

**STATE PARK
PROJECT TITLE**

This section applies whenever trees or tree roots will be or may be impacted. This template is generic and must be edited for each project. Contact the Agency Forester or Natural Resource Program Manager if you have any questions.

SECTION 015639 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the administrative and procedural requirements for the protection of trees, shrubs, and plant material not designated for removal. Leave such trees, shrubs, and plant materials in place and protected from damage or injury during construction using full and adequate methods of protection and trimming of existing trees and other vegetation that interfere with, or are affected by, execution of the work, whether temporary or permanent construction, in order to preserve the aesthetic character of the park.

1.2 REFERENCES

A. Definitions

1. Arborist Qualifications: An arborist approved of by the Project Representative or certified by ISA and licensed in the jurisdiction where project is located.
2. Critical Root Zone (CRZ): The portion of the root system nearest the stem that is critical for the stability and vitality of the tree. The minimum CRZ is a circular area having a radius of 1.25 feet for each one inch of trunk diameter defined by measuring the trunk diameter at 4.5 feet above ground level. For example, a tree that has a diameter of 20" would have a CRZ with a radius of 25' from the base of the tree. This is a MINIMUM CRZ radius for healthy trees; the CRZ is usually beyond the dripline of the tree. If achievable, a ratio 2.5 feet radius for each 1 inch diameter is desirable.
3. Vegetation Protection Zone (VPZ): A defined area of any size within the project area where existing vegetation (trees, shrubs, or other plant material) is to be protected from construction impacts. The zone may be accomplished by physical barriers or other means (e.g., soil protection layers or treatments).
4. High Risk Tree: Any tree with a structural defect and/or disease that makes the tree highly prone to failure, and which has a target and may result in personal injury or property damage. A high risk tree is the same as an "Emergency Tree" as defined in WAC 352-28-010 (<http://apps.leg.wa.gov/wac/default.aspx?cite=352-28-010>).

B. Reference Standards

1. ANSI A300. Specifications for Tree, Shrub, and Other Woody Plant Management.
2. ANSI Z133-2012. Safety Requirements for Arboricultural Operations.
3. Council of Tree and Landscape Appraisers. (2000). *Guide for Plant Appraisal*, 9th ed. International Society of Arboriculture, Champaign, Illinois.

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1.3 SUBMITTALS **Specifier note: edited as needed for project.**

- A. Tree Removal and Pruning Schedule: Written schedule from arborist detailing scope and extent of tree removals and pruning of trees to remain that interfere with or are affected by construction.
- B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

1.4 QUALITY ASSURANCE

- A. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."
- B. Construction Management Standard: Comply with ANSI A300 (Part 5): Management of Trees and Shrubs During Site Planning, Site Development, and Construction
- C. Tree Planting: Comply with ANSI A300 (Part 6) Planting and Transplanting
- D. Tree Root Protection and Management: Comply with ANSI A300 (Part 8) - 2013 Root Management Standard

PART 2 - PRODUCTS

2.1 PLASTIC MESH FENCING WITH STEEL POSTS

- A. Continuous molded safety mesh 36 inches wide with clear openings no more than 1-1/2" x 2". Orange, 40 grams per square foot, high density polyethylene with U-V inhibitor suitable for above-grade use.
- B. Posts five foot steel heavy-duty "T" posts, 1-3/8" x 1-3/8" x 7/64" with steel anchor.
- C. Nylon zip straps having a minimum breaking strength of 150 lbs.

2.2 SOIL AND ROOT PROTECTION

- A. Mulch: Ground, shredded bark, or wood and bark chips, free from deleterious materials. Or new straw mulch, free from weeds, weed seeds, and foreign materials.
- B. Landscape fabric: American Excelsior Stablenka 140, Celanese Mirafi 140, Propex 45-45, or approved equivalent geotextile.
- C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

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- D. Ground staples: 9" x 9" wire staples sufficient for holding landscape fabric or filter fabric in place for required time period.
- E. Ground protection mats: Construction mats or timber mats, as a temporary road surface of sufficient weight rating for the equipment being operated in the work area.

2.3 TREE TRUNK PROTECTION

- A. Common wood 2" x 4" lumber, 8' long, without nails, other hardware, concrete residue, or other material that may be detrimental to plant health.
- B. Strapping sufficient to hold 2 x 4's in place.

PART 3 - PLANNING AND EXECUTION

3.1 PLANNING AND NOTIFICATION

- A. Where existing trees and other vegetation are in the area of work, or where existing trees outside the area of work have a CRZ extending into the area of work, employ methods to minimize adverse impact to the existing trees (including limbs, stems, and roots), understory vegetation and their root systems, and soils. Where VPZ are designated by the Project Representative and/or in project plans, observe protection measures set forth herein. Notify the Project Representative of any construction work within the CRZ of trees at least two (2) working days before the scheduled activity.

3.2 PREPARATION

- A. Prior to Construction: Erect tree and plant protection prior to beginning any site work.. Protect trees to remain against cutting, breaking, skinning, or compaction of roots; skinning or bruising of bark; breaking of branches and foliage. Review locations, fencing, and other markings of any VPZ and CRZ for trees within the construction area with the Project Representative.
- B. Tree Removal: Trees that are scheduled for removal as part of the project should be removed before construction to prevent hazards during construction.
- C. Material Storage: Do not store construction materials, debris, or excavated material inside critical root zones or vegetation protection zones.
- D. Vehicle and Foot Traffic: Designate access routes within construction area and limitations on equipment and vehicles. Designate parking on existing pavement or away from critical root zones of trees. Limit vehicle and foot traffic within CRZ to minimize soil compaction over root systems.

3.3 CRITICAL ROOT ZONE AND VEGETATION PROTECTION ZONE DESIGNATION

- A. Temporary Fencing: Install temporary fencing around CRZ and VPZ as indicated by Project Representative. Maintain temporary fence and remove when construction is complete.

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1. Line posts space at eight feet maximum. Set posts vertically to minimum 18" depth. Posts may be driven provided method of driving does not damage posts. Ensure that posts do not damage tree roots.
2. Secure plastic fencing to posts with nylon zip-straps, minimum three per post. Draw fence material tight and vertical.
3. With Project Representative's approval, sections of tree protection fencing may be removed temporarily to allow approved short-term construction activities. Stockpile removed fencing carefully for reinstallation. Reinstall fencing immediately when construction operations permit.

- B. Tree Trunk Protection: Where required tree trunks shall be protected by placing 2 x 4 lumber around the trunk, spaced so that strapping will not come in contact with the tree bark and lumber does not damage branches. Use strapping to hold lumber in place. Secure straps without nailing into or otherwise damaging tree bark.

3.4 SOIL COMPACTION, LOSS, AND DAMAGE WITHIN THE CRITICAL ROOT ZONE

- A. Protection against soil compaction within the CRZ may include but will not be limited to the following methods:

1. Application of a 6-inch thick layer of mulch (or wood chips salvaged from clearing and grubbing operations) within the CRZ. Replenish mulch as necessary to maintain a 6-inch depth. Do not place mulch within 6 inches of tree trunks. Where mulch is to be removed following project completion it should be underlaid with a porous geotextile.
2. Ground protection mats, such as: timber or steel planking, construction mats, 1/2" thick CDX grade plywood, or brush for protection of surface roots and vegetation from equipment.
3. Where equipment operating within the CRZ exceeds 12,000 lbs use a 6-inch layer of mulch overlaid with ground protection mats described above.

- B. Protection of soils against erosion and loss within the critical root zone of trees may require application of mulch, wood chips, or landscape fabric at the request of the Project Representative.

- C. Noxious Materials: Protect soils from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials; washout of concrete mixing vessels and tools or other products that change the acidity of soils; and ponding, eroding, or excessive wetting caused by dewatering operations.

3.5 TRENCHING, DIGGING, TUNNELING, AND GRADING WITHIN THE CRITICAL ROOT ZONE:

- A. Disturbance to soils and impacts to roots within the CRZ may require any of, and will not be limited to, the following methods, practices, and restrictions:

- B. Maintain existing grade within CRZ of trees unless otherwise directed.

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- C. Lowering grades (cutting): Where existing grade is above new finish grade shown around trees, carefully excavate within CRZ to new grade. Cleanly cut roots exposed by excavation approximately 3-inches below soil surface of new finish grade.
- D. Raising grades (filling): Where existing grade is raised within the CRZ to greater than 4 inches above existing grade these roots shall be considered damaged by smothering. Methods to increase air exchange of tree roots within these areas may be required. Examples of such methods may include and will not be limited to:
 - 1. Application of a 6 inch or thicker layer of large clean aggregate (2" by 4" or larger) covered with landscape fabric below fill material to maintain large pore space.
- E. Alternative excavation methods that minimize root damage may be required. These may include but are not limited to: hand digging, horizontal boring, use of an air excavation tool, or other methods as otherwise deemed necessary by the Project Representative.
- F. Only limited intrusions into tree CRZ zones will be allowed as shown on the plans and with the approval of the Project Representative. Where trenching for utilities or irrigation is required within CRZ's of trees the following may be required:
 - 1. No cutting of roots greater than two inches diameter. Tunnel under or around roots by drilling, auger boring, air excavation, or digging by hand.
 - 2. Where necessary for installation, cut roots with sharp pruning instruments flush with the edge of the trench or tunnel; do not break or chop.
 - 3. Avoid hitting roots with heavy equipment. Roots that are ripped by equipment should be excavated and cut cleanly at the closest point to the end of the damage.
 - 4. Pile excavated soil outside of the CRZ of residual trees and return area to original grade upon completion of work.
 - 5. Cover exposed roots with soil as soon as possible or at the end of each day; the soil compacted to the original firmness only; and, watered when conditions are dry.
 - 6. Tree root pruning or other tree root treatments as directed by the Project Representative.
 - 7. Root painting is not permitted.

3.6 **STEM AND BRANCH PRUNING:**

- A. Any unnecessary cutting, breaking, skinning, or bruising of bark; breaking of branches and foliage; damage or clearing of vegetation in the work area will not be permitted. Where permitted, stem and branch pruning must follow ANSI A300 (Part 1).
- B. Temporary tie-up of low limbs is permitted where designated by the project representative.
- C. All final pruning cuts shall be made in branch tissue close to the trunk or parent limb, without cutting into the branch bark ridge or collar and without leaving a stub. Flush cuts to the tree trunk that remove the branch collar are unacceptable. Flush cuts result in a larger wound and expose trunk tissues to the possibility of decay.
- D. All major tree pruning must have prior approval of Project Representative. An ISA certified arborist may be required, at the Contractors expense, for extensive or technically challenging pruning activities. Such requirements will be made explicit to the Contractor prior to the start of work.

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- E. Only proper branch pruning techniques will be accepted. Improperly pruned trees could be irreparably damaged and are subject to section 3.7 DAMAGE TO TREES AND TREE REPLACEMENT.

3.7 DAMAGE TO TREES AND TREE REPLACEMENT:

- A. Should any tree or vegetation designated to remain be damaged in the course of construction immediately notify the Project Representative for inspection and direction for remedy.
- B. Remedies for damage will, at the Owner's discretion, require removal and disposal of the damaged tree(s) and be one of the following, at the discretion of the Project Representative.
 - 1. Replace trees under 6" caliper measurement with new trees of 6" caliper measure, and the same species. Plant and maintain according to the requirements of ANSI A300 (Part 6) – Planting and Transplanting.
 - 2. Replace trees over 6" caliper measurement with new trees 6" caliper measure. The new trees may or may not be the same species, at the discretion of the Project Representative. Select nursery stock, plant, and maintain as specified in Section 1.4 QUALITY ASSURANCE. Compensate the Owner for the difference in value of the damaged tree and the replacement tree, calculated as the difference between the assessed values of the tree as calculated by an ISA certified arborist according to the latest edition of the *Guide for Plant Appraisal*.
 - 3. Compensate the Owner in cash or as a credit to the contract for the full value of the damaged tree, as appraised by an ISA certified arborist according to the latest edition of the *Guide for Plant Appraisal*.
- C. Notify Project Representative in any case where construction called for in the contract documents cannot be completed without damage to trees identified to remain. Approval of the Project Representative is required prior to beginning construction described in the contract documents that might damage a tree designated to remain. Any tree designated to remain which is damaged without Project Representative's written approval, even if damage is necessary to complete the work, will subject the Contractor to remedies described in section 3.7 B above.

END OF SECTION