

SAVING TREES ON CONSTRUCTION SITES¹

by Steve Clark

Proper planning, negotiation and coordination of design and construction procedures will save more trees on construction sites than trimming and fertilizing trees severely damaged by poor planning and construction procedures. Whether it be on residential, commercial, industrial, federal, state, county or city construction, the faint cry of "Save these trees!" is becoming louder. Whether our concern is over the threat of global warming, or simply for Aunt Lucy's backyard, we are all responsible for this earth created by God. The very least we can do is to be good stewards. We must be leaders in this area. Before this type of intervention can become widespread, however, our profession must look inward and improve and redirect its own educational systems.

We urban foresters and arborists must be leaders in a change of philosophy in the construction industry. Changing global conditions mandate that we, as a global community, stop sacrificing our remaining trees in the name of urban development. It is our responsibility, as arborists to plan, redesign, engineer and oversee construction procedures that save trees.

Ours is a profession which has developed a multitude of state-of-the-art tools, techniques and systems. We have done a fantastic job of creating specialties to handle tree removal, fertilization, trimming procedures and chemical treatment of trees on commercial, residential, industrial, retail and corporate sites. We have, to some extent, pooled our knowledge. What we must do now is apply this pooled knowledge with the specialties involved in construction at the very beginning, in the planning stages.

A growing section of the public is convinced that trees are important to almost every environmental setting. Today's forward-thinking client sees the preservation of trees as not only a way of retaining the natural beauty of a site and of holding onto the heritage of an area, he also sees trees as an economic benefit. I needn't tell you again all the benefits of trees because we have built enough

empires within the profession. I think we have beat some of the data to death. It is time to tell the various audiences what they need to know in their language.

It is not hard to convince our more informed clients, such as 3M, Exxon and Chrysler Corporation, of the benefits provided by green spaces. Many can now readily see the advantage of mature trees, along with new landscaping to enhance the forest.

These changes are going to affect all of us in this industry. I have testified on subcommittees in Washington, and met with city, county and state officials around the country, like many of you. A small, but growing, number of communities have actually designed ordinances which benefit trees, rather than the politics of the area. A few counties in Maryland, Georgia and other states for example, have designed some very workable legislation.

There are a lot of good, creative and intelligent people who are part of a growing cause: the promotion of green space in this country. As I speak around the country, I am delighted to see the people in the audiences who are more aware of their environment and who are eager to know more about their heritage and how to protect it. When they ask me what an urban forester does, I say, "I don't know about the rest of them, but, I help developers put sticks, stones, bricks, steel and concrete in the middle of a forest—with minimal disturbance to Mother Nature."

A multitude of media projects, including a recent National Geographic spread, have pinpointed the dangers of global warming and the importance of trees in countering this pending disaster. President George Bush has allocated money specifically to further the cause.

Now, we are not in the business of casting blame for past procedures. Then, and even now, the standard procedure has been to clear most, if not all trees, from areas designated for construction. After the building is complete, landscape

1. Presented at the annual conference of the International Society of Arboriculture in St. Charles, Illinois in August 1989.

companies replace the greenspace.

In the past, many contractors tried to save existing trees on construction sites. They roped off the areas, and insisted the trees not be harmed, despite the fact that this often meant more work. We have not, in the past, done a good job of communicating to them what our profession can do. What happened? Despite their efforts, after construction was completed, many of the trees died anyway. If the trees were going to die anyway, the most expedient route to take was to simply remove them in the first place, and then replace them later. That is a logical deduction based on the wrong procedural knowledge.

The problem is, even as I speak, contractors are making decisions based on the wrong information. I was giving a talk a few weeks ago in Alabama and a forester I have known for years came up to me after the talk. He said, "I always get excited about what you say, but I don't know what to do about it."

Trees are being needlessly destroyed across this nation. We, have failed to successfully communicate to them the principles for even a common sense approach. Today, the technology is here to save existing trees on construction sites, to save the valuable topsoil, and to coordinate physical construction on a site with the existing greenscape so that the future growth and health of the trees is insured.

I cannot stress enough that our whole philosophy must be that it is our responsibility to plan, redesign, engineer and follow through with construction procedures that will not kill the trees. When it comes to working with clients, we have on our side the dollars and cents of this issue. The technique we use at SC&A has amounted to a 25 to 100 percent savings in some landscaping budgets, depending on the project and other variables. A bonus is that when the building phase is complete, tree landscaping is native, hence low on maintenance, and looks as if it has been there for years—which, of course, it has. There is a certain amount of stability that comes with a large, spreading canopy.

On The Parkway project in Houston, for example, we identified a quarter of a million dollars worth of transplantable trees on the 400-acre site. An estimated \$50,000 worth of topsoil was

used on an all landscaped areas. On the Saturn project in Franklin, Tennessee, 800 existing transplants represented a quarter of a million dollars on the retail market. Exxon America headquarters saved thousands in landscape costs.

We are making headway with developing data base systems and management programs. It is our job now to educate with the best marketing and educational people in our field. What is best for the country is best for us. We must not get greedy or arrogant as we move into the limelight. We have been the "good guys" for a long time, and now it is time to move forward with both strength and humility. Society is now high-tech, and our message is what it wants to hear. People want to progress, but they also want what the book *Mega-Trends* calls "high touch."

The key is for us to have technical input at the planning stage of construction. We must convince the businessman or bureaucrat that the input of trained urban foresters and/or arborists is as important to a building project as the input of the engineer, architect, landscape architect, etc. It will take years and maybe even decades to earn this type of respect.

First, however, we must look within our own profession. The fact is, we have an education challenge. People are making major mistakes because our profession is not reviewing the initial plans. And, one very important reason is that our educational institutions are not producing specialists trained to do these very important initial evaluations.

We must train people to be in on the very earliest discussions of construction projects. We need to be familiar with the disciplines of engineering, construction management, architecture, landscape architecture, marketing and, yes, psychology. Winning reluctant builders over to this new way of thinking about trees will take a gentle hand.

Buildings and trees can co-exist, if this relationship is completely understood and the needs of the trees respected. The first step is a tree stand delineation. This general information about the forest will help to convince the planners in the conceptual stage to save the right trees in the right place for the right reason.

After the general concept is complete, SC&A

goes to the second step, which is design development. Trees that are worthy of consideration are accurately surveyed. They are then plotted on a base map along with the root system size.

The third step is a general review of all the project design parameters with all of the professionals involved. A tree preservation seminar is held to give them basic principles. These professionals are normally architects, landscape architects, planners, engineers (civil, structural, soil), and occasionally a geologist. Once we have negotiated a design that harmonizes with nature, then we go to the construction people.

The fourth step is negotiating engineering and construction procedures that will create minimal damage to the trees.

Much detail goes into all phases, but probably more in construction than any other. Some of the items are:

1. Tree treatment—Trimming, chemical treatment, watering, mulching, guying, wood chips for trails, root pruning, aeration systems
2. Tree protection signage
3. Fencing and land mine placement
4. Clearing coordination and procedures
5. Grading design and procedures
6. Utility design and equipment used
7. Walks, drives, streets
8. Building—Scaffolding, clearance, painting, construction corridors, subcontractors work areas, material storage, dynamite use

The list goes on to over 100 items. The common practice of trying to save trees severely damaged during construction by trimming and fertilizing them later simply does not work. With proper planning, engineering and coordination, we need not severely damage them in the first place.

This is only the beginning of the foresters' involvement with a project. Once the plans have been finalized and the tree preservation plan is in the documents, a seminar is held for all construction personnel. Unless they understand the process of tree preservation, all or much of the planning can be undermined.

It has been my experience that once the on-site workmen understand that we now have the technology to save the trees, but we cannot do it without their cooperation, they are almost always willing to help. In every case, an esprit de corps

develops between the workmen and the urban forester, resulting in a team effort which enhances the project.

Our country is blessed with some great inventions which, if used properly, make our job easier. For example, we use a hydro-ax, which resembles an oversized lawnmower. It utilizes a 600-pound blade spinning at 1000 rpm's to cut undesirable vegetation to within 3 inches of the ground, grinds it into chips and redeposits it on top of the undisturbed topsoil. This mulch effectively protects both the topsoil and tree roots during construction and prevents erosion as well. On projects where explosives must be used, trees can be protected by using more charges than usual, but each containing less explosives. Wherever possible, we substitute the use of a rock saw to cut rock, rather than dynamite.

The loss of many trees on construction sites is due to the results of soil compaction. Roots may extend three times the distance of the leaf canopy, often in irregular or uneven patterns. We perform sample digging to determine the extent and direction of the main system. These areas are marked as "off limits" to heavy machinery with barbed wire fences, land mines and 6'6" foresters with shotguns. Hand grenades are also extremely effective. Another protective measure is a geotextile sandwich with 4" to 6" of rock between the layers of fabric. Aeration systems often are installed to prevent suffocation of a tree.

Where it is not possible to protect the expensive topsoil, it is removed and stored for later use. Excess topsoil on our projects is often sold. Just think how much valuable topsoil is continually being totally destroyed on construction sites every day. It takes generations to build topsoil and we can destroy it simply by pulling a lever.

Root pruning procedures are imperative. We use a vibratory knife to sever the roots. In other cases, we have successfully used a rock saw to cut in rocks as well as soil.

When all else fails, many times transplanting is in order. We have moved thousands of trees from 4" to 10" in diameter and a few that weighed over 80 thousand pounds. Over the past 16 years, we have saved trees in 23 states, with a survival rate of 95 percent. Some trees are left on site, utilizing a wide variety of techniques to protect them from

construction. Others are moved off-site to holding areas.

In the case of large construction projects, many of our clients now view tree preservation as a part of their economic future as well. They often maintain their own "tree farms" on land designated for future development. Trees are planted in rotation in relation to the "land use" plan. Many are transplanted and some remain in place as part of the landscape.

This new broad vision of the urban forester will be more and more in demand in the future.

Our profession knows the tree and all of its life functions. We must learn to harmonize our construction with the existing trees to create a successful, well-designed, well-managed urban forest. We can no longer afford the environmental

costs of losing part of our heritage.

Summary. Good, honest, well-meaning people are making wrong decisions every day. The result is the destruction of millions of trees every year which are being replaced with a sea of concrete. The reason for the decision is plain and simple: Ignorance." Why? We haven't educated the public well enough. I know some organizations and a few individuals are doing a super job of developing awareness, but, we need to move in strength. Stewardship of this land is everyone's responsibility.

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Abstracts

SCHOENEWEISS, D.F. 1988. **Low-temperature stress and cankers.** *Am. Nurseryman* 168(9):69-75.

Every year, injury due to low temperatures occurs to some extent. Species planted north of their natural hardiness zones are most frequently damaged. A plant's ability to withstand low winter temperatures begins to develop as the days of late fall shorten and dormancy sets in. Much, if not most, winter injury follows rapid, radical temperature drops to below-freezing levels following extended mild fall weather. To survive low midwinter temperatures, most hardy woody plants need to be exposed to temperatures at or below freezing for some time before they become fully acclimated. In many cases, the sensitivity of plant part to low temperatures limits the plant's geographic or economic use.

BROWN, C.L. 1988. **How the environment affects pesticides.** *Am Nurseryman* 168(9):77-79.

Poor results with pesticides are sometimes caused by environmental factors. Sunlight, alkaline water and soil microorganisms destroy certain pesticides. Runoff, vapor drift and leaching may move pesticides away from target sites. Absorption is the binding of chemicals to soil particles. Absorption of a pesticide varies with the properties of the chemical. Volatilization occurs when solid or liquid changes into a gas. Some pesticides, when applied to soil, plants or water may convert into a gas and drift away. Runoff is the movement of chemicals in water over a sloping surface. It can carry pesticides mixed in water or bound to eroding soil. Leaching is the movement of chemicals in water through soil. Too much leaching can move a pesticide beyond a target site, reducing control of the pest and increasing the potential of injuring plants and animals. Degradation processes usually destroy pesticides. One of the most common chemical degradation processes is hydrolysis. Understanding the environmental processes that influence pesticide movement and degradation can enhance both the effectiveness and the safety of pesticides.