32 01 90 - Operation and Maintenance of Planting

**Planting Guarantee:**
During the Guarantee to Repair Period specified in the General Conditions the Contractor shall be liable for damages to all trees covered by the provisions of this Section. Compensation to the University shall be as outlined below.

Contractor will not be held responsible for damages due to vandalism or freak acts of nature during the guarantee period. Immediately report such conditions to the University's Representative.

**Protection and Preservation Procedures**
On any site survey map, all trees should be identified whose root systems are likely to be impacted by construction equipment, staging areas, proposed walks and roads, utility corridors, and any cut or fill activities. A tree protection zone (TPZ) shall be established to encompass the critical root zone (CRZ) and maintained for all trees to be preserved in a construction site. TPZ should be determined by the tree size, health, how the species responds to construction damage, and should be adjusted according to specific tree and site factors; calculated as 1.50’x the diameter at breast height (DBH) of the tree in inches. For example, a healthy California black walnut with a 30” diameter. = 1.50’ X 30” = 45’ radius TPZ.

At no time should the TPZ be less than a radius of 6’. The TPZ must be clearly identified as an exclusion zone, where construction and equipment use is prohibited, and must be fenced before demolition to avoid damage.

A barrier shall be constructed for each tree or grouping of trees to protect the trunk and root systems. Chain link 6’ fencing shall be the approved barrier material. No root raking shall be allowed within any tree protection zone at any time during clearing, grading, or construction of a project. No equipment or vehicle shall be parked or construction material stored, or substances poured or disposed of or placed within any tree protection zone at any time during clearing or construction of a project.

Vigilance is required to protect trees on construction sites. Monitoring of tree health during and after construction on a regular, frequent basis shall apply to all trees intended for preservation. Monitoring shall be executed by a registered arborist or appointee and shall include watching for signs of tree stress, such as dieback, leaf loss, or general decline in tree health or appearance.

**Pruning Materials**
- Pruning materials shall be in accordance with current horticultural practices.
- Pruning sterilant shall be Physan 20 Fertilome Type A, or diluted bleach.

**Fencing**
Fencing Materials: 11-gauge galvanized 6’ high chain-link fence with galvanized steel posts at 10’ o.c. minimum.
A continuous 6' high temporary chain-link fence will be erected around trees with a caliper of 4" or larger at the dripline, in order to prevent soil compaction, limb damage, or the accidental introduction of toxic materials into the root zone. Fence can be erected around groups of adjacent trees where possible. Otherwise, fence to be erected around individual tree.

The fence will be removed only at the end of construction, as approved by the University's Representative.

**Plant Material Protection:**

Provide protection for all plant materials designated to be retained. Contractor is responsible for replacing damaged plant life with approved equivalent.

New and existing plant materials shall not be allowed to deteriorate and shall be maintained in a healthy and vigorous condition during the course of construction and maintenance period.

During the course of construction the Contractor shall take all necessary precautions, as outlined herein, to protect existing plant materials to be preserved from injury and death. Protection shall be given to the roots, trunk, and foliage.

The Contractor shall conduct operations continually to completion, unless weather conditions are prohibitive.

Provide ample water supply of potable quality and sufficient quantity for all operations required under this Section.

Trees subject to the provisions of this Section, which have been injured shall be repaired immediately by a certified Arborist. Repairs shall include removal of rough edges, sprung bark and severely injured branches as directed by the Arborist.

Necessary measures shall be taken to maintain healthy living conditions for existing plant materials to be preserved. Such measures shall include monthly washing of leaves for the removal of dust, regular irrigation, root feeding, etc.

Tree protection fencing shall be installed for the protection of existing trees to be preserved. No construction, demolition, or work of any nature will be allowed within the fenced area without prior written approval by the University's Representative.

- Approval by the University's Representative for work within the fenced area shall not release the Contractor from any of the provisions specified herein for the protection of existing trees to be preserved.
- During the course of construction of approved work within the fence area, no roots shall be cut without prior written approval by the University's Representative.
During construction, the existing site surface drainage patterns shall not be altered within the area of the drip line of existing plant materials.

Contractor shall not alter the existing water table within the area of the drip line of existing plant materials.

Do not permit the following within the drip line of any existing tree or shrub to be preserved:

- Storage or parking of automobiles or other vehicles.
- Stockpiling of building materials, refuse or excavated materials.
- Skinning or bruising of bark.
- Use of trees as support posts, power poles, or signposts; anchorage for ropes, guy wires, or power lines; or other similar functions.
- Dumping of poisonous materials on or around plant materials and roots. Such materials include but are not limited to paint, petroleum products, dirty water, or other deleterious materials.
- Cutting roots by utility trenching, foundation digging; placement of curbs and trenches, and other miscellaneous excavation without prior written approval by the University's Representative.
- Damage to the trunk, limbs, or foliage caused by maneuvering vehicles or stacking material or equipment to close to the plant.
- Compaction of the root area by movement of trucks or grading machines; storage of equipment, gravel, earth fill, or construction supplies; etc.
- Excessive water or heat from equipment, utility line construction, or burning of trash under or near shrubs or trees.
- Damage to root system from flooding, erosion, and excessive wetting and drying resulting from watering and other operations.

**Excavation around trees**

- Excavation within the drip lines of trees shall be done only where absolutely necessary, under the direction of a Certified Arborist and with prior approval from the University's Representative.
- Where trenching for utilities is required within drip lines, tunneling under and around roots shall be by hand digging. Main lateral roots and taproots shall not be cut. Smaller roots that interfere with installation of new work may be cut with prior approval from certified Arborist.
- Where excavation of new construction is required within drip line of trees, hand excavation shall be employed to minimize damage to root system. Roots shall be relocated in backfill areas wherever possible. If large, main lateral roots are encountered, they shall be exposed beyond excavation limits as required to bend, and relocate without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical, roots shall be cut approximately 6 inches back from new construction under the direction of a certified Arborist.
- Exposed roots shall not be allowed to dry out before permanent backfill is placed. Temporary earth cover shall be provided, or roots shall be packed with wet peat moss or four layers of wet, untreated burlap and temporarily supported and protected from damage until permanently relocated and covered with backfill. The cover over the roots shall be wetted to the point of runoff daily.
- Branching structure shall be thinned in accordance with National Arborists Association "Pruning Standards and Principles" to balance loss of root system caused by damage or cutting of root system. Thinning shall not exceed 30 percent of existing branching structure.

**Tree Trimming**
A Certified Arborist, shall be engaged to direct removal of branches from trees if necessary to protect the health of the tree or if required to clear for construction.

In company with the University's Representative, University and a certified Arborist, ascertain the limbs and roots which are to be trimmed. Clearly mark them to designate the approved point of cutting.

Dead and damaged trees that are determined by the Certified Arborist to be incapable of restoration to normal growth pattern shall be removed.

Cut evenly, using proper tools and skilled workmen, to achieve neat severance with the least possible damage to the tree.

In the case of root cuts, apply wet burlap or other protection, approved as noted herein, to prevent drying out, and maintain in a wet condition as long as necessary for temporary protection.

**Landscape Maintenance**
Plant material will be maintained throughout the duration of the construction period in a healthful manner. Plant material identified which requires special pruning, insect control, fertilization or other remedial health action will be treated during this period. Methods and rates of pesticide and fertilizer application will be reviewed by the University's Representative prior to approval.

**Watering**
Plant materials will be watered on a regular basis, at a rate consistent with their particular requirements. Verification of the proposed watering schedule shall be reviewed by the University's Representative prior to commencement of the maintenance.

- The maintenance of the plant materials shall comply with standard horticultural practice for the correct watering, fertilizing, pruning and spraying of the specimen boxed trees.
- The maintenance and quality of the plant materials shall be subject to monthly checks. The dates of these checks shall be outlined in the University's Representative's field notification relating to the establishment of the plant maintenance period. Additional checks shall be scheduled as determined by the University's Representative.
- Contractor shall be responsible for performing periodic inspections of existing plant materials to be protected and relocated throughout the construction period, and submit written proposals to the University's Representative for additional maintenance work as may be required to ensure the health and general well-being of the plant material. Contractor shall retain, at the direction of the University's Representative additional specialists as may be required to perform this work.
• Contractor shall keep plant material free from weeds and debris at all times.

**Tree Damage Compensation**

Damage to existing tree crowns or roots over 1” in diameter shall be immediately reported to the University’s Representative.

A Certified Arborist shall direct all repairs to trees. Repairs shall be made promptly after damage occurs to prevent progressive deterioration of damaged trees. Repairs shall be at the Contractor’s expense.

Development activities shall be planned to preserve and protect trees on Cal Poly’s campus. Any tree that must be removed to accommodate development, or because of damage during storm events, disease, or water/sewer repairs must be shown on the site plan and a method of compensation shall apply as follows:

• For trees and shrubs with diameters up to 4 inches, compensation shall be the actual cost on replacement with an item similar in species, size and shape, including:
  o Actual cost of the item boxed out of ground
  o Transportation and delivery of boxed item to Project site.
  o Planting and staking
  o Maintenance, including watering, fertilizing, pruning, pest control and other care for a period of 90 days.
  o Values for removals of trunks up to:
    ▪ Twelve inches - $7,200
    ▪ Thirteen inches - $8,200
    ▪ Fourteen inches - $9,200
    ▪ Fifteen inches - $10,000
    ▪ Sixteen inches - $11,500
    ▪ Seventeen inches - $12,000
    ▪ Eighteen inches and over, add for each caliper inch - $1,200

• A penalty will be assessed for a limb and root injury of $200 per inch of limb/root diameter for and limb/root greater than 2 inches in diameter, measured where the limb should be pruned in order to make a proper thinning cut or root to the point a clean cut can be made.

• A penalty will be assessed of $20 per square inch of tree trunk area injured. This penalty shall be assessed when it is determined that an entity is responsible for the damage to the tree trunk, but the tree is still healthy enough to remain at the site. An example of this kind of damage would be the collision of a tractor with the trunk of a mature tree where the bark is peeled back, and the injured area will require repair and healing.

The Landscape Services operating account shall receive and manage the tree replacement program. Payment shall be made to the tree planting and replacement account if there is a problem with site space or readiness.
General: The Contractor guarantees the protection of all plant material included as part of this work, in a healthful manner during the duration of the construction period. Destruction of, or significant damage to, any or all of the plant materials to be protected, as determined by the University's Representative, will result in compensation by the Contractor of 3-36" box trees, installed on the site, for each existing tree damaged.

Assessment:
All damaged trees on Cal Poly’s campus shall be assessed by a Certified Arborist or outside consultant using the tree evaluation form or other similar methods preapproved by the Landscape Advisory Committee. Results from the evaluation determine whether the tree should be removed, pruned, or receive treatment such as fertilization and insect/disease control. All actions post-evaluation are updated on the tree inventory list.

Enforcement:
Whenever it is determined that violation of this procedure has occurred, the Facilities representative or designee shall immediately issue written and oral notice to the person or company or department in violation, identifying the nature and location of the violation and specifying that remedial action is necessary to bring the violation into compliance.

Penalties:
The person, company or department in violation shall immediately, conditions permitting, commence remedial action and shall have seven (7) working days after the receipt of the notice, or such longer times as may be specified in the notice, to complete the remedial actions required to bring the activity into compliance with this policy.