



Best Management Practices for Tree Protection

Purpose

Provide the basic Best Management Practices (BMPs) that can be implemented within any Texas community to initiate the protection and preservation of existing community trees and natural populations of forest and woodlands.

Benefits

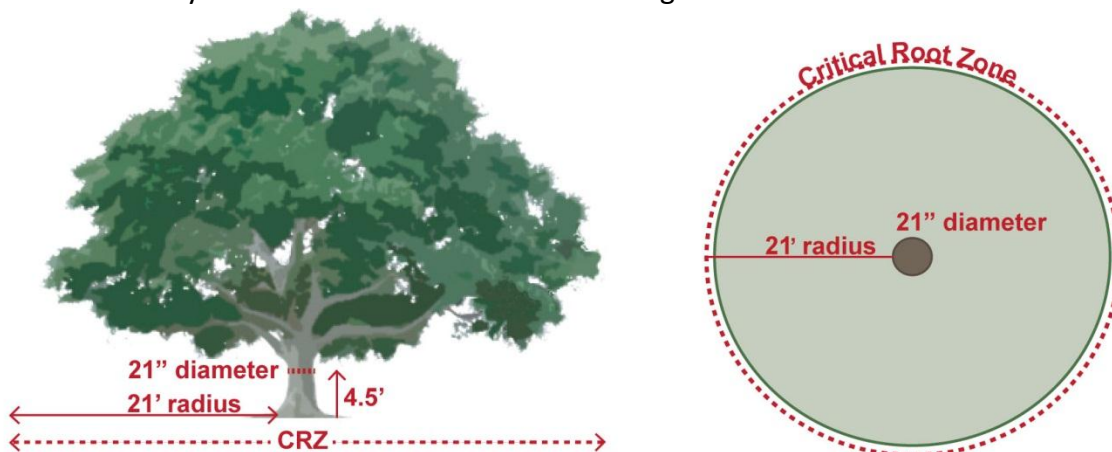
Trees provide a variety of social, economic, and environmental benefits to the community that often times go unnoticed. Trees increase property values, lower energy costs, improve air quality, reduce stormwater runoff, promote walkable communities and increase business sales, among many other benefits. These are some of the reasons many communities have already implemented tree protection codes.

With this in mind, it is crucial to implement BMPs for tree protection early on to ensure trees remain healthy and continue to provide benefits long-term. Since tree roots are not visible to the naked eye, they are often crushed, cut and suffocated during construction. A healthy mature tree has stored energy resources within it and can sometimes withstand temporary disturbances to its roots. However, damage to tree roots and surrounding soils are often permanent and compromise tree health in the short- and long-term. Continual disturbance overtime from pedestrian, vehicle, and construction activities only perpetuate the declining health of the tree and eventually leads to structural failure (dropping of dead limbs or the entire tree falling over), which can damage property and even cause injury to people. Implementing basic BMPs for tree protection early on reduces the likelihood of tree decline and failure due to construction activities.

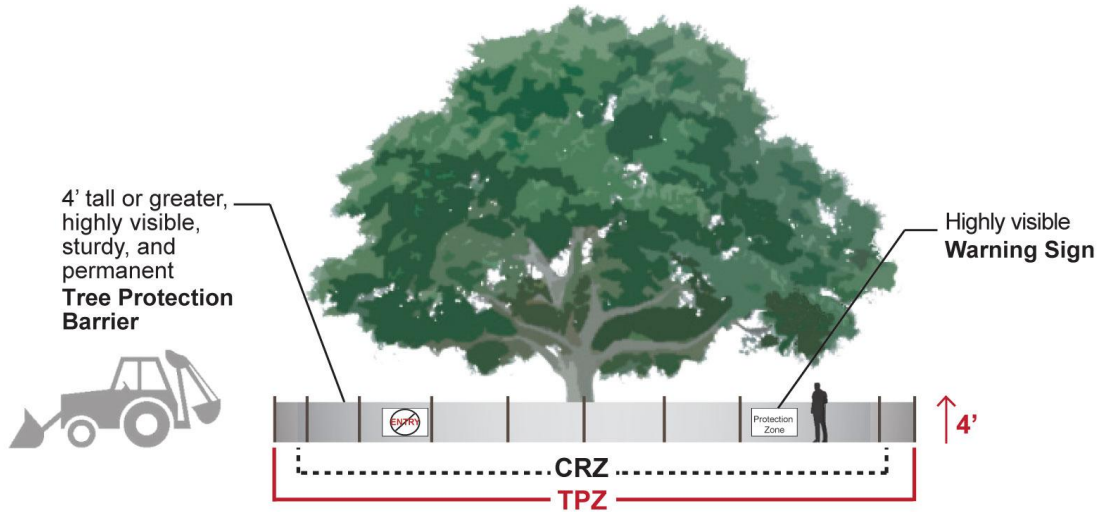
Definitions

Best Management Practices (BMPs) are general guidelines used in many different disciplines to help define the best currently known or accepted practice for an optimal outcome.

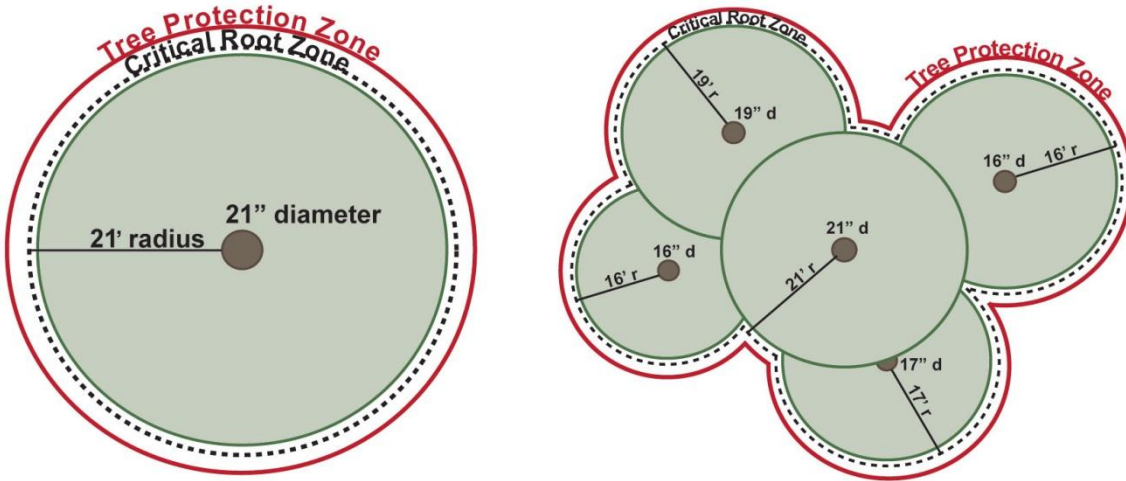
Critical Root Zone (CRZ) is the area of soil extending from the tree trunk where roots required for future tree health and survival are located. This area can also be defined as a circle with a *minimum radius* of 1' for every 1" in trunk diameter at 4.5" above ground.



Tree protection barrier encloses the Tree Protection Zone and is at least 4' tall, highly visible, sturdy, permanent and has warning signs on or near it for the duration of any construction activities.



Tree Protection Zone (TPZ) is an area where construction activities are prohibited or restricted to prevent injury to preserved trees, especially during pre- construction and construction, and includes the Critical Root Zone and/or beyond.



Best Management Practices

To promote the health of trees and stands of trees before, during, and after construction activities, follow these basic BMPs:

Planning Phase

1. Before assessing trees and other site structures and conditions, mark the site boundaries on plans and in the field to delineate which trees and stands of trees will be inventoried.
2. Perform a tree inventory that includes at minimum the location, size, and health of each tree and delineates quality stands of trees. Scope of the inventory should be based on communication and needs of the project team (developer, planner, engineer, architect,

landscape architect, and other professionals involved), as well as City ordinances. This is the time to confer with the project team on conceptualizations for site design, so that way long-term tree protection and health gets integrated into the design.

Tips

- When selecting trees to be saved on site, other factors to consider include tree structure, tree species and tolerance to construction activity, age and health of trees, and soil properties.
- In addition to preserving existing trees on site, consider communicating with the project team on areas suitable for future tree planting so that way healthy soils can be preserved during and after construction activities for the preservation of all trees on site.
- It could be useful to write a tree management report that identifies which trees are most suitable for preservation and those that should be removed due to potential impacts from construction activities or structures and infrastructure.

Design Phase

3. Communicate with the project team to accurately site structures and utilities and determine the trees to remain on site. Conserve and protect trees in stands or groups where possible. Make sure the trees and stands of trees selected to be saved go into plans and construction documents. Include in all plans the Tree Protection Zone (TPZ) for all saved trees to avoid conflict with the protected area and placement of structures and utilities during construction.

Tips

- Consider protecting beyond the Critical Root Zone (CRZ) of a tree to further protect the roots and soil essential to tree health and structural stability.
- If there are grade changes occurring on site, work with the landscape architect or engineer to incorporate the use of tree islands and wells to prevent disturbance to tree roots.

Pre-construction Phase

4. Prior to pre-construction activities, including tree removal, access roads, construction staging areas, and building layout, erect tree protection barriers to visually indicate TPZs. Be sure to:
 - Use tree protection barriers that are highly visible, sturdy, and restrict entry into the TPZ.
 - Install or erect signs along the tree protection barrier stating that no one is allowed to disturb this area.
 - Remove any branches or trees that pose an immediate risk to structures or people prior to any construction activities.

Tips

- Include highly visible language on all signs that specifies the financial penalties for violating policies.

Construction Phase

5. Communicate the intent of the tree protection barriers to the construction manager and workers to ensure that TPZs are not disturbed during construction activities. Have the construction manager sign a contract of compliance.

6. Prohibit these activities in the TPZ:
 - Stockpiling of any type, including construction material, debris, soil, and mulch
 - Altering soils, including grade changes, surface treatment, and compaction due to vehicle, equipment, and foot traffic
 - Trenching for utility installation or repair and irrigation system installation
 - Attaching anything to trunks or use of equipment that causes injury to the tree
7. Schedule site visits to ensure the contract is being met by the construction manager and that tree health is not being compromised by construction activity. Inspect and monitor trees for any decline or damages.
8. Keep in place all tree protection barriers until the project is completed.

Tips

- Sometimes site boundaries and existing site conditions prevent complete protection of the CRZ, so consider performing construction activities in these areas manually and installing trunk protection to prevent mechanical damage to the trunk.
- Apply at least 6" of mulch within the TPZ to prevent disturbance to tree roots and soil.
- Prior to any construction activity, consider taking photographs of the trees to be saved and surrounding areas to identify any construction damage caused to trees during construction.
- Add a penalty clause in the contract of compliance that prevents moving or altering the tree protection barrier and entering the TPZ.

Post-construction Phase

9. Perform a final inspection and continue monitoring after construction. Monitoring includes maintaining mulch, managing soil moisture, assessing tree damage, inspecting for insects and pests, and fertilization if needed.

Resources

- For information on managing trees during construction and guidelines for determining tree protection zones, see *Best Management Practices: Managing Trees During Construction*
- For more information on tree protection BMPs on construction and development sites, see *A Best Management Practices Guidebook for the Pacific Northwest*
<http://oregoncommunitytrees.org/tree-faqs/additional-resources/how-to-plant-a-tree/> and *A Community Forestry and Development Guide*
<http://www.urbanforestrysouth.org/resources/library/tree-protection-bmps-for-contractors-and-builders/view?searchterm=urban>
- For information on conserving wooded areas in developing communities see *Best Management Practices in Minnesota*
<http://www.dnr.state.mn.us/forestry/urban/bmps.html>
- Visit the Arlington Virginia webpage for standards on construction drawings
<http://www.arlingtonva.us/departments/CPHD/planning/docs/CPHDPlanningDocsLandscapeDocs.aspx>