

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes requirements for:

1. Development of a Tree and Landscape Protection Plan to be submitted to and approved by the Resident Engineer for all Trees and Landscapes Requiring Protection. The Tree and Landscape Protection Plan shall include all associated tree and plant protection elements required to protect existing plants and shall be submitted for review and approval prior to the commencement of any construction activity.
2. Furnishing all labor, materials, equipment, supplies, and operations as required to install and to maintain tree and plant protection as indicated and as required by the approved Tree and Landscape Protection Plan.
3. Maintaining tree and landscape protection elements, including, but not limited to, fencing, wood chips, geotextile fabric, cabling, and signs.
4. Pruning, per the direction of the Project Arborist, to remove dead or damaged branches and to ensure clear sight lines for public safety and security.
5. Areas for Tree and Landscape Requiring Protection, as shown on Contract Drawings, include properties under the local authorities having jurisdiction (AHJ) and the Washington State Department of Transportation. Standards of each agency having jurisdiction must be met or exceeded.

1.02 REFERENCES

A. This Section incorporates by reference the following documents:

1. Council of Tree and Landscape Appraisers
 - a. Guide for Establishing Values of Trees and Other Plants, issued by the Council of Tree and Landscape Appraisers
2. International Society for Arboriculture (ISA)
 - a. ISA Tree Risk Assessment Manual, 2nd Edition
3. Washington State Department of Transportation (WSDOT)
 - a. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, Section 9-14.5(8)
 - b. WSDOT Roadside Policy Manual, Chapter 2
4. ANSI A300
 - a. PART 1 – Tree Pruning

- b. PART 2 – Tree Fertilization
- c. PART 3 – Tree Support Systems

1.03 DEFINITIONS

- A. Critical Root Zone (CRZ): An area surrounding the tree trunk which is equal to 1 foot radius for every 1 inch diameter of diameter of tree at breast height (DBH), measured from the center of the tree.
- B. Compliance Report: A report prepared by the Project Arborist documenting construction activities affecting Trees and Landscapes Requiring Protection, the status of protection elements, changes in the health of Trees and Landscapes Requiring Protection, measures taken to correct deficient conditions, and maintenance and watering activities.
- C. DBH: Diameter of a tree at breast height, as measured 4-1/2 feet above the root flare.
- D. Dripline: The area on the ground beneath the outer edge of the tree's canopy.
- E. Hazard Tree: A tree that, in the opinion of an ISA-qualified tree risk assessor, poses a threat to property or people due to mortality, a structural defect, or changed stand conditions and, as a result, may cause property or personal injury.
- F. Inner Critical Root Zone: An area surrounding the tree trunk which is equal to 1 half foot radius for every 1 inch diameter of diameter of tree at breast height (DBH), measured from the center of the tree.
- G. ISA: International Society of Arboriculture.
- H. Project Arborist: An International Society of Arboriculture (ISA) certified arborist of the Contractor or Subcontractor's team and approved by Sound Transit.
- I. Root Flare: The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- J. Significant Tree: Within WSDOT limits, is a Category 1 tree as defined by the WSDOT Roadside Policy Manual, Chapter 2. Within city limits, is as defined by the municipal codes for each city (see Appendix A).
- K. Supplemental Tree Inventory: The Supplemental Tree Inventory contains information on newly surveyed/assessed trees that were not included in the Tree Inventory. The Contractor shall submit the Supplemental Tree Inventory to the Resident Engineer prior to any construction activities. Tree identification numbers in the Supplemental Tree Inventory shall not duplicate identification numbers in the Tree Inventory
- L. Tree Inventory: Surveyed locations and arborist descriptions for all trees 4-inch DBH or greater that are within the project limits and may be impacted by construction activities. The Tree Inventory includes the location of each surveyed tree, its unique identification number, DBH, species (common name and botanical name), diameter of CRZ, and remarks relating to the health or condition of the tree as provided by a certified arborist. The Tree Inventory is provided to the Contractor by the Resident Engineer.
- M. Trees and Landscapes Requiring Protection: All existing trees, vegetation, and soil that supports their growth to remain and be protected as identified in the Contract Documents, including trees in critical areas (wetlands, streams, buffers) and areas of critical root zones of trees within the vicinity of the Project Site that may be affected by construction.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate temporary tree and landscape protection with property owners.

1.05 SUBMITTALS AND TRANSMITTALS

- A. Prior to construction activities, the Contractor shall submit a Tree and Landscape Protection Plan. This plan includes the following:
 - 1. Table of Contents
 - 2. Name, qualifications, and contact information of Project Arborist
 - 3. Supplemental Tree Survey as defined herein
 - 4. Plan sheets showing locations of Trees and Landscapes Requiring Protection and protection fencing locations. If protection fencing locations must change to accommodate other Work, include a phasing plan showing how trees will be protected during all work phases.
 - 5. On-site confirmation by the Project Arborist of the CRZ for all Trees Requiring Protection
 - 6. Description of work activities within the CRZ of Trees and Landscapes Requiring Protection
 - 7. Recommendations from the Project Arborist to include the following:
 - a. Techniques for protecting Trees and Landscapes Requiring Protection. Techniques shall include but are not limited to adjusting protection fencing, protecting roots with geotextile fabric and a thick layer of wood chips (minimum 6-inch depth), installing plywood boxes around tree trunks, pruning or tying back tree branches, and cabling trees. Include plan sheets that show where these techniques will be used relative to work activities.
 - b. List and schedule of all maintenance practices to ensure the continued health of all Trees and Landscapes Requiring Protection. Maintenance practices may include but are not limited to watering, mulching, fertilizing, cabling, and pruning as needed throughout the life of the Contract.
 - c. Product data and samples for all materials used to protect and maintain Trees and Landscapes Requiring Protection. Materials may include but are not limited to fencing, wood chips, geotextile fabric, plywood, steel plates, cables, compost, mycorrhizae fungal inoculant, or slow-release fertilizer.
 - d. Identification of hazard trees to be removed prior to or during construction.
 - 8. Authorities Having Jurisdiction (AHJ) requirements (see Appendix A)
- B. Transmit Product Data for:
 - 1. Protection fencing
 - 2. Tree support systems
 - 3. Root protection materials

- 4. Trunk protection materials
- C. Transmit Sample:
 - 1. Landscape protection signage: One (1)
- D. Transmit Reports:
 - 1. Compliance Reports
 - 2. Laboratory Reports

1.06 PROJECT CONDITIONS

- A. The Resident Engineer may order the Work stopped if tree and landscape protection elements are not installed prior to site work, if unauthorized use of protected area is occurring, or if protection fencing is not restored within 24 hours of notice to do so.
- B. Tree Identification: In all correspondence regarding Trees and Landscapes Requiring Protection, refer to the location and specific tree number in the Tree Inventory or Supplemental Tree Inventory.

1.07 WARRANTY

- A. Warranty for plants installed as replacements for damaged Trees and Landscapes Requiring Protection shall be in accordance with planting requirements as stated elsewhere in the Contract.

1.08 PROJECT ARBORIST QUALIFICATIONS AND RESPONSIBILITIES

- A. Qualifications of Project Arborist.
 - 1. International Society for Arboriculture Certified Arborist in good standing
 - 2. International Society for Arboriculture Certified Tree Risk Assessor in good standing
 - 3. Minimum 5 years of experience in the field
- B. Conduct a site visit to confirm the CRZ and condition of all trees requiring protection and prepare confirmation documentation.
 - 1. Review Contract Documents and periphery of Site for any additional landscape or trees whose critical root zones may be affected by construction and therefore need to be protected.
 - 2. Identify Hazard Trees and transmit completed risk assessment form to Resident Engineer for any trees requiring removal prior to construction activities or additional monitoring for the duration of the Contract. Risk assessment form shall be the Basic (Level 2) Risk Assessment Form in accordance with Tree Risk Assessment, Second Edition, published by the ISA.
- C. Provide recommendations for protecting trees or landscape requiring protection in the Tree and Landscape Protection Plan described herein.
- D. Conduct site visits and prepare a Compliance Report of observations and recommendations for each site visit.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Protection Fencing:
 - 1. In accordance with the jurisdictional standards for each site.
 - 2. If no standards exist, use High Visibility Fencing per WSDOT Standard Specifications Section 9-14.5(8).
- B. Protection Signage:
 - 1. In accordance with the jurisdictional standards of the property owner for each site.
 - 2. If no standards exist, provide weather-resistant, fluorescent green or yellow signs with minimum 3-inch high letters stating the following:
 - a. Tree / Vegetation Protection Area: Do not enter this area without direct approval of Resident Engineer. Do not park or store materials within the Protection Area.
- C. Tree Support Systems: Meet landscape industry standards for tree support, ANSI A300.
- D. Water: Potable water supplied by the Contractor.
- E. Wood Chips: Chipped wood mulch or hog fuel or approved equal to meet jurisdictional requirements. Submit mulch to laboratory to be checked for undesirable pathogens. Transmit laboratory report.
- F. Planting fill for areas within CRZ: Planting Soil in accordance with soil preparation requirements as stated elsewhere in the Contract Documents.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Prior to any construction activity:
 - 1. Have an approved Tree and Landscape Protection Plan which meets or exceeds the standards of the jurisdiction of the property owner.
 - 2. Install protection fencing.
 - 3. Post protection signage on protection fencing as specified herein.
 - 4. Install other tree, trunk, soil and root protection measures as described in the approved Tree and Landscape Protection Plan.
 - 5. Transmit a Compliance Report to the Resident Engineer documenting that the Project Arborist has visited the work area and, in the opinion of the Project Arborist, the protection fencing and other tree and root protection measures have been properly installed.
- B. Notification:
 - 1. Notify the Resident Engineer 48 hours prior to all work to be performed within the CRZ of any Trees and Landscapes Requiring Protection.

C. For Local Authorities Having Jurisdiction Properties: See Appendix A.

3.02 INSTALLATION

A. Protection Fencing:

1. Install protection fencing per jurisdictional requirements and as indicated in the approved Tree and Landscape Protection Plan.
2. Do not compact soil or use heavy equipment in the CRZ when installing protective fencing.

B. Protection signage:

1. Affix one (1) protection sign to the protection fencing around each area of Tree or Landscape Requiring Protection.
2. For trees outside the protection fencing, affix one (1) protection sign to each Tree Requiring Protection using a method accepted by the Project Arborist

C. Root Protection:

1. Where the CRZ of a Tree Requiring Protection falls outside the protection fencing, install additional materials to protect roots and prevent soil compaction within the CRZ as shown in the approved Tree and Landscape Protection Plan.
2. Include root protection where the CRZ of trees on adjacent properties extend into the work zone.

D. Trunk Protection:

1. For Trees Requiring Protection that are outside the protection fencing, protect tree trunks as shown in the approved Tree and Landscape Protection Plan.

3.03 CONSTRUCTION

A. Project Arborist to:

1. Monitor any work within CRZ of all Trees and Landscapes Requiring Protection including all excavation, demolition, and all resurfacing of sidewalks and road beds, including excavation requirements as shown in the clearing and grubbing requirements elsewhere in the Contract Documents.
2. Monitor and be on site at time of removal of existing hardscape within CRZs to avoid root damage. As hardscape is removed, identify existing subgrade and assist in establishing final grade or new pavement subgrade by providing direction for root protection. Where new pavement is planned, direct the cutting of roots 6 inches clear of planned paving edge.
3. Monitor the maintenance of all Trees and Landscapes Requiring Protection to ensure trees and vegetation are in a healthy condition.
4. Immediately report any deficiencies or concerns to the Contractor.
5. Implement adjustments to Tree and Landscape Protection Plan as needed during the Work with the approval of the Resident Engineer.
6. Perform on-site review as needed during construction for activities that are adjacent to or affecting Trees and Landscapes Requiring Protection.

7. Transmit Compliance Reports of maintenance site visits and field inspections.

B. Contractor to:

1. Remove hazard trees identified by the Project Arborist and as specified in the Tree and Landscape Protection Plan.
2. Protect landscape in accordance with approved Tree and Landscape Protection Plan.
3. Carefully plan and execute operations to avoid damaging Trees and Landscapes Requiring Protection. Coordinate with Project Arborist and Resident Engineer in accordance with requirements specified herein.
4. Locate tree protection in accordance with the Contract Documents and approved Tree and Landscape Protection Plan.
5. Protect against cutting, breaking or skinning of roots, skinning or bruising of bark, compaction of root zones, and breaking of branches.
6. Perform all earthwork operations within the CRZ under the supervision of the Project Arborist. Work within the protection fencing shall be done by hand with access on foot only.
7. Within the CRZ, hand-excavate or use an air spade to prevent tears and breaks in root surfaces. Leave roots larger than 2 inches in diameter intact and undamaged. If roots greater than 2 inches in diameter must be removed, consult with Project Arborist prior to removal. Cut roots cleanly with a diamond blade when roots are exposed or disturbed by work activities.
8. At all times when roots are exposed, keep roots moist with moist soil or wet mulch and burlap, or approved equal.
9. Within the CRZ, install utilities deeper than 3 feet below existing grades using tunneling. For shallower utilities, trenching shall be allowed under the supervision of the Project Arborist. Trenching is not allowed within the Inner Critical Root Zone of any Tree Requiring Protection.
10. Perform heavy equipment work from locations, angles, and directions that minimize compaction to tree or shrub roots and soils.
11. Place any planting fill soil that is needed at the perimeter of the CRZ and spread inward toward the tree trunk by raking to meet existing soil grades within the CRZ.
12. Under the supervision of the Project Arborist, tie back flexible limbs and overhead branches which may, in the opinion of the Project Arborist or Resident Engineer, be damaged by the passage or activity of equipment. Anticipate limbs that may be in the way of necessary equipment to avoid limb damage and provide remedy before work occurs. Do not remove limbs without the prior written acceptance of the Resident Engineer.

C. Use of area within protection fencing and within CRZs of all Trees and Landscapes Requiring Protection:

1. Do not store materials potentially harmful to tree roots within 20 feet of the outer most limits of protected areas without proper surface preparation and authorization from the Resident Engineer. Potentially harmful materials include, but are not limited to: petroleum products, cement and concrete materials, cement additives, lime, paint coatings, waterproofing agents, form coatings, detergents, acids, and cleaning agents.

2. Control soil moisture within the protected areas. Prevent flooding of the soil, and protect root areas from leachate, cement, oil, fuel and lubricating oil, and all contaminants.
3. Notify the Resident Engineer 48 hours in advance of the need to move protection fencing.
4. Upon relocation of protection fencing, continue all other protection efforts and maintenance of Trees and Landscapes Requiring Protection in accordance with the approved Tree and Landscape Protection Plan.

D. For Local Authorities Having Jurisdiction Properties: See Appendix A.

3.04 MAINTENANCE

A. Protection Fencing

1. Maintain fence in good condition until removal. Immediately repair or replace damaged fencing, regardless of cause, including acts of vandalism and theft.
2. Protection fencing may be removed temporarily for specific construction operations only under review and acceptance of the Project Arborist and the Resident Engineer.

B. Root and Trunk Protection:

1. Maintain Root Protection and Trunk Protection in good condition until removal. Replenish materials as needed to ensure tree roots and trunks are protected for the duration of the Contract.

C. Trees and Landscapes Requiring Protection:

1. Perform all pruning, thinning or other maintenance under the direction of the Project Arborist and per ANSI A300. Prune to remove dead or damaged branches and to provide clear sight lines for public safety and security.
2. Maintain all Trees and Landscapes Requiring Protection in a healthy and flourishing condition until work is complete. Protection and maintenance responsibilities include, but are not limited to:
 - a. Pruning as necessary to remove dead or damaged limbs or to promote the health and stability of the tree.
 - b. Aerating compacted soils.
 - c. Controlling surface runoff.
 - d. Pruning and treating damaged roots.
 - e. Fertilizing trees or plants with slow-release fertilizer.
 - f. Inoculating trees or plants with mycorrhizae.
 - g. Watering trees or plants during the growing season.
3. Compliance Reports: Transmit to the Resident Engineer a compliance report for site visits during the maintenance phase.

3.05 REPAIR/RESTORATION OF DAMAGED LANDSCAPE

- A. Repair and restore damage to Trees and Landscapes Requiring Protection. Repairs may include removing and replacing damaged trees or plants, rehabilitating or replacing damaged, compacted or stripped soil, and installing temporary irrigation or repairing damaged irrigation as approved by the Resident Engineer.
- B. Damages for loss or injury to Trees or Landscape Requiring Protection include loss or injury as a result of vandalism or construction activities:
 - 1. In the event of damage or loss to any Tree or Landscape Requiring Protection due to failure to protect and maintain said tree, the Contractor shall pay Sound Transit as liquidated damages a sum equal to:
 - a. The value of each lost tree, as determined by the Project Arborist, based upon the current *Guide for Establishing Value of Trees and Other Plants*.
 - b. The cost to remove and dispose of the damaged or lost tree.
 - c. An additional \$1,500 per damaged or lost tree or plant in compensation for the efforts of Sound Transit in administering and overseeing the replacement.
 - 2. In the event of injuries to the crown, trunk, branches or root system of any Trees and Landscapes Requiring Protection that are the result of the Contract's failure to protect and maintain such tree, the Resident Engineer may elect to retain the tree and hold the Contractor liable for compensation.
 - 3. Completely remove and dispose of any plant requiring protection that is killed or irreparably damaged due to vandalism, natural acts, diseases, or failure to protect or maintain the plant. Remove and dispose of the plant, including the entire stump and roots to a depth of 2 feet below finish grade.
 - 4. At the Resident Engineer's direction, replace any tree or plant lost or, in the opinion of the Resident Engineer, irreparably damaged as a result of failure to protect or to adequately maintain. Trees which fail to fully foliate in the spring following completion of construction operations may be presumed to have been lost due to construction activities.
 - 5. All costs incurred in the protection, replacement, and repair of Trees and Landscapes Requiring Protection are at the Contractor's expense.
- C. Locate and install replacement trees and landscape in accordance with jurisdictional standards and as approved by the Resident Engineer. The Resident Engineer may require lost trees be replaced in areas other than in their original location.
- D. Pruning of Damaged Trees
 - 1. Sterilize equipment with alcohol prior and during trimming and pruning operation.
 - 2. Under the direction of the Project Arborist, cleanly cut off broken limbs and branches to the nearest crotch in accordance with good horticultural practice. Cut limbs and branches greater than 1/2 inch in diameter. Carry out all pruning of damaged trees to the approval of the Resident Engineer.
 - 3. If, in the opinion of the Resident Engineer, any trunks or major limbs 3 inches in diameter or over are damaged, they shall be repaired by a professional tree surgeon.

3.06 REMOVAL OF PROTECTION MEASURES

- A. Remove protection fencing, root protection, trunk protection, protection signage, and other protection measures utilized during construction only at Resident Engineer's direction. Removal of protection materials is subject to all requirements for Trees and Landscapes Requiring Protection being satisfied as stated in this Section and as stated in the Tree and Landscape Protection Plan prepared by the Project Arborist.

3.07 EXHIBITS

- A. Appendix A: Local Authorities Having Jurisdiction Requirements

END OF SECTION