

## 7.3 Tree and Natural Area Reservation

---



### Description

Tree and natural area preservation insures that important vegetated areas existing on-site prior to development will survive the construction process. Tree protection areas prevent the losses and damages to trees that are common as a result of construction. This practice is useful to protect individual trees, and areas of forest or natural vegetation in stream corridors, or open space.

### Conditions Where Practice Applies

This practice is applicable to any tree, forested or naturally vegetated area planned for long-term survival and subject to construction impacts. Existing trees provide valuable benefits during and after construction including: reduced erosion, reduced runoff rates and volume, reduced cooling costs, sound and visual barriers and higher property values.

### Planning Considerations

Preservation of important natural areas must begin before the location of buildings, roads and utilities is determined. Early site planning should include delineating forested areas and significant trees and creating an inventory of the existing trees on-site. These should influence the placement of roads, buildings, and parking areas in the same manner as topography, streams and wetlands.

***Tree Stand Delineation*** – Useful information for the delineation may include:

- Stands of trees to be preserved
- Individual trees of significance due to age, size, history, or aesthetic value

- Hazard trees to be removed
- Open areas
- Sensitive areas such as wetlands, riparian corridors, important wildlife habitat
- Other important natural or historic features.

**Tree Survey (Inventory)** – A tree inventory or survey provides more detailed information about tree resources. Key to this step is outlining, on the engineering plans, the root zone of trees that may be impacted during construction. A method to calculate the root zone is to allow one-foot of radius for each inch of trunk diameter at breast height. Alternatively drip line or outline of the furthest hanging branches can be used (see the figure). Information to include in the tree survey includes:

- All trees to be impacted by proposed construction and critical root zone
- Diameter of tree
- Species of tree
- Health of tree
- Notes on crown or root condition

Note regarding tree survival: A tree's root zone is critical to its ability to survive. Damaging the root zone during construction will lead to the tree's decline and ultimately its death within 1 to 10 years. Ninety-five percent of a tree's roots are in the upper 12-18 inches of soil, and the majority of the roots supplying nutrients are found just below the soil surface. The critical root zone extends at least to the drip zone of a tree and must be protected from soil compaction, grubbing, filling activities, and other disturbances.

## Design Criteria

**Site Plan** - With the tree survey data and high value natural areas clearly shown on a base map, site designers can plan the location of roads, utilities, and other improvements to minimize impacts. Regarding trees, the plan identifies tree preservation areas as well as those trees that will be severely impacted by development, and which may need to be removed.

The following should be shown on the erosion and sediment control plans and clearly marked on site:

- Limits of clearing and grubbing
- Natural preservation areas including the specimens (detail extent and type)
- Construction roads and stockpile areas outside of preservation areas
- Notes and drawings detailing measures to protect preservation areas during construction,
- Notes and drawings detailing protect preservation areas following construction,
- Areas for planting.

**Protection During Construction for Tree Preservation Areas** - Construction administration is the on-site protection and care of trees selected to remain. The following are necessary activities for adequate protection:

- **Prevent any filling, compaction, storage, or excavation within the tree protection zone.** Weight and traffic on a tree's root zone cause soil compaction. This reduces air and water movement to the tree's root system and is a major cause of tree decline.

- **Fence out construction traffic.** Tree protection areas must be made visible during construction. A physical barrier of a fence and signage must be in place prior to clearing and remain in place throughout construction.
- **Delineate parking, material storage, and cement washout areas to prevent inappropriate areas from being utilized.**
- **Supervise clearing activities to insure “save” areas are preserved.**

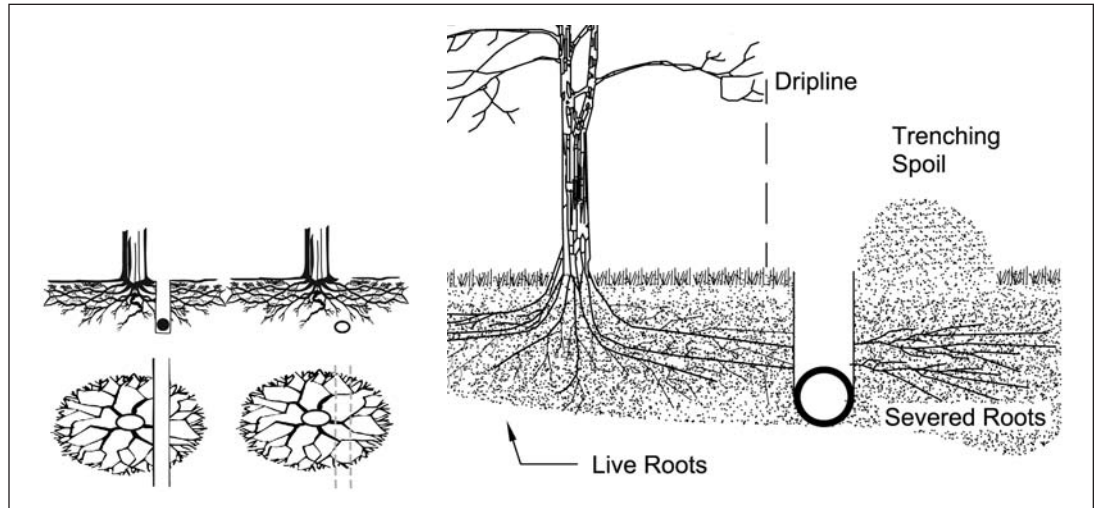


Figure 7.3.1 Inappropriate trenching (40% root loss) versus Tunneling (no significant root loss) and more appropriate trenching.

- **Supervise trenching, excavation and tunneling near trees to be saved.** Trenching near trees effectively cuts off large portions of a tree’s root system (see figure). Ideally trenching should stay beyond the drip zone of a tree. A better alternative is to tunnel beneath the root zone at a depth greater than 2 feet.
- **Care for damaged trees.** Cutting damaged root systems clean and removing damaged branches may aid slightly damaged trees.

*Provide a permanent visual barrier* - Protecting forest vegetation permanently requires visual barriers to encroachment. It is not enough to protect areas with conservation easements, deed restrictions or even separate ownership. Forested stream buffers, parks and valuable wood lots are often severely degraded by mowing, removal of the understory and ground cover plants, and dumping of yard waste. Permanent signs or fences should identify the area and describe allowable uses.

### Common Concerns

The following consequences can result from tree damage during construction activities:

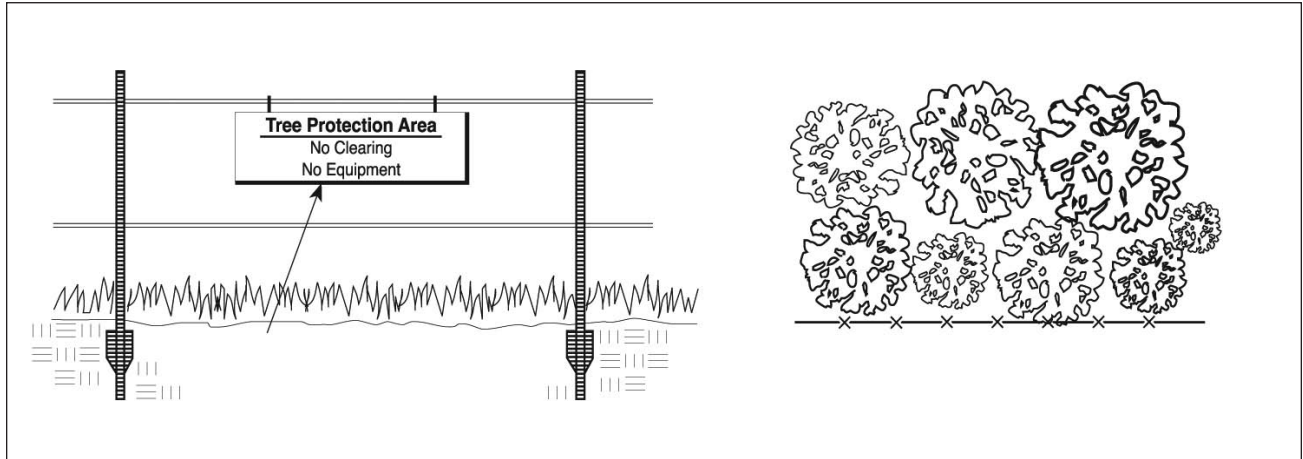
- Loss of individual or groups of trees
- Long term decline of tree health
- Increased personal property damage
- Reduced property values
- Increased cost of removal once the project is complete

**References:**

- Fairfax County Virginia Board of Supervisors. 1986. *Vegetation Preservation and Planting*. Fairfax County Board of Supervisors, Fairfax County, VA.
- Koehler, C. S., R. H. Hunt., D. F. Lobel, and J. Geiger. 1984. *Protecting Trees When Building on Forested Land*. University of California Cooperative Extension, Berkeley, CA 94720.
- Fazio, J. 1992. *Trenching and Tunneling Near Trees*. The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410.
- Miller, L. M., D. Rathke, and G. Johnson. 1993. *Protecting Trees from Construction Damage*. Minnesota Extension Service, 20 Coffey Hall, Saint Paul, MN 55108-6064.
- The National Arbor Day Foundation. *Tree City USA Bulletins. The National Arbor USA Bulletins*. The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410.
- Penn State University. A Guide to preserving trees in Development projects. The Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802. <http://pubs.cas.psu.edu/FreePubs/pdfs/uh122.pdf>
- International Society of Arboriculture. *Avoiding Tree Damage During Construction*. [http://www.treesaregood.com/treecare/avoiding\\_construction.asp](http://www.treesaregood.com/treecare/avoiding_construction.asp)

Specifications  
for  
**Tree and Natural Area Preservation**

---

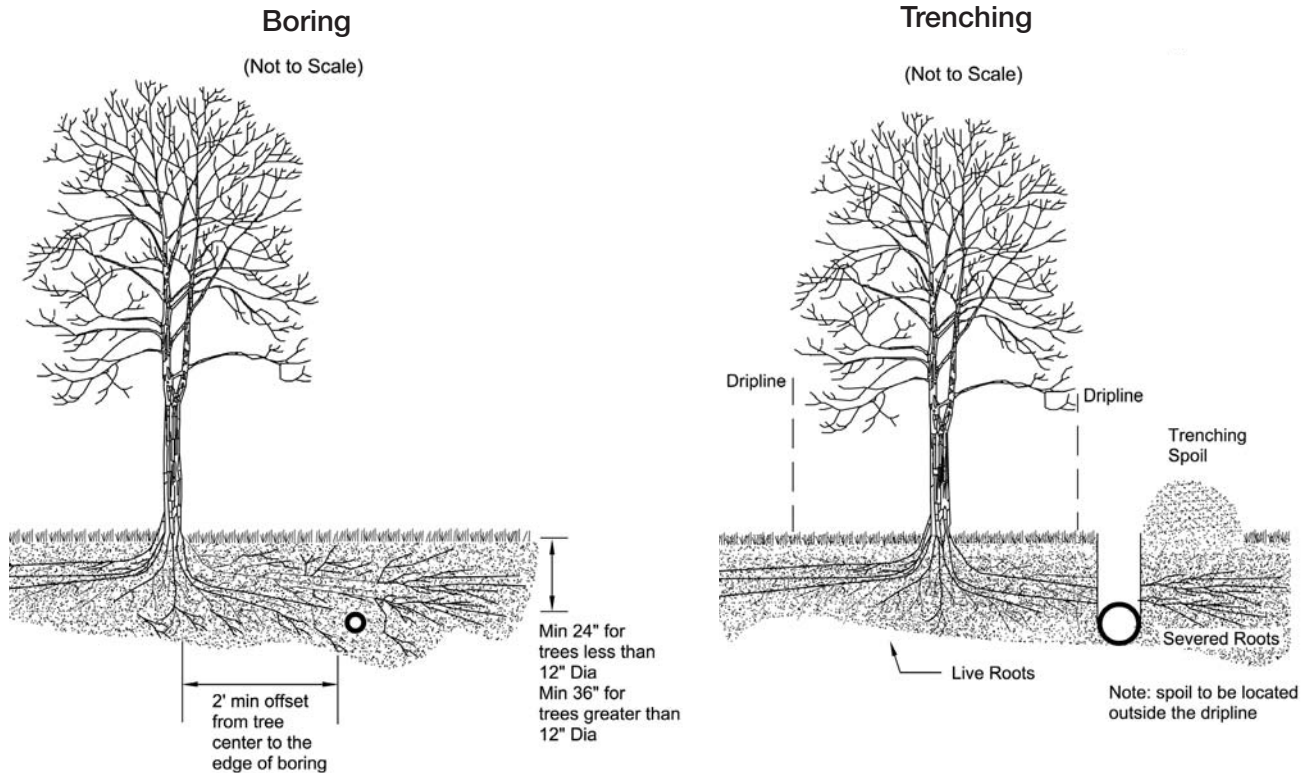


1. Tree and natural area preservation shall be fenced prior to beginning clearing operations.
2. Fence materials shall be metal fence posts with two strands of high tensile wire, plastic fence or snow fence.
3. Signage shall clearly identify the tree and natural preservation area and state that no clearing or equipment is allowed within it.
4. Fence shall be placed as shown on plans and beyond the drip line or canopy of trees to be protected.
5. If any clearing is done around specimen trees it shall be done by cutting at ground level with hand held tools and shall not be grubbed or pulled out. No clearing shall be done in buffer strips or other preserved forested areas.
6. No filling or stockpiling of materials shall occur within the tree protection area, including deposition of sediment.



Specifications  
for  
**Protection During Utility Installation**

---



1. Where utilities must run through a tree's dripline, tunneling should be used to minimize root damage. Tunneling should be performed at a minimum depth of 24 inches for trees less than 12 inches in diameter or at a minimum depth of 36 inches for larger diameter trees.
2. Where tunneling will be performed within the dripline of a tree, the tunnel should be placed a minimum of 2 feet away from the tree trunk to avoid taproots.
3. Minimize excavation or trenching within the dripline of the tree. Route trenches around the dripline of trees.
4. Roots two inches or larger that are severed by trenching should be sawn off neatly in order to encourage new growth and discourage decay.
5. Soil excavated during trenching shall be piled on the side away from the tree.
6. Roots shall be kept moist while trenches are open and refilled immediately after utilities are installed or repaired