

Tree preservation

▣ BY MARGARET CHANDLER ▣

A beautiful old tree is an asset to any home. Providing shade, wildlife habitat, and immense charm, it is worth the effort to retain these valuable natural resources on a construction site. Building around these trees is a collaborative process and requires cooperation of the builder, architect, structural engineer, and arborist, if needed.

A good rule of thumb in working around trees is the “drip-line” rule. Consider any roots below the drip-line, or outer circumference of the tree’s canopy, plus about 10 to 20 extra feet to be untouchable. This is your “root-protection zone,” or RPZ. Erecting a barrier around this zone is the best way to ensure that this crucial area remains un-damaged. Vehicles should not park or drive here, it should not be used as a regular footpath, and materials or trash should never be stacked in the RPZ. The soil around a tree’s root system must remain porous, allowing air and water to percolate through the soil. Using the area beneath a tree for parking or material storage prevents water from reaching the root system.

A few new construction tips:

■ Establish root-protection zones before construction begins and ensure that these are respected

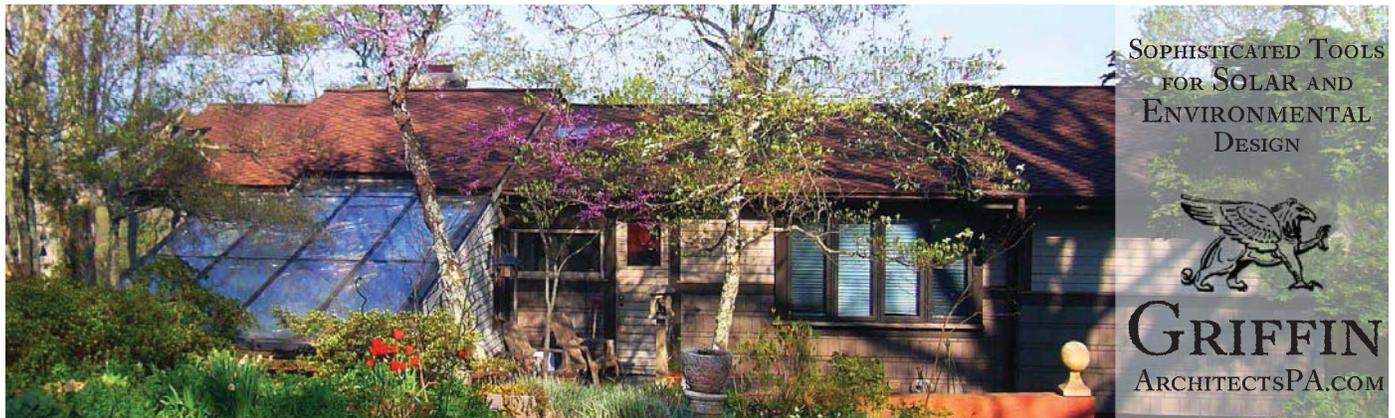
throughout the construction process. Simple fences provide a good visual barrier to prevent encroachment into the RPZ.

■ Place a four-to-six-inch protective layer of chip mulch within the barrier. It is likely that clearing the rest of the lot will provide the chip mulch material, with no purchase necessary.

■ If the RPZ must be breached, create a temporary driving path with plywood sheets laid out in tracks through the potentially impacted area.

■ If footings must be installed within the RPZ, maintain as much distance from the trunk as possible. Trenchers are never to be used within the RPZ - they rip the roots, exposing large portions of root to rot and decay. Any digging within this zone should be done by hand. This way, roots can be dug around or cleanly cut, if required. A clean-cut root is more likely to heal than a mangled one, increasing the nearby tree’s chance of survival.

If there are conflicts between existing root structures and footings that cannot be surmounted by thoughtful design, there are ways to work around these root structures. While not guaranteed to preserve the tree, they can at least increase the chances that the tree will survive construction. Some roots may be sacrificed in the process, but if conducted responsibly, the tree will live long enough to gen-



The 6' diameter trunk is less than 5' from the kitchen window. Brooke Tate, Samsel Architects photo

erate other roots to make up for the lost structure.

Let's look at one home as an extreme case study. On a recently completed a renovation to an existing home from the 1920s, there was a massive white oak tree approximately 5 feet from the kitchen window, and the homeowners wanted more kitchen space. Aside from the home itself, the tree's presence was the site's main feature, with a canopy 100 feet in diameter and a trunk 6 feet at its widest. Sacrificing the tree was out of the question, but locating the kitchen expansion elsewhere was not financially feasible. As a compromise, a large portion of the house adjacent to the kitchen was demolished, and most of the kitchen function was expanded in this direction. Even with this design compromise, construction of new footings was required.

The next step was hiring a professional arborist to evaluate the tree and determine whether it was a viable candidate to be saved, or if any nearby construction would be detrimental to its long-term health. It was determined that this tree could withstand the stresses of nearby construction, but it did require stabilizing. The trunk naturally forked into two sections about 5 feet above the ground, and six cables were required to tie the two sides together and prevent the trunk from splitting in two.

Footings installation was the most critical part of the construction process. Footings were designed to be as small as structurally permissible. The engineer recommended hand-excavated pier footings with reinforced grade beams, rather

than slab-on-grade or crawl space, to minimize disturbance to the surrounding soil. After digging began and actual root locations were determined, this design was adapted to minimize root damage. Roots near footings were given a 4" minimum clearance, to allow for future root growth without disturbing the foundation.

The tree roots that were exposed during footing excavation needed careful attention. The arborist was on-site all day during footing construction, ensuring that the correct measures were being taken. Before any concrete was poured, exposed roots were wrapped in a protective PVC sleeve with a few inches of extra space between pipe and root. This extra space was filled with topsoil, and the seams in the pipe were sealed with duct tape. Once these precautions were in place, rebar was carefully placed in the hole beneath the roots. The concrete footings were poured, and construction proceeded as normal.

While it does require significant effort, retaining existing trees on a construction site integrates the building with its environment. Tree protection practices can be effectively utilized on a standard construction site, and the owner will benefit from the results for years to come.

Margaret Chandler is a nearly-licensed intern architect with Samsel Architects. She has worked in sustainable design since earning her degrees at Clemson University, and briefly lived in a treehouse off the grid in Austin, TX. Margaret currently serves on the WNCGBC Board of Directors and the AIA AVL Executive Committee.

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