



Division 325639

Tree and Plant Protection

DESIGN GUIDE

325639 - Tree and Plant Protection

PART 1 - GENERAL

1.1 Summary

- A. The scope of work includes all labor, materials, tools, equipment, facilities, transportation, and services necessary for, and incidental to performing all operations in connection with protection of existing trees and other plants as shown on the drawings and as specified herein.
 - 1. Provide preconstruction evaluations
 - 2. Provide tree and plant protection fencing.
 - 3. Provide protection of root zones and above ground trees and plants
 - 4. Provide pruning of existing trees and plants.
 - 5. Coordinate with the requirements of Section Planting Soil for modifications to the soil within the root zone of existing trees and plants.
 - 6. Provide all insect, weed, and disease control.
 - 7. Provide maintenance of existing trees and plants including irrigation during the construction period as recommended by the Owner's Representative or an ISA Certified Arborist.
 - 8. Remove tree protection fencing and other protection from around and under trees and plants.
 - 9. Clean up and disposal of all excess and surplus material.

1.2 Related Documents and References

- A. Related Documents:
 - 1. Drawings and general provisions of contract including general and supplementary conditions and Division I specifications apply to work of this



- section.
- a. Section - Earthwork
 - b. Section - Planting Soil
 - c. Section - Irrigation
 - d. Section - Plantings
 - e. Section - Turf Grasses
 - f. Section - Storm Drainage
 - g. Section - Sustainable Design Requirements
- B. References: This section incorporates the following documents, specifications, and standards.
1. ANSI A 300 (Part 1) – Standard Practices (*Pruning*), and recommendations by the International Society of Arboriculture’s Best Management Practices (*Pruning*), most current edition.
 2. ANSI A 300 (Part 2) – Standard Practices (*Soil Management*), and recommendations by the International Society of Arboriculture’s Best Management Practices (*Soil Management*), most current edition.
 3. ANSI A 300 (Part 5) – Standard Practices (*Management of Trees and Shrubs During Site Planning, Site Development, and Construction*), and recommendations by the International Society of Arboriculture’s Best Management Practices (*Managing Trees During Construction*), most current edition.
 4. ANSI A 300 (Part 8) – Standard Practices (*Root Management*), and recommendations by the International Society of Arboriculture’s Best Management Practices (*Root Management*), most current edition.
 5. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign Il, most current edition.

1.3 Definitions

- A. Owner’s Representative: The person appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner’s Representative may appoint other persons to review and approve any aspects of the work.
- B. Critical Root Zone (CRZ): The area equal to one (1) foot radius for every one (1) inch diameter of a tree at breast height (DBH).
- C. Diameter at Breast Height (DBH): Diameter of a tree, as measured 4 ½ feet above the root flare.
- D. Drip Line: The area on the ground beneath the outer edge of the trees canopy.
- E. Arborist: An International Society of Arboriculture (ISA) Certified Arborist.
- F. Tree and Plant Protection Zone (TPZ): Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and defined by a circle centered on the trunk with each tree with a radius equal to the



crown dripline unless otherwise indicated by the owner's representative.

G. Integrated Pest Management (IPM):

1. A pest control approach requiring regular monitoring to determine if, and when, treatments are needed. This approach employs physical, mechanical, cultural, biological, and educational tactics to keep weeds and pest numbers low enough to prevent unacceptable damage or annoyance.
2. Additional treatments, such as pesticide applications, are made only when and where monitoring has indicated that the pest will cause unacceptable economic, medical, or aesthetic damage. Treatments are not made according to a predetermined schedule. Treatments are chosen and timed to be most effective and least hazardous to non-target organisms and the general environment.

1.4 Quality Assurance

A. Contractor qualifications:

1. All pruning, branch tie back, tree removal, root pruning, and fertilizing required by this section shall be performed by or under the direct supervision of ISA Certified Arborist. Submit individual's qualifications for approval by the Owner's Representative.
2. All applications of pesticide or herbicide shall be performed by a person maintaining a current Washington State Pesticide Applicator's license to apply chemical pesticides. Submit copies of all required state licensing certificates including applicable chemical applicator licenses. Submit current labels of proposed herbicides.
 - a. Pesticide applications shall only be applied with the approval of the Owner's Representative if other methods of control stated in the IPM are unsuccessful.

1.5 Submittals

- A. TREE AND PLANT PROTECTION PLAN: Submit to Owner's Representative 30 days prior to commencement of any construction activity. Include the following:
1. Fence locations.
 2. Identification of all Trees, Shrubs, Ground Covers, and Turf grasses that are to be protected.
 3. Identification of all CRZ's requiring protection.
 4. Temporary Irrigation Plan: Include source of water, a reliable method of slow application, schedule of application including volume of irrigation water per week.
 5. Phasing plan and schedule for any anticipated work within the Tree and Plant



Protection Zone including proposed methods of operation and quality assurance.

6. All work within 50 feet of the CRZ
 7. Proposed tree and root avoidance techniques.
- B. PRODUCT DATA: Submit manufacturer product data and literature describing all products required by this section to the Owner's Representative for approval. Provide submittal 30 days before the start of any work at the site.
1. Tree and Plant Protection fencing.
 2. Wood Chips.
 3. Coir mat.
- C. SAMPLES:
1. Landscape Protection signage: One
 2. Wood Chips: One pound bag.
 3. Coir mat: One square foot
- D. QUALIFICATIONS SUBMITTAL: For each applicable person expected to work on the project, provide copies of the qualifications and experience of the Consulting arborist, proof of either the registered Consulting Arborist® (RCA) with American Society of Consulting Arborists or an ISA Board Certified Master Arborist and any required Herbicide/Pesticide license to the Owner's Representative, for review prior to the start of work.

1.6 Verification

- A. Before any work is performed the Contractor shall verify with the Owner's Representative on the dimensions and locations of all TPZ's. Permanent or temporary adjustments to the TPZ's may be made with the approval of both the Contractor and Owner's Representative.

1.7 Protection of Work, Property and Person

- A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor's actions.

1.8 Changes in the Work

- A. The Owner's Representative may order changes in the work, and the contract sum being adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.



- B. All changes in the work, notifications, and Contractor's request for information (RFI) shall conform to the contract general condition requirements.

1.9 Correction of Work

- A. The Contractor, at their own cost, shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest possible time that can be coordinated with other work and seasonal weather demands.

1.10 Observation of the Work

- A. The Owner's Representative may inspect the work at any time. They may remove samples of materials for conformity. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications shall be paid by the Contractor.

1.11 Project Conditions

- A. The Owner's Representative may order Work stopped if the Tree and Plant Protections Plan is not complete prior to site work, if unauthorized use of protected Zones are occurring, or if protection fencing is not restored within 24 hours of notice to do so.

1.12 Warranty

- A. For Warranty for replacement plants, refer to Section 329000 – Plantings.

PART 2 – PRODUCTS

2.1 Mulch

- A. Medium Bark or Hog Fuel: Supplied by MRM Landscape Supply, Ellensburg Washington.

2.2 Wood Chips

- A. Wood Chips from an arborist chipping operation with less than 20% by volume green leaves. Chips stockpiled from the tree removal process may be used if free from pests.



2.3 Water

- A. Potable irrigation water provided by the Contractor.

2.4 Coir Mat

- A. Geocoir 400 by Belton Industries, Koir Mat 400 by Nedia Enterprises, or approved equal.

2.5 Tree Protection Fencing

- A. CHAIN LINK FENCE: Materials include footings, posts, braces, and mesh to be used to form a 6 foot high enclosure.
 1. Footings: above ground precast concrete block footings of sufficient size to hold the fence erect.
 2. Posts: 2 ½ inch diameter galvanized steel pipe
 3. Mesh: 2 inch by 2 inch, 11 gauge galvanized steel chain link fabric.

2.6 Tree Protection Sign

- A. Contractor shall post weather resistant 48 inch by 48 inch, white colored background with black 2 inch high or larger letters block letters. The signs shall be attached to the tree protection in 2 locations at a minimum for each Tree and Pant Protection Zone. The sign shall read:
 1. "Tree and Plant Protection Zone- Keep Out. No Trespassing on the landscape or critical root zone of tree(s) without direct approval of Owner's Representative. Unauthorized activities or Work within the critical root zone of trees will result in a fine of \$1,500, or the appraised landscape value, whichever is greater."

2.7 Matting

- A. Matting for vehicle and work protection shall be heavy duty matting designed for vehicle loading over tree roots, Alturmat as manufactured by Alturmat, Inc. Franklin, PA 16323 or approved equal.

PART 3 – EXECUTION

3.1 Site Examination



- A. Examine the site, tree, plant and soil conditions. Notify the Owner's Representative in writing of any conditions that may impact the successful Tree and Plant Protections Plan that is the intent of this section.

3.2 Preparation

- A. Prior to any construction activity:
 - 1. Protect the Landscape in accordance with the Contract Drawings.
 - 2. Layout the limits of the Tree and Plant Protection Zone in accordance with Contract Drawings. Obtain the Owner's Representative's approval of the limits of the protection zone and the alignment of all fencing.
 - 3. Verify temporary irrigation is available.
- B. Root Pruning:
 - 1. Prior to any excavating into the existing soil grade within 25 feet of the limit of the Tree and Plant Protection Zone or trees to remain, root prune all existing trees to a depth of 24 inches below existing grade in alignments following the edges of the Tree and Plant Protection Zone or as directed by the Owner's Representative. Root pruning shall be in conformance with ANSI A 300 (Part 8) – Standard Practices (*Root Management*), latest edition.
 - 2. After completion of the cut, make clean cuts with a lopper, saw or pruner to remove all torn root ends on the tree side of the excavation, and backfill the trench immediately with existing soil, filling all voids.
 - 3. Root pruning shall be done by, or under the direction of an ISA Certified Arborist.

3.3 Installation

- A. Protection Fencing:
 - 1. Install fencing on above ground precast concrete block type footings in location as approved by Owner's Representative and Contractor.
 - 2. Do not compact soil or use heavy equipment within the TPZ when installing the protective fencing.
 - 3. Install chain link fabric tight to grade at the bottom edge and stretched uniformly between posts. Install top of fabric 6 feet above grade, minimum.
 - 4. Install fabric to form continuous fencing. Attach fabric to posts 12 inches on center with 11 gauge wire ties securely fastened, or with bolted ring clips, and to top rail not over 3 feet on center.
- B. Protection Signage:
 - 1. Affix one protection sign to the Protection Fence around each area of



Landscape

Requiring Protection.

- C. Installation of Matting, Wood Chips, or Mulch:
 - 1. Install Matting, Wood Chips and or Mulch in areas and depths shown on the plans and details or as directed by the Owner's representative. In general, it is the intent of this specification to provide the following levels of protection:
 - 2. All areas within the Tree and Plant Protection Zone provide 4 - 6 inches of Wood Chips or Mulch.
 - 3. Maintain a 12 inch radius clear of mulch at the trunk flair.
 - 4. Areas where traffic or operations are anticipated to be unavoidable, provide a temporary layer of Matting over 10 - 12 inches of Wood Chips or Mulch. This temporary layer shall be removed when operations within the Tree ad Plant Protection Zone are completed.
 - 5. The Owner's Representative shall approve the appropriate level of protection.
 - 6. Bulk materials such as soil, or aggregate shall never be stored within the Tree and Plant Protection Zone.

3.4 Maintenance

- A. Protection:
 - 1. Protect the Tree and Plant Protection Zone at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves and roots of all plants; and contamination of the soil, bark or leaves with construction materials, debris, silt, fuels, oils, and any chemicals substance. Notify the Owner's Representative of any spills, compaction or damage and take corrective action immediately using methods approved by the Owner's Representative. No materials shall be stored in the TPZ either permanently or temporarily. No equipment operation shall take place inside the TPZ without approval from the Owner's Representative and a mitigation plan in place prior to work. The Tree and Plant Protection Plan shall remain in place until all construction is complete.
- B. Watering:
 - 1. The Contractor shall be fully responsible to ensure that adequate water is provided to all plants to be preserved during the entire construction period. Adequate water is defined to be maintaining soil moisture above the permanent wilt point to a depth of 8 inches or greater.
 - 2. The Contractor shall adjust the automatic irrigation system, if available, and apply additional water, using hoses or water tanks as required.
 - 3. Periodically test the moisture content in the soil within the root zone to determine the water content.
 - a. Soil Moisture



- 1.) Volumetric soil moisture level, in all soils within the Tree and Plant Protection Zone shall be maintained above permanent wilt point to a depth of at least 8 inches. No soil work or other activity shall be permitted within the Tree and Plant Protection Zone when the volumetric soil moisture is above field capacity. The permanent wilt point and field capacity for each type of soil texture shall be defined as follows (numbers indicate percentage volumetric soil moisture).

Soil type	Permanent wilt point v/v	Field capacity v/v
Sand, Loamy sand, Sandy loam	5-8%	12-18%
Loam, Sandy clay, Sandy clay loam	14-25%	27-36%
Clay loam, Silt loam	11-22%	31-36%
Silty clay, Silty clay loam	22-27%	38-41%

- 2.) Volumetric soil moisture shall be measured with a digital, electric conductivity meter. The meter shall be the Digital Soil Moisture Meter, DSMM500 by General Specialty Tools and Instruments, or approved equivalent meter.
- 3.) The Contractor shall confirm the soil moisture levels with a moisture meter. If the moisture is too high, suspend operations until the soil moisture drains to below field capacity.

C. Weed removal:

- 1. During the construction period, control any plants that seed in and around the fenced Tree and Plant Protection Zone at least three times a year.
 - a. All plants that are not shown on the planting plan or on the Tree and Plant Protection Plan to remain shall be considered as weeds.
- 2. At the end of the construction period provide one final weeding of the Tree and Plant Protection Zone.

D. Insect and disease control:

- 1. Monitor all plants to remain for disease and insect infestations during the entire construction period. Provide all disease and insect control required to keep the plants in a healthy state using the principles of Integrated Plant Management (IPM). All pesticides shall be applied by a Licensed pesticide applicator in the state of Washington.

E. Pruning:

- 1. Within six months of the estimated date of substantial completion, prune all dead or hazardous branches larger than 2 inch in diameter from all trees to remain.



2. Implement all pruning recommendations provided by Owner's Representative or ISA Certified Arborist.
3. Prune any low, hanging branches and vines from existing trees and shrubs that overhang walks, streets and drives, or parking areas as follows:
 - a. Walks - within 8 feet vertically of the proposed walk elevation.
 - b. Streets and drives - within 14 feet vertically of the proposed driving surface elevation.
 - c. All pruning shall be done in accordance with ANSI A 300 (Part 1) – Standard Practices (*Pruning*), and recommendations by the International Society of Arboriculture's Best Management Practices (*Pruning*), most current edition.
4. Perform other pruning task as indicated on the drawings or requested by the Owner's Representative.
5. Where tree specific disease vectors require, sterilize all pruning tools between the work in individual trees.

3.5 Clean-Up

1. During tree and plant protection work, keep the site free of trash, pavements reasonably clean and work area in an orderly condition.
2. Once tree protection work is complete, wash all soil from pavements and other structures. Ensure that Mulch is confined to planting beds.
3. Make all repairs to grades, ruts, and damage to the work or other work at the site.
4. Remove and dispose of all excess Mulch, Wood Chips, packaging, and other material brought to the site by the Contractor.
5. At the end of the construction period or when requested by the Owner's Representative remove all fencing, Wood Chips or Mulch, Geogrids and Filter Fabric, trunk protection and or any other Tree and Plant Protection material.

3.6 Damage or Loss to Existing Plants to Remain

- A. Any trees or plants designated to remain, and which are damaged by the Contractor shall be replaced in kind by the Contractor at their own expense. Trees shall be replaced with a tree of the same or similar species and of equal size or 6 inch caliper whichever is less. Shrubs shall be replaced with a plant of the same or similar species and equal size or the largest size plants reasonably available whichever is less. The Owner's Representative shall approve the size and quality of the replacement plant.
 1. All trees and plants shall be installed per the requirements of Specification Section Planting.



- B. Plants that are damaged shall be considered as requiring replacement or appraisal in the event that the damage affects more than 20 % of the crown, 15% of the trunk circumference, or root protection area, or the tree is damaged in such a manner that the tree could develop into a potential hazard. Trees and shrubs to be replaced shall be removed by the Contractor at his own expense.
 - 1. The Owner's Representative may engage an independent arborist to assess any tree or plant that appears to have been damaged to determine their health or condition.
- C. Any tree that is determined to be dead, damaged or potentially hazardous by the Owner's Representative shall be immediately removed by the Contractor at no additional expense to the owner. Tree removal shall include all clean up of all wood parts and grinding of the stump to a depth sufficient to plant the replacement tree or plant, removal of all chips from the stump site and filling the resulting hole with topsoil.
- D. Any remedial work on damaged existing plants recommended by the Owner's Representative shall be completed by the Contractor at no cost to the owner. Remedial work shall include but is not limited to: soil compaction remediation and vertical mulching, pruning and or cabling, insect and disease control including injections, compensatory watering, additional mulching, and could include application tree growth regulators (TGR).

END OF SECTION