

Avoiding Tree Damage During Construction

Possible ways in which existing trees may be damaged during a construction project and methods for planning and facilitating the prevention of tree damage.



The Importance of Engaging an Arborist

The process of protecting trees during construction is not always easy, but the benefits can be substantial. Larger trees provide aesthetic beauty, financial value, and benefits to the environment and quality of life.

Construction damage to trees may take many years to impact the tree and can be deadly. Small injuries accumulating over time can start a hard-to-reverse decline.

To ensure that trees will survive and thrive after construction, it is important to work with an ISA Certified Arborist® from the beginning of the planning phase through to the end of the post-construction phase of the project. The sooner and more involved an ISA Certified Arborist is in the project, the greater chance of maintaining or improving tree health and survival.

The Critical Root Zone and Tree Protection Zone

A tree's tolerance for damage depends on its age, species, condition, and other factors. One of the most important factors is the tree's root zone.

A tree's root zone can extend far from the trunk and outer branch spread. The portion of the root zone that is essential for tree health and stability is called the critical root zone.

One of the early steps in protecting trees and the critical root zone during construction is to have an ISA Certified Arborist define a tree protection zone. This area should have specific limitations to construction activity and requirements for protection.

Finding the balance between project requirements and protection zones requires an ISA Certified Arborist and a cooperative construction team.



How Construction Can Damage or Kill Trees

Root Damage: Grading, trenching, paving, altering drainage patterns, and adding or removing soil within a tree's critical root zone damages tree roots. If too many roots are damaged, the tree will be affected.

Soil Compaction: Heavy construction equipment increases soil density (compaction), slowing root growth, limiting water penetration, and decreasing oxygen needed for root survival.



Physical Injury to Trunk Crown and Root Collar:

Construction equipment can break branches, tear bark, and wound the trunk. These wounds weaken the tree and allow the entry of decay-causing fungi. The base of the tree and its root collar are especially vulnerable to damage from machinery and soil or debris placed over the lower trunk.

Heat and Chemical Damage: Bark and foliage are easily damaged by the heat from running machinery and burning material. When spilled fuels and runoff from cleaning concrete delivery vehicles seep into the soil, soil chemistry changes and root growth and function are reduced.

Removal of Supporting Trees: Closely spaced trees grow as a community, supporting and protecting each other. Removing some of the trees exposes the remaining trees to sunscald stress or structural failure.

Getting Advice

To protect your trees during construction, engage an ISA Certified Arborist to be a member of the project design team. This arborist is typically the only member of the team that represents the interest of the trees. Have the arborist work on any decisions that impact trees throughout all the phases of the project.

Planning and Design Phase

Ensure the ISA Certified Arborist is involved early in the planning phase of construction. Minor design changes can result in significant reductions in tree damage and make a great difference in whether a tree will survive.

There are many options an arborist might suggest during the planning and design phase to protect trees: driveways and walls can be realigned; grading can be reconfigured; structures such as footings or paving can be designed to bridge over roots; and utilities can be rerouted or tunneled under roots.

All tree protection requirements determined by the arborist should be incorporated into the project plans.

Pre-Construction Phase

Prior to the start of work, an arborist can recommend where tree protection fences should be installed. Fences should have signs attached to inform people of why they should stay out and who to contact if they need to get in.

If machinery must come close to a tree trunk, an arborist can recommend how the trunk can be protected from damage with additional protection materials.

If there will be trenching, grading or other excavation near trees that may damage roots, an arborist can prune roots out of the way before excavation, or cleanly cut them before any damage is done.

If there is significant root loss or if construction is done during dry periods, an arborist can develop a temporary irrigation system. This may be from nearby hoses or water may need to be trucked into the site.

An ISA Certified Arborist can also help create a plant health care program that will monitor and treat stress, diseases and insect pests throughout all phases of construction.



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a greater worldwide awareness of the benefits of trees.

Construction Phase

During the construction phase, trees and any required protection zones must be monitored by an arborist regularly. Having access to the construction site allows the arborist to confirm the requirements are properly being followed.

Construction plans may change often and the arborist can make adjustments to protect trees as the project changes. Flexibility and establishing trust between all team members is critical to the successful preservation of large trees.

Post-Construction Phase

At the end of the project, installation of new plantings, irrigation, lighting, and planting soil are often made close to existing trees. These new changes in a tree's environment can have a devastating impact on the tree.

Despite the best tree protection plans and intentions, construction can result in unintended damage that may take years to become apparent. An ISA Certified Arborist can develop a post-construction maintenance plan to help trees recover and adapt to their new environment.

What Is a Certified Arborist?

ISA Certified Arborists are individuals who have proven a level of knowledge in the art and science of tree care through experience and by passing a comprehensive examination developed by some of the nation's leading experts on tree care. ISA Certified Arborists must also continue their education to maintain their certification. Therefore, they are more likely to be up to date on the latest techniques in arboriculture.

Finding an Arborist

Visit TreesAreGood.org for free tools:

- The "Find an Arborist" tool can help you locate an arborist in your area.
- The "Verify a Credential" tool enables you to confirm whether an arborist has an ISA credential.

Be an Informed Consumer

One of the best methods to use in choosing an arborist is to educate yourself about some of the basic principles of tree care. Visit TreesAreGood.org to read and download all brochures in this series.