How to Save Trees During Construction

TREE CITY USA® BULLETIN

No. 7 Editor: Dr. James R. Fazio • $3.00

At the University of Nebraska-Lincoln, chain link fence is used around every tree in a construction zone, showing serious intent to protect vegetation.

Life is just better when you are surrounded by trees. Bird songs fill the air, adding delight to daily routine. Trees cast their sheltering shade as they moderate the temperature, quiet the noise, and clean the air.

In summer, shade trees can save up to 58 percent of air conditioning costs. In winter, windbreaks can reduce heating bills by as much as 30 percent.

As an organization, the Arbor Day Foundation works hard to encourage people to plant trees. However, it is equally important to save the trees that Mother Nature has invested years in growing.

Saving trees during construction often requires courage by an individual — especially in communities where the common practice is simply to bulldoze everything in sight before construction begins. We've been inspired by the stories of people who have battled to save trees slated for destruction during a construction project. And we've been saddened by the stories of people who willfully destroy trees that could've and should've been saved.

But saving trees during construction requires more than the right attitude. It requires the right actions. This bulletin features a concise description of the actions you need to take to ensure the health of existing trees long after the sounds of construction fade away. We hope the information provided here will be put to good use. Your efforts will pay off for years as you enjoy the trees you've saved.

Arbor Day Foundation®
100 Arbor Avenue • Nebraska City, NE 68410

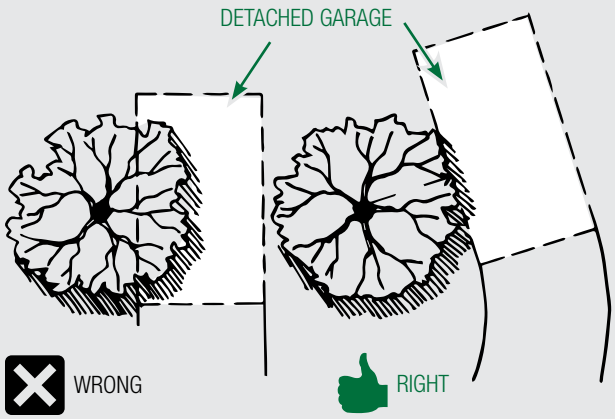
Plan to Avoid Trouble

One of the toughest parts of building on a wooded lot is also the first step — deciding which trees to save and which to cut. A good rule to remember is that it is easier, cheaper, and safer to remove potential future problems before construction begins.

Here's how:

RIGHT SITE, RIGHT TREES

1 On a map of your property, show the location of trees that are important to you. Consider these in deciding the location of the house, garage, driveway, walks, and patio. Stake out the location of improvements for better visualization. Sometimes by changing the angle of a building or curving a walk, you can preserve the essential root space of a prized tree.



2 Know your trees, or find someone who does. This is necessary to help make the right decisions. For example, some species growing in shade may do poorly if changes result in more sunlight. Each species also differs in how it can withstand root cutting or how susceptible it is to local insects and disease. A knowledge of trees will help guide your decisions about which to remove and which to save.

3 Consider the vigor and health of existing trees. If the tips of the branches are dying on a large tree or fruiting bodies of fungus are growing on its trunk, it is probably over-mature. In general, it is best to keep only those trees that are in good health. An arborist can help you evaluate tree health.

4 If the existing trees make it possible, try for a good mix of ages and sizes in the stand that remains after construction. This is more visually pleasing and reduces the impact when a tree does die.

DESIGN WITH NATURE

To minimize root damage, do not alter the terrain except where absolutely necessary. Leveling, cutting, and filling:

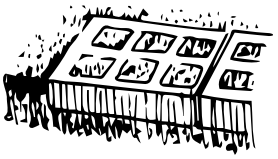
- Severs roots.
- Removes nutrient-rich topsoil.
- Dries roots when soil depth is reduced.
- Smothers roots when soil depth is increased.
- Changes the natural flow of water.

AN ARCHITECT CAN HELP BY:

- Locating buildings to harmonize with the natural terrain.
- Using posts, bridges, and decks to suspend parts of buildings over uneven terrain.
- Raising paved driveways and using similar techniques that minimize excavation.

BRICK

FLAGSTONE

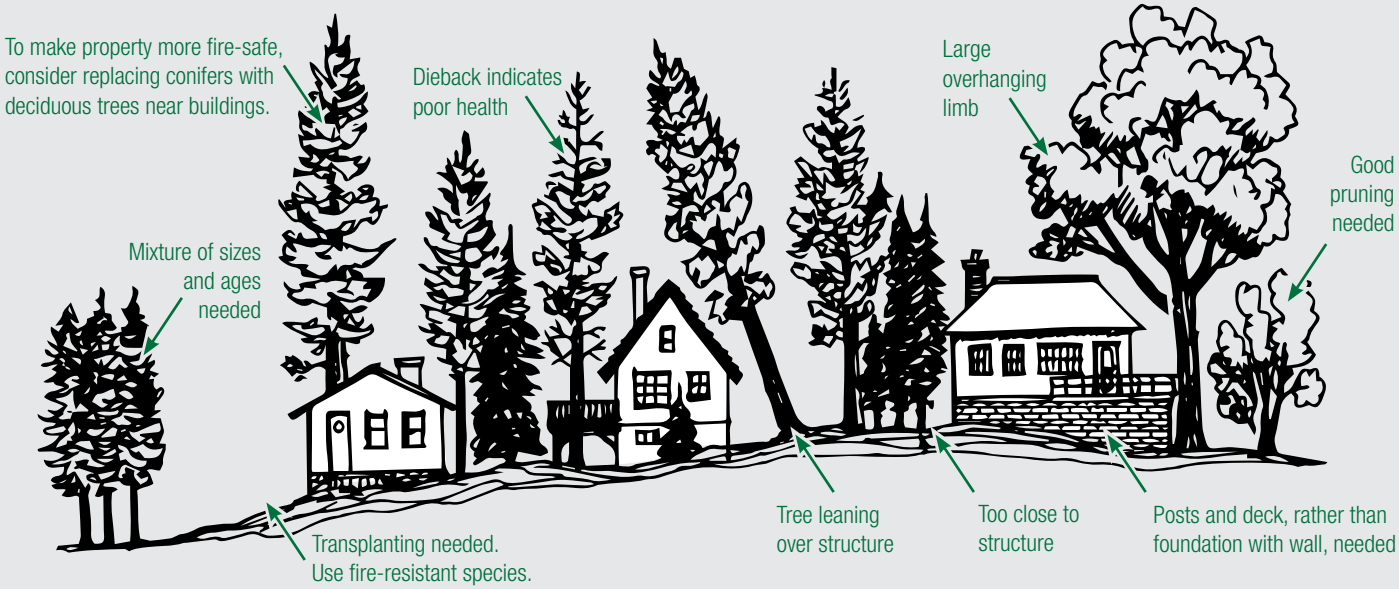


HONEYCOMB BLOCK

CHIPS/GRAVEL

To allow maximum aeration and water penetration to tree roots, select walk materials other than concrete or asphalt.

- ☑ Remove trees that are leaning over the site of future structures.
- ☑ It is usually best to remove trees that will be within 5 feet of a new house.
- ☑ Rather than destroying all trees where structures will be located, consider transplanting trees that are less than 2 inches in diameter and 10 feet tall. Tree spades can move larger trees.
- ☑ After all trees to be saved are selected and marked with bright-colored flagging, prune each one as needed. Follow the guidelines of good pruning that are available from local experts or are shown in *Bulletin No. 1: How to Prune Young Shade Trees*. Pruning will help trees survive the stresses of construction activities. Also, for safety, remove large limbs that will overhang structures.



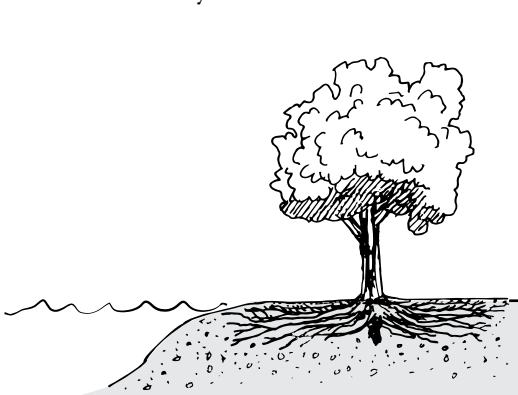
Avoid Damage During Construction

As the organized chaos of building takes place, the surest way to protect trees that are to be saved is to:

1. Work with the builder to locate and mark with flagging and/or signs all construction roads, parking places for workers, and areas for storage of building materials, gravel, and soil.

2. Work with utility contractors to stake out the exact locations of trenches.

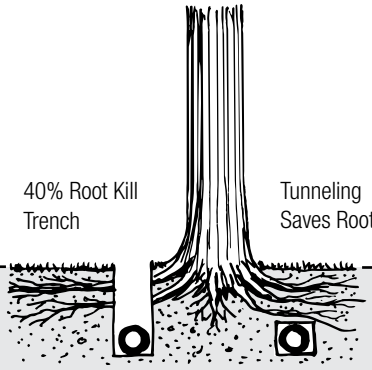
3. Erect physical barriers around all "save" trees or, better yet, around *groups* of trees near the construction activity.



DRAINAGE CHANGES If terrain is altered, there will be a change in how water drains from the land. If flows are created that add too much moisture to a wooded site, a drainage system may be needed to maintain the previous amount of moisture (which provided the natural growing conditions for the existing trees.) Similarly, existing trees along the edge of a new pond may eventually die from their roots suffocating. On sites deprived of water, irrigation may be needed to maintain existing trees.

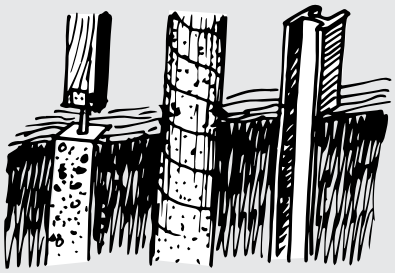
A CARDINAL PRINCIPLE:

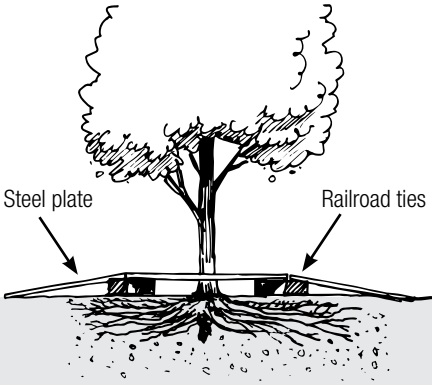
What happens below the ground is more important than what meets the eye above ground.



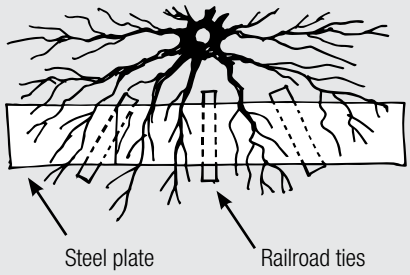
SEVERING ROOTS Some cutting of roots near construction is inevitable, but much *is* avoidable. For example, the routing of underground utilities does not have to follow a straight line from street to house. Careful route selection can often avoid important trees. When that is not possible, tunneling is a good way to reduce damage. To reduce trenching for foundations, posts and pillars can be substituted for footers and walls.

PIT AND POST CONSTRUCTION





SOIL COMPACTION The key to tree survival in the years following construction is protection of the roots during construction. This is probably the most insidious problem because the results of compaction cutting off air and water passages in the soil show up slowly. When barriers are not possible to keep away vehicles and foot traffic, other protective methods used include spreading several inches of wood chips, pumping concrete from the truck through conveyor pipes instead of driving over root systems, and bridging root areas with plates of steel.



ABOVE THE GROUND

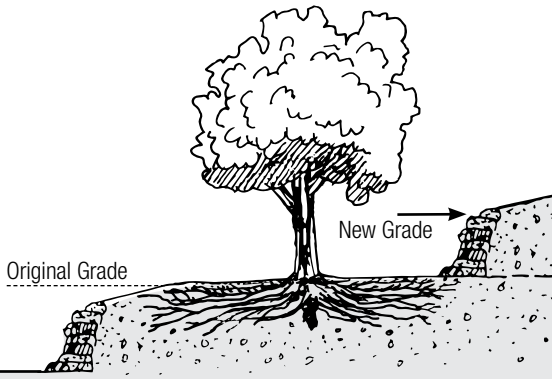
BARRIERS that extend beyond the dripline are a good way to protect individual trees or groups of trees during construction.

High-visibility plastic mesh fence is inexpensive but easily violated. Chain link or well-built wood fences show a more serious intent to protect vegetation.

NAILS Keep trees free of nails, screw eyes, and other fastening devices. Use posts — not trees — for signs, electrical wires, pulleys, etc.

BREAKS AND SCRAPES Even with barriers around trees, equipment sometimes breaks limbs or gouges tree trunks. Watch for damage and repair it promptly. See *Tree City USA Bulletin No. 2.*

CHANGING GRADE If a grade change is unavoidable, a retaining wall can be used to protect much of the root network. It can also lend some pleasant diversity to the landscape.



BELOW THE GROUND

SOIL CHEMISTRY Poisoning or otherwise altering the soil can result in weakened trees, making them more susceptible to insects and disease. In some cases, trees can be killed outright within a few years after construction. To prevent adverse effects on soil chemistry:

- Spread heavy plastic tarp where concrete is to be mixed or plasterboard will be cut. The alkalinity of these materials can change the soil pH.
- Read labels. Do not use wood products containing pentachlorophenol. These are deadly to roots. CCA-treated timber (greenish color) is a safer alternative.
- Paint brushes and tools should not be cleaned over tree roots.
- Chemical wastes (paint thinner, etc.) should be disposed of properly and not drained on site. Local sanitary authorities can advise on recommended disposal methods.

COMMUNICATION IS ESSENTIAL

There are many techniques that will help save trees during construction, but this is only one part of the challenge. The key to success is communication. It begins with the property owner making it clear to the architect that mature trees on the lot are just as important as the size of the kitchen. In fact, you may want to seek out an architect who has interest and experience designing with trees in mind. Communication continues as plans are discussed with landscape architects, arborists, foresters, extension agents, or other experts.

Most importantly, communication with the actual builder is essential. Many builders sympathize with the need to save trees, but often they view it as too time-consuming or otherwise costly. Still others may not know as much about tree-saving techniques as you do, so there is an education challenge.

Finally, there are the dozer operators, truck drivers, painters, masons, and a small army of others who are on the site daily. While it is usually not possible to work with each one or even visit the site daily, it is possible to convince contractors and foremen that you are serious in your desire to save trees and that they need to relay this concern to their workers.

A Word About ...

SAVING A TREE

When the house below was constructed, the 30-year-old pin oak directly adjacent to it was kept vigorously healthy, a result of good planning and communication.

- The house was designed so that a terrace on piers was located near the tree, not a wall requiring a foundation and footings.
- As much of the tree's root zone as possible was fenced off to minimize the compaction of the roots by construction equipment and workers.
- The pier at the corner of the terrace nearest the tree was carefully located between major roots so the roots were not severed.
- Following construction, the soil in the root zone was aerated by an arborist injecting pressurized water.
- A fertilizer high in phosphorus was applied to stimulate root growth.

A beautiful, healthy, mature tree shading a new house is the result.

WATER, BUGS, AND DISEASE

Despite your best efforts, trees in construction areas will suffer some degree of stress. Unfortunately, trees under stress fall victim more easily to insect and disease attacks.

A good way to help your trees stay healthy is to provide adequate water during dry spells both during construction and afterward. Soil should be moistened to a depth of approximately 12-18 inches. A good rule is to slowly apply at least 1 inch of water per week over the entire area beneath the tree's branches.

Inspect your trees regularly and consult an expert if insect or disease damage begins to appear.

KEEPING YOUR PROPERTY FIRE-SAFE

In all regions of the country, homes in wooded areas are destroyed each year by wildfires. Keep your home and neighborhood safe by:

- Breaking up solid areas of evergreens and avoiding planting them close to buildings.
- Asking nursery professionals about fire-resistant shrubs to use in landscaping.
- Keeping trees well watered, regularly pruned, and in healthy condition.
- Preventing buildup of leaves and old branches.
- Making sure your roads and bridges allow access for heavy fire equipment.

To learn more about fire-safe construction and wildland fire safety precautions on a broader scale visit firewise.org.

Healthy trees provide lots of shade for homes in this neighborhood.

Construction and the Urban Forestry Program

To save trees during construction, the right action begins with awareness of the values of large trees and a can-do attitude. The result is a better community for everyone.

In communities where the urban or suburban forest is endangered by building projects, protection of existing trees deserves high priority in the urban forestry program. There are three primary paths to action:

ORDINANCES

Many communities have found it necessary to regulate the development of private property in order to protect the public-asset value of trees. However, there are alternatives to legal restrictions, and in most cases, the benefits from enlightened private enterprise pay higher dividends to the community.

EDUCATION

Professionals in urban forestry are usually in a good position to provide the education necessary to save trees during construction, or at least to begin the chain reaction. In this process, there are several distinct audiences to reach, each needing a different approach.

HOMEOWNERS Whether for do-it-yourself projects or planning a new home, homeowners need to be made aware of the benefits provided by mature trees and how to protect these assets. The owner has the upper hand when it comes to working with builders, but he or she needs to know the available options.

ARCHITECTS Some architects specialize in designing with nature, but to others, the potentials need to be pointed out. Architects not only have the opportunity to prevent many kinds of tree problems for their clients, they can also enhance their firm's reputation by demonstrating a sensitivity toward trees on wooded lots.

DEVELOPERS/BUILDERS Once a developer or builder understands the concept of saving trees, he or she can add an estimated 3-7 percent to sale prices — and sometimes even save on labor costs by clearing less land. However, more is required than simply not cutting down trees. Knowledge of the long-term effects of each activity is needed, as well as how to avoid negative impacts.

CITY EMPLOYEES Sewer and utility workers, sidewalk crews, and engineers need to understand the damage that trenching can do. Without their respect for roots, all other efforts could be for nothing.

OTHERS Real estate agents, planning and zoning boards, and others need to be made aware that wooded property is more appealing, offers a higher standard of living, and commands higher resale prices than similar property that has been stripped during construction.

In all cases, copies of this bulletin may serve as a good starting point. Encouraging all parties to seek the assistance of urban foresters and arborists before construction begins would also be a valuable service.

PUBLIC ACTION

Actions do speak louder than words and are a good way to get public attention. Saving trees during construction must include the projects of government. Whether it is widening a street or building a new office complex, an urban forestry program can guide the way to saving trees and set a good example for others to follow.

THINK OF THE FUTURE

Saving trees during construction goes beyond preserving aesthetics and ecoservices or increasing property values. Trees and natural vegetation can help connect young children to nature. Today, computer technology and organized activities are producing a generation that takes little notice or interest in the outdoors. By preserving trees, especially mature ones, an environment is provided that helps children take note and appreciate their outdoor surroundings. It is a more attractive place to play, and it is easier to "befriend" trees that let you climb or swing than it is to enjoy small, planted stock.

Nature Explore, a collaborative program of the Arbor Day Foundation and Dimensions Educational Research Foundation, has been developed to help provide ways for young people to associate with nature. Nature Explore Classrooms are outdoor spaces that are designed to provide enjoyable experiences and foster childhood development for all levels of ability and learning styles. Whether under the canopy of aged oak trees or on sites where trees need to be planted, Nature Explore Classrooms provide an opportunity for children to have pleasant experiences outdoors at a young age.

The classrooms — and the research-based principles upon which they are based — can be included in developing neighborhoods in a number of ways. With some advanced planning, they can be part of:

- Lots or park sites designated as part of a new development
- School or child care center grounds
- Industrial park campuses or office complex grounds
- Individual homes

By including nature and children in plans for development, we are helping to ensure leaders and citizens who will support stewardship of natural resources in the future. More information is available at **natureexplore.org**.

What About Street Tree Planting After Residential Development?

Tree-lined streets with all their practical and aesthetic benefits just don't happen by chance. Recognizing this, some communities have passed strict ordinances requiring developers to plant street trees. Others have no requirements, and planting is spotty at best. A compromise measure has been put into effect in some communities that not only spreads the financial responsibility but helps ensure involvement of new homeowners. This, in turn, helps ensure watering and the proper care that young trees need. Here is how it works:

1. The developer must contribute $100 per tree into a fund maintained by the city. Normally, there will be space for two large trees, so the developer pays $200 per lot. For corner lots, the amount is $400. For odd-shaped lots or other unusual circumstances, the city forester makes a decision on the amount.
2. The person who purchases the home receives a voucher for the amount contributed for his/her lot and an explanation of the program. Included is a list of appropriate and prohibited trees. Because 8-foot planting strips are part of this ordinance and because of the long-term benefits of large-maturing trees, the homeowner is encouraged (but not required) to plant accordingly.
3. The homeowner takes the voucher to a local nursery and selects the trees and does the planting and care. The site is checked by the city forester for compliance.
4. The nursery uses the voucher to bill the city.
5. If a homeowner does not want trees and does not use the voucher, the money remains in the city's fund and after 10 years is used to plant trees in public areas serving the neighborhood.

Experience with this method has shown that it does not work well with out-of-town duplex or apartment building owners. To counter this, the city contacts the owner, explains the voucher system, and offers to have local volunteers plant the trees and provide care for the first several years.

Fencing to save existing trees during construction and planting street trees where none exist are important in areas of development or renewal.

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Arbor Day Foundation in cooperation with the U.S. Forest Service and National Association of State Foresters. To achieve the national recognition of being named as a Tree City USA, a town or city must meet four standards:

Standard 1: A tree board or department
Standard 2: A tree care ordinance
Standard 3: A community forestry program with an annual budget of at least $2 per capita
Standard 4: An Arbor Day observance and proclamation

Each recognized community receives a Tree City USA flag, plaque, and community entrance signs. Towns and cities of every size can qualify. Tree City USA application forms are available from your state forester, the Arbor Day Foundation at **arborday.org/treecity,** or your state forestry agency.

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FOR MORE INFORMATION …

Some helpful references relative to Bulletin No. 7 may be found at **arborday.org/bulletins.**

Published for the ***Friends of Tree City USA*** by Arbor Day Foundation®
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