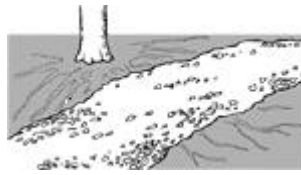


that location is off limits. Plan in advance locations for storage of excavated soils and parking. Activities that one would think would never occur such as burning of materials and dumping of toxic fluids (paint thinner, gas) routinely happen next to the trunk in the shade of a tree's canopy.

**Don't Trench the Roots!** Great damage may occur when trenching for utilities and foundations or where grade lowering is performed close to the trunk of the tree. Each root that is cut reduces the tree's ability to supply water and nutrients to the leaves. Trenching within a few feet of the trunk of the tree can reduce the functional support system of the tree and create a **hazard** or "**high risk**" tree. Reroute utilities outside of the critical root zone (CRZ) or require them to be "tunneled". If trees cannot be safely preserved then they should be removed **prior** to construction.

**Don't Change the Grade!** When soil is cut away near a tree, portions of the tree's roots are cut away as well. Likewise, if fill is added near a tree, portions of the tree's roots are smothered (tree roots need oxygen too). Changes in grade also may influence the water table and the amount of water available to the tree. Retaining walls are often the best way to preserve larger amounts of existing grade around trees. Retaining walls can be used whether the area next to the tree is excavated or filled.

**Don't compact the soil!** Soil compaction occurs when equipment passes over the soil and squeezes out the air spaces leaving no source of oxygen for the roots below and no pore space for water. In dense compacted soil, roots cease to function and die. Where construction traffic cannot be avoided, a layer of 10 –16 inches of



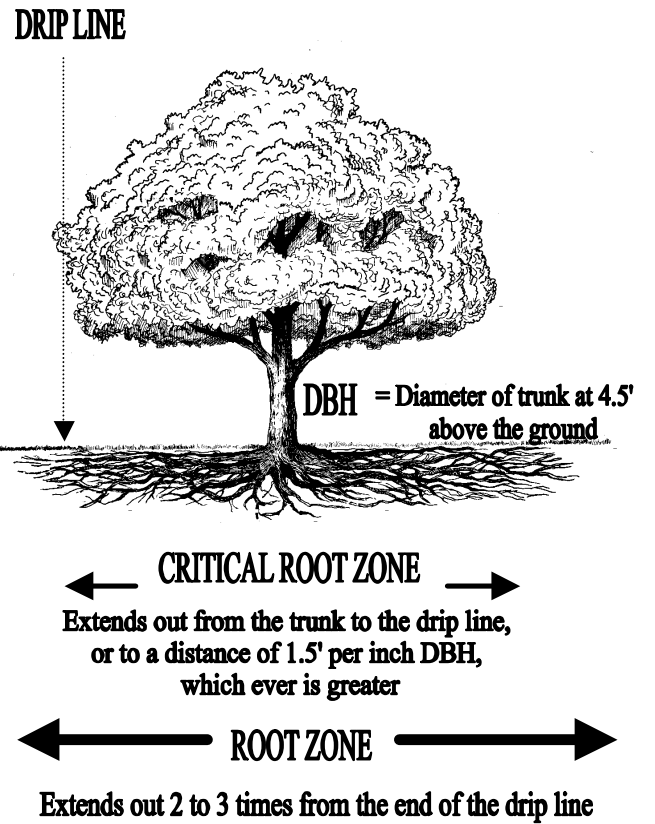
"Mulch pad" over critical root zone (CZR) of tree.

wood chips topped with heavy, non-skid surfaced plywood or chain link fencing panels can be placed in the area to be compacted.

For information on selecting a *Certified Arborist* in your area go to the International Society of Arboriculture (ISA) website @ <http://www.isa-arbor.com> and click on "Find an Arborist".

For more information about tree preservation and protection, contact the **City Arborist** @ 703.248.5183 or the **Urban Environmental Inspector** @ 703. 248. 5105 and request "The City of Falls Church Tree Preservation Standards and Specifications".

# Tree Preservation During Construction



So you want to save some of the trees on your property? The City has created this brochure to help you understand how to preserve trees during construction.

Every year, large numbers of trees are damaged by construction activities. In many cases, the construction damage trees sustain is preventable when tree preservation is incorporated into the design and building phases of construction. Even the smallest amount of construction activity, such as a bob cat driving over the root system of a tree, has irreversible impacts. Trees have a slow metabolism so it sometimes takes several years for the effects of construction damage to show.

Large mature trees are less able to cope with changes to their environment and are even more susceptible to damage. Once trees are damaged beyond repair there are immediate financial and other consequences such as the cost to remove the tree and loss of environmental benefits such as cooling and air pollution reduction.

It is not true that the tree root's are a mirror reflection of the tree's canopy above ground or that trees have big tap roots that look like carrots. Ninety percent of the tree's root system is found in the top two feet of soil. Sensitive specialized "absorbing" roots are located in the first 8-12 inches where water and oxygen can readily penetrate. Roots require both water and oxygen to grow and function. Roots function to support and anchor the tree.




### 3 Steps to Tree Preservation


1. **Plan Ahead** – In order to incorporate tree preservation in the design process, you will need to hire a *Certified Arborist* to perform a site and tree evaluation. An Arborist will be able to tell you which trees have the best chance to survive during and after construction.


Construction around trees can be done successfully when it is a part of the design process. Not all trees are worthy of saving especially if they may become liabilities for future homeowners. Your *Certified Arborist* will assist you with these decisions. It may be more desirable in the long run to remove trees prior to construction and plant new trees after construction is completed. However, when valuable mature trees are present, the effort and expense to preserve them is worthwhile. Mature trees take many years to grow and their environmental benefits are exponential in comparison to smaller trees.


2. **Design Your Project to Accommodate Tree Preservation** - Some things to consider when evaluating the site and its trees include:

 **Protect the Critical Root Zone (CRZ)**  
The best way to protect trees on a construction site is to avoid disturbing the roots within the critical root zone (CRZ). The CRZ of a tree extends well beyond the spread of its branches. The CRZ is a function of tree size, health, and how the species responds to construction damage. For example, the critical root zone of a young, vigorous red maple (tolerant to construction damage) is much smaller than that of an old, declining yellow poplar (low tolerance for construction damage).

Generally, the CZR can be calculated as 1.5 X the diameter at breast height (DBH) of the tree. As an example, a 20 inches DBH tree would require 30 feet of area of no disturbance. The size of the critical root zone should be adjusted according to the specific tree and site factors. The tree preservation fence must protect the CRZ.

 **Root Prune Trees that are to be Preserved**  
Root prune along the CRZ where there is construction activity such as grade changes. Roots are cut with a specialized machine that provides for a cleaner cut than with a backhoe. When roots greater than 2 inches in diameter are exposed, they should be further pruned by hand using a sharp hand saw. New roots will regenerate at the point of this cut.

 **Groups of trees**  
Preserving stands of trees or "tree save" islands is encouraged because groups of trees often tolerate construction disturbance better than individual trees.

 **Transplanting Trees**  
If a good quality tree needs to be removed because it is located where construction activities are planned, look for opportunities to transplant it to another location on the site. This works best for small trees less than 10 inches diameter at breast height.

3. **Protect Trees During Construction**  
Construction activities such as trenching, slope cut, soil compaction, grade changes and stock piling of materials damage trees. Please note the following protection measures:

**Don't Forget To Install Tree Preservation Fencing!** Tree preservation fencing is the most effective technique to preserve the existing conditions around the tree. Fencing types can be 48 inches high 14-gauge welded wire secured on 2 inches metal posts or 6 feet high chain link fence on moveable blocks. Fencing must be installed prior to the entrance of any equipment on the site. Securing "Keep Out, Tree Save Area" signs onto the fencing alerts workers that