1.7 Tree Protection Area



Description

Wounds to trunks and branches by equipment operating in proximity, trenching and soil compaction within the root zone, changes to the nearby soil drainage, grade, or chemistry, and inadvertent clearing can all destroy or severely damage trees on or next to a construction site. A tree protection area ensures that trees retained in the development plan are protected during construction. It may protect stream and wetland setbacks, stormwater management conservation areas, groundwater recharge zones, landscaping, or other conserved natural areas.

Planning and Feasibility

Existing trees are a capital asset. Consider an appraisal to quantify the financial value that retaining existing trees may add to the project. In addition to increasing property values, trees can provide tangible economic value through stormwater management, reduced energy costs, and sound and visual barriers.

Saving a grove of trees (including the understory and groundcover) rather than individual trees provides greater ecological value and improves the chances of survival.

Early site planning should include a survey of the trees on the site to influence the placement of roads, buildings, utilities, and parking areas in a similar manner as topography, streams, and wetlands do. The extent of the survey will depend on the specific project needs. A certified arborist or similarly qualified expert should conduct a tree survey that notes species, size, and health of each tree on site; recommends the trees to preserve; and delineates the critical root zone.

Critical Root Zone

The Critical Root Zone (CRZ) refers to the area surrounding the trunk containing the majority of the tree's roots that provide structural stability and absorb nutrients and water. The International Society of Arboriculture defines the CRZ as a 1-foot radius from the base of the tree's trunk for every inch of the tree's diameter at breast height (DBH), which is measured 4.5 feet above grade. For example, a tree with a 10-inch DBH would have a CRZ radius of 10 feet. A 1.5-foot radius per inch of DBH is recommended for important trees or sensitive species such as Oaks or Black Walnut.

Most tree roots in the CRZ lie within the top 12 to 18 inches of soil, making them highly susceptible to damage even where no excavation occurs.

Design Criteria

Establish a Tree Protection Area (TPA) around trees designated to be retained for any purpose. A certified arborist or similar expert should delineate the TPA to equal or exceed the CRZ. Where the TPA must encroach into the CRZ, no more than 25 percent of the CRZ should be disturbed. Where construction traffic must occur in the CRZ, install a 12-inch-thick layer of wood chips or use timber mats to prevent soil compaction.

Clearly mark the TPA in the project plans and consider including liquidated damages for encroachment in the contract documents.

Install a fence around the TPA before clearing and maintain it throughout construction. Install signs on the fence that identify the area as a TPA and that it is not to be disturbed.

Regularly water trees before and during construction to promote vigor when rainfall is not adequate (less than 1 inch per week).

When possible, remove nearby trees that will not be preserved within the TPA after leaves have fallen, when they are less vulnerable to damage and disease.

Supervising clearing activities and any construction activity that takes place near critical protected areas is strongly recommended.

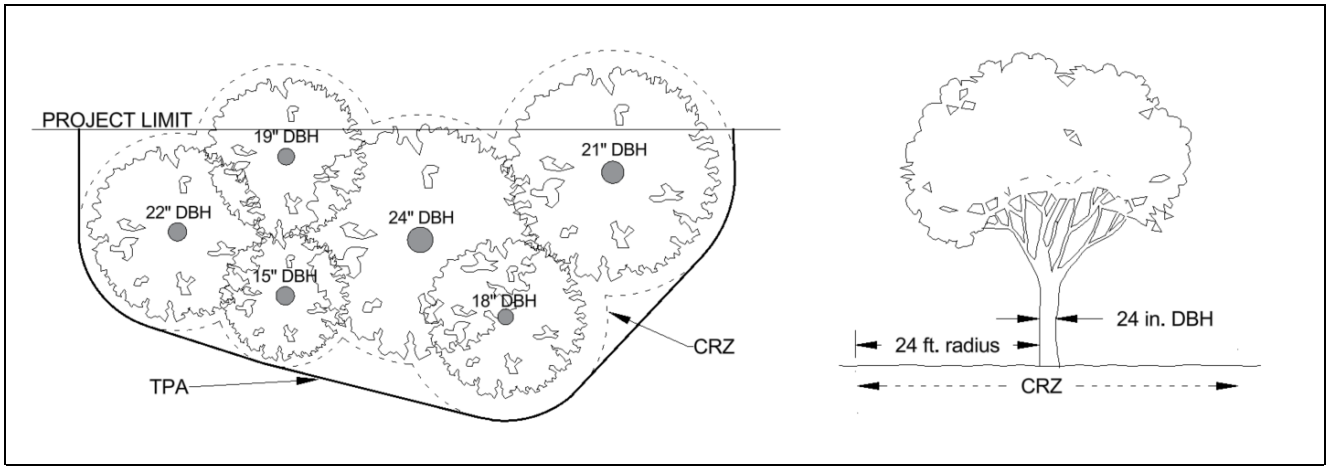

Figure 7.3.1 Illustration Critical Root Zone and Tree Protection Area

Utility Installation

Trenching buried utilities close to a tree can sever substantial portions of a tree's root system. Make every effort to locate buried utilities outside of the CRZ. If buried utilities must go through the CRZ, tunnel underneath the roots, or excavate a trench using an air spade. See Table 2.16.1 for recommended separation distances from the truck and depth for tunnels. Any roots two inches or larger that are severed should be sawn off neatly to encourage new growth and discourage decay.

Table 2.16.1 Tunnel Separation Distances (adapted from MNDOT, 2013)

Tree Diameter at DBH (inches)	Minimum Distance from Trunk (feet)	Minimum Depth of Tunnel (feet)
<9	6	2
9-14	10	3
14-19	12	3
>19	15	4

Stormwater Pollution Prevention Plan

The following should be shown on the Stormwater Pollution Prevention Plan (SWP3) and construction documents:

- the limits of clearing and grubbing,
- tree protection area boundaries (including the individual tree specimens), and
- notes and drawings detailing measures to protect the tree protection area.

Maintenance

Evaluate trees after construction for signs of stress. Signs of damage may not be visible for years after construction. Water, prune, fertilize, and apply pest controls as needed. Consulting a certified arborist is recommended.

Conservation easements, deed restrictions, or even separate ownership are often ineffective at preventing degradation to forested areas in urbanizing areas. Permanent signs or fences should identify the area and describe allowable uses.

References

International Society of Arboriculture. 2021. Avoiding Tree Damage During Construction.

Johnson, Gary. 1999. Protecting Trees from Construction Damage: A Homeowner's Guide. University of Minnesota Extension.

Minnesota. 2013. Specification 2572 Protection and restoration of Vegetation. Department of Transportation.

Texas A&M Forest Service. Best Management Practices for Tree Protection.

Practice Specification
Tree Protection Area

1. The tree protection area shown on the plans ensures that the roots of trees retained in the development plan are protected during construction.
2. Fence off tree protection areas as shown on plans prior to beginning clearing operations. Ensure the fence prevents traffic and the placement of equipment, materials, or any other construction in the Tree Protection Area except for tree maintenance activities as directed in the construction plans or approved by the engineer.
3. Tree Protection Area fence shall be a minimum of 4’ high, and a conspicuous color.
4. Place signs at 50-foot intervals that clearly state no clearing or equipment is allowed within the tree protection area.
5. Clearing done in proximity to the Tree Protection Area shall be done in a manner that does not damage trees or roots within the Tree Protection Area.
6. Where authorized work is done within the Tree Protection Area, roots shall be kept moist while trenches are open. Cleanly cut any damaged roots and immediately cover with topsoil. Water any damaged root-damaged trees to maintain adequate soil moisture. Trenches shall be refilled immediately after utilities are installed or repaired.