

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0000 VEGETATION PRESERVATION AND PLANTING - TABLE OF CONTENTS

12-0100 PURPOSE AND INTENT

12-0200 BACKGROUND AND ORDINANCE APPLICABILITY

12-0300 ESTABLISHMENT OF THE TREE COMMISSION

12-0400 GUIDE FOR SELECTION OF TREES AND OTHER VEGETATION TO BE PRESERVED

12-0401 Guide to Tree and Forest Preservation Area Selection

12-0402 Site Planning for Tree and Forest Preservation

12-0403 Stresses of Construction

12-0404 Relative Ability of Trees to Withstand Construction Impacts

12-0405 Preparation of Existing Vegetation Maps (EVMs)

12-0406 Tree Surveys, Tree Transplanting Plans, and Tree Preservation Plans

12-0500 GUIDE FOR SELECTION OF TREES TO BE PLANTED

12-0501 Consideration Items

12-0502 Tree Selection and Cover Guide

12-0600 CONSERVATION PLANS

12-0601 Applicability

12-0602 Exceptions to Applicability

12-0603 Conservation Plan Contents

12-0604 Approval of Conservation Plans

12-0700 LANDSCAPE PLANS

12-0701 Requirements and Required Elements

12-0702 Tree Cover Specifications and Calculations

12-0703 Interior Parking Lot Landscaping

12-0704 Requirements and Specifications for Replacement Trees

12-0800 STANDARDS FOR FIELD PRACTICE

12-0801 Preconstruction

12-0802 Land Clearing Operations

12-0803 Vegetation Protection

12-0804 Treatment of Preservation Areas During Construction

12-0805 Tree and Shrub Planting

12-0806 End of Construction

12-0900 VIOLATIONS

12-0901 Constitution and Processing of Violations

12-0902 Replacement Trees and/or Vegetation

12-0000 VEGETATION PRESERVATION AND PLANTING

12-1000 PLATES

STANDARD DESIGNATION	PLATE NUMBER	DESCRIPTION	SECTION
N/A	1-12 (1M-12)	Critical Root Zones and Driplines of Trees	12-0402.1
N/A	2-12 (2M-12)	Tunneling	12-0403.3E
N/A	3-12 (3M-12)	Energy Conservation Tree Cover Credit	12-0501.10
N/A	4-12 (4M-12)	Deck Planter	12-0502.1D3
N/A	5-12 (5M-12)	Tree Protection Devices	12-0603.2C
N/A	6-12 (6M-12)	Tree Protection Fence Installation	12-0603.2C
N/A	7-12 (7M-12)	Root Pruning	12-0802.1
N/A	8-12 (8M-12)	Tree Planting	12-0805.3A
N/A	9-12 (9M-12)	Tree Staking	12-0805.3C
N/A	10-12 (10M-12)	Tree Guying	12-0805.3C
N/A	11-12 (11M-12)	Planting for Tree Seedlings	12-0805.5E(2)
N/A	12-12 (12M-12)	Pruning Cuts	12-0806.4A
N/A	13-12 (13M-12)	Vertical Mulching	12-0806.4B

12-1100 TABLES

TABLE NUMBER	DESCRIPTION	SECTION	PAGE NUMBER
12.1	Construction Tolerance	12-0404	12-7
12.2	Existing Vegetation Map Cover Types	12-0405	12-11
12.3	Undesirable Tree Species for a Developed Environment	12-0501.9	12-13
12.4	Tree Uses and Screening Yard Use Codes	12-0502.1D	12-14
12.5	Environmental Tolerance Codes	12-0502.1E	12-15
12.6	Problem Codes	12-0502.1F	12-16
12.7	Tree Selection and Cover Guide	12-0502	12-17
12.8	Sample Plant Schedule	12-0701.5	12-31
12.9	Plant Material Stock Size Specifications	12-0701.5C	12-32
12.10	Preservation Area Minimum Size Requirements	12-0702.1A(3)	12-33
12.11	Tree Cover Credit Using Option B	12-0702.2C	12-35
12.12	Tree Cover Calculations	12-0702.2	12-36
12.13	Interior Parking Lot Landscaping Calculations	12-0703.4	12-37
12.14	Replanting of Temporary Use and Resource Protection (RPA) Areas	12-0704.4	12-38

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0100 PURPOSE AND INTENT. It is the purpose and intent of § 12-0000 et seq. to regulate the removal of vegetation from public and private property within the County in order to preserve, protect, and enhance a most valuable natural resource entrusted to the Commonwealth, and to protect the health, safety, and welfare of its citizens. Section 12-0000 et seq. also establishes standards limiting the removal of vegetation and ensuring the replacement of vegetation sufficient to safeguard the ecological and aesthetic environment necessary to a healthy and happy community; prevents the unnecessary clearing and disturbing of land so as to preserve, insofar as practicable, the natural and existing growth of vegetation; and to replace, when necessary, the removed vegetation with the same or comparable species.

12-0200 BACKGROUND AND ORDINANCE APPLICABILITY. Prompted by the unnecessary destruction of trees in the County during the process of development, the Board, on June 18, 1973, unanimously passed the Tree Planting and Preservation Ordinance. This ordinance was designed to control the destruction of trees and established the Office of the County Arborist (now known as the Urban Forestry Division) to administer the ordinance. Over the first three years it became evident that certain revisions were necessary for more effective control of tree removal in the County. As a result, the ordinance requirements were incorporated into § 104-1-1 of the Code thereby becoming the Tree Preservation and Planting Requirements of § 104-1-1, with, ultimately, the requirements being changed to cover all vegetation as specified in § 104-1-1. In 1990 these requirements were again revised to reflect changes in the Code that require a percentage of tree cover to be established or retained on each site being developed. The new provisions were established pursuant to State enabling legislation allowing certain localities to adopt tree replacement ordinances. Section 12-0000 et seq. deals primarily with woody vegetation (trees, shrubs, and vines) while other vegetation for erosion control stabilization is more specifically covered in the Virginia Erosion and Sediment Control Handbook.

12-0300 ESTABLISHMENT OF THE TREE COMMISSION. The Board on June 18, 1973,

established the Tree Commission to provide advice to the Board based on annual reevaluation of the experience under the ordinance, provide leadership in developing understanding of the objectives and methods of the tree program, and assist the Urban Forestry Division in the development and maintenance of technical specifications and guidelines.

12-0400 GUIDE FOR SELECTION OF TREES AND OTHER VEGETATION TO BE PRESERVED

12-0401 Guide to Trees and Forest Preservation Area Selection

12-0401.1 Tree/Forest Selection. Individual trees and groups of trees to be preserved should be selected prior to design of development or construction plans. Selection of trees and groups of trees to be preserved should be accomplished through the use of Existing Vegetation Maps and tree surveys. Tree preservation areas shall include all existing trees and understory vegetation.

12-0401.2 Transplanting. Trees that will be removed for development should be assessed to determine if they are suitable for transplanting to other locations on and/or off-site. Successfully transplanted trees typically are more valuable than smaller nursery stock and can provide a cost savings over the use of nursery stock.

12-0401.3 Design and Demolition. No tree should be destroyed or damaged in any manner until the design of buildings and utility systems is final, nor should any tree planned for preservation or transplantation be destroyed or damaged during the demolition of any existing site features or structures.

12-0401.4 Preservation of Critical Areas. Critical areas, such as floodplains, streams and their associated steep slopes, and wetlands, should be left in their natural condition, only partially developed as open space, or renaturalized after any disturbance.

12-0401.5 Roadway Design. Roadways should be located where they will cause the least damage to valuable trees and forests. The existing contours should be followed, where feasible, to minimize cuts and fills.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0401.6 Preservation Area Placement. Every effort should be made in the planning and design stages to avoid fragmentation of preservation areas. The preservation of individual trees or small stands of trees is not generally recommended when disturbance to the critical root zone is to occur on more than two sides. Preservation areas should be located adjacent to existing forest on adjacent properties. Individual trees that will have 40% or more of the critical root zone disturbed by construction are not generally recommended for preservation.

12-0401.7 Trenching should be minimized by locating several utilities in the same trench. Excavations for basements and utilities should be kept away from the dripline of trees.

12-0401.8 Construction material storage areas and employee parking shall be located where they will not cause soil compaction near tree preservation areas.

12-0401.9 When retaining existing trees in parking areas, sufficient undisturbed ground around each tree shall remain to allow for tree survival.

12-0402 Site Planning for Tree and Forest Preservation

12-0402.1 Grading. Grading shall not take place within the dripline or critical root zone of trees to be preserved on or off-site unless approved by the Director. (See Plate 1-12 (1M-12)).

12-0402.2 Tolerance to Sudden Exposure. Consideration should be given to the tolerance of trees and other vegetation to the new environmental conditions created by clearing and grading such as increased direct sunlight, increased radiant heat from proposed buildings, and pavement, and increased wind.

12-0402.3 Water Table and Surface Drainage. Consideration should be given to the effect of grading on the water table and surface drainage patterns. An increase or reduction in available water caused by grading may adversely impact trees and other vegetation proposed to be preserved.

12-0402.4 Outstanding Specimens. Trees and other vegetation which have been determined by the

Director to be of high value because of their species, size, age, form, historical significance, or other professional criteria, shall be preserved if possible.

12-0402.5 Structural Characteristics. Trees with a well developed crown and trunk taper should generally be given preference over those with misshapen crowns or trunks, those with a small crown at the top of a tall trunk, or those with narrow, V-shaped trunk or branch unions.

12-0402.6 Forest Successional Stages. The existing successional stage of a forest can influence the ability of trees to survive construction. In general, the term "forest succession" refers to the gradual supplanting of one community of plants by another over time on a given site. The existing forest successional stage shall be considered during the design phase. In general, younger trees are better able to withstand the microclimactic changes that occur when surrounding trees are cleared and the soil is graded or compacted.

12-0402.7 Hazardous Trees. When planning for the preservation of trees or groups of trees, trees that are potentially hazardous should be thoroughly evaluated prior to making decisions regarding preservation. A hazardous tree is one that: a) possesses an above and/or below ground structural defect that predisposes the tree or a portion of the tree to failure, and b) has the potential to strike and cause damage to an existing or proposed target such as a road, structure, pedestrian, etc. Any tree which possesses these two qualities shall be considered hazardous and shall be subject to removal or corrective action as determined by the Director.

12-0402.8 Wildlife Value. The retention of trees and other vegetation preserves wildlife habitat. Trees that provide mast, berries and/or fruit, or nesting cover are valuable to wildlife. Trees with a high food value for wildlife include oaks, hickories, and dogwoods.

12-0402.9 Energy Conservation. Consideration should be given to the location of trees to be retained in relation to the planned use of the site. With proper selection of species and location, trees provide decreased energy consumption in buildings they shade from summer heat, or serve to reduce wind speed. (See 12-0501.10).

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0402.10 Health and Disease Susceptibility. Trees should be checked for scarring caused by fire or lightning, insect or disease damage, and rotted or broken trunks or limbs. Preservation of trees that are in good condition and are resistant to pests and pollution is preferred.

12-0403 Stresses of Construction

12-0403.1 Trees and Construction. Construction activities expose trees to a variety of stresses resulting in injury ranging from superficial wounds to death. Understanding these stresses is critical to planning for tree preservation.

12-0403.2 Surface Impacts. Forces exerted on the tree above the ground, such as those listed below, can cause significant damage and limit a tree's ability to survive construction.

12-0403.2A Wind Damage. Removal of some trees from a forest will expose the remaining trees to greater wind velocities. Trees tend to develop anchorage where it is most needed. Isolated trees develop anchorage rather equally all around, with stronger root development on the side of the prevailing winds. The more a tree is protected from the wind in a forest, the less secure is its anchorage. Improper thinning or removal of adjacent vegetation often exposes trees to wind-throw. Knowledge of each species' susceptibility to wind-throw damage is important to selecting trees for preservation.

12-0403.2B Excessive or Inappropriate Pruning. Trees are often "topped" or carelessly pruned to prevent interference with utility wires or buildings. "Topping" or the removal of a large percentage of the top of a tree to reduce its height is not an industry accepted practice. If too much green tissue is removed, the tree may not be able to sustain itself. If the pruning is done without considering the tree's growth habit, the tree may lose all visual appeal. If the branches are not pruned correctly, decay and invasion by pathogens and insect pests may occur and weaken the tree structurally. (See § 12-0806.4).

12-0403.2C Trunk Damage. Tree trunks are often wounded by being hit by trucks and construction equipment. Such wounds provide points of entry for insects, diseases, and decay organisms thereby damaging vital conductive tissues. This damage can result in decline and death of the tree.

12-0403.2D Lightning Hazards. The preservation of an individual tree may create a lightning hazard, especially if the individual tree was previously protected by other trees or is the tallest feature in the area. Lightning protection should be installed in individual trees that present a lightning hazard.

12-0403.3 Root Zone Impacts. On construction sites it is often impossible to preserve the entire root zone of a tree. For open-grown trees, preservation of the root zone area within the dripline is usually sufficient for survival; for forest-grown trees, the entire critical root zone should remain undisturbed to ensure the trees survival. For a definition of "dripline" and "critical root zone" see Plate 1-12 (1M-12). For a list of individual tree species' tolerance to construction damage, see Table 12.1.

12-0403.3A Raising the grade by placing fill over the root zone can retard the normal exchange of air and gases between the roots and soil. Roots may suffocate due to lack of oxygen, or be damaged by toxic gases and chemicals released by soil bacteria. Raising the grade may also elevate the water table which may produce intolerably wet conditions.

12-0403.3B Lowering the grade more than a few inches (centimeters) may sever or irreparably damage a significant portion of both the structural and absorbing roots. Shallow grading results in the removal of top soil, leaf litter, understory vegetation and absorbing roots. The end result is a tree with the reduced capacity to absorb water and nutrients, and reduced stability against wind-throw.

12-0403.3C Lowering the grade may lower the water table, inducing drought. This is a problem in large roadway cuts, underdrain installations, or other deep trenches.

12-0403.3D Compaction of the soil within the root zone of a tree by equipment operation, materials storage, parking, or paving can block off air and water from roots. Lack of oxygen and water can cause tree roots to die, resulting in tree decline and/or death.

12-0403.3E Trenching within the dripline or critical root zone of an existing tree is extremely detrimental due to the partial or complete severing of roots, and desiccation by exposure to sun and wind. When trenching activities sever 40% or more of a tree's

12-0000 VEGETATION PRESERVATION AND PLANTING

critical root zone, the tree will likely die within two to five years. An alternative to trenching is tunneling, which causes less disturbance and mortality to the root system and lessens considerably the physical impact on the tree. (See Plates 1-12 (1M-12) and 2-12 (2M-12)).

12-0403.3F Construction chemicals or toxic refuse disposed of in the soil can be taken up through a tree's roots causing decline and/or death of the tree.

12-0404 Relative Ability of Trees to Withstand Construction Impacts

12-0404.1 Construction Tolerance. Table 12-1 rates tree species on their general and relative ability to withstand construction impacts. This list is not to be considered inclusive of all species' variations and possible site conditions. The list was prepared based on field observations over several decades and reflects each species' ability to tolerate the following impacts: soil compaction, physical injury, overall root loss, microclimatic change, and other environmental factors. The tolerance ratings are based on the assumption that prior to impact the trees are healthy. The information in the table was adapted for Fairfax County from an article entitled: Relative Tolerance of Tree Species to Construction Damage, by Dr. Kim Coder, University of Georgia, 1996.

12-0404.2 Construction Tolerance Columns (Table 12.1).

12-0404.2A Common/Botanical Name. Tree species are listed by common name in alphabetical order. The trees included are native to, or have been routinely planted in, the Mid-Atlantic region.

12-0404.2B General Tolerance. The tolerance ratings listed reflect the overall ability of a species to tolerate construction impacts:

P = Poor

M = Medium

G = Good

These ratings should be considered very general because an individual tree's tolerance of construction damage is influenced by many factors including age, health, and site and weather conditions.

12-0404.2C Limiting Factors. The limiting factors listed reflect characteristics of individual tree species: I = physical injury - species known to have limited/poor ability to resist decay through compartmentalization of injured tissue.

R = impacts to root zone - species known to have limited ability to recover from loss of and/or physical damage to the root system.

P = pest complications - species known to be susceptible to chronic and acute attacks by known pests and diseases.

C = climatic tolerance - species known to have limited ability to tolerate changes in microclimate including changes to hydrology, soil structure, adjacent vegetation (increased exposure to sunlight and wind), and weather; and species with limited ability to survive outside or near the limits of its known native range, and/or plant hardiness zone.

12-0404.2D Comments. The comments listed are generally recognized characteristics which may or may not affect a species ability to tolerate construction-related damage.

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.1 CONSTRUCTION TOLERANCE

COMMON/ BOTANICAL NAME	GENERAL TOLERANCE	LIMITING FACTORS	COMMENTS
ash, green/ <i>Fraxinus pennsylvanica</i>	G	P	borers
ash, white/ <i>Fraxinus americana</i>	M	I, R, C	
Atlantic white cedar/ <i>Chamaecyparis thyoides</i>	G	C	
baldcypress/ <i>Taxodium distichum</i>	G	R, C	
basswood, American/ <i>Tilia americana</i>	M	I, R	
beech, American/ <i>Fagus grandifolia</i>	P	I, R, P, C	
birch, black/sweet/ <i>Betula lenta</i>	M	I, C	
birch, river/red/ <i>Betula nigra</i>	G		
blackgum/ <i>Nyssa sylvatica</i>	G		
black locust/ <i>Robinia pseudoacacia</i>	G	P, C	weak wood
black walnut/ <i>Juglans nigra</i>	P	I, R, C	allelopathic
bigtooth aspen/ <i>Populus grandidentata</i>	P	I, R, C	weak wood
butternut/white walnut/ <i>Juglans cinerea</i>	P	I, R, C	weak wood, allelopathic
catalpa, southern/ <i>Catalpa bignonioides</i>	G	R	
cherry, black/ <i>Prunus serotina</i>	M	I, P	eastern tent caterpillar
crabapple species/ <i>Malus spp.</i>	M	I, P, C	fire-blight, scab
cryptomeria, Japanese/ <i>Cryptomeria japonica</i>	G		
cucumbertree/ <i>Magnolia acuminata</i>	M	I	
dogwood, flowering/ <i>Cornus florida</i>	M	I, P, C	Discula anthracnose
downy serviceberry/ <i>Amelanchier arborea</i>	M	I, R, C	
eastern hophornbeam/ <i>Ostrya virginiana</i>	M	R, C	
eastern redcedar/ <i>Juniperus virginiana</i>	G		

GENERAL TOLERANCE:

G = good; M = medium; P = poor

LIMITING FACTORS:

I = physical injury; R = root zone impacts; P = pest complications;
C = climatic tolerance

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.1 CONSTRUCTION TOLERANCE

COMMON/ BOTANICAL NAME	GENERAL TOLERANCE	LIMITING FACTORS	COMMENTS
elm, American/ <i>Ulmus americana</i>	M	P	Dutch elm disease
elm, Chinese/ <i>Ulmus parvifolia</i>	M	R, P	
elm, Siberian/ <i>Ulmus pumila</i>	M	C, P	weak wood
elm, slippery/ <i>Ulmus rubra</i>	M	R, P, C	
fringetree/ <i>Chionanthus virginicus</i>	M	I, R, C	
ginkgo/maiden-hair tree/ <i>Ginkgo biloba</i>	G		
hemlock, eastern/ <i>Tsuga canadensis</i>	P	I, R, P, C	woolly adelgid
hickory, bitternut/ <i>Carya cordiformis</i>	M	R, C	
hickory, mockernut/ <i>Carya tomentosa</i>	M, P	R, C	
hickory, pignut/ <i>Carya glabra</i>	M	R, C	
hickory, shagbark/ <i>Carya ovata</i>	M, P	R, C	
holly, American/ <i>Ilex opaca</i>	G		
honeylocust/ <i>Gleditsia triacanthos</i>	G	I, P	
hornbeam, American/ <i>Carpinus caroliniana</i>	M	R, C	
magnolia, southern/ <i>Magnolia grandiflora</i>	M	I, C	
magnolia, sweetbay/ <i>Magnolia virginiana</i>	G	C	
maple, Norway/ <i>Acer platanoides</i>	M, G	I, R	invasive exotic, allelopathic
maple, red/ <i>Acer rubrum</i>	G		weak wood
maple, silver/ <i>Acer saccharinum</i>	P	I, R, P, C	weak wood
maple, sugar/ <i>Acer saccharum</i>	P	C	
oak, black/ <i>Quercus velutina</i>	G	R	
oak, chestnut/ <i>Quercus prinus</i>	G, M	R, C	

GENERAL TOLERANCE: G = good; M = medium; P = poor
 LIMITING FACTORS: I = physical injury; R = root zone impacts; P = pest complications;
 C = climatic tolerance

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.1 CONSTRUCTION TOLERANCE

COMMON/ BOTANICAL NAME	GENERAL TOLERANCE	LIMITING FACTORS	COMMENTS
oak, pin/ <i>Quercus palustris</i>	G		iron chlorosis in alkaline soil
oak, laurel/ <i>Quercus laurifolia</i>	G	R	
oak, northern red/ <i>Quercus rubra</i>	G, M	R, C	
oak, post/ <i>Quercus stellata</i>	G	R	
oak, sawtooth/ <i>Quercus acutissima</i>	G	R	
oak, scarlet/ <i>Quercus coccinea</i>	G	R	
oak, southern red/ <i>Quercus falcata</i>	G	R, C	
oak, swamp chestnut/ <i>Quercus michauxii</i>	G	R, C	
oak, swamp white/ <i>Quercus bicolor</i>	G	R, C	
oak, water/ <i>Quercus nigra</i>	G	R, C	
oak, white/ <i>Quercus alba</i>	G, M	R, C	
oak, willow/ <i>Quercus phellos</i>	G, M	R, C	
persimmon, common/ <i>Diospyros virginiana</i>	G	P	
pine, Austrian/ <i>Pinus nigra</i>	G, M	P	
pine, eastern white/ <i>Pinus strobus</i>	M	I, R, P, C	weak wood
pine, loblolly/ <i>Pinus taeda</i>	G	C	
pine, pitch/ <i>Pinus rigida</i>	G		
pine, scotch/ <i>Pinus sylvestris</i>	G	C	
pine, shortleaf/ <i>Pinus echinata</i>	M	P	
pine, Virginia/ <i>Pinus virginiana</i>	M	C	weak wood, wind-throw hazard
plum, American/ <i>Prunus americana</i>	M	I, R, P	

GENERAL TOLERANCE: G = good; M = medium; P = poor
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 C = climatic tolerance

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.1 CONSTRUCTION TOLERANCE

COMMON/ <i>BOTANICAL NAME</i>	GENERAL TOLERANCE	LIMITING FACTORS	COMMENTS
redbud, eastern/ <i>Cercis canadensis</i>	M	R, C	
sassafrass/ <i>Sassafrass albidum</i>	G		weak wood
silverbell, Carolina/ <i>Halesia carolina</i>	M	I, R, C	
snowbell, American/ <i>Styrax americana</i>	M	I, R	
sourwood/ <i>Oxydendrum arboreum</i>	P	I, R, P, C	
spruce, Colorado blue/ <i>Picea pungens</i>	M	R, C	
stewartia, Virginia/ <i>Stewartia malacodendron</i>	G		
sweetgum/ <i>Liquidambar styraciflua</i>	G	R	
sycamore, American/ <i>Platanus occidentalis</i>	M	P, C	anthracnose
tulip poplar/ tulip tree/ <i>Liriodendron tulipifera</i>	P	I, R, C	weak wood
yellowwood/ <i>Cladrastis kentukea</i>	P	I, R, P, C	

GENERAL TOLERANCE:

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LIMITING FACTORS:

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12-0000 VEGETATION PRESERVATION AND PLANTING

12-0405 Preparation of Existing Vegetation Maps (EVMs)

12-0405.1 EVM Definition. Existing vegetation maps (EVMs) shall depict vegetative cover types as defined in Table 12.2. This depiction shall include the approximate area of each cover type 500ft² (46m²) or greater, a list of the primary tree species in each cover type, a general statement regarding the successional stage of each cover type, and a statement regarding the general health and condition of each cover type.

TABLE 12.2. EXISTING VEGETATION MAP COVER TYPES

The following forest cover types are comprised of various vegetative communities. For each forest cover type the most commonly found vegetative communities are listed, as applicable.

(1) Open Field	no trees present; meadow
(2) Upland Forest	upland hardwoods: oak, hickory and yellow-poplar upland softwoods: Virginia pine
(3) Old Field	hardwood cover: sweet gum, ash, red maple softwood cover: eastern red cedar, Virginia pine
(4) Agricultural Land	land currently in use or recently used for agriculture or plant nurseries, as defined in the Zoning Ordinance, except for the growing of trees for sale
(5) Developed Land	areas constructed with physical features including buildings, parking and roadways
(5) Maintained Grasslands	grassed and landscaped areas, athletic fields or other green areas devoid of natural vegetation

(6) Bottomland Forest river birch, sycamore, yellow poplar, sweet gum, green ash

12-0406 Tree Surveys, Tree Transplanting Plans, and Tree Preservation Plans

12-0406.1 Timing. When required by proffers and/or development conditions on sites subject to rezoning, special exception, special permit, and/or variance approvals, tree surveys, tree transplanting plans, and tree preservation plans shall be provided as part of the first submission of the conservation plan.

12-0500 GUIDE FOR SELECTION OF TREES TO BE PLANTED

12-0501 Consideration Items. The following elements shall be considered when selecting tree species to be planted.

12-0501.1 Ultimate Tree Size. The mature height and spread of trees shall be considered to ensure that they will not interfere with proposed structures and overhead or underground utilities. Root development shall be considered to ensure that tree placement will not cause interference with walls, walks, drives, patios, and other paved surfaces or affect water and sewer lines, septic systems, underground drainage systems or dam embankments.

12-0501.2 Site Conditions. The existing and proposed use(s) and condition(s) of the developed area, as well as the existing and future availability of light and water, shall be considered prior to plant selection. Trees which exhibit a tolerance to air pollution should be selected if a large amount of air pollution will be present. Trees which are suitable for buffering or screening should be selected where noise or objectionable views are anticipated problems. Generally, evergreens provide better buffering and screening than deciduous trees. Trees should be selected which can tolerate de-icing salts if there is a chance these will be used in close proximity. (See Table 12.7).

12-0501.3 Life Span. Preference should be given to trees with long life spans.

12-0501.4 Resistance to Disease and Insects. Trees that are known to be resistant to attacks by disease or

12-0000 VEGETATION PRESERVATION AND PLANTING

insects should be given preference over those known to be susceptible.

12-0501.5 Native Trees

12-0501.5A Native trees and shrubs should be used whenever possible. Exotic (non-native) species known to be invasive should not be planted. Contact the Urban Forestry Division for information on published lists of native tree and plant species.

12-0501.5B Tree Cover Credit for Native and Other Desirable Trees. A tree cover credit of 1.10 times the 10-year canopy may be counted toward meeting the tree cover credit for those landscape trees designated as native and desirable species in Table 12.7. However, this credit can only be taken if the designated native and desirable trees comprise at least 90% of all trees listed in the plant schedule to be planted on-site. Other native and desirable trees not listed in the table may also receive the 1.10 credit if approved by the Director.

12-0501.6 Aesthetics. Consideration should be given to flowering habits, autumn foliage, bark and crown characteristics, and type of fruit.

12-0501.7 Wildlife Value. Trees and other vegetation that provide food and habitat for wildlife should be considered.

12-0501.8 Landfills. The proximity to landfills should be considered. Gases generated from fill soils can travel underground for a considerable distance and kill trees.

12-0501.9 Undesirable Characteristics. Table 12.3 includes trees that exhibit undesirable qualities when planted in a developed environment. While some of these trees may have desirable qualities in a natural environment, such as providing food and shelter for wildlife or serving to stabilize stream banks, care should be given when considering these species for use near residences, buildings, parking structures, roads and pedestrian walkways.

12-0501.10 Energy Conservation

12-0501.10A Tree Planting for Energy Conservation. Planting or preserving deciduous trees near buildings and other structures reduces heat absorption during the summer and allows for passive solar heating during the winter. In Fairfax County, maximum cooling savings and minimum heating expenditures will result when deciduous trees shade the western, southwestern, and northwestern walls and windows of buildings. (See Plate 3-12 (3M-12)).

12-0501.10B Tree Selection for Energy Conservation. Table 12.7 identifies trees that are effective for energy conservation. These trees are well suited for this purpose due to their ultimate size, form, canopy density, and other criteria.

12-0501.10C Tree Location for Energy Conservation. When choosing a planting location for energy conservation, the tree's form and ultimate size must be considered to minimize maintenance and assure healthy, long-term growth and survival. Consult Table 12.7 to determine tree sizes and other species-specific constraints. For example, if the planting area is located 20' (6.1m) from a building, a Category III tree would be appropriate. If the planting distance from the building is 30' (9.1m) or greater, a Category IV tree should be considered. (See Plate 3-12 (3M-12)).

12-0501.10D Tree Cover Credit for Energy Conservation. A tree cover credit of 1.5 times the 10-year canopy credit listed in Table 12.7 for approved energy conservation trees may be counted toward meeting the tree cover requirement. These trees must be located 20' to 35' (6.1m to 10.7m) from the edge of a building and significantly shade its western, southwestern or northwestern exposure from 2:30 p.m. to 7:30 p.m. from May through September. (See Plate 3-12 (3M-12)). The landscape plan must clearly label those trees which are used for the energy conservation credit, and the calculations must be separately identified in the Tree Cover Calculations. Other trees counted toward meeting the tree cover requirement not listed in Table 12.7, or the use of existing trees preserved for energy conservation credit, may be approved by the Director if they meet the above requirements.

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.3 UNDESIRABLE TREE SPECIES FOR A DEVELOPED ENVIRONMENT

BOTANICAL NAME	COMMON NAME	PROBLEMS
<i>Acer negundo</i>	box elder	weak wood, short lived, susceptible to various insect infestations
<i>Acer platanoides</i>	Norway maple	prolific seeds, invasive
<i>Acer saccharinum</i>	silver maple	objectionable root system, prolific seeds, weak wood, susceptible to various insects and diseases
<i>Ailanthus altissima</i>	tree of heaven	weak wood, male flowers have a strong odor, prolific seeds
<i>Albizia julibrissin</i>	mimosa	invasive, susceptible to wilt disease and mimosa webworm
<i>Betula pendula</i>	white birch	susceptible to severe borer damage
<i>Ginkgo biloba</i> (female only)	ginkgo	female plant produces fruits with objectionable odor; male plant only is recommended
<i>Maclura pomifera</i> (female only)	osage orange	large prolific fruit, thorns, shallow roots; thornless male varieties only are recommended.
<i>Morus spp.</i>	mulberries	prolific fruit
<i>Paulownia tomentosa</i>	empress tree	weak wood, prolific seeds, invasive
<i>Phellodendron ameurense</i> (female only)	Amur corktree	prolific seeds, invasive, male varieties only recommended
<i>Populus spp.</i>	poplars	short lived, objectionable root system, weak wood, susceptible to canker disease
<i>Pyrus calleryana</i> >Bradford=	Bradford pear	highly susceptible to storm damage, invasive
<i>Prunus serotina</i>	black cherry	prolific seeds, susceptible to eastern tent caterpillar infestation
<i>Salix babylonica</i>	weeping willow	objectionable root system, weak wood
<i>Ulmus americana</i>	American elm	highly susceptible to Dutch elm disease, elm phloem necrosis, and various insect infestations; cultivars may be desirable if resistant to Dutch elm disease
<i>Ulmus pumila</i>	Siberian elm	short lived, susceptible to various insect and disease infestations.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0502 Tree Selection and Cover Guide. Table 12.7 contains information which is helpful when selecting trees to be planted on sites after construction has been completed. For the purposes of defining tree cover credit, the table contains categories of trees based on their ultimate height and spread. This information is not all inclusive, but does include many species which have performed well in this region and are generally available in local nurseries. The highlighted tree species and their cultivars, many of which are native species, have proven to perform well in the landscape under the conditions typical for the listed tree uses. These native and desirable landscape trees may be eligible for increased tree cover credit. (See § 12-0501.5B).

12-0502.1 Explanation of Tree Selection and Cover Guide Columns and Codes

12-0502.1A Botanical/Common Name. This column lists trees alphabetically and categorizes them based on their ultimate size and tree cover area. Botanical names are given first, including genus, species, and, in some cases, cultivar name. Common names used in the Mid-Atlantic region are given second. Deciduous trees are separated from evergreens in all categories. Evergreens include both coniferous and broadleaf species.

12-0502.1B Minimum Required Planting. This column shows the soil surface area in ft² (m²) that must be provided when planting a given species. This information shall be used to determine the minimum planting space for all planted trees. When minimum planting areas cannot be provided due to existing conditions, alternative designs that provide the maximum possible planting areas may be allowed as approved by the Director. A detail showing the alternative design shall be provided on the landscape plan.

12-0502.1C Projected 10-Year Tree Cover Area. These columns give the projected 10-year tree cover area in ft² (m²) for trees of different sizes at time of planting. Deciduous trees are listed by commonly available caliper sizes and evergreen trees are listed by commonly available heights. The 10-year canopy cover shall be used to determine tree cover credit for planted trees and shall be used for drawing trees to scale on the landscape plan and to determine minimum spacing requirements. When drawn to

scale, tree canopies shall not significantly overlap. (See § 12-0701.4).

12-0502.1D Tree Uses and Screening Yard Use. Tree selection should be based upon post-development site conditions. (See Table 12.4).

TABLE 12.4 TREE USES AND SCREENING YARD USE CODES

<u>Tree Uses</u>	<u>Code</u>
General	G
Native	N
Parking Lot Planting Areas	PL
Planting in Restricted Areas	RA
Energy Conservation Credit	EC
Wildlife Value	WL
<u>Screening Yard Use</u>	
Categorized by Transitional Screening Requirements:	
Large Evergreen Tree	LE
Medium Evergreen Tree	ME
Large Deciduous Tree	LD
Small Deciduous Tree	SD

12-0502.1D(1) General. These trees are suitable for a variety of uses.

12-0502.1D(2) Native. A native tree is defined as a species that was indigenous to the vegetation communities in Fairfax County before the arrival of Europeans to North America (pre-Columbian).

12-0502.1D(3) Parking Lot Planting Areas (PL). These tree species have been selected for use in parking areas based on their favorable branching habits and tolerance of poor soils, drought, radiant heat, and restrictive root space. Trees most appropriate for planting on parking decks will have the following environmental tolerances: restricted root zone (RZ), poor soils (SC), air pollution (AP), and drought tolerance (D). Tree planters on decks shall provide the minimum planting areas as stated in Table 12.7 and include a suitable, lightweight soil

12-0000 VEGETATION PRESERVATION AND PLANTING

mix, and means of irrigation and drainage. (See Plate 4-12 (4M-12)).

12-0502.1D(4) Plantings in Restricted Areas (RA). Where the ultimate size and form of a tree, along with its root structure, must be given consideration in order to avoid potential maintenance, safety, and access problems. These species should be considered.

12-0502.1D(5) Energy Conservation Credit (EC). The deciduous species listed (EC) are suggested for use adjacent to buildings to conserve energy by providing shade. (See Plate 3-12 (3M-12)).

12-0502.1D(6) Wildlife Value (WL). These trees provide food and/or shelter for wildlife.

12-0502.1D(7) Screening Trees (LE, ME, LD, SD). Trees identified by these notations are effective in meeting the transitional screening requirements of the Zoning Ordinance by providing eye-level visual screening. Both deciduous and evergreen species are listed but only evergreens provide year-round screening.

12-0502.1E Environmental Tolerances. This column is used to select species that are tolerant of specific environmental factors, both natural and constructed, that occur frequently in the urban setting. Refer to Table 12.5 for the tolerance code list.

TABLE 12.5 ENVIRONMENTAL TOLERANCE CODES

<u>Environmental Tolerances</u>	<u>Code</u>
Restricted Root Zone	RZ
Poor Soil Conditions	SC
Partial Shade	PS
Full Shade	SH
Air Pollution	AP
De-icing Salts	IS
Wet Soil Conditions	W
Drought Conditions	D

12-0502.1E(1) Restricted Root Zone (RZ). These species will tolerate limited planting areas better than other species. Roots of these trees will usually not disrupt surrounding hardscapes. It is noted that trees

that are planted in areas that meet only the minimum requirements for planting area, generally will not be healthy, long-lived trees. A larger planting space will result in more healthy, vigorous specimen trees due to increased nutrient availability and improved soil conditions.

12-0502.1E(2) Poor Soil Conditions (SC). These species are noted for their tolerance to a range of soil conditions found in the urban environment. It should be noted that most trees do not tolerate poor soils. Tolerant trees that may grow in poor soil will generally not thrive.

12-0502.1E(2)(a) A poor soil is a soil used as a growing medium that has marginal properties for support of plant life. Poor soil conditions may include one or more of the following characteristics: low nutrient content (essential nutrients have been leached or the soil lacks nutrient holding capacity), improper pH (a soil that is either too acidic or too alkaline) and poor structure (highly compacted with little pore space and a low water infiltration and percolation rate).

12-0502.1E(2)(b) Subsoils used to provide a stable base for sidewalks, parking lots, buildings, etc., and general grading purposes are often inadequate for plant growth. Amending these soils with composted organic matter and agricultural lime may improve soil pH, structure, and nutrient availability. Testing soil for pH and nutrient content is advisable prior to amending soil. Soil amending in individual planting holes is not recommended. If soil amendments are needed, they should be applied using broadcast methods and tilled in over a large planting area.

12-0502.1E(3) Partial Shade (PS). These species tolerate or prefer areas receiving partial amounts of direct sunlight such as on the eastern or northern sides of structures or forested areas.

12-0502.1E(4) Full Shade (SH). These species tolerate or prefer a shaded environment. However, the deeper the shade, the more difficult it is for any tree to thrive.

12-0502.1E(5) Air Pollution (AP). This group of species will tolerate areas subjected to exhaust gas emissions found along roadways and within parking lots. These trees are typically deciduous and shed their leaves before particulate matter can damage

12-0000 VEGETATION PRESERVATION AND PLANTING

plant tissue. Evergreens retain leaves or needles longer, allowing particulate matter to be absorbed and destroy plant tissue, and as such are more susceptible to pollution injury.

12-0502.1E(6) De-icing Salts (IS). These species are tolerant of root and leaf exposure to de-icing salts such as sodium chloride and calcium chloride. These trees should be planted along roadways and in the vicinity of parking lots, sidewalks, and asphalt paths subject to snow and ice removal operations.

12-0502.1E(7) Wet Soil Conditions (W). These species will tolerate moderate to excessive soil moisture. These trees should be planted adjacent to waterways, ponds, lakes, and stormwater retention and detention facilities.

12-0502.1E(8) Drought Conditions (D). These species will tolerate hot, dry conditions. They require less available soil moisture than most trees and should be considered for planting areas subjected to heat, drying winds, and intense solar radiation without the benefit of supplemental moisture. These conditions are often found along roadways, parking lots, parking decks, and around buildings that absorb heat and reflect sunlight.

12-0502.1F Problems. This column is provided to identify general problems associated with certain tree species. (See Table 12.6).

periodic replacement of the entire tree will be required.

12-0502.1F(2) Insect Damage (IN). These trees are subject to damage by insects or related organisms. Considerable damage such as defoliation or death may occur with these species because the pests often cannot be effectively controlled without considerable expense and use of pesticides. Periodic inspection and maintenance will be necessary on these species.

12-0502.1F(3) Structural Problems (due to weak wood) (WW). These species are susceptible to structural failures such as falling branches and main stem failure. These species should not be planted near buildings or facilities where people gather or reside.

12-0502.1F(4) Objectionable Fruit (FR). These tree species produce fruit with objectionable qualities. These include fruit that is capable of causing damage when falling, is slick or sticky on roads or walkways, attracts pests, produces disagreeable odors, causes stains, and/or produces prolific seedlings.

12-0502.1F(5) Objectionable Root System (RS). These trees typically produce surface roots that are capable of heaving sidewalks and asphalt trails, clogging sewer and drainage pipes, and/or creating tripping hazards.

TABLE 12.6 PROBLEM CODES

<u>Problems</u>	<u>Code</u>
Disease Problems	DS
Insect Damage	IN
Structural Problems (due to weak wood)	WW
Objectionable Fruit	FR
Objectionable Root System	RS

12-0502.1F(1) Disease Problems (DS). These species are susceptible to severe stress, disfigurement, or death caused by diseases which produce symptoms which are not curable or controllable. Species that fall into this category are not recommended for planting. If these species are planted, then it is likely that annual maintenance and

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				
CATEGORY I		Trees 50 feet or less in height at maturity with a spread less than one-half of their height						
DECIDUOUS TREES								
<i>Acer rubrum</i> 'Columnare'/ Columnar red maple	50 (5)	40 (4)	50 (5)	75 (7)	RA		RZ	
<i>Carpinus betulus</i> 'Fastigiata'/ Fastigate European hornbeam	50 (5)	40 (4)	50 (5)	75 (7)	RA		PS	
<i>Fagus sylvatica</i> 'fastigiata'/ Fastigate European beech	50 (5)	40 (4)	50 (5)	75 (7)	RA		PS	
<i>Ginkgo biloba</i> 'Sentry'/ Sentry ginkgo	50 (5)	40 (4)	50 (5)	75 (7)	RA		AP, D, RZ, SC	
<i>Pyrus calleryana</i> 'Chanticleer'/ Chanticleer pear	50 (5)	40 (4)	50 (5)	75 (7)	PL, RA			
<i>Pyrus calleryana</i> 'Whitehouse'/ Whitehouse pear	50 (5)	40 (4)	50 (5)	75 (7)	PL, RA			DS
<i>Quercus robur</i> 'Fastigiata'/ Fastigate English oak	50 (5)	40 (4)	50 (5)	75 (7)	RA		SC	
CATEGORY II		Trees that can be maintained at a height of 20 feet or less and have a spread approximately equal to their height						
DECIDUOUS TREES								
<i>Acer campestre</i> / Hedge maple	50 (5)	75 (7)	100 (9)	125 (12)	G	SD	AP, D	
<i>Acer ginnala</i> / Amur maple	50 (5)	75 (7)	100 (9)	125 (12)	G, RA	SD	D, PS, RZ	
<i>Acer palmatum</i> / Japanese maple	50 (5)	75 (7)	100 (9)	125 (12)	G	SD	RZ, SH	
<i>Amelanchier arborea</i> / Downey serviceberry	50 (5)	75 (7)	100 (9)	125 (12)	G, N, RA, WL	SD	PS, RZ, W	IN



Native or other proven desirable species for the uses indicated

TREE USES:

EC=energy conservation G=general N=native PL=parking lot RA=for restricted areas WL=wildlife value
(See 12-0502.1D)

SCREENING

YARD USE:

SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL

TOLERANCES:

AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions
SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS:

DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				
<i>Amelanchier laevis</i> / Allegheny serviceberry	50 (5)	75 (7)	100 (9)	125 (12)	G, N, RA, WL	SD	PS, RZ, W	IN
<i>Carpinus caroliniana</i> / American hornbeam	50 (5)	75 (7)	100 (9)	125 (12)	G, N, RA	SD	SH, W	
<i>Cercis canadensis</i> / Eastern redbud	50 (5)	75 (7)	100 (9)	125 (2)	G, N, RA	SD	D,PS, RZ, SC	DS
<i>Chionanthus virginicus</i> / Fringetree	50 (5)	75 (7)	100 (9)	125 (12)	G, N, RA	SD	PS, RZ, W	
<i>Cornus florida</i> / Flowering dogwood	50 (5)	75 (7)	100 (9)	125 (12)	N, WL		PS	DS
<i>Cornus kousa</i> / Kousa dogwood	50 (5)	75 (7)	100 (9)	125 (12)	G, WL	SD	RZ	
<i>Cornus mas</i> / Corneliancherry dogwood	50 (5)	75 (7)	100 (9)	125 (12)	G, RA, WL	SD	PS, RZ	
<i>Halesia carolina</i> / Carolina silverbell	50 (5)	75 (7)	100 (9)	125 (12)	G, N	SD	PS	
<i>Magnolia soulangiana</i> / Saucer magnolia	50 (5)	75 (7)	100 (9)	125 (12)	G	SD	AP, RZ	
<i>Magnolia stellata</i> / Star magnolia	50 (5)	75 (7)	100 (9)	125 (12)	G, RA	SD	AP, RZ	
<i>Magnolia virginiana</i> / Sweetbay magnolia	50 (5)	75 (7)	100 (9)	125 (12)	G, N, RA	SD	RZ, SH, W	
<i>Oxydendrum arboreum</i> / Sourwood	50 (5)	75 (7)	100 (9)	125 (12)	G, N	SD	D, PS	
<i>Prunus x incam</i> 'Okame'/ Okame cherry	50 (5)	75 (7)	100 (9)	125 (12)	RA	SD		
<i>Stewartia koreana</i> / Korean stewartia	50 (5)	75 (7)	100 (9)	125 (12)	RA	SD	RZ	



Native or other proven desirable species for the uses indicated

TREE USES:

EC=energy conservation G=general N=native PL=parking lot RA=for restricted areas WL=wildlife value
(See 12-0502.1D)

SCREENING

YARD USE:

SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL

TOLERANCES:

AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions
SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS:

DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				
<i>Stewartia ovata</i> / Mountain stewartia	50 (5)	75 (7)	100 (9)	125 (12)	G, RA	SD	RZ	
<i>Stewartia pseudocamellia</i> / Japanese stewartia	50 (5)	75 (7)	100 (9)	125 (12)	RA	SD	RZ	
<i>Styrax americana</i> / American snowbell	50 (5)	75 (7)	100 (9)	125 (12)	G, RA	SD	PS, RZ	
<i>Styrax japonicus</i> / Japanese snowbell	50 (5)	75 (7)	100 (9)	125 (12)	G, RA	SD	PS, RZ	
CATEGORY III								
DECIDUOUS TREES								
Trees 25 to 50 feet in height at maturity with a spread equal to or greater than their height and trees over 50 feet in height at maturity with a spread less than their height								
<i>Aesculus hippocastanum</i> / Horsechestnut	90 (8)	125 (12)	150 (14)	175 (16)	G	LD	IS, SC	
<i>Betula nigra</i> / River birch	90 (8)	125 (12)	150 (14)	175 (16)	G, N	LD	W	
<i>Castanea mollissima</i> / Chinese chestnut	90 (8)	125 (12)	150 (14)	175 (16)	G	LD		FR
<i>Celtis occidentalis</i> / Hackberry	90 (8)	125 (12)	150 (14)	175 (16)	EC, G, N, WL	LD	AP, D, SC, W	
<i>Cercidiphyllum japonicum</i> / Katsuratree	90 (8)	125 (12)	150 (14)	175 (16)	EC, G, PL	LD		
<i>Diospiros virginiana</i> / Persimmon	90 (8)	125 (12)	150 (14)	175 (16)	N, WL	SD	D, SC	FR
<i>Eucommia ulmoides</i> / Hardy rubber tree	90 (8)	125 (12)	150 (14)	175 (16)	EC, PL		D, SC	
<i>Fagus sylvatica</i> / European beech	90 (8)	125 (12)	150 (14)	175 (16)	G	LD	PS	



Native or other proven desirable species for the uses indicated

TREE USES: EC=energy conservation G=general N=native PL=parking lot RA=for restricted areas WL=wildlife value
(See 12-0502.1D)

SCREENING YARD USE: SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL TOLERANCES: AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS: DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				

<i>Fraxius pennsylvantica/ Green ash</i>	90 (8)	125 (12)	150 (14)	175 (16)	EC, N, PL	LD	D, IS, SC, W	IN
‘Marshall’s seedless’	90 (8)	125 (12)	150 (14)	175 (16)	EC, PL	LD	D, IS, SC, W	IN
‘Patmore’	90 (8)	125 (12)	150 (14)	175 (16)	EC, PL	LD	D, IS, SC, W	IN
‘Summit’	90 (8)	125 (12)	150 (14)	175 (16)	EC, PL	LD	D, IS, SC, W	
<i>Gleditsia triacanthos inermis/ Thornless honeylocust</i>	90 (8)	125 (12)	150 (14)	175 (16)	PL	LD	AP, D, SC, W	IN, WW
‘Imperial’	90 (8)	125 (12)	150 (14)	175 (16)	PL	LD	AP, D, SC, W	IN, WW
‘Skyline’	90 (8)	125 (12)	150 (14)	175 (16)	PL	LD	AP, D, SC, W	IN, WW
‘Shademaster’	90 (8)	125 (12)	150 (14)	175 (16)	PL	LD	AP, D, SC, W	IN, WW
<i>Gymnocladus dioicus/ Kentucky coffeetree</i>	90 (8)	125 (12)	150 (14)	175 (16)	G	LD	D, SC, W	
<i>Juglans nigra/ Black walnut</i>	90 (8)	125 (12)	150 (14)	175 (16)	N, WL	LD	SC, W	FR
<i>Koelreuteria paniculata/ Goldenrain tree</i>	90 (8)	125 (12)	150 (14)	175 (16)	G	SD	D, SC	WW
<i>Larix decidua/ European larch</i>	90 (8)	125 (12)	150 (14)	175 (16)	G	LD	D	
<i>Maclura pomifera/ Osage orange (male only)</i>	90 (8)	125 (12)	150 (14)	175 (16)	G, N	LD	D	RS



Native or other proven desirable species for the uses indicated

TREE USES:

EC=energy conservation G=general N=native PL=parking lot RA=for restricted areas WL=wildlife value
(See 212-0502.1D)

SCREENING

YARD USE:

SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL

TOLERANCES:

AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions
SH=full shade W=wet soil (See 212-0502.1E)

PROBLEMS:

DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 212-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				
<i>Magnolia acuminata</i> / Cucumber tree	90 (8)	125 (12)	150 (14)	175 (16)	G, N	LD		
<i>Magnolia macrophylla</i> / Bigleaf magnolia	90 (8)	125 (12)	150 (14)	175 (16)	G	LD		
<i>Metasequoia glyptostroboides</i> / Dawn redwood	90 (8)	125 (12)	150 (14)	175 (16)	G	LD	AP, W	
<i>Nyssa sylvatica</i> / Black gum	90 (8)	125 (12)	150 (14)	175 (16)	EC, G, N, PL, WL	LD	PS, W	
<i>Phellodendron amurense</i> / Amur corktree (male only)	90 (8)	125 (12)	150 (14)	175 (16)	EC, G	LD	AP, D	
<i>Prunus serrulata</i> 'Kwansan'/ Kwansan cherry	90 (8)	125 (12)	150 (14)	175 (16)	G	LD	AP	DS, WW
<i>Prunus sargentii</i> / Sargent cherry	90 (8)	125 (12)	150 (14)	175 (16)	G	SD		
<i>Prunus subhirtella</i> / Weeping Japanese cherry	90 (8)	125 (12)	150 (14)	175 (16)	G	SD		
<i>Prunus yedoensis</i> / Yoshino cherry	90 (8)	125 (12)	150 (14)	175 (16)	G	SD		
<i>Pyrus calleryana</i> 'Aristocrat'/ Aristocrat pear	90 (8)	125 (12)	150 (14)	175 (16)	PL	LD	AP	DS
<i>Pyrus calleryana</i> 'Autumn blaze'/ Autumn blaze pear	90 (8)	125 (12)	150 (14)	175 (16)	PL	LD	AP	DS
<i>Pyrus calleryana</i> 'Redspire'/ Redspire pear	90 (8)	125 (12)	150 (14)	175 (16)	PL	LD	AP	DS
<i>Taxodium distichum</i> / Bald cypress	90 (8)	125 (12)	150 (14)	175 (16)	G, N	LD	W	
<i>Tilia cordata</i> / Littleleaf linden	90 (8)	125 (12)	150 (14)	175 (16)	EC, G, PL	LD	AP	IN



Native or other proven desirable species for the uses indicated

TREE USES:

EC=energy conservation G=general N=native PL=parking lot RA=for restricted areas WL=wildlife value
(See 12-0502.1D)

SCREENING

YARD USE:

SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL

TOLERANCES:

AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions
SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS:

DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				
'Glenleven'	90 (8)	125 (12)	150 (14)	175 (16)	EC, G, PL	LD	AP	IN
'Greenspire'	90 (8)	125 (12)	150 (14)	175 (16)	EC, G, PL	LD	AP	IN
CATEGORY IV								
DECIDUOUS TREES		Trees 50 feet and greater in height at maturity with a spread equal to or greater than their height and trees over 75 feet in height at maturity with a spread less than their height						
<i>Acer rubrum</i> / Red maple	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, PL	LD	IS, PS, W	RS
<i>Acer saccharum</i> / Sugar maple	130 (12)	150 (14)	200 (18)	250 (23)	EC, G	LD	PS	RS
<i>Carya illinoensis</i> / Pecan	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, WL	LD	W	
<i>Carya ovata</i> / Shagbark hickory	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, WL	LD		
<i>Fagus americana</i> / American beech	130 (12)	150 (14)	200 (18)	250 (23)	G, N, WL	LD	PS	
<i>Fraxinus americana</i> / White ash	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N	LD	IS, W	
<i>Ginkgo biloba</i> / Ginkgo (male only)	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, PL	LD	AP, D, RZ	
<i>Liquidambar styraciflua</i> / Sweetgum	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N	LD	W	FR
<i>Liriodendron tulipifera</i> / Tulip poplar	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N	LD	AP, W	WW
<i>Platanus acerifolia</i> / London planetree	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, PL	LD	AP,D	RS
<i>Platanus occidentalis</i> / Sycamore	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N	LD	W	DS



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(See 12-0502.1D)

SCREENING

YARD USE:

SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

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TOLERANCES:

AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions
SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS:

DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				
<i>Quercus acutissima</i> / Sawtooth oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, PL, WL	LD		
<i>Quercus alba</i> / White oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, WL	LD	IS	
<i>Quercus bicolor</i> / Swamp white oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, WL	LD	D, IS, SC, W	
<i>Quercus coccinea</i> / Scarlet oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, WL	LD		
<i>Quercus imbricaria</i> / Shingle oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, WL	LD	W	
<i>Quercus palustris</i> / Pin oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, PL, WL	LD	W	DS
<i>Quercus phellos</i> / Willow oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, PL, WL	LD		
<i>Quercus rubra</i> (borealis)/ Northern red oak	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, WL	LD	IS	DS
<i>Sophora japonica</i> / Japanese pagoda tree	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, PL	LD	AP, D, SC	FR
<i>Tilia americana</i> / American linden, basswood	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, N, PL	LD		
‘Redmond’	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, PL	LD		
‘Legend’	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, PL	LD		
<i>Ulmus hollandica</i> ‘Groenveldt’/ Groenveldt elm	130 (12)	150 (14)	200 (18)	250 (23)	EC, G	LD	D	IN



Native or other proven desirable species for the uses indicated

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(See 912-0502.1D)

SCREENING

YARD USE:

SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL

TOLERANCES:

AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions
SH=full shade W=wet soil (See 912-0502.1E)

PROBLEMS:

DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 912-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND CALIPER IN in (cm) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		1.0 (2.5)	2.0 (5.0)	3.0 (8.0)				
<i>Ulmus parvifolia</i> / Chinese elm	130 (12)	150 (14)	200 (18)	250 (23)	EC, G, PL	LD		
<i>Zelkova serrata</i> / Japanese zelkova	130 (12)	150 (14)	200 (18)	250 (23)	G, PL	LD		

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND HEIGHT IN ft (m) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		6.0 (1.8)	8.0 (2.4)	10.0 (3.0)				

CATEGORY I Trees generally less than 30 feet in height at maturity with a spread less than 15 feet

EVERGREEN TREES								
<i>Ilex x attenuata</i> 'Fosteri'/ Foster's holly	30 (3)	40 (4)	50 (5)	75 (7)	G	ME	SH	
<i>Ilex x Nellie Stevens</i> '/ Nellie Stevens holly	30 (3)	40 (4)	50 (5)	75 (7)	G	ME		
<i>Juniperus chinensis</i> / Chinese juniper	30 (3)	40 (4)	50 (5)	75 (7)	G		D	
'Columnaris'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	
'Denserecta'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	
'Erecta Glauca'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	



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SCREENING YARD USE: SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL TOLERANCES: AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS: DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND HEIGHT IN ft (m) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		6.0 (1.8)	8.0 (2.4)	10.0 (3.0)				
'Grey Glean'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	
'Hetzi columnaris'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	
'Keteleeri'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	
'Robusta green'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	
'Torulosa'	30 (3)	40 (4)	50 (5)	75 (7)	RA		D	
<i>Juniperus virginiana</i> 'Princeton Sentry' / Eastern redcedar	30 (3)	40 (4)	50 (5)	75 (7)	RA	ME	D, IS	IN
<i>Taxus baccata</i> 'Fastigiata' / Upright Irish yew	30 (3)	40 (4)	50 (5)	75 (7)	RA			
<i>Thuja occidentalis</i> 'Nigra' / Dark green American arborvitae	30 (3)	40 (4)	50 (5)	75 (7)	G, RA		W	
<i>Thuja orientalis</i> / Columnar oriental arborvitae	30 (3)	40 (4)	50 (5)	75 (7)	G, RA	ME	PS, W	
CATEGORY II Trees 30 to 40 feet in height at maturity with a spread of 15 to 20 feet								
EVERGREEN TREES								
<i>Abies conlor</i> / White fir	50 (5)	75 (7)	100 (9)	125 (12)	G	ME		
<i>Calocedrus decurrens</i> / Incense cedar	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	W	
<i>Chamaecyparis lawsoniana</i> / Lawson falsecypress	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	PS	
<i>Chamaecyparis obtusa</i> / Hinoki false cypress	50 (5)	75 (7)	100 (9)	125 (12)	G	LE	W	



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(See 12-0502.1D)

SCREENING YARD USE: SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL TOLERANCES: AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS: DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.7 TREE SELECTION AND COVER GUIDE

BOTANICAL/ COMMON NAME	MINIMUM PLANTING AREA IN ft ² (m ²)	PROJECTED 10-YR TREE COVER AREA IN ft ² (m ²) AND HEIGHT IN ft (m) AT PLANTING			TREE USES	SCREENING YARD USE	ENVIRONMENTAL TOLERANCES	PROBLEMS
		6.0 (1.8)	8.0 (2.4)	10.0 (3.0)				
		<i>Chamaecyparis pisifera</i> 'Plumosa'/ Plume sawara false cypress	50 (5)	75 (7)				
<i>Chamaecyparis thyoides</i> / Atlantic whitecedar	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	W	
<i>Crytomeria japonica</i> / Japanese cryptomeria	50 (5)	75 (7)	100 (9)	125 (12)	G	LE	IS	
<i>Cunninghamia lanceolata</i> / China fir	50 (5)	75 (7)	100 (9)	125 (12)	G	ME		
<i>Cupressocyparis leylandii</i> / Leyland cypress	50 (5)	75 (7)	100 (9)	125 (12)	G	LE	PS, W	
<i>Ilex aquafolium</i> / English holly	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	SH	
<i>Ilex opaca</i> / American holly	50 (5)	75 (7)	100 (9)	125 (12)	G, N	ME	IS, SH	
<i>Juniperus scopulorum</i> 'Moonglow'/ Rocky Mt. Juniper	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	D	
<i>Juniperus virginiana</i> / Eastern redcedar	50 (5)	75 (7)	100 (9)	125 (12)	G, N	ME		
'Canaert'	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	D, IS	IN
'Manhattan Blue'	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	D, IS	IN
<i>Picea glauca</i> / White spruce	50 (5)	75 (7)	100 (9)	125 (12)	G	LE	D, PS, RZ	
<i>Picea omorika</i> / Serbian spruce	50 (5)	75 (7)	100 (9)	125 (12)	G	LE		
<i>Picea orientalis</i> / Oriental spruce	50 (5)	75 (7)	100 (9)	125 (12)	G	LE	SC	



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(See 212-0502.1D)

SCREENING

YARD USE:

SD=small deciduous LD=large deciduous ME=medium evergreen LE=large evergreen (See Zoning Ordinance Sect. 13-302.3)

ENVIRONMENTAL

TOLERANCES:

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PROBLEMS:

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12-0000 VEGETATION PRESERVATION AND PLANTING

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		6.0 (1.8)	8.0 (2.4)	10.0 (3.0)				
		<i>Picea pungens</i> / Colorado blue spruce	50 (5)	75 (7)				
<i>Pinus bungeana</i> / Lacebark pine	50 (5)	75 (7)	100 (9)	125 (12)	G	ME		
<i>Pinus parviflora</i> / Japanese white pine	50 (5)	75 (7)	100 (9)	125 (12)	G	ME		
<i>Pinus thunbergiana</i> / Japanese black pine	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	D, IS, RZ	
<i>Pseudotsuga menziesii</i> / Douglas fir	50 (5)	75 (7)	100 (9)	125 (12)	G	ME		
<i>Taxus cuspidata</i> 'Capitata'/ Pyramidal Japanese yew	50 (5)	75 (7)	100 (9)	125 (12)	G	ME		
<i>Tsuga canadensis</i> / Canadian hemlock	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	SH	IN
<i>Tsuga caroliniana</i> / Carolina hemlock	50 (5)	75 (7)	100 (9)	125 (12)	G	ME	SH	
CATEGORY III Trees 40 to 50 in height at maturity with a spread of 20 to 30 feet								
EVERGREEN TREES								
<i>Cedrus atlantica</i> / Atlas cedar	90 (8)	125 (12)	150 (14)	175 (16)	G	LE		
<i>Picea abies</i> / Norway spruce	90 (8)	125 (12)	150 (14)	175 (16)	G	LE	PS	
<i>Pinus echinata</i> / Shortleaf pine	90 (8)	125 (12)	150 (14)	175 (16)	G	LE	PS	
<i>Pinus nigra</i> / Austrian pine	90 (8)	125 (12)	150 (14)	175 (16)	G	LE		DS, IN



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YARD USE:

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12-0000 VEGETATION PRESERVATION AND PLANTING

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		6.0 (1.8)	8.0 (2.4)	10.0 (3.0)				
CATEGORY IV								
Trees 50 feet in height or greater at maturity with a spread of over 30 feet								
EVERGREEN TREES								
<i>Magnolia grandiflora/ Southern magnolia</i>	130 (12)	150 (14)	200 (18)	250 (23)	G	LE	PS, W	WW
<i>Pinus rigida/ Pitch pine</i>	130 (12)	150 (14)	200 (18)	250 (23)	G, N	LE		
<i>Pinus strobus/ White pine</i>	130 (12)	150 (14)	200 (18)	250 (23)	G	LE	PS	DS, IN, WW
<i>Pinus sylvestris/ Scotch pine</i>	130 (12)	150 (14)	200 (18)	250 (23)	G	LE	D	
<i>Pinus taeda/ Loblolly pine</i>	130 (12)	150 (14)	200 (18)	250 (23)	G, N	LE	W	



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ENVIRONMENTAL TOLERANCES: AP=air pollution D=drought IS=de-icing salts PS=partial shade RZ=restricted root zone SC=poor soil conditions SH=full shade W=wet soil (See 12-0502.1E)

PROBLEMS: DS=disease FR=objectionable fruit IN=insects RS=objectionable root system WW=weak wood (See 12-0502.1E)

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0600 CONSERVATION PLANS

12-0601 Applicability

12-0601.1 Section 104-1-2 of the Code states that a conservation plan is required of anyone engaging in land disturbing activities in the County.

12-0601.2 A construction plan approved by the Director shall constitute an approved conservation plan.

12-0602 Exceptions to Applicability

12-0602.1 A conservation plan is not required to be submitted under the following conditions:

12-0602.1A Those exceptions to land disturbing activity as specified in § 104-1-7 of the Code.

12-0602.1B For the removal of trees grown and intended to be sold as live trees in the course of business on nursery or dealer properties registered by the Virginia Commissioner of Agriculture and Immigration (Plant Pest Act of 1952). This provision does not supercede the requirement to obtain an approved conservation plan prior to engaging in any other land disturbing activity.

12-0602.2 Commercial Forest

12-0602.2A A conservation plan shall not be required for the harvesting of trees on commercial forest land if the operation is conducted in conformance with the Virginia Department of Forestry's Best Management Practices. However, when the State Forester is required to be notified of a timber harvesting operation, the operation shall be conducted pursuant to a forest management plan approved by the Director.

12-0602.2B A forest management plan shall not be approved for land for which a commitment with the County, such as a rezoning proffer, has been made to preserve trees.

12-0602.2C A forest management plan shall include but not be limited to the following information:

12-0602.2C(1) Location and description of the property.

12-0602.2C(2) Type and species of trees on the site.

12-0602.2C(3) Outstanding or monarch trees on the site.

12-0602.2C(4) Diameter range of the timber to be cut.

12-0602.2C(5) Description of the quality of the timber, including soundness and maturity.

12-0602.2C(6) Description of the topography and forest floor condition.

12-0602.2C(7) Source of regeneration.

12-0602.2C(8) Time frame in which cutting will take place.

12-0602.2C(9) Methods for stabilization, siltation and runoff control.

12-0602.2C(10) Future use of the land.

12-0602.3 A conservation plan shall not be required to cut down any tree which has become, or threatens to become, a danger to human life or property due to accidental or natural causes or other emergency.

12-0603 Conservation Plan Contents

12-0603.1 Site/Grading Plan Sheets - Required Information

12-0603.1A Existing vegetation

12-0603.1A(1) The existing tree line must be accurately and clearly shown and labeled so that it is understood where the existing trees are located. This delineation shall include groups of trees and individual trees standing apart from any woods.

12-0603.1A(2) Existing trees shall include areas of woody vegetation greater than or equal to 5' (1.5m) in height at time of plan submission.

12-0603.1A(3) The existing tree line shall be provided on the existing condition and demolition plan sheets, if provided, and on site/grading and Erosion and Sediment control plan sheets.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0603.1A(4) The location and accurate dripline of open grown trees, or critical root zone for individual forest grown trees (See Plate 1-12 (1M-12)), of all outstanding or monarch trees shall be shown on the plans. Every attempt shall be made to preserve these trees.

12-0603.1A(5) Areas of trees or individual trees to be preserved shall be labeled as "Tree(s) to be Preserved."

12-0603.1B Limits of clearing and grading

12-0603.1B(1) The limits of clearing and grading shall be shown for all items listed in the definition of "limits of clearing," (13-0300) off-site as well as on-site. The limits shall encompass only the proposed area of construction associated with the plan, be clearly labeled, and shall not include any unnecessary clearing.

12-0603.1B(2) If existing trees are proposed to be retained in a parking lot area, sufficient ground, as determined by the Director, shall be left undisturbed around each tree to assure its preservation.

12-0603.1B(3) Grading of residential lots may be included with plans and profiles for subdivisions if either the approximate house location and septic field location (if necessary) are shown or the zoning district designation allows three or more dwelling units per acre, and it is reasonably safe to assume that necessary overlot grading will preclude tree preservation. In the case of zoning which allows three or more dwelling units per acre, clearing shall not exceed 80' (24.4m) from the VDOT right-of-way line, or pavement edge of private streets or pipestems.

12-0603.1B(4) If tree walls are to be constructed in order to preserve trees on the site, they shall be accurately located on the site plan. Construction of such walls shall be in accordance with 12-0804.8.

12-0603.1B(5) Stormwater management and best management practices facilities, including outfalls, shall be designed to minimize clearing of existing vegetation and maximize the areas suitable for planting vegetation. Whenever practical, facilities should be designed as embankment only facilities (e.g., facilities that require only the clearing for a dam embankment, emergency spillway, outfalls, pipe

easements, maintenance access, and required clearance zones). Whenever practical, bioretention facilities that are designed to minimize clearing should also be utilized, subject to approval by the Director.

12-0603.1C Existing and Proposed Utilities

12-0603.1C(1) Proposed utilities shall be located so that their installation will not adversely affect vegetation proposed to be preserved or planted on the site. All existing or proposed utilities which are required to be shown shall be clearly shown on all site/grading plan and landscape plan sheets.

12-0603.1C(2) Adequate clearing shall be shown for the installation of water, storm, sanitary sewer lines, and existing utilities to be relocated. Clearing limits shall include room for trench wall sloping or benching, equipment access, and deposition of soil. The limits of clearing for the installation of these lines shall be adequate for the size of line and depth of installation. Generally, clearing limits should be equal to four times the depth of the trench. Wherever adequate space does not exist for utility clearing, the utility lines shall be installed using trenchless methods, sheeting and shoring, trench boxes, or tunnelling. If such methods are to be used, a note on the plan shall be provided indicating which sections of utilities are to be installed using these methods.

12-0603.1C(3) Lateral utility connections for each house shall be designed to minimize the clearing of existing vegetation.

12-0603.1C(4) Area shown for reserve lines for septic fields shall not be shown to be cleared except when required under one or more of the following circumstances:

12-0603.1C(4)(a) Clearing is necessary to provide a minimum horizontal distance of 10' (3m) between the proposed septic field and any tree.

12-0603.1C(4)(b) Clearing is necessary to properly grade reserve areas which are alternated between proposed active septic field lines.

12-0603.1C(4)(c) Clearing is otherwise lawfully required by the Health Department.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0603.1D Other Information. Other information shall be furnished as deemed necessary by the Director.

12-0603.2 Phase I and II Erosion and Sediment Control Plan Sheets - Required Information. (Also see PFM § 11-0104).

12-0603.2A The limits of clearing and grading shown on the Erosion and Sediment control plan sheets shall match the limits shown on all other sheets in the plan set.

12-0603.2B All Erosion and Sediment control and tree protection measures shall be shown on the Erosion and Sediment control plan sheets. Tree protection measures for trees and vegetation to be retained shall also be shown on the demolition plan sheet, if provided.

12-0603.2C All Erosion and Sediment controls and tree protection devices shall be placed within the area to be disturbed, at the limits of clearing and grading, not in areas shown to remain undisturbed. Tree protection fencing shall be provided within the disturbed area at the limits of clearing and grading wherever other control devices are not shown. (See Plates 5-12 (5M-12), 6-12 (6M-12) and 7-12 (7M-12)).

12-0603.2D If a type of tree protection is proffered or conditioned other than the standard tree protection fence in the Virginia Erosion and Sediment Control Handbook, a detail showing the alternate type of tree protection shall be provided.

12-0603.2E Temporary sediment basins should be designed to use the natural land forms to minimize grading and vegetation removal. If the construction of the sediment basins requires the clearing of trees, replacement trees as specified in § 12-704.3 shall be required by the Director so that the area is restored to a natural condition when the basin is removed.

12-0603.2F Other information. Other information shall be furnished as deemed necessary by the Director.

12-0603.3 Landscape Plan Sheets - Required Information. Refer to § 12-0700 for landscape plan sheet requirements.

12-0604 Approval of Conservation Plans

12-0604.1 When considering a plan for approval, in addition to reviewing for conformance to other policies, standards and guidelines contained in the PFM, the following factors shall also be taken into consideration:

12-0604.1A The extent to which the area would be subject to environmental degradation due to removal of the trees and other vegetation.

12-0604.1B The importance of preserving trees and other vegetative cover in densely developed or densely populated areas.

12-0604.2 If the conservation plan conforms to all policies, standards, and guidelines, and there are no objections resulting from consideration of the factors listed in § 12-0604.1, the conservation plan shall be approved.

12-0604.3 If the plan does not conform to all policies, standards, and guidelines, or there is an objection resulting from the consideration of the factors listed in § 12-0604.1, the plan shall be rejected. The Director shall require that the plan be modified to bring it into conformance with the policies, standards, and guidelines, or to eliminate any objection to the plan.

12-0700 LANDSCAPE PLANS

12-0701 Requirements and Required Elements

12-0701.1 Scale. The landscape plan sheets shall be drawn at a scale equal to the site/grading plan sheets.

12-0701.2 Legibility. The landscape plan shall be clearly drawn and legible.

12-0701.3 Plant Labels. Each plant to be planted shall be accurately located and labeled using the botanical species name or appropriate abbreviation. If symbols are used they shall be easily discernible, and a symbol key shall be provided on the right hand side of each landscape plan sheet.

12-0701.4 Tree Canopies. The symbols used to locate trees shall be drawn to scale to accurately represent their projected 10-year tree cover area. Trees should be spaced so that their 10-year tree

12-0000 VEGETATION PRESERVATION AND PLANTING

cover areas do not significantly overlap. (See Table 12.7 for projected 10-year tree cover areas).

12-0701.5A Plant name, both botanical and common.

12-0701.5 Plant Schedule. The landscaping plan shall include a plant schedule which shall include the following (See Table 12.8):

12-0701.5B Quantity of each species used in the plan.

TABLE 12.8 SAMPLE PLANT SCHEDULE (English units used in this example)

Key	Botanical Name	Common Name	Qty.	Stock Size (height/ caliper)	Stock Type	10-yr Tree Cover ft ²	Tree Cover Sub-total ft ²	Remarks
IO	<i>Ilex opaca</i>	American holly	12	6 ft height	cont.	75	900	sheared
JV	<i>Juniperus virginiana</i>	eastern redcedar	10	6 ft height	cont.	45	450	
AS	<i>Acer saccharum</i>	sugar maple	5	2 in. caliper	B&B	200	1000	
KP	<i>Koelreuteria paniculata</i>	goldenrain tree	7	2 in. caliper	B&B	150	1050	specimen
VD	<i>Viburnum dentatum</i>	arrowwood viburnum	10	24 in. height	B&B	0	0	

TOTAL TREE COVER PROVIDED BY PLANTING = 3,400 ft²

NOTE: The remarks column may also be used to note any other characteristics which a plant should exhibit (e.g., sheared, specimen, multi-stem, tree form).

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0701.5C Stock size as specified in Table 12.9

TABLE 12.9 PLANT MATERIAL STOCK SIZE SPECIFICATIONS

<u>Type of Plant & Stock</u>	<u>Specify by</u>
Deciduous trees	Caliper
Evergreen trees	Height
Deciduous shrubs	Height
Evergreen shrubs	Height
Seedlings, bare-root	Age

12-0701.5D Type of root stock to be planted (e.g., balled and burlapped (B&B), bareroot, container).

12-0701.5E The total amount of tree cover claimed for each species of tree to be planted.

12-0701.5F If a symbol is used instead of a plant name label on the plan, the symbol shall be included in the plant schedule.

12-0701.6 Plant Diversity. To curtail the spread of disease or insect infestation in a plant species, no more than 70% of the trees required to be planted on-site shall be of one genus. In addition, when more than 20 trees are required on a site, no more than 35% of the deciduous trees nor 35% of the evergreen trees shall be of a single species.

12-0701.7 Transitional Screening Yard Labels

12-0701.7A A label(s) shall be provided that identifies the location and width of all transitional screening yard(s) required by Article 13 of the Zoning Ordinance. Labels shall also be provided on all adjacent parcels that identify their use and zoning in order to determine screening requirements for the proposed on-site use.

12-0701.7B No existing or proposed sidewalk, trail, or easement shall exist or be proposed within a transitional screening yard unless it is placed perpendicular to, or nearly perpendicular to, the transitional screening yard.

12-0701.8 Planter Details and Alternative Designs. If trees are shown to be planted in planters, or other areas of restricted root growing space, a detail shall

be provided which illustrates the overall size, depth, soil composition, irrigation technique, and drainage of the planter or planting space. (See Plate 4-12 (4M-12)). When minimum planting areas cannot be provided, alternative designs that provide the maximum possible planting area may be allowed as approved by the Director.

12-0701.9 Tree Cover Calculations. All required calculations for tree cover shall be provided on the landscape plan sheet in a table similar to Table 12.12.

12-0701.10 Interior Parking Lot Landscaping. All calculations and illustrations for interior parking lot landscaping shall be provided on the landscape plan sheet.

12-0701.11 Planted Trees and Easements

12-0701.11A The landscape plan shall show all existing and proposed easements that may conflict with the tree planting requirements of Article 13 of the Zoning Ordinance.

12-0701.11B Trees shall not be planted within any existing or proposed public utility easement that is required to be delineated on the plan, or within 5' (1.5 m) of storm drainage easements that contain pipes. In addition, trees shall not be planted in an area which will interfere with existing or proposed utilities or obstruct or interfere with access of maintenance personnel or equipment, as determined by the Director, except as may be allowed in accordance with 12-701.11C.

12-0701.11C If trees are shown to be planted within an existing or proposed public utility easement, the plan shall contain a letter of permission from the owner of the easement.

12-0701.11D Trees in public utility easements, even with a letter of permission, shall not be granted tree cover credit and shall not be credited toward meeting the transitional screening requirements of Article 13 of the Zoning Ordinance.

12-0701.12 Existing vegetation or proposed plantings in VDOT rights-of-way shall not be credited toward meeting the requirements of Article 13 of the Zoning Ordinance, except as may be permitted in a Commercial Revitalization District.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0701.13 Areas to be Reforested With Seedlings. If areas are shown on the plan to be reforested with seedlings, a legend shall be provided describing the species type(s) and stock type(s) to be used (bare root and/or containerized), seedling age, planting method, ground and/or soil treatment to be conducted, ground cover treatment if any, and timing relative to other construction activities. Signage shall be posted on all sides of the area to be planted. The plan shall show the location of all signage and a detail showing the size and text of the signs.

12-0701.14 Areas to be Reforested by Direct Seeding. If areas are shown on the plan to be reforested using seeding methods, a description shall be provided of the seed mix content, seeding rate, application method, ground and/or soil treatment, ground cover treatment, and timing relative to other construction activities. Signage shall be posted on all sides of the seeded area. The plan shall show the location of all signage and a detail showing the size and text of the signs.

12-0701.15 Other Information. Other information shall be furnished as deemed necessary by the Director.

12-0702 Tree Cover Specifications and Calculations

12-0702.1 Tree Cover Specifications

12-0702.1A Existing vegetation

12-0702.1A(1) Existing trees which are intended to be preserved for tree cover credit shall be selected in accordance with § 12-0400. The suitability of existing trees proposed to meet the tree cover requirements shall be determined by the Director based upon the criteria specified in § 12-0400.

12-0702.1A(2) Existing vegetation which is intended to provide all or part of the tree cover requirements shall be accurately located, identified, and shown on the plan by its dripline or critical root zone, as applicable. (See Plate 1-12 (1M-12)). If individual tree locations have not been identified, the dripline of existing forested areas shall be shown.

12-0702.1A(3) Tree preservation areas should meet the minimum size requirements described in Table 12.10 and have a minimum width of 25' (7.6m). If

the minimum size and/or width requirements cannot be met, but it can be demonstrated that the trees shown will survive for 10 years, preservation areas below the minimum size requirements may be approved by the Director.

12-0702.1A(4) The areas of existing vegetation to be credited toward the tree cover requirements shall be shaded and labeled indicating the amount of tree cover credit claimed for each area. If additional tree cover credit is being requested, all necessary calculations and illustrations shall be provided on the landscape plan sheet.

TABLE 12.10. PRESERVATION AREA MINIMUM SIZE REQUIREMENTS

<u>Successional Stage</u>	<u>Minimum Area Size</u>	
	<u>ft²</u>	<u>m²</u>
Pioneer and Early Successional	3,000	278.7
Sub-Climax	7,000	650.3
Long-term Subclimax and Climax	10,000	929.0

12-0702.1A(5) Tree cover credit shall only be given to trees with main trunks located on the site being developed. Trees located on property lines shall not be counted toward tree cover credit.

12-0702.1B Planted trees

12-0702.1B(1) The suitability of the trees proposed to meet the tree cover requirements shall be based upon the Construction Tolerance Table (Table 12.1) and the Tree Selection and Cover Guide (Table 12.7). Trees not listed in Tables 12.1 and 12.7 may be used to meet the tree cover requirement if their attributes contribute to the development as approved by the Director.

12-0702.1B(2) Trees planted to provide all or part of the tree cover requirement shall be shown on a landscaping plan in accordance with § 12-0701. These trees shall be planted as per § 12-0805 with the minimum size planting area provided for each tree according to its projected 10-year tree cover area as found in Table 12.7. The minimum width of any

12-0000 VEGETATION PRESERVATION AND PLANTING

planting area shall be 8' (2.4m), measured from the interior of the sides of the restrictive barrier such as curb or pavement. Trees shall be planted no closer than 4' (1.2m) from any restrictive barrier.

12-0702.1B(3) Trees planted to satisfy any requirement of Article 13 of the Zoning Ordinance shall be spaced so that the outer limit of their projected 10-year tree cover area as listed in Table 12.7 does not significantly overlap, or as determined by the Director. All efforts shall be made to locate or space planted trees in a manner which will promote long-term survival.

12-0702.1B(4) Trees used to satisfy the transitional screening and parking lot landscaping requirements may also be used to satisfy the tree cover requirements.

12-0702.1B(5) Trees proposed to be planted in sizes larger than those listed in Table 12.7 (larger than 3" (8cm) caliper for deciduous trees and taller than 10' (3m) in height for evergreens) may receive additional tree cover credit using Table 12.7 as a guide as approved by the Director.

12-0702.1B(6) Unsuitable and undesirable trees shall not be counted toward tree cover credit if they are shown to be planted in an area where they will have an adverse impact. Table 12.3 provides a list of undesirable trees for an urban environment in Fairfax County.

12-0702.2 Tree Cover Calculations

12-0702.2A Calculate the gross site area in ft² (m²) for all plans.

12-0702.2A(1) Subtract the ft² (m²) of land shown to be dedicated for parks, street frontage, and other public facilities to determine the adjusted gross site area. Areas of proposed interior streets that will be dedicated to VDOT shall not be subtracted. A note describing the areas subtracted shall be provided.

12-0702.2A(2) Areas containing the uses listed in 12-0702.2A(2)(a) through 12-0702.2A(2)(h) may be subtracted from the gross site area; however, once subtracted these areas cannot be counted toward meeting the tree cover requirement. Calculate the sum of all areas identified in 12-0702.2A(3)(a) through 12-0702.2A(3)(h) which are clearly shown on

the plan. Subtract this sum from the adjusted gross site area and provide a note describing the areas subtracted.

12-0702.2A(2)(a) Playing fields and other nonwooded, developed recreation areas, such as athletic fields, tennis courts, multi-use courts, playgrounds, and tot lots; and other uses and facilities of a similar nature as determined by the Director.

12-0702.2A(2)(b) Land dedicated for school sites

12-0702.2A(2)(c) Lakes and retention ponds, based on the normal water surface elevation, and swimming pools.

12-0702.2A(2)(d) Lands under active commercial production or management of agricultural, horticultural, or forest crops, or active use as pasture lands for grazing animals.

12-0702.2A(2)(e) Landfills and quarries.

12-0702.2A(2)(f) Major utility distribution easements 25' (7.6m) or more in width.

12-0702.2A(2)(g) Absorption fields and seepage pits for on-site sewage disposal systems.

12-0702.2A(2)(h) Floodplains and wetlands.

12-0702.2A(3) For site plans, subtract the footprint area of all buildings, except parking structures.

12-0702.2B Multiply the adjusted gross site area by the percentage of tree cover area required by the zoning district in Article 13 of the Zoning Ordinance, or Section 101-2-2 of the Subdivision Ordinance, to obtain the area of tree cover required.

12-0702.2C Calculate the area of tree cover provided through preservation of existing vegetation by using one or more of the following methods:

Option A: Multiply the area of trees to be preserved by 1.25, except multiply areas of trees in a bottomland forest in an RPA or major floodplain by 1.0.

Option B: To receive additional tree cover credit for preservation of large contiguous tree save areas, an Existing Vegetation Map shall be

12-0000 VEGETATION PRESERVATION AND PLANTING

prepared in conformance with § 12-0405, be submitted as part of the plan, and contain the cover types and successional stages in good condition as listed in Table 12.11. These areas must meet the minimum size requirements of Table 12.10 and § 12-0702.1A(3). Each area must also be protected in perpetuity by a deed restriction, such as a conservation easement. Multiply the area of trees to be preserved by the appropriate credit factor to determine the tree cover provided. This option cannot be applied to areas of bottomland forest in an RPA or major floodplain.

TABLE 12.11 TREE COVER CREDIT USING OPTION B

Cover type and Successional Stage	Credit Factor
Pioneer, early successional, or subclimax	1.5
Long-term sub-climax or climax bottomland forest	1.75
Long-term sub-climax or climax upland forest	2.0

Option C: To receive additional tree cover credit for monarch trees in good condition being preserved, the trees shall be surveyed and be accurately shown on the plan. Monarch trees are defined as the County champion trees as listed on the Big Tree Registry and any tree with a point total at least 80% of the point total of the County champion of that species. Multiply the tree cover area of the monarch tree by 2.5 to determine the tree cover provided, if, at a minimum the critical root zone of the tree is protected in perpetuity (as described in Option B). If the tree does not receive this level of protection, multiply the tree cover area by 1.75. Add this tree cover to that obtained by using Option A (minus the cover counted for the monarch tree under Option A).

12-0702.2D Total all areas where tree cover credit is claimed for preservation of existing vegetation. If additional tree cover credit is claimed utilizing Options B or C, a breakdown of the calculations shall be provided.

12-0702.2E Calculate the area provided by proposed landscape trees by obtaining the 10-year canopy credit for each tree by using Table 12.7.

12-0702.2E(1) Calculate the additional tree cover credits (if any) for planting trees for energy conservation as described § 12-0501.10D.

12-0702.2E(2) Calculate the additional tree cover credits (if any) for planting seedlings. Additional tree cover credit may be claimed for planting an area with seedlings that was not forested prior to development at a rate of 25% of the area planted. Additional tree cover credit may be claimed for reforesting an area forested prior to development at a rate of 10% of the area planted. All seedlings shall be planted in conformance with § 12-0805.5.

12-0702.2E(3) Calculate the additional tree cover credits (if any) for planting native and desirable trees as described in §12-0501.5B.

12-0702.2F Total all the credits provided by planted trees.

12-0702.2G Add the tree cover credits (existing vegetation + planted trees) to determine the total proposed tree cover credit. The total proposed tree cover credit must meet or exceed the percentage of 10-year tree cover area required as calculated in § 12-0702.2B.

12-0000 VEGETATION PRESERVATION AND PLANTING

TABLE 12.12 TREE COVER CALCULATIONS

	Gross site area
!	Land dedications (☉ 12-0702.2A(1))
!	Deductions (☉ 12-0702.2A(2)) (optional)
!	Building footprints for site plans (☉ 12-0702.2A(3))
<hr/>	
=	Adjusted gross site area
x	Percentage of tree cover required
<hr/>	
=	TREE COVER REQUIRED
	Credit for trees preserved
+	Additional credit for preservation (if any)
+	Credit for trees planted
+	Additional credit for trees planted (if any)
<hr/>	
=	TREE COVER PROVIDED

TREE COVER PROVIDED MUST BE GREATER THAN OR EQUAL TO TREE COVER REQUIRED.

12-0702.2H For subdivision plans showing only the construction of public improvements, tree cover shall be calculated on the development shown plus an estimate of the clearing necessary for the lot development. The estimated final clearing for all activities shall be shown on the plan. A graphic representation of the estimated tree cover to be preserved after lot clearing may be requested by the Director if deemed necessary. If the area to be provided by preserved vegetation does not meet or exceed the total percentage required as calculated in ☉ 12-0702.2B, then the deficiency shall be provided on the subdivision plan by planting acceptable landscape trees.

12-0702.2I For projects where only public improvements are to be constructed, such as road or other linear projects, the provision of the required tree cover shall be deferred until such time as the developments for which the linear projects are being installed are constructed. The plan for the linear project shall contain the following note: ATree cover requirements for this project shall be provided with each associated site or subdivision plan, as applicable.≡ This provision does not exclude the plan from meeting all other requirements of ☉ 12-0000.

12-0702.2J Sections or Phases

12-0702.2J(1) When a development is divided into phases or sections, each phase or section shall be treated separately for tree cover requirements.

12-0702.2J(2) In developments that are divided into phases or sections which provide conservation or scenic easements, or dedicated open space, tree cover provided in those areas may be used toward meeting the tree cover requirement for the entire development. The remaining tree cover requirement shall be met in the individual phases or sections of the development, and can not be used to meet the requirement for more than one section. In these cases, the calculations showing breakdown of where tree cover shall be provided in the easements or open space and each section or phase shall be shown on each plan submitted within the development.

12-0702.2J(3) The following shall be provided on each landscaping plan for developments which are divided into sections and utilize the provisions of ☉ 12-0702.2J(2): a graphic representation of the tree cover provided for each section; tree cover provided for completed sections; tree cover that will be provided for the section under review; and tree cover anticipated for each future section. At no time shall the cumulative tree cover provided be less than the tree cover required by Article 13 of the Zoning Ordinance on the entire development.

12-0702.2K On nonbonded grading plans submitted under Chapter 104 of the County Code, a request for modification of the tree cover requirement may be included in the plan narrative. For all other site and subdivision plans, a modification of the tree cover requirement must be requested in a letter to the Director.

12-0703 Interior Parking Lot Landscaping

12-0703.1 Requirement. As stated in Article 13 of the Zoning Ordinance, all parking lots with 20 or more spaces are required to provide interior parking lot landscaping that covers no less than 5% of the total area of the parking lot.

12-0703.2 Area to be Counted. The area to be counted as part of the parking lot is defined as the entire surface of the parking lot, loading spaces, drive-thru spaces, the exposed surfaces of parking

12-0000 VEGETATION PRESERVATION AND PLANTING

decks, and any paved surface that serves exclusively as access to the parking lot, deck, loading area, or drive-thru.

12-0703.3 Area to be Credited

12-0703.3A Interior parking lot landscaping credit shall be calculated using the 10-year canopy cover shown in Table 12.7.

12-0703.3B Peripheral parking lot landscaping, and trees counted toward meeting the transitional screening requirements, may not be used toward meeting interior parking lot landscaping requirements.

12-0703.3C Only those deciduous trees that provide shade directly to a portion of the area to be counted shall be credited toward meeting the required 5%. A portion of the 10-year canopy must overlap the parking lot surface to be counted toward the requirement.

12-0703.3D A majority of the trees planted or preserved to meet the requirement shall be located in the interior portion of the parking area, and shall be reasonably dispersed throughout the parking lot. Alternative designs may be approved by the Director.

12-0703.3E If existing forest trees are to be used to meet this requirement, only that portion of the preservation area located in the interior of, or directly adjacent to, the area to be counted may be credited.

12-0703.4 Calculations. To determine the amount of interior parking lot landscaping required, a) multiply the area to be counted as described in § 12-0703.2 by 5%; b) based on 10-year tree cover, calculate the total tree cover provided by each tree and/or the total amount of preserved vegetation that provides shade directly to the parking lot. The total tree cover provided must equal or exceed the total landscaped area required. A table similar to that shown in Table 12.13 shall be provided on the landscape sheet.

TABLE 12.13 INTERIOR PARKING LOT LANDSCAPING CALCULATIONS

	ft ²	m ²
Area to be Counted =	50,500	4,691
Int. Landscaping Required (5%) =	2,525	235
Total Shade Tree Cover Provided. (11 trees @ 250 ft ² (23m ²) ea.) =	2,750	255
Total Area Required =	2,525	235
Total Area Provided =	2,750	255

12-0703.5 Illustrations. To receive credit for the trees counted toward meeting the interior parking lot landscaping requirement, the areas to be counted as calculated under § 12-0703.2 shall be shaded and each tree counted toward meeting the requirement shall be marked with a symbol indicating its use as a tree providing shade to the area to be counted. The illustration does not need to be the same scale as the landscape plan sheet.

12-0703.6 Temporary Parking Lots. When temporary surface parking lots are to be replaced with parking decks in future phases of development, the calculations for interior parking lot landscaping shall be completed separately for the surface parking lot and the permanent parking decks to ensure that when the temporary surface parking lot is removed, the requirement will continue to be met. If a combination of permanent surface and decked parking is proposed as the final overall design, calculations shall be provided to demonstrate that the requirement will continue to be met throughout the phased development.

12-0704 Requirements and Specifications for Replacement Trees

12-0704.1 The Director may require that trees located in areas shown to be preserved on an approved plan be replaced if removed without prior permission from the Director or if so damaged as to reasonably require removal. The value of replacement trees required by the Director shall not exceed the value of those removed as determined by the formula in the most recent edition of the Guide

12-0000 VEGETATION PRESERVATION AND PLANTING

for Plant Appraisal prepared by the Council of Tree and Landscape Appraisers and published by the International Society of Arboriculture. (Also see § 12-0902.2).

12-0704.2 Deciduous replacement trees shall be a minimum of 2" (5cm) caliper, measured 6" (15cm) from the ground, and evergreen trees shall be a minimum of 6' to 8' (1.8m to 2.5m) in height unless otherwise approved or required by the Director. The type of plant material required shall be appropriate for the site condition and planted as specified in § 12-0805 (see Table 12.9).

12-0704.3 When an area has been cleared of vegetation for landfill areas or for a temporary use (such as a sediment basin, pond, temporary construction easement, stockpile or construction easements for public or private utility installation), replanting shall be required to restore the area to a condition similar to its natural state. At least 25% of the disturbed area shall be planted with trees specified in § 12-704.2 using the figures for 10-year tree cover. The remaining area shall be planted with seedlings as specified in § 12-0805.5, and stabilized with a seed mix of grasses, perennials and woody vegetation as approved by the Director. All replacement trees shall be specified on the planting plan (see Table 12.14).

Native species suitable for the proposed site conditions shall be provided approximating the species composition existing prior to clearing.

12-0704.4 When RPAs have been disturbed without prior approval by the Director, or are proposed to be disturbed as part of a construction plan, buffer areas with native vegetation shall be restored or created as required under Chapter 118 of the Code, and planting shall be consistent with Performance Criteria found in the "Local Assistance Manual" published by the Chesapeake Bay Local Assistance Department. At least 25% of the area shall be planted with trees as specified in § 12-0704.2. In addition, one seedling as specified in § 12-0805.5A shall be planted for each 100ft² (9.3m²) of disturbed area and one shrub with a minimum height of 18" (0.4m) shall be planted for each 40ft² (3.7m²) of disturbed area. Soil preparation, soil amendments, and/or woody seed mix shall be required as determined by the Director. Wetland plantings (including herbaceous plantings) and/or wetland seed mix shall be used where site conditions warrant. (See Tables 12.7 and 12.14).

TABLE 12.14 REPLANTING OF TEMPORARY USE AND RESOURCE PROTECTION (RPA) AREAS

Area Type	Trees 2 inches in caliper or greater	Shrubs	Seedlings	Other
Temporary Use (12-0704.3)	25% of the disturbed area	N/A	15 per 1000ft ² (15 per 93m ²)	Grass, perennial, and woody seed mixes
RPA (12-0704.4)	25% of the disturbed area	25 per 1000ft ² (25 per 93m ²)	10 per 1000ft ² (10 per 93m ²)	Wetland plants, Wetland seed

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0800 STANDARDS FOR FIELD PRACTICE

12-0801 Preconstruction

12-0801.1 Prior to the preconstruction meeting, all activities prescribed on an approved tree preservation plan that are to occur prior to construction shall be completed.

12-0801.2 When areas shown on the approved plans to be preserved are not located within an RPA, conservation easement, or other protected area, and do not contain any significant vegetation, it shall be the responsibility of the permittee to obtain approval from the Director for an exemption from preservation and protection requirements prior to clearing the area.

12-0801.3 If, during the preconstruction walk-through, or during any other inspection of the site, the Director identifies trees that have become hazardous due to the introduction of a target such as a structure or other improvement, removal of these trees shall be required. Trees shall be removed by hand with a chain saw and the stump shall be left in place unless it too is deemed a hazard. The removal of the trunk or branches of the felled tree(s) is not required within wooded areas, unless specifically required by the Director.

12-0801.4 If demolition of existing site features (houses, structures, etc.) is to occur next to trees to be preserved, tree protection shall be installed before demolition begins.

12-0802 Land Clearing Operations

12-0802.1 Prior to land disturbing activities, root pruning with a vibratory plow, trencher, or similar device shall be conducted along the limits of clearing and grading adjacent to tree preservation areas. (See Plate 7-12 7M-12)).

12-0802.2 Trees being removed shall not be felled, pushed, or pulled into tree preservation areas. Equipment operators shall not clean any part of their equipment by slamming it against the trunks of trees to be retained.

12-0802.3 Trees on the edge of the limits of clearing and grading shall be cut down by hand with a chain saw. Remaining stumps shall either be left in place or ground down with a stump grinder.

12-0802.4 The permittee may preserve individual trees or groups of trees over and above that required by the approved plan. However, any additional tree save area(s) shall be protected from construction activity in the same manner as areas shown on the approved plan to be preserved.

12-0802.5 Subsequent removal of individual trees or tree preservation areas shown on the approved plan to be preserved must be pre-approved by the Director.

12-0803 Vegetation Protection

12-0803.1 Tree Protection Devices. The permittee shall protect the above and below-ground portions of all vegetation shown on the approved plan to be preserved within and contiguous to the site. After vegetation has been removed within the area authorized to be cleared under the Phase I Erosion and Sediment control plan, protective devices shall be installed immediately.

12-0803.1A Along all limits of clearing and grading adjacent to areas of vegetation to be preserved, a device shall be used which effectively protects the above and below-ground portions of the trees and other vegetation to be preserved. The device(s) used shall be in conformance with the approved plans and all construction personnel shall be instructed to honor these devices. The protection devices described below are provided as suggestions only. Other devices affording equally effective protection may be used subject to the Director's approval. (See Plate 5-12 (5M-12)).

12-0803.1B Barrier fence, snow fence, orange plastic fence, welded wire fence, chain link fence, board fence, or chicken wire fence may be used when placed within the disturbed area at the limits of clearing and grading and erected at a height of 4' (1.2m). The fencing material shall be mounted on 6' (1.8m) tall steel posts driven 1.5' (0.45m) into the ground and placed a maximum of 6' (1.8m) apart, except for welded wire fence and chain link fence

12-0000 VEGETATION PRESERVATION AND PLANTING

where steel posts may be placed a maximum of 10' (3m) apart. When board fencing is used it shall be mounted on 6' (1.8m) tall wooden stakes driven 1.5' (0.45m) into the ground and placed a maximum of 6' (1.8m) apart.

12-0803.1C Filter fabric fence, silt fence, or super silt fence. This fencing may be used for tree protection when placed at the limits of grading and constructed as specified in the Virginia Erosion and Sediment Control Handbook. The Director may also require the placement of one of the tree protective devices listed in § 12-0803.1B if the filter fabric fence or silt fence is not adequate to protect the trees shown on the approved plan to be preserved.

12-0803.1D Berm. A temporary perimeter dike which has been constructed for erosion and sediment control may double as a protective device for vegetation to be preserved. The dike shall be constructed as specified in the Virginia Erosion and Sediment Control Handbook and shall be constructed entirely within the disturbed area. If the dike is removed before the construction is completed, the Director may require the installation of substitute tree protection and/or erosion and sediment control devices.

12-0803.2 Once clearing is completed and protective devices installed according to the approved Phase I erosion and sediment control plan (see PFM § 11-0104.1), an inspection shall be requested by the permittee or their designee. The Phase I clearing and erosion and sediment control devices shall be approved by the Director before additional clearing begins.

12-0804 Treatment of Preservation Areas During Construction

12-0804.1 Tree protection devices shall be maintained until all work in the vicinity has been completed and shall not be removed or relocated without the consent of the Director. If the Director deems that the protective devices are insufficient, installation of additional protective devices may be required.

12-0804.2 Heavy equipment, vehicular traffic, stockpiling of materials, or deposition of sediment shall not be permitted within tree preservation areas.

12-0804.3 No toxic materials shall be stored within 100' (30 m) of vegetation areas to be retained.

12-0804.4 Fires authorized by Fairfax County Air Pollution Control Ordinance, Fire Code, or any other State or County law shall not be permitted within 100' (30m) of vegetated areas retained unless approved by the Director in accordance with the ordinance, code or law. If authorized, fires shall be limited in size so as not to adversely affect the vegetation.

12-0804.5 No protective devices, signs, utility boxes or other objects shall be nailed or affixed to trees to be preserved.

12-0804.6 In the event that a tree or portion thereof is dead or dying due to construction or environmental changes resulting from construction and/or clearing, and poses a hazard to either life or property, the permittee shall take such action as necessary to eliminate the hazard carefully. The permittee should notify the Director of any actions taken or proposed to be taken under this Section.

12-0804.7 When excavating, all tree roots greater than 1" (25mm) in diameter that are exposed and/or damaged shall be trimmed cleanly, and covered temporarily with moist peat moss, burlap, or other suitable material to prevent the exposed roots from drying out until the final soil grade is restored.

12-0804.8 Tree walls shall be provided when necessary to maintain the limits of clearing and grading and tie into existing grades. A certified arborist should be consulted to determine the proper tree wall location to protect the structural integrity of the tree's root system, to help ensure the tree's survival and public safety. Once a grade has been lowered for the construction of a tree wall, the wall shall be constructed as soon as possible, but, in any event, within two weeks. If the wall is over 2' (0.6 m) in height, a building permit is required according to § 2-0205.

12-0804.9 Any damage inflicted to the above or below-ground portions of the trees shown to be preserved shall be repaired immediately. All damaged branches in the crown shall be cut off cleanly, as specified in § 12-0806.4.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0804.10 Any portion of a tree preservation area that is disturbed without prior approval of the Director shall be mulched immediately with a minimum of 4" (100mm) of wood chips or shredded hardwood mulch.

12-0804.11 Trenching shall be done only within the areas shown to be disturbed on the approved plan, unless otherwise approved by the Director prior to commencing work. (See Plate 7-12 (7M-12)).

12-0804.12 When trenching or tunneling, all tree roots greater than 1" (25mm) diameter that are exposed and/or damaged shall be trimmed cleanly, and covered temporarily with moist peat moss, burlap, or other suitable material to prevent the exposed roots from drying out until the soil grade is restored.

12-0804.13 Trees or preservation areas that are damaged by trenching or tunneling shall be mulched immediately after the work is completed with wood chips or shredded hardwood mulch 4" (100mm) deep and as wide as the area of disturbance to mitigate the impacts of disturbance.

12-0805 Tree and Shrub Planting

12-0805.1 Materials

12-0805.1A The trees and shrubs that are planted shall be of the species and size specified on the approved plans.

12-0805.1B All tree and shrub sizes shall meet the standards specified in the American Association of Nurserymen's American Standard for Nursery Stock, (ANSI Z60.1-1996).

12-0805.1C Tree substitutions within the tree categories listed in Table 12.7 are generally accepted unless otherwise specified by proffered conditions, development conditions, special exceptions, special permits, or variances, and shall be in conformance with the following:

12-0805.1C(1) The use of substitutions shall not result in exceeding the genus and species limits specified in § 12-0701.6.

12-0805.1C(2) A letter signed by the permittee shall be provided to the Director acknowledging any

proposed substitutions to trees or shrubs shown on the approved plans.

12-0805.1C(3) Substitution of a tree shown on the approved plan from one tree category with a tree from another category shall require the submission and approval of a revision to the approved plan.

12-0805.1D Trees and shrubs shall be nursery grown unless otherwise approved and shall be healthy and vigorous, free from defects, decay, disfiguring roots, sun-scald, injuries, abrasions, diseases, insects pests, and all forms of infestations or objectionable disfigurements as determined by the Director. Plants shall be in conformance with American Standard for Nursery Stock, (ANSI Z60.1-1996).

12-0805.1E Balled and burlapped trees and shrubs shall be dug using standard sizes with firm, natural balls of earth and securely wrapped in accordance with American Standard for Nursery Stock, (ANSI Z60.1-1996)

12-0805.1F Bare root trees and shrubs shall be dug with adequate fibrous roots which shall be protected during handling and planting to guard against drying and physical damage.

12-0805.1G Container grown stock shall have grown in a container long enough for the root system to hold its soil together.

12-0805.2 Delivery and Temporary Storage

12-0805.2A Plants shall be protected during delivery to prevent desiccation of leaves.

12-0805.2B Trees and shrubs should be planted on day of delivery. If this is not possible, the contractor shall protect unplanted plants by keeping them in shade, watered, and protected with soil, mulch, or other acceptable material.

12-0805.2C Trees and shrubs shall not remain unplanted for more than two weeks.

12-0805.3 Planting of Nursery Stock

12-0805.3A All trees and shrubs shall be planted as specified in the latest edition of "Landscape Specification Guidelines for Baltimore-Washington

12-0000 VEGETATION PRESERVATION AND PLANTING

Metropolitan Area," prepared by the Landscape Contractors Association of Metropolitan Washington and American Society of Landscape Architects. (See Plate 8-12 (8M-12)).

12-0805.3B If planting in areas that have been previously compacted, the soil shall be properly prepared (tilled and amended as needed based on soil samples) to a depth of 2' (0.6m), prior to installation of landscape material. Soil within individual planting holes shall not be amended.

12-0805.3C The staking and guying of trees is not required except where the Director determines that site conditions warrant their use. Examples of conditions where these methods may be necessary include: planting in windy locations, on steep slopes, or where vandalism may be a concern. All stakes and guys must be removed within six months of plant installation. (See Plates 9-12 (9M-12) and 10-12 (10M-12)).

12-0805.3D Mulching. All trees and shrubs shall be mulched after planting, to a minimum depth of 2" (50mm), but no more than 3" (75mm), with an appropriate mulch such as pine bark, pine needles, wood chips, or shredded bark. Mulch shall cover the entire root area and saucer; however, mulch shall not touch the trunk. (See Plate 8-12 (8M-12)).

12-0805.4 Planting of Transplanted Trees and Shrubs

12-0805.4A Selection. Trees to be transplanted shall be full and healthy without any significant defects and should be able to overcome root disturbance. The proposed transplant location(s) shall approximate the environmental tolerances the species is able to withstand.

12-0805.4B Timing. Relocating deciduous trees is best carried out in late fall or early spring. Relocating evergreen trees is best carried out in the early spring. Moving trees at less than ideal times of the year can only be successful if extraordinary after-care measures are taken. Such measures shall be detailed on the tree transplanting plan.

12-0805.4C Treatment before, during, and after transplantation. Trees to be transplanted shall be crown cleaned and watered heavily before lifting.

Immediately after planting, the tree shall be well watered and top dressed with 2 - 3" (50 - 75mm) of mulch. Soil moisture levels shall be checked at least every two weeks and trees shall be watered if necessary.

12-0805.4D Storage. Trees to be transplanted should be placed in their permanent locations immediately. If this is not possible, root balls of lifted balled and burlapped trees should be placed in a storage area in temporary trenches dug deep enough to entirely surround the root ball, or encased in a minimum of 12" (0.3m) of composted mulch. Root balls of trees lifted with a tree spade shall be placed in temporary storage holes that are created with the same size tree spade. The storage area shall be well protected from construction equipment and personnel, located in a shady environment, and have a water source nearby. Soil moisture levels shall be checked at least every two weeks and trees shall be watered if necessary.

12-0805.5 Planting of Seedlings

12-0805.5A Age and height. Seedlings shall be at least three years old and 12" (0.3m) in height. Any age configuration in terms of initial seedbed age - to - transplant bed age such as 3-0, 2-1, 1-2, etc. is permissible so long as the total age is 3 years. Seedlings of a greater age may be used provided they conform to the specifications outlined under this Section.

12-0805.5B Quality. Planting stock shall be healthy and free from insect and disease pests and have a single leader. The root system is to be well-developed, fibrous, and kept moist until planted.

12-0805.5C Time of planting. Seedlings shall be planted between March 1 and April 15 unless otherwise approved by the Director.

12-0805.5D Density. Seedlings shall be planted at a density of approximately 600 seedlings/acre (15 seedlings/100m²). See 12-0805.5E(10) for survival rate thresholds.

12-0805.5E Planting

12-0805.5E(1) Seedlings shall be planted where shown on the conservation plan.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0805.5E(2) In areas of undisturbed, uncompacted soil, seedlings may be planted with a dibble bar, shovel, or auger. See Plate 3.37-4 in the Virginia Erosion and Sediment Control Handbook for a description of the dibble bar method. See Plate 11-12 (11M-12) for an illustration of the shovel or auger method.

12-0805.5E(3) In areas of compacted soil or fill, the soil throughout the area shall be amended with 3 - 6" (75 - 150mm) of organic matter and thoroughly tilled to a depth of 12" (0.3m) before planting. After the soil has been prepared and allowed to settle, the seedlings may be planted using the dibble bar, shovel or auger method.

12-0805.5E(4) Seedlings shall be kept moist, fresh, and protected from wind and sun to prevent mortality before planting. Seedlings shall be carried in a pail or bucket filled with sufficient mud and/or water to puddle the roots until planting. However, seedling roots which have been clay dipped for moisture protection may be wrapped in wet burlap until planted instead of being carried in a bucket.

12-0805.5E(5) Seedlings shall be planted at approximately the same depth as growing in the nursery, i.e., the root collar should be at ground level.

12-0805.5E(6) Seedlings shall be planted erect.

12-0805.5E(7) Seedling roots shall be spread carefully in a natural position in the planting hole.

12-0805.5E(8) Seedlings shall be securely planted with the soil firmly packed around the roots.

12-0805.5E(9) Deciduous seedlings shall be planted with tree protection tubes, mulch, and netting when required by the Director.

12-0805.5E(10) Seedlings shall be watered the day they are planted and thereafter as necessary to insure a survival rate after two years of 400 plants per acre (10 seedlings per 100 m²).

12-0806 End of Construction

12-0806. Inspection. The developer shall request an inspection when construction is completed to ensure that all work is in accordance with the approved plans.

12-0806.2 Repair. All trees that have been damaged as a result of construction activity shall be repaired as specified in § 12-0806.4.

12-0806.3 Dead or Dying Trees

12-0806.3A In the event any tree or portion thereof is dead or dying due to construction or environmental changes resulting from construction and/or clearing, and poses a hazard to either life or property, the permittee shall take such action as necessary to eliminate the hazard carefully. The permittee shall notify the Director of any actions taken or proposed to be taken under this Section.

12-0806.3B Trees that are required to be removed shall be removed in such a way that the surrounding trees, vegetation, landscaping, structures, and site features are not damaged.

12-0806.3C Trees that are required to be removed shall be cut down flush with the ground (within 2" (50mm) of the soil), and cut into movable lengths, to prevent the creation of a new hazard. If site conditions interfere with the permittee's ability to do this, an inspection by the Director will be necessary to determine if the remaining stump can be left or must be removed by other means.

12-0806.3D If a stump created by the removal of a hazardous tree is determined by the Director to pose a hazard (i.e., jagged stumps, stumps of hollow trees) then the stump shall be removed by acceptable means in conjunction with the removal of the tree.

12-0806.3E When trees must be taken down or pruned to comply with the provisions of this Section, the resulting wood shall remain the property of the property owner.

12-0806.3F Replacement trees.

12-0806.3F(1) The tree canopy lost due to the removal of trees dead and/or dying due to construction shall be replaced by the planting of replacement trees, except as provided for in § 12-0806.3(F)2. Replacement trees shall be planted in the vicinity of the dead or dying tree which was removed unless other arrangements are agreed to by the owner and the permittee and approved by the Director. Replacement trees shall duplicate the

12-0000 VEGETATION PRESERVATION AND PLANTING

species composition of the surrounding forest as closely as possible.

12-0806.3F(2) Except for trees required to be preserved because of applicable proffered conditions, development conditions, special exceptions, special permits, variances, or other County requirements, replacement trees may not be required when individual trees or groups of trees shown on the approved plans to be preserved need to be removed for a reason clearly demonstrated to the Director prior to their removal.

12-0806.3G The permittee shall obtain written permission from the property owner or his/her agent before entering the subject property to comply with the requirements of this Section. In the event that such permission is denied and such denial is demonstrated to the satisfaction of the Director, the permittee may be required to plant replacement trees elsewhere on-site, as determined by the Director.

12-0806.4 Pruning

12-0806.4A All pruning shall be done in accordance with the American National Standards Institute (ANSI) A300-1995 pruning standards. Pruning shall be done by personnel who, through training and on-the-job experience, understand the techniques and hazards of tree care work, and understand the safety requirements outlined in the ANSI Z133.1-1994 standards. Refer to the ANSI standards listed above, and Plate 12-12 (12M-12) for a graphical depiction of proper pruning technique.

12-0806.4A(1) Cuts and wounds shall not be treated with tree wound dressing unless approved by the Director.

12-0806.4A(2) Climbing spikes. Climbing or tree spikes shall not be used to climb live trees unless the tree is being removed. The holes left by such spikes provide access points for insects and disease to enter the tree.

12-0806.4B Vertical Mulching. If the soil has become compacted over the root zone of any tree, the ground shall be aerated by vertical mulching. This treatment is accomplished by drilling 1" to 2" (25mm to 50mm) diameter holes in the ground to a depth of 1' (0.3m), and filling the holes with commercially available organic matter products, humus, composted

manure or other composted products. This procedure shall be repeated every 18" to 24" (0.45m to 0.6m) (See Plate 13-12 (13M-12)).

12-0806.4C Newly planted vegetation

12-0806.4C(1) Any vegetation required by the approved conservation plan or the Director, which in the opinion of the Director is dead or is not healthy, shall be replaced by the permittee.

12-0806.4C(2) Trees shall be restaked by the permittee if necessary. All stakes and supporting wires shall be removed within one year of planting.

12-0900 VIOLATIONS

12-0901 Constitution and Processing of Violations

12-0901.1 Failure to comply with Article 2 of the Subdivision Ordinance, Chapter 104, Article 1 of the Code, or Article 13 of the Zoning Ordinance and § 12-0000 et seq. shall constitute a violation.

12-0901.2 Violations shall be processed in accordance with § 101-1-4 and 104-1-12 of the Code and § 2-0000 et seq., and Part 9 of Article 18 of the Zoning Ordinance.

12-0902 Replacement Trees and/or Vegetation

12-0902.1 Land disturbing activity without an approved plan.

12-0902.1A When a violation is issued for land disturbing activity without an approved plan in accordance with Chapter 104 of the County Code, a conservation plan shall be submitted to the County within the time frame established on the violation. The conservation plan shall show all site features as they existed prior to the violation and the site features as they are proposed to appear, in the same manner as if a violation had not occurred. The plan shall provide a date for completion of all items shown on the plan.

12-0902.1B Site remediation may be required to restore the site to its pre-violation condition. Such remediation may include but not be limited to regrading of the site to the pre-existing contours.

12-0000 VEGETATION PRESERVATION AND PLANTING

12-0902.1C Replacement trees and/or other vegetation may be required by the Director according to the guidelines set forth in § 12-0704.

12-0902.2 Land disturbing activity conducted in violation of an approved plan.

12-0902.2A A revision to the approved plan may be required by the Director when land disturbing activities are conducted, without prior approval of the Director, in areas beyond the limits of clearing and grading shown on the approved plan. The revision shall provide all of the required plan information and shall show the original limits of clearing and grading approved, the area that was over-cleared, and the required number of replacement trees.

12-0902.2B Replacement trees and/or other vegetation may be required by the Director according to the guidelines set forth in § 12-0704.