# SECTION 01568

# TREE AND PLANT PROTECTION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

### 1.2 SECTION INCLUDES

A. Requirements for protection of existing landscape plant materials, including trees, shrubs and ground covers. Contractor shall preserve, protect, and prune as necessary existing trees and shrubs, and other vegetation indicated to remain.

### 1.3 RELATED SECTIONS

A. Section 01560 – Temporary Barriers and Enclosures: Barricades and barriers used to protect landscaping.

B. Section 01570 – Temporary Controls: Runoff.

C. Division 02 - Site Construction: Landscaping specifications related to trees, shrubs and ground covers, as applicable.

### 1.4 WORK DESCRIPTION

A. Protection: All trees and plant materials to remain on site shall be protected from construction activities. Preserve, protect, and prune as necessary existing trees and shrubs and other vegetation indicated to remain.

B. Maintenance: Until Contract closeout, Contractor shall irrigate, fertilize, prune and clean as necessary to maintain all existing trees, shrubs and ground covers in healthy condition, within and adjacent to Project area.

### 1.5 QUALITY ASSURANCE

A. Arborist: Contractor shall engage and pay a Certified Arborist who will be responsible for supervising implementation of tree and plant protection measures specified in this Section.
   1. Arborist shall be subject to acceptance by University's Representative.
   2. Arborist registered by the American Society of Consulting Arborists.
   3. Submit evidence contract with acceptable Certified Arborist prior to commencing site mobilization activities.

## PART 2 - PRODUCTS

### 2.1 BARRIERS

A. Barriers: As specified in Section 01560 - Temporary Barriers and Enclosures.

### 2.2 FERTILIZER

A. Fertilizer: Unless otherwise directed by University's Representative, type and quantity of fertilizer shall be determined by soil agronomist engaged and paid by Contractor, who is acceptable to University's Representative.

1. As basis for bidding, fertilizer shall be Romeo "Greenbelt" 22-14-14 tree fertilizer or approved equal at 4 lb. fertilizer dissolved in 100 gallons water.

B. Accessory Materials: As determined by Contractor as necessary for sustained health of trees and plants, subject to acceptance by University's Representative. Accessory materials shall include mulch, tree and plant stakes and temporary covers.

**PART 3 - EXECUTION**

**3.1 PROTECTION**

A. Protection: Prior to construction activities, especially demolition and excavation, on the site, Contractor shall submit to University's Representative evidence of a contract with a Certified Arborist who shall be responsible for supervising implementation of the following tree protection measures.

1. Protect all existing trees, shrubs and ground covers from stockpiling, material storage including soil, vehicle parking and driving within the tree drip line. Restrict foot traffic to prevent excessive compacting of soil over root systems.

2. Protect root systems of existing trees, shrubs, and ground covers from damage due to chemically injurious materials in solution caused by runoff and spillage during mixing, placement of construction materials, and drainage from stored materials.

3. Protect root system from flooding, erosion, excessive wetting and drying resulting from de-watering and other operations.

4. Above-ground surface runoff shall not be directed into the tree canopy area from adjacent areas. Ensure that sidewalks or other construction do not trap water near the tree. Coordinate with requirements specified in Section 01570 - Temporary Controls.

5. Protect existing plant materials from unnecessary cutting, breaking and skinning of roots and branches, skinning and bruising of bark.

6. Use no soil sterilants under pavement near existing trees.

7. Do not allow fires under and adjacent to existing trees or plants.

B. Maintenance: Throughout duration of the Contract, Contractor shall be responsible for irrigation, fertilizing, pruning, and other measures necessary to protect and nurture all existing trees, plants, ground covers and lawns indicated to remain in Project.

**3.2 PRUNING**

A. Pruning: Certified Arborist shall direct removal of branches from trees and large shrubs and correctional pruning and cabling of specified trees which are to remain in Project, if required to clear new construction and where indicated, and to direct tree root pruning and relocation Work. Procedure for each tree may vary and shall be subject to approval by Certified Arborist and University's Representative prior to commencing Work.

1. Where indicated by University's Representative, extend pruning operation to restore natural shape of entire tree using only Western Chapter, ISA Pruning Standards.

2. Cut branches and roots with sharp pruning instruments. Do not break, chop, or mutilate.

3. Pruning of existing trees shall be limited to removal of all dead wood 1/2-inch or greater in size and removal of vines and sucker growth. Tree cavities existing on all oak trees shall be cleaned of wood rot.

4. Tree limbs shall be trimmed or removed only under direction of skilled and experienced supervisor, according to directions of Arborist.

## 3.3 IRRIGATION

A. Irrigation: Irrigate trees and other plants to remain, as necessary to maintain their health before, during and after Work under the Contract, as directed by the Consulting Arborist.

1. Maintain an irrigation schedule and document. Submit schedule to University's Representative for review and acceptance.

2. Provide temporary piping, valves, hoses, emitters and spray heads as necessary until Contract closeout.

B. Soil Preparation: If soil within drip line of trees is compacted, then prior to watering or fertilizing trees, area within the drip lines shall be tilled to break up the top two inches of existing soil.

C. Tree Irrigation: All trees shall be deep-root watered by the use of an injection needle to a depth of 18-inches.

1. Needle shall be inserted into ground at 5-foot intervals in concentric rings around the tree, beginning at trunk. Each ring shall be 4-feet wider than previous one. Process shall continue out to drip line of the tree.

2. For trees greater than 12-inches in caliper, irrigate trees during first month of construction using 1,200 gallons of water per tree.

3. For trees less than 12-inches in caliper, 800 gallons of water shall be used per tree.

4. Repeat procedure every three months until Contract completion.

## 3.4 FERTILIZING

A. Fertilizing: All trees shall be fertilized before, during, and after construction by pumping under pressure directly 18-inches into root zone as directed by Certified Arborist.

## 3.5 EXCAVATION AROUND TREES

A. Excavation Around Trees: Excavate within drip lines of trees only where indicated.

1. Where trenching for utilities is required within drip lines, tunnel under and around roots of 2-1/2 inches diameter or larger by hand digging. Do not cut main lateral roots that are two inches or larger. Cut smaller roots that are smaller than two inches that interfere with installation of new Work. Use sharp, approved pruning tools. Pipes shall be routed into alternate locations to avoid conflict with remaining tree roots.

2. Where excavating for new construction is required within drip lines of trees, hand excavate to minimize damage to root systems. Use narrow tine spading forks and comb soil to expose roots. Relocate roots in backfill areas wherever possible. If large, main lateral roots are encountered, expose beyond excavation limits as required to bend and relocate without breaking.

3. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots approximately six inches back from new construction. Treat and cover cut ends as directed by Certified Arborist.

4. Do not allow exposed roots to dry out before permanent backfill is placed. Provide temporary earth cover, pack with wet peat moss or four layers of wet untreated burlap and temporarily support and protect roots from damage until permanently relocated and covered with backfill. Irrigate to eliminate voids and air pockets.

B. Pruning: Thin branching structure in accordance with Western Chapter, ISA Pruning Standards to balance loss to root system caused by damage or cutting of root system. Thinning shall not exceed 30 percent of existing branching structure.

## 3.6 GRADING AND FILLING AROUND TREES

A. Grading and Filling Around Trees: Maintain existing grade within drip line of trees unless otherwise indicated.

1. Grade changes shall be limited to six inches of cut or fill from original grade and shall be accomplished by hand.

2. Under all Quercus and Sequoia trees there shall be no grade change under at least the inner 50% of the tree canopy.

B. Lowering Grades Around Trees: Where existing grade is above new finish grade shown around trees, carefully hand excavate within drip line to new grade. Cut roots exposed by excavation to approximately three inches below elevation of new finish grade.

C. Raising Grades Around Trees: Permitted only as acceptable to Certified Arborist and University's Representative.

D. Other Changes: If building pads or foundations are indicated to be constructed within Project area or if existing landscaping requires alteration due addition of fill or reduced by excavation, notify University's Representative for directions prior to starting Work. Measures as directed by University's Representative, such as addition of small retaining walls or subgrade aeration lines, may be required to mitigate construction procedures affecting tree.

## 3.7 REPAIR AND REMOVAL OF TREES

A. Repair and Removal of Trees: Certified Arborist and University's Representative will determine whether trees shall be restored or removed. Treat and restore trees damaged by construction operations in a manner acceptable to University's Representative. Perform restoration and pruning promptly after damage occurs to prevent progressive deterioration of damaged trees. If trees cannot be restored, equitable adjustment to Contract Sum shall be made to compensate University for loss, in accordance with the Contract General Conditions.

1. Remove dead and damaged trees that are determined by Certified Arborist to be incapable of restoration to normal growth pattern.

2. Contractor shall be liable for all damage and necessary restoration actions to existing trees, including trunk, branches, or roots. Restoration shall be performed under direction of Certified Arborist.

## 3.8 REPAIR AND REPLACEMENT OF SHRUBS AND GROUND COVER

A. Repairs and Replacements of Shrubs and Ground Cover: Repair shrubs and other vegetation damaged by construction operation in manner acceptable to University's Representative.

1. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged plant. Remove and replace all dead and damaged plants up to six inch diameter which are determined by University's Representative as being incapable of restoration to normal growth pattern.

2. Provide new shrubs of same size and species as those replaced or as acceptable to the University's Representative.

## 3.9 COMPENSATION TO UNIVERSITY FOR LOST AND DAMAGED TREES

A. Compensation to University for Lost and Damaged Trees: Contractor shall be liable for loss in value to damaged trees and trees which are damaged beyond restoration, unless trees are specifically indicated on Contract Drawings to be removed.

B. All resulting repair or replacement costs, as determined by University's Representative, shall be compensated to University by change order deducting sum from monies owed Contractor.

1. Because of irreplaceable nature of many existing trees, amount of assessment shall be determined by University's Representative after consultation with Certified Arborist, and shall depend upon tree species, condition before damage and location value.

2. Disputed sums shall be governed by applicable provisions of the Contract General Conditions.

**END OF SECTION**