This replacement ratio should

Appendix M

represent a *minimum*. If the replacement ratio cannot be achieved on an individual project, it should be applied on an area-wide basis.

All replacement trees shall be healthy and free of kinked, overgrown, or otherwise defective roots.

7. TYPES OF TREES

The type of park trees installed in a particular area shall conform to the Urban Forest Program maintained by the Recreation and Parks Department. Deviations shall only be made with the- approval of the Recreation and Parks principal forester.

Tree types shall be selected with the viewpoint of maximizing environmental, aesthetic and other tree values balanced with acceptable maintenance levels. Wherever suitable, blooming and accent foliage trees shall be utilized. Trees that will eventually provide a wide canopy and significant shade shall be favored. When community plantings are planned, the consensus of the property owners shall be given heavy consideration

The landscaping of publicly owned properties and parking lots shall conform to the City's Landscape Ordinance.

8. MAINTENANCE OF TREES

Maintenance of landscaping based on the best available arboricultural practices and urban forestry practices using state-of-the-art professional standards for planting, pruning, and general maintenance including but not limited by use of the most recent management tools shall be the responsibility of the Recreation and Parks Department. Agencies shall develop a maintenance schedule for trees located on lands under their control

9. DESIGN PERSONNEL

To insure a high degree of professional expertise, personnel responsible for directly supervising the street trees and landscaping program, and for preparing related improvement plans shall be licensed professionals in the field of landscape architecture, arboriculture, or urban forestry.

10. COORDINATOR FOR LANDSCAPING AND TREE PROGRAMS

The Bureau of Street Services shall coordinate meetings as needed for program changes that affect multiple Departments. The Memorandum of Understanding between the multiple Departments need be kept in force to assure exchange of information, collaboration, contribution and equal cost share of the Arbor Day celebrated as a joint educational outreach. The Community Forest Advisory Committee (CFAC) shall advise City Departments in determining the landscaping and tree policy program and the coordination of that program. In addition, the CFAC shall report to City Council on a quarterly basis, the Departments' progress towards establishing their respective landscaping and tree policies.

Recreation and Parks Department Tree Planting and Selection Guidelines

The urban forest, which includes trees in our parks, improves environmental quality and increases the economic, physical, and social health of communities. Urban forests will be important to the quality of life as communities continue to grow in the next decade. Urban forests provide energy benefits, improve air and water quality, and have social benefits such as noise abatement, creation of wildlife habitat, reduce exposure to ultraviolet light, provide pleasure, improve individual health, provide jobs and educational opportunities, and increase land value.

The ideal park tree is a shade tree with minimum susceptibility to wind damage and branch drop, does not require frequent pruning, produces slight litter, is deep-rooted, has few serious pest and disease problems, and tolerates a wide range of soil conditions, irrigation regimes, and air pollutants. Since relatively few trees have all these traits, it is important to match the tree species to the planting site by determining what issues are most important on a case-by-case basis. **A tree list is provided to establish a uniform guiding principle, but is not meant to limit tree selection if another tree is a better choice for the planting site.**

Our Department recognizes a number of factors that should be considered when selecting park trees:

Below is a list of guidelines and recommendations that our Department recognizes as important when selecting and planting park trees:

- The use of California native tree species and trees that are indigenous to the area that have proven to adapt well
- Trees that conserve water and energy
- To avoid a monoculture, non-native trees from a diverse species list that represent a ratio of no more than 30% of one genera, 20% of one species, and 10% of one cultivar
- Trees must be compatible with climate zone recommended by the current edition of the *Sunset Western Garden Book*
- Trees are selected to provide shade. Large trees should be used only when space permits proper branch and root development
- Trees are selected to provide aesthetics with respect to color, shape, and texture
- Dense evergreen trees are recommended where windbreaks are desired

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- Tree species that drop fruit or seed pods should not be planted near paved areas used by pedestrians
- Trees (in their maturity) that will conflict with overhead power lines, lights, underground main water or sewer lines, signs, and buildings shall not be planted
- Newly planted trees are selected to match water requirements with those of surrounding plants
- Trees will only be planted in locations where adequate aftercare can be provided
- Nurseries that provide trees with their natural form intact will be used as suppliers (e.g., those that do not prune remove lower branches)
- Minimum 15 gallon sized trees are recommended for planting in our parks. Smaller sized specimens may be considered on slopes
- A minimum of 30 feet between newly planted trees is required. Denser spacing may be considered for palms or if the density does not interfere with the use of the park or hinder proper tree development
- Trees are required to be properly staked with three wooden stakes and cinch ties. Reddy Stakes© may be used when vandalism is not anticipated and aesthetics are an important consideration
- The possibility of vandalism needs to be considered when planning, planting, and establishing replacement agreements or policies
- For every tree removed, the replacement ratio is minimum 2 to 1
- A 6- foot diameter tree basin shall be established around all newly planted trees
- Trees must have root protection barriers installed when rodents are present. Root barriers are always installed according to the manufacturer's specifications

To establish a compatible climate zone and properly match the palette of tree species for each zone, the location of City parks are divided into two communities:

Inland Plant Community and Coastal Plant Community

The Department's arborists, horticulturists, landscaping and maintenance staff have selected the tree species listed below to be the primary tree palette. Trees on this list have proven to work well in California's temperate climate, require moderate pruning, and are considered to be pest and disease resistant. Other tree species will be considered on an individual basis.

TREE PALETTE FOR INLAND PARKS

Inland Community areas compared to coastal regions have hotter summers and higher levels of air pollution. This region's climate is still mild enough to grow a diverse mix of trees. The ocean influences the Inland Community climate less than 15% of the time. The community's boundaries correspond with *Sunset Western Garden Book's* climate zones 18, 19, 20, and 21.

Trees native to California

* Indicates that it may be difficult to obtain a large number or at a low price

<i>Acer macrophyllum</i>	big leaf maple
<i>Alnus rhombifolia</i>	white alder
<i>Calocedrus decurrens</i>	incense cedar
* <i>Cercidium floridum</i>	blue palo verde
* <i>Cercocarpus betuloides</i>	California mountain mahogany
* <i>Chilopsis linearis</i>	desert catalpa
* <i>Heteromeles arbutifolia</i>	toyon
* <i>Juglans californica</i>	black walnut
<i>Lyonothamnus floribundus asplenifolius</i>	Catalina Ironwood
<i>Platanus racemosa</i>	California sycamore
<i>Populus fremontii</i>	Fremont cottonwood
<i>Quercus agrifolia, Quercus lobata,</i>	CA live oak, valley oak
* <i>Salix lasiolepis</i>	arroyo willow
* <i>Sambucus mexicana</i>	blue elderberry
* <i>Umbellularia californica</i>	California bay

Structured trees known to be pest and disease resistant

<i>Acacia baileyana</i>	Bailey acacia
<i>Acacia saligna</i>	blue leaf wattle
<i>Acer paxii</i>	evergreen maple
<i>Acrocarpus fraxinifolius</i>	pink cedar
<i>Angophora floribunda</i>	rough-barked apple
<i>Angophora costata</i>	NCN
<i>Arbutus unedo</i>	strawberry tree
<i>Brachychiton acerifolius</i>	flame tree
<i>Brachychiton populneus</i>	bottle tree
<i>Calocedrus decurrens</i>	incense cedar
<i>Calodendrum capense</i>	Cape chestnut
<i>Cassia excelsa</i>	crown of gold tree
<i>Cassia leptophylla</i>	gold medallion tree
<i>Casuarina cunninghamiana</i>	river she-oak
<i>Cedrus deodara</i>	deodar cedar
<i>Chionanthus retusus</i>	Chinese fringe tree
<i>Chitalpa tashketensis</i>	chitalpa
<i>Cinnamomum camphora</i>	camphor
<i>Ceiba insignis, Ceiba speciosa</i>	floss silk tree

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<i>Dombeya cacuminum</i>	NCN
<i>Fraxinus oxycarpa</i>	raywood ash
<i>Geijera parviflora</i>	Australian willow
<i>Ginkgo biloba</i>	maidenhair
<i>Gleditsia tricanthus</i>	honey locust
<i>Harpephyllum caffrum</i>	kaffir plum
<i>Koelreuteria bipinnata</i>	Chinese flame tree
<i>Lagerstroemia indica</i> and hybrids	crape myrtle
<i>Leptospermum scoparium</i>	New Zealand tea
<i>Liquidambar styraciflua</i> and varieties	American sweet gum
<i>Liriodendron tulipifera</i>	tulip tree
<i>Magnolia grandiflora</i>	southern magnolia
<i>Melaleuca linarifolia</i>	flax-leaf paperbark
<i>Melaleuca styphelioides</i>	prickly paperbark
<i>Metasequoia glyptostroboides</i>	dawn redwood
<i>Metrosideros excelsus</i>	New Zealand christmas tree
<i>Morus alba</i>	mulberry
<i>Parkinsonia aculeata</i>	Mexican palo verde
<i>Pinus canarienses</i>	Canary Island pine
<i>Pistacia chinensis</i>	Chinese pistache
<i>Platanus x acerifolia</i> ,	London plane
<i>Podocarpus gracilior</i>	fern pine
<i>Pyrus calleryana</i>	ornamental pear
<i>Quercus ilex</i> , <i>Quercus virginiana</i>	holly oak, southern live oak
<i>Rhodosphaera rhodanthema</i>	yellow wood
<i>Rhus lancea</i>	African sumac
<i>Schinus molle</i>	California pepper
<i>Sapium sebiferum</i>	Chinese tallow tree
<i>Stenocarpus sinuatus</i>	firewheel tree
<i>Taxodium distichum</i>	bald cypress
<i>Taxodium mucronatum</i>	Montezuma cypress
<i>Tipuana tipu</i>	tipu tree
<i>Tristania conferta</i>	Brisbane box
<i>Ulmus parvifolia</i>	Chinese elm
<i>Zelkova serrata</i>	sawleaf zelkova

PALMS

<i>Archonotophoenix cunninghamiana</i>	king palm
<i>Brahea armata</i> , <i>Brahea edulis</i>	Mexican blue palm, Guadalupe
<i>Butia capitata</i>	S. American jelly palm
<i>Jubaea chilensis</i>	Chilean wine palm
<i>Livistona chinensis</i>	Chinese fountain palm
<i>Phoenix canariensis</i>	Canary Island palm
<i>Phoenix dactylifera</i>	date palm
<i>Phoenix reclinata</i>	Senegal date palm
<i>Syagrus romanzoffianum</i>	queen palm
<i>Trithrinax acanthocoma</i>	Buriti palm
<i>Washingtonia filifera</i>	California fan palm
<i>Washingtonia robusta</i>	Mexican fan palm

Washingtonia filifera x robusta

desert fan palm

ADDITIONAL TREES CONSIDERED FOR INLAND GOLF COURSES

Araucaria heterophylla

Cedrus atlantica, Cedrus glauca atlantica

Cedrus deodara, Cedrus libani

Cupaniopsis anacardioides

Eucalyptus leucoxylon

Ficus macrophylla nitida, Ficus rubiginosa

Norfolk Island pine

atlas cedar, blue atlas cedar

deodar cedar, Lebanon cedar

carrotwood

white ironbark

Indian laurel fig, rusty leaf fig

TREE PALETTE FOR COASTAL PARKS AND GOLF COURSES

The ocean influences the Coastal Community climate more than 85% of the time. The community's boundaries correspond with *Sunset Western Garden Book's* climate zones 22, 23, and 24.

Trees native to California

* Indicates that it may be difficult to obtain a large number or at a low price

<i>Acer macrophyllum</i>	big leaf maple
<i>Alnus rhombifolia</i>	white alder
<i>Platanus racemosa</i>	California sycamore
<i>Populus fremontii</i>	Fremont cottonwood
* <i>Quercus agrifolia</i>	coastal live oak
* <i>Salix lasiolepis</i>	arroyo willow
* <i>Sambucus mexicana</i>	blue elderberry
* <i>Umbellularia californica</i>	California bay

Strongly-structured trees known to be pest and disease resistant

<i>Agonis flexuosa</i>	peppermint tree
<i>Chitalpa tashketensis</i>	chitalpa
<i>Cinnamomum camphora</i>	camphor
<i>Bischofia javanica</i>	toog
<i>Erythrina spp.</i>	coral tree species
<i>Fraxinus oxycarpa</i>	raywood ash
<i>Koelreuteria bipinnata</i>	Chinese flame
<i>Lagerstroemia indica</i> and hybrids	crape myrtle
<i>Leptospermum scoparium</i>	New Zealand tea
<i>Liquidambar styraciflua</i> and varieties	American sweetgum
<i>Liriodendron tulipifera</i>	tulip tree
<i>Magnolia grandiflora</i>	southern magnolia
<i>Pinus canarienses</i>	Canary Island pine
<i>Pinus pinea</i>	Italian stone pine
<i>Pistacia chinensis</i>	Chinese pistache
<i>Platanus x acerifolia</i> ,	London plane
<i>Podocarpus gracilior</i>	fern pine
<i>Pyrus calleryana</i> , <i>Pyrus kawakamii</i>	ornamental pear, evergreen pear
<i>Quercus ilex</i> , <i>Q. virginiana</i>	holly oak, southern live oak
<i>Tabebuia impetiginosa</i>	pink trumpet
<i>Tipuana tipu</i>	tipu tree
<i>Tristania conferta</i>	Brisbane box
<i>Ulmus parvifolia</i>	Chinese elm

City of Los Angeles
Recreation and Parks Department

Nursery Specification for Park Trees
for 5 gallon, 15 gallon, and 24 inch box Container-Grown Trees

I. PROPER IDENTIFICATION

All trees shall be true to name as ordered or shown on the planting plans and shall be labeled individually by genus and species and where appropriate, the cultivar.

II. COMPLIANCE

All trees shall comply with federal and state laws and regulations requiring inspection for plant disease, pests, and weeds. Inspection certificates required by law shall accompany each shipment of plants. Clearance from the County Agricultural Commissioner, if required, shall be obtained before planting trees originating outside the county in which they are to be planted. Even though trees may conform to county, state, and federal laws, the buyer may impose additional requirements.

III. TREE CHARACTERISTICS AT THE TIME OF SALE OR DELIVERY

A. TREE HEALTH

As is typical for the species/cultivar, trees shall be healthy and vigorous, as indicated by an inspection for the following:

- foliar crown density
- length of shoot growth (throughout crown)
- size, color, and appearance of leaves
- uniform distribution of roots in the container media
- appearance of roots
- absence of twig and/or branch dieback
- relative freedom from insects and diseases

Note: some of these characteristics cannot be used to determine the health of deciduous trees during the dormant season.

B. CROWN

1. **Form:** Trees shall have a symmetrical form as is typical for the species/cultivar and growth form.
 - a) **Central Leader:** Trees shall have a single, relatively straight central leader and a tapered trunk, free of codominant stems and vigorous, upright branches that compete with the central leader. Ordinarily, the central leader should not have been headed. However, in cases where the original leader has been headed, an upright branch at least $\frac{1}{2}$ (one-half) the diameter of the original leader just below the pruning point shall be present. **Note:** This section applies to single trunk trees, as typically used for street or landscape planting. These specifications do not apply to plants that have been specifically trained in the nursery, e.g., topiary, espalier, multi-stem, clump, etc., or unique selections such as contorted varieties.

b) **Main Branches (Scaffolds):** Branches should be distributed radially around and vertically along the trunk, forming a generally symmetrical crown typical for the species. Minimum vertical spacing may be specified.

- Main branches, for the most part, shall be well-spaced
- Branch diameter shall be no larger than 2/3 (two thirds) the diameter of the trunk, measured 1" (one inch) above the branch.
- The attachment of scaffold branches shall be free of included bark.

c) **Temporary branches:** Unless otherwise specified, small "temporary" branches shall be present along the lower trunk below the lowest main (scaffold) branch, particularly for trees less than 1-1/2" (one and one-half inches) in trunk diameter. Temporary branches should be distributed radially around and vertically along the lower trunk. They should be no greater than 3/8" (three-eighths inch) in diameter and no greater than 1/2 (one-half) the diameter of the trunk at the point of attachment. Heading of temporary branches is usually necessary to limit their growth.

C. TRUNK

1. Trunk diameter and taper shall be sufficient so that the tree will remain vertical without the support of a nursery stake.
2. The trunk shall be free of wounds (except properly-made pruning cuts), sunburned areas, conks (fungal fruiting-bodies), wood cracks, bleeding areas, signs of boring insects, galls, cankers and/or lesions.
3. Trunk diameter at 6" (six inches) above the soil surface shall be within the diameter range shown for each container size below:

Container	Trunk Diameter (in)	Soil Level from Container Top (in)
5 gallon	0.5" TO 0.75"	1.25" to 2"
15 gallon	0.75" to 1.5"	1.75" to 2.75"
24-inch box	1.5" to 2.5"	2.25" to 3"

4. All palm trees shall have minimum 6-foot brown trunk.

D. ROOTS

1. The trunk, root collar (root crown) and large roots shall be free of circling and/or kinked roots. Soil removal near the root collar may be necessary to inspect for circling and/or kinked roots.
2. The tree shall be well rooted in the soil mix. When the trunk is carefully lifted both the trunk and root system shall move as one.
3. The upper-most roots or root collar shall be within 1" (one inch) above or below the soil surface. The soil level within the container below the rim should be within the distance ranges shown in the table above
4. When the container is removed, the root ball shall remain intact.
5. The root ball periphery should be free of large circling and bottom-matted roots. The acceptable diameter of circling peripheral roots depends on species and size of root ball. The maximum acceptable size should be indicated for the species (if necessary).

E. MOISTURE STATUS

At time of inspection and delivery, the root ball shall be moist throughout, and the tree crown shall show no signs of moisture stress, as indicated by wilt, shriveled, dead leaves, or branch dieback. Roots shall show no signs of being subjected to excess soil moisture conditions, as indicated by root discoloration, distortion, death, or foul odor.

IV. INSPECTION

The City reserves the right to reject trees that do not meet specifications as set forth in these guidelines or as adopted by the buyer. If a particular defect or sub-standard element or characteristic can be easily corrected, appropriate remedies shall be required. If destructive inspection of root balls is to be done, the buyer and seller should have a prior agreement as to the time and place of inspection; minimum number of trees to be inspected, or percentage of a species (or cultivar), and financial responsibility for the inspected trees.

GLOSSARY:

Codominant – stems: two or more vigorous and upright branches of relatively equal size that originate from a common point, usually where the leader has been lost or removed.

Crown – The portion of a tree above the lowest main (scaffold) branch, including the trunk, branches and foliage.

Cultivar – A named plant selection from which identical or nearly identical plants can be produced, usually by vegetative propagation or cloning.

Girdling root – A root that partially or entirely encircles the trunk and/or large buttress roots, which could restrict growth and downward movement of photosynthate.

Included bark – Bark embedded within the crotch between a branch and the trunk or between two or more stems that prevents the formation of a normal branch bark ridge. This often occurs in branches with narrow-angled attachments or branches resulting from the loss of the leader. Such attachments are weakly attached and subject to splitting out.

Kinked root – A primary root(s), which is sharply bent and causes a restriction to water, nutrient, and photosynthate movement. Kinked roots may compromise the structural stability of roots systems.

Leader – The dominant stem that usually develops into the main trunk.

Photosynthate – pertains to sugar and other carbohydrates that are produced by the foliage during photosynthesis, an energy trapping process.

Root collar – The flared area at the base of a tree where the roots and trunk merge. Also referred to as the "root crown" or "root flare."

Shall – used to denote a practice that is mandatory.

Should – used to denote a practice that is highly recommended.

Scaffold branches – large, main branches that form the main structure of the crown.

Temporary branch – A small branch that is retained temporarily along the lower trunk of young trees. Temporary branches provide photosynthate to increase trunk caliper and taper help protect it from sunburn damage and mechanical injury. Such branches should be kept small and gradually removed as the trunk develops.

Trunk – The main stem or axis of a tree that is supported and nourished by the roots and to which branches are attached.

Guarantee:

The Successful bidder shall guarantee that the trees meet all of the specifications included in this contract. If a particular defect or sub-standard element or characteristic can be easily corrected, appropriate remedies shall be required. If destructive inspection of root balls is to be done, the City and seller should have a prior agreement as to the time and place of inspection; minimum number of trees to be inspected, or percentage of a species (or cultivar), and financial responsibility for the inspected trees.

Rejection:

The City reserves the right to reject trees that do not meet specifications as set forth in this contract or as adopted by the buyer at the time of delivery. The successful vendor shall be responsible for picking up the rejected trees at no cost to the City.

Training Leaflets

- Leaflet 1 – *Understanding the Oak Tree Ordinance* page 40
- Leaflet 2 - *Tree Wounds* page 41
- Leaflet 3–*Tree and Turf Association* page 42-43
- Leaflet 4 – *Watering Practices* page 44
- Leaflet 5 – *Mulch and It's Benefits* page 45
- Leaflet 6 - *Tree Staking* page 46
- Leaflet 7 – *Maintaining Young Trees* page 47-48
- Tree Care PowerPoint Presentation Outline page 49
- Video Guide –*Tunneling and Trenching*. Call the Forestry Division for more information.
- *The Green in Your City* series are public outreach brochures on various topics related to trees and nature. Call the Forestry Division for more information.

The Forestry Division also offers a 2.5-hour presentation on tree care. The presentation includes PowerPoint visuals and hands-on discussions using wood samples. Below is the training outline.

To arrange the presentation, call the Forestry office at 213-485-6547 at least two weeks prior to desired date. A room with projection wall and electrical outlet is necessary for the training.

UNDERSTANDING THE OAK TREE ORDINANCE

What governmental organizations have Oak Tree Ordinances?

- The State of California has no Ordinance that covers Oak Trees
- The County of Los Angeles has an Oak Tree Ordinance that is enforced by the Los Angeles County Fire Department
- The City of Los Angeles also has an Oak Tree Ordinance that is enforced by the Department of Public Works, Street Tree Division
- The City and County work together to save and protect oaks in our area, taking equal responsibility for enforcement and preservation of the existing indigenous oaks

What does the City of Los Angeles Ordinance do?

The Ordinance states that you cannot do anything to cause damage to, relocate, or remove, an Oak Tree on over an acre of private or public property, without the permission of the Board of Public Works. The Ordinance also identifies the type of oaks that are protected such as coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), and any indigenous oak tree except the scrub oak (*Quercus dumosa*).

What size Oak Tree is protected?

Oak trees with a diameter at breast height (DBH) of less than 8 inches are exempt from the Ordinance. Oaks that have a DBH of greater than 8 inches fall under the auspices of the Oak Tree Ordinance.

What type of work can you do to Oak Trees?

Once you have obtained a permit from the Department of Public Works Street Tree Division, you can trim an Oak Tree as long as you do not remove any limbs over 2 inches in diameter, or permanently damage the tree. You can remove dead wood and damaged limbs due to limb failure or physical damage to eliminate potential hazards. A Certified Arborist shall inspect any trimming requests of Oak Trees and an Oak Tree Report must then be submitted to the Street Tree Division for approval. Any trimming shall be done in compliance with the Oak Tree Pruning Standards of the Western Chapter of the International Society of Arboriculture.

Penalties for illegal trimming or removal

Failure to comply with, or willful violation of, any condition or requirement imposed is a misdemeanor. The illegal removal of a protected Oak Tree can result in a \$10,000 fine and/or 6 months in jail. The illegal trimming or willful damage to any protected Oak Tree can result in a \$10,000 fine and/or 6 months in jail.

TREE WOUNDS

What is a tree wound? A wound is a cut or breach in living tissue due to external intrusion. Wounds destroy the *cambium* layer, which is responsible for tree growth. *Cambium*, by division, forms new cells on both sides. These new cells are the duct system of trees. *Xylem*, the inside cells, conduct water and nutrients from the soil up the stems and *phloem*, the outside cells near the bark, conduct organic substances responsible for physiological process of trees from regions of higher to lower concentration in the tree. Wounds often close but do not heal. When wounds close and do not heal, the wood inside the tree will decay in what appears on the outside a sound tree trunk. Decayed wood loses conductive and storage capabilities.

Why do trees die from starvation and not a wound? Trees, like other living things, starve when water, nutrients, and organic substances (food) become limited. Trees also starve when space for storing energy reserves begins to decrease. Decayed wood means no storage.

How many times can you wound a tree before it dies? Trees have a defense system that is called CODIT (Compartmentalization of Decay in Trees). This system develops “internal barriers” limiting the spread of pathogens in trees vertically and horizontally. Trees do not heal, they compartmentalize. Any treatment that breaks the internal boundaries will destroy the tree’s defense system, and the pathogens will spread rapidly. Trees survive as long as they can form new parts in new positions faster than old parts are breaking down. Many wounds create many entries for pathogens; additional strains mean less vigor in developing the defense system. Trees will die if the CODIT does not develop in only one wound thus multiple wounds dramatically increase the potential of trees to die.

What are the pathogens? Pathogens are microorganisms that cause diseases. Fungi, bacteria, viruses and nematodes are the most common pathogens

What causes stress and strain? Injuries, cuts, burn, soil compaction around roots, over-watering, under-watering, or insect damage are factors that cause stress. Stress is a *reversible* process. Stress is a condition resulting from disruption, breakage, drain, or shunt of energy. When the condition of stress remains, the tissues become strained. Strain is an *irreversible* condition resulting from excessive stress.

How do wounds occur? Wounds may occur naturally through self-pruning or can be made inadvertently in the course of normal tree care. The bark of the trunk is the tissue of trees most often subject to mechanical damage, especially in spring and early summer when the *cambium* is active and the bark is “slipping”. Mowers, string trimmers, rubbing tree stakes and ties, aerating and other equipment bumping into trees, and intentional knife carving debarks trees at any season. Hot coals, chains, and even ropes left tied on tree trunks over time will injure trees.

How to prevent wounds? The best way to prevent injuries is to place mulch around tree basins to provide distance between operating machinery and tree trunks. Stakes and ties need to be removed before they rub against the bark and girdle the tree. For surfacing roots, place soil over exposed areas.

TREE AND TURF ASSOCIATIONS

The common association of trees and turf in landscaped areas is a complex competition for resources such as water, nutrients, and sunlight. Trees and turf grass are commonly grown together in man-made landscapes because of the desire to have both lush, green lawns and the shelter of large shade trees. Grassy lawns with trees are an unnatural ecosystem.

Tree habitat: Trees are native to forests that provide dense shade that prevents grasses and under-story plants from becoming established and competing for available nutrients. Forest topsoil's are moist and fertile from the constant decomposition of leaf litter and other organic matter. The soil is porous and loose; conditions are highly favorable for tree root growth. Water and nutrient absorbing roots occupy the top 12 to 18-inches of topsoil.

Turf habitat: Grasses are native to dry and arid prairie settings. They adapt to low water availability by developing dense, aggressive root systems and have the ability to go dormant in periods of drought. The absence of an over-story allows grasses to capture plenty of light to fuel their aggressive growth. Healthy turf requires morning sunlight to optimize growth, health, and stand density. Roots occupy the top 12-inches of topsoil.

Competition Problems and Maintenance Conflicts:

Trees block sun exposure from turf. Therefore, in areas where trees are already well established, grass is often sparse and unhealthy due to lack of sunlight. Some shade-tolerant types are able to get by with less light than others; however, all perform poorly in the heavy shade of a densely canopied tree. Heavy shade conditions can also create temperature and moist conditions that are favorable to turf disease organisms. Some grasses have the ability to produce chemicals that can retard the growth of tree roots, stunting the growth and development of young trees.

Trees that have grass growing up to their trunks will invariably have wounds at the base of the trunk caused by lawnmowers and string-line trimmers. Exposed tree roots that run along the surface of the ground also fall victim to scalping by these machines. Mechanical wounds make a tree more susceptible to decay and insects, which can eventually compromise its health and structural integrity. Wounds to the trunk remove not only the bark but also tissue just inside of the bark, which is responsible for diameter growth and food transport. When wounds destroy enough of the trunk, the tree is girdled -- cut off from its food supply and the tree dies.

Frequent irrigation required to maintain turf in the hot summer months is detrimental to some trees. Water that strikes the tree trunk and collects at the base can cause root and stem rot. High-pressure sprinklers set too close to the trunk will peel off the bark and create wounds that never close.

Finding Solutions:

Instead of struggling to keep your competing trees and turfgrass healthy with heavy inputs of water and fertilizer, the best approach is to eliminate or reduce the competition and conflicts by mimicking the conditions under which these plants grow best in nature. The result will be fewer insect and disease problems, less time and expense in maintenance, and a more attractive, longer-lasting landscape. Here are a few of the ways to accomplish these objectives:

- Designate turf-free areas under the canopies of trees. Turf outside of the tree's canopy area will have ample sunlight and competition for rooting space within a major portion of the tree's root zone will be eliminated. Remember to establish boundaries according to the ultimate size of the tree or plan to enlarge the turf-free zone, as the young tree gets larger.
- Mulch with wood chips, bark or pine straw within the turf-free zone surrounding the trees. The larger the mulched area, the better for the tree. Apply mulch up to six inches deep but avoid piling it directly against tree trunk, which can create moist conditions that can lead to rot or insect invasion of the tree trunk.
- Before mulching, use herbicides cautiously around trees to kill any dense patches of grass. If grass growth is already suppressed by shade conditions, then mulching alone will most likely eliminate it, much like a tree would in its native environment. Many herbicides used to control weeds in turf are absorbed by tree roots and can severely injure or kill trees.
- Plant shade tolerant shrubs and ground covers in mulched areas if more "green" is desired under tree canopies. Although these plants also compete with the tree, their root systems are much less aggressive than that of turfgrass. They also are better adapted to living within the shade of trees. Ideally, these plantings should be done while a tree is young. However, if you must plant around mature trees, be careful not to cut large roots or disturb any of the finer feeder roots in the top 4 to 6 inches of the soil. Tilling the planting area is not recommended, as it will sever a large portion of those finer roots. Instead, dig individual planting holes using hand tools.
- Supplement water and nutrients to reduce the effects of competition in areas where trees and turfgrass must grow together. You may irrigate turf with sprinklers during dry periods, but avoid wetting the base of tree trunks. Young trees will respond better to occasional deep soakings rather than to the more frequent light watering for turf.

WATERING PRACTICES

Poor water management is probably the biggest problem suffered by landscape trees. Each species has a different range of maximum and minimum water necessary for survival. An optimal watering should simulate natural climatic patterns of the tree's origin and should follow seasonal changes. Unfortunately the park trees grow in conflicting environments. Trees and turf are mutually exclusive in nature.

It is rare to see trees growing in grasslands, and grass is not common on the forest floor. Grassy lawns with trees are an unnatural ecosystem; they compete for water and nutrients. They also compete for sunlight and root space underground. However, watering brings the biggest challenge in maintaining a healthy environment for both. This leaflet will provide tree facts and watering do's and don'ts, which should help to apply attractive and accommodating alternatives in our parks.

Tree Facts. Healthy roots are vital to a tree's survival. Trees absorb water, nutrients, and oxygen through root tips (also called fine roots), of which 85 percent are in the top 18 inches of soil surrounding trees. Roots typically extend beyond the tree canopy dripline and the majority of trees have a root system extending twice the tree height. Roots eliminate waste carbon dioxide, store food, reduce erosion, produce compounds essential to the plant, and support the above ground structure.

Damage appearing on aboveground often occurs because roots have been improperly cared for. Roots are often neglected because they grow underground and are not seen. Most healthy trees have beneficial fungi (mycorrhizae or mycorrhizal root tips) growing in or on their roots. Trees need more water in the growing season and warm/hot months when evapotranspiration is increased. Trees "transpire" water through stomates, small openings mostly occurring in leaves. One isolated tree with a canopy spread of 36 feet may transpire 525 gallons of water per summer day.

Water stress symptoms exhibited by broadleaf trees include wilting of leaves and normally shiny green foliage that becomes faded, dull, or grayish. Growing tips may wilt in the afternoon and recover as evening approaches. Stress is a reversible condition; the sooner the condition is eliminated the better chance for total recovery. Native and drought tolerant trees benefit from deep, supplemental water at 1 or 2 month intervals during summer.

Tree Watering Do's. Water trees around and beyond the dripline, not near the trunk. Water infrequently and deep to encourage a deep root system. Examine trees regularly for symptoms of water stress. For young trees and mature trees showing drought stress, form a basin by creating a berm of soil several inches high that encompasses the dripline of the tree; fill basin with water. Probe the soil to a depth of three feet to monitor soil moisture within dripline; daily and weekly for young trees and monthly to bimonthly for the mature trees. Irrigate trees early morning or just before dawn. Install sprinklers outside the dripline and direct sprinklers away from trunks and canopy.

Tree Watering Don'ts. Don't underwater which leads to drought stress. Do not overwater, which is a more common problem in our parks due to trees growing in turf. Excess water excludes oxygen from soil, a vital factor for healthy roots. Excessive water increases probability of soil compaction by closing soil pores essential for root survival. Excessive water in the root zone, especially near the root collar, is a primary cause of root and crown diseases such as *Armillaria*, *Phytophthora* and *Dematophora*. These fungi-causing diseases are present in many soils but activate damaging effects in moist and/or warm conditions. Do not install sprinklers within the dripline. Avoid sprinklers wetting tree trunks and canopies, especially trees susceptible to fungal diseases.

Finding an Attractive and Accommodating Alternative. Plant shrubs near trees that have the same water requirements. Mulch trees in groups and individually as far from tree trunks as possible.

Mulch within the tree's dripline is perhaps the most important maintenance recommendation. It will minimize competition with turf, improve moisture content in the soil and enhance tree health. Learn how to properly apply mulch in the next training leaflet 5 – **Mulch and Its Benefits.**

MULCH AND ITS BENEFITS

Mulching enriches and protects soil, helping to provide a better growing environment for trees. Mulch is simply a protective layer of a material that is spread on top of the soil. Mulches can either be organic, such as grass clippings, straw, shredded wood, bark chips and similar materials or inorganic, such as stones, brick chips, gravel and plastic. Properly applied mulches, both organic and inorganic have numerous benefits and they:

- protect the soil from erosion
- reduce compaction from the impact of heavy rains
- conserve moisture, reducing the need for frequent watering
- maintain a more even soil temperature
- prevent weed growth
- provide a protection zone for trees against accidental equipment damage

Organic mulches also improve the condition of the soil. As these mulches slowly decompose, they provide organic matter which helps keep the soil loose. This improves root growth, increases the infiltration of water and also improves the water-holding capacity of the soil. Organic matter is a source of plant nutrients and provides an ideal environment for earthworms and other beneficial soil organisms. In poor soils, organic mulch may cause a nitrogen deficiency caused by wood decomposing bacteria. In that case apply nitrogen fertilizer at the minimized rate.

Inorganic mulches have their place in certain landscapes; however they lack the soil-improving properties of organic mulches. Inorganic mulches, because of their permanence, may be difficult to remove if you decide to change your garden plans at a later date.

When to apply mulch? Mulch may be applied at any time in our Southern California climate. Mulches moderate the soil temperature by providing an insulating barrier between the soil and the air. This means that a mulched soil in the summer will be cooler than the adjacent unmulched soil; while in the winter, the mulched soil may not cool off as deeply. Since mulches slowly decompose, they need to be replenished every two to three years to maintain an effective layer.

How much mulch to apply? Mulch groups of trees, mulch trees in planters, mulch individual trees and mulch all young trees for at least 3-5 years after planting. Mulch is measured in cubic feet. As an example, if you have an area 10 feet by 10 feet and you wish to apply 6 inches of mulch, you would need 50 cubic feet.

How to apply mulch? Do not apply mulch directly in contact with plants and especially tree trunks. Leave an inch or so of space next to plants and six inches away from tree trunks to help prevent diseases from flourishing from excessive humidity. Remove weeds before spreading mulch. Spread mulch evenly at a six-inch thickness.

Griffith Park's Green Waste Facility produces shredded tree trimming mulch continually, which is always available for distribution throughout City parks. Call (213) 485-4826 to request a mulch delivery to your park.

TREE STAKING

Newly planted trees may need artificial support to prevent excessive swaying in the wind, to promote upright growth, or to guard against mechanical damage.

Why to Stake Park Trees?

Staking is not always necessary for many trees and can have negative effects on the young trees being planted. Research has shown that staked trees develop smaller root systems and decreased trunk taper. The young trees are often injured by leaving the tree ties on too long or by using metal wire and other unsuitable material for securing the tree to the stake. The decision to stake or not should be determined by the strength of the trunk of the tree being planted, wind conditions, traffic patterns and maintenance requirements. The proper use of stakes on young trees can lessen or prevent problems that may occur as the tree matures.

Trees with strong trunks may need stakes only to prevent mechanical damage such as Weed Eater line girdling, being run into by lawnmowers, and park patron vandalism. The stakes are there to provide stability for the young tree until its roots can expand and grow into the surrounding soil, anchoring it securely.

How to Stake Park Trees?

The Forestry Division recommends that at least three stakes be used when staking a tree. Stakes should be at least 9-12 inches from the trunk of the tree. Stake ties should be loose enough to allow the tree to sway with the wind to help develop trunk strength. If the ties are too tight, they will cause weak spots in the trunk that will eventually lead to trunk failure.

The materials used during staking can be either metal or wood, metal stakes can be used if they are easily removable and are removed before the tree grows around the stake. The DRP recommends wooden peeler poles that are biodegradable and easily removed when needed. The material used for tying the trees to the stakes should never be metal or wire.

There are many new products on the market that do not damage the tree's bark and can expand with the developing trunk structure. The ties should make a "figure-eight" pattern around the trunk and back to the stake, and then nailed to the stake. The ties should be spaced along the trunk of the tree at different heights, not all at one height at the same place on the trunk of the tree.

How Long to Keep Tree Stakes?

Trees should be staked no longer than two to three years. If the tree is unable to support itself after that time it should be evaluated for removal and replacement. Tree stakes are for protection—not for support of the tree.

MAINTAINING YOUNG TREES

Mulching, pruning, watering, staking, and fertilizing affect the growth and development of young trees.

Why Mulching is Important?

Mulching is the most important post-planting practice that you can do to improve the health and vitality of your landscape plant. Research has shown that wood chip mulch can nearly double plant growth in the first few years after planting. Mulching conserves moisture and insulates roots from heat and cold extremes. Proper mulching provides a well-groomed appearance, eliminates grass or weed competition, and prevents mechanical damage from mowers and weed trimmers. Mechanical damage is one of the leading causes of injury and death to landscape plants.

Mulch groups of trees, mulch trees in planters, mulch young trees for at least 3-5 years after planting. Mulch is measured in cubic feet. As an example, if you have an area 10 feet by 10 feet and you wish to apply 6 inches of mulch, you would need 50 cubic feet. Do not apply mulch directly in contact with plants and especially tree trunks. Leave six inches away from tree trunks to help prevent diseases flourishing from excessive humidity. Remove weeds before spreading mulch. Spread mulch evenly at 6-inch thickness.

Caution must be used when applying mulch since a heavy mulching can also be a problem in poorly drained or wet sites where moisture can remain at high levels for extended periods and cause root dieback. In addition, heavy mulch layers encourage tree roots to grow up into the mulch material, which may dry out during long dry periods and cause these roots to die.

How Much to Prune?

Trees and shrubs should be pruned at planting time to remove branches damaged during handling and transplanting. The main leader on a single-stemmed tree should not be pruned unless it has been damaged. Lower branches should not be removed because they manufacture critically needed food and help to develop a strong trunk caliper. All planted and transplanted trees should be inspected during the first fall and winter after planting and pruned to remove any dead or crossing branches or to improve structure. This pruning period is also an excellent time to inspect the trees for other problems.

How to Water Young Trees?

Water is critical to the success of any tree or shrub planting. Tree roots, especially the small, water-absorbing roots, are easily damaged during original planting and transplanting. For sufficient water uptake to occur, the root ball of a newly planted tree must be kept moist, but not saturated. Monitor the moisture in the root ball daily, and water as needed so that the root ball does not dry out. The area outside of the root ball also should be watered to encourage root growth into the surrounding soil. Avoid over-watering, which is a major cause of tree failure. Heavy clay soils that have been compacted during construction activities severely restrict the movement of water and commonly lead to saturated conditions.

In areas with fine textured soils, such as those containing high levels of clay or silt, newly planted trees should receive no more than an inch of surface water per week during the growing season. Supplemental watering may not be necessary during periods of adequate rainfall. Water no more than two or three times per week for a total of one inch. Operating automatic lawn irrigation systems for 20 to 30 minutes per day often results in a continuously saturated soil condition, which in turn causes severe root damage and tree death.

In sandy soils, water drains more easily, and up to 2 inches of water per week may be necessary to keep the soil moist. Carefully monitor the moisture level in the root ball of container trees planted in sandy soils. Water does not drain easily from the fine textured soil of the root ball into the surrounding sandy soil, and saturated conditions in the root ball may develop. Use a typical two-foot soil probe to monitor soil moisture in no more than 7-day intervals.

How to Stake, Tie, and Why to Install Tree Guards?

The purpose of most staking and tying is to prevent the newly planted tree from tipping over in the wind. If at all possible, staking and guying systems should not be used, but in windy, exposed areas this practice is sometimes appropriate. Excessive movement will dislodge the small, fibrous roots from their new footing in the soil before they are firmly established. However, many trees are girdled and killed because guying materials are not removed or are improperly installed.

Staking and guying materials should be strong enough to provide support but flexible enough to allow some movement. Ties should have a broad surface to prevent damage from rubbing. Do not use a wire in a hose. All guying materials should be loosened or removed at the end of the first growing season to prevent trunk girdling. Trees with strong trunks need stakes only to prevent mechanical damage such as Weed Eater line girdling, being run into by lawnmowers, and park patron vandalism.

The Forestry Division recommends that at least three stakes be used when staking a tree. They should be at least 9"-12" inches from the trunk of the tree. Staked should be removed after two to three years. If the tree is unable to support it self after that time, it should be evaluated for removal and replacement. Plastic tree guards can prevent trunk damage from rodents, mowers and weed trimmers. They should be monitored regularly and removed before rubbing or girdling problems occur.

Should the Young Trees be Fertilized?

Fertilizers are generally not recommended at planting time since most soils contain sufficient levels of available nutrients to supply the requirements of newly planted landscape trees. Nitrogen fertilizers, in particular, should be avoided because the nitrogen promotes shoot growth over root growth, and re-establishment of the root system is required before a newly planted tree can adequately support new top growth.

Sites with very poor soil, or where construction activities have altered the soil composition, may be deficient in certain nutrients and especially mycorrhizae, which are fungal organisms that have beneficial association with tree roots. They are present in all native soils. Although they do not directly provide nutrients, they greatly increase effective surface area for root absorption of nutrients and water from the soil.

If a tree grows in poor disturbed urban soil, shows stress symptoms, and all other tree's requirements are met, most likely this is an indicator of a fungi-sterile soil. Analysis of existing tree roots for the presence of native mycorrhizae fungi may be advisable prior to deciding about the application of mycorrhizal fungal inoculants. If fertilizing applications are needed fertilizing formula should be slow release, complete fertilizing with chelate trace of elements and mix at label rates not to exceed 4-pounds nitrogen per 100 gallons of water.

Tree Care PowerPoint Presentation Outline

To arrange the presentation, call the Forestry office at 213-485-6547 at least two weeks prior to the desired date. A room with projection wall and electrical outlet is necessary for the training.

1. Welcome to the Forestry Division
2. Our Mission
3. Department's Responsibility
4. Park Trees
5. Forestry Division's Responsibility
 - Preserve the urban forest
 - Provide a safe environment
 - Inspect trees for hazards
 - Evaluate needs
 - Prune selectively
 - Remove hazardous trees
6. Tree Selection
 - Choose the right tree for the environment
 - Avoid root bound trees
 - Avoid very old trees
7. Favor trees with branches along the trunk
8. Tree Planting Considerations
9. Planting Depth
10. Development of Trunk Caliper Is Essential
11. Comparison of Trees Planted at the Same Time
12. Proper Reduction of Lower Branches
 - The lowest branches and leaves on young trees are essential for development of trunk caliper to hold mass when trees mature
 - If you must, cut lower branches to 6 inches in length - but DO NOT cut them all the way to the trunk
 - Do not remove these branches until tree is 5-6 years old
13. Proper Reduction of Lower Branches
14. Basic Principles of Pruning
15. Stake Trees Only When Necessary
 - Tree trunks kept from moving by guying or staking grow taller, exhibit less caliper growth, and develop less taper
 - Staking makes a tree less able to stand without support and more subject to injury
16. Benefits of Staking
 - Trees need support to stand against the wind or grow upright
 - Stakes protect young trees from vehicles, equipment, animals, and vandalism
17. Proper Staking Practices
 - Remove nursery stake
 - Use one, two, or three stakes
 - Place single stakes on the upwind side
18. Staking always requires follow-up maintenance
19. Stake Strap Tying Practices
 - Tie tree to stakes with a figure eight loop
 - Place ties near the top of stake
 - Use broad, smooth and somewhat flexible straps

20. Avoid Tree Girdling
 - Check staking within one year to prevent injury to tree
 - Stakes should generally be removed after one growing season
21. Girdling Damage
22. Benefits of Mulch
 - Protects soil from erosion caused by wind and rain
 - Reduces compaction caused by short, heavy rains
 - Retains moisture
 - Maintains an even soil temperature
 - Prevents weed growth that competes with desired plants for water and nutrients
 - Helps keep feet clean, allowing access to parks even when damp
 - Provides an aesthetically pleasing "finished" look to parks and gardens
23. Use Mulch To Protect Tree Trunks
 - Avoid turf from touching tree trunk
 - Maintain turf a minimum of three feet away from trunk
 - Use a thin blanket of mulch to maintain machinery away from trunk
 - Maintain mulch away from the trunk
24. Avoid Compost Mounds
25. Follow-Up Maintenance is Necessary
 - Maintain lawn away from tree
 - Monitor tree guards constantly
26. Maintenance Practices to Avoid
 - Eliminate soil compaction and lack of oxygen in tree root zone through soil aeration
 - Avoid planting and deep cultivation within trees' drip lines, which may cause root disturbance and nutrient deficiency
 - Do not scalp tree roots or grade down to the soil level within the dripline; consider adding soil to protect roots
 - Use alternative layout for utilities to stay away from trees
 - If necessary, make sharp cuts and do not rip roots
 - Remove all volunteer tree seedlings before they mature into trees
 - Control rodents out of the roots zone
 - Do not chain objects to tree trunks
 - Maintain crown above the grade
 - Avoid any trunk damage
27. All Projects Affect Trees
28. Improvement projects in our parks affect the trees.
29. Capital Improvement Projects
30. Tree Protection During Construction
 - **FENCES:** Construction fences should be erected around trees that are to be retained. The fences should be placed as far from the trunk as possible with the intent to protect the above ground portion of the trees as well as the root zone
 - **STORING AND PILING:** Leaning objects against the tree trunks and piling soil over the root zone is prohibited
 - **PRUNING:** Pruning for vertical clearance of buildings, traffic, and construction equipment should be performed only by an arborist and not by construction personnel

- **COMPACTION:** Driving equipment and walking within the drip line zone causes soil compaction and is a serious cause of tree decline and death long after construction is over. Fences around trees reduce unnecessary traffic. If traffic cannot be avoided, it is recommended to spread a 6-12 inch thick layer of mulch to reduce the compaction. Additionally, placing large plywood sheets over the mulch can disperse weight.
- **EXCAVATION:** Excavation causes major damage to trees. Digging and trenching should be planned ahead and all alternatives should be explored to minimize the root loss. When roots must be severed, clean cuts shall be made by an arborist. The soil shall then be backfilled immediately to minimize drying of the roots.

TREE MAINTENANCE. Abruptly cutting off regular tree maintenance is another cause of tree decline.

- Provide supplemental irrigation in similar volumes to replicate seasonal distribution
31. Alternatives For Healthy Trees
 32. Successful Story
 33. Principles Of Urban Forest
 - The propagation, design, installation, and maintenance of landscape trees and plants, and long-term management of trees should conform to reasonable standards.
 - The standards should be based on professional knowledge of tree biology, tree ecology, experience, and on research of a tree's response system.
 34. Trees Are the Foundation of RAP!