



Protecting Trees during Construction

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Trees add considerable value to homes and buildings. We enjoy, appreciate and need trees around our homes and places of business. They provide shade and privacy, improve and diversify the landscape, and attract wildlife. When choosing property for construction, trees can be an attractive asset.

However, problems with trees often arise when construction begins. Most construction crews are not conditioned to notice or appreciate landscape trees and may inadvertently cause irreparable damage. Often tree injuries and their effects are not noticeable until the years following project completion. The subsequent need to remove a tree can be expensive because of newly created obstacles. Proper planning and action prior to and during construction will minimize damage to trees, allowing them to contribute to a healthy and pleasing landscape.

To protect trees from construction damage, follow these simple steps:

1. First, assess the existing trees on the construction site to determine which ones are *worth* retaining;
2. Next, design or arrange approaches to the building site that consider the trees to be retained and protected during construction;
3. Finally, provide sound tree maintenance during and after construction.

Which Trees to Save?

Create a map of your property and indicate the location of trees that are important to you.

Envision the placement of the building(s), driveways, walks and patio in relation to the landscape trees you plan to save. Stake out the location of improvements for better visualization. Sometimes by changing the angle of a building or curving a walk, you can



Photo Credit: Sara Clatterbuck

A sugar maple tree that has been damaged during building construction. Branches have been broken, excess soil has been piled around the tree and the primary entrance to the construction site is only 10 feet from the tree.

preserve the root space of a prized tree. The majority of the trees that die from various aspects of construction will be within 30 feet of the foundation and drive.

Factors such as tree species, longevity, hardiness, rooting and crown patterns are important considerations when selecting trees to keep. Emphasis should be placed on trees that are ideally located, are vigorous, have desirable characteristics and require minimum protective effort. If you lack knowledge of trees, seek professional advice from an ISA (International Society of Arboriculture) Certified Arborist.

When examining your trees, study their health and vigor. Visual signs of poor condition or impending problems include dying branch tips, split bark, insect-emergence holes, exposed roots, mushrooms growing at the tree base or conks (fruiting bodies) on the trunk. Remove trees showing these signs, plus any that have potential to affect the proposed structure. The structure may also affect the health of a tree in the future (by altering sunlight, water, air temperature or root zone). *Remember*, removal of high-risk trees prior to construction will be easier and cheaper than waiting until construction is completed.

Ask how changing the environment is likely to impact your trees. Will removing larger, overstory trees expose the smaller trees to more sunlight and cause sunscald? Will the removal of one tree cause an adjacent tree to be subjected to high winds and knockdown?

Over-mature trees should be removed prior to construction. They are less likely to tolerate the injuries imposed by construction than vigorously growing, younger trees. Plus, the expense in their removal will likely be considerably more after construction.

Consider retaining an assortment of tree species, and varying their size and age. This creates a more attractive landscape, and lessens the risk of sudden injury or loss of several trees simultaneously. Bear in mind that creating vertical structure in tree height will encourage a greater diversity of wildlife.

What Protection Is Necessary?

Once you've determined the trees to keep, you must direct the construction to minimize tree damage. Damage generally results from one or more of the following: mechanical injury (equipment), soil alteration (compaction and grade changes) and excavations.

Protection from mechanical injury – Mechanical injury results when equipment operators bump trees, scrape tree bark and break branches. To

prevent mechanical injury, work with the contractors and clearly mark trees that are to be retained. **Erect physical barriers** such as high-visibility plastic fence around individual trees or groups of retention trees. The larger the area enclosed, the better. Clear any brush near trees by hand rather than machinery if possible. Use lighter pieces of equipment and direct all contractor deliveries into one entrance.

Avoid altering the soil – As trees grow, they adapt to the surrounding soil. Construction often causes alterations to the soil, which places trees under stress. The key to tree survival in the years following construction is protecting tree roots *during* construction. Soil compaction caused by construction equipment creates significant problems when soil pores are compressed. Compressed pores inhibit the passage of air, water and nutrients to the roots. **During construction, equipment handlers should avoid driving over tree root systems.** This may be achieved by erecting barriers, bridging the roots with posts or steel, mulching, and/or pumping concrete above the ground through conveyor pipes rather than backing the truck up to the foundation.

Changing the grade of the soil surrounding a tree changes the original rooting depth. For example, roots that were 6 inches deep prior to construction may (because of fill dirt) become 18 inches deep after construction. This could cause roots to smother, sucker or rot. If the grade must be lowered, a retaining wall can be used to protect much of the root network. If the grade must be raised, loose stones in combination with small tile will help air and water circulation.

Excavations sever roots – During construction trenches are created to bury utilities. **Try to route the trenches around trees.** The larger the tree, the farther the trench should be rerouted. Alternatively, a power-driven soil auger can be used to tunnel under the tree and reduce root damage. If trenching is unavoidable and augering is not possible, follow these rules: cut as few tree roots as is necessary, cut them cleanly (rather than ripping or tearing), recut torn roots to facilitate healing, backfill the trench quickly (do not leave the roots exposed to sunlight and air), then water the damaged roots immediately.

Follow Up with Maintenance

Once the construction is completed, any damaged or stressed trees should be watered regularly during the growing season for at least one year and prefer-

ably two. Water the entire root zone of the tree, not just the base of the trunk. Be careful not to over-water. One to two good soakings per week should be sufficient. In addition, broadcast a complete fertilizer high in phosphorus to stimulate root growth (particularly if root damage occurred). During the winter months, prune damaged or dead limbs. Consider applying mulch in a layer 2 to 3 inches deep, extending several feet out from the tree. Be sure to keep the mulch 6 inches from the tree trunk. This will limit rot, inhibit suckering and reduce the likelihood of bark feeding by small rodents. Bark wounds that were created by equipment should be gently traced or re-cut into the shape of a vertical oval to facilitate recovery.

Parting Advice

Learn to appreciate the value of trees when beginning a construction project. With minor protection measures, you can guard against tree damage. Your

trees will remain healthy and will continue to provide the aesthetic and environmental benefits that we have come to appreciate.

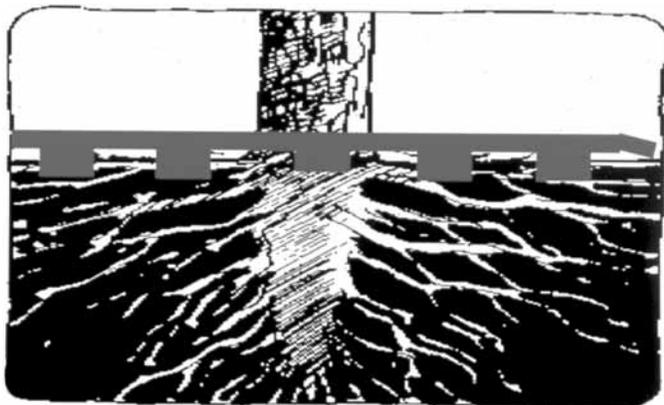
For additional information, see:

Doye, Robert P. March, 1982. How to Protect Trees During Construction. Grounds Maintenance. Pgs. 10-16.

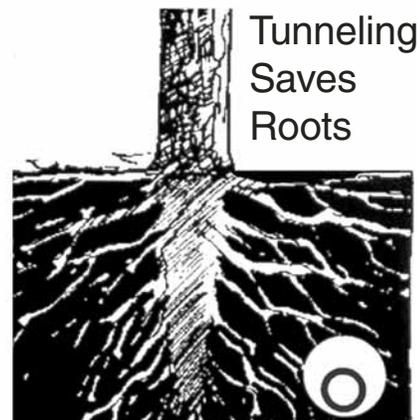
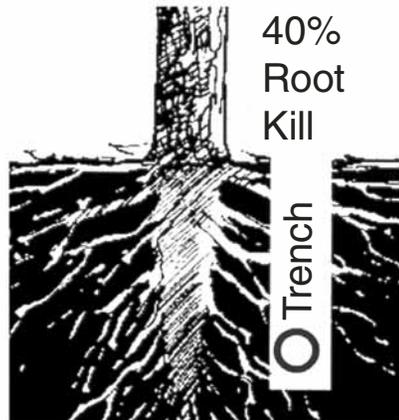
Fazio, James R. 1996. How to Save Trees During Construction. Tree City USA Bulletin No. 7, National Arbor Day Foundation. 8 pg.

Shigo, Alex L. 1990. A New Tree Biology. Shigo and Trees, Associates. 618 pg.

U.S. Department of Agriculture. 1975. Protecting Shade Trees During Home Construction. Home and Garden Bulletin No. 104, 8 pg.



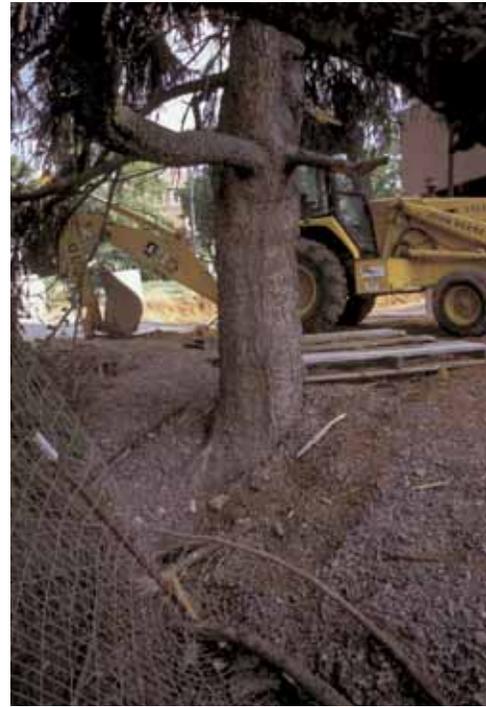
To avoid soil compaction from construction equipment, bridge the roots temporarily with posts or steel.



Tunneling (or augering) will cause less damage to roots than trenching.



Photo Credit: Sara Clatterbuck



Both of these examples illustrate poor tree management during construction. Roots are not protected, soil has been added or allowed to erode, heavy machinery has compacted the soil and the tree environment has become a depository for construction waste.



Photo Credit: Sara Clatterbuck

Providing a physical barrier around the tree protects the tree from mechanical injury and soil compaction during construction activities.



Photo Credit: Sara Clatterbuck

Trenching for underground utilities can sever roots and damage the tree. If possible, the trench should avoid tree roots and be routed around trees.

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