SECTION 01 56 39 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general protection, pruning, and care of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Requirements:

1. Section 01 50 00 "Temporary Facilities and Controls" for temporary site fencing.
2. Section 31 10 00 "Site Clearing" for removing existing trees and shrubs.

1.3 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape at a height 12inchesabove the ground.

B. Drip Line: The width of the canopy of the tree as measured by the lateral extent of the foliage on all sides.

C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings or defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

a. Tree-service firm's personnel, and equipment needed to make progress and avoid delays.
b. Arborist's responsibilities.
c. Quality-control program.
d. Coordination of Work and equipment movement with the locations of protection zones.

e. Trenching by hand or with air spade within protection zones.
f. Field quality control.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.
2. Indicate extent of trenching by hand or with air spade within protection zones.

C. Samples: For each type of the following:

1. Organic Mulch: 1-quart volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.

D. Tree Preservation Schedule: Schedule, written by the arborist, detailing scope and extent of work to be performed to preserve and protect existing trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location of tree on site plan. Include unique identifier for each.
3. Location of protection zone for each tree.
4. If arborist determines pruning is required, provide reason for pruning, description of pruning to be performed, and description of maintenance procedures following pruning.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For arborist and tree service firm.

B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

E. Quality-control program.

1.7 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by the International Society of Arboriculture (ISA) or a Registered Consulting Arborist as designated by ASCA.

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing and signage, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.8 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Storage or use of equipment and non-related construction activities including, but not limited to, pipe-cutting machines, tile-cutting machines, and lumber saws.
3. Storage or dumping of deleterious materials harmful to plant growth. Deleterious materials might include, but are not limited to, fuels, oils, other petroleum products, acids, liquids, concrete mix or concrete washout, stucco mix or stucco washout, paint or paint washout, and zinc grindings from working with galvanized products in the field.
4. Soil disturbance or grade change.
5. Moving or parking vehicles or equipment, even temporarily.
6. Foot traffic.
7. Erection of sheds or structures.
8. Drainage changes or impoundment of water.
9. Excavation or other digging unless otherwise indicated.
10. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
11. The use of a tree as a temporary power pole, backstop, winch support, anchorage, or other similar function.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

1. Planting Soil: Fertile, friable, surface soil, containing natural loam and complying with ASTM D 5268. Provide topsoil that is free of stones larger than 1 inch in any dimension and free of other extraneous or toxic matter harmful to plant growth. Obtain topsoil only from well-drained sites where soil occurs in depth of 4 inches or more; do not obtain from bogs or marshes.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:

1. Type: Screened fir bark.
2. Size Range: 3/8 inch to 3/4 inch diameter.
3. Color: Natural, no dyes.

C. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements. Previously used materials may be used when approved by District Representative.

1. Chain-Link Protection-Zone Fencing: Galvanized-steel fencing fabricated from minimum 2-inch opening, 0.148-inch-diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch-OD line posts, and 2-7/8-inch-OD corner and pull posts; with 0.177-inch-diameter top tension wire and 0.177-inch-diameter bottom tension wire; with tie wires, hog ring ties, and other accessories for a complete fence system.

a. Height: 72 inches.

2. Gates: Single swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones; leaf width 36 inches.

D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering and as follows:

1. Size and Text: [**As shown on Drawings**] <**Insert requirement**>.
2. Lettering: 3-inch-high minimum, black characters on white background.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. Prepare written report, authored by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain [**or to be relocated**]. Tie a 1-inch blue vinyl tape around each tree trunk at 54 inches above the ground.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

1. Apply 2-inchuniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

3.3 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
2. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to District Representative.
3. Access Gates: Install; adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by District Representative. Install one sign spaced approximately every 20 feeton protection-zone fencing, but no fewer than four signs with each facing a different direction.

C. Maintain protection zones free of weeds and trash.

D. Maintain protection-zone fencing and signage in good condition as acceptable to District Representative and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 31 20 00 "Earth Moving" unless otherwise indicated.

B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

A. Root pruning shall not be attempted by untrained construction personnel, but shall be performed by a qualified tree care professional or a certified tree care worker. Only personnel approved by the arborist shall perform pruning operations.

B. Prune tree roots that are affected by temporary and permanent construction. Prune roots as directed by the arborist or as follows. If direction from arborist is different from what is stated below, then direction from arborist governs.

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Cut Ends: Treat as directed by arborist.
3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible according to requirements in Section 31 20 00 "Earth Moving."

C. Root Pruning at Edge of Protection Zone: Prune tree roots 6 inches of the protection zone by cleanly cutting all roots to the depth of the required excavation.

D. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.6 CROWN PRUNING

A. Crown pruning shall not be attempted by untrained construction personnel, but shall be performed by a qualified tree care professional or a certified tree care worker. Only personnel approved by the arborist shall perform pruning operations

B. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by arborist.

1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).

a. Type of Pruning: Cleaning, raising, reducing, and thinning as directed by arborist.
b. Specialty Pruning: Structural restoration, vista, espalier, pollarding, palm, and utility as directed by arborist.

C. Unless otherwise directed by arborist and acceptable to District Representative, do not cut tree leaders.

D. Cut branches with sharp pruning instruments; do not break or chop.

E. Do not paint or apply sealants to wounds.

F. Provide subsequent maintenance pruning during Contract period as recommended by arborist.

G. Chip removed branches and dispose of off-site.

3.7 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

D. Minor Fill within Protection Zone: Where existing grade is **2 inches** or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports. Submit inspection reports monthly.

3.9 MAINTENANCE

A. Irrigation: Supplemental irrigation shall be applied to moisten the soil within the protection zone to the depth of the existing root system, typically in the top 2 to 3 feet of soil, and to then replace that moisture once it is depleted. Irrigation frequency and depth shall be based on the needs of the individual tree. Irrigation applications performed on a schedule are not acceptable, as many variables determine the individual tree's needs (age of tree, size of tree, soil type, aspect, weather, time of year, extent of root pruning, etc). Light, frequent irrigation applications shall be avoided. Apply water deeply, thoroughly, and infrequently, by a method directed by the arborist. Water used in supplemental irrigation applications shall be clean potable water from a reliable source.

B. Where temporary clearance is needed for adjacent access, tree branches shall be temporarily tied back to hold them out of the clearance zone, with approval by the arborist. Tied branches shall be protected with burlap or other protective material to prevent wounding and chafing.

C. Dust Control: Tree shall be maintained in a clean fashion throughout the length of the Work. During periods of demolition, clearing & grubbing, grading activities, post-wind, or simply time, gently spray the foliage, trunks, and branches with clean potable water to remove construction dust. Do not utilize pressure washers, large streams of water with high volumes, or other insensitive methods to clean the foliage.

D. Area inside the tree protection zone shall be maintained in a neat manner, removing excessive leaf build-up, fallen twigs and branches, or debris deposited by winds or other causes.

E. When installing concrete adjacent to the tree protection zone, install a plastic vapor barrier behind the concrete to prohibit leaching of lime into the soil.

F. Pest and Disease Control: Notify the arborist if any symptoms of pest or disease are observed. Provide appropriate measures to prevent or remedy pests and diseases, as directed by the arborist.

3.10 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by District Representative.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by District Representative.

B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that District Representative determines are incapable of restoring to normal growth pattern.

1. Small Trees: Provide new trees of same size and species as those being replaced for each tree that measures 10 inches or smaller in caliper size.
2. Large Trees: Project Arborist shall determine the tree appraisal value for damage and replacement using the most recent edition of the *Guide for Plant Appraisal*, authored by the Council of Tree and Landscape Appraisers (CTLA), and published by the International Society of Arboriculture (ISA), Champaign, IL. The formula used shall also be noted.

    a. Species: As selected by District Representative.

3. Plant and maintain new trees as specified in Section 32 93 00 "Plants."

C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 3 inch uniform thickness to remain.

D. Soil Aeration: Aerate surface soil compacted during construction. Aerate 10 feetbeyond drip line and no closer than 36 inchesto tree trunk. Drill 2 inchdiameter holes a minimum of 12

inchesdeep at 24 incheso.c. Backfill holes with an equal mix of augered soil and sand.

3.11 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off District's property.

END OF SECTION 01 56 39

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