PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies minimum requirements for protection from damage as a result of the Contractor's operations and for maintenance of existing trees, shrubs, and other plant materials including lawn surfaces indicated to remain on the Project site.

B. The Contractor shall ensure all labor, equipment, and materials are provided for temporary tree, plant, and lawn protection during the work including, but not limited to:

1. Marking of clearing limits;
2. Protection signage and fencing;
3. Tree trunk boxing;
4. Tree and root pruning; and
5. Maintenance of trees and landscaping.

C. Definitions:

1. Landscape Requiring Protection and Maintenance: All existing on-site trees, plants, and lawn areas which are not identified for Contractor's lay down or parking use, including tree canopies and root zones extending within the Project site.

2. Critical Root Zone (CRZ): The area around a tree equal to one (1) foot radius for every inch of tree diameter measured at four (4) feet above grade.

3. Certified Arborist: An arborist certified by the International Society of Arboriculture (ISA).

4. Dripline: The dripline of a tree is the imaginary line on the ground beneath the tree's canopy.

1.2 SUBMITTALS

A. Tree and Landscape Protection Plan: Prior to any site disturbance, the Contractor shall submit for Owner's approval a "Tree and Landscape Protection Plan" developed in consultation with a certified arborist for all trees, plants, and lawn indicated to remain. The Contractor shall submit the name and credentials of the certified arborist with the plan.

1. The Tree and Landscape Protection Plan shall include:

a. Proposed protection fence locations;
b. The location of all on-site trees requiring protection
(For the Seattle campus, identify by UW tree inventory tag-number);
c. Identification of the CRZ for each tree requiring protection; and
d. Temporary irrigation and fertilization schedule.

1.3 CONTRACTOR RESPONSIBILITY

A. The Contractor shall assume all landscape shall be protected, unless indicated to be removed in the Contract Documents, and shall be responsible for all damage and/or disturbance within the CRZ of trees indicated to remain such as, cutting or skinning of roots, skinning or bruising of bark, compaction of root zones, and breaking of branches.

1. Damage and/or disturbance which, at the Owner's sole discretion, can be remedied by corrective maintenance shall be immediately repaired by the Contractor upon written notice by Owner.

    a. The Contractor shall employ a certified arborist to repair damage to trees.

2. Trees or shrubs which are injured or irreparably damaged shall, at the Owner's sole discretion, be replaced by the Contractor with new trees or shrubs of the same size and type. However, the Owner is not bound to have the trees or shrubs replaced in the same location and may request the Contractor provide the tree or shrub for installation by Owner.

    a. Trees which fail to fully foliate in the spring following Substantial Completion shall be presumed to have been injured or irreparably damaged due to construction.

3. If, in the Owner's sole opinion, replacement of damaged trees is determined impracticable, the full replacement cost shall be borne by the Contractor at values based upon the square inches of cross sectional area of trunk measured at four (4) ft. above grade, in accordance with the following criteria:

    a. $75.00/square inch for trees less than or equal to six (6) inch diameter

    b. $50.00/square inch for trees greater than six (6) inch and less than eighteen (18) inch diameter

    c. $40.00/square inch for trees greater than or equal to eighteen (18) inch diameter

B. Trees or shrubs which require removal and/or replacement due to damage by construction shall be removed to a depth of two (2) feet below grade and include the refilling and repair of the ground surface, with such costs to be borne by the Contractor.

C. Protection and maintenance shall include, but not be limited to, replacement of damaged protection fencing; aeration of compacted soils; control of temporary irrigation water runoff; pruning and treatment of damaged roots, limbs, and branches; and replacement of wood chips within tree protection areas.

D. Site damage and/or disturbance caused by the Contractor outside the Project site shall be repaired or replaced, and all costs shall be borne by the Contractor.

1. Repairs shall include, but are not limited to, pruning or removing damaged vegetation, replacement of damaged vegetation and/or lawn restoration, soil remediation to alleviate over-compaction, and temporary irrigation to establish new plantings.

PART 2 - PRODUCTS

2.1 PROTECTION FENCING

A. Protection fencing shall be six (6) feet high, 11 gauge-galvanized, 2-inch mesh chain link fencing with nominal 2 1/2 inch diameter galvanized steel posts, or approved equal.

1. The Contractor shall post weather-resistant 8 1/2" x 11" fluorescent green or yellow signage on protection fencing at twenty (20) foot intervals warning construction personnel to keep out of protective zones.

2.2 TREE TRUNK BOXING

A. Existing trees that are not protected with fencing and are to remain shall be protected by boxing constructed with 4 x 4 inch posts at corners with 2 x 4 inch horizontal top, middle, and bottom rails on each side. Box shall be approximately 8 x 8 feet in size centered on the tree trunk to a height of approximately six (6) feet.

2.3 WOOD CHIPS

A. Wood chips shall be composted for a minimum of one (1) year prior to use.

2.4 FERTILIZER

A. Fertilizer shall be Osmocote Plus 15-9-12, or approved equal.

PART 3 - EXECUTION

3.1 ON-SITE PRE-INSTALLATION MEETING

A. Prior to on-site mobilization, the Contractor shall arrange a pre-installation meeting with the Owner’s Representative to identify and stake out all areas of trees, plants, and lawn that are to be protected or removed. The Contractor shall be responsible for all damage to landscape features that results from the failure to schedule and attend the pre-installation meeting.

3.2 PROTECTION OF EXISTING TREES AND SHRUBS

A. Trees indicated to remain within the Project site shall have protection fencing located at the CRZ drip line that shall be maintained by the Contractor in good condition until Substantial Completion. Tree trunk boxing may be permitted by approval of owner.

B. When no ground cover, lawn or shrubs exist within the CRZ of a tree indicated for protection, the ground shall be protected with a minimum of twelve (12) inches of wood chips extending from a three (3) foot radius clear zone around each truck to the protection fencing.

C. All site work within the CRZ should be performed by hand. However, the use of heavy equipment to perform work within the CRZ may be requested by the Contractor for approval by the Owner. The Contractor shall perform approved heavy equipment work from angles and directions that minimize compaction to tree roots in the protection area.

D. The Contractor shall utilize a certified arborist to tie back all flexible limbs and overhead branches which may be damaged by the passage or activity of construction equipment.

E. Materials shall not be stored and equipment shall not be operated under the branches of existing trees which are to remain, except as approved by the Owner.

3.3 INSTALLATION OF TREE PROTECTION FENCING

A. Install posts a minimum of two (2) feet below grade and spaced ten (10) feet on center maximum. Provide diagonal bracing to posts at corners of enclosures and whenever needed to ensure rigidity of the fencing.

B. Install fencing tight to grade at the bottom edge and stretched uniformly between posts.

C. Provide one gate into each fenced area.

D. Take care not to damage roots or to compact soil inside the fence line during placement of posts. Do not use heavy equipment within the protection area for this operation.

3.4 USE OF AREA ADJACENT TO PROTECTION FENCING

A. Do not store materials potentially harmful to tree roots within twenty (20) feet of protection fencing. Potentially harmful materials include, but are not limited to, petroleum products, cement and concrete materials, cement additives, lime, paints and coatings, waterproofing products, concrete forms coatings, detergents, acids, and cleaning agents.

3.5 FERTILIZING AND IRRIGATING DURING CONSTRUCTION

A. All trees and landscape requiring protection shall be fertilized and watered by the Contractor until Substantial Completion, per the approved Tree and Landscape Protection Plan.

1. Water used for irrigation shall be potable water.

3.6 ROOT PRUNING

A. Root pruning is the intentional cutting of tree roots to minimize root damage and promote healing. (Any construction operation which pulls and/or tears roots is unacceptable.)

1. All root pruning shall be performed by a certified arborist.
2. For all roots smaller than one (1) inch diameter, use a sharpened spade.
3. For all roots greater than one inch (1) diameter, use an ax or chainsaw.
4. A backhoe bucket, or any other excavating machine, should not be used to root prune.

B. When construction is in close proximity to existing trees to remain, and roots are encountered, the roots shall be pruned.

1. Root pruning shall be performed as early as possible before trenching or tunneling operations.

a. Hand-dig trenches in areas with extensive roots.

2. Leave roots larger than two (2) inches in diameter intact and undamaged.

a. Keep roots moist with wet mulch and burlap or equivalent during exposure.

C. Backfill trenches that require root pruning with existing soil mixed with peat moss to a mixture of approximately 75% loam and 25% humus by volume. Tamp soil in six-inch lifts. Each lift shall be compacted to a point at which a foot print makes only a 1/16 inch impression.

D. Apply mulch to a depth of four (4) inches at a minimum ten- (10) to fifteen- (15) foot radius around tree to reduce compaction and increase moisture retention.

3.7 PRUNING OF EXISTING TREES

A. Limbs and branches broken by construction shall be cut off cleanly above the nearest crotch in accordance with good horticultural practice.

END OF SECTION