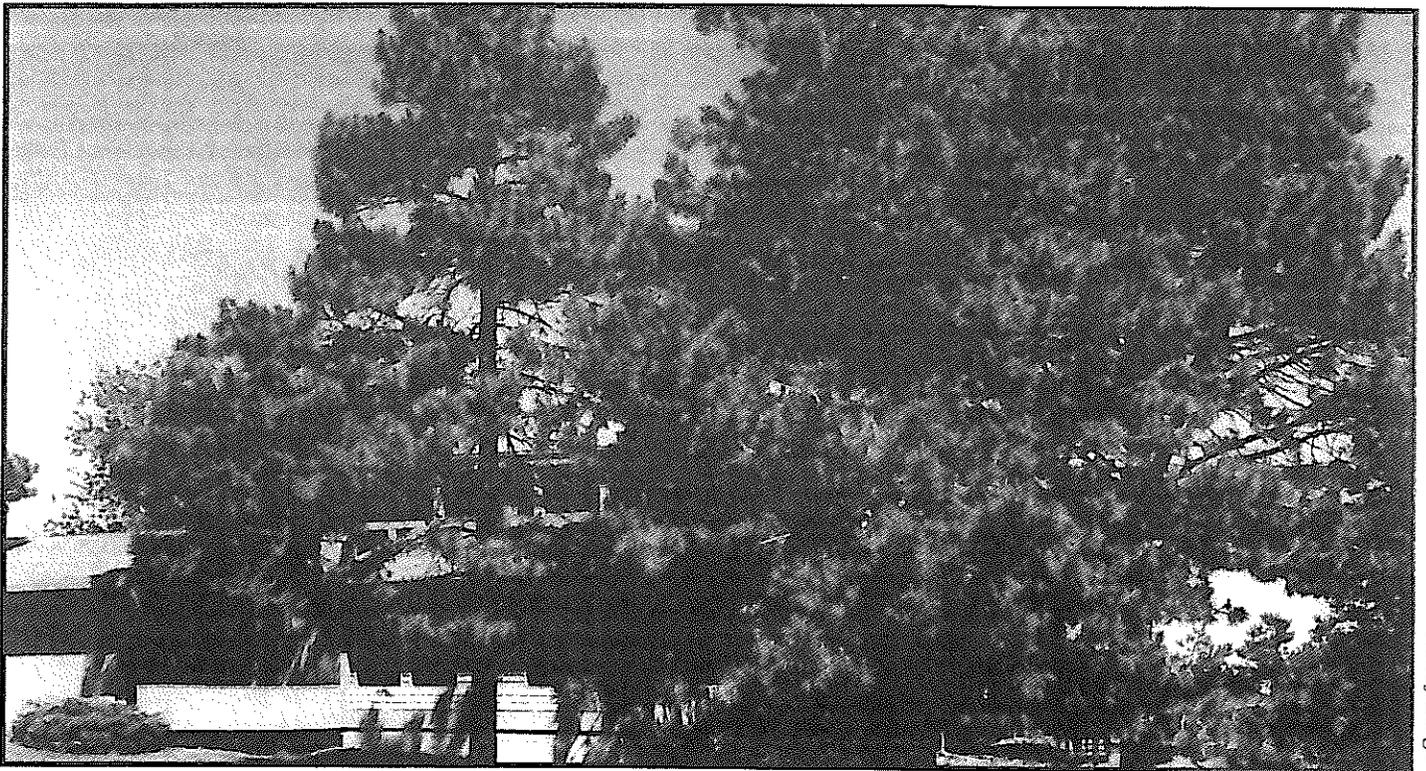


TREE CITY USA.
BULLETIN

No. 7

Dr. James R. Fazio, Editor • \$3.00

How to Save Trees During Construction



Randy Burger

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 50% of air-conditioning costs. In winter, windbreaks can reduce heating bills as much as 30%.

As an organization, The National 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. Of all the letters I receive here at the Foundation, few inspires me more than the stories of people who battled to save trees that were to have been needlessly destroyed for a construction project. And few sadden me more than the stories of people who willfully destroy trees that could and should be saved.

But saving trees during construction requires more than the right attitude. It requires the right actions. Bulletin editor Jim Fazio has prepared 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. I hope you will put this good information to good use. Your efforts will pay off for years as you enjoy the trees you've saved.

John Rosenow
President
The National Arbor Day Foundation

Published by



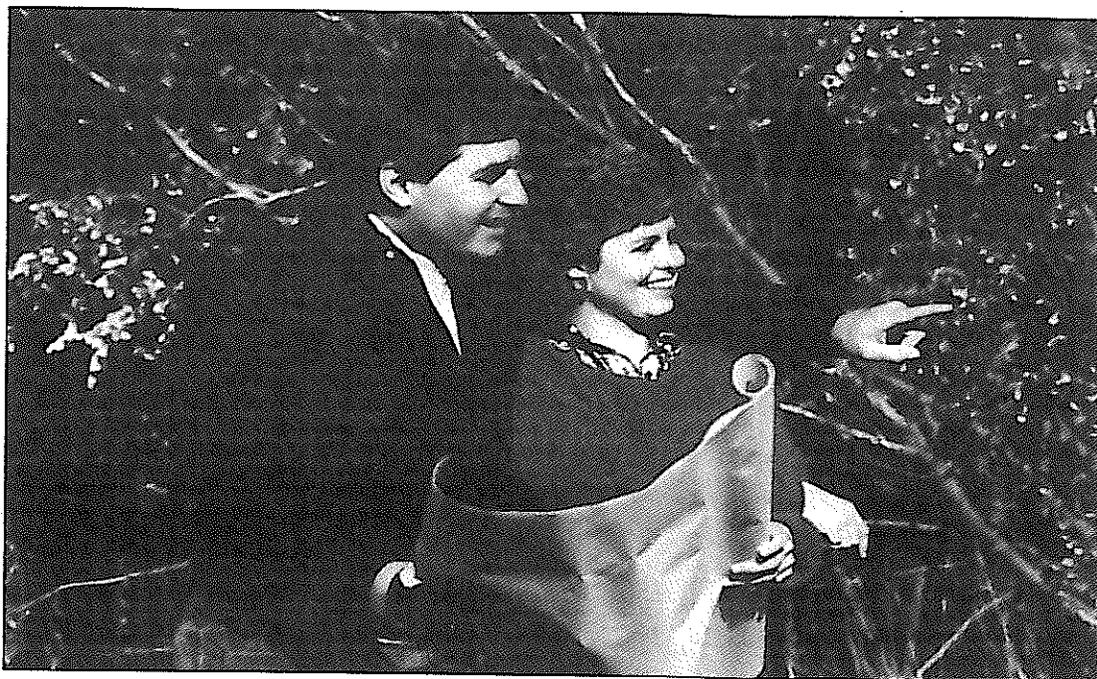
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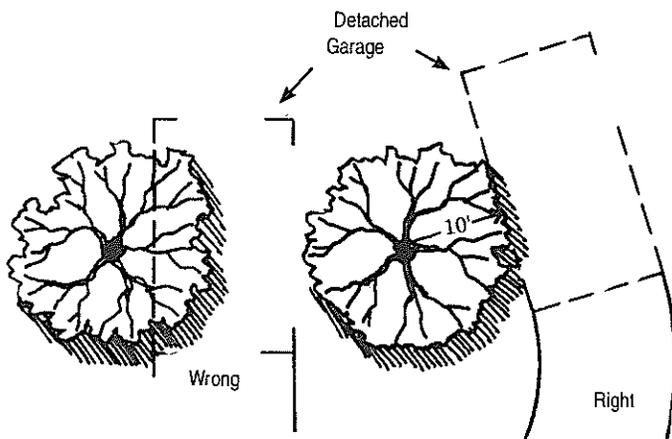
Plan to Avoid Trouble

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 future problems *before* construction begins.

Here's how:



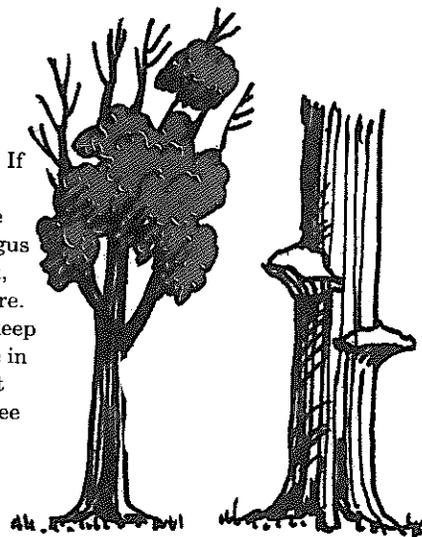
Right Site, Right Trees



1 On a plat 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.

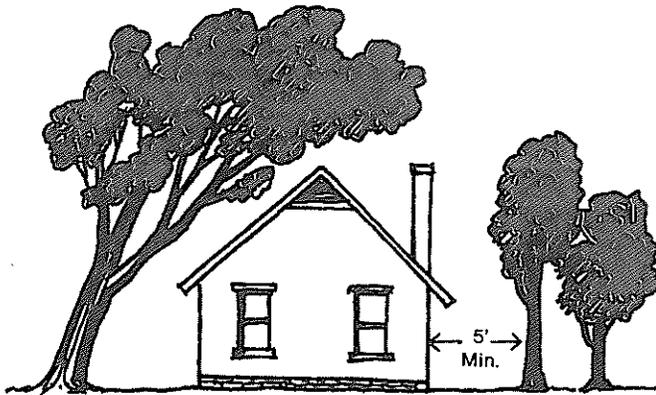
2 Know your trees, or find someone who does. This is necessary to help make the right decisions. For example, some species growing in shade may do poorly if changes result in more sunlight. Each species also differs in how it can withstand root cutting or how susceptible it is to local insects and disease.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

Removals and Pruning



- ☑ Remove trees that are leaning over the site of future structures.
- ☑ It is usually best to remove trees that will be closer than five feet from a new house.
- ☑ Rather than destroying all trees where structures will be located, consider transplanting trees that are under two inches in diameter and ten feet tall. Tree spades can move larger trees.
- ☑ After all trees to be saved are selected and marked with bright-color flagging, prune each one as needed. Follow the guidelines of good pruning that are available from local experts or are shown in *Tree City USA Bulletins 1 and 2*. Pruning will help trees survive the stresses of construction activities. Also, for safety, remove large limbs that will overhang structure.

Design with Nature

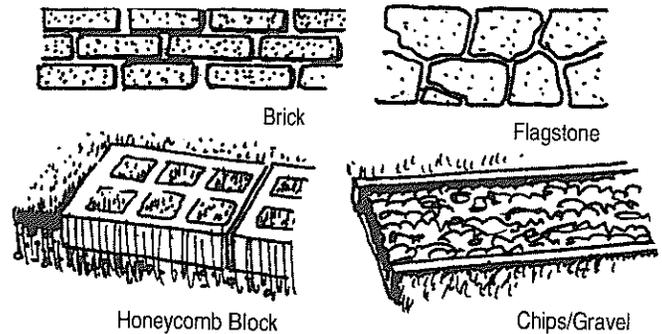
To minimize root damage, do not alter the terrain except where absolutely necessary. Leveling, cutting, and filling:

- 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

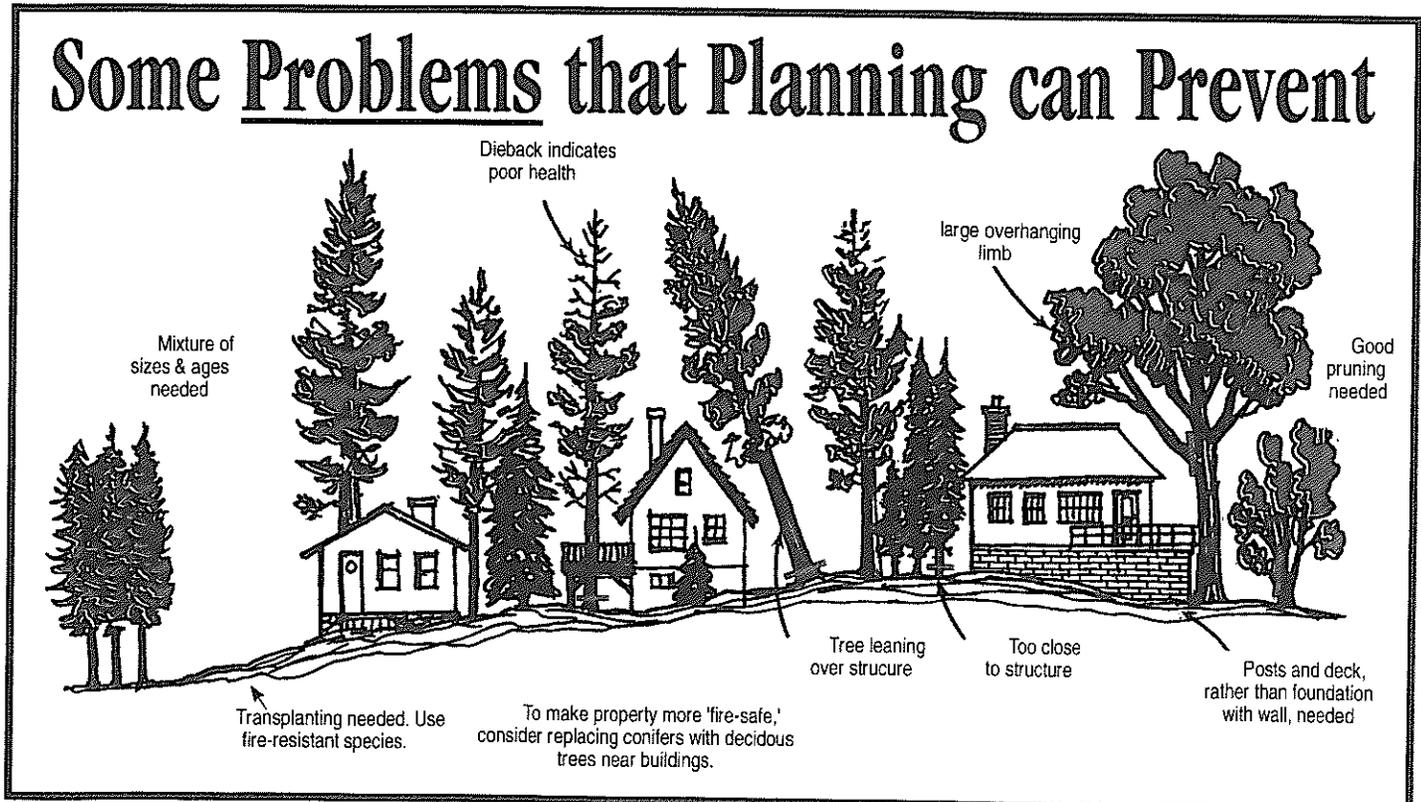
An architect can help by:

- ☑ 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

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



Some Problems that Planning can Prevent

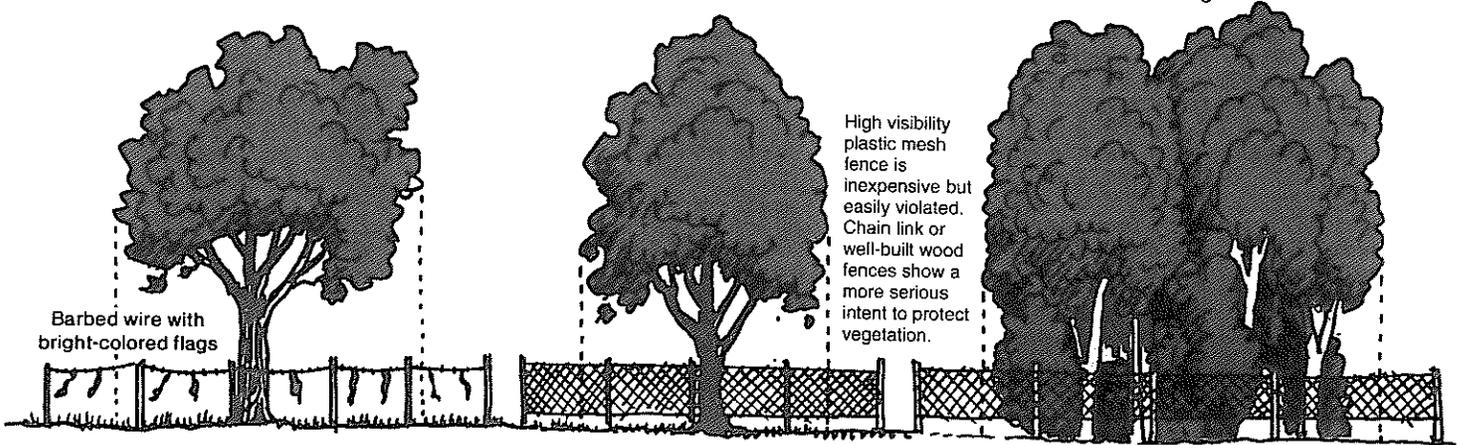


Avoiding Damage During Construction

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

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



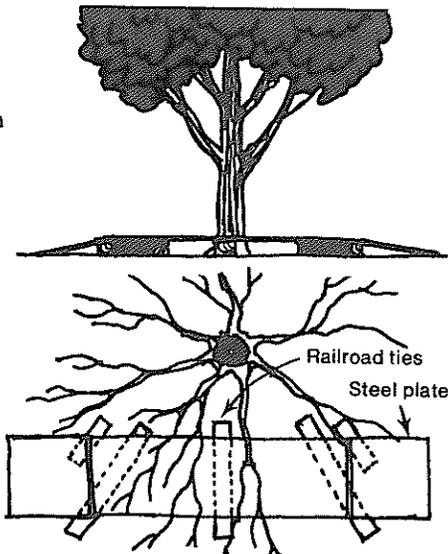
Below the Ground

A Cardinal Principle:

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

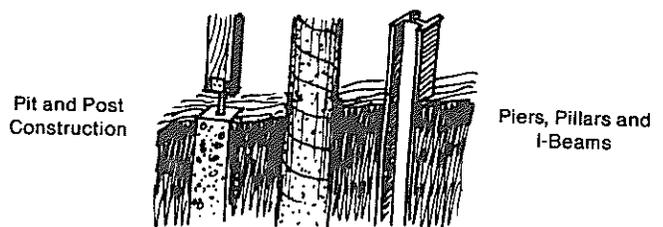
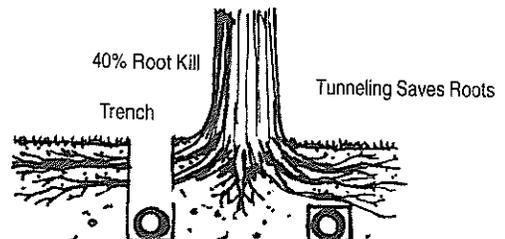
Soil Compaction

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 that can be 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.



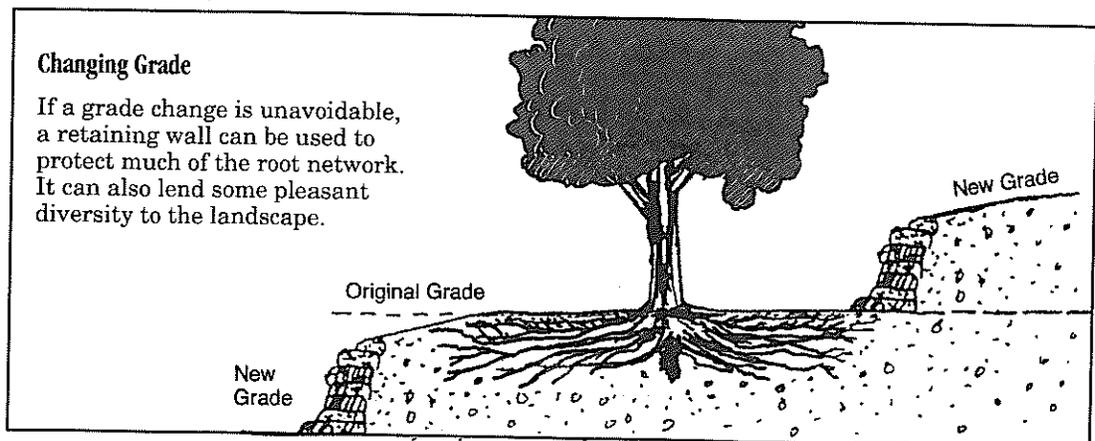
Severing Roots

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.



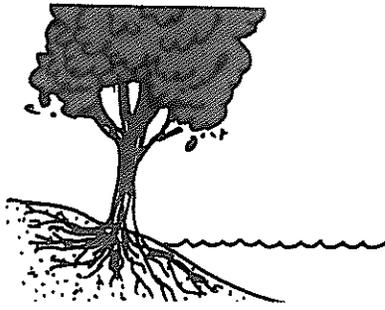
Changing Grade

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.



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.

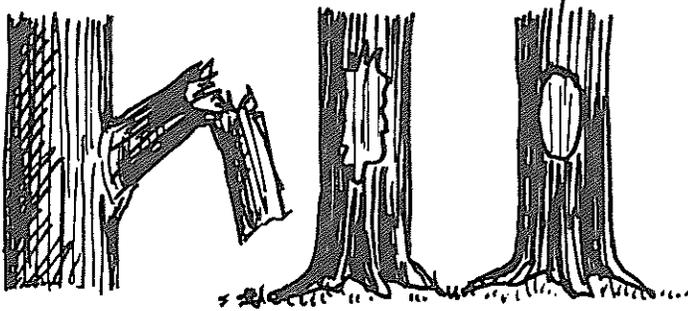


Soil Chemistry

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:

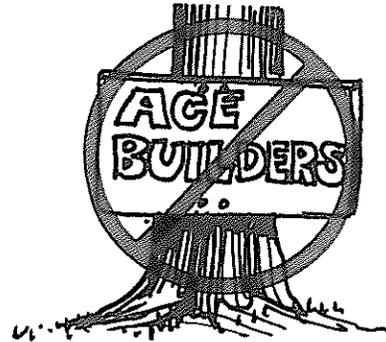
- ☑ Spread heavy plastic tarp where concrete is to be mixed or sheet rock will be cut. The alkalinity of these materials can change the soil pH.
- ☑ Read labels. Do not use wood products containing pentachlorophenol. These are deadly to roots. CCA-treated timber (greenish color) is a safer alternative.
- ☑ 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.

Above the Ground



Breaks and Scrapes

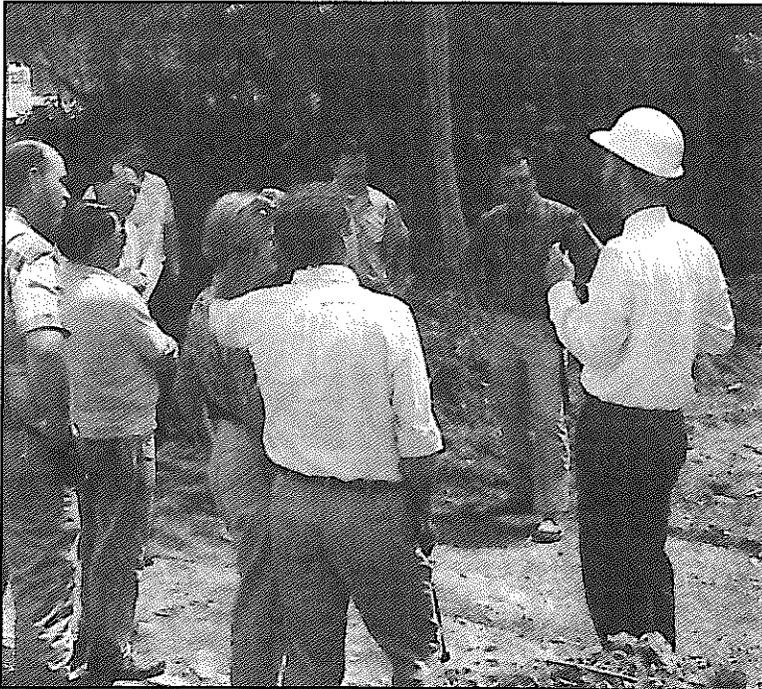
Even with barriers around trees, equipment sometimes breaks limbs or gouges tree trunks. Watch for damage and repair it promptly. See *Tree City USA Bulletin No. 2*.



Nails

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

Communication is Essential

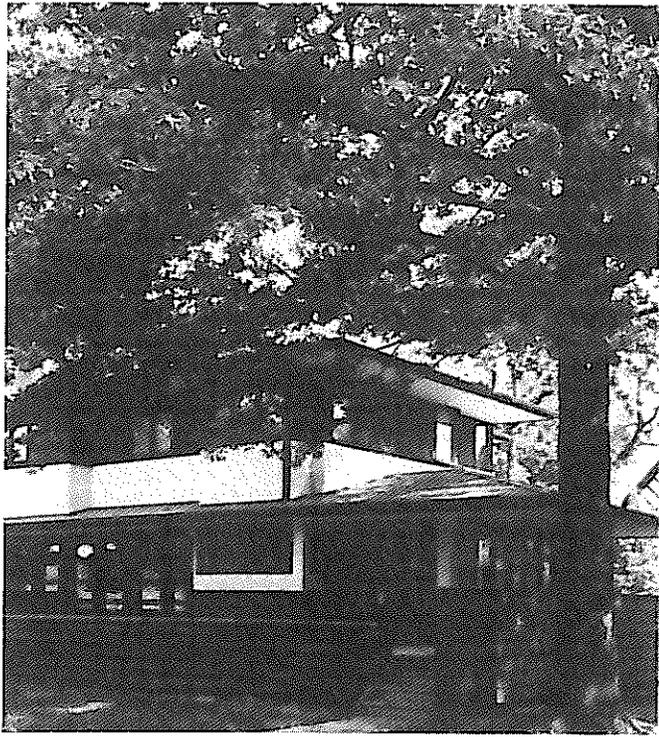


James R. Fazio

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 very 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.



To Save A Tree ...

When this house was recently constructed, the 30-year-old pin oak directly adjacent to it was kept vigorously healthy, a result of good planning and communications. These are the steps that were taken:

- 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.

A Word about 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 afterwards. Soil should be moistened to a depth of approximately 12-18 inches. A good rule of thumb is to slowly apply at least one 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.



Keep 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 build-up of leaves and old branches.
- making sure your roads and bridges allow access for heavy fire equipment.
- and, of course ... think! Prevent forest fires.

For more information about fire-safe construction, visit www.firewise.org. Click on Fire Wise Communities to learn more about wildland fire safety precautions on a broader scale and the Firewise Communities/USA program.

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:

1 Ordinances

Many communities have found it necessary to regulate the development of private property in order to protect the public-asset value of trees. This will be covered in more detail in a future *Tree City USA Bulletin*. However, there are alternatives to legal restrictions, and in most cases the benefits from enlightened private enterprise pay higher dividends to the community.

2 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. For example:

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 is in the catbird seat 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, it has been estimated that he or she can add 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, and 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 can come to naught.

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 denuded 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.

3 Public Action

Actions do speak louder than words and they 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.

Building With Trees Awards

In The National Arbor Day Foundation tradition of honoring individuals and companies whose actions demonstrate high ideals in tree planting and care, an awards program was created in 1998 specifically for builders and developers. Co-sponsored by the National Association of Home Builders, the purpose of the program is primarily to encourage the preservation of trees during construction. It does this by calling attention to the value of trees, showing what techniques can save trees, and focusing the public spotlight on projects where the job has been done in an exemplary way.

The Building With Trees recognition program has two phases. Builders and developers that plan and design projects in accordance with prescribed tree protection techniques – and sign a pledge to continue the commitment to trees during and after construction – are eligible for recognition they can use in their sales and promotion activities.

Once construction has been completed, projects may be entered in an annual competition that is judged by a jury of industry and urban forestry professionals. Awards are presented at the annual Building With Trees Conference at Arbor Day Farm's Lied Lodge & Conference Center. Again, the honor can be used by the company in future sales programs and in working with local government entities when planning future projects.

If you intend to build or to develop land, or if you know builders and developers who should know about this program, contact The National Arbor Day Foundation for a free copy of the program's entry form and award criteria. For fastest service, phone Member Services at 888-448-7337.



TREE CITY USA

Other Sources of Information

BOOKS

Trees and Development: A Technical Guide to Preservation of Trees During Land Development by Nelda Matheny and James R. Clark. This 200-page book includes case studies, detailed illustrations and helpful tables and charts. It provides a comprehensive look at saving trees during all stages of the development process.

Trees and Building Sites Conference Proceedings. 191 pp. on the topics of construction injury, mitigating tree and soil damage, site management practices, building designs, and ordinances.

International Society of Arboriculture
P.O. Box 3129
Champaign, IL 61826-3129
(<https://secure.isa-arbor.com/store1>)

HELPFUL VIDEOS

The following videos, available from the above address, are helpful either as training tools or for your own personal knowledge. Contact ISA for current prices.

Root Injury and Tree Health
Trenching and Tunneling & Utility Pruning (Set of two)

BOOKLET

Protecting Trees When Building on Forested Land
This excellent, 12-page, full color booklet is especially applicable in California and the west coast. It includes discussions of insect and disease threats that should be considered when building on a wooded lot. Single copies for sale at \$3.75 ppd. Phone for information on volume discounts. Order Pub. No. 21348 from:

ANR Publications
University of California
6701 San Pablo Ave.
Oakland, CA 94608-1239
(Phone: 510-642-2431)

TRAINING OPPORTUNITIES

Learn a system and specific techniques for saving trees during construction by attending a *Building With Trees Workshop*. For a list of workshop dates and locations, contact Conference Services, The National Arbor Day Foundation, P.O. Box 81415, Lincoln, NE 68501 or phone 888-448-7337.

TRENCHLESS TECHNOLOGY

For a look at the potential of drilling or boring in lieu of the more traditional (and damaging) digging of trenches, visit the Web site of a trade publication, *Trenchless Technology*, at www.trenchlessonline.com.

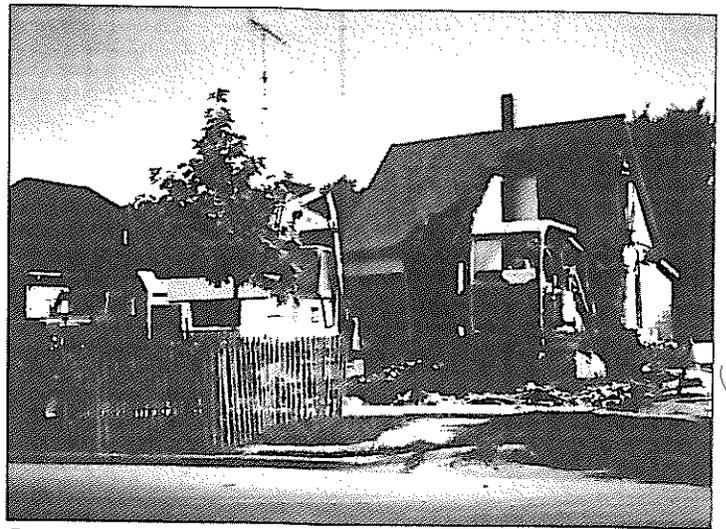
To join the Friends of Tree City USA ... to receive a subscription to *Tree City USA Bulletin*, and to become more involved in the urban forestry movement in your town and throughout America, send a \$10 dues-donation to Friends of Tree City USA, The National Arbor Day Foundation, 100 Arbor Avenue, Nebraska City, NE 68410. Make your check payable to The National Arbor Day Foundation.

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Fencing is just one of many techniques for saving trees that are shown in the videos described on this page.

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TREE CITY USA

The Tree City USA program is sponsored by The National Arbor Day Foundation in cooperation with the USDA 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: An Annual Community Forestry Program
- Standard 4: An Arbor Day Observance and Proclamation

Each winning 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 or The National Arbor Day Foundation.