Tree Canopy Conservation Ordinance
Administrative Standards

January 18, 2022

City of Decatur®

I. Introduction

The standards contained in this document are part of the *City of Decatur's Tree Canopy Conservation Ordinance* and provide detailed information on how the ordinance is to be administered and implemented. These standards, as well as industry standards and best management practices, are applicable to any and all protected trees, properties and activities required by the ordinance. However, the City Arborist at his/her discretion once approval is obtained from the UDO administrator per Chapter IV of the Unified Development Ordinance, Section 11.1.1. 2. A. may modify or waive any standards based on site or tree conditions, property owner circumstances, or for the incorporation of alternative green technologies on a site.

II. Industry Standards and Best Management Practices

Industry standards and best management practices exist for most tree care activities and have been developed and published by the American National Standards Institute (ANSI) and the International Society of Arboriculture (ISA). ANSI standards are designed to be used in the development of specifications for tree purchases and work to be performed on, and around trees. The best management practices are more user friendly versions of the standards development by ISA.

The latest version of the standards and best management practices listed below are available for purchase on the ISA website at www.isa-arbor.com (except for ANSI Z60.1 which is available at the Urban Forestry South website at www.urbanforestrysouth.org).

Standards

Z60.1 American Standard for Nursery Stock
Z133.1 –Safety Requirements (also available in Spanish)
A300 (Part 1) –Pruning
A300 (Part 2) –Fertilization
A300 (Part 3) –Supplemental Support Systems
A300 (Part 4) –Lightning Protection Systems
A300 (Part 5) –Management of Trees and Shrubs During Site Planning, Site Development, and Construction
A300 (Part 6) –Transplanting
A300 (Part 7) –Integrated Vegetation Management, a. Electric Utility Rights-of-way
A300 (Part 9) – Tree Risk Assessment, a. Tree Structure Assessment

Best Management Practices

Tree Pruning (also available in Spanish)
Tree and Shrub Fertilization
Tree Support Systems: Cabling, Bracing, Guying, and Propping (Revised)
Tree Lightning Protection Systems, 2nd Edition
Tree Planting (also in Spanish)
Integrated Vegetation Management
Utility Pruning of Trees (also available in Spanish)
Integrated Pest Management
Tree Inventories
Tree Risk Assessment

III. Tree Species List

The *City of Decatur Tree Species List* is included in Appendix A. It is referred to in the remainder of this document as the tree species list.

Those species approved for planting and eligible for the standard tree canopy cover credit are identified on the tree species list. All species on the list are approved for conservation, except for those listed as unacceptable due to their poor quality or invasive nature.

The tree species list includes the amount of standard tree canopy cover assigned to each approved species. Invasive and non-native, flowering ornamental trees that are ineligible for tree canopy cover credit are also identified on the list. Tree species acceptable for planting in parking lot islands are also identified on the list. Trees on the Georgia EPPC Invasive Species List, Category 1 or 2 shall not be planted or approved for canopy credit. https://www.gaeppc.org/list/.

IV. Tree Canopy Cover Credit

All existing, healthy trees greater than 4 inches Diameter at breast height, with the exception of invasive and non-native, flowering ornamental species, are eligible for tree canopy credit. Invasive species and non-native, flowering ornamental species are identified in the tree species list.

The amount of tree canopy cover on a site shall be measured in percent of the lot area that is covered by tree canopy, including canopy that projects over buildings and impervious surfaces. The canopy projected over and onto the applicant's property by a tree growing on a neighboring property may not be included in the measurement of total tree canopy cover for a site. Trees growing on City owned property or on the property line may be included

Trees planted outside but within 3 to 10 feet of the perimeter of a parking lot shall receive one-half of the standard tree canopy cover credit for the purpose of meeting the 45 percent requirement for parking lots.

New trees shall receive credit at the time of planting based on the tree canopy cover potential for the species at maturity, and in urban settings, as listed in Table 1 and the tree species list.

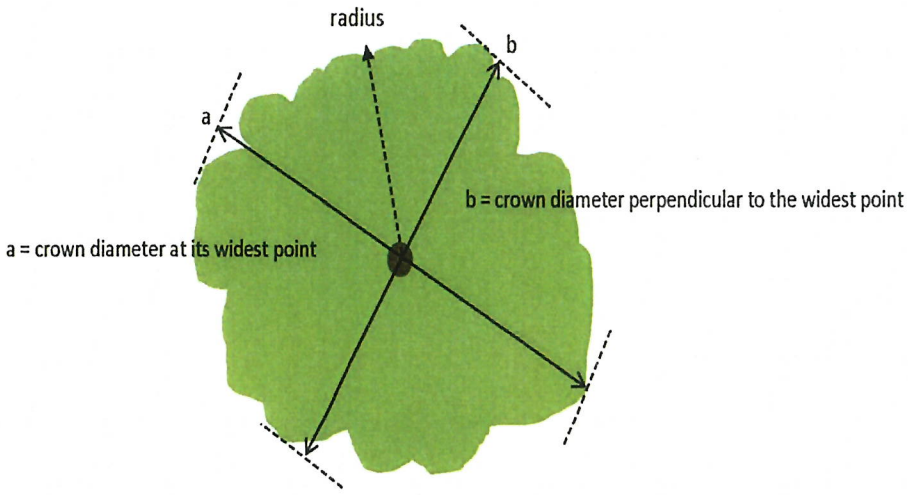
Table 1. Tree Canopy Cover Credit by Mature Canopy Size

Typical Mature Canopy Size	Tree Canopy Cover Credit
Large	1,600 square feet (SF) x 50% = 800 sf
Medium	900 SF x 65% = 585 SF
Small	400 SF x 80% = 320 SF
Very Small	150 SF x 80% = 120 SF

V. Measuring Tree Canopy Cover

The city's goal is to have a minimum 63% percent of the geographic area within the city limits covered by tree canopy. The city's tree canopy cover will be measured every 5 years using the latest satellite imagery technology. The measurements of tree canopy showed 57% tree canopy cover in 2009 and 57% in 2019. Measuring the amount of cover provided by trees on an individual property is a much simpler task than measuring the tree canopy cover across the city. There may be a need to measure just one tree, or the entire tree canopy cover on a lot.

For an individually growing tree with a crown that does not overlap other trees, it is first assumed that the outermost extent of the crown at the dripline will roughly form a circle when projected directly down onto the ground. This area beneath the tree's crown can be calculated using the formula for the area of a circle: radius squared times a constant of 3.14, known as *pi*. Since no tree canopy projection will be a perfectly round circle, the average crown radius will be used to calculate the area of canopy cover. ***See Figure 1 below.***



CALCULATING TREE CANOPY COVER

1. Measure the diameter of the crown at its widest point in feet (a).
2. Measure the diameter of the crown perpendicular to its widest point in feet (b).
3. Add those two diameters together, divide by 2 to get the average diameter.
4. Divide the average diameter by 2 to get the average radius.
5. Square the radius (r) and multiply by *pi* (a constant of 3.14) to get the canopy cover in square feet.

For example, if (a) is 65 feet and (b) is 55 feet, then:
65 feet + 55 feet = 120 feet, 120 feet/2 = 60 foot average diameter
60 feet/2 = 30 foot average radius
30 feet x 30 feet x 3.14 = 2,826 square feet

You can also calculate the square foot area of a tree's crown using the city's GIS mapping tool, OneMap Decatur.

To calculate this average, the width of crown is measured at its widest point in feet (round to the nearest foot), as it is projected onto the ground. Then the width of the crown in a perpendicular (crosswise) direction is measured. Add these two crown widths (diameters) together and divide by 2 to get the average crown *diameter*, and by 2 again to get the average crown *radius*.

This radius squared multiplied by 3.14 will equal the tree canopy cover for the tree, in square feet.

To measure the canopy cover of a group of trees or all trees on a lot takes a few additional steps. First map the projection of the canopy onto the ground on a plat or aerial photograph of the property. Measure and map the extent of the canopy in relation to the house and property lines by recording the distances from the property lines, buildings, and other structures. Calculate the square foot area by sectioning the canopy off into squares, rectangles, triangles or circles. Multiply the length by the width of the sections if they are a square or rectangle, multiply length by width and divide by 2 for a triangle, and use the formula for the area of a circle if more or less circular. Add the various sections together to calculate the total tree canopy cover in square feet.

The existing cover of a single or multiple trees can also be estimated by visiting the city's website and navigating to the city's GIS mapping page, One Map Decatur. Use the draw and measure tool to estimate tree canopy. This will be particularly helpful

when trees have overlapping crowns or they project over a house or other structure on the site. Note that the canopy of hardwood trees in the winter can be more difficult to delineate than evergreen trees. Include all the area within the outer extent of the branches of hardwood trees, but do not include the shadows projected from your trees that are outside of the dripline. Again, the canopy you may have to be sectioned off and each section measured added together to get a more accurate measurement and total tree canopy cover amount. Verify the measurements outside, on the ground, to make sure that no changes to tree canopy have occurred since the aerial photographs on the website were taken.

Once the total amount of tree canopy cover on a property has been measured, divide that total by the total area of the lot in square feet to calculate the percent canopy cover for the lot.

Foresters and arborists may also use an appropriately sized dot grid that can be placed over the top of an aerial photograph or map of a property to determine total tree canopy cover percent for a lot. All dots that fall on top of tree crowns are counted and divided by the total number of dots that cover the entire lot to arrive at an estimate of tree canopy cover percent.

For tree removal permits and tree plans, tree canopy cover must be estimated by a qualified professional using one of the methodologies described above, or other methodologies approved by the City Arborist.

VI. Measuring Tree Trunk Diameter

Foresters use a standard measurement methodology to determine the trunk diameter of a tree. This standard measurement is known as Diameter at breast height and is measured at 4.5 feet above the ground for trees that are not forked below 4.5 feet. Foresters often use a special diameter tape that while measuring the circumference of the trunk, it shows diameter inches on the tape. However, any tape may be used to measure the circumference of the tree and calculate its diameter. Once you have the circumference, divide by the constant *pi* to calculate the diameter. The diameter should be rounded to the nearest whole inch and if exactly between two numbers, then rounded to the lower whole inch.

When trees are forked below 4.5 feet, the trunk diameter should be measured at the smallest point below the fork. For multi-trunked trees, measure the largest trunk diameter, or if all trunks provide significant crown cover, then add the diameters of the individual trunks together to get the effective trunk diameter.

For example, a single-trunked has a circumference of 37 inches and the trunk diameter is:

37 inches divided by 3.14 = 11.783439 inches = 12 inches Diameter at breast height

VII. Tree Risk Evaluation

Tree risk shall be determined by a certified arborist with experience in evaluating tree condition and risk factors, and preferably by a certified arborist who is tree risk assessment qualified by the International Society of Arboriculture. Tree risk evaluation shall conform to current *ANSI A300 Standards for Tree Care Operations—Tree, Shrub, and Other Woody Plant Management—Standard Practices (Tree Risk Assessment a. Tree Structure Assessment)* and ISA Best Management Practices for Tree Risk Assessment or other industry best management practices.

A tree risk assessment shall be submitted with an application for tree removal or a tree conservation plan for any tree that is proposed for removal due to its risk of failure. The tree risk assessment shall be completed by a certified arborist and shall include the objectives of the assessment, the level of assessment performed, risk rating (low, moderate, high, or extreme) tree species, Diameter at breast height, tree canopy cover, description of tree condition, the type, severity, and location of the defect(s) present, presence or absence of reaction wood and compensatory growth, live crown ratio and crown density, site conditions and characteristics, site history, and past failure patterns. The City Arborist will determine if mitigation options other than removal exist prior to the approval of a tree removal permit or a tree conservation plan.

VIII. Tree Conservation Plan

A tree conservation plan shall be submitted with any application for a commercial tree removal permit or for a residential tree removal permit when impervious area or gross floor area is increased. The plan shall be prepared and certified by a registered forester, registered landscape architect, or certified arborist. A tree conservation plan shall include the following information as appropriate to the situation and as required by the tree ordinance, subject to the discretion of the City Arborist. Tree Canopy cover provided by existing trees as of (date of ordinance adoption) shall be conserved on a property to the greatest extent possible. Tree ratings must be listed on the tree protection plan for each existing protected tree. Tree ratings are to be performed by a certified arborist or registered forester. Transplanting Company contact information, location of temporary tree nursery or permanent tree location. At the City Arborist's discretion, a tree protection prescription can be developed by the City Arborist and can take the place of a tree protection design when a tree owner has a bonafide hardship and is unable to provide a tree protection design. The

development of a tree protection design as part of the tree conservation plan is required prior to the issuance of a tree removal permit.

A. Tree Conservation Plan Information

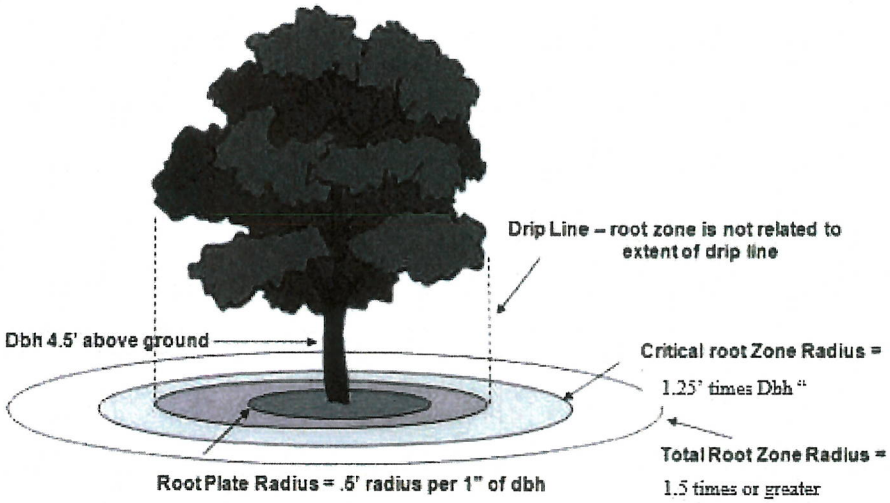
General Information:
Project manager name and contact information
Emergency contact name and 24-hour contact information
Name of the project certified arborist or registered forester
Proposed project starting and ending dates
Schedules for the implementation, installation, and maintenance of tree protection measures
Name and contact information for the individual responsible for monitoring tree protection and maintaining tree protection measures

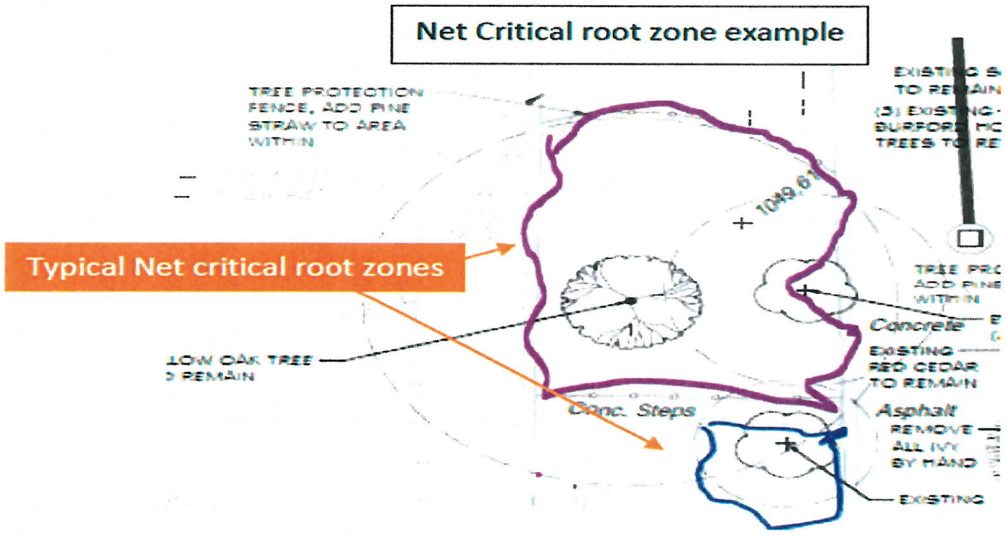
Site Plan:
Proposed Grading cuts, fills, and soil disturbance limits
Structure and egress locations
Location of any proposed hardscapes (pervious or impervious)
Underground utilities existing and proposed, pipes, conduits, including irrigation and electrical lines
Erosion control fencing
Equipment and vehicle ingress and egress corridors
Soil and materials storage areas
Construction trailer, portable toilet and other temporary structures

Location and Identification of:
Protected trees and their net critical root zones: proposed for conservation, proposed for removal, and proposed % of impaction
Trees proposed for transplanting (Transplant Agreement required)
List of all protected trees with species, rating, diameter at breast height and sqft of tree canopy cover
Protected Boundary trees, their net critical root zones, and proposed % of impaction
Tree protection design
Tree planting design
Tree canopy cover calculations showing:
Total tree canopy cover existing on the site calculated by percentage and square feet of canopy and total of lot square footage
Tree canopy cover to be removed
Tree canopy cover required at completion of project

Definitions for Root Zone Detail:

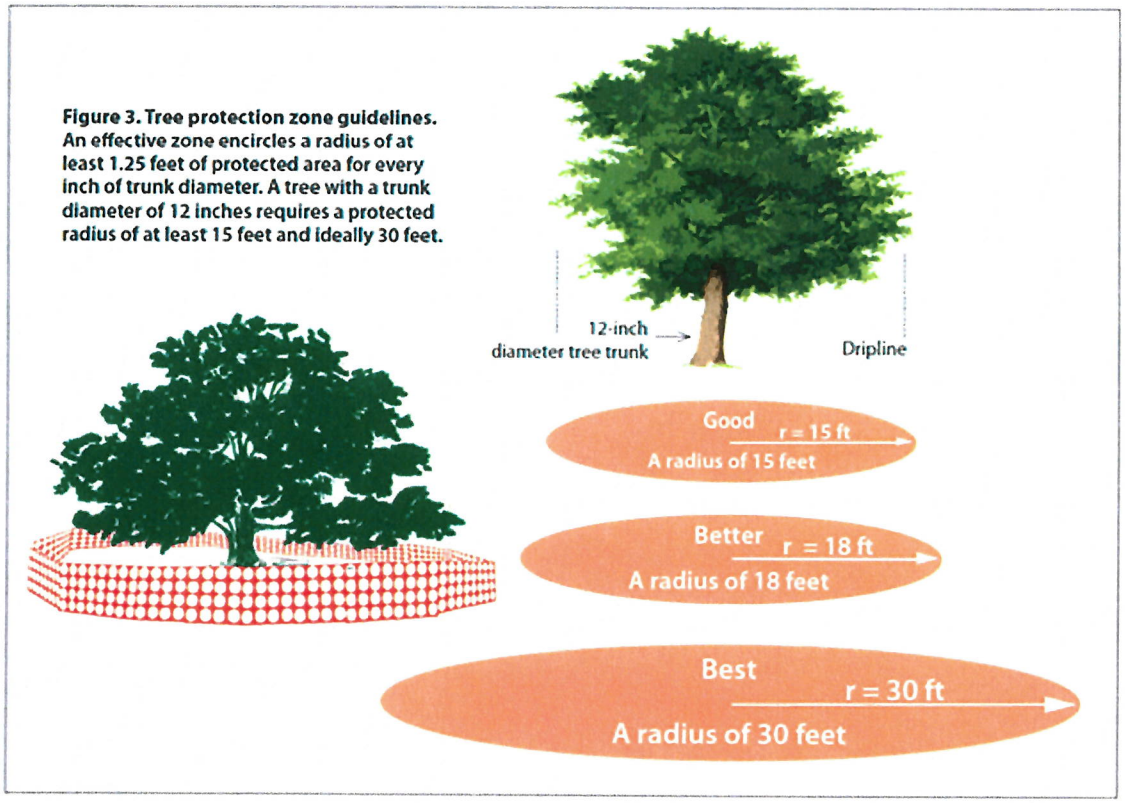
Tree Dbh – diameter breast height measured 4.5 feet above the ground.
Root Plate – area of rapid tapering roots supporting the vertical weight of the tree.
Critical Root Zone – a minimum root area needed to sustain a healthy tree.
Total Root Zone – Maximum extent of root area of healthy tree.
Drip Line – furthest extent of live branches: bears no relation to root zone.



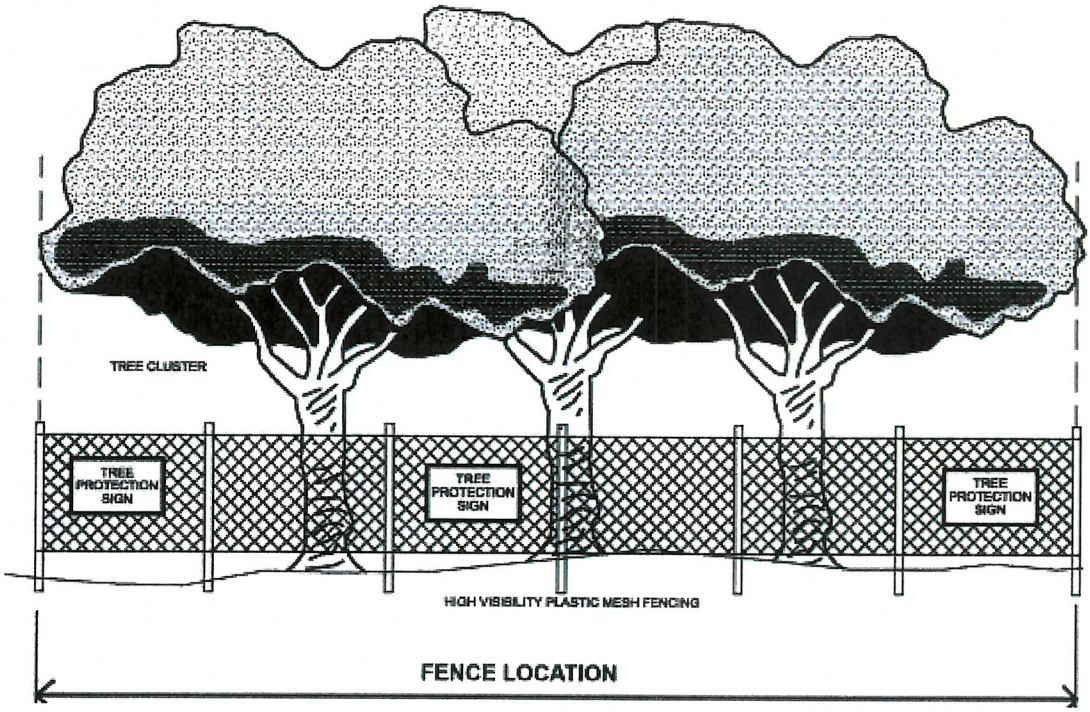


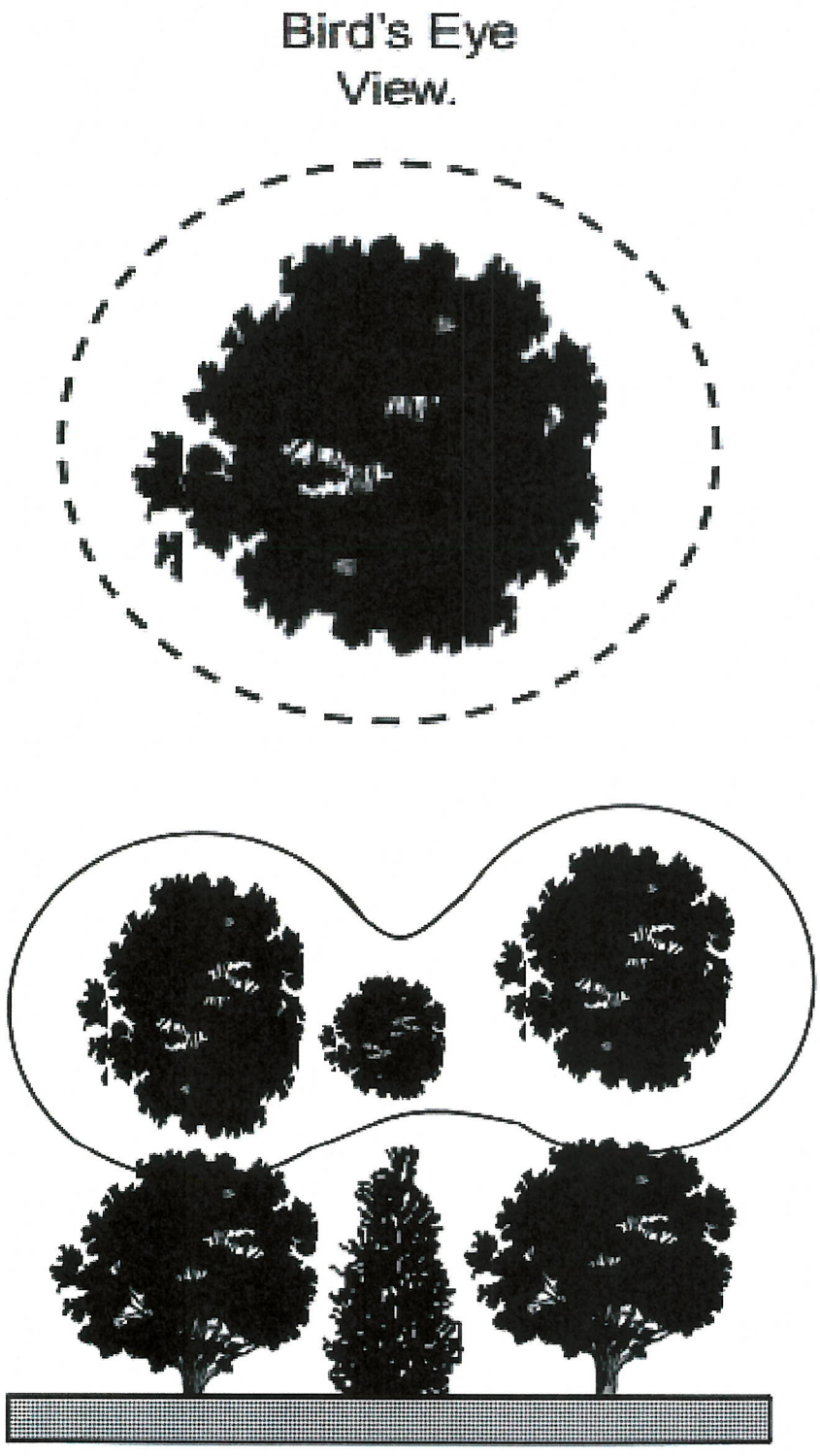
Tree roots do not usually grow into hardened dry compacted soils or beyond cement barriers such as retaining and foundation walls or curbs.

Tree protection measures to be installed staked hay bales and orange fence or Chain link



Tree Protection signage is required stating **Tree Save Area Keep Out, Zona De Protección De Árboles**

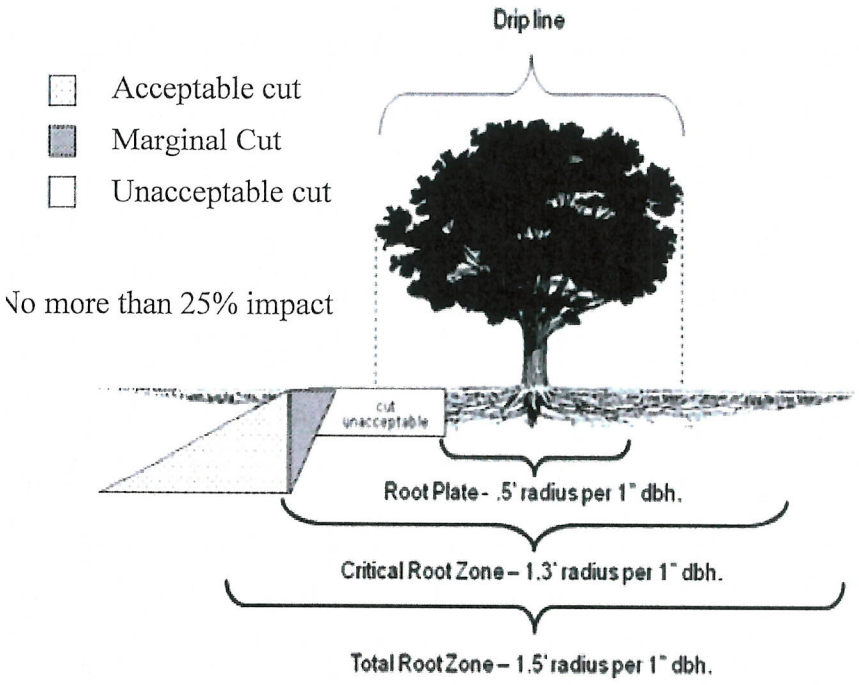


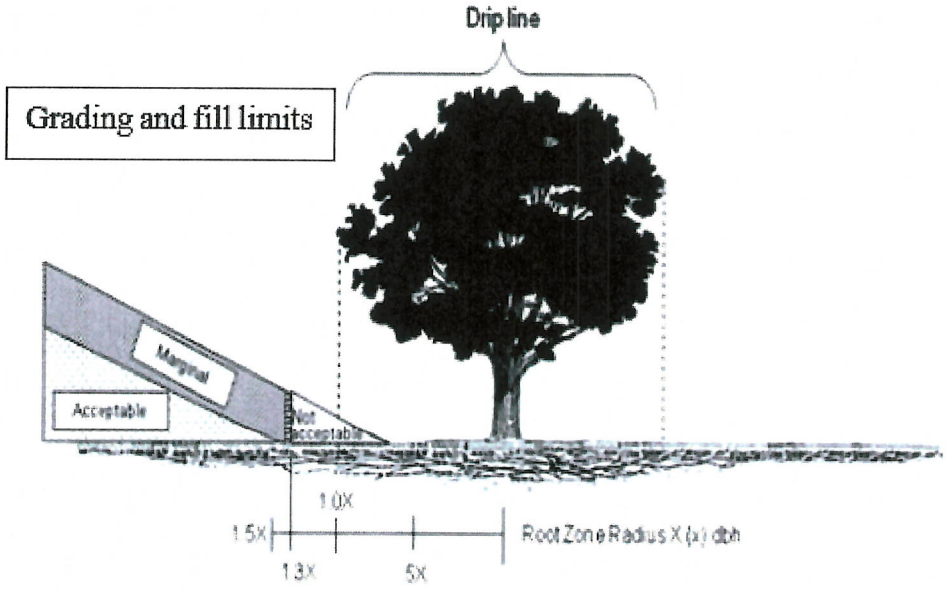


Tree Protection Fence placed at far edge of Critical Root Zone (CRZ) of all trees in group

No land disturbance, trees soil disturbance, or site development activity is allowed within more than 20% of the net critical root zone (CRZ) without an approved arborist prescription and original soils within the remaining root zone are to be undisturbed and not altered. City Arborist approval is required prior to any planting within the (CRZ).

Cut limits





B. Tree Planting Plan

A tree planting plan is required for any site where tree planting to replace or increase tree canopy is required. The tree planting plan may be separate from or may be part of a required tree conservation plan. For single family homeowner occupied parcels a hardship may be granted by the U.D.O. Administrator for Tree planting prescriptions to be developed by the City Arborist to take the place of a tree planting plan when a tree owner is unable to develop or have a certified arborist develop a tree planting plan.

The tree planting plan may be a parcel map or hand sketch that shows, at a minimum:

Approximate location of property boundaries

Approximate location of protected trees or tree stands, including boundary trees

Extent of tree canopy cover on the site including that provided by trees on adjacent properties

Approximate location of structures, driveways, and paved areas on the site

The number of trees to be planted by species and caliper

Approximate locations of trees to be planted

Location of trees to be planted on site
Tree planting
Tree root ball staking
Tree well, if applicable
Tree aeration system, if applicable
Number and species of 2.5" caliper trees to be planted to replace canopy lost if required
Detail drawings and specifications where appropriate

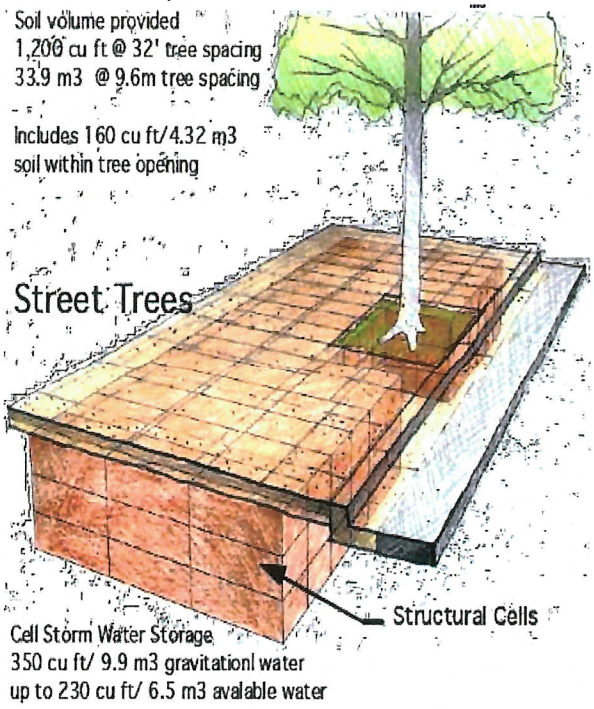
C. For parking lot tree plantings

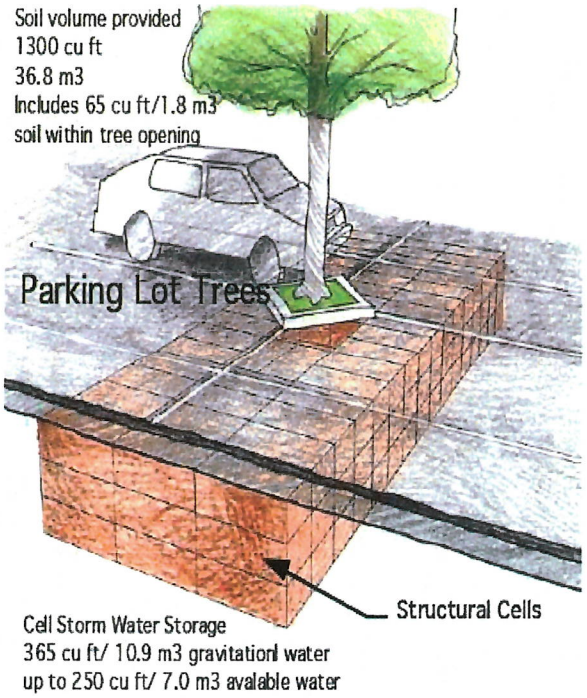
Parking lot trees must be a minimum of 2.5-inch caliper and no parking space shall be more than 50 feet from a tree. A 50-foot dashed radius circle for each parking parcel tree shall be depicted on the tree protection and replacement plan. Large and medium canopy trees shall have a minimum of 1200 square feet per tree per planting area or be designed using structure supporting soil system or silva cells.

Parking parcel tree islands shall terminate each row of parking and shall be a minimum of nine feet wide. Interior islands shall be a minimum of eight feet wide. Tree islands shall be backfilled with suitable soils and shall be free from construction site debris. Root barriers shall be used to prevent damage to hardscapes.

Light poles and associated underground electric lines shall not be allowed in parking parcel tree islands. A 20-foot minimum spacing is required between the trunks of all deciduous shade trees and any existing or proposed light poles. The final light pole locations shall be depicted on the plan with a 20-foot dashed radius circle around each light pole. Non hardwired solar lights shall be exempt from this requirement.

Soil cell example:





Examples of disturbance include but are not limited to, the following:

Soil erosion and sedimentation, Materials storage, Concrete, paint, or chemical washout,
Fire and excessive heat, Trenching, Soil excavation and or stockpiling, Soil backfill and compaction,
Sod installation, Irrigation installation, Vehicle or equipment traffic or parking, Placement of temporary buildings, Placement of portable toilets.

Improper maintenance practices shall be prohibited for protected trees, including but not limited to, improper mulching, severe or improper pruning including topping, tipping, or heading back, and damage from mowers, string weed trimmers, and herbicides. Protected trees growing on development sites that are deemed by the City Arborist to be untreatably diseased, infested, irreparably damaged by natural events, or high risk shall be removed and a 2.5" caliper tree shall be planted to replace the lost canopy at the permittees expense.

Tree Rating Guide

The zone 7 species rating list is not the approved planting list for the City of Decatur (see section III. for Tree Species List). The Tree Rating Guide is to be used by Certified Arborists or Registered Foresters only. They should rate trees based on species rating, which includes the species rating guide, condition, and yearly benefit amount which utilizes size. The Arborist or Forester should also assess the sites trees and their existing soils. Then a determination is made that the trees are:

	Poor	Fair	Good	High
Zone 7 Rating:				
Overstory:	0-49	50-64	65-80	81-100
Understory:	0-15	16-35	36-55	56-100
Condition:	uncorrectable major defects	correctable defects	minor correctable defects	no known defects
Yearly Benefits:				
Overstory	$0.00-70.00	$71.00- 165.00	$166.00-186.00	$187.00 or more
Understory	$0.00-10.00	$11.00- 14.00	$15.00-20.00	$21.00 or more

Zone 7 tree ratings are an assigned value based on all the landscape merits of a landscape tree species and its accompanying potential for problems. It is a comparative value given to the tree based upon its individual characteristics. The rating numbers given on the guide can be increased for healthy native low potential invasive trees with a long life expectancy. Those trees that provide the most benefit should also receive a higher rating. Please refer to the National Tree Benefit calculator south edition at: http://www.treebenefits.com

Condition of the tree is a subjective determination made by the appraiser during the inspection. It is an assessment of the tree's structural integrity and health at the time of appraisal. Thought should be given to rooting, branching, health and vigor, any damage or wounds, and evidence of pest infestation. Please use the I.S.A. Basic Tree Risk Assessment Form to provide detailed information concerning trees with target impacts and moderate or high risk without ability to reduce the risk to an acceptable level and for extreme or imminent risk trees.

Size of the tree is measured using common tools and industry standards. A diameter tape or tape measure can be used to measure trunk size, and is typically recorded as the diameter at 4.5 feet above grade, or diameter at breast height. Canopy square footage can be determined using guide in section V. pages 4-6

***Example #1**: 24" White Oak, Overstory tree rating is 99, It has minor correctable defects, Natl benefits calculator: **24 inch White oak** provides overall benefits of: $238 every year.*
*The soils are natural existing and it is mulched, therefore the tree would receive a **High** rating. The same tree and soils with uncorrectable major defects, and a moderate Tree risk rating (target present) would make this a **Poor** tree. The same tree with limited poor soils, with correctable defects could be **Fair** if prescription is received for correction of defects, could be **Good** with added soils remediation.*

Example #2: *10" Redbud, Understory tree rating is 67, It has minor correctable defects, Natl benefits calculator: This* ***10 inch Eastern redbud*** *provides overall benefits of: $25 every year.*
The soils are natural existing and it is mulched, therefore the tree would receive a ***High*** *rating.*
The same tree and soils with uncorrectable major defects would make this a ***Poor*** *tree, with correctable defects it could be a* ***Good*** *tree with a prescription for pruning.*
The same tree with limited poor soils, with correctable defects could be ***Fair*** *if prescription received for correction of defects, could be* ***Good*** *with added soil remediation as well.*

Trees on the Georgia EPPC Invasive Species List, Category 1 or 2 will not be considered toward canopy save credits. https://www.gaeppc.org/list/. Trees designated as Landmark trees shall receive a rating of High. This Guide was created using information in part and with permission from the I.S.A.'s Southern Chapter Board member Tom Smiley, PH.D., from the *Southeastern United States Tree Species Ratings Guide 9th & 10th Edition*, and the *Tree Appraisal pdf*, from Purdue University and the *Landscape Tree Evaluation pdf*, from Purdue University Cooperative Extension. Kay Evanovich, Certified TRAQ Arborist, created this Guide with input from Ed Macy, Consulting Urban Forester and Certified TRAQ Arborist.

Zone 7 species ratings list

*Maximum value can be increased for Native trees with low invasive potential.
The rating guide is not the approved planting list for the City of Decatur
(see section III. for Tree Species Planting List).

Species	Common Name	Matu re Heigh	Spread	Good Under power lines	Growth Rate	Lifespan	Invasive potential	Sidewalk damage	Major pests	GA. Native	Zone 7 Rating
Abies concolor	white fir	Tall	medium	no	slow to moderate	Long	low	low			20-40
Abies fraseri	fraser fir	Tall	medium	no	slow	long	low	low			10-30
Acer barbatum	southern sugar maple	Medium	Medium	no	moderate	long	low	low		yes	75-90
Acer buergeranum	trident maple	Medium	medium	yes	slow to moderate	medium	low	low			80-95
Acer campestre	hedge maple	Medium	medium	yes/ maybe * can grow to 75'	slow	medium	medium	low			70-90
Acer ginnala	amur maple	medium	narrow to medium	yes	moderate	medium	low	low			70-90
Acer leucoderme	chalkbark maple	medium	narrow to medium	medium to fast	moderate	medium	low	low	Verticilium Wilt		70-90
Acer negundo	boxelder	medium to tall	medium to wide	no	fast	short to medium	medium	low	box elder bugs	yes	15-30
Acer palmatum	Japanese maple	short to	narrow to medium	yes	slow to moderate	medium to long	low	low	Japanese beetle		80-100

Acer rubrum	red maple	Tall	wide	no	moderate to fast	long	low	high	Cankerworm, Leaf Hopper	yes	80-95
Acer saccharinum	silver maple	Tall	wide	no	fast	medium	low	high	Anthracnose, cottony maple scale	yes	40-70
Acer saccharum	sugar maple	Tall	wide	no	slow	long	medium	medium	Leaf Scorch, Verticilium Wilt, Sapsucker	Southern Yes	50-80
Aesculus glabra	Ohio buckeye	medium to tall	medium to wide	no	moderate	medium	low	low	Leaf blotch, powdery mildew	yes	50-70
Aesculus hippocastanum	Horse-chestnut	Tall	Wide	no	moderate	long	low	low	bleeding canker		50-70
Aesculus octandra	yellow buckeye	tall	wide	no	moderate	long	low	low	bleeding canker, powdery mildew	yes	50-70
Aesculus pavia	red buckeye	Short to	narrow to medium	yes	moderate	medium	low	low	n/a	yes	50-80
Aesculus sylvatica	painted buckeye	Short to	narrow to medium	yes	fast	medium	medium	low	powdery mildew	yes	50-80
Ailanthus altissima	tree of heaven	Tall	medium to wide	no	fast	short to medium	high	medium	Verticilium Wilt		20-40

Albizia julibrissin	mimosa	Medium	Medium	no	fast	short	high	high	Fusarium Wilt		30-50
Alnus spp.	alder	Tall	medium to wide	no	fast	medium	low	low	Powdery mildew, cankers	yes Hazel	50-80
Alnus glutinosa	European black alder	Tall	medium to wide	no	fast	medium	low	low	Powdery mildew, cankers		50-70
Amelanchier sp.	serviceberry	Short to medium	narrow to medium	yes	moderate	medium	medium	medium	Rust	yes	70-90
Aralia spinosa	devils walking stick	short to medium	wide	yes	slow to moderate	medium	low	low	n/a	yes	10-70
Asimina triloba	paw-paw	Short to medium	medium	maybe	moderate	medium	low	low	n/a	yes	40-70
Betula nigra	river birch	Tall	wide	no	moderate to fast	medium	low	high	leaf spot	yes	60-90
Betula sp.	white birch	Tall	wide	no	moderate to fast	medium	low	medium	bronze birch borer		30-70
Carpinus betulus	European hornbeam	Tall	medium to wide	no	slow to moderate	medium	low	low	n/a		80-100
Carpinus caroliniana	American hornbeam	Short to medium	narrow to medium	yes	slow	medium	low	low	leaf spot, cankers	yes	70-90
Carya aquatica	water hickory	tall	wide	no	moderate	long	low	low	n/a	yes	70-80
Carya cordiformis	bitternut hickory	tall	wide	no	slow	Long	low	low	n/a	yes	60-90
Carya floridana	scrub hickory	short to medium	medium	no	slow	Long	low	low	n/a		20-40
Carya glabra	pignut hickory	tall	medium to wide	no	slow	Long	low	low	n/a	yes	70-85
Carya illinoensis	pecan	tall	wide	no	moderate	medium to long	low	low			70-90
Carya laciniosa	shellbark hickory	tall	wide	no	slow	Long	low	low	n/a	yes	60-90
Carya ovata	shagbark hickory	tall	wide	no	slow to moderate	Long	low	low	n/a	yes	60-80
Carya tomentosa	mockernut hickory	tall	wide	no	slow	Long	low	low	n/a	yes	70-90
Castanea crenata	Korean chestnut	medium	medium	no	moderate	medium	low	low	leaf spot, anthracnose		40-60
Castanea dentata	American chestnut	tall	wide	no	moderate	short	low	low	Chestnut blight	yes	5-15
Castanea mollissima	Chinese chestnut	tall	wide	no	slow to moderate	medium	low	low	Chestnut blight		30-60
Castanea pumila	Allegheny chinquapin	short to medium	narrow to medium	yes	moderate	medium	low	low	Chestnut blight	yes	50-60
Catalpa sp.	catalpa	tall	wide	no	moderate to fast	medium to long	low	medium	Powdery mildew	yes	40-60
Cedrus atlantica 'Glauca'	blue atlas cedar	tall	wide	no	slow to moderate	long	low	low	tip blight, root rot		60-80

Cedrus deodara	deodar cedar	tall	wide	no	moderate to fast	long	low	low	top die back (canker)		70-90
Celtis laevigata	sugarberry	tall	wide	no	moderate to fast	long	medium	high	nipple gall		50-80
Celtis occidentalis	hackberry	tall	wide	no	moderate to fast	medium to long	medium	high	leaf spot, witches' broom	yes	50-80
Celtis tenuifolia	Georgia hackberry	short to medium	narrow to medium	maybe	slow	medium	low	high	leaf spot	yes	40-70
Cephalanthus occidentalis	buttonbush	short	narrow	yes	medium	short to medium	moderate	low	n/a	yes	20-70
Cercidiphyllum japonicum	katsuratree	tall	medium to wide	no	moderate to fast	medium	low	low	n/a		50-65
Cercis canadensis	American redbud	short to medium	narrow to medium	yes	moderate	medium	low	low	canker, Verticilium Wilt	yes Eastern	60-85
Chamaecyparis thyoides	Atlantic whitecedar	tall	narrow to medium	no	moderate	long	low	low	n/a	yes	50-80
Chionanthus Virginicus	fringetree	short to medium	narrow to medium	yes	slow	medium	low	low	n/a	yes	60-85
Cladrastis lutea	yellowwood	medium to tall	medium to wide	no	moderate	medium	low	low to medium	n/a	yes	50-80
Cornus florida	dogwood	short to medium	narrow to medium	yes	slow	medium	low	low	Dogwood borer, anthracnose, powdery mildew	yes	80-100
Cornus kousa	kousa dogwood	short to medium	narrow to medium	yes	slow	medium	low	low	n/a		70-95
Cotinus obovatus	smoketree	short to medium	narrow to medium	yes	moderate	medium	low	low	Verticilium Wilt	yes	60-80
Crataegus sp.	hawthorn sp.	medium	medium	yes	slow to moderate	long	medium	low	fireblight, rust	yes	60-90
Cryptomeria japonica	Japanese cryptomeria	tall	medium to wide	no	moderate	long	low	low to medium	tip die back		70-90
Cunninghamia lanceolata	chinafir	tall	narrow to medium	no	slow to moderate	medium to long	low	low	n/a		60-80
Cupressus x chamaecyparis	leyland cypress	tall	narrow to medium	no	fast	short	low	medium	bagworm, canker, root rot		60-80
Diospyros virginiana	persimmon	tall	medium	no	slow to moderate	medium	low	medium	leaf spot	yes	50-80
Eriobotrya japonica	loquat	medium	medium	yes	moderate	medium	low	medium	fireblight		20-50
Fagus grandifolia	American beech	tall	wide	no	slow	long	low	medium	n/a	yes	80-95
Fagus pendula	weeping beech	medium to tall	medium to wide	no	slow to moderate	long	low	high			50-75

Fagus sylvatica	European beech	tall	wide	no	slow to moderate	long	low	high			50-80
Fagus sylvatica 'Cuprea'	copper beech	tall	wide	no	slow to moderate		low	high			40-70
Franklinia alatamaha	franklinia	short to medium	narrow	yes	moderate	short to medium	low	low	Wilt from Phytophthora	wild extinct	40-90
Fraxinus americana	white ash	tall	wide	no	moderate	long	low	high	EAB	yes	0-10
Fraxinus caroliniana	Carolina ash	medium	medium	no	moderate	medium to long	low	high	EAB	yes	0-10
Fraxinus pennsylvanica	green or red ash	tall	medium to wide	no	fast	long	low	medium	EAB	yes	0-10
Fraxinus profunda	pumpkin ash	tall	wide	no	moderate to fast	long	low	low	EAB		0-10
Ginkgo biloba	ginkgo (male)	tall	wide	no	slow to moderate	long	low	low	n/a		80-95
	ginkgo (female)	tall	wide	no	slow to moderate	long	low	low	n/a		10-40
Gleditsia aquatica	waterlocust	medium	medium	no	slow	medium	low	low	cankers	yes	10-20
Gleditsia triacanthos	honeylocust	medium to tall	medium to wide	no	fast	medium	medium	low	cankers,	yes	40-70
Gordonia lasianthus	loblolly bay	medium to tall	medium	no	fast	short	low	low	n/a	yes	70-95
Gymnocladus dioicus	Kentucky coffeetree	tall	wide	no	slow to moderate	long	low	low	n/a		40-80
Halesia carolina	Carolina silverbell	medium	medium	no	moderate	short	low	low	n/a	yes	70-85
Hamamelis virginiana	witch hazel	medium	medium	??	slow to moderate	long	low	low	n/a	yes	60-80
Ilex decidua	possum haw	short	narrow	maybe	moderate	medium	low	low		yes	70-90
Ilex montana	mountian holly	medium	medium	no	moderate to fast	medium	low	low			70-90
Ilex opaca	American holly	medium	medium	no	slow to moderate	long	low	low	leaf miner, spittle bug	yes	80-100
Ilex vomitoria	yaupon holly	short to medium	narrow to medium	??	moderate to fast	long	low	low	leaf miner	yes	70-90
Ilex x attenuata	Foster's, Savannah holly	medium	narrow	??	moderate to fast	medium	low	low	spittle bugs		75-90
Juglans cinerea	butternut	tall	wide	no	slow	short	low	medium	canker	yes	50-70
Juglans nigra	black walnut	tall	wide	no	moderate	long	low	medium	fall webworm	yes	50-80
Juglans regia	English walnut	tall	wide	no	moderate	long	low	medium	Phytopthora		50-80
Juniperus silscicola	southern redcedar	tall	medium	no	slow	long	low	low	n/a	yes	60-80

Juniperus virginiana	eastern redcedar	medium to tall	narrow to medium	no	moderate	long	medium	low	cedar apple rust, bagworms	yes	60-80
Koelreuteri a paniculata	golden raintree	medium to tall	medium to wide	no	moderate to fast	short to medium	medium	low	n/a		60-80
Laburnum x watereri	goldenchain tree	short	narrow	yes	moderate	short	low		twig blight, leaf spot		50-90
Lagerstroe mia indica	crape myrtle	short to tall	narrow to medium	no	moderate to fast	medium to long	medium	medium	powdery mildew, scale		80-100
Liquidamba r styraciflua	sweetgum	tall	wide	no	moderate to fast	long	low	high	bleeding necrosis, leaf spot	yes	40-75
Liriodendro n tulipifera	tulip or yellow poplar	tall	wide	no	fast	long	low	high		yes	70-90
Maclura pomifera	osage-orange	medium to tall	medium to wide	no	fast	short to medium	medium	medium	n/a		20-50
Magnolia acuminata	cucumbertr ee	tall	wide	no	moderate to fast	medium	low	medium	n/a	yes	60-80
Magnolia fraseri	fraser magnolia	short	narrow to medium	yes	moderate	medium	low	medium		yes	50-70
Magnolia grandiflora	southern magnolia	tall	wide	no	slow to moderate	medium	low	medium	n/a	yes	80-100
Magnolia macrophyll a	bigleaf magnolia	medium to tall	medium	no	moderate	medium	low	medium		yes	70-90
Magnolia tripetala	umbrella magnolia	medium to tall	medium to wide	no	moderate	medium	low	medium		yes	50-80
Magnolia virginiana	sweetbay	short to medium	narrow to medium	yes	moderate	medium	low	medium		yes	60-90
Magnolia x soulangian a	saucer magnolia	medium	medium	yes	moderate	medium	low	medium	leaf spot, Verticilium wilt		60-80
Malus sp.	crabapple, apple	short to medium	narrow to medium	yes	moderate	short	medium	low	fireblight, cedar apple rust		50-90
Melia azedarach	chinaberry	medium	medium	no	fast	short to medium	high	low	n/a		10-30
Metasequoi a glyptostrob oides	dawn redwood	tall	medium	no	fast	long	low	high	canker		80-100
Morus sp.	mulberry	medium	medium	no	fast	short to medium	high	medium	bacterial blight, leaf spot, cankers	yes Red	30-60
Myrica cerifera	wax myrtle	short	narrow	yes	moderate	short to medium	medium	low	n/a	yes	70-95
Nyssa ogeche	Ogeechee tupelo	medium	medium	no	slow to moderate	long	low	medium		yes	70-90
Nyssa sylvatica	blackgum / tupelo	medium to tall	medium to wide	no	slow to moderate	long	low	medium	canker, rust, leaf spot	yes	75-95

Osmanthus	devilwood, tea olive	short	narrow	yes	slow to moderate	short to medium	low	low	n/a	yes	70-95
Ostrya virginiana	ironwood, hop-hornbeam	medium	medium	no	slow	medium to long	low	low	n/a	yes	70-90
Oxydendrum arboreum	sourwood	medium	medium	no	slow	medium	low	low	leaf spot	yes	75-95
Paulownia tomentosa	princess tree	medium	medium	no	fast	short to medium	high	high	n/a		50-70
Persea borbonia	redbay	medium	medium	no	moderate	medium	low	low	galls, ambrosia beetle	yes	43403
Picea abies	Norway spruce	tall	medium	no	moderate to fast	medium	low	low	spruce gall aphid		40-80
Picea glauca	dwarf Alberta spruce	tall	medium	no	moderate	medium	low	low	root rot, bagworm		20-60
Picea pungens	Colorado blue spruce	tall	medium	no	slow to moderate	long	low	low	spruce gall aphid,		15-60
Pinus echinata	shortleaf pine	tall	medium	no	fast	long	low	low	southern pine beetle	yes	50-70
Pinus elliottii	slash pine	tall	medium	no	moderate to fast	long	low	low		yes	20-50
Pinus glabra	spruce pine	tall	medium	no	moderate to fast	long	low	low		yes	20-40
Pinus mugo	Swiss mountain pine	short to medium	narrow to medium	maybe	slow to moderate	long	low	low			40-60
Pinus nigra	Austrian pine	tall	medium to wide	no	moderate	long	low	low	Diplodia tip blight		50-70
Pinus palustris	longleaf pine	tall	medium	no	moderate to fast	long	low	low		yes	40-70
Pinus pungens	table mountain pine	tall	medium	no	moderate to fast	long	low	low		yes	20-40
Pinus rigida	pitch pine	tall	wide	no	moderate	long	low	low		yes	20-50
Pinus serotina	pond pine	tall	medium	no	moderate to fast	long	low	low		yes	20-30
Pinus strobus	eastern white pine	tall	medium to wide	no	fast	long	low	low	White pine blister rust, White Pine weevil	yes	40-60
Pinus taeda	loblolly pine	tall	medium to wide	no	fast	long	low	low	pine beetle	yes	60-80
Pinus virginiana	Virginia pine	medium	medium	no	slow	long	low	low		yes	50-70
Pistacia chinensis	Chinese pistache	medium	medium	no	moderate	medium to long	low	low	n/a		70-90
Planera aquatica	water elm	medium	medium	no	moderate	long	low	medium			10-20

Platanus acerifolia	London planetree	tall	wide	no	moderate	medium	low	high	cankerstain, anthracnose, BLS		40-60
Platanus occidentalis	sycamore	tall	wide	no	moderate to fast	long	low	high		yes	40-60
Populus sp.	poplar	tall	wide	no	fast	short	medium	high	canker, leaf spot, scales, etc	yes Yellow	20-50
Prunus alleghanien sis	Allegheny plum	short	narrow	yes	fast	short	low	low		yes	10-20
Prunus americana	American plum	short to medium	narrow to medium	yes	fast	short	low	low		yes	30-50
Prunus angustifolia	chickasaw plum	short to medium	narrow to medium	yes	moderate to fast	short	low	low		yes	20-30
Prunus caroliniana	Carolina cherrylaurel	short to medium	narrow to medium	maybe	moderate	medium to long	low	low	shot hole fungus, canker	yes	50-80
Prunus sargentii	sargent cherry	medium	medium	yes	moderate	short to medium	low	low			50-70
Prunus serotina	black cherry	medium to tall	medium to wide	no	moderate	long	low	medium		yes	30-50
Prunus serrulata	Japanese (Kwanzan) cherry	short to medium	medium	yes	moderate	short	low	low			30-70
Prunus umbellata	hog plum	short to medium	narrow	yes	moderate	short	low	low			10-20
Prunus virginiana	chokecherry	short to medium	narrow to medium	maybe	moderate	medium	low	low		yes	30-60
Prunus x yedoensis	Yoshino cherry	short to medium	short to medium	yes	moderate	short	low	low			40-60
Ptelea trifoliata	hoptree	short	narrow	yes	slow to moderate	long	low	low	leaf spot, rust, not serious	yes	60-90
Pyrus calleryana	flowering pear	medium to tall	medium	no	fast	short	high	medium	fireblight		50-80
Quercus acutissima	sawtooth oak	tall	medium to wide	no	moderate to fast	long	high	medium	n/a		70-90
Quercus alba	white oak	tall	wide	no	slow to moderate	long	low	medium	anthracnose BLS	yes	85-100
Quercus bicolor	swamp white oak	tall	wide	no	moderate	long	low	low		yes	70-90
Quercus coccinea	scarlet oak	tall	wide	no	moderate	long	low	low		yes	50-80
Quercus falcata	southern red oak	tall	wide	no	moderate	long	low	low		yes	60-85
Quercus georgiana	Georgia oak	medium	medium	no	moderate	long	low	low		yes	60-75
Quercus imbricaria	shingle oak	tall	wide	no	slow to moderate	long	low	low	anthracnose, BLS		40-60
Quercus incana	bluejack oak	medium	medium	no	moderate	long	low	low		yes	30-50
Quercus laevis	turkey oak	short to medium	medium	no	moderate	long	low	low		yes	20-40

Quercus laurifolia	laurel oak	medium to tall	medium to wide	no	moderate	long	low	low		yes	70-90
Quercus lyrata	overcup oak	tall	wide	no	moderate	long	low	low		yes	70-90
Quercus macrocarpa	bur oak	tall	wide	no	slow	long	low	low	anthracnose, BLS		70-90
Quercus montana	chestnut oak	tall	wide	no	moderate	long	low	low		yes	70-90
Quercus muehlenbergii	chinapin oak	tall	wide	no	moderate	long	low	low	n/a	yes	50-70
Quercus myrtifolia	myrtle oak	short to medium	medium	no	moderate	long	low	low		yes	10-30
Quercus nigra	water oak	tall	wide	no	moderate	long	low	low		yes	50-85
Quercus palustris	pin oak	tall	medium to wide	no	moderate to fast	long	low	high	galls		40-60
Quercus phellos	willow oak	tall	medium to wide	no	moderate	long	low	high	Leucanium scale, canker worm	yes	80-100
Quercus prinus	chestnut oak	medium to tall	medium to wide	no	moderate	long	low	low	decline	yes	70-90
Quercus robur	English oak	tall	wide	no	slow to moderate	long	medium	low	mildew		60-80
Quercus rubra	northern red oak	tall	wide	no	moderate to fast	long	medium	low	BLS		50-70
Quercus shumardii	shumard oak	medium to tall	medium to wide	no	moderate	long	low	low		yes	60-90
Quercus stellata	post oak	tall	wide	no	moderate	long	low	low		yes	60-80
Quercus virginiana	live oak	tall	wide	no	moderate	long	low	high	root rot, BLS	yes	50-90
Rhamnus	buckthorn	medium	medium	no	moderate to fast	short to medium	high	medium	rust		5-40
Robinia pseudoacacia	black locust	tall	medium to wide	no	fast	medium	medium	medium	locust borer	yes	30-60
Robinia viscosa	clammy locust	medium	medium	no	moderate	medium	low	low		yes	5-20
Sabal palmetto	palmetto	tall	narrow	no	moderate	medium	low	low		yes	5-30
Salix sp.	willow	tall	wide	no	fast	medium	medium	high	canker,	yes	20-60
Sapium sebiferum	popcorn tree	medium	medium	no	fast	short to medium	high	low			10-30
Sassafras albidum	sassafras	medium to tall	medium	no	moderate to fast	medium to long	low	low	canker, leaf spot, Sassafras weevil	yes	60-80
Sophora japonica	Japanese pagoda tree	medium to tall	medium to wide	no	fast	short to medium	low	low			50-70
Sorbus	mountain ash	medium	medium	yes?	moderate	medium	low	low	borer, fireblight		20-40
Stewartia sp.	stewartia	short to medium	narrow to medium	maybe	slow	medium	low	low	n/a		80-100

Styrax sp.	snowbell	short to medium	narrow to medium	maybe	slow	medium	low	low			70-90
Syringa reticulata	Japanese tree lilac	short to medium	narrow to medium	yes	moderate	short to medium	low	low			30-70
Taxodium distichum	baldcypress	tall	medium	no	moderate	long	low	high	twig blight, cankers	yes	80-100
Thuja occidentalis	Arborvitae	medium	narrow	maybe	moderate	medium	no	low			30-60
Thuja 'Green Giant'	Green Giant Western Arborvitae	tall	medium	no	moderate	medium	no	low			30-50
Tilia americana	American linden	tall	wide	no	moderate	long	low	low	anthracnose, verticilium wilt, Japanese beetle	yes	50-70
Tilia cordata	littleleaf linden	tall	wide	no	moderate	long	medium	low	anthracnose, verticilium wilt, Japanese beetle		40-60
Tilia hetrophyilia	white basswood	medium to tall	medium to wide	no	moderate	long	low	low			40-60
Tilia X euchlora	Crimean linden	medium	medium	no	moderate	long	low	low			70-90
Tsuga canadensis	Canadian (eastern) hemlock	tall	medium	no	moderate	long	low	low	wooly adelgid, cankers, rust, hemlock scale	yes North GA	50-80
Tsuga caroliniana	Carolina hemlock	tall	medium	no	slow to moderate	long	low	low	wooly adelgid, ambrosia beetle		30-50
Ulmus alata	winged elm	medium to tall	medium to wide	no	moderate to fast	medium to long	moderate	low	Dutch Elm disease, wilt diseases, etc		40-60
Ulmus americana	American elm	tall	wide	no	moderate to fast	medium to long	low	high	Dutch Elm disease, wilt diseases, etc	yes	20-50
Ulmus parvifolia	Chinese or lacebark elm	medium to tall	medium to wide	no	moderate to fast	medium	low	low			75-100
Ulmus pumila	Siberian elm	tall	wide	no	fast	short to medium	high	medium	elm leaf beetle		5-20

Ulmus rubra	slippery or red elm	medium	medium	no	moderate to fast	medium to long	medium	medium	yes	40-60
Zanthoxylum	prickly ash, hurcules club	short	narrow to medium	yes	moderate	medium	medium	low	n/a	5-20
Zelkova serrata	Japanese zelkova	medium to tall	medium to wide	no	moderate	long	low	low	Verticilium Wilt	70-90

IX. Tree Establishment (Planting) Standards

Tree establishment consists of more than just planting and includes a series of steps to provide quality soil and an adequate volume of soil, selection of a site in general and exact placement of the tree, the selection of quality trees, proper planting of the tree and follow-up maintenance during the establishment period.

a. Soil Quality

The rooting zone of all trees planted for tree canopy cover credit shall contain quality soil to enhance, and not limit, tree growth. The minimum standards for soil quality include:

- Loamy, well-aerated soil that includes topsoil
- Approximately 5 percent organic matter, 45 percent mineral matter and 50 percent pore space for holding water and oxygen
- A pH (soil acidity) between 5.5 and 7.0

The arborist may require the applicant to submit a soil analysis performed by the University of Georgia Cooperative Extension Soil, Plant and Water Laboratory or other approved laboratory to determine soil fertility, organic matter content, or ph. The City Arborist may perform on-site tests to assess compaction, determine the overall suitability of the soil for tree growth and additional steps that must be taken to provide quality soil. No construction rock or debris shall be allowed in the planting area.

The City Arborist shall approve the use of suspended pavement systems, such as structural cells, to meet soil depth and volume requirements in areas where the soil surface must be covered by pavement for parking lots, driveways and sidewalks.

The planting site shall have good drainage from the bottom of the planting hole to ensure root health and tree survival.

Soil compaction shall be avoided within the critical root zone of protected trees.

Root barriers shall be used to redirect root growth away from streets, sidewalks, curbs, driveways, fluid conveyance pipes, and buildings.

b. Soil Volume

Trees planted for tree canopy cover credit shall have a minimum amount of soil volume present at the time of planting to promote health, growth and the ability to achieve the size potential for the

species. The minimum depth of soil shall be 36 inches and the minimum open soil surface area, soil volume and planting area dimension for trees by mature tree size are shown in Table 2.

Table 2. Required Minimum Open Soil Areas and Soil Volumes by Mature Tree Size

Mature Canopy Size	Minimum Open Soil Area	Minimum Soil Volume	Minimum Planting Area Width for Landscape Strips
Large	400 square feet	1,200 cubic feet	5 feet
Medium	225 square feet	675 cubic feet	4 feet
Small	100 square feet	300 cubic feet	3 feet
Very Small	36 square feet	108 cubic feet	3 feet

In landscape strips, trees may share soil volume and tree placement standards shall govern the number of trees allowed within a particular landscape strip.

In parking lots and other paved areas, landscape islands shall be no less than 6 feet wide in any one direction. Two (2) trees may share the same required soil volume in landscape islands if the island is at least 325 square feet in size (the size of two parking bays). The City Arborist may approve a reduction in the open soil surface area required with the use of suspended pavement systems that increase the rooting area for trees. The owner, applicant or responsible party shall water such trees as necessary for their survival, establishment and growth.

c. ***Site* Selection**

The placement and spacing of trees must be compatible with site spatial limitations and with considerations toward the potential height and crown size of the tree. Required trees shall be placed where they are able to grow to maturity with a minimum of restriction to their roots, trunks and crowns, and where they will not create conflicts with sight, vehicle, and pedestrian clearance, infrastructure such as overhead and underground utility lines, streets, walkways, utility poles, and other infrastructure.

Only small and very small species of trees shall be planted beneath or within 15 feet of overhead utility lines. Medium trees shall be planted at least 20 feet from overhead utility lines and large trees shall be planted at least 30 feet from overhead utility lines. Trees shall be planted at least 5 feet from underground utility lines.

Trees shall be planted a minimum of 35 feet from intersections.

Trees shall be planted a minimum of 15 feet from an existing or proposed building or driveway and 5 feet from walkways.

In parking lots, trees shall be planted so their trunks are located a minimum of 30 inches from any barrier curb and aligned with the parking space boundary to prevent injury to trees from vehicle bumpers.

Where the City Arborist determines that site spatial constraints result in an absolute inability to provide the required tree canopy cover on the site, as many trees as possible shall be planted on

the site. The remaining balance of tree canopy may be made by a payment in lieu of planting to the Decatur tree bank in accordance with tree ordinance provisions.

d. Species Selection

Only those species listed on the tree species list shall be selected for planting. Species not on the list shall only be planted with the approval of the City Arborist. Trees on the Georgia EPPC Invasive Species List, Category 1 or 2 shall not be allowed (https://www.gaeppc.org/list/).

Species selected for planting shall be ecologically compatible with the intended growing site.

At least 90 percent of trees planted to meet tree canopy cover requirements must be large or medium sized canopy trees. Conifers may not account for more than 10 percent of the planted tree canopy. Small and very small trees may not account for more than 10 percent of the planted tree canopy. Invasive and non-native, flowering ornamentals shall not be used to satisfy canopy requirements.

e. Species Diversity

The species of trees planted to maintain no net loss of canopy or meet tree canopy cover requirements shall be diverse.

On a site where the planting of 10 or more trees is required, no more than 30 percent of any one species shall be planted, and on a site where the planting of 30 or more trees is required, no more than 10 percent of any one species shall be planted, unless otherwise approved by the City Arborist.

f. Tree Size and Quality

On residential sites, for replacement required by tree removal permits and for projects that do not increase the impervious surface 10 percent or more, trees must be a minimum of 6 feet tall at time of planting and if grown in a container, at least in a 15 gallon container. On commercial sites, trees shall be no less than 2.5 inches caliper and 10 feet in height at time of planting. The City Arborist may approve smaller size trees for difficult to obtain native shade trees along with documented and appropriate maintenance plans.

Trees selected for planting shall meet the current *ANSI Z60.1 American Standard for Nursery Stock*. Trees may be balled and burlapped, grown in containers, or bare root, however trees shall be free of root defects including kinked roots, stem encircling roots, and stem girdling roots.

Trees approved for planting shall:

- Have a healthy and extensive root system
- Have a trunk that stands upright without support
- Have a trunk free from wounds
- Have a central leader if typical for the species and shall not have co-dominant stems or included bark
- Have well distributed branches along the upper two-thirds of the stem
- Have a crown that has not been topped, tipped, or headed back
- Be free from insects and diseases

All plant materials shall be subject to approval by the City Arborist.

g. Time of Planting

Required trees shall be planted between November 15 and March 1. The City Arborist may approve planting at other times and approve a certificate of occupancy if tree planting funds are placed in escrow with the city prior to the final inspection. The total amount of the escrow funds shall include the purchase, transport and installation of plant materials.

h. Planting Specifications

Planting holes shall be at least 2 times the width of the root ball. When soils are compacted, the planting hole shall be at least 3 times and as much as 5 times the width of the root ball. The sides of the planting hole shall be sloped toward the bottom of the hole and scarified to allow penetration of developing roots.

Trees shall not be planted deeper than they were in their former location or container and the first woody root shall not be deeper than 1 inch below the ground line after planting.

No soil amendments or fertilizer shall be added to the planting hole unless soil conditions warrant amendments as determined by soils test or as determined by the City Arborist. No construction debris shall be permitted in the planting soil or fill.

X. Tree Maintenance

1. Protected trees shall be maintained in a healthy and structurally sound condition by the owner. At a minimum, conserved trees shall be pruned to maintain public health and safety. After the establishment period, ongoing maintenance that includes mulching, clearance, structural and deadwood pruning, inspections and pest management as necessary is recommended to keep trees healthy and structurally sound.
2. Actions contrary to standards and best management practices that result in damage to trees is prohibited. The topping of any protected tree is prohibited; if topped, a protected tree shall be ineligible for tree canopy cover credit. Replacement of the tree canopy provided by the tree shall be required and payment of the canopy loss fee is required.
3. A Canopy loss fee will be assessed and is based on the amount of yearly tree benefit lost per Fair or higher rated tree removed. Please visit the National Tree Benefit calculator at: http://www.treebenefits.com to determine the monetary amount. Then use the following formula: $___.__yearly benefit amount, times 30 years=$_____.__ that amount shall be paid to the tree bank.
   A 50% Reduction in canopy loss fees is allowed on commercial and residential properties if the site design includes rooftop solar voltaic panels or green infrastructure practices and no additional trees are removed to install them. Measures can found on the EPA website: http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm including, but not limited to, bioretention, rain gardens, infiltration trenches, bioswales, permeable pavement, stormwater planters, subsurface infiltration, rainwater harvesting/cisterns, and green roofs and trees are not removed for the installations. The Canopy loss fee may be waived for a single family owner occupied property by the City Arborist with the UDO Administrator's approval of a bonafide hardship.
4. It shall be the duty of any person owning or occupying real property bordering on any street upon which property trees may exist to prune such trees and large shrubs in such a manner that they will not obstruct or shade the streetlights, obstruct the passage of pedestrians on sidewalks or vehicles on streets, obstruct vision of traffic signs, or obstruct views of any street or alley intersection. The minimum clearance of any overhanging portion thereof shall be 10 feet over sidewalks and 12 feet over all streets except truck thoroughfares, which shall have a clearance of 16 feet.

5. Initial Maintenance

Trees planted to satisfy the requirements of this ordinance shall be maintained during the establishment period (the first 3 growing seasons after planting). All maintenance shall be done in accordance with the standards cited and described herein.

Required maintenance for planted trees shall include:

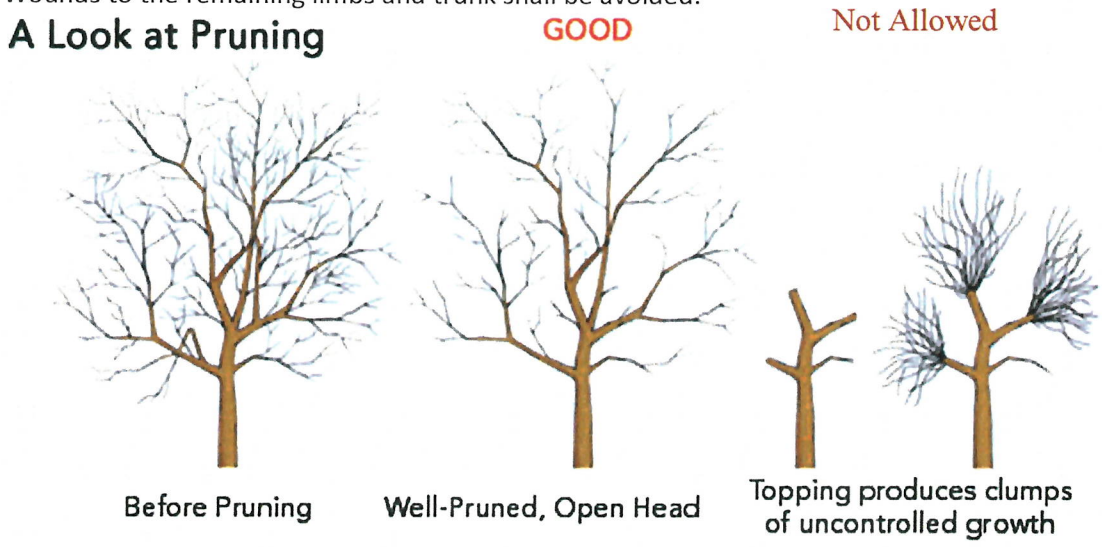
- Regular watering to provide the equivalent of 1 inch of water per week
- Mulching once per year
- Training pruning to remove co-dominant stems and dead, diseased, dying, crossed, broken, rubbing and otherwise objectionable branches

6. Tree Pruning

Only experienced professionals should prune mature trees and the use of tree pruning contractors employing certified arborists who will supervise pruning activity are strongly recommended. Planted trees should be pruned by experienced and trained persons. ANSI standards for pruning shall be followed.

The following tree pruning specifications shall apply to all protected trees:

- Tree topping shall be prohibited.
- The objectives of tree pruning should be established prior to commencement of pruning activity.
- Pruning at the time of planting shall be limited to the removal of co-dominant stems and dead, diseased, dying, crossed, broken, rubbing branches, and otherwise objectionable branches.
- The removal of live branches and foliage from a mature tree shall be limited to that required to ensure tree health and safety. Less than one-fourth of a mature tree's foliage and no more than one-third of a young tree's foliage shall be removed in any one growing season.
- Climbing spikes shall not be used in a tree pruning operation.
- Branches shall be pruned back to the parent branch or trunk and the pruning cut made just outside the branch collar. Flush cuts and stub cuts shall be prohibited.
- Wounds to the remaining limbs and trunk shall be avoided.



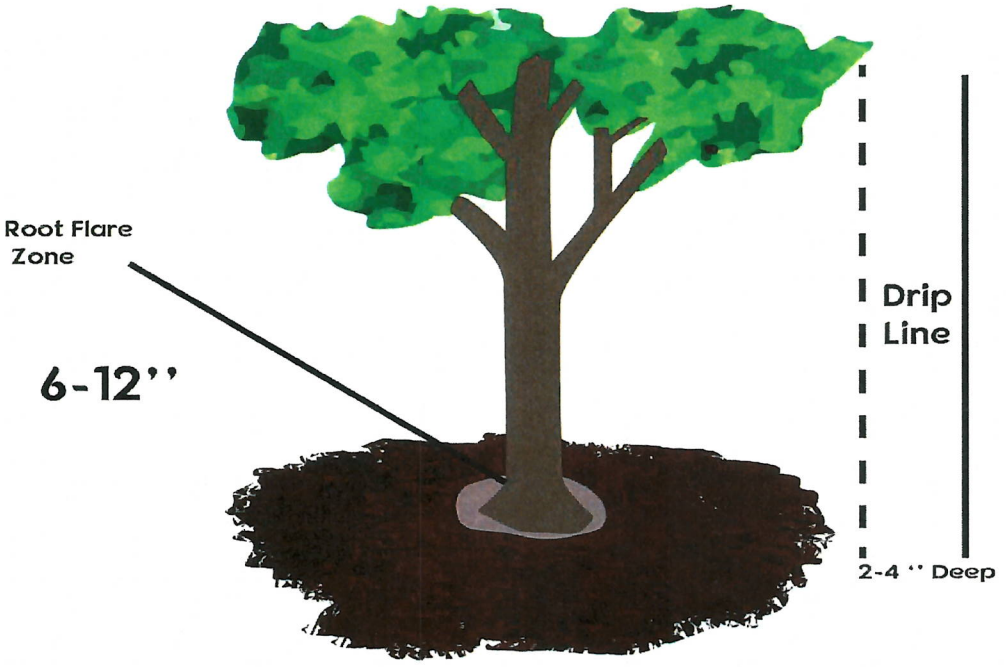
7. Tree Mulching

Mulching benefits a tree by retaining soil moisture, moderating soil temperatures, suppressing weed growth, reducing soil compaction and reducing the potential for mower and string weed trimmer damage. The purpose of mulch is to cover the root system of the tree, not the trunk.

The following mulching specifications shall apply to all protected trees:

- Mulch shall be applied annually, preferably in the late winter or early spring. Mulch from the previous year should be removed and replaced with fresh mulch, or the older and new mulch mixed to ensure good aeration through the mulch.
- Only organic materials, such as pine straw, leaves, aged wood chips, and compost, shall be used as mulch. Grass clippings, plastic sheeting, landscape fabric, or rocks shall not be used as mulch.
- Mulch shall be applied in an even layer to the tree's dripline, or to the greatest extent possible, in an even layer 2 inches deep.
- For newly planted trees, mulch shall be applied in a minimum 4.5 foot radius around the trunk.
- Mulch shall be kept at least 3 inches from the trunk of young trees and at least 4 inches from the trunk of mature trees. Mulch mounded up around the trunk shall be prohibited.

Incorrect Mulching



Proper Mulching Method

8. Tree Fertilization

The following fertilization specifications shall apply to all protected trees:

- Trees in an urban growing environment with limited natural nutrient cycling should be fertilized on a regular basis, every 3 to 5 years, at according to recommendations based on a soil sample analysis.
- For trees that are exhibiting signs and symptoms of nutrient deficiency, soils should be tested prior to fertilization and the fertilizer formulation should be adjusted to address the specific deficiency.
- Newly planted, drought stressed, or severely damaged trees shall not be fertilized.
- Fertilizer should be applied when roots are actively growing, in late winter, early spring, and through early summer.
- Slow release organic fertilizers with a salt index less than 50 are recommended at a rate of 2 to 4 pounds of elemental nitrogen per 1,000 square feet of rooting area.
- The use of trunk fertilizer injections or implants is not recommended.

9. Irrigation

Adequate soil moisture levels result in better tree growth, reduced stress, and reduced susceptibility to insect and disease problems. Mulching trees helps to conserve soil moisture. But excessive soil moisture can result in anaerobic conditions, nutrient deficiencies, and tree decline.

The following irrigation specifications shall apply to all protected trees:

- Tree species should be selected to match soil conditions on the site.
- In the absence of adequate rainfall, trees should be irrigated at the rate of 1 inch of water per week throughout the growing season and the establishment period.
- Water should be applied evenly throughout the outer 75% of a tree's critical root zone and runoff should be avoided.
- Avoid wetting the tree trunk during irrigation.

10. Inspections

The City Arborist will conduct a preliminary on-site analysis of all projects prior to permitting to evaluate the potential for tree conservation, tree protection, and tree planting relative to the proposed site design.

All tree protection measures shall be installed prior to land disturbance. The City Arborist or their representative shall be contacted for an on-site inspection after tree protection measures are installed and prior to land disturbance.

The City Arborist and/or City Inspectors shall conduct follow-up site inspections to monitor compliance with the tree ordinance.

The City Arborist shall make a final site inspection upon completion of the project and prior to the issuance of a certificate of occupancy. An approved final tree inspection by the City Arborist is required before a certificate of occupancy can be issued.

Additional site inspections may be made by the City Arborist after project completion to monitor compliance with tree canopy conservation and cover requirements. At any time if trees conserved or planted for tree canopy cover credit die or are in irreversible decline as determined by the City Arborist, then additional planting shall be required to replace the tree canopy cover credit assigned to the dead or declining tree.

XI. Tree Planting on City Property

No trees shall be planted on city property unless approved in writing by the City Arborist or unless included in an annual work plan approved by the City Arborist. The cutting of paved sidewalks for tree planting shall require the approval of the City Manager or his/her designee.

Trees planted within rights-of-way may be counted toward the minimum tree canopy cover requirements if approved by the City Arborist and when the City Arborist has determined that these requirements cannot be met on site.

If approved, the following conditions must be met to plant trees on the city street rights-of-way:

- A shoulder cross-section must be provided indicating the placement of the trees in relation to the curb and underground utilities.
- Root barriers to prevent root and infrastructure conflict must be provided, subject to approval by the City Arborist.
- Suspended pavement systems that use structural cells to increase rooting volumes may be installed with approval of the City Arborist.
- Location and details of root barriers and/or suspended pavement systems shall be provided.
- The placement and species of trees are subject to the approval of the City Arborist and Director of Public Works.
- Minimum soil volumes shall be provided.
- Drawings for irrigation systems within rights-of-way must indicate the location of lines, head, spray radius, shut off valves, timer and a 24-hour emergency contact phone number.

XII. Annual Work Plans

Any person, organization, or company that proposes to routinely remove, prune, or work within the tree protection zone of protected trees shall be required to submit an annual work plan to the City Arborist by December 1 each year, or prior to the commencement of any routine work.

The work plan shall include:

- Company or organization name and contact information (name, address, city/state/zip, contact phone number, city business license number)
- Name of person responsible for work to be performed with contact information
- Names of subcontractors with contact information
- Proposed locations of work, described in writing and identified on a map of the work area
- Type of work to be performed; extent of work to be performed
- Schedule of work to be performed
- Type of tree disturbance that is expected
- Tree protection measures to be installed
- Plans for tree canopy cover replacement

When changes are required to the annual work plan, notice shall be submitted to the City Arborist in writing prior to the changes taking place. These changes may include, but are not limited to, utility infrastructure installation, repair, and tree removal or disturbance not described in the annual work plan.

All work to be performed on protected trees shall be done in accordance with current *ANSI A300 Standards for Tree Care Operations*, *ANSI Z133 Safety Standards*, industry best management practices and the administrative standards that accompany this ordinance.

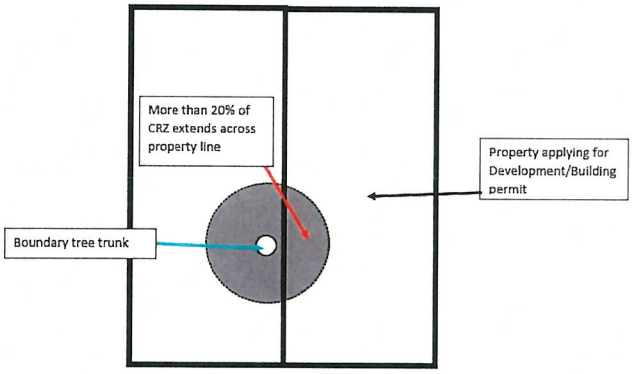
All tree pruning shall be supervised by a certified arborist. Pruning cuts shall be made in accordance with ANSI standards. Topping, tipping or heading cuts, flush cuts and stub cuts shall

be prohibited. No climbing spurs or spikes shall be used in trees except when trees are to be removed or in cases of a public safety emergency, natural disaster or aerial rescue of personnel.

XIII. Boundary Tree Standards

Definitions:

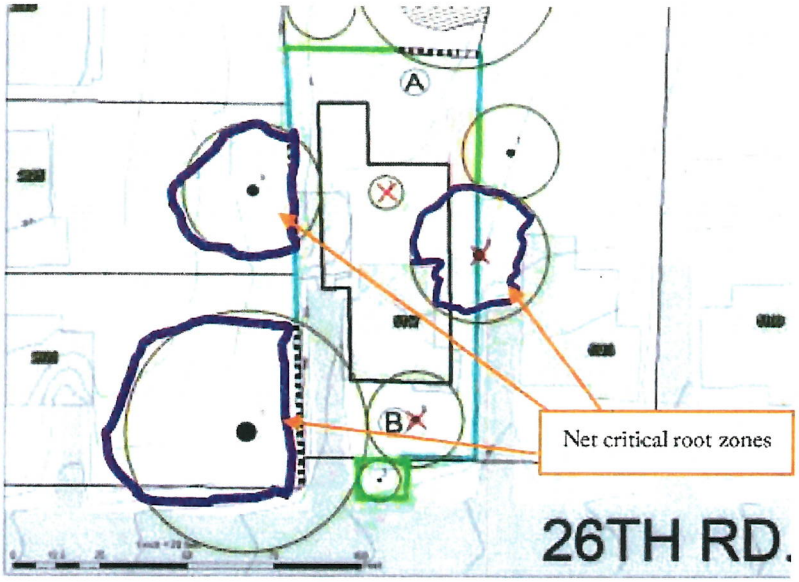
Boundary tree - a tree over 6" diameter with 20% or greater of its critical root zone (crz) extending across a property boundary line into adjacent property that has applied for a land development or building permit; a tree that is growing on a boundary property line between lots resulting in joint ownership



Boundary tree Agreement required

Arboricultural prescription-means any type of mitigation or treatment plan developed by an arborist certified by the International Society of Arboriculture that is provided for preserving tree(s). It is required for trees with 20% or greater net critical root zone impacts

Net critical root zone impact- the area of the critical root zone that has been obstructed with barrier's from the urban environment, i.e. public roads, retaining walls, and underground house foundation walls. You must subtract that square footage that exceeds beyond those barriers from the critical root zone circumference area. The remaining square footage of critical root area will be used to evaluate if preservation is possible.



Standards:

- The City of Decatur Tree Protection Ordinance addresses boundary trees and their protection during construction activity by stating no boundary trees critical net root zone may be encroached by more than 20% without the tree owner's written permission in the form of a boundary tree agreement (BTA) Standard form available at Decaturga.com
- The applicant must make three attempts including a certified mailing with a waiting period of at least 3 weeks for response to obtain an agreement. If the tree owner does not respond then BTA is waived and an arborist prescription and tree bond will be required. Net critical root zone impact must be kept under 20%.
- No boundary tree may be removed without written permission from the trees owner or co-owners.
- The builder/ developer/construction site property owner must submit a boundary tree agreement (BTA) signed by tree owner and if applicable co-owner giving permission to/ for the tree with construction impact to be treated or removed. The minimum arborist prescription length shall be 2 years. The receipt for the paid contract and the agreement will need to be submitted with the plans for review.
- The City Arborist may require a boundary tree to have an escrow amount submitted to the City based on the arboricultural prescription.
- The escrow shall be for an amount of 125% of the cost of removal and replacement of the tree/s listed in the boundary tree agreement with 3" caliper tree/s of similar canopy and the escrow amount will be held for three (3) years by the City see (Section 9. 1. 9. Of the U.D.O.)
- For Boundary Trees next to a proposed Second story addition or increase of building height applicant for permit shall provide a pruning plan with scope of work to be performed by a qualified professional and a boundary tree agreement is required if the pruning will cross the property line. ANSI pruning standards shall be followed.
- For Boundary Trees with net critical root zone impact of 19% or less and protected by tree protection, no arboricultural prescription required or boundary tree agreement is required.
- For Boundary Trees with net critical root zone impact of 20%-25% but protected by tree protection (no structural root plate impact) provide arboricultural prescription and a boundary tree agreement with plan for review by city.
- For Boundary Trees with net critical root zone impact of 20%-25% and structural root plate has impact, tree removal may be required. No tree shall be removed without written permission from the trees owner or co-owners. A tree variance to move construction away from the trees root zone may be obtained.