

SECTION 02236

TREE AND PLANT PROTECTION, PRUNING AND REMOVAL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Tree and shrub protection fencing.
2. Boxing of tree trunks.
3. Root pruning.
4. Crown pruning.
5. Tree removals.
6. Restoration.
7. All other tree and plant protection indicated.

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 02200 – Earthwork
- C. Section 02900 – Restoration and Landscaping

1.03 CODES AND STANDARDS

A. The following standards in effect at bid shall apply to the work of this Section.

1. ANSI Z133.1 - Safety Requirements for Pruning, Trimming, Repairing, Maintaining and Removing Trees, and for Cutting Brush
2. National Arborist Association, 3537 Stratford Rd., Wantagh, NY 11793 (NAA): Ref. 1 Pruning Standards for Shade Trees
3. International Society of Arboriculture, Savoy, IL 61874 (ISA): Guide for Plant Appraisal

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01300:

1. Tree and Shrub Protection and Pruning Plan as specified in Paragraph 1.04.C and as follows including all methods, materials, and the schedule for tree and plant protection, pruning and fertilization within 60 days after NTP.
 - a. Findings from the Certified Arborist on-site evaluation of the existing trees prior to the commencement of Work.
 - b. Review the proposed construction plans and use the information to inform the Tree and Shrub Protection and Pruning Plan.
 - c. Proposed methods, materials, and schedule for root pruning and tree fertilization, where these methods are required.
 - d. Proposed crown pruning methods, where these methods are required.
 - e. Proposed methods of providing water source and irrigation for trees.
2. Tree Removal Plan as specified in Paragraph 3.01 including identification of trees and shrubs to be removed, methods, materials and the schedule for tree removal within 60 days after NTP.
3. Within 30 days after NTP, evidence of qualifications of the Contractor's Certified Arborist as specified in Paragraph 1.05.A.
4. Within 30 days after NTP, proof of licensure by the Massachusetts Department of Food and Agriculture for all chemical and pesticide applicators to be used on the Project.
5. Within 30 days after NTP, Material Safety Data Sheets (MSDS) of all chemicals to be applied on the Project.
6. At least 30 days prior to ordering materials, provide samples, certifications, manufacturer's product data and certified test results for the following materials:
 - a. Fertilizer:
 - i. Product literature of planting fertilizer and certificates showing composition and analysis.
 - ii. Fertilization rates for fertilizer product based upon soil testing, analysis, and recommendations as described in this section.

- b. Mulch
- c. Dormant Oil Spray

B. Coordination with the Town of Needham.

1. Refer to the Town of Needham Conservation Commission guidelines and submit a plan, if required.
2. Notify and coordinate with the Town of Needham, Tree Warden, Edward Olsen, Public Works Division, 781-455-7550 ext. 316.
 - a. Notify the Town of Needham Tree Warden, a minimum of thirty (30) days prior to any tree or shrub removal.

C. Tree and Shrub Protection and Pruning Plan:

1. The Contractor's Certified Arborist shall develop a Tree and Shrub Protection and Pruning Plan to address the maintenance and protection of existing trees and shrubs from damage.
2. The Tree and Shrub Protection and Pruning Plan shall address:
 - a. Protection of those existing trees indicated to remain and any trees impacted by Contractor's selected means and methods. Indicate the type of protection for each tree adjacent to locations where excavation will occur.
 - b. Pruning or supporting of overhanging branches that interfere with the operation of equipment used to perform the Work including trees overhanging roadways, even if trees are along sidewalks or on private property.
 - c. Materials to be employed for tree and shrub protection as specified in Part 2 of this section.
 - d. Type of tree pruning to be used for each tree to be pruned.
 - e. Additional fertilization and watering of trees adjacent to excavations is required to maintain the health of the tree(s).
 - f. Mulching at trees and shrubs.

D. Site Inspections:

1. The Certified Arborist shall prepare and submit a monthly site visit report outlining the condition of the trees.

- a. The first report shall be a pre-construction report.
- b. The final report shall be a post-construction report following completion of Work on site.
- c. Each tree within 10 feet of the Limits of Disturbance shall be designated a unique identification number keyed to street location or other key feature (e.g., tree x-60 Charles Street) and the identification numbers indicated on a plan of each work area.
- d. Where any tree's condition has deteriorated from the previous month, the report shall recommend remedial actions (e.g., additional watering, fertilizing and the like) to restore the health of the tree.
- e. Where remedial measures cannot save a tree, the report shall make recommendations for removal and replacement of the tree.
- f. Include monthly photographs of trees adjacent to active construction sites (six (6) photos at each site).

1.05 QUALITY ASSURANCE

- A. Root pruning, fertilizing, spraying, and similar activities shall be undertaken only by the Certified Arborist and chemical applicators.
 1. Application of chemicals shall be performed by licensed chemical applicators.
 2. A Certified Arborist meeting the following qualifications shall evaluate the condition of existing trees, develop the Tree Protection and Pruning Plan, monitor the health of trees adjacent to the Work, make recommendations for the repair or replacement of trees that are damaged by construction, tree pruning and maintenance of trees planted.
 - a. The Certified Arborist shall:
 - i. Be a member of American Society of Consulting Arborists, ASCA.
 - ii. Have a four-year degree in Arboriculture.
 - iii. Have a minimum five (5) years of experience in projects involving tree protection, tree pruning (including tree climbing), and root pruning similar to that required under this contract during the last eight (8) consecutive years.
 - iv. Be certified by the Massachusetts Arborists Association.

- B. The Certified Arborist shall review ongoing construction activities to determine the impact to the trees.
- C. The Certified Arborist shall coordinate daily on the tree impacts from construction work. Contractor to provide information to the Authority daily regarding tree work.
- D. Selective Pruning methods shall conform to the applicable requirements of ANSI Z133.1.

1.06 QUALIFICATIONS (NOT USED)

1.07 DELIVERY, STORAGE, AND HANDLING (NOT USED)

1.08 PROJECT/SITE CONDITIONS (NOT USED)

1.09 DEFINITIONS (NOT USED)

1.10 TOLERANCE (NOT USED)

PART 2 PRODUCTS

2.01 TREE PROTECTION FENCING AND TRUNK PROTECTION

- A. Tree protection fencing shall be: 3/8-inch x 1-1/2-inch #1 grade spruce minimum 4-foot height snow fence secured to wood or steel posts with 8 gauge galvanized wire. Posts shall be minimum 6-foot height steel channel posts or 4-inch x 4-inch x 6-foot pressure treated wood posts to limit of canopy, placed at 6-foot to 8-foot intervals. Fence shall form an enclosure around trees and shrubs to be protected as indicated. Orange plastic fencing instead of wood slat or steel rebar for posts will not be permitted.
- B. Trunk protection shall include heavy duty burlap wrapping with 2-inch x 4-inch #1 grade natural pine or spruce boards spaced 6-inches apart secured with metal strapping laid vertically over burlap as indicated.

2.02 FERTILIZERS

- A. Fertilizer shall be a commercial product complying with the Massachusetts and United States fertilizer laws. Deliver to the site in the original unopened containers that shall bear the manufacturer's certificate of compliance covering analysis. Liquid fertilizer for subsurface hydraulic injection to correct soil nutrient deficiencies shall be a product meeting the requirements of ANSI A300 and as modified by this paragraph. Liquid fertilizer shall include a slow release form of nitrogen (50% of N to be water insoluble), phosphorus and potassium; shall be chloride free; shall have a low salt content; and shall have a wetting agent to aid with dispersion. Fertilizer shall contain required micro-nutrients established by soil test analysis.

2.03 BARK MULCH

- A. Mulch shall be high quality, double-ground, premium bark mulch of 70 percent hemlock bark with the balance spruce and pine bark.
- B. Mulch shall have been aged for six (6) months and not longer than two (2) years.
- C. Mulch shall be shredded to a uniform size, free of dirt, debris and foreign matter, with pieces no thicker than ¼ inch.
- D. Mulch shall be free of stringy material or chunks over three (3) inches long.

2.04 DORMANT OIL SPRAY

- A. Dormant oils spray shall be a dormant miscible spray: "Volck Oil", manufactured by Ortho; "Scalicide", manufactured by Southern Mill Creek; "Horticultural Superior Spray", manufactured by Rockland or equal.

2.05 INSECTICIDES

- A. Insecticides shall be approved for use under NAA Ref. 1.

PART 3 EXECUTION

3.01 IDENTIFICATION OF TREES AND SHRUBS TO BE REMOVED ("TREE REMOVAL PLAN")

- A. All trees and shrubs shall remain and shall be protected from damage, unless it is specifically indicated on the Contract Drawings to stake out trees or remove trees as necessary to perform the Work.
- B. Prior to start of Work on site, stake out, for verification by the Authority and the local tree warden(s), all areas where the Contract Drawings indicate the removal of trees and shrubs. Prepare a Tree Removal Plan showing the trees to be removed within the layout of the Work. Where individual trees are to be removed, mark trees in a manner that is visible from the nearest roadway. Field review trees to be removed with the Authority and the local tree warden(s). Under no circumstances shall the tree removal operation commence without the written notice to and approval of the Authority and the local tree warden(s).
- C. A preliminary tree survey is included in Appendix J of the Specifications.

3.02 PROTECTION OF EXISTING TREES AND SHRUBS

- A. Install protection as indicated on the Contract Drawings and approved Tree and Shrub Protection Pruning Plan.

- B. Individual trees shall be protected as indicated on the Contract Drawings and approved Tree and Shrub Protection and Pruning Plan. No spikes or nails are to be driven into trees.
- C. Tree and shrub protection at each site shall remain in place and be maintained in working condition until the work at that location is completed.
- D. Damage no plants to remain.
 - 1. No plants to be saved shall be used for crane stays, guys or other fastenings.
 - 2. Construction vehicles shall not be parked within the dripline.
 - 3. Construction materials shall not be stored beneath dripline of trees to be saved.
- E. Perform all Work in accordance with the Tree and Shrub Protection and Pruning Plan for all trees and shrubs to be saved.
- F. Where excavation cuts through tree roots, perform the following:
 - 1. Watering
 - 2. Regular fertilizing.
 - 3. Spraying for insect and fungus control.
 - 4. Pruning of all broken, dead, diseased or weak branches as specified in Paragraph 3.05.
 - 5. Removal and disposal of debris generated by maintenance activities.
- G. Where included in the Tree and Shrub Protection and Pruning Plan, water trees and other vegetation to remain within Limits of Disturbance during course of work on site.
- H. Repair or replace all damage caused by the Work to existing trees and shrubs not otherwise designated for removal as directed by and at no additional cost to the Authority.

3.03 MULCH FOR TREES

- A. Where mulching for trees is included in the Tree and Shrub Protection and Pruning Plan, spread 4-inches of mulch from the tree to the limit of mulching.

3.04 ROOT PRUNING

- A. After the installation of tree protection, perform root pruning on all trees identified in the Tree and Shrub Protection and Pruning Plan.

- B. Trees and plants designated to be saved shall be protected during pruning operations. Prevent scrapes and scars to trunks and branches.
- C. Certified Arborist shall monitor and protect the root systems during root pruning.
- D. Root pruning shall consist of a three-step operation:
 - 1. Mark the limit of excavation with wood stakes and trench to a depth of twelve (12) inches. Root pruning trenching shall occur at the limit of trench excavation line.
 - 2. Where roots are encountered which cannot be cut with the root pruning blades of the trenching machine, hand excavate the trench and hand prune the roots.
 - 3. If, in the course of the pipeline trench excavation, large roots are encountered immediately cut the large roots with a chain saw.
- E. Root pruning shall occur within the drip line of all trees.

3.05 CROWN PRUNING

- A. Certified Arborist shall prune top of tree to approximate percent of root zone area that has been disturbed no sooner than six (6) months after the roots are disturbed. A maximum of one-third of the total leaf surface of each branch may be removed.
- B. Crown pruning shall include a fertilization/insecticide program.
- C. Tree pruning shall be "Class I Fine Pruning", "Class II Medium Pruning", "Class III Coarse Pruning" or "Class IV Pruning, Drop Crotch Pruning" conforming to NAA Ref. 1 in locations as identified in the Tree and Shrub Protection and Pruning Plan and conform to the requirements of ANSI Z133.1.
 - 1. Climbing spurs, hooks or irons shall not be used.
 - 2. All dead, diseased, and decayed wood; weak branches; suckers; and all broken or bruised branches shall be removed to the full height of the tree. Main shoots of trees shall not be cut.
 - 3. All cuts shall be made as close as possible to the trunk or parent limb, without cutting into the branch collar or leaving a protruding stub. Bark at the edge of all pruning cuts shall remain attached.
 - 4. Treatment of cuts and wounds with wound dressing or paints is prohibited.
 - 5. Old injuries shall be inspected. Areas where they are not closing and where the callus growth is not completely established shall be bark traced if the bark appears loose or damaged. Such tracing shall not penetrate the xylem (sapwood), and

margins shall be kept rounded.

6. All cut limbs shall be removed from the crown upon completion of the pruning.
7. Immediately notify the Authority in writing of the presence of disease, pest infestations, weak crotches requiring bolting or cabling, structural weakness, and other issues that require action to protect the health of plant material or to public health and safety. Include recommendation for type and schedule of treatment.

3.06 FERTILIZATION AND INSECT SPRAYING

- A. Root pruned and crown pruned trees shall be treated with liquid fertilizer, dormant oil spray, and insecticide.
- B. Soluble fertilizer shall be mixed with water and applied in liquid form by liquid injection method.
 1. Injection points shall be spaced three (3) feet on center beneath the dripline of the tree. Place the first band of injections approximately 1/4 the distance from the trunk to the edge of the dripline. Successive bands shall be spaced 3 feet apart out to one (1) to three (3) feet beyond the edge of the dripline.
 2. Mixing and application rates shall be in accordance with the soil test report recommendations to an area under the dripline. Use three (3) foot by three (3) foot injection spacing.
 3. Fertilizing of all trees shall occur immediately after pruning and again prior to Substantial Completion.

3.07 PROTECTION OF TREE ROOTS

- A. Do not allow exposed tree roots to dry out. Cover with damp burlap until trench is backfilled and roots are covered with soil.
- B. Damaged tree roots shall be flush cut back to uninjured tissue. No jagged cuts will be permitted.

3.08 TREE AND SHRUB REMOVAL

- A. Where trees or shrubs are indicated to be removed, the trees or shrubs and their stumps or roots shall be removed completely without damage to other trees or shrubs, utility lines and poles, houses, garages, lawns, plantings, and pavement.
- B. Do not remove any trees or shrubs prior to construction work within the project area. Removal of trees or shrubs shall occur after coordination with the Town of Needham, DCR, the Tree and Shrub Protection and Pruning Plan, establishment of the construction

zone, and the Authority.

- C. Dispose and eliminate all associated vegetation materials, above and below ground including but not limited to leaves, branches, trunk, roots, and the stump, and restoration of the area.

3.09 RESTORATION

- A. Tree protection material, excavated soil, pruned vegetation, irrigation system, tensiometers, debris and trash produced from tree and shrub protection work, deadwood, brush, tree trunks, branches, and stumps and vegetative debris shall be removed from the site and legally disposed of.

**** END OF SECTION ****