

DETERMINING THE CRITICAL ROOT ZONE

THE CRITICAL ROOT ZONE OF A TREE IS THE ZONE IN WHICH THE MAJORITY OF A TREE'S ROOTS LAY. NINETY-FIVE PERCENT OF THE ROOTS OF MOST TREES WILL BE FOUND IN THE UPPER 30-36" OF THE SOIL. OF THOSE, THE MAJORITY OF THE ROOTS THAT SUPPLY THE NUTRIENTS AND WATER TO THE TREE ARE FOUND IN THE UPPERMOST LAYER, JUST BELOW THE SOIL SURFACE. THE TOTAL AMOUNT OF A TREE'S ROOTS ARE GENERALLY PROPORTIONAL TO THE VOLUME OF THE TREE'S CANOPY. THEREFORE, IF THE ROOTS ONLY PENETRATE A THIN LAYER OF SOIL, THEN THE ROOTS MUST SPREAD FAR FROM THE TREE, BEYOND THE LIMITS OF THE CANOPY.

ROOTS ARE VITAL TO THE FUNCTIONING OF ANY TREE. THEY PROVIDE STRUCTURAL SUPPORT AS WELL AS THE MAJOR MECHANISM FOR NUTRIENT AND WATER UPTAKE FOR USE BY THE REST OF THE TREE. DESTROYING A SECTION OF A TREE'S ROOTS WILL ULTIMATELY RESULT IN A PROPORTIONAL LOSS OF THE TREE'S CANOPY.

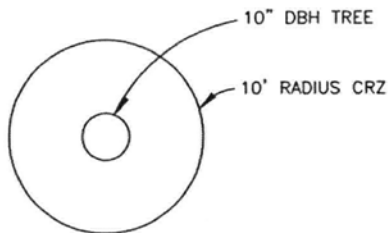
THE CRITICAL ROOT ZONE OF A TREE TO BE SAVED SHALL BE THE MINIMUM AREA PROTECTED WITH TREE PROTECTION FENCING.

THE FOLLOWING IS THE METHOD USED BY ARLINGTON COUNTY TO DETERMINE THE SIZE OF THE CRITICAL ROOT ZONE.

DRAFT: PENDING REVIEW AND APPROVAL BY DPW

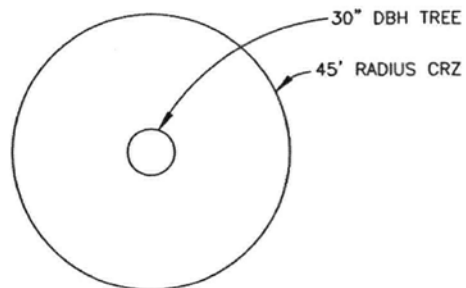
TREES GREATER THAN 8" DBH (DBH=DIAMETER BREAST HEIGHT):

1" DBH OF THE TREE = 1' RADIUS OF THE CRITICAL ROOT ZONE (CRZ)



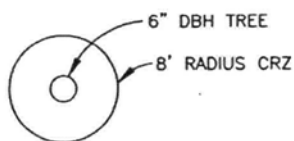
SPECIMEN TREES

1" DBH = 1.5' RADIUS OF THE CRITICAL ROOT ZONE.



TREES 8" DBH AND SMALLER:

8 FT. RADIUS CIRCLE AROUND THE TRUNK OF THE TREE.



TREE PROTECTION DETAIL
FOR DETERMINATION OF CRITICAL ROOT ZONE

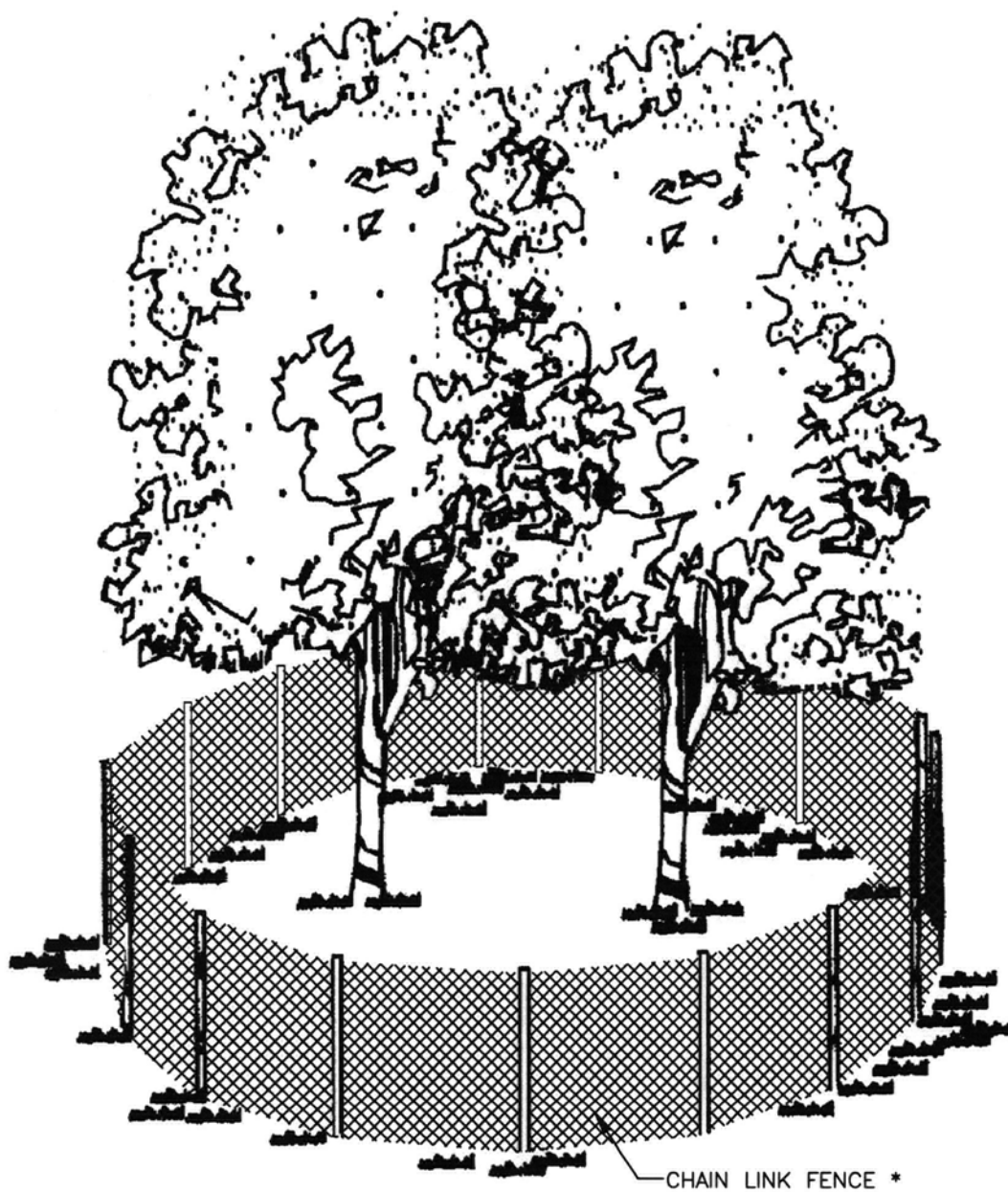
DIRECTOR _____ DATE _____



ARLINGTON COUNTY, VIRGINIA
DEPARTMENT OF PUBLIC WORKS

DRAWING NO.
R-7.7





TREE PROTECTION FENCE DETAIL

(NOT TO SCALE)

* TREE PROTECTION SHALL BE A MINIMUM 4' CHAIN LINK FENCE MOUNTED ON VERTICAL PIPES DRIVEN 2' INTO THE GROUND WITH NO GATES (WITH THE EXCEPTION OF 4.1 SITE PLANS, WHERE A MINIMUM OF 6' HIGH CHAIN LINK FENCE IS REQUIRED).

20-Yr Tree Canopy Coverage Worksheet

For determining compliance with Section 61-10.C of the Chesapeake Bay Preservation Ordinance

		Planting size Height (ft.) caliper (in.)	Spread at Planting (ft.)	Canopy Size	20 year coverage (sq. ft.)	Native to Region	Coverage bonus** (sq. ft.)
Tree Species	Common Name						
Deciduous Trees							
Acer buergerianum	trident maple	6-7	3-4	Medium	175		
A. negundo	boxelder			Large	315	X	393.75
A. rubrum	red maple	2-2 1/2	5-7	Large	315	X	393.75
A. saccharum	sugar maple	2-2 1/2	5-7	Large	315	X	393.75
Amelanchier arborea	downy serviceberry	6-7	4-6	Medium	175	X	218.75
A. canadensis	shadblow serviceberry	6-7	4-6	Medium	175	X	218.75
A. laevis	Allegheny serviceberry	6-7	4-6	Medium	175	X	218.75
Betula nigra	river birch	8-10	5-7	Medium	175	X	218.75
Carpinus betulus 'Fastigiata'	Fastigiata' European hornbeam	2-2 1/2	2-3	Small	50		
C. caroliniana	American hornbeam	6-7	3-5	Medium	175	X	218.75
Carya cordiformis	bitternut hickory	4-5	2-3	Medium-Large	250	X	312.5
C. glabra	pignut hickory	4-5	2-3	Medium-Large	250	X	312.5
C. tomentosa	mockernut hickory	4-5	2-3	Medium-Large	250	X	312.5
Castanea mollissima	Chinese chestnut	2-2 1/2	5-7	Medium	175		
Celtis laevigata	sugarberry	2-2 1/2	5-7	Medium-Large	250	X	312.5
C. occidentalis	common hackberry	2-2 1/2	5-7	Large	315	X	393.75
Cercidiphyllum japonicum	katsuratree	8-10 or 2-2 1/2	2-3	Medium	175		
Cercis canadensis	eastern redbud	6-7	2-3	Medium	175	X	218.75
C. chinensis	chinese redbud	6-7	2-3	Small-Medium	110		
Chionanthus virginicus	fringetree	6-7	2-3	Small-Medium	110	X	137.5
Cladrastis lutea	American yellowwood	2-2 1/2	3-5	Medium-Large	250		
Cornus alternifolia	pagoda dogwood	6-7	2-3	Small-Medium	110	X	137.5
C. florida	flowering dogwood	6-7	2-3	Medium	175	X	218.75
C. kousa	kousa dogwood	6-7	2-3	Medium	175		
C. mas	Cornelian-cherry	6-7	2-3	Small-Medium	110		
Cotinus coggygria	smoketree	6-7	3-4	Small-Medium	110		
Crataegus crus-galli	cockspur hawthorn	6-7	3-4	Medium	175	X	218.75
C. phaenopyrum	Washington Hawthorn	6-7	3-4	Small-Medium	110	X	137.5
C. viridis	Green hawthorne	6-7	3-4	Medium	175	X	218.75
Diospyros virginiana	common persimmon	2-2 1/2	4-6	Medium	175	X	218.75
Fagus grandifolia	American beech	1 3/4 - 2	4-5	Large	315	X	393.75
F. sylvatica	European beech	1 3/4 - 2	4-5	Medium	175		
Ginkgo biloba	ginkgo, maidenhair tree	2-2 1/2	3-5	Small-Medium	110		
'Autumn Gold'	'Autumn Gold' ginkgo	2-2 1/2	3-5	Medium	175		
Gleditsia triacanthos	honeylocust	2-2 1/2	3-5	Medium-Large	250	X	312.5
Gymnocladus dioica	Kentucky coffeetree	2-2 1/2	5-7	Medium	175		
Hamamelis virginiana	Witchhazel	4-5	2-3	Small-Medium	110	X	137.5
Juglans nigra	black walnut	2-2 1/2	5-7	Large	315	X	393.75
Lagerstroemia indica	crepe-myrtle	6-7	3-4	Small-Medium	110		
Liquidambar styraciflua	sweetgum	2-2 1/2	5-7	Medium	250	X	312.5
Liriodendron tulipifera	tulip poplar	2-2 1/2	5-7	Medium	250	X	312.5

20-Yr Tree Canopy Coverage Worksheet

For determining compliance with Section 61-10.C of the Chesapeake Bay Preservation Ordinance

Tree Species	Common Name	Planting size Height (ft.) caliper (in.)	Spread at Planting (ft.)	Canopy Size	20 year coverage (sq. ft.)	Native to Region	Coverage bonus* (sq. ft.)
Magnolia x soulangiana	saucer magnolia	6-7	3-4	Medium	175		
M. stellata	star magnolia	6-7	3-4	Small	50		
Malus coronaria	sweet crabapple	4-5	2-3	Small-Medium	110	X	137.5
M. angustifolia	southern crabapple	4-5	2-3	Small-Medium	110	X	137.5
Metasequoia glyptostroboides	dawn redwood	8-10	3-4	Medium	175		
Morus rubra	red mulberry	4-5	2-3	Medium-Large	250	X	312.5
Nyssa sylvatica	black gum	2-2 1/2	3-5	Medium-Large	250	X	312.5
Platanus x acerifolia	London plane tree	2-2 1/2	5-7	Medium-Large	250		
P. occidentalis	sycamore	2-2 1/2	5-7	Large	315	X	393.75
Populus grandidentata	bigtooth aspen	2 - 21/2	3-5	Large	315	X	393.75
P. deltoides	eastern cottonwood	2 - 2 1/2	3-5	Large	315	X	393.75
Prunus americana	American plum	4-5	3-4	Small	50	X	62.5
P. x incamp 'Okame'	Okame' cherry	6-7	3-4	Medium	175		
P. serrulata 'Kwansan'	Kwansan cherry	6-7	3-4	Medium	175		
P. sargentii	Sargent cherry	6-7	3-4	Medium	175		
P. serotina	black cherry	6-7	3-4	Medium-Large	250	X	312.5
P. x yedoensis	Yoshino cherry	6-7	3-4	Small-Medium	110		
Quercus alba	white oak	1 3/4 - 2	4-5	Large	315	X	393.75
Q. bicolor	swamp white oak	1 3/4 - 2	4-5	Large	315	X	393.75
Q. coccinea	scarlet oak	1 3/4 - 2	4-5	Large	315	X	393.75
Q. falcata	southern red oak	1 3/4 - 2	4-5	Large	315	X	393.75
Q. laurifolia	laurel oak	1 3/4 - 2	3-5	Medium	175		
Q. hemisphaerica	Darlington oak	1 3/4 - 2	3-5	Small-Medium	110		
Q. marilandica	blackjack oak	1 3/4 - 2	3-5	Small-Medium	110	X	137.5
Q. palustris	pin oak	2-2 1/2	5-7	Medium-Large	250	X	312.5
Q. phellos	willow oak	2-2 1/2	3-5	Medium-Large	250	X	312.5
Q. montana	chestnut oak	1 3/4 - 2	3-5	Medium-Large	250	X	312.5
Q. rubra	northern red oak	2-2 1/2	4-5	Large	315	X	393.75
Q. stellata	post oak	1 3/4 - 2	3-5	Medium-Large	250	X	312.5
Q. velutina	black oak	2 - 2 1/2	4-5	Medium-Large	250	X	312.5
Salix babylonica	weeping willow	2-2 1/2	4-5	Medium-Large	250		
S. matsudana 'Tortuosa'	corkscrew willow	2-2 1/2	3-4	Medium	175		
S. nigra	black willow	2-2 1/2	3-5	Medium-Large	250	X	312.5
Sophora japonica	pagodatree, scholar tree	2-2 1/2	3-4	Medium-Large	250		
Stewartia koreana	Korean stewartia	6-7	2-3	Small-Medium	110		
S. ovata	mountain camellia	6-7	2-3	Small-Medium	110		
S. psuedocamellia	Japanese stewartia	6-7	2-3	Small-Medium	110		
Styrax japonicus	Japanese snowbell	6-7	2-3	Small-Medium	110		
Syringa reticulata	Japanese tree lilac	6-7	2-3	Small-Medium	110		
Taxodium distichum	baldcypress	8-10	3-4	Medium-Large	250		
Tilia americana	American basswood	2-2 1/2	3-4	Large	315	X	393.75
T. cordata	littleleaf linden	2-2 1/2	3-4	Medium	175		
Ulmus americana	American elm	2-2 1/2	3-5	Large	315	X	393.75
'Liberty'	'Liberty' elm	2-2 1/2	3-5	Large	315	X	393.75
'Valley Forge'	Valley Forge' elm	2-2 1/2	3-5	Large	315	X	393.75
U. rubra	slippery elm	2-2 1/2	3-5	Medium-Large	250	X	312.5
Zelkova serrata	Japanese zelkova	2-2 1/2	3-5	Medium	175		

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For determining compliance with Section 61-10.C of the Chesapeake Bay Preservation Ordinance

		Planting size Height (ft.) caliper (in.)	Spread at Planting (ft.)	Canopy Size	20 year coverage (sq. ft.)	Native to Region	Coverage bonus* (sq. ft.)
Tree Species	Common Name						
Evergreen trees							
Abies concolor	white fir	6-7	2-4	Small-Medium	110		
Cedrus atlantica 'Glaucia'	blue atlas cedar	6-7	3-4	Small-Medium	110		
C. deodara	deodar cedar	6-7	3-4	Medium	175		
Chamaecyparis obtusa	Hinoki falsecypress	6-7	2-3	Small	50		
C. pisifera 'Plumosa'	Sawara cypress	6-7	2-3	Small	50		
x Cupressocyparis leylandii	Leyland cypress	6-7	3-5	Small	50		
Ilex x attenuata 'Fosteri'	Foster's holly	6-7	2-4	Small-Medium	110		
I. x 'Nellie R. Stevens'	Nellie R. Stevens holly	6-7	3-5	Small-Medium	110		
I. cornuta 'Burford'	Burford holly	6-7	2-4	Small-Medium	110		
I. opaca	American holly	6-7	2-4	Small-Medium	110	X	137.5
Juniperus chinensis							
'Robusta Green'	Chinese cedar 'Robusta Green'	6-7	3-5	Small	50		
'Spartan'	Chinese cedar 'Spartan'	6-7	3-5	Small	50		
J. virginiana	eastern red cedar	6-7	2-3	Small-Medium	110	X	137.5
Magnolia grandifolia	southern magnolia	8-10	5-7	Large	315		
M. virginiana	sweetbay	6-7	3-4	Medium	175	X	218.75
Picea glauca	white spruce	6-7	3-4	Small-Medium	110		
P. omorika	Serbian spruce	6-7	3-4	Small-Medium	110		
P. pungens	Colorado blue spruce	6-7	3-4	Small-Medium	110		
Pinus bungeana	lacebark pine	6-7	3-5	Small-Medium	110		
P. echinata	shortleaf pine			Medium	175	X	218.75
P. nigra	Austrian black pine	6-7	3-5	Medium	175		
P. rigida	pitch pine	6-7	3-5	Medium	175	X	218.75
P. strobus	eastern white pine	6-7	3-5	Medium	175		
P. taeda	loblolly pine	6-7	3-5	Medium	175	X	218.75
P. virginiana	Virginia pine	6-7	3-5	Medium	175	X	218.75
Thuja occidentalis	arborvitae, northern white cedar	6-7	3-4	Small	50		
T. orientalis	Oriental arborvitae	6-7	3-4	Small	50		
Tsuga canadensis	eastern hemlock	6-7	3-5	Medium	175	X	218.75
NOTES							
Estimated canopy at 20 years has been divided into 5 categories:							
	Large	315 sq. ft.					
	Medium - Large	250 sq. ft.					
	Medium	175 sq. ft.					
	Small - Medium	110 sq. ft.					
	Small	50 sq. ft.					
Minimum spacing requirements:							
	Large, Medium-Large	20 ft.					
	Medium	15 ft.					
	Small - Medium, Small	10 ft.					
Tree canopy coverage bonuses available:							
	Existing trees	1.5					
	*New native trees, outside the RPA	1.25					
1. Tree species listed as highly or moderately invasive by the VA DCR are not eligible for tree canopy coverage credit.							
2. Due to concerns about the spread Emerald Ash Borer, ash trees (Fraxinus sp.) will not be approved for canopy credit in Arlington County.							