

Standard Specification

SECTION 01 56 39 TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Perform all Work necessary and required to protect and maintain all trees, shrubs, groundcover and turf, not identified for removal, within the limits of the Work in healthy growing condition at all times during the Project. If during the course of construction, any adjacent trees or shrubs are damaged, penalties will be assigned for tree injury, which results in the decline or death of trees. The preservation of existing trees to remain is a critical project requirement.
- B. Contractor shall be directly responsible for protection and welfare of all existing trees within the limits of the Work and directly adjacent to the limits of the Work. This responsibility shall continue until the entire Project is completed and accepted by the University and through the maintenance period.
- C. Limits of Work: Refer to Drawings for limits of Work.
- D. Definitions
  - 1. "Injury" is defined, without limitation, as any bruising, scarring, tearing, or breaking of roots, branches, or trunk.
  - 2. "Tree protection zone" is defined for each species. Species tolerance to construction impacts and the tree's age determine the radius of the tree protection zone. The tree protection zone shall be 1.5 feet per inch trunk diameter unless otherwise noted by the University's Representative.
  - 3. "Existing tree" is defined as any or all of the existing trees to be preserved, as designated on the Drawings.
  - 4. "Consulting Arborist" is a certified arborist registered by the International Society of Arboriculture (ISA). Contractor shall submit Arborist credentials for review by University's Representative. Consulting Arborist shall be supplied at the expense of the Contractor.

1.2 Standards

- A. Published specifications, standards, tests, or recommended methods of trades, industry, or governmental organizations apply to the Work of this Section.
  - 1. Cabling, Bracing and Guying Standards for Shade Trees, latest revision, as published by the National Arborist Association (NAA), 174 RT 101, Bedford, New Hampshire 03102.

1.3 SITE CONDITIONS

- A. Field verify all dimensions, grades, and coordinates, which affect existing trees and plants. Indicate elevations at the base of all trees within the limits of the Work on the grading plan. Report discrepancies to the University's Representative in writing, and obtain the University's Representative instructions prior to proceeding with the Work affected.
- B. Should utilities, grade changes, or other conditions not shown on the Drawings be found within the tree protection zone during the course of the Work, report to the University's Representative in writing, and obtain instruction prior to proceeding with the Work affected.

1.4 PRECONSTRUCTION CONFERENCE

- A. It shall be the responsibility of the Contractor to call for a meeting at the Project site with the University's Representative. Meeting attendees shall include the Contractor, University's Representative, Consulting Arborist, Engineers, and Architects. This meeting shall occur prior to start of construction of any nature within the protection zone of the trees.

- B. The purpose of the meeting shall be to establish the conditions of all existing trees upon receipt of the Project site by the Contractor. Failure to call for said meeting implies acceptance by the Contractor of existing trees in their existing condition.
- C. The University's Representative shall document the condition of the trees prior to this meeting. The purpose of the meeting shall be to confirm what work is to occur near the trees and to discuss mitigation of the potential impacts on trees to be preserved if necessary.

#### 1.5 TREE PROTECTION

- A. No trees shall be cut or felled without specific permission from the University's Representative. Trees cut or damaged without written permission of the University's Representative shall be subject to provisions of Repair and Compensation.
- B. During the course of construction, take all necessary precautions to protect the existing trees from injury or death. Protection shall be given to the roots, trunk, limbs and foliage of all existing trees.
- C. Fencing:
  - 1. Contractor shall install tree protection fencing around trees to be preserved at a distance required from the base of the trunk to the protection zone. All fencing shall remain until Project completion, and it shall then be removed only as directed by the University's Representative.
  - 2. Tree protection fencing shall be chain-link fencing (minimum 6-feet) on concrete anchor blocks unless otherwise noted.
  - 3. During the course of construction, Contractor shall relocate the fence if required to facilitate construction only after notifying University's Representative, to avoid compaction or other injury of tree roots.
  - 4. The Contractor shall protect the fencing and shall be responsible for any damage incurred to the fences requiring replacement or reinstallation.
- D. Approval by the University's Representative for Work within the tree protection zone shall not waive the Contractor's responsibility for complying with the requirements of this Section.
- E. During the course of construction of approved Work within the tree protection zone, no roots larger than 2 inches in diameter shall be cut without prior written approval by the University's Representative.
- F. Do not permit the following within the tree protection zone of an existing tree, except as specified in this Section:
  - 1. Storage or parking automobiles or other vehicles.
  - 2. Stockpiling of building material, refuse, or excavated materials.
  - 3. Skinning or bruising of bark.
  - 4. Use of trees as support posts, power poles, or signposts; anchorage for ropes, guy wires, or power lines; or other similar functions.
  - 5. Dumping of poisonous materials on or around trees and roots. Such materials include but are not limited to paint, petroleum products, contaminated water, or other deleterious materials.
  - 6. Cutting of tree roots by utility trenching, foundation digging, placement of curbs and trenches, and other miscellaneous excavation without prior written approval by the University's Representative.
  - 7. Damage to trunk, limbs, or foliage caused by maneuvering vehicles or stacking material or equipment too close to the tree.
  - 8. Compaction of the root area by movement of trucks or grading machines, storage of equipment, gravel, earth fill, or construction supplies, etc.

9. Excessive water or heat from equipment, utility line construction, under or near shrubs or trees.
10. Damage to root system from flooding, erosion, and excessive wetting and drying resulting from dewatering and other operations.
11. Do not use herbicide within the area of the tree protection zone without prior written approval from the University's Representative. The application of herbicides anywhere on the Project site to which can be attributed the decline or death of existing trees shall constitute negligence on the part of the Contractor. Contractor shall be liable for damages.
12. During construction the existing site surface drainage patterns shall not be altered within the area of the tree protection zone, except as shown on the Drawings.
13. Contractor shall not alter the existing water table within the area of the tree protection zone.
14. Grading is to be avoided within the tree protection zone unless absolutely necessary. Grading techniques and mitigation procedures are to be specified by the University's Representative.

G. Excavation Around Trees:

1. Excavation within tree protection zone of trees shall be done only where absolutely necessary and by, or at the direction and with approval from the University's Representative.
2. Where utilities are to be installed within tree protection zones, boring shall be used. Contractor also has the option of tunneling under and around roots by hand digging or vacuuming. Main lateral roots, and taproots shall not be cut. Smaller roots that interfere with installation of new Work may be cut.
3. Where excavation for new construction is required within tree protection zone of trees, hand excavation, vacuuming and tunneling shall be employed to minimize damage to root systems. If large, main lateral roots are encountered, they shall be exposed beyond excavation limits. 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. Obtain approval from the University's Representative before cutting.
4. Tree roots shall be cut with a mechanical root-cutter rather than typical trenching to minimize root wrenching.
5. 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 4 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 so roots stay moist. This should be done at least daily during most seasons, but may be required more frequent watering during the summer months. Excavations shall be closed within 24 hours; and, where this is not possible, the side of the excavation adjacent to the tree shall be kept shaded with burlap or canvas. No excavation shall occur within 10 feet of the trunk of any tree. Excavations within 20 feet of any tree shall be limited to that which is absolutely necessary for building construction under the supervision of the University's Representative.

H. Backfilling in tree protection zone:

1. Approved excavations shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall conform to adjacent grades without dips, sunken areas, humps, or other surface irregularities. Jet backfill when trench has been backfilled to half its depth and again when fully backfilled, making certain no air pockets exist around roots.
2. Do not use mechanical equipment to compact backfill. There shall be no air tamping used to avoid compaction of tree root systems. Tamp carefully using hand tools, refilling and retamping until Final Acceptance as necessary to offset settlement.

1.6 TRIMMING OF TREES

- A. In company with the University's Representative ascertain the limbs and roots, which are to be trimmed, and clearly mark them to designate the approved point of cutting.
- B. Cutting and pruning of trees as required to accommodate construction shall be done only with the specific permission and direction of the University's Representative.
- C. A Consulting Arborist, certified by the International Society of Arboriculture (ISA), may be engaged to direct removal of branches from trees and large shrubs that are to remain if required to clear for new construction.
- D. Dead and damaged trees that are determined by the University's Representative to be incapable of restoration to normal growth pattern shall be removed at no additional cost to the University.
- E. Pruning operations shall be extended to restore the natural shape of entire tree where directed by the University's Representative and as noted on the Drawings.
- F. Cut evenly, using proper tools and skilled workers, to achieve neat severance with the least possible damage to the tree. Follow ISA Pruning Guidelines.
- G. Branching structure shall be thinned in accordance with NAA "Pruning Standards and Practices" to balance structural or weight balance problems in the crown of the tree that might lead to further damage. Thinning shall not exceed 30 percent of existing branching structure.

1.7 MAINTENANCE DURING CONSTRUCTION

- A. Maintenance includes, but is not limited to mitigation of damage due to storm drainage, or any condition, which requires immediate attention, and proper placement & maintenance of Tree Protection Fencing. Unauthorized moving of fencing may subject the Contractor to charges.
- B. Contractor shall perform periodic inspections of existing trees to be preserved and submit written reports to the University's Representative outlining additional maintenance Work as may be required to ensure the health and general well being of the plant material. The Contractor shall retain, at the direction of the University's Representative, additional specialists as may be required to perform this Work.
- C. Irrigation: During construction, the existing trees to be preserved shall be given water to saturate the top 3 to 4 feet of the soil within the tree protection zone and 2 to 3 feet extending from the tree protection zone, as demonstrated by the soil probe, by the Contractor after coordination with the University's Representative. Quantities and lengths of watering time are variable and shall depend upon seasonal rainfall. Irrigation recommendations from the University's Representative shall be followed.
- D. All necessary measures shall be taken to maintain healthy living conditions for existing trees to be preserved. Such measures shall include but not be limited to periodic washing of leaves for the removal of dust, irrigation, etc.

1.8 REPAIR AND COMPENSATION

- A. Any injury to existing tree trunks, limbs or roots over 2 inches in diameter shall be immediately reported in writing to the University's Representative and, at the direction of the University's Representative, repaired immediately at the Contractor's expense and approved by the University's Representative.
- B. The University's Representative shall direct repair of trees injured by construction operations. Repairs shall be made promptly after injury occurs to prevent progressive deterioration of damaged trees.
- C. Any tree to remain which is injured or destroyed owing to the Contractor's failure to provide adequate protection shall be compensated for in accordance with the following schedule of values using "tree caliper" method (greatest trunk diameter, measured 30 inches above ground):

1. For trees and shrubs with diameters up to and including 4 inches, compensation shall be the actual cost of replacement with item similar in species, size, and shape, including:
  - a. Actual cost of item boxed out of ground.
  - b. Transportation and delivery of boxed item to Project site.
  - c. Planting and staking.
  - d. Maintenance, including watering, fertilizing, pruning, pest control, and other care for a period of 90 days.
2. For trunks up to:
  - a. Twelve inches - \$7,200
  - b. Thirteen inches - \$8,200
  - c. Fourteen inches - \$9,200
  - d. Fifteen inches - \$10,000
  - e. Sixteen inches - \$11,500
  - f. Seventeen inches - \$12,000
  - g. Eighteen inches and over, add for each caliper inch - \$1,200
  - h. For each mature (5 years or older) Tree - \$30,000
3. A penalty will be assessed for limb injury of \$200 per inch of limb diameter for any limb greater than 2 inches in diameter, measured where the limb should be pruned in order to make a proper thinning cut.
4. 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 the Contractor is responsible for damage to a 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.

D. Damaged tree limbs or trees that have died as a result of injury during construction shall remain the property of the University and shall remain or be removed by the Contractor as directed by the University.

#### 1.9 SHRUB, GROUNDCOVER AND TURF PROTECTION

A. Keep damage to shrubs, groundcover, turf and other plant materials to a minimum and restore to original condition. Turf shall be restored with sod lawn unless otherwise approved by the University's Representative.

#### 1.10 WARRANTY OF REPLACEMENT PLANT MATERIAL

A. Contractor shall warrant that all plants covered by the provisions of this Section will be healthy and in flourishing condition of active growth 1 year from the date of Final Acceptance.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 56 39