6.0 Tree Protection and Construction

Protecting existing trees during construction has a profound impact on the longevity of the tree and may determine whether the tree lives or dies. The goal is to reduce the negative impacts of construction on trees before, during and after project completion to a less than significant level.

Mature trees have been established in their preexisting physical environment. Disruption of this environment by construction activities interrupts the tree's physiological processes causing depletion of energy reserves and a decline in vigor, often resulting in the tree's death over time. It is important to note that it may take years for a tree to decline due to damage caused during construction, leaving the property owner with a large dead tree to remove.

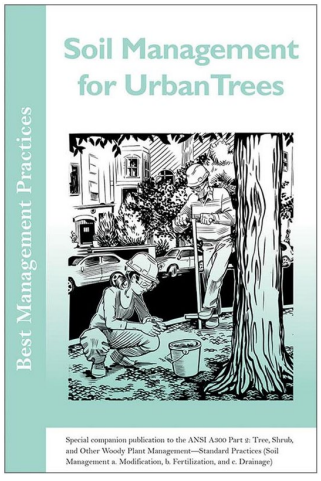
6.1 City property

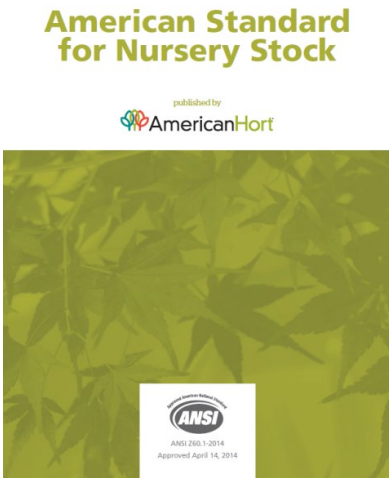
10.136 - Conservation and Maintenance of Protected Trees During Construction or Other Disturbance.

(a) ***City property****. Except as provided in this section, trees on city property:*

(1) must be established and maintained in accordance with ANSI A300 standards for tree care operations and the ISA Best Management Practices; or

(2) the American Standard for Nursery Stock Z60.





(b) ***In general.*** *Where a property owner plans to retain protected trees on a site to be developed or otherwise disturbed in a manner that may affect protected trees, the following requirements must be met:*

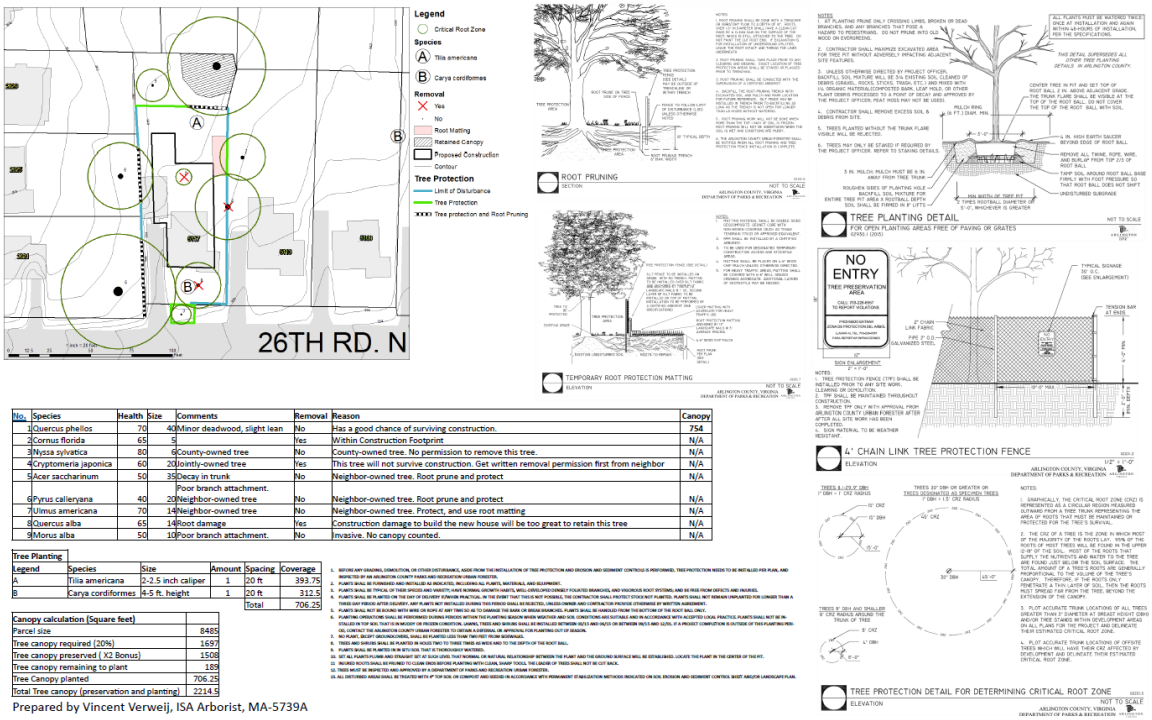
6.2 Before Construction

(1) Tree protection plan

in general. A tree protection plan submitted to the building official must meet the specifications found in ***ANSI A300 Standards for Tree Care Operations****, as amended, and* ***ISA Best Management Practices****.*

(2) Tree protection plan additional requirements. A tree protection plan must include the following:

(A) A ***site plan*** *drawn to scale, indicating the location of land disturbance, clearing, grading, trenching, tree protection zones (TPZ), general projection of the tree canopy area over the property, proposed underground utilities, staging areas for parking, material storage, concrete washout, and debris burn and burial holes where these areas might affect tree protection, and areas where soil compaction is likely to occur in a tree protection zone due to traffic or materials storage.*



No.	Species	Health	Size	Comments	Removal	Reason	Canopy
1	Quercus phellos	70	40	Minor deadwood, slight lean	No	Has a good chance of surviving construction.	754
2	Cornus florida	65	5		Yes	Within Construction Footprint	N/A
3	Nyssa sylvatica	80	6	County-owned tree	No	County-owned tree. No permission to remove this tree.	N/A
4	Cryptomeria japonica	60	20	Jointly-owned tree	Yes	This tree will not survive construction. Get written removal permission first from neighbor	N/A
5	Acer saccharinum	50	35	Decay in trunk Poor branch attachment.	No	Neighbor-owned tree. Root prune and protect	N/A
6	Pyrus calleryana	40	20	Neighbor-owned tree	No	Neighbor-owned tree. Root prune and protect	N/A
7	Ulmus americana	70	14	Neighbor-owned tree	No	Neighbor-owned tree. Protect, and use root matting	N/A
8	Quercus alba	65	14	Root damage	Yes	Construction damage to build the new house will be too great to retain this tree	N/A
9	Morus alba	50	10	Poor branch attachment.	No	Invasive. No canopy counted.	N/A

Tree Planting					
Legend	Species	Size	Amount	Spacing	Coverage
A	Tilia americana	2-2.5 inch caliper	1	20 ft	393.75
B	Carya cordiformes	4-5 ft. height	1	20 ft	312.5
				Total	706.25

Canopy calculation (Square feet)	
Parcel size	8485
Tree canopy required (20%)	1697
Tree canopy preserved (X2 Bonus)	1508
Tree canopy remaining to plant	189
Tree Canopy planted	706.25
Total Tree canopy (preservation and planting)	2214.5

Prepared by Vincent Verweij, ISA Arborist, MA-5739A

https://rtectreecare.com/tree-protection-construction/

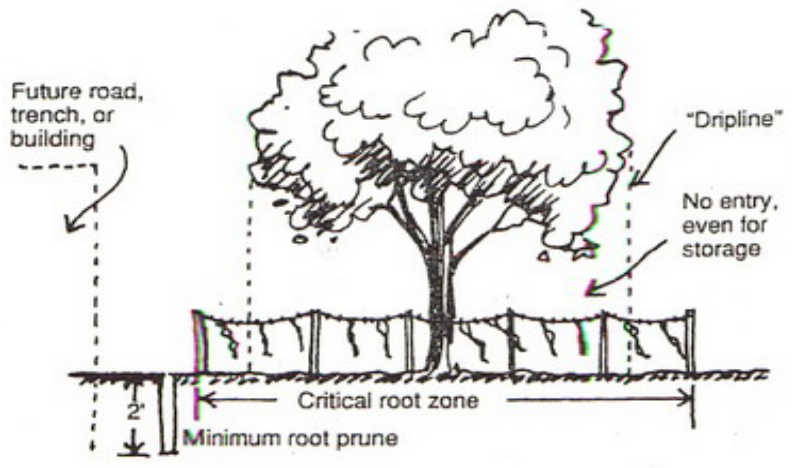
*(B) A complete **tree survey** in accordance with the requirements set forth in Section 51A-10.132, or a **forest stand delineation** approved by the building official. Significant and historic trees must be specifically designated on the survey.*

				With a Qualified Tree Professional			
species	*condition*	*dbh"*	*Mitigation "*	*species*	*condition*	*dbh"*	*Mitigation "*
red oak	fair	21"	21"	red oak	fair	21"	21"
cedar elm	fair	16"	16"	cedar elm	poor	16"	0"
hackberry	dead	11"	0"	hackberry	dead	11"	0"
		TOTAL: 48"	TOTAL: 37"			TOTAL: 48"	TOTAL: 21"

*(C) Detailed drawings and descriptions of any of the following **tree protection measures** that will be used during development.*

*(i) **Tree protection fencing**. Tree protection fences must be constructed within the development impact area unless an alternative is approved by the building official on the tree protection plan.*

(aa) Except as provided in this subparagraph, tree protection fences must be a minimum of four feet high, constructed with adequate, durable material (e.g. orange plastic construction fencing) approved by the building official, and located at the drip line or the edge of the critical root zone, whichever is farthest from the trunk, unless the building official determines that a fence line closer to the trunk will not be likely to result in damage to the tree. The building official may require an expansion of the critical root zone or approved encroachment. Once established, the fence line must remain in place as approved.



(bb) Tree protection fences located in the development impact area within 15 feet of construction activity must be a minimum of six-feet-high and constructed of chain-link, wire-mesh, or wood fence materials, and be solidly anchored to the ground ***if****:*

(I) a required tree protection fence located within the critical root zone of a protected tree on the property is determined by the building official to be in violation of this subsection;

(II) a significant or historic tree is located within a development impact area;

(III) a tree preservation plan for sustainable development incentives is designed for the preservation of protected trees within the area of construction activity; or

(IV) tree canopy cover credit for single family or duplex uses is applied to protected trees in the construction activity area.

PROTECT THE TREES. PROTECT THE HOMEOWNER.

Whenever any work is being done contrary to the provisions of this division, the building official may order the work stopped by notice in writing served on any person engaged in the work or causing the work to be done. A person issued this notice shall stop work immediately until authorized by the building official to proceed with the work. – Sec. 51A-10.137(a).

(ii) ***erosion control fencing or screening****. All protected trees or stands of trees, and tree protection zones must be protected from the sedimentation of erosion material. Silt screening must be placed along the outer uphill edge of tree protection zones.*

(iii) ***tree protection signs****.*

(iv) ***transplantation specifications.*** *Trees to be transplanted on property, or relocated from a remote property, must conform to the specifications found in* ***ANSI A300 Standard for Tree Care Operations****, as amended.*

(v) ***tree wells, islands, retaining walls, and aeration systems****.*

(vi) ***tree specifications.***

(vii) ***canopy and root protection.***

(viii) ***protection.***

(ix) ***and site watering plan.***

(c) ***Clearing.*** *For clearing invasive, exotic, or unprotected vegetation on a building site, a forest stand delineation is required. The building official may require a tree protection plan to be provided on all or a portion of the building site.*

6.3 During Construction

General Maintenance

Trees are stressed during construction, minimizing other impacts will decrease adding stresses. Impacts may include but are not limited to fertilization and pruning. Although pruning of a broken or damage limb may be necessary, proper pruning is critical. For pruning standards, see Section 2.

Treatments such as soil fluffing can decrease compaction, and thus increase water percolation to the roots.

(d) ***Implementation of tree protection plan.***

(1) The responsible party must install and maintain all tree protection measures indicated in the approved plan prior to and throughout the land disturbance process and the construction phase.

(2) No person may disturb the land or perform construction activity until the required tree protection measures have been inspected by the building official.

(3) The responsible party must mulch areas where soil compaction is likely to occur as indicated on the plan with a minimum four-inch layer of wood chip[s] mulch, or by other options listed in ISA Best Management Practices, or methods and materials recommended by a consulting arborist and approved by the building official.

(4) If a cut is made to the root of a tree that is not intended to be removed or seriously injured as indicated on the plan, the cut must be made at a 90 degree angle.

(5) The responsible party must tunnel utilities if utilities are to run through a tree protection zone, rather than being placed along corridors between tree protection zones.

(6) The responsible party must provide water to the tree protection zone (TPZ) as needed due to weather or site conditions, with penetration between six and 18 inches of soil.

Additional measures to take during construction for a sustainable work site:

Prohibit or restrict access to TPZs
Review tree protection plans, activity restrictions. Ensure activities such as storage, vehicle services, parking, placing port-a-let, etc…DO NOT take place within the TPZ, per City Code ??

Monitor trees
Use professionals or trained staff to monitor tree health and inspect the TPZ on a monthly basis.

Monitor TPZ fencing
Ensure safety of pedestrians. Ensure it is structural safe as to not cause property damage or personal damage.

Optimize tree health – assign a responsible person or hire a professional to complete regular tree maintenance tasks, including watering, fertilization, and mulching to protect tree roots

- Watering –*see below*
- Mulching - During construction, wood chips may be spread within the TPZ to a 4-to 6-inch depth, leaving the trunk clear of mulch to help inadvertent compaction and moisture loss from occurring. The mulch may be removed if improvements or other landscaping is required. Mulch material shall be 2-inch unpainted, untreated wood chip mulch or approved equal.
- Root Buffer. When areas under the tree canopy cannot be fenced, a temporary buffer is required and shall cover the root zone and remain in place at the specified thickness until final grading stage
- *Vertical mulching – may be required to improve the vigor of the tree before and during construction. Drill 2" – 4" holes approximately 18" – 24" deep within the TPZ and fill with compost.*

(e) ***Damage to protected trees.*** *Where the building official has determined that* ***irreparable damage*** *has occurred to trees within tree protection zones, the responsible party must remove and replace those trees. The building official may determine that irreparable damage to a tree has occurred based on, but not limited to, the following factors:*

(1) site evaluation;

(2) visible extensive damage to a tree root system;

(3) extensive soil compaction around the tree protection zone;

(4) visual evidence that required tree protection has been removed or is in disrepair; or

(5) a tree risk assessment by a consulting arborist that includes the current condition and proposed remedial measures.

(f) ***Topping.*** *Topping is not an acceptable practice.*

Why Topping Hurts Trees (ISA)

https://trinitytreewv.com/proper-pruning/

6.4 After Construction

Continued care for the site - remove tree protection zone fences, prune any damaged limbs, and continue maintenance care. For pruning standards, see *Section 4 Tree*

Specification, Planting and Care. Loosen topsoil in areas compacted by construction activities. Avoid fertilization for the first year following construction.

* After trees are established: as the majority of feeder roots are found at and outside the edge of canopy, water should be applied in this area. 10 to 20 gallons of water once every two weeks or so only if it does not rain

Deep infrequent watering versus frequent watering. Since most tree roots are found in the top 12-16 inches of our soils, this is the depth that should stay moist (not saturated) in between watering's.

Examples of common watering needs for established trees in Dallas under normal weather and soil conditions:

WATER NEEDS	Summer watering interval	Tree species
LOW	<90°, twice per month >90°, once per month	Texas red oak sumac cedar elm Texas persimmon American smoketree mountain laurel
MODERATE	<90°, once per week >90°, twice per week	American elm chinkapin oak Eve's necklace buckeye
HIGH	Temp <70°, check soil for dryness, water only when soil is dry 70° - 80°, once a week 80° - 90°, twice per week >90°, three times per week	southern magnolia

http://www.cad.com.au/images/misc/tree-protection-zone-sample-elevation-view-plan-view-sample.gif

http://www.greening.gov.hk/filemanager/content/images/tree_care/Design_for_Tree_Protection_Zone_e.jpg

Tree Technical manual

www.cityofpaloalto.org/civicax/filebank/documents/6436

North Carolina State University Cooperative Extension

http://content.ces.ncsu.edu/construction-and-tree-protection

North Carolina Forest Service

http://ncforestservice.gov/Urban/protecting_trees_during_construction.htm