ARTICLE 6 – LANDSCAPING AND SCREENING

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ARTICLE 6 – LANDSCAPING AND SCREENING

6-1 TREE COVER REQUIREMENT STANDARDS

1. General

A. Minimum Size Standards. All trees required to meet the required provisions of this Article and Article 5, Division 5 of the Zoning Ordinance and Article 5, Division 1 of the Subdivision Ordinance shall meet the following minimum size standards.

(1) Large and medium deciduous trees: A minimum caliper of at least two (2) inches measured six (6) inches from the ground.

(2) Compact and small deciduous trees: A minimum height of six (6) feet measured from the ground elevation after planting.

(3) Evergreen trees: A minimum height of at least (6) feet measured from the ground elevation after planting.

B. All developments requiring submission and approval of a site plan shall include the preservation and planting of trees on site to the extent that, at maturity of twenty (20) years, minimum tree cover area shall be provided consistent with Table 6.1 below.

C. The tree cover requirement shall be calculated and shown on the landscaping plan. The method of calculating the required tree cover is located in Section 6-1.2 and 6.1.3.

D. Tree cover credit shall only be given to trees with main trunks located on the site being developed.

E. Tree cover area must meet or exceed the figures listed in Section 6.1.1.B and Table 6.1 and may be provided by existing vegetation or planted landscape trees. These trees may occur on residential lots, in open space or within VDOT rights-of-way associated with the development.

F. If any tree that has been credited dies within two (2) years of construction, replacement trees shall be planted to meet the minimum tree cover canopy density.

G. Compliance with these requirements by the approval of a landscape plan and subsequent issuance of an occupancy permit shall be deemed to meet the requirement of tree cover at a maturity of twenty (20) years.

Table 6.1
Tree Cover Requirement

TABLE INSET:

Zoning Districts	Percentage Cover
Office; commercial; industrial and PDC	Ten (10) percent
R-12; PDH-12; and PDH-16	Fifteen (15) percent
R-8 and PDH except single-family detached, at a density of ten (10) or less d.u.a.	Twenty (20) percent

2. Tree Cover Calculations- Commercial, Office and Industrial Projects

Tree Cover calculations for Commercial, Office and Industrial projects shall be calculated using the following procedures:

A. Calculate the gross site area in square feet.

B. Calculate the footprint area of all buildings in square feet. Exclude parking structures, and other areas which are identified as exceptions (or modifications approved by the Planning Director) to the tree cover requirements. Subtract this total from the gross site area.

C. If grading is not required for other purposes, calculate the area required to meet the 2% grade away from buildings and add to total in step B above. This is the adjusted gross site area.

D. Multiply the adjusted gross site area by the percentage of tree cover area required by the zoning district to obtain square footage of tree cover required. The minimum tree canopy cover required is found in Table 6.1 of this Article, and in Sections 20-5.1.4 (Subdivision) of the County code.

E. Calculate the square footage of tree cover provided by vegetation proposed to be preserved. Multiply this area by a factor of 1.5 which allows for 20 year growth of existing vegetation (a higher factor of up to 2.0 may be used for trees of outstanding size or quality if approved by the Planning Director). If the area to be provided by preserved vegetation does not meet the total percentage required as calculated in D above, then the deficiency shall be met by planting acceptable landscape trees.

F. To calculate the area in square footage provided by proposed landscape trees consult the Tree Selection and Cover Guide in Table 6.3. This Guide provides square footage areas credited to the planting of specific tree species according to the proposed size at planting. Add the square footage credits provided by all acceptable tree species to arrive at the total area to be provided by landscape planting.

G. Add the area provided by existing vegetation to be preserved to the area provided by landscape planting (if needed) to determine the total proposed tree cover area. The total of proposed tree cover area must meet or exceed the percentage of 20-year tree cover area as calculated in D above.

3. Tree Cover Calculations- Residential Subdivision Projects

Tree cover requirements for residential subdivision plans, except single family detached, shall be calculated as follows:

A. Calculate the gross site area in square feet (SF).

B. Determine the impervious surface area in SF, including dwellings, roadways and shoulders, sidewalks, paths, parking areas and recreation facilities. For proposed dwellings, assume 2500 square feet per lot or the typical impervious surface area per lot, whichever is greater. Subtract the results from A, above. (It is suggested that prior to the submission of the Landscape Plan and Tree Cover calculations the designer contact the Planning Director to ensure the assumptions used to calculate impervious area are accurate.)

C. Calculate the SF of all areas identified as exceptions (or modifications approved by the Planning Director) to the tree cover requirements in the Subdivision Ordinance, Chapter 20-5.1.7. Subtract the

resulting SF from Section B, above. This provides the adjusted gross site area.

D. Multiply the adjusted gross site area by the percentage of tree cover required by the zoning district. Refer to Table 6.1 to obtain the percentage of tree cover required.

E. Calculate the SF of tree cover provided by vegetation proposed to be preserved. Multiply this area by a factor of 1.5 which allows for 20 year growth of existing vegetation (A higher factor of up to 2.0 may be used for trees of outstanding size or quality if approved by the Planning Director). If the area to be provided by preserved vegetation does not meet the total percentage required as calculated in Section D, above, then the deficiency will have to be provided by planting acceptable landscape trees.

F. To calculate the area in square footage provided by proposed landscape trees, consult the Tree Selection and Cover Guide in Table 6.3. This Guide provides square footage areas credited to the planting of specific tree species according to the proposed size at planting. Add the square footage credits provided by all acceptable tree species to arrive at the total area to be provided by landscape planting.

G. Tree cover area shall meet or exceed the figures listed in Section D, above, and may be provided by existing vegetation or planted landscape trees. These trees may occur on residential lots, in open space or within VDOT rights-of-way in that subdivision. Trees proposed to be planted in VDOT rights-of-way must meet the specifications set forth in the "Guidelines for Planting along Virginia's Roadways" and appropriate permits must be submitted.

4. Sections or Phases

A. When a development is divided into phases or sections, each phase or section shall be treated separately for tree cover requirements.

B. In the event a development provides conservation or scenic easements or provides dedicated open space, tree cover provided in the dedicated open space may be credited toward the tree cover requirement for the entire development. The remaining tree cover requirements shall be met in the individual phases or sections of the development. In such cases, the calculations showing a breakdown of where tree cover is to be provided in the open space and each section or phase shall be shown on the overall plan and on each incremental phase or section submitted within the development.

5. Road frontage Tree Cover Buffer – Single Family Detached

A landscaped buffer shall be provided in common area adjacent to the side or rear of lots in single family detached subdivisions proposed along current interstate highway, primary or secondary roads.

The buffer shall be used for the cultivation of trees, shrubs or other vegetation of such character as will lessen the adverse impact of vehicle movement over such roads upon the residential development.

A. The width of the landscaped buffer shall be based upon the right-of-way width and determined as follows:

Right-of-way width	Buffer width
< 90' ROW	20'
90'-150' ROW	50'
> 150'	75'

B. The buffer shall be planted with:

One large evergreen tree with an ultimate height of 40 feet or greater for every 15 feet, plus one large deciduous tree with an ultimate height of 40 feet or greater for every 35 feet, plus one medium deciduous or evergreen tree with an ultimate height of 20-40 feet every 20 feet, plus 2 medium evergreen shrubs with an ultimate height of 12 feet or less for each 10 linear feet.

C. Existing vegetation which is preserved may be applied toward the planting requirements in Section B, above.

D. The landscape requirements for the buffer may be reduced by 40 percent when an earthen berm or brick or architectural block wall is provided. The berm or wall shall be a minimum of 3 feet in height measured from the road surface and be designed to lessen the impact of vehicle movement upon the residential development.

The Planning Director may allow architecturally suitable wood fences that are appropriate for the character of the development and meet the intent of this section.

E. The buffer area, and landscaping, including berms, walls and fences shall be shown on the Landscape Plan.

F. The plant material shall be perpetually maintained in a healthy state by the Homeowner's Association. This requirement shall not preclude the planting of additional plant material within the buffer which will lessen the adverse impact of vehicle movement upon the residential development.

6. Tree Preservation Credit/ Incentives

A. Existing trees that are to be preserved may be included to meet all or part of the tree cover requirements if the existing trees are accurately located, identified by the drip line on the landscape plan and the trees meet the standards of desirability and life-year expectancy found within Article 6 of the Design Standards Manual.

B. Tree preservation credit shall only be given to trees with main trunks located on the site being developed.

C. When existing trees and associated understory plants are to be preserved for tree cover credit, efforts should be made to design the development to avoid fragmentation of the preservation areas from other woodlands within or contiguous to the site. Such a design will enhance the preservation of wildlife corridors and proliferation of the predominant vegetation types in that region.

D. Existing trees intended to be preserved for tree cover credit shall be selected in accordance with Section 6-4 of this article. If these trees become dead, dying or hazardous due to construction activities then removal or repair will be required in accordance with Section 6-11 of this article.

E. If during construction, vegetation that is shown to be preserved is cleared or removed for unforeseen reasons so that the tree cover credit is no longer met, then replacement trees shall be required in accordance with Section 6-11 of this article. Conversely if additional trees are preserved, then tree cover credit may be added to the calculations in accordance with Section 6.1.2 or 6.1.3 of this article.

F. Areas with ten or more native trees and/ or individual specimen tree(s) to be preserved shall be labeled on a site plan as "Tree(s) to be Preserved". Any tree the developer chooses to save of 10" caliper or larger will be considered a "strength" in a rezoning application. For every existing healthy tree greater than 10" caliper preserved outside the required screening and buffer areas, the developer will receive four (4) tree credits that can replace required tree plantings elsewhere on site outside a screening or buffer area. For every other existing healthy tree of 6" to 10" caliper preserved, the developer will receive two (2) tree credits that can replace required tree plantings outside buffer areas.

G. Transplanting of tree(s) with a caliper greater than 4" shall count towards the planting of two nursery planted tree(s).

H. Existing vegetation in a Resource Protection Area (RPA) may be used to meet the requirements of this Article upon approval by the Planning Director. Any addition or removal of vegetation in a resource protection area shall be subject to the provisions of Chapter 6A of The County Code. The addition of vegetation in a resource protection area shall be indigenous or adaptable to the site without extraordinary measures and shall be approved by the director.

7. Tree Planting Credit

A. Trees planted in peripheral and interior parking lot landscaping, transitional screening areas, landscaped open space areas, tree replacement and other trees that are planted on the site may qualify for tree cover credit.

B. Trees shall not be planted within a utility easement or within 5' outside the utility easement. 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.

C. Each plant to be planted shall be accurately located and labeled as to species. The symbols used to locate trees intended to be used as part of the tree cover requirements shall be drawn to scale to accurately represent their projected 20 year crown spread.

D. The minimum size planted tree that will qualify for tree planting credit shall be as follows:

(1) Large and medium deciduous trees: A minimum caliper of at least two (2) inches measured six (6) inches from the ground.

(2) Compact and small deciduous trees: A minimum height of six (6) feet measured from the ground elevation after planting.

(3) Evergreen trees: A minimum height of at least six (6) feet measured from the ground elevation after planting.

6-2 TREE COVER MODIFICATIONS, WAIVERS AND EXCEPTIONS

1. General

A. The Planning Director may impose conditions to any modification, waiver or exception to assure that the results of the modification, waiver or exception will be in accordance with the purpose and intent of the tree cover requirements.

B. A waiver or modification of the parking lot landscaping or transitional screening requirements shall not be deemed a modification, waiver or exception to the tree cover requirements.

2. Modifications or Waivers

A. The tree cover requirements may be modified by the director for areas comprised of the following features, provided those areas are identified and delineated on the site plan.

(1) Floodplains and wetlands.

(2) Non-wooded developed recreation areas, such as athletic fields, tennis courts, multi-use courts, playgrounds and tot lots.

B. Tree cover requirements may also be modified or waived by the Planning Director where the strict provisions thereof would reduce the usable area of a lot due to lot configuration or size to a point which would preclude a reasonable use of the lot.

C. The director may waive or modify the requirements of this section in conjunction with the approval of a site plan for expansions or alterations not exceeding twenty-five (25) percent of the gross floor area of the building being expanded or altered.

3. Exceptions

A. An exception to the tree cover requirements may be approved by the Planning Director for areas comprised of the following features, provided those areas are identified and delineated on the site plan:

(1) Lakes and retention ponds, based on the normal water surface elevation, and swimming pools.

(2) Lands under active commercial production or management of agricultural, horticultural or forest crops; landfills and quarries.

(3) Major utility distribution easements of twenty-five (25) feet or more in width.

(4) Absorption fields and seepage pits for on-site sewage disposal systems.

6-3 LANDSCAPE STANDARDS AND SPECIFICATIONS

1. Landscape Design

A. General

(1) Planting required by this Appendix should be in an irregular line and spaced at random. Plants and tree species should be clustered in order to provide a professionally acceptable composition and mix of vegetation.

(2) Trees that are to be planted shall be selected from species suitable for the proposed site conditions. For example, if the location for the tree is to be wet, then the tree must be able to withstand wet conditions. If the tree is to be located near an area where the pollution will be at a high level, such as near or in a parking lot or near a highway, then the tree to be planted must be able to withstand the high pollution. Refer to the Tree Selection and Cover Guide, Section 6-3.4 and Table 6.2 and 6.3

(3) Trees shall not be planted within a utility easement or within 5’ of the utility easement. 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.

(4) Trees proposed to be planted in VDOT rights-of-way must meet the specifications set forth in the

"Guidelines for Planting along Virginia's Roadways" and appropriate permits must be submitted.

2. Tree Selection and Cover

A. **Proposed Development**. The mature height and spread of the trees shall be considered to ensure that they will not interfere with the proposed structures and overhead utilities. The root development characteristics shall be considered to ensure that they will not cause interference with walls, walks, drives, patios, and other paved surfaces or affect water and sewer lines, septic systems, or underground drainage systems.

B. **Proposed Use.** The proposed use of the developed area shall be considered. 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 if noise or objectionable views are going to be a problem. (Evergreens provide better buffering and screening than deciduous trees). Trees located adjacent to streets or parking lots should be selected for their tolerance to de-icing salts. (Refer to Table 6.3)

C. **Landfills.** The proximity to landfills should be considered. Generated gases can travel underground for a considerable distance to kill trees.

D. **Life Span.** Preference should be given to trees with long life spans.

E. **Resistance to Disease and Insects.** Trees that are known to be resistant to attacks by disease or insects should be given preference to those known to be susceptible.

F. **Aesthetics Value.** Consideration should be given to flowering habits, autumn foliage, bark and crown characteristics, and type of fruit.

3. The Placement of Trees and Woody Plants for Energy Conservation.

A. Landscaping may be used to effectively reduce the amount of energy used to cool residences and buildings. The placement of trees and shrubs reasonably close to buildings can minimize heat gain during the peak load demands of the hottest months by:

(1) blocking solar radiation from the building envelope, the adjacent ground and foundation;

(2) creating cool microclimates near the building by evapotranspiration, and;

(3) either channeling or blocking air flows through and around the residences.

B. This proximity planting provides optimal shading patterns and also uses solar radiation for evapotranspiration by landscape plants thereby creating cool micro climates directly adjacent to walls and windows. The resulting reduction in ambient air temperatures and direct solar exposure reduces the rate of heat transfer through the walls and windows. A landscape design which maximizes this effect involves the use of a multi-layer canopy of trees with dense shrubs underneath and immediately adjacent to the walls and windows.

C. The trees and shrubs are oriented to provide maximum shading of windows and walls directly exposed to solar angles during the hottest times of the day during the hottest months. In the County this would typically be 1 to 5 o'clock in the afternoon in the months of June through September.

D. Trees and shrubs may be placed in the following manner to provide the following benefits:

(1) Trees and shrubs planted on the south side of a building insulate the lower sections of the walls and the adjacent ground during the long afternoons of August through September when solar angles are low.

(2) At least one or more trees should be placed fairly close to air conditioning units so that after a five year growth period their canopies will provide shade to the unit from morning and afternoon solar exposure. Caution should be used however, in making sure that lower branches and foliage will not block the air intakes of air conditioning units.

(3) If a building will be air conditioned during most of the cooling season, low canopy trees and shrubs should be used to block prevailing winds. For example, if summer winds are from the southeast, tall shrubs-positioned on the south sides of east windows can significantly reduce warm air infiltration through the windows. These same shrubs will provide shade for adjacent walls and windows.

(4) For buildings in which air conditioning will be used infrequently, care should be taken to place trees and shrubs so that winds are channeled into the building when windows are open.

E. Detailed studies have shown that judicious placement of landscaping can reduce the electrical energy used to air condition building interiors by 58% to 65% on very warm summer days.

F. The types of plants used in energy conservation landscaping is very important. For southern building exposures deciduous trees are appropriate since they permit passive solar heating during the winter months, yet block or filter solar radiation in the summer. Evergreen trees and shrubs should be used on the northern exposures since these are useful in insulating winter winds from walls, windows and foundations.

G. The placement of trees near buildings for energy conservation should be tempered with safety in mind. The ultimate height and spread of trees and shrubs should be considered when placing these close to buildings. Potential conflicts can result from plants overgrowing the site in which they are placed. Trees and shrubs that are in scale to the building and environment should be selected. Preference should be given to tree varieties with strong branching habits and without objectionable root systems (Refer to the Tree Selection and Cover Guide, Table 6.3).

4. Tree Selection and Cover Guide: Guide for Selection of Trees and Other Vegetation to be Preserved.

A. **General**

(1) Grading – Consideration shall be given to the proximity of proposed grading to the trees and other vegetation retained. Grading shall not take place within the drip line of trees retained unless approved by the Planning Director.

(2) Tolerance to sudden exposure- Consideration shall be given to the tolerance of the trees and other vegetation to the new environmental conditions such as increased direct sunlight, increased radiant heat from proposed buildings and pavement,

and resiliency from construction stresses. Trees with a strong tap or fibrous root system shall be given priority over those with a weak root system.

(3) Water table- Consideration shall be given to the effect of grading on the water table and its accompanying effect on trees and other vegetation retained. Grades that are lowered will cause the water table to drop which will reduce the ground water available to the vegetation.

(4) Outstanding or specimen plant material- Trees and other vegetation of impressive size or shape, of historical significance, or rare species shall be given priority to be preserved.

(5) Appearance- Trees with a well developed crown shall 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 crotches. Those trees which are open grown usually possess better form than those which are grown in a denser woodland environment.

(6) Wildlife value- The retention of trees and other vegetation is desirable to provide a good source of food, cover and nesting sites for wildlife. Example: Oaks, Hickories, and Dogwoods have a high food value.

(7) Other vegetation- Considerations shall be given to other vegetation growing in the immediate area. Examples: Virginia Pine, which would not be of particular value if growing with hardwoods, would increase in value if this were the only species present on the site; trees which have been standing alone are of higher value than those in a wooded situation.

(8) Comfort- Consideration shall be given to the location of the trees to be retained in relation to the planned use of the site. Trees provide relief from summer heat and strong winds.

(9) Health and disease susceptibility- Trees shall be checked for scarring caused by fire or lightning, insect or disease damage, and rooted or broken trunks or limbs. Pest and pollution resistant trees shall be preferred.

B. Tree Selection and Cover Guide Tables

Tables 6.2, 6.3, 6.4 and 6.5 contain information that will be helpful in the selection of trees to be preserved on sites planned for construction as well as the selection of trees to be planted on sites after construction has been completed. This information is by no means all inclusive but does contain some of the trees commonly found existing on sites where construction will take place as well as some of the trees commonly planted on construction sites in the County. The list of undesirable trees for a developed environment provides information on problems associated with specific trees when they are planted near residences, parking structures, roads and pedestrian walkways.

TABLE 6.2 Explanation of Tree Selection
and Cover Guide Columns and Codes

1. **Botanical/Common Name**. This column lists trees categorized according to their projected 20 year crown cover area. Botanical names are given first including genus, species and in some cases cultivar. Common names used in the Mid-Atlantic region are given second. Deciduous trees are separated from evergreens in all size categories. Evergreens include both coniferous and broadleaf species. The species listed will thrive in the County and are normally commercially available from local nurseries.

2. **Projected 20 Year Tree Cover Area in Square Feet and Caliper / Height at Planting.** These columns give the projected 20 year tree cover area in SF when a given species is planted as 1", 2" or 3" caliper tree. Evergreens that are specified by height instead of caliper will receive the following credits: Evergreens that are 5 to 6' in height will receive 1" diameter credits, Evergreens 7 to 8' in height will receive 2" diameter credits, and Evergreens 9' in height or more will receive 3" diameter credits. This information will be used when calculating tree cover SF requirements for planted trees only.

3. **Minimum Planting Space.** This column gives the area in SF that must be provided when planting a given species. This information will be useful in parking lot designs and any other areas where planting spaces are confined.

4. **Uses.** This column is used to select a species which will thrive and exhibit desirable characteristics suitable to the demands of the listed environment or situation. Five environments are listed: parking lot planting areas, transitional screening areas, VDOT rights-of-way, planting in small areas and under or close to overhead utility lines.

   A. *In parking lot planting areas.* These tree species have been selected for use in parking lots based on their historical tolerances of poor soils, drought conditions, reflected heat restrictive root zones, and do not exhibit a pendulous or spreading branching habit that would restrict eye-level sight distance or impede vehicular or pedestrian traffic. Trees to be planted in this harsh environment must be carefully chosen in order to avoid replacement and potential maintenance and safety problems associated with the upheaval or cracking of concrete and asphalt surfaces. Consideration of these species will aid in the design of parking lot landscaping required by the Zoning Ordinance.

   B. *As screening trees.* Categorized by Transitional Screening Requirements of Section 6-6 of the Zoning Ordinance. These species exhibit the characteristics necessary to provide eye-level and or overhead visual screening of undesirable views. Both deciduous and evergreen species are listed by it should be kept in mind that only evergreens provide year round screening since they retain their foliage regardless of season. 4 codes are given to categorize the species as evergreen or deciduous and according to ultimate height as defined in the transitional screening requirements of Section 6-6, of the Zoning Ordinance. These codes will be useful in the selection of species to be planted in transitional screening areas.

   C. *Within VDOT right-of-way.* These trees have been suggested for planting within VDOT rights-of-way in the booklet "Guidelines for Planting Along Virginia's Roadways" published by the Commonwealth of Virginia. The suggested species have been divided into two categories, Minor Trees and Major Trees, based on their general form and potential dimensions. These codes will be useful in the selection of species for

streets tree plantings and the preparation of landscape plans submitted for Street Tree Planting Permits.

D. *As plantings in small areas.* These species should be considered for planting near the foundations of structures such as residences, office buildings, or other restricted areas 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.

E. *Near overhead utilities.* These trees are suggested for plantings that occur underneath or adjacent to overhead utility lines where ultimate height and form of trees can cause interference. Use of the suggested species can avoid disfigurement and associated structural and health problems caused by periodic "Topping" or pruning of trees occurring near power lines.

5. **Environmental Tolerances.** This column is used to select species that are tolerant of specific environmental factors, both natural and manmade, that occur frequently in the urban setting. Eight factors are listed: restricted root zone, poor soil conditions, partial shade, shade, air pollution, de-icing salts, wet soil conditions and drought conditions.

A. *Restricted root zone.* Species that fall into this category will grow in a planting area relatively limited in soil volume and surrounded by impervious barriers typical of parking lot islands and planting strips provided between sidewalks and curbing. Roots of these trees will develop without major disruption of surrounding structures such as pedestrian walkways, streets and curb and gutter. It should be noted that limiting the area accessible to a root system will shorten the life expectancy of any given plant. A larger planting space will result in a healthier, vigorous specimen due to increased nutrient availability and improved soil conditions.

B. *Poor soil conditions.* These species are noted for their tolerance to a wide 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 soils will generally not thrive in it.

(1) A poor soil as defined herein is a soil intended for use as a growing medium that has marginal properties that are necessary to support plant life. These inadequate properties would include: 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; poor structure – highly compacted with little pore space and has a low water infiltration and percolation rate.

(2) Subsoils used to provide a stable base for sidewalks, parking lots, buildings, etc., and general grading purposes are often found to be inadequate for plant growth. Adding amendments such as composted organic matter and agricultural lime can improve soil pH, structure and nutrient availability and should be considered before planting. Testing soil for pH and nutrient content is advisable prior to amending soil.

C. *Partial Shade.* These species should be planted in areas receiving partial amounts of direct sunlight such as on the eastern or western boundary of a structure.

D. *Shade.* These species can be planted in a shaded environment, although the deeper the shade the more difficult it is for any tree to thrive properly. This information will be helpful in selecting trees that can

be planted in areas that receive little or no direct sunlight due to obstruction or in areas that receive filtered or diffused sunlight.

E. *Air Pollution.* This group of species will tolerate areas subjected to exhaust gas emissions as found along roadways and within parking lots with excessive stop and go traffic. These trees are typically deciduous and shed their leaves before particulate matter can damage leaf tissue. Evergreens are more susceptible to pollution injury as these retain leaves or needles longer allowing particulate matter to be absorbed and destroy plant tissue.

F. *De-icing salts.* These species are tolerant of exposure to de-icing salts such as sodium chloride and calcium chloride. This would include exposure in the form of foliar spray and the uptake of salts throughout the root system. This information is important when selecting trees to be planted along roadways and in the vicinity of parking lots, sidewalks, and asphalt paths subject to snow and ice removal operations.

G. *Wet soil conditions.* These species will tolerate moderate to excessive soil moisture. This information is important when selecting trees to be planted adjacent to waterways, ponds, lakes and storm water retention and detention facilities.

H. *Drought conditions.* These species will tolerate hot, dry conditions. They require less available soil moisture than most trees and should be considered when 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, and around buildings that absorb heat and reflect sunlight.

6. **Associated Problems.** This column is used to identify general problems associated with specific tree species. Five problem codes have been provided: disease problem, insect damage, storm damage and structural damage due to weak wood, production of objectionable fruit and production of objectionable root system.

A. *Disease problems.* These species are susceptible to severe stress, disfigurement or death brought about by disease causing agents which produce symptoms which are not curable or controllable by known or practical methods. Some of these species are susceptible to one or more pathogens therefore no attempt has been made to list specific symptoms, causal agents or disease names. This general information will be useful in selecting trees that are relatively disease free and easy to maintain especially if they must be planted in a stressful environment. Species that fall into this category are not recommended for planting, especially where they would be planted in groups. If such species are planted that it is likely that annual maintenance and periodic replacement of the entire tree will have to be provided.

B. *Insect damage.* These trees are subject to damage by insects or related organisms. Considerable damage such as defoliation or even death can result from these pests infesting host plants and often cannot be effectively controlled without considerable expense and use of pesticides. Periodic inspection and maintenance may need to be provided if these species are planted.

C. *Storm and structural damage due to weak wood.* These species are subject to structural failure such as falling branches and major portions of the main trunk snapping off during storms. These species should not be planted near

buildings or facilities where people gather or reside.

D. *Objectionable fruit.* These tree species will produce fruit with objectionable qualities. This would include fruit that is capable of causing damage when falling, fruit that is slick or sticky on roads or walkways, fruit that attracts pests, fruit that produces disagreeable odors and fruit which produces prolific seedlings.

E. *Objectionable root system.* These trees will typically produce shallow or surface oriented roots that are capable of heaving sidewalks and asphalt surfaces and clogging or destroying sewer and drainage pipes. They may also pose a tripping or mowing hazard when planted in lawns. These trees are also capable of damaging foundations if planted too close to buildings.

Table 6.3 – Tree Selection and Cover Guide

BOTANICAL/COMMON NAME	PROJECTED 20 YEAR TREE COVER AREA IN SQUARE FOOTAGE AND CALIPER/HEIGHT AT PLANTING			MINIMUM PLANTING AREA SQ. FEET	USES*	ENVIRONMENTAL TOLERANCES*	ASSOCIATED PROBLEMS*
COMPACT DECIDUOUS TREES	6’	7’	8’				
Acer palmatum / Japanese Maple	100	125	150	30	SD, VTA, F, U	SH, PS	
Chionanthus virginicus / Fringetree	100	125	150	30	SD, F, U	PS	
Cornus kousa / Kousa Dogwood	100	125	150	30	SD, VTA, F, U	PS	
Cornus mas / Corneliancherry Dogwood	75	100	125	30	SD, U	PS	
Continus coggygria / Smoketree	100	125	150	30	VTA, F, U		
Magnolia stellata / Star Magnolia	50	75	100	30	SD, VTA, F, U	AP	
Oxydendrum arboretum / Sourwood	75	100	125	30	SD, VTA, F, U	PS	
Prunus cerasifera / Flowering Plum	100	125	150	30	SD, VTA, F, U, PL	AP	
Stewartia koreana / Korean Stewartia	75	100	125	30	SD, U		
Stewart ovata / Mountain Stewartia	75	100	125	30	SD, U		
Stewartia pseudo-camellia / Japanese Stewartia	75	100	125	30	SD, U		
Styrax japonicum / Japanese Snowbell	100	125	150	30	SD, U	PS	
Syringa reticulate / Japanese Tree Lilac	75	100	125	30	SD, F, U	PS	
SMALL DECIDUOUS TREES	6’	7’	8’				
Amelanchier arborea / Downey Serviceberry	150	175	200	50	SD	PS, SH, W	IN
Amelanchier laevis / Allegheny Serviceberry	150	175	200	50	SD	PS, SH, W	IN
Betula pendula / White Birch	175	200	250	500			IN
Carpinus caroliniana / American Hornbeam	125	150	200	50	SD, F	W	
Cercis Canadensis / Redbud	125	150	200	50	SD, F, U, VTA	SC, D, SH, PS	
Cornus florida / Flowering Dogwood	125	150	200	50	SD, VTA, F, U	PS, SH	D
Crataegus spp. / Hawthorns	125	150	200	50	SD, U	SC, PS, W, D	DS, IN
Elaeagnus angustifolia / Russian Olive	150	175	225	50	SD, F, U	SC, AP, D	
Koelreuteria paniculata / Goldenrain Tree	125	150	200	50	SD, VTA, U	SC, D	
Lagerstroemia indica / Crapemyrtle	100	150	200	50	SD, VTA, F, U		
Magnolia soulanglana / Saucer Magnolia	100	150	200	50	SD, VTA, F, U	AP	
Prunus X incam ‘Okame’ / OkameCherry	125	150	200	50	SD, F, U		

Prunus sargentii / Sargent Cherry	125	150	200	50	SD, VTB, F, U		
Pyrus calleryana / Callery Pear 'Chanticleer'	125	150	175	50	PL, SD, F, U		
'Whitehouse'	125	150	175	50	PL, SD, F, U		
Sorbus alnifolia / Mountain Ash	175	200	250	50	SD, U	AP, W	
MEDIUM DECIDUOUS TREES	1"	2"	3"				
Acer campestre / Hedge Maple	150	175	225	90	SD, U	AP, D	
Acer ginnala / Amur Maple	150	175	225	90	SD, U, VTA	PS, D	
Aesculus hippocastanum / Horsechestnut	250	275	325	90	LD	RZ, SC, IS	
Betula nigra / River Birch	250	275	325	90	LD	W	
Carpinus betulus / European Hornbeam	150	175	250	90	PL, LD, VTB	PS	

Table 6.3 – Tree Selection and Cover Guide

BOTANICAL/COMMON NAME	PROJECTED 20 YEAR TREE COVER AREA IN SQUARE FOOTAGE AND CALIPER/HEIGHT AT PLANTING			MINIMUM PLANTING AREA SQ. FEET	USES*	ENVIRONMENTAL TOLERANCES*	ASSOCIATED PROBLEMS*
MEDIUM DECIDUOUS TREES	1”	2”	3”				
Carya ovota / Shagbark Hickory	150	175	250	90	LD		
Castanea mollissima / Chinese Chestnut	150	175	250	90	LD		
Celtis occidentalis / Hackberry	250	300	325	90	LD	SC, W, D	
Cercidiphyllum japonicum / Katsuratree	150	175	250	90	LD		
Diospyros virginiana / Persimmon	150	175	250	90	LD		
Ginkgo biloba / Ginkgo, Maidenhair Tree	150	175	225	90	PL, LD, VTB	RZ, AP, D	FR
Gymnocladus dioicus / Kentucky Coffeetree	150	175	250	90	PL, LD	SC, W, D	
Juglans nigra / Black Walnut	200	275	325	90	LD	SC, W	FR, RS-T
Larix decidua / European Larch	175	200	250	90	LD	D	
Liquidambar styraciflua / Sweetgum	175	200	250	90	LD	W	FR
Magnolia macrophylia / Bigleaf Magnolia	150	175	200	90	LD		
Malus spp. / Crabapples	150	175	200	90	SD, F, U	AP	FR
Metasequoia glyptostroboides / Dawn Redwood	150	175	250	90	LD	AP, W	
Morus spp. / Mulberries	150	175	250	90		SC, AP, D	
Nyssa sylvatica / Black Gum, Tupelo	150	175	250	90	LD, VTB	PS, W	
Prunus serotina / Black Cherry	150	175	250	90		IS	DS, IN, FR
Prunus subhirtella ‘Pendula’ / Weeping Japanese Cherry	150	175	200	90	SD		
Prunus yedoensis / Yoshino Cherry	150	175	200	90	SD, U		
Pyrus calleryana / Callery Pear ‘Redspire’	150	175	250	90	PL, LD	AP	
‘Aristocrat’	175	200	250	130	PL, LD	AP	WW
Quercus alba / White Oak	175	200	300	90	LD	IS	IN
Quercus imbricaria / Shingle Oak	175	200	300	90	LD	W	
Quercus robur / Pyramidal English Oak	150	175	250	90	PL, LD	SC	
Salix nigra / Black Willow	175	200	250	90	LD	W	
Sophora japonica / Japanese Pagoda Tree	175	200	250	90	PL, LD	SC, AP, D	FR
Tilia Americana / American Linden	225	250	325	90	LD		
‘Redmond’	225	250	325	90	PL, LD		
‘Legend’	225	250	325	90	PL, LD		
LARGE DECIDUOUS TREES	1”	2”	3”				
Acer plantanoides / Norway Maple	225	250	350	130	LD VTB	PS, IS	RS
Acer rubrum / Red Maple	225	250	350	130	LD, VTA	PS, IS, W	RS

Acer saccharinum / Silver Maple	225	300	375	130		W	WW, FR, RS
Acer saccharum / Sugar Maple	225	250	350	130	LD VTB	PS	
Carya illinoinensis / Pecan	275	350	400	130	LD	W	
Eucommia ulmoides / Hardy Rubbertree	200	250	275	130	PL, LD	SC	
Fagus sylvatica / European Beech	200	250	300	130	LD	PS	
Fraxinus americana / White Ash	225	250	350	130	LD	IS, W	
Fraxinus pennsylvanica / Green Ash 'Marshall's Seedless'	200	250	300	130	PL, LD, VTB	RZ, SC, IS, W, D	IN, WW
'Patmore'	200	250	300	130	PL, LD, VTB	RZ, SC, W, D	

Table 6.3 – Tree Selection and Cover Guide

BOTANICAL/COMMON NAME	PROJECTED 20 YEAR TREE COVER AREA IN SQUARE FOOTAGE AND CALIPER/HEIGHT AT PLANTING			MINIMUM PLANTING AREA SQ. FEET	USES*	ENVIRONMENTAL TOLERANCES*	ASSOCIATED PROBLEMS*
LARGE DECIDUOUS TREES	1”	2”	3”				
‘Summit’	200	250	300	130	PL, LD, VTB	RZ, SC, W, D	
‘Skyline’	225	250	350	130	LD, VTB	SC, AP, W, D	WW, IN, FR
‘Shademaster’	225	250	350	130	LD, VTB	SC, AP, W, D	WW, IN, FR
Liriodendron tulipfera / Tulip Poplar	220	250	300	130	LD	AP, W	WW
Maclura pomifera / Osage-Orange	225	275	350	130	LD	D	FR, RS
Magnolia acuminate / Cucumber Tree	200	250	300	130	LD		
Phellodendron amurense / Amur Corktree	200	250	300	130	LD	AP, D	
LARGE DECIDUOUS TREES	1”	2”	3”				
Platanus acerfolia / London Planetree	250	325	400	130	LD	AP, D	RS
Platanus occidentalis / Sycamore	250	325	400	130	LD	W	DS
Prunus serrulata ‘Kwanzan’ / Kwanzan Cherry	200	250	300	130	SD, VTA, U	AP	
Pyrus calleryana / Callery Pear ‘Aristrocrat’	250	300	350	130	PL, LD	AP	
‘Autum Blaze’	200	250	300	130	PL, LD	AP	
Quercus acutissima / Sawtooth Oak	200	250	300	130	PL, LD		
Quercus coccinea / Scarlet Oak	200	250	325	130	LD		
Quercus palustrus / Pin Oak	200	250	325	130	PL, LD, VTB	W	
Quercus phellos / Willow Oak	200	250	300	130	PL, LD		
Quercus rubra (borealis) / Red Oak	200	250	325	130	PL, LD	IS	
Salix babylonica / Weeping Willow	250	325	400	130	LD	W	
Salix matsudana ‘Tortuosa’ / Corkscrew Willow	200	250	300	130	LD	W	
Taxodium distichum / Bald Cypress	200	250	300	130	LD	W	
Tilia cordata / Littleleaf Linden	200	250	300	130	PL, LD, VTB	AP	IN
‘Glenleven’	200	250	300	130	PL, LD, VTB	AP	IN
‘Greenspire’	200	250	300	130	PL, LD, VTB	AP	IN
Ulmus hollandica ‘Groenveldt’ / Groenveldt Elm	250	300	375	130	LD	D	IN
Ulmus parvifolia / Chinese Elm	200	250	300	130	LD		IN, RS
Zelkova serrata / Zelkova	200	250	325	130	PL, LD, VTB		IN
COMPACT EVERGREEN TREES	6’	7’	8’				
Abies concolor / White Fir, Concolor Fir	50	75	100	30	LE		
Chamaecypans lawsoniana / Lawson Falsecypress	50	75	100	30	LE	PS	
Chamaecyparis obtuse / Hinoki False Cypress	50	75	100	30	ME		

Chamaecyparis pisifera 'Plumosa' / Plume Sawara False Cypress	50	75	100	30	LE		
Cunninghamia lanceolata / China Fir	50	75	100	30	LE		
Ilex aquifolia / English Holly	50	75	100	30	ME	PS, SH	
Iles x attenuate 'Fosteri' / Foster's Holly	50	75	100	30	ME, VTA	PS, SH	
Ilex x Nellie R. Stevens / Nellie Stevens Holly	75	100	125	30	ME, VTA	PS, SH	
Ilex opaca / American Holly	50	75	100	30	ME, VTB	PS, SH, IS	

Table 6.3 – Tree Selection and Cover Guide

BOTANICAL/COMMON NAME	PROJECTED 20 YEAR TREE COVER AREA IN SQUARE FOOTAGE AND CALIPER/HEIGHT AT PLANTING			MINIMUM PLANTING AREA SQ. FEET	USES*	ENVIRONMENTAL TOLERANCES*	ASSOCIATED PROBLEMS*
COMPACT EVERGREEN TREES	6’	7’	8’				
Juniperus chinensis / Chinese Juniper-Columnar Varieties of Chinese Juniper ‘Denserecta’	50	70	90	30	ME	D	
‘Hetzi columnaris’	60	70	90	30	ME	D	
‘Keteleeri’	50	70	90	30	ME	D	
‘Robusta Green’	50	70	90	30	ME	D	
‘Torulosa’	50	70	90	30	ME	D	
Juniperus scopulorum / Rocky Mountain Juniper ‘Blue Haven’	50	70	90	30	LE	D	
‘Cologreen’	50	70	90	30	LE	D	
‘Columnaris’	50	70	90	30	LE	D	
‘Grey Gleam’	50	70	90	30	ME	D	
‘Erecta Glauca’	50	70	90	30	ME	D	
‘Moonglow’	50	70	90	30	ME	D	
Juniperus virginiana / Eastern Red Cedar ‘Canaert’	50	70	90	30	ME	D	IN
‘Manhattan Blue’	50	70	90	30	ME	D	IN
‘Princeton Sentry’	50	70	90	30	ME	D	IN
Taxus baccata ‘Fastigata’ / Upright Irish Yew	50	70	90	30	ME		
Taxus cuspidate ‘Capitata’ / Pyramidal Japanese Yew	50	70	90	30	ME		
Thuja occidentalis ‘Nigra’ / Dark Green American Arborvitae	50	70	90	30	ME	W	
Thuja orientalis (Platycladus orientalis) / Columnar Oriental Arborvitae	50	70	90	30	ME, VTA		
SMALL EVERGREEN TREES	6’	7’	8’				
Cedrus deodora / Deodar Cedar	100	125	175	50	LE		
Cryptomeria japonica / Japanese Cryptomeria	100	125	175	50	LE	IS	
Cupressocyparis leylandi / Leyland Cypress	100	125	175	50	LE	PS, W	
Picea gluaca / White Spruce	100	125	175	50	LE		
Picea omorika / Serbian Spruce	75	100	150	50	LE		
Picea pugens / Colorado Blue Spruce	100	125	175	50	LE		
Pseudotsuga menziesil / Douglas Fir	100	125	175	50	LE		
Tsuga Canadensis / Canadian Hemlock	100	125	175	50	LE	PS, SH	
Tsuga caroliniana / Carolina Hemlock	100	125	175	50	LE	PS, SH	
Cedrus atlantica / Atlas Cedar	125	150	175	90	LE		

Picea abies / Norway Spruce	150	175	225	90	LE	PS	
Pinus bungeana / Lace-Bark Pine	125	150	175	90	LE		
Pinus echinata / Shortleaf Pine	150	175	225	90	LE	PS	
Pinus nigra / Austrian Pine	150	175	225	90	LE, VTB		
Pinus thunbergiana / Japanese Black Pine	150	175	225	90	LE		
LARGE EVERGREEN TREES	6’	7’	8’				
Magnolia Grandiflora / Southern Magnolia	175	250	325	130	LE		

Table 6.3 – Tree Selection and Cover Guide

BOTANICAL/COMMON NAME	PROJECTED 20 YEAR TREE COVER AREA IN SQUARE FOOTAGE AND CALIPER/HEIGHT AT PLANTING			MINIMUM PLANTING AREA SQ. FEET	USES*	ENVIRONMENTAL TOLERANCES*	ASSOCIATED PROBLEMS*
LARGE EVERGREEN TREES	6’	7’	8’				
Pinus ridida / Pitch Pine	175	250	300	130	LE		
Pinus strobus / White Pine	175	250	300	130	LE	PS, D	WW
Pinus sylvestris / Scotch Pine	175	250	300	130	LE		
Pinus taeda / Loblolly Pine	175	250	300	130	LE		

NOTES:

1. Size categories based on 12-year crown spread, not mature height or spread.

2. *Refer to Table 6.4 Vegetation Preservation and Planting Codes for the Tree Selection and Cover Guide, for a Description of these codes.

Table 6.4 – Vegetation Preservation and Planting Codes for the Tree Selection and Cover Guide

LOCATION OF TREES	CODE
In parking lot planting areas	PL
As screening tree	
Categorized by Transitional Screening Requirements	
Large Evergreen Tree	LE
Medium Evergreen Tree	ME
Large Deciduous Tree	LD
Small Deciduous Tree	SD
Within VDOT right-of-way	
Minor Trees	VTA
Major Trees	VTB
As plantings in small area	F
Near overhead utilities	U
Environmental Tolerances	
Restricted root zone	RZ
Poor soil conditions	SC
Partial shade	PS
Shade	SH
Air pollution	AP
De-icing salts	IS
Wet soil conditions	W
Drought conditions	D
Associated Problems	
Disease problems	DS
Insect damage	IN
Storm and Structural damage due to weak wood	WW
Objectionable fruit	FR
Objectionable root system	RS
Objectionable root system- root/ soil toxicity	RS-T

TABLE 6.5 Undesirable Tree Species
for a Developed Environment

The following is a list of trees that have exhibited qualities that are undesirable when planted in a developed environment. These trees may have many values in a natural environment such as providing food and shelter for wildlife or serving to stabilize stream banks. In some instances these species may be considered for enhancing portions of sites abutting Resource Protection Areas, wet lands or open bodies of water. However, care should be given when considering these species for use near residences, buildings, parking structures, roads and pedestrian walkways. A short list of problems normally associated with each species is provided.

BOTANICAL NAME	COMMON NAME	PROBLEM
Acer negundo	Box Elder	Weak wood, short lived, insects
Acer saccharinum	Silver Maple	Objectionable root system, weak wood, insects, diseases and prolific seeds.
Ailanthus altissima	Tree of Heaven	Weak wood, male flowers have bad odor, prolific seeds
Albizia julibrissin	Mimosa	Wilt disease, mimosa webworm
Betula pendula	White Birch	Severe borer damage
Ginkgo biloba	Ginkgo	Female plant produces messy seeds with bad smell. (female only) Male plant is recommended.
Maclura pomifera (female only)	Osage-Orange	Messy fruit, thorns, shallow roots. Thornless male varieties
Morus spp.	Mulberries	Messy fruit
Paulownia tomentosa	Empress Tree	Weak wood, messy, prolific seeds
Populus spp.	Poplars	Short lived, objectionable roots, weak wood, and canker diseases
Prunus serotina	Black Cherry	Messy, prolific seeds, Eastern Tent Caterpillar damage
Salix spp.	Willows	Objectionable root system, weak wood
Ulmus americana	American Elm	Subject to Dutch Elm Disease, Elm Phloem Necrosis, insects
Ulmus pumila	Siberian Elm	Short lived, insects, diseases.

Table 6.6 Undesirable Non-Native Invasive Species

The following is a list of non-native invasive species compiled by the Virginia Department of Conservation and Recreation that are undesirable when planted, or maintained within the natural, or landscape environment. Though the use of such species is not prohibited in the State of Virginia, it is recommended that the use and/ or preservation of the species listed here be avoided.

Invasive Alien Plant Species of Virginia

DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street
Richmond, Virginia 23219
(804) 786-7951
http://www.dcr.virginia.gov/natural_heritage/

Virginia Native Plant Society
Blandy Experimental Farm
400 Blandy Farm Lane, Unit 2
Boyce, Virginia 22620
(540) 837-1600
http://www.vnps.org

September 2003

Key

M = Mountains, P = Piedmont, C = Coastal
F = Full sun, P = Part Sun, S = Shade
H = Hydric, M = Mesic, X = Xeric

SCIENTIFIC NAME	COMMON NAME	REGION			LIGHT			MOISTURE		
		M	P	C	F	P	S	H	M	X
Highly Invasive Species										
Ailanthus altissima	Tree-of-heaven	•	•	•	•	•			•	
Alliaria petiolata	Garlic mustard	•	•		•	•	•		•	
Alternanthera philoxeroides	Alligator weed			•	•	•		•		
Ampelopsis brevipedunculata	Porcelain-berry		•		•	•	•		•	
Carex kobomugi	Asiatic sand sedge			•	•	•				•
Celastrus orbiculata	Oriental bittersweet	•	•	•		•	•		•	
Centaurea dubia	Short-fringed knapweed	•			•	•			•	•
Centaurea biebersteinii	Spotted knapweed	•	•	•	•	•				•
Cirsium arvense	Canada thistle	•	•	•	•				•	
Dioscorea oppositifolia	Chinese yam	•	•	•		•	•		•	
Elaeagnus umbellata	Autumn olive	•	•	•	•	•			•	
Euonymus alata	Winged burning bush		•			•	•		•	
Hydrilla verticillata	Hydrilla			•	•	•		•		
Imperata cylindrica	Cogon grass			•		•	•		•	
Lespedeza cuneata	Chinese lespedeza	•	•		•				•	
Ligustrum sinense	Chinese privet	•	•	•		•	•		•	
Lonicera japonica	Japanese honeysuckle	•	•	•	•	•	•		•	
Lonicera morrowii	Morrow's honeysuckle	•	•		•	•	•		•	
Lonicera standishii	Standish's honeysuckle	•	•			•	•		•	
Lythrum salicaria	Purple loosestrife	•	•	•	•			•	•	
Microstegium vimineum	Japanese stilt grass	•	•	•	•	•	•	•	•	

September 2003		**Key** M = Mountains P = Piedmont C = Coastal			F = Full sun P = Part Sun S = Shade			H = Hydric M = Mesic X = Xeric		
SCIENTIFIC NAME	COMMON NAME	REGION			LIGHT			MOISTURE		
		M	P	C	F	P	S	H	M	X
Highly Invasive Species - continued										
Murdannia keisak	Aneilema		•	•	•	•		•		
Myriophyllum aquaticum	Parrot feather	•	•	•	•			•		
Myriophyllum spicatum	European water-milfoil	•	•	•	•			•		
Phragmites australis	Common reed		•	•	•	•		•	•	
Polygonum cuspidatum	Japanese knotweed	•	•	•	•	•			•	
Polygonum perfoliatum	Mile-a-minute		•		•	•	•		•	
Pueraria montana	Kudzu vine	•	•	•	•	•	•		•	
Ranunculus ficaria	Lesser celandine			•		•	•		•	
Rosa multiflora	Multiflora rose	•	•	•	•	•			•	
Rubus phoenicolasius	Wineberry	•	•	•		•	•		•	
Sorghum halepense	Johnson-grass	•	•	•	•	•			•	
Moderately Invasive Species										
Acer platanoides	Norway maple	•	•	•	•	•			•	
Agropyron repens	Quack grass	•	•	•	•	•			•	
Agrostis tenuis	Rhode Island bent-grass	•	•		•	•			•	
Akebia quinata	Five-leaf akebia		•	•	•	•	•		•	
Albizia julibrissin	Mimosa	•	•	•	•	•			•	
Allium vineale	Wild onion	•	•	•	•	•			•	
Artemisia vulgaris	Mugwort	•	•	•	•	•			•	•
Arthraxon hispidus	Jointed grass	•	•	•	•	•	•	•	•	
Arundo donax	Giant reed		•	•	•	•		•	•	
Berberis thunbergii	Japanese barberry	•	•	•	•	•	•		•	
Carduus nutans	Musk thistle	•	•	•	•				•	
Cassia obtusifolia	Sickle pod		•	•	•	•			•	•
Centaurea jacea	Brown knapweed	•	•		•	•			•	•
Cirsium vulgare	Bull-thistle	•	•	•	•				•	
Convolvulus arvensis	Field-bindweed	•	•	•	•	•			•	
Dipsacus laciniatus	Cut-leaf teasel	•			•				•	
Dipsacus sylvestris	Common teasel	•	•	•	•			•	•	
Egeria densa	Brazilian water-weed	•	•	•	•	•		•		
Euonymus fortunei	Wintercreeper			•		•	•	•	•	

September 2003		**Key**								
		M = Mountains P = Piedmont C = Coastal			F = Full sun P = Part Sun S = Shade			H = Hydric M = Mesic X = Xeric		
SCIENTIFIC NAME	COMMON NAME	REGION			LIGHT			MOISTURE		
		M	P	C	F	P	S	H	M	X
Moderately Invasive Species - continued										
Festuca elatior (F. pratensis)	Tall fescue	•	•	•	•	•			•	
Foeniculum vulgare	Fennel		•	•	•			•	•	•
Glechoma hederacea	Gill-over-the-ground	•	•	•		•	•		•	
Hedera helix	English ivy		•	•	•	•	•		•	
Holcus lanatus	Velvet-grass	•	•	•	•	•		•	•	
Humulus japonicus	Japanese hops	•	•	•	•	•	•	•	•	
Ipomoea hederacea	Ivy-leaved morning-glory	•	•	•	•	•		•	•	
Ipomoea purpurea	Common morning-glory	•	•	•	•				•	
Iris pseudacorus	Yellow flag	•	•	•	•	•		•		
Ligustrum obtusifolium	Blunt-leaved privet		•	•			•		•	
Lonicera maackii	Amur honeysuckle	•	•			•			•	
Lonicera tatarica	Tartarian honeysuckle	•	•		•	•			•	
Lysimachia nummularia	Moneywort	•	•	•	•	•	•	•	•	
Melia azedarach	China-berry		•	•	•	•			•	
Paulownia tomentosa	Princess tree	•	•	•	•	•			•	
Phleum pratense	Timothy	•	•	•	•	•			•	
Phyllostachys aurea	Golden bamboo		•	•	•	•			•	
Poa compressa	Canada bluegrass	•	•	•	•	•	•		•	•
Poa trivialis	Rough bluegrass	•	•	•	•	•	•	•	•	
Polygonum cespitosum	Bristled knotweed	•	•	•	•	•	•	•	•	
Populus alba	White poplar	•	•	•	•	•			•	
Rumex acetosella	Red sorrel	•	•	•	•	•			•	
Rumex crispus	Curled dock	•	•		•				•	•
Setaria faberi	Giant foxtail		•	•	•	•			•	
Spiraea japonica	Japanese spiraea	•	•			•	•	•	•	
Stellaria media	Common chickweed	•	•	•	•	•	•		•	
Veronica hederifolia	Ivy-leaved speedwell	•	•	•	•	•	•		•	
Wisteria sinensis	Chinese wisteria		•	•		•	•		•	
Xanthium strumarium	Common cocklebur	•	•	•	•	•			•	•

September 2003

Key

M = Mountains, P = Piedmont, C = Coastal
F = Full sun, P = Part Sun, S = Shade
H = Hydric, M = Mesic, X = Xeric

SCIENTIFIC NAME	COMMON NAME	REGION			LIGHT			MOISTURE		
		M	P	C	F	P	S	H	M	X
Occasionally Invasive Species										
Agrostis gigantea	Redtop	•	•	•	•	•			•	
Ajuga reptans	Bugleweed	•	•	•	•	•			•	•
Arrhenatherum elatius	Oatgrass	•	•	•	•	•			•	
Commelina communis	Common dayflower	•	•	•	•	•			•	
Conium maculatum	Poison hemlock	•	•	•	•	•			•	
Coronilla varia	Crown-vetch	•	•	•	•				•	•
Dactylis glomerata	Orchard grass	•	•	•	•	•			•	
Elaeagnus angustifolia	Russian olive	•	•	•	•	•			•	
Elaeagnus pungens	Thorny elaeagnus		•	•		•			•	
Eragrostis curvula	Weeping lovegrass	•	•	•	•				•	•
Euphorbia esula	Leafy spurge	•	•			•	•		•	
Ipomoea coccinea	Red morning-glory	•	•	•	•				•	
Lapsana communis	Nipplewort	•			•	•			•	
Lespedeza bicolor	Shrubby bushclover	•	•	•	•	•			•	
Lonicera fragrantissima	Sweet breath of spring		•		•	•			•	
Lonicera x bella	Bell's honeysuckle	•	•	•	•	•			•	
Lotus corniculatus	Birdsfoot trefoil	•	•	•	•	•			•	•
Melilotus alba	White sweet clover	•	•	•	•	•			•	
Melilotus officinalis	Yellow sweet clover	•	•	•	•	•			•	
Miscanthus sinensis	Silver grass	•	•	•	•	•			•	
Morus alba	White mulberry	•	•	•	•	•			•	
Pastinaca sativa	Wild parsnip	•	•	•	•	•			•	
Perilla frutescens	Beefsteak plant	•	•	•		•	•		•	
Trapa natans	Water chestnut			•	•			•	•	
Ulmus pumila	Siberian elm		•		•	•			•	
Viburnum dilatatum	Linden viburnum		•		•	•			•	
Vinca minor & V. major	Periwinkle	•	•	•	•	•	•		•	
Wisteria floribunda	Japanese wisteria			•		•	•		•	

About the List
This advisory list is published by Virginia Department of Conservation and Recreation (VDCR) to inform land managers of potential risks associated with certain plant species known to exhibit invasive behavior in some situations. The list is not regulatory in nature, and thus does not prohibit the use of the plant species listed.

VDCR and Virginia Native Plant Society use detailed criteria to assess the invasiveness of a plant. Factors used to rank each species include: cumulative impacts on natural areas; impacts on other species; potential to disperse and invade natural landscapes; distribution and abundance; and difficulty to manage.

Invasiveness Ranking
Highly invasive species exhibit the most invasive tendencies in natural areas and native plant habitats. They may disrupt ecosystem processes and cause major alterations in plant community composition and structure. They establish readily in natural systems and spread rapidly.

Moderately invasive species may have minor influence on ecosystem processes, alter plant community composition, and affect community structure in at least one layer. They may become dominant in the understory layer without threatening all species found in the community. These species usually require a minor disturbance to become established.

Occasionally invasive species generally do not affect ecosystem processes but may alter plant community composition by outcompeting one or more native plant species. They often establish in severely disturbed areas. The disturbance may be natural or human origin, such as icestorm damage, windthrow, or road construction. These species spread slowly or not at all from disturbed sites.

Regions
For the purpose of this list, the state has been divided into three regions: Coastal Plain, Piedmont, and Mountains. The Coastal Plain and Piedmont regions follow conventional physiographic province boundaries. The Mountain region combines the Blue Ridge, Ridge and Valley, and Appalachian Plateau physiographic provinces.

Habitat Requirements
The categories for light and soil requirements are very broad and are only meant to give general indication of habitat adaptations for these plants.

Table 6.7 Virginia Native Plant Species

The following is a list of Virginia native plant species compiled by the Virginia Department of Conservation and Recreation (DCR). Spotsylvania natives, identified by the area master gardeners have also been identified. Species listed below would be considered favorable for planting or preservation on-site.

Recommended Uses	Native Regions	Min. Light Req'ts	Min. Moisture Req'ts
W = Wildlife	M = Mountains	S = Full Shade	L = Low Moisture
H = Horticulture and Landscaping	P = Piedmont	P = Partial Sun	M = Moderate Moisture
C = Conservation and Restoration	C = Coastal Plain	F = Full Sun	H = High Moisture
D = Domestic Livestock Forage	Spotsylvania County Plant List	Wet	

	Scientific Name	Common Name	Uses				Region		Light			Moisture		
			W	H	C	D	M	P	C	S	P	F	L	M	H
Small trees															
1	*Amelanchier arborea*	downy serviceberry	x	x	x		x	x	x		x	x		x	
2	*Amelanchier canadensis*	Canada serviceberry	x	x	x		x	x	x			x		x	x
3	*Amelanchier laevis*	smooth serviceberry	x	x	x		x				x	x	x	x	
4	*Asimina triloba*	paw paw	x	x	x		x	x	x	x	x			x	
5	*Cercis canadensis*	redbud (Eastern)		x	x		x	x	x	x	x			x	
6	*Chionanthus virginicus*	fringetree		x			x	x	x		x	x		x	
7	*Cornus alternifolia*	alternate-leaf dogwood	x	x	x		x	x		x	x		x	x	
8	*Cornus amomum*	silky dogwood	x		x		x	x	x	x	x			x	x
9	*Cornus florida*	flowering dogwood	x	x	x		x	x	x	x	x		x	x	
10	*Crateagus crus-galli*	cockspur hawthorne	x	x	x		x	x	x		x	x	x	x	
11	*Crateagus flava*	October haw	x	x			x	x	x		x	x		x	
12	*Euonymous atropurpureus*	wahoo		x	x		x	x	x	x	x			x	
13	*Halesia tetraptera* (*H. carolina*)	common silverbell		x			x				x	x		x	
14	*Ilex opaca*	American holly	x	x	x		x	x	x	x				x	
15	*Magnolia virginiana*	sweetbay magnolia		x	x			x	x	x	x			x	x
16	*Morus rubra*	red mulberry	x	x	x		x	x	x	x	x			x	
17	*Ostrya virginiana*	Eastern hop-hornbeam		x			x	x	x	x	x			x	
18	*Persea borbonia*	redbay, sweet bay		x	x				x	x	x			x	x
19	*Prunus americana*	American wild plum		x	x		x	x	x		x			x	
20	*Prunus virginiana*	choke cherry	x	x	x		x				x			x	
21	*Rhus glabra*	smooth sumac	x	x	x		x	x	x			x	x	x	
22	*Rhus hirta* (*R. typhina*)	staghorn sumac	x	x	x		x	x	x			x	x		
23	*Salix nigra*	black willow			x		x	x	x		x	x		x	x
Medium to Large Trees															
1	*Acer rubrum*	red maple		x	x		x	x	x			x		x	x
2	*Acer saccharum*	sugar maple		x	x		x	x			x	x		x	
3	*Aesculus flava* (*A. octandra*)	yellow buckeye		x			x	x			x			x	
4	*Betula alleghaniensis*	yellow birch	x	x	x		x				x	x		x	
5	*Betula lenta*	sweet birch, black birch	x	x	x		x	x			x	x		x	
6	*Betula nigra*	river birch	x	x	x		x	x	x			x		x	x
7	*Carya alba* (*C. tomentosa*)	mockernut hickory			x		x	x	x	x	x		x	x	
8	*Carya glabra*	pignut hickory	x	x	x		x	x	x	x	x		x		
9	*Carya ovata*	shagbark hickory			x		x	x	x		x	x		x	
10	*Chamaecyparis thyoides**	Atlantic white cedar	x	x					x	x	x			x	x
11	*Diospyros virginiana*	persimmon	x	x	x		x	x	x	x	x	x	x	x	

12	*Fagus grandifolia*	American beech	x	x			x	x	x	x	x	x		x	
13	*Fraxinus americana*	white ash	x	x			x	x	x		x	x		x	
14	*Fraxinus pensylvanica*	green ash	x	x	x		x	x	x		x	x		x	
15	*Juglans nigra*	black walnut	x		x		x	x	x		x	x		x	
16	*Juniperus virginiana*	red cedar (Eastern)	x	x			x	x	x		x	x	x	x	
17	*Liquidambar styraciflua*	sweetgum		x	x		x	x	x	x	x	x		x	x
18	*Liriodendron tulipifera*	tulip-tree, tulip poplar	x	x	x		x	x	x			x		x	
19	*Magnolia acuminata*	cucumber magnolia		x			x					x		x	
20	*Nyssa aquatica*	water tupelo	x	x	x				x		x	x			x
21	*Nyssa sylvatica*	black gum	x	x	x		x	x	x		x	x		x	
22	*Oxydendrum arboreum*	sourwood		x			x	x	x		x			x	
23	*Pinus echinata*	shortleaf pine		x			x	x	x		x	x	x		
24	*Pinus serotina*	pond pine	x	x	x				x			x		x	x
25	*Pinus strobus*	white pine		x	x		x	x	x			x	x	x	
26	*Pinus taeda*	loblolly pine	x	x	x			x	x			x	x		x
27	*Pinus virginiana*	Virginia pine			x		x	x	x			x	x		
28	*Platanus occidentalis*	sycamore			x		x	x	x		x	x		x	x
29	*Prunus pennsylvanica*	pin cherry, fire cherry	x		x		x				x	x	x		
30	*Prunus serotina*	wild black cherry	x		x		x	x	x		x	x	x		
31	*Quercus alba*	white oak	x	x	x		x	x	x		x	x	x		
32	*Quercus bicolor*	swamp white oak	x		x		x	x	x	x	x				x
33	*Quercus coccinea*	scarlet oak	x	x			x	x	x		x	x	x		
34	*Quercus falcata*	Southern red oak	x	x	x		x	x	x	x	x		x	x	
35	*Quercus ilicifolia*	bear oak	x		x		x	x				x	x		
33	*Quercus laurifolia*	swamp laurel oak	x		x				x		x	x		x	x
34	*Quercus michauxii*	swamp chestnut oak	x	x				x	x		x	x			x
35	*Quercus montana* (*Q. prinus*)	chestnut oak	x		x		x	x	x	x	x		x		
36	*Quercus nigra*	water oak	x		x				x	x	x		x	x	
37	*Quercus palustris*	pin oak	x	x	x		x	x	x	x	x			x	x
38	*Quercus phellos*	willow oak	x	x	x			x	x		x	x		x	x
39	*Quercus rubra*	Northern red oak	x	x	x		x	x	x		x	x	x	x	
40	*Quercus stellata*	post oak	x	x	x		x	x	x			x	x		
41	*Quercus velutina*	black oak	x		x		x	x	x	x	x		x		
42	*Robinia pseudoacacia*	black locust			x		x	x	x		x	x		x	
43	*Sassafras albidum*	sassafras			x		x	x	x		x	x	x	x	
44	*Taxodium distichum*	bald cypress		x	x				x			x			x
45	*Thuja occidentalis*	white cedar	x	x	x		x					x		x	x
46	*Tilia americana*	American basswood			x		x	x	x		x			x	
47	*Tsuga canadensis*	Eastern hemlock	x	x	x		x	x			x	x		x	
48	*Tsuga caroliniana*	Carolina hemlock	x	x	x		x				x	x	x	x	

+ May be aggressive in garden setting.

* Due to the rarity and sensitivity of habitat in Virginia, these species are recommended for horticultural use only. Planting these species in natural areas could be detrimental to the survival of native populations.

ARTICLE 6 – LANDSCAPING AND SCREENING

Recommended Uses	Native Regions	Min. Light Req'ts	Min. Moisture Req'ts
W = Wildlife	M = Mountains	S = Full Shade	L = Low Moisture
H = Horticulture and Landscaping	P = Piedmont	P = Partial Sun	M = Moderate Moisture
C = Conservation and Restoration	C = Coastal Plain	F = Full Sun	H = High Moisture
D = Domestic Livestock Forage			

Native Grassland Plants

	Scientific Name	Common Name	Uses				Region			Light			Moisture		
			W	H	C	D	M	P	C	S	P	F	L	M	H
	Forbs														
1	*Acorus americanus*	sweet flag		x	x		x	x	x		x	x			x
2	*Antennaria neglecta*	field pussytoes		x	x		x	x			x	x	x	x	
3	*Asclepias incarnata*	swamp milkweed	x	x	x		x	x	x		x	x			x
4	*Asclepias syriaca+*	common milkweed	x	x	x		x	x	x			x	x		
5	*Asclepias tuberosa*	butterfly weed	x	x	x		x	x	x			x	x		
6	*Aster laevis*	smooth blue aster	x	x	x		x					x	x		
7	*Aster novae-angliae*	New England aster		x	x		x				x	x	x	x	
8	*Aster novi-belgii*	New York aster	x	x	x				x		x	x		x	
9	*Aster pilosus*	white heath aster	x	x	x		x	x	x			x	x		
10	*Aster umbellatus*	flat-top white aster		x	x		x	x			x	x		x	x
11	*Baptisia tinctoria*	yellow wild-indigo	x	x			x	x	x		x	x	x		
12	*Caltha palustris*	marsh marigold		x	x		x		x		x	x			x
13	*Chamaecrista fasciculata+*	partridge pea			x		x	x	x			x	x	x	
14	*Chrysogonum virginianum*	green and gold		x	x		x	x	x	x				x	
15	*Chrysopsis mariana*	Maryland golden aster	x	x	x		x	x	x		x	x	x		
16	*Clitoria mariana*	Maryland butterfly pea		x	x		x	x	x	x	x		x		
17	*Coreopsis tripteris*	tall coreopsis		x	x		x	x	x		x	x		x	
18	*Coreopsis verticillata*	threadleaf coreopsis		x	x		x	x	x		x	x	x		
19	*Desmodium paniculatum*	narrow-leaf tick trefoil	x		x		x	x	x	x			x		
20	*Eupatorium coelestinum*	mistflower	x	x	x		x	x	x	x	x	x		x	
21	*Eupatorium fistulosum*	Joe Pye weed	x	x	x		x	x	x		x	x		x	
22	*Eupatorium perfoliatum*	common boneset			x		x	x	x		x	x		x	x
23	*Helenium autumnale*	sneezeweed	x	x	x		x	x	x		x	x		x	
24	*Helianthus angustifolius*	narrow-leaf sunflower	x	x	x			x	x		x	x		x	x
25	*Helianthus divaricatus*	woodland sunflower	x	x	x		x	x	x		x		x		
26	*Heliopsis helianthoides*	oxeye sunflower	x	x	x		x	x	x		x	x	x	x	
27	*Iris prismatica*	slender blueflag		x					x		x	x		x	x
28	*Iris virginica*	Virginia blue flag		x	x			x	x		x	x			x
29	*Kosteletskya virginica*	seashore mallow	x		x				x			x			x
30	*Lespedeza capitata*	round-head bush clover	x		x		x	x	x			x	x		
31	*Liatris graminifolia*	grass-leaf blazing star	x	x	x		x	x	x		x	x	x	x	
32	*Liatris spicata*	spiked blazing star	x	x	x		x				x	x		x	
33	*Liatris squarrosa*	plains blazing star	x	x	x			x			x	x		x	
34	*Lilium canadense*	Canada lily		x			x	x			x	x		x	x
35	*Lilium philadelphicum*	wood lily		x			x				x	x	x		
36	*Lilium superbum*	Turk's cap lily		x			x	x	x		x	x		x	x
37	*Lobelia cardinalis*	cardinal flower	x	x	x		x	x	x		x	x			x
38	*Lobelia siphilitica*	great blue lobelia	x	x	x		x	x	x	x	x				x
39	*Lupinus perennis*	lupine, sundial lupine		x			x	x	x		x	x	x		
40	*Mimulus ringens*	monkeyflower		x	x		x	x	x			x			x
41	*Monarda didyma*	bee balm	x	x	x		x			x	x			x	
42	*Monarda fistulosa*	wild bergamot	x	x	x		x	x	x		x	x	x	x	
43	*Oenothera fruticosa*	sundrops	x	x	x		x	x	x			x		x	x
44	*Opuntia humifusa*	Eastern prickly-pear	x	x	x		x	x	x			x	x		

45	*Penstemon laevigatus*	smooth beardtongue		x			x	x	x	x	x	x		x	
46	*Physostegia virginiana*	obedient plant		x	x		x	x			x	x		x	
47	*Pycnanthemum incanum*	hoary mountain mint	x		x		x	x	x	x			x		
48	*Pycnanthemum tenuifolium*	narrow-lvd mountain mint	x	x	x		x	x	x		x	x	x	x	
49	*Rhexia virginica*	Virginia meadow-beauty	x		x		x	x	x			x			x
50	*Rudbeckia fulgida*	early coneflower		x	x			x			x	x	x	x	
51	*Rudbeckia hirta*	black eyed Susan		x	x		x	x	x		x	x	x	x	
52	*Rudbeckia laciniata*	cut-leaved coneflower	x	x	x		x	x	x		x	x		x	
53	*Rudbeckia triloba*	three-lobed coneflower	x	x	x		x	x	x		x	x		x	
54	*Sagittaria latifolia*	broadleaf arrowhead	x	x	x		x	x	x			x			x
55	*Salvia lyrata+*	lyre-leaf sage			x		x	x	x		x	x	x		
56	*Saururus cernuus*	lizard's tail		x	x		x	x	x		x	x			x
57	*Senecio aureus+*	golden ragwort	x		x		x	x	x	x	x			x	x
58	*Senna marilandica*	Maryland wild senna		x	x		x	x	x		x		x	x	
59	*Silphium perfoliatum*	cup plant	x		x		x	x		x	x	x		x	
60	*Solidago caesia*	bluestem goldenrod	x	x	x		x	x	x	x	x			x	
61	*Solidago rugosa+*	rough-stemmed goldenrod	x		x		x	x	x		x	x		x	
62	*Solidago sempervirens*	seaside goldenrod	x	x	x				x		x	x		x	
63	*Tradescantia virginiana*	Virginia spiderwort		x	x		x	x	x	x	x	x		x	
64	*Viola pedata*	bird's foot violet	x	x			x	x	x		x	x	x		
65	*Yucca filamentosa*	common yucca	x	x			x	x	x			x	x		
66	*Zephranthes atamasco*	Atamasco lily		x	x				x		x	x		x	x
		Ferns													
1	*Onoclea sensibilis+*	sensitive fern		x	x		x	x	x		x	x		x	x
2	*Osmunda cinnamomea*	cinnamon fern		x	x		x	x	x	x	x			x	x
3	*Woodwardia virginica+*	Virginia chain fern		x	x				x	x	x	x		x	x
		Grasses, sedges, rushes													
1	*Agrostis perennans*	autumn bentgrass			x		x	x	x	x	x	x	x	x	x
2	*Andropogon gerardii*	big bluestem	x	x	x	x	x	x			x	x	x	x	
3	*Andropogon glomeratus*	bushy bluestem		x	x		x	x	x		x	x		x	x
4	*Andropogon virginicus*	broomsedge		x	x		x	x	x		x	x	x	x	x
5	*Arundinaria gigantea*	wild cane, river cane	x		x		x			x	x	x	x	x	x
6	*Calamagrostis canadensis*	bluejoint reedgrass	x		x		x				x	x		x	x
7	*Carex crinita var. crinita*	long hair sedge	x	x	x		x	x	x		x	x		x	x
8	*Carex lurida*	sallow sedge	x		x		x	x	x		x	x		x	x
9	*Carex stricta*	tussock sedge	x		x		x	x	x		x	x		x	x
10	*Danthonia sericea*	silky oatgrass	x		x		x	x	x		x	x	x	x	
11	*Danthonia spicata*	poverty oatgrass	x		x		x	x	x	x	x	x	x	x	
12	*Dichanthelium clandestinum*	deer-tongue	x		x	x	x	x	x		x	x	x	x	x
13	*Dulichium arundinaceum*	dwarf bamboo	x		x	x	x	x	x		x	x			x
14	*Elymus hystrix*	bottlebrush grass	x	x			x	x	x	x	x	x	x	x	
15	*Festuca rubra*	red fescue	x		x	x	x				x	x	x	x	
16	*Juncus canadensis*	Canada rush	x		x			x	x		x	x		x	x
17	*Juncus effusus*	soft rush	x		x		x	x	x		x	x		x	x
18	*Leersia oryzoides*	rice cutgrass	x		x		x	x	x		x	x		x	x
19	*Panicum virgatum*	switch grass	x	x	x		x	x	x		x	x	x	x	x
20	*Saccharum giganteum*	giant plumegrass	x	x	x			x	x		x	x		x	x
21	*Schizachyrium scoparium*	little bluestem	x	x	x	x	x	x	x		x	x	x	x	
22	*Scirpus cyperinus*	woolgrass bulrush	x	x	x		x	x	x		x	x		x	x
23	*Sorghastrum nutans*	Indian grass	x	x	x	x	x	x	x		x	x	x	x	
24	*Tridens flavus*	redtop	x	x	x	x	x	x	x		x	x	x	x	
25	*Tripsacum dactyloides*	gama grass	x	x	x	x	x	x	x		x	x		x	x
26	*Zizania aquatica*	wild rice	x	x	x				x			x			x

Shrubs															
1	*Aronia arbutifolia*	red chokeberry		x	x		x	x	x	x	x			x	x
2	*Aronia melanocarpa*	black chokeberry		x	x		x	x	x		x	x	x	x	x
3	*Baccharis halimifolia*	high tide bush		x	x				x			x	x	x	x
4	*Ceanothus americanus*	New Jersey tea	x	x	x		x	x	x		x	x	x		
5	*Cornus amomum*	silky dogwood	x		x		x	x	x	x	x			x	x
6	*Myrica cerifera*	Southern wax myrtle	x	x	x				x	x	x		x	x	
7	*Myrica heterophylla*	Southern bayberry	x	x	x				x	x	x		x	x	
8	*Myrica pennsylvanica*	Northern bayberry	x	x	x				x			x	x	x	x
9	*Rhododendron catawbiense*	Catawba rhododendron		x	x		x	x			x	x		x	
10	*Rhododendron prinophyllum*	rose azalea	x	x			x			x	x	x	x	x	
11	*Rhododendron viscosum*	swamp azalea		x	x		x	x	x		x	x		x	x
12	*Rubus allegheniensis*	Alleghany blackberry	x	x	x		x	x				x	x		
13	*Salix humilis*	prairie willow		x	x		x	x	x			x	x		
14	*Salix sericea*	silky willow		x	x		x	x	x		x	x		x	
15	*Sambucus canadensis*	common elderberry	x	x	x		x	x	x			x		x	x
16	*Spiraea alba*	narrow-lvd meadowsweet	x	x	x		x					x		x	
17	*Spiraea latifolia*	broad-leaved meadowsweet	x	x	x		x					x		x	
Small trees															
1	*Amelanchier arborea*	downy serviceberry	x	x	x		x	x	x		x	x		x	
2	*Amelanchier canadensis*	Canada serviceberry	x	x	x		x	x	x			x		x	x
3	*Cercis canadensis*	redbud (Eastern)		x	x		x	x	x	x	x			x	
4	*Chionanthus virginicus*	fringetree		x			x	x	x		x	x		x	
5	*Rhus glabra*	smooth sumac	x	x	x		x	x	x			x	x	x	
6	*Rhus hirta*	staghorn sumac	x	x	x		x	x	x			x	x		
Medium & Large Trees															
1	*Diospyros virginiana*	persimmon	x	x	x		x	x	x	x	x	x	x	x	
2	*Liquidambar styraciflua+*	sweetgum		x	x		x	x	x	x	x	x		x	x
3	*Nyssa sylvatica*	black gum	x	x	x		x	x	x		x	x		x	
4	*Pinus serotina+*	pond pine	x	x	x				x			x		x	x
5	*Prunus pennsylvanica*	pin cherry, fire cherry	x		x		x				x	x	x		
6	*Prunus serotina+*	wild black cherry	x		x		x	x	x		x	x	x		
7	*Quercus coccinea*	scarlet oak	x	x			x	x	x		x	x	x		
8	*Quercus falcata*	Southern red oak	x	x	x		x	x	x	x	x		x	x	
9	*Quercus ilicifolia*	bear oak	x		x		x	x				x	x		
10	*Quercus montana*	chestnut oak	x		x		x	x	x	x	x		x		
11	*Quercus stellata*	post oak	x	x	x		x	x	x			x	x		
12	*Quercus velutina*	black oak	x		x		x	x	x	x	x		x		
13	*Robinia pseudoacacia*	black locust			x		x	x	x		x	x		x	
14	*Sassafras albidum*	sassafras			x		x	x	x		x	x	x	x	
+ May be aggressive in garden setting.															

6-4 TREE PRESERVATION AND PROTECTION

1. General

A. Purpose and Intent

The Tree Preservation Design Standards will enhance the appearance and improve the quality of life in Spotsylvania County by protecting some unique trees and woodland areas from being lost as development occurs on both public and private properties. The preservation of trees helps to aid in the stabilization of the environment's ecological balance by protecting natural habitat, contributing to the process of air purification, oxygen regeneration, soil stabilization and ground water recharge; while aiding in the reduction of heat, glare, and noise. Tree preservation also provides a greater, more mature tree canopy in a new development as opposed to one where clear cutting has resulted in replacement with much smaller nursery planted trees that will take a number of years to provide a more substantial landscape effect.

The intent of the Tree Preservation Design Standards (consistent with the goals set forth in Section 15.2-961.1 of the Code of Virginia) is to establish standards that; encourages saving existing specimen trees, and encourages limited clearing and disturbing of land to preserve natural and existing growth of vegetation.

B. Exceptions of applicability for Tree Preservation and Protection

Though the preservation of existing trees onsite has been encouraged in this document and is not a requirement, a number of exceptions of applicability have been identified to show where the preservation of trees may not be appropriate, they are as follows;

(1) For the removal of trees grown and intended to be sold as live trees in a nursery, cut trees sold as holiday trees, and/ or dealer properties registered by the Virginia Commissioner of Agriculture and Immigration (Plant Pest Act of 1952).

(2) Commercial forests, where the trees are grown for harvesting on commercial land, shall follow the Virginia Department of Forestry's Best Management Practices.

(3) Diseased, structurally unsafe trees, or trees overhanging structures where, if toppled by storm could pose an immediate danger to life or personal property.

(4) Existing trees whose root systems may damage sidewalk facilities creating unsafe walking surfaces, building walls or foundations.

2. Tree Preservation Standards

A. General

(1) If the lot size allows, trees to be saved should be selected prior to siting the building. No tree shall be destroyed or damaged in any manner until clearing and grading or early clearing and grading permits, or site plans are final and the plans are approved by the County.

(2) Existing vegetation in a Resource Protection Area (RPA) may be used to meet the requirements of this Article upon approval of the Planning Director. Any addition or removal of vegetation in a RPA shall be subject to the provisions of Chapter 6A of The County Code. The addition of vegetation in a resource protection area shall be indigenous or adaptable to the site without extraordinary measures and

shall be approved by the Planning Director.

(3) Removal and/ or clearing of "scrub" underbrush to enhance the aesthetic quality, or remove invasive species from a site shall be permitted provided replacement with native perennials tolerant to soils and lighting conditions occurs to ensure continue soil stabilization, habitat preservation, and enhance the aesthetic of the site.

(4) Grading of residential lots shall be limited to areas of proposed infrastructure only and include plans and profiles for subdivisions if either the approximate house location and septic field location (if necessary) are shown or the zoning is R-3 or denser and it is reasonably safe to assume that necessary over lot grading will preclude tree preservation. In the latter case, clearing shall not exceed 80 feet from the right-of-way line.

(5) Proposed utilities shall be located so that their installation will not adversely affect onsite retained vegetation.

a. Laterals from each house shall be located so installation will have minimum impact on the vegetation retained.

b. Area shown for reserve lines for septic fields shall not be shown to be cleared.

c. Adequate clearing shall be shown for the installation of water, storm, and sanitary sewer lines. Clearing limits shall include room for trench wall sloping or benching, equipment access, and deposition of soil. (Generally, clearing limits should equal 4 times the depth of the trench). The limits of clearing for the installation of utility lines shall be adequate for the size of line and depth of installation.

(6) All erosion and sediment controls shall be placed at the limits of grading and not in areas shown to remain undisturbed. This shall preclude the depositing of sediment within the drip line of the trees to be retained.

Sediment basins shall be constructed so as to take advantage of natural terrain in order to minimize grading and vegetation removal. If the construction of the sediment basins requires the clearing of trees, replacements as specified in this Section shall be required by the Planning Director so that the area is restored to a natural condition when the basin is removed.

(7) Retention and detention ponds. Dry ponds shall be constructed so as to take advantage of the natural terrain in order to minimize grading and vegetation removal. If grade changes are not necessary for providing the capacity required for the retention or detention facility, then clearing shall not be required or permitted in this area.

(8) When areas have been cleared of vegetation for landfills or for temporary uses (such as basins, ponds, or construction easements for public utility installation), replanting shall be required to restore these areas to a condition similar to its natural state.

(9) Critical areas, such as flood plains, steep slopes (in excess of 15%), and wetlands, should be left in their

natural condition or only partially developed as open space.

(10) Roadways are to be located where they would cause the least damage to valuable stands. The original contours should be followed, where feasible, to minimize cuts and fills.

B. Field Practices for Tree Preservation-Pre-construction.

(1) Prior to requesting a pre-construction meeting as specified in this Section, the limits of clearing shall be visibly marked on the trees to be retained with surveyor's tape or water-base paint. For their potential threat to soils and human health, lead based paints shall not be used. If paint is used, only the minimum amount necessary for marking shall be used.

(2) The limits of clearing shall not exceed that shown on the approved plans.

(3) When the aforementioned marking has been completed, a meeting shall be requested with the Planning Director to inspect the marked limits of clearing.

(4) At the discretion of the Planning Director and as site conditions warrant, the clearing limits shall be inspected and approved prior to any clearing taking place. This shall include any and all clearing undertaken subsequent to the initial development work that has not been previously marked and inspected, i.e. over lot clearing, utility work or silt basins.

(5) The permittee has the option to retain additional vegetation over and above that which is required by the approved plan. However, additional vegetated areas on the site that are to be preserved must be protected in some way from encroachment by construction activity. If a natural area or individual tree not shown on the plans to be preserved is retained on site and is intended to be preserved throughout the duration of construction activity, then the permittee is required to protect these trees the same as designated preservation areas.

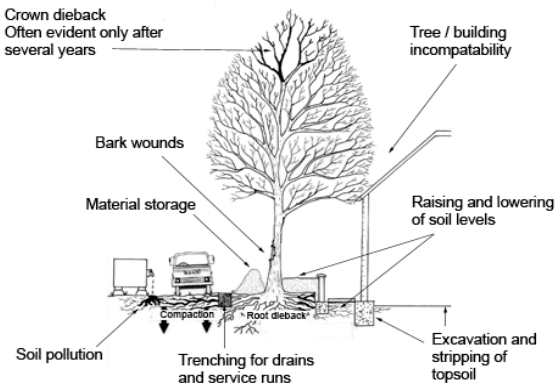
(6) When areas shown on the approved plans to be preserved, do not contain any significant vegetation, it shall be the responsibility of the permittee to obtain approval from the Planning Director for an exemption from preservation and protection requirements prior to commencing work in the area.

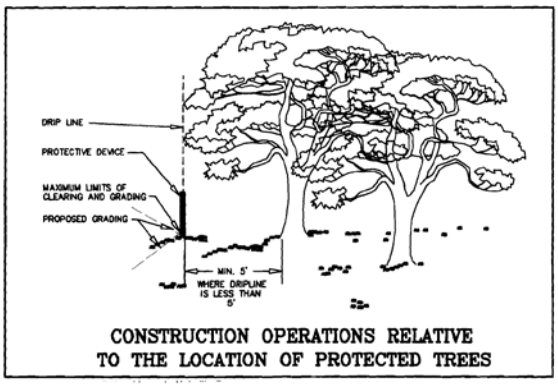
(7) Once clearing is completed and protective devices installed an inspection shall be requested to approve these items prior to commencing further construction.

(8) If at any time subsequent to the initial clearing it becomes necessary to remove additional trees which were shown on the plan to be preserved, the Planning Director shall be notified and must grant approval prior to performing any additional clearing.

C. Protection of Vegetation Retained

Trees may appear to be inanimate objects, but they are living organisms that are constantly involved in the process of respiration, food processing and growth. Construction activities expose trees to a variety of stresses resulting in injury ranging from superficial wounds to death. An understanding of these stresses is helpful in planning for tree protection.





To avoid damage of trees slated for preservation during construction, the following steps shall be taken in accordance with the Virginia Erosion and Sediment Control Handbook.

(1) The permittee shall be responsible for the protection of tops, trunks and roots of all existing trees as well as other vegetation that are to be retained on the site. After vegetation has been removed within the area authorized to be cleared, protective devices shall be installed along the limits of clearing prior to any construction work or traffic taking place within 50 feet of the vegetation retained onsite. Protection shall be maintained until all work in the vicinity has been completed and shall not be removed without the consent of the Planning Director. If the Planning Director finds that the protective devices are insufficient to protect the vegetation retained on the site, additional protective devices shall be installed to ensure adequate protection.

(2) Heavy equipment, vehicular traffic, stockpiling of any materials, or deposition of sediment, shall not be permitted within the drip line of trees to be retained. An example of this is shown in the next column. See Plate 6-1.

(3) Trees being removed shall not be felled, pushed or pulled into trees being retained. Equipment operators shall not clean any part of their equipment by slamming it against the trunks of trees to be retained.

(4) No toxic materials shall be stored within 100 feet of vegetation areas to be retained.

(5) Fires authorized by Spotsylvania County Fire Prevention and Protection Code or any other state or county law shall not be permitted within 100’ of vegetated areas retained unless approved by the Planning Director in accordance with such ordinance, code or law. They shall be limited in size so as not to adversely affect the vegetation.

(6) When retaining existing trees in parking areas, surround trees with an island so enough ungraded ground around the tree shall be left. See Plates 6-2 and 6-3.

(7) No protective devices, signs, utility boxes or other objects shall be nailed to the trees to be retained on the site.

(8) Any device may be used which will effectively protect the roots, trunk and top of the trees and other

vegetation retained on the site outside the limits of grading. The less formidable the barrier used, the greater the care that must be taken to avoid inflicting damage. Personnel working in the vicinity of the vegetation area retained must be instructed to honor the protective devices The devices for protection outlined below are suggested devices only and are not intended to exclude the use of other devices, subject to the Planning Director's approval, which will protect the vegetation retained. Refer to the Standard 3.38 in the 1992 Virginia Erosion and Sediment Control Handbook and Plates 6-2 and 6-3 for tree preservation and protection measures.

a. Snow fence- A standard 48" high snow fence may be placed at the limits of grading no posts mounted 6' apart.

b. Filter fabric or silt fence. This fencing may be placed at the limits of grading.

c. Additional trees. Additional trees may be left standing as protection between the trunks of the trees to be retained and the limits of grading. The trunks of trees in this buffer should be no more than 6' apart to prevent passage of equipment and material through the buffer. When additional trees are used as protection, the limits of clearing shown on the approved plan shall be flagged in the field so that the additional buffer area is delineated. When this method of protection is used, these additional trees shall be removed prior to completion of the project if required by the Planning Director.

d. Cord fence- Fencing may be placed at the limits of grading and should consist of 2" by 2" posts set securely in the ground spaced no more than 8' apart and protruding at least 4' above the ground, and connected to each other by a cord at least ¼" thick. Strips or surveyors flagging shall be tied to the cord at intervals no greater than 3'.

e. Berm- The temporary perimeter dike which has been constructed for erosion and sediment control may double as a protective device for vegetation to be retained. The dike shall be constructed at the limits of grading outside the drip line of the trees to be preserved (See Plate 6-1).

(9) Extra care shall be taken when raising the grade by placing fill over the root zone or when lowering the grade (which can be detrimental to the tree roots). To better preserve trees very little or no grade changes shall occur in the drip line of the trees.

(10) Natural and man-related forces exerted on the tree above the ground can cause significant damage. To avoid damage of trees during construction the following steps shall be taken to preserve the tree(s).

(11) Wind damage caused from the removal of forest trees will expose the survivors to greater wind velocities, and shall be avoided. Isolated trees develop anchorage rather equally all around, with stronger root development on the side of the prevailing winds. The more tree is protected from the wind, the less secure is its anchorage. The result of improper thinning or clearing is often wind

thrown trees. Selective removal in favor of a single tall tree may also create a lightning hazard.

(12) Excessive pruning shall be avoided. Unprotected tress are often "topped" or carelessly pruned to prevent interference with utility wires or buildings. If too many branches are cut, the tree may not be able to sustain itself. If the pruning is done without considering the growth habit, the tree may lose all visual appeal. If the branches are not pruned correctly, decay may occur.

(13) Trunk damage shall be avoided. Tree trunks are often nicked or scarred by trucks and construction equipment. Such superficial wounds provide access to insects and disease.

(14) Root Zone Impacts shall be avoided. Disturbing the delicate relationship between soil, roots and the rest of the tree can damage or kill a tree. The roots of an existing tree are established in an area where essential materials – water, oxygen and nutrients – are present. The mass of the root system is the correct size to balance the intake of water from the soil with the transpiration of water from the leaves (Refer to Plate 6-1).

a. Raising the grade as little as 6" can retard the normal exchange of air and gases. Roots may suffocate due to lack of oxygen, or be damaged by toxic gases and chemicals released by soil bacteria.

b. Raising the grade may also elevate the water table. This can cause drowning of the deeper roots.

c. Deep fills and relatively impervious fills may also retard the normal exchange of soil gases and air to such a degree that root mortality occurs.

d. Shallow fill over heavy turf or thick leaf litter can cause root mortality and seriously affect a living tree.

e. Lowering the grade is not usually as damaging as raising it. However, even shallow cuts of 6" to 8" will remove most of the top soil, natural mulch and ground vegetation, removing some feeder roots and exposing the rest to drying and freezing.

f. Deep cuts may sever a large portion of the root system, depriving the tree of water and increasing the chance of wind-throw.

g. Lowering the grade may lower the water table, inducing drought. This is a problem in large roadway cuts or under drain installations.

h. Trenching close to individual valuable ornamental shade trees in woodland tracts in development is often necessary to facilitate the installation of utility lines, the construction of buildings, driveways, walkways and the construction of necessary curbing and guttering. Trenching can be extremely detrimental to established trees due to the partial or nearly complete severing of roots, which can cause the mortality of individual ornamental trees and edge trees of existing woodlands. Trenching or excavating through a tree's root zone can eliminate as much

as 40% of the root system. Trees suffering such damage usually die within 2 to 5 years. (Refer to Plate 6-9).

i. Tunneling usually causes less disturbance and mortality of the root system, and where pipe can be driven under a tree's root system, the physiological impact is lessened considerably. (Refer to Plates 6-9 and 6-10).

j. Compaction of the soil within the drip line of a tree by equipment operation, materials storage, or paving can block off air and water from roots.

k. Construction chemicals or refuse disposed of in the soil can change soil chemistry or be toxic to trees.

D. Grade Changes- Lowering Grade

(1) Grade cuts of 12" or more which, in the determination of the Planning Director, are harmful to trees, shall be reduced or eliminated within the drip line of trees to be retained by the construction of a tree wall. Once grade has been lowered, the wall shall be constructed within two weeks.

(2) When excavating, all tree roots that are exposed and/ or damaged shall be trimmed cleanly, and covered temporarily with moist peat moss, burlap or other suitable material to keep them from drying out.

(3) Tree walls shall be constructed in accordance with the Tree Wall Detail (Refer to Plates 6-5, 6-6, and 6-7. Note: If the wall is over 24" in height, a building permit shall be required.

(4) The backfill shall consist of top soil to retain moisture and aid root development.

(5) Fertilizer shall be applied according to the Fertilization Table (Refer to Table 6-8). Fertilizer should be spread evenly over root area of the tree affected. (Refer to Plate 6-1)

(6) The tree crown shall be pruned in accordance with Section 6-5.1.F, thereby reducing the leaf surface to compensate for root loss. (Refer to Plate 6-16)

(7) A means for drainage through the wall shall be provided so water will not accumulate behind the wall. Weep holes shall be required with a solid masonry wall.

E. Grade Changes- Raising Grade

(1) Raising grade – When fill of 6" or more is necessary within the drip line of a tree to be retained, a tree well shall be required and shall be installed prior to any filling. The following method shall be used to ensure survival of the tree. (Refer to Plate 6-8)

(2) Before making a fill, remove the green vegetation, sad, leaf litter and other organic matter from beneath the tree or trees and loosen the surface soil without damaging the roots.

(3) Fertilizer shall be applied according to the Fertilization Table. Fertilizer should be spread evenly over the root area of the tree or the trees affected. (Refer to Table 6-8)

(4) The dry well shall be constructed with clearance sufficient to allow for tree trunk diameter growth.

(5) The well shall be built high enough to bring the top just above the level of the proposed fill.

(6) The well shall be constructed of large stones, brick, building tile, concrete blocks, or cinder blocks with care being taken to ensure that ample openings are left through the wall of the well to allow for free movement of air and water. Mortar shall be used only near the top of the well and only above the porous fill.

(7) One or more drain lines shall begin at the lowest point inside the well and extend down and outward from the tree trunk. Additional drain lines shall also radiate out from the well wall with vertical tiles and/or pipes being used if fills over two feet are contemplated. (Refer to Plate 6-8).

(8) Tar paper or approved equivalent shall be placed over the tile and/or pipe joints to prevent clogging and large stone shall be placed around and over the drain tiles and/or pipes for protection.

(9) A layer of stone (2" to 6") shall be placed over the entire area under the tree from the well out at least as far as the drip line as shown on the detail. For fills up to 2" deep, a layer of stone 8 to 12" thick is usually adequate. A thicker layer of stone not to exceed a maximum of 30" will be needed for deeper fills. (Refer to Plate 6-8)

(10) A layer of small ¾" to 1" stone covered by straw or a fiberglass mat shall be used to prevent soil sifting through the stone.

(11) Filling shall be completed with porous soil such as top soil until the desired grade is reached.

(12) To prevent clogging of the drain lines, crushed stone shall be placed inside the dry well over the openings of the radial tiles. Vertical tiles shall also be filled with crushed rock and may also be covered with a screen.

(13) To prevent anyone from falling into the dry well and the accumulation of leaves and debris, the area between the trunk and the well wall may either be covered by an iron grate or ruled with a 50-50 mixture of crushed charcoal and sand. (The latter measure also will prevent rodent infestation and mosquito breeding).

F. Trenching and Tunneling

(1) If in the determination of the Planning Director a tree or group of trees shown to be preserved on the approved plans is of significant value or importance, the Planning Director shall determine whether trenching or tunneling is required when working within the drip line of these trees.

(2) Trenching shall be minimized by locating several utilities in the same trench. Excavations for basements and utilities shall be kept away from the drip line of trees to be preserved, and;

(3) Trenching shall be done outside the drip line of the tree unless otherwise approved by the Planning Director, so as to reduce the amount of root area damaged or killed by trenching activities.

(4) Tunneling shall be conducted in accordance with the specifications in Plates 6-9 and 6-10.

(5) The avoidance of large roots or root concentrations shall be accomplished by curving the trench or by tunneling under large roots and areas that do not have a large taproot.

(6) Roots shall not be left exposed to the air. The ends of damaged and cut roots must be cut off smoothly. They shall be covered with soil as soon as possible or protected and kept moistened with wet burlap or peat moss until the trench can be filled.

(7) Trenches and tunnels shall be filled as soon as possible. Air spaces in the soil shall be avoided by careful filling.

(8) The tree shall be mulched and fertilized to conserve moisture and stimulate new root growth and enhance general tree vigor. Fertilize according to Fertilization Table 6.8, in Section 6-5.1.G. Broadcast fertilizer evenly over the root area of the tree affected.

(9) If a significant amount of root system has been damaged or killed, the tree shall be pruned in accordance with Section 12-0806.

G. End of Construction

(1) Inspection. Inspection shall be requested at the completion of construction to ensure that the work accomplished agrees with the approved plans.

(2) Repair. All trees that have been damaged as a result of construction activity shall be repaired as specified in Section 6-5.1.D.

(3) Work shall have been accomplished as stated in this Section.

(4) If any trees shown on the approved plan to be saved are dead or dying due to acts of negligence by the permittee, they shall be removed and replaced by the permittee. The size, species, and quantity of replacement trees shall be specified by the Planning Director based on the value of the trees that were to have been saved as determined by the formula in the latest revision of "Guide for Establishing Values of Trees and Other Plants" prepared by the Council of Tree and Landscape Appraisers. The quantity shall be dictated by the constraints of the site.

(5) Soil Aeration. If the soil has become compacted over the root zone of any tree, the ground shall be aerated by vertical mulching. One inch to 2" diameter holes shall be drilled in the ground to a depth of 1', and then filled with organic material (mulch). This procedure shall be repeated every 18" until all of the compacted soil beneath the crown of the tree has been loosened.

6-5 LANDSCAPE PLANTING AND INSTALLATION

1. Landscaping and Maintenance

A. General

(1) Minimum Size Standards – All trees required to meet the provisions of this Article, Article 5, Division 5 of the Zoning Ordinance and Article 5, Division 1 of the Subdivision Ordinance shall meet the following minimum size standards:

a. Large and medium deciduous trees: A minimum caliper of at least two (2) inches measured six (6) inches from the ground.

b. Compact and small deciduous trees: A minimum height of six (6) feet measured from the ground elevation after planting.

c. Evergreen trees: A minimum height of at least (6) feet measured from the ground elevation after planting.

B. Planting Materials

(1) All plant materials shall be living and in healthy condition.

(2) The trees and shrubs that are planted shall be of the species and size specified on the approval plans unless substitutions have been approved by the Planning Director prior to planting. Undesirable substitutions that have been planted without prior approval by the Planning Director shall be removed and replaced by acceptable species, if required by the Planning Director.

(3) Trees and shrubs shall be nursery grown, unless otherwise approved, and be healthy and vigorous plants, free from defects, decay, disfiguring roots, sun-scald, injuries, abrasions of the bark, plant diseases, insect pest eggs, borers and all forms of infestations. Plants shall be in accordance with the current American Association of Nurserymen's standards and conform in general to representative species.

a. Balled and burlapped trees and shrubs shall be dug with firm, natural balls of earth of adequate size as specified by the American Association of Nurserymen, "American Standards for Nursery Stock," with the balls securely wrapped.

b. Bare root trees and shrubs shall be dug with adequate fibrous roots which shall be protected during handling and planting to guard against drying out and damage.

c. Container grown stock shall have grown in a container long enough for the root system to have developed sufficiently to hold its soil together.

(4) Plants shall be protected during delivery to prevent desiccation of leaves.

a. Insofar as is practicable, trees and shrubs shall be planted on day of delivery. If this is not possible the contractor shall protect unplanted trees by keeping them in shade, well-protected with soil, mulch or other acceptable material and shall keep trees well watered.

b. Trees and shrubs shall not remain unplanted for more than 2 weeks.

C. Planting Specifications

(1) Plant materials used in conformance with the provisions of these specifications shall conform to the standards of the most recent edition of the "American Standard for Nursery Stock," published by the American Association of Nurserymen.

(2) Trees and other plant materials that are to be planted shall be selected from species suitable for the proposed site conditions. For example, if the location for the tree is to be wet, then the tree must be able to withstand wet conditions. If the tree is to be located near and area where the pollution will be at a high level, such as near or in a

parking lot or near a highway, then the tree to be planted must be able to withstand the high pollution. (Refer to Section 6-3.4 and Table 6-3).

(3) All trees and shrubs shall be planted in such a manner as to ensure their survival. This shall include the planting of intact balls, planting at proper depth, properly backfilling and watering, and construction of a planting saucer.

(4) The planting of all trees and shrubs shall be in accordance with the "Standardized Landscape Specifications," jointly adopted by the Virginia Nurseryman's Association, the Virginia Society of Landscape Designers and the Virginia Chapter of the American Society of Landscape Architects.

a. Any rope or wire binding the ball shall be cut prior to the conclusion of backfilling operations to prevent girdling of the tree trunk.

b. All non-biodegradable materials used around the plant ball shall be completely removed prior to backfilling.

c. Prior to installation, the roots of container grown stock shall be separated or split to ensure proper root development.

d. If planting islands, incorporated into parking lots, have been previously compacted, the soil shall be properly prepared (tilled and amended with fertilizer and organic material) to a depth of 12", prior to installation of landscape material.

(5) Guying and staking. All trees shall be properly guyed or staked to keep them in a vertical position. (Refer to the planting details in Plate 6-11 thru 6-15). Guying and staking should be removed from the plantings 1 year after installation.

(6) Wrapping. The trunks of all trees except for low branching conifers shall be properly wrapped with waterproofed tree wrapping paper.

(7) Mulching. All trees and shrubs shall be properly mulched after planting, to a minimum depth of 2", with any appropriate mulch such as pine bark, pine needles, wood chips, or shredded bark. Mulch shall cover the entire plant saucer. (Refer to Plates 6-11 through 6-15)

(8) Inspection. Inspection shall be requested at the completion of construction to ensure that the work accomplished agrees with approved plans.

a. Any vegetation required by the approved Landscape Plan or the Planning Director, which in the opinion of the Planning Director is dead or is not healthy, shall be replaced by the permittee.

b. Trees shall be restaked and rewrapped by the permittee if necessary.

D. Maintenance

(1) Residents of Spotsylvania County have a vested interest in having newly planted trees develop into a tree canopy. Therefore, newly planted trees and landscaping plants shall be maintained for two years and replaced if ruined or destroyed. The replacement cost of all trees and landscaping plants shall be

reflected in the Bond posted at site plan approval. To assure plant survival, fifty percent (50%) of the bond amount for trees and landscaping plants shall not be released for at least two years after planting.

(2) The maintenance of all trees and shrubs shall be in accordance with the "Standardized Landscape Specifications," jointly adopted by the Virginia Nurseryman's Association, the Virginia Society of Landscape Designers and the Virginia Chapter of the American Society of Landscape Architects.

(3) The owner, or his agent, shall be responsible for the maintenance, repair and replacement of all landscaping materials required by this Article. Replacement landscaping must be in accordance with the minimum standards of Section 6-11.

(4) All plant material shall be tended and maintained in a healthy growing condition, replaced when necessary and kept free of refuse and debris. All unhealthy, dying or dead plant materials shall be replaced during the next planting season and in all cases within one year.

(5) All landscaped areas shall be provided with a readily available water supply. This may include water trucks or any other acceptable water supply program. The utilization of storage chambers to collect runoff to be later used to irrigate plant materials is encouraged.

(6) When required tree cover is provided on individual lots in residential districts, the homeowner, subsequent to occupancy permit issuance, shall not be precluded from adding, removing or relocating tree cover.

E. Dead or Dying Trees

(1) In the event any tree or portion thereof which is dead or dying due to construction or environmental changes brought about by construction and/or clearing and poses a hazard to either life or property, the permittee shall be required to take such action as requested by the Planning Director to eliminate the hazard carefully.

(2) Trees that are required to be removed by the permittee shall be cut down flush with the ground (within 2" 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, then an inspection by the Planning Director will be necessary to determine if the remaining stump can be left or must be removed by other means.

(3) If a stump created by the removal of a hazardous tree is determined by the Planning Director to pose a hazard in itself, 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.

(4) If any trees shown on the approved plan to be saved are dead or dying due to acts of negligence by the permittee, they shall be removed and replaced. The number of replacement trees shall be specified by the Planning Director based on the guidelines as set forth in Section 6-11. Replacement trees shall be planted as nearly as possible to the location of the dead or dying tree

which was removed unless other arrangements are agreed to by the owner and the permittee.

(5) When trees must be taken down, removed, or pruned as a result of the paragraphs above, the wood from these operations shall remain the property of the property owner.

F. Pruning

(1) All pruning of branches shall be done in accordance with the current edition of "Pruning Standards for Shade Trees" published by the National Arborist Association. Cuts must be made properly to prevent additional bark from being torn from the tree. Flush cuts are unacceptable. All final cuts shall be made sufficiently close to the trunk or parent limb without cutting into the branch collar or leaving a protruding stub, so that wound closure can readily start under normal conditions.

(2) Pruning shall be performed by tree workers who, through related training and on-the-job experience, are familiar with the techniques and hazards of this work, including trimming, maintenance, repairing or removal, and equipment used in such operations. The use of climbing spurs or irons shall not be approved in pruning operations on live trees. This type of work is a potentially hazardous occupation and shall be undertaken only by trained personnel or under the supervision of trained personnel, all of whom are covered with workers compensation, property damage, public liability and completed operations insurance.

(3) If a large amount of the root system has been damaged and killed, the crown leaf surface shall be proportionately reduced to balance the reduced root system. This may be accomplished by pruning 20 to 30% of the crown foliage as shown in the Crown Reduction Diagram (Plate 6-16). If roots are cut during the winter, pruning shall be accomplished before the next growing season. If roots are cut during the growing season, pruning shall be done immediately.

(4) When pruning above ground level, a climbing method other than one requiring tree spikes shall be used, unless otherwise approved by the Planning Director. The holes left by such spikes provide access points for insects and disease to enter the tree.

(5) Repair of Damage. Any damage to the crown, trunk or root system of trees retained on the site shall be repaired immediately.

a. Crown – All damaged branches in the crown shall be cut off cleanly.

b. Trunk – All jagged trunk wounds shall immediately be cut clean by making all edges smooth, and rounding the wounds at the top and the bottom. Jagged and damaged wood within the wound shall also be cut clean and smooth. In the event that callous growth has already started to develop, it shall not be removed when trimming the wound.

c. Roots – Damaged roots shall be cut off cleanly behind the damage and covered with topsoil.

G. Fertilization.

(1) The permittee shall fertilize trees that in the opinion of the Planning Director have been stressed or damaged during construction.

(2) Trees shall be fertilized in the late fall (after October 1) or early spring (from the time frost is out of the ground until May 1). Fall applications are preferred, as the nutrients will be made available over a longer period of time.

(3) Fertilizer shall be applied to the soil over the feeder roots. (Refer to Table 6.8, below). In no case should it be applied closer than 3' to the trunk.

(4) Fertilizer shall be applied using approved fertilization methods and equipment.

(5) Formulations and application rates shall conform to the guidelines given in the Fertilization Table (Table 6.8), below.

TABLE 6.8 – Fertilization Table	
Greater than 6" diameter at breast height (DBH) except American Beech and Crabapples	4 lbs. 5-10-5 or 2 lbs. 10-6-4 per inch DBH
Smaller than 6" diameter at breast height (DBH) including American Beech and Crabapples	2 lbs. 5-10-5 or 1 lb. 10-6-4 per inch DBH

6-6 PARKING LOT LANDSCAPING

1. Interior Parking Lot Landscaping

A. Any parking lot of twenty (20) or more spaces shall be provided with interior landscaping covering not less than five (5) percent of the total area of the parking lot. Such landscaping shall be in addition to any planting or landscaping within six (6) feet of a building, planting or landscaping required as peripheral planting by Section 6-6.2 below, and transitional screening as may be required by Section 6-7.

B. The primary landscaping materials used in parking lots shall be trees which provide shade. Shrubs and other live planting material may be used to complement the tree landscaping, but shall not be the sole contribution to the landscaping.

C. The landscaping areas shall be reasonably dispersed throughout the parking lot.

D. The interior dimensions of any planting area shall be sufficient to protect all landscaping materials planted therein. The minimum dimension of the planting area should be nine (9) feet by eighteen (18) feet and contain at least 162 square feet.

E. On-site landscape islands within parking areas shall be designed and planted to prevent vehicular overhang, onto private cross-streets or internal parking lot thoroughfares where parking lot intersections exist, and so as not to allow vegetation to create blind spots or interfere with a sight distance triangle of at least 80 feet with uninhibited sight distance between 3.5 and 5 feet in height from a private drive intersection.

F. The Planning Director may waive or modify the requirements of this Section for any use in an Industrial (I) district wherein vehicles are parked or stored, provided the use is screened from view of all adjacent public, residential, office, or commercial property and all public streets.

G. The Planning Director, in conjunction with the approval of a rezoning or special use permit may approve a waiver or modification of the requirements of this Section. Such waiver or modification may be approved:

(1) For an interim use of a specified duration, and/ or where deemed appropriate due to the location, size surrounding area or configuration of the parking lot, and;

(2) When such waiver or modification will not have any deleterious effect on the existing or planned development of adjacent properties.

H. The Planning director may waive or modify the requirements of this section in conjunction with the approval of a site plan for expansions or alterations not exceeding twenty-five (25) percent of the gross floor area of the building being expanded or altered.

2. Peripheral Parking Lot Landscaping

If any parking lot contains twenty (20) or more spaces and transitional screening is not required by Section 6-7, then peripheral parking lot landscaping shall be required as follows:

A. When the property line abuts land not in the right-of-way of a street:

(1) A landscape strip five (5) feet in width shall be located between the parking lot and the abutting property lines, except where driveways or other openings may necessitate other treatment.

(2) At least one (1) tree for each fifty (50) feet shall be planted in the landscaping strip; however, this shall not be construed as requiring the planting of trees on fifty (50) foot centers.

B. Where the property line abuts the right-of-way of a street:

(1) A landscaping strip of at least ten (10) feet in width, which neither shall include a sidewalk or trail, shall be located between the parking lot and the property line.

(2) At least one (1) tree for each forty (40) feet shall be planted in the landscaping strip; however, this shall not be construed as requiring the planting of trees on forty (40) foot centers.

(3) Where peripheral landscaping required by this Section conflicts with the street planting regulations of the Virginia Department of Transportation, the regulations of the latter shall govern.

(4) On-site landscape islands within parking areas shall be designed and planted to prevent vehicular overhang, onto private cross-streets or internal parking lot thoroughfares where parking lot intersections exist, and so as not to allow vegetation to create blind spots or interfere with a sight distance triangle of at least 80 feet with uninhibited sight distance between 3.5 and 5 feet in height from a private drive intersection.

C. The Planning Director, in conjunction with the approval of a rezoning or special use permit, may approve a waiver or

modification of the requirements of this Section. Such waiver or modification may be approved:

(1) For an interim use of a specified duration, and/or where deemed appropriate due to the location, size, surrounding area or configuration of the parking lot, and;

(2) When such waiver or modification will not have an adverse effect on the existing or planned development of adjacent properties.

D. The Planning director may waive or modify the requirements of this section in conjunction with the approval of a site plan for expansions or alterations not exceeding twenty-five (25) percent of the gross floor area of the building being expanded or altered.

6-7 TRANSITIONAL SCREENING

1. General Provisions

A. Transitional Screening shall be required at the outer boundaries of a lot, except where driveways or other openings may be required and may be provided within the required minimum yard.

B. Section 6-7.3 provides 3 transitional screening areas of varying widths and densities to be situated between uses of differing characteristics in order to reduce the adverse impacts of the more intense use on the lower intense use.

C. Transitional Screening shall be provided in accordance the Transitional Screening Matrix located in Table 6.9 of the Design Standards Manual, below.

D. Transitional screening shall be provided within the zoning district and on the lot of the use indicated in the left column of the matrix where it is contiguous or across the street from land used or zoned for uses indicated across the top of the matrix as follows:

(1) Where the proposed development is contiguous to undeveloped land, fifty (50) percent of the required screening shall be provided within the zoning district and on the lot of the proposed development. The remainder of the screening shall be provided on the contiguous lot at the time that lot is developed.

(2) Where the proposed development is contiguous to developed land, 100% of the required screening shall be provided within the zoning district and on the lot of the proposed development.

(3) Where the proposed development is contiguous to a street, road, or right-of-way other than a public freeway, arterial, or collector, 100% of the required screening shall be provided within the zoning district and on the lot of the proposed development.

(4) Where the proposed development is contiguous to a public freeway, arterial, or collector, transitional screening will not be required. Rather, a street buffer shall be required per Section 6-8, Street Buffers, below.

E. Where the structure is to contain more than one use or category of uses as presented in the Matrix (DSM Table 6.9), the more stringent requirements of the Matrix shall apply; provided, however, that the Planning Director may allow the lesser requirements of the Matrix upon a finding that the need for the more stringent requirements has been eliminated by the arrangement of the uses.

F. The uses in the Matrix are listed in abbreviated form. Other similar matrix

uses may be included in the listing, and shall be subject to the same regulations as uses listed within the Matrix.

G. In instances where a proposed use and/or an existing use on the abutting property is not listed in the Matrix, the Planning Director, using the matrix as a guide, shall determine whether or not and to what extent transitional screening shall be provided.

H. All uses allowed by special permit in a given district shall be required to provide transitional screening as determined by the Board of Supervisors, using the Matrix as a guide.

I. In those instances where an outdoor recreation or amenity area that includes tennis courts, swimming pools, and/ or athletic fields is proposed as an accessory use to a residential development, a buffer area between the proposed amenities area and any adjacent residential property shall be provided as follows:

(1) When amenities area is located wholly within the residential development and does not abut any residential property outside the development and does not abut any residential property outside the development, a buffer no less than thirty-five (35) feet in width shall be provided and shall include the required vegetation for the transitional screening category shown in the matrix.

(2) When the amenities area is located at the periphery of the residential development adjacent to residential property that is not part of the development served by the amenities area a buffer no less than one hundred (100) feet in width shall be provided and shall include the required vegetation for the transitional screening category shown in the matrix.

J. Proffers shall be in addition to the transitional screening requirements of that zoning.

K. Plates 6-18 to 6-21 should be helpful in the preparation and design of the required transitional screens.

2. Transitional Screening Requirements

A. Transitional Screening shall be required only at the outer boundaries of a lot and shall be provided except where driveways or other openings may be required.

B. Transitional Screening may be provided within the required minimum yard.

3. Transitional Screening Categories and Specifications.

There shall be three (3) different transitional screening requirements as identified in Table 6.9, the Transitional Screening Matrix, which shall be provided as follows (See Plate 6-18 to 6-21):

A. Transitional Screening 1 shall consist of an unbroken strip of open space a minimum of twenty-five (25) feet wide (see Plate 6-18) and planted with;

(1) One large evergreen tree with an ultimate height of forty (40) feet or greater for every ten (10) linear feet, plus one medium evergreen tree with an ultimate height of twenty (20) to forty (40) feet for every five (5) linear feet.

OR

(2) With approval of the Planning Director, one large evergreen tree with an ultimate height of fifty (50) feet or greater for every fifteen (15) linear feet, plus one medium

evergreen tree with an ultimate height of twenty (20) to forty (40) feet for every five (5) linear feet.

B. Transitional Screening 2 shall consist of an unbroken strip of open space a minimum of 35 feet wide and planted with (See Plate 6-19).

(1) One large evergreen tree with an ultimate height of forty (40) feet or greater for every ten (10) linear feet, plus one medium evergreen tree with an ultimate height of twenty (20) to forty (40) feet for every five (5) linear feet, plus one deciduous tree with an ultimate height of fifty (50) feet or greater for each thirty (30) linear feet.

OR

(2) With approval of the Planning Director, one large evergreen tree with an ultimate height of fifty (50) feet or greater for every fifteen linear feet, plus one medium evergreen tree with an ultimate height of twenty (20) to forty (40) feet for every five (5) linear feet, plus one (1) small deciduous tree with an ultimate height of twenty (20) feet or less for each twelve (12) linear feet.

C. Transitional Screening 3 shall consist of an unbroken strip of open space a minimum of 50 feet wide and planted with (See Plate 6-20):

(1) One large evergreen tree with an ultimate height of forty (40) feet or greater for every ten (10) linear feet, plus one medium evergreen tree with an ultimate height of twenty (20) to forty (40) feet for every five (5) linear feet, plus one large deciduous tree with an ultimate height of fifty (50) feet or greater for each thirty (30) linear feet, plus one medium evergreen shrub with an ultimate height of twelve (12) feet or less for every fifteen (15) linear feet.

OR

(2) With approval of the Planning Director, one large evergreen tree with an ultimate height of fifty (50) feet or greater for every fifteen (15) linear feet, plus one medium evergreen tree with an ultimate height of twenty (20) to forty (40) feet for every five (5) linear feet plus one small deciduous tree with an ultimate height of twenty (20) feet or less for each twelve (12) linear feet, plus seven (7) medium evergreen shrubs with an ultimate height of twelve (12) feet or less for each ten (10) linear feet.

D. Averaging the above transitional screening width requirement may be permitted if one (1) of the following circumstances exist and the director of planning determines that averaging the transitional screening meets the intent of this section:

(1) The traditional (rectangular/ linear) transitional screening requirement cannot be one hundred (100) percent physically accommodated; or

(2) The placement would create a pronounced unnatural appearance from the public viewscape; or

(3) The area within the transitional screening contains a fragmented clump of diverse and/ or unique native tree species that exceeds the transitional screening width requirement; or

(4) The placement of the screening requirement, due to parcel configuration, would cause a change

in the placement of design elements (building, parking, SWM/BMP, etc.) that create inappropriate compatibility issues with adjacent properties.

(5) Once a parcel is determined eligible for transitional screen averaging, the following rules of usage apply:

a. The width requirement, when measured at various points along the length of the transitional screen, shall average the minimum required width.

b. In no case shall an individual measurement point along the transitional screening width requirement be less than sixty (60) percent of the required width.

c. The total square footage of open space contained within an average linear transitional screening requirement shall equal that of the straight linear transitional screening requirement.

d. Table 6.10 provides the required number of measurement points based upon the length of the required transitional screening.

TABLE 6.9: TRANSITIONAL SCREENING MATRIX

TABLE INSET:

Uses	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Dwellings, detached																	
2. Dwellings, attached	1																
3. Dwellings, multiple family, manufactured home	1	1															
4. Child Care Centers, Places of Worship, Private Schools	1	1	1														
5. Golf Courses, Country Clubs & Club Houses	1	1	1														
6. Medical Care Facilities	2	2	1														
7. Financial Institution	1	1	1														
8. Business Service & Supply Estab., Eating Estab., Funeral Homes, Offices, Personal Service Estab., Repair Service Estab., Retail Sales Estab. w/out outside display	2	2	1	1													
9. Bus, Railroad Stations, Carwashes, Drive-in Banks, Drive-in Restaurants, Plant Nursery, Retail Sales Estab. with Outside Display, Theaters to include Drive-in Motion Picture, Vehicle Light Service Estab., Vehicle Sale & Rental Estab.	3	3	2														
10. Hotels, motels	2	2	1														

11. Commercial, Recreational Facility	2	2	1														
12. All other quasi-public uses	2	2	2	1													
13. Mini-warehousing Estab., Scientific Research & Development Estab., Wholesale Trade Estab.	2	2	2														
14. Light Public Utility Uses	3	2	2	1	1	1		1									
15. Contractors' Offices & Shops, Heavy Equip. And Spec. Vehicle Sale, Rental & Service Estab., Heavy Public Utility Uses, Industry Type I, Lumber & Bld.. Material Yard, Motor Freight Terminals, Storage Yards, Warehousing Facilities	3	3	3	1	1	1	1										
16. Industry Type II, Junk Yards, Motor Vehicle Storage & Impoundment Yards, Recycling Centers, Vehicle Major Service Estab.	3	3	2	1	1	1	1	1	1	1	1				1		
17. Industry Type III	3	3	2	1	1	1	1	1	1	1	1				1	1	

(Ord. No. 23-66, 10-24-95; Ord. No. 23-72, 4-22-97; Ord. No. 23-79, 4-13-99)

Table 6.10
Transitional Screen Averaging

TABLE INSET:

Length of Transitional Screening	Number of Measurement Points*
<100 feet	3
101--200 feet	4
201--301 feet	6
301--400 feet	8
>400 feet	8 + 1 per 50 feet

*No measurement point required for a fractional thereof
(Ord. No. 23-66, 10-24-95; Ord. No. 23-109, 12-14-04)

4. Transitional Screening Waivers and Modifications

Transitional screening may be waived or modified by the Planning Director in any of the following circumstances. The Planning Director may attach conditions to any waiver or modification to assure that the results of the waiver or modification would be in accordance with the purpose and intent of this Division.

A. Transitional screening and barriers may not be required between uses that are to be developed under a common development plan or series of development plans within a zoning district or a common site plan.

B. Where the strict provisions of this division would reduce the usable area of a lot due to lot configuration or size to a point which would preclude a reasonable use of the lot, transitional screening may be waived or modified by the Planning Director where the side of a building, a barrier and/ or the land between that building and the property line has been specifically designed to minimize adverse impact through a combination of architectural and landscaping techniques.

C. Transitional screening may be modified where the building, a barrier and the land between that building and the property line has been specifically designed to minimize adverse impact through a combination of architectural and landscaping techniques. In no event can the requirements be reduced by more than 50%.

D. The transitional screening yard width and planting requirements may be reduced as much as two-thirds (2/3) where the developer chooses to construct a seven (7) foot brick or architectural block wall. This wall may be reduced to a height of six (6) feet where the Planning Director deems such a height will satisfy the purpose and intent of this Division (See Plate 6-21).

E. Transitional screening may be waived or modified where the adjoining land is designated in the adopted comprehensive plan for a use which would not require the provision of transitional screening between the land under site plan and the adjoining property.

F. Transitional screening may be waived or modified where the adjacent property is zoned to allow a use similar to that of the parcel under site plan.

G. Transitional screening may be waived or modified where the adjoining property is

used for any public purpose other than a school, park, or hospital.

H. Transitional screening may be waived or modified where adjacent residential property is used for any use permitted by the Board as a special permit use except nursery schools, day care centers, and private schools.

I. Transitional screening may be waived or modified where the subject property abuts a railroad or interstate highway right-of-way.

J. Transitional screening may be waived or modified for any public use when such use has been specifically designed to minimize adverse impact on adjacent properties.

K. The Director may waive or modify the requirements of this section in conjunction with the approval of a site plan for expansions or alterations not exceeding twenty-five (25) percent of the gross floor area of the building being expended or altered.

L. Transitional screening may be temporarily waived for a phased development where only one or more internal phases are being developed. The phase, or phases, proposed for development shall be identified on the site development plan by either a phase line or a proposed lot line. A screening, equivalent to a street buffer B, shall be provided along said line. This waiver shall not permanently exempt the overall development from the required transitional screening requirement.

6-8 STREET BUFFERS

1. General Provisions

A. Development of any parcel of land which is adjacent to a public freeway, arterial or collector shall provide a street buffer in accordance with Table 6.11 below.

B. Street Buffer descriptions are on Plates 6-22 through 6-26. Plantings for street buffers shall be installed so as not to impede clear sight distance at intersections and points of access onto public roads.

C. Within subdivisions and planned developments, the street buffer shall be provided in common area or easement.

Table 6.11 Street Buffers

Zoning	Freeways	Arterial	Collector
R-1	D	C	B
R-2	D	C	B
R-3	D	C	B
R-8	D	C	B
R-12	D	D	C
PDH	D	C	B
R-MHP	D	D	C
V	D	C	A
O-1	D	B	A
O-2	D	B	A
C-1	D	B	A
C-2	D	B	A
C-3	D	C	B
I-1	D	D	C
I-2	D	E	D
PDC	D	B	A

2. Street buffer waivers and modifications.

A. The street buffer may be waived or modified by the director in any of the following circumstances. The director may attach conditions to any waiver or modification which would assure that the results of the waiver or modification would be in accordance with the purpose and intent of this division.

(1) Where the strict provisions of this division would reduce the usable area of a lot due to lot configuration or size to a point which would

preclude a reasonable use of the lot, the street buffer may be modified where the building, a barrier and/or the land between that building and the property line has been specifically designed to minimize adverse impact through a combination of architectural and landscaping techniques.

(2) The street buffer may be modified where the building, a barrier and/or the land between that building and the property line has been specifically designed to minimize adverse impact through a combination of architectural and landscaping techniques.

(3) The street buffer width and planting requirements may be reduced by as much as ½ where the developer chooses to construct a berm or wall. This berm or wall must be no more that three feet in height.

(4) The street buffer may be waived or modified where the property is developed with a similar streetscape as adjoining properties where that streetscape is consistent with the intent of this division.

(5) The street buffer may be modified where the proposed use is permitted in a less intense zoning district.

(6) The street buffer may be waived or modified in conjunction with the approval of a site plan for expansions or alterations not exceeding twenty-five alterations not exceeding twenty-five (25) percent of the gross floor area of the building being expanded or altered.

(7) The street buffer may be temporarily waived for a phased development where only one or more internal phases are being developed. The phase, or phases, proposed for development shall be identified on the site development plan by either a phase line or a proposed lot line. The required street buffer shall be provided along the line closest to, and parallel with, the street. This waiver shall not permanently exempt the overall development from the required street buffer requirement.

B. The street buffer requirements may be waived or modified by the board of supervisors as a special use or in connection with the approval of a special use or rezoning. Waivers or modifications of the street buffer requirements may also be made pursuant to Article 9 of the Design Standards.

6-9 LANDSCAPING PLANS

1. Applicability

Section 23-4.11.1(b) of the Zoning Ordinance states that a site plan shall be a prerequisite to any use except single family detached dwellings. In addition, Section 23-5.5.5(a) of the Zoning Ordinance states that a Landscape Plan shall be submitted as part of every generalized development plan and site plan.

2. Landscape Plan Requirements

A. A Landscape Plan shall include the following information:

(1) Scale and scale graphic.

(2) Dimensions and distances to delineate all existing and proposed property, right-of-way lines, easements and buildings.

(3) Delineation of existing and proposed parking spaces or other vehicle areas, access aisles and driveways.

(4) Location, size and description of all existing and proposed landscaping materials.

a. The drip line of groups of trees and individual trees standing alone that will be retained on the site shall be accurately located on the plan and identified as "Trees to be "Saved" and as well as the area designated as "Trees to be saved." These trees shall be used to meet tree cover requirements.

b. The location of all outstanding or specimen trees shall be accurately shown on the plans. Every attempt shall be made to save these trees. (Refer to the definition located in Section 6-3.A.(4).

(5) All tree protection devices shall be accurately shown and identified on the plan. These protective devices shall be located, to the greatest extent possible, at the drip line of the vegetation to be protected. All protective devices will be installed and meet the specifications as set forth in Section 6-4.

(6) Clearly identify all landscape matters regulated by zoning proffers and conditions.

(7) Tree cover calculations as set forth in Section 6-1.2 and 6-1.3 These calculations shall include the gross site area, the adjusted site area, the percentage and area of tree cover required and the percentage and area of tree cover provided. The percentage and area of the tree cover provided shall be broken down to show the amount provided by existing vegetation and the amount provided by landscape planting. Each plant to be planted shall be accurately located and labeled as to species. The symbols used to locate trees intended to be used as part of the tree cover requirements shall be drawn to scale to accurately represent their projected 20 year crown spread.

(8) Detailed drawings including the following:

a. Protective tree fencing and markers.

b. Transplanting specifications.

c. Tree wells and aeration systems.

d. Staking specifications.

e. Other applicable drawings.

f. Site distance profile, demonstrating compliance.

(9) The landscaping plan shall include a plant schedule (Refer to Table 6.12) which shall include the following:

a. Plant name, abbreviation used, botanical and common.

b. Quantity of each species indicated.

c. Size of plant to be planted, (i.e. trees, caliper and height; shrubs, container size and height or spread).

d. Type of root stock to be planted (e.g., balled and burlapped (B&B), bareroot, container etc.).

e. Description of seed mixture and rate.

(10) In instances where trees are to be saved, a Tree Preservation Survey filed with each rezoning, or each site/subdivision plat shall illustrate the general location, size, and

species of healthy specimen trees and healthy stands of ten or more trees to be preserved, separate from the wood line and located within the proposed clearing limits of a project. The inventory may be provided by a surveyor already working on-site. There is no requirement to identify trees identified for removal.

In an effort to protect trees targeted for preservation, the following information shall be provided.

a. Preconstruction treatments proposed, including crown or root pruning shall be identified; and

b. The clearing operations and what tree protection measures will be taken during construction including erosion control, watering, fertilizing, or mulching shall be identified, and

c. If transplanting trees, a detailed description of the transplanting process shall be submitted as part of the tree preservation plan.

(11) Construction material storage areas, staging areas and employee parking should be noted on the site plan and located when possible where they will not cause compaction over roots.

(12) If tree wells or 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 wells or walls shall be in accordance with Section 6-4.2.D and 6-4.2.E.

(13) Other information shall be furnished as deemed necessary by the Planning Director.

3. Exception to Applicability

A landscape plan is not required to be submitted under the following conditions:

A. Those exceptions to land disturbing activity as specified in Chapter 6A (Chesapeake Bay Preservation), 8 (Erosion and Sediment Control), or 23 (Zoning).

B. The clearing of trees on commercial forest land. However, timber harvesting shall be conducted pursuant to a Forest Management Plan approval by the Planning Director.

(1) A Forest Management Plan shall include but not be limited to the following information:

a. Location and description of property.

b. Type and species of trees on the site.

c. Outstanding or monarch trees on the site.

d. Diameter range of the timber to be cut.

e. Description of the quality of the timber to include the soundness and maturity.

f. Description of the topography and forest floor condition.

g. Source of regeneration.

h. Time frame in which cutting will be taking place.

i. Methods for stabilization, siltation and runoff control.

j. Future use of the land.

(2) 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.

C. Subject to approval by the Planning Director, a Landscape Plan shall not be required to clear 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.

TABLE 6.12 – Sample Planting Schedule

Key/ Abr.	Botanical Name	Common Name	Quantity	Size	Remarks
A	Acer saccharum	Sugar Maple	5	2-2 ½ Caliper 10-12' HT	B&B
P	Pinus strobus	White Pine	100	1" Caliper	Container
S	Pinus strobus	White Pine	12	6-8' HT	B&B

NOTE: Remarks column may also be used to note any other characteristics which that plant should exhibit (i.e., sheared, specimen, multi-stem, tree form, etc.).

6-10 MODIFICATIONS, WAIVERS AND EXCEPTIONS

1. General

A. The Planning Director may impose conditions to any modification, waiver or exception which will assure that the results of the modification, waiver or exception would be in accordance with the purpose and intent of the tree cover requirements.

B. The approval of a waiver or modification of the parking lot landscaping or transitional screening requirements does not alter the tree cover requirements for the site.

2. Modifications or Waivers

A. The tree cover requirements may be modified by the Planning Director for areas comprised of the following features, provided those areas are identified and delineated on the site plan:

(1) Floodplains and wetlands.

(2) Non-wooded developed recreation areas, such as athletic fields, tennis courts, multi-use courts, playgrounds and tot lots.

B. Tree cover requirements may also be modified or waived by the Planning Director where the strict provisions thereof would reduce the usable area of a lot due to lot configuration or size to a point which would preclude a reasonable use of the lot.

3. Exceptions

A. An exception to the tree cover requirements may be approved by the Planning Director for areas comprised of the following features, provided those areas are identified and delineated on the site plan:

(1) Lakes and retention ponds, based on the normal water surface elevation, and swimming pools.

(2) Lands under active commercial production or management of agricultural, horticultural or forest crops; landfills and quarries.

(3) Major utility distribution easements of one hundred fifty (150) feet or more in width.

(4) Absorption fields and seepage pits for on-site sewage disposal systems.

6-11 REPLACEMENT TREES AND / OR VEGETATION

1. Violations

A. When vegetation is cleared in violation of Chapter 23 of the Spotsylvania County Code, this Article, or the approved Landscape Plan, replacement trees and/or other vegetation may be required by the Planning Director.

B. Re-vegetation required due to a violation of Code Section 23-5.5, Landscaping and Screening shall be accomplished in a time frame specified by the Planning Director on the violation notice. At the discretion of the Planning Director a revision to the approved Landscape Plan may be submitted and approved showing the required re-vegetation to be planted at a later date. Such plan shall be prepared in accordance with Sections 6-5 and 6-6.

6-12 ADMINISTRATION

1. Factors to Consider for Approval of Landscape Plans

In addition to reviewing for conformance to other policies, standards and guidelines contained in this manual, the following factors shall also be taken into consideration:

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

B. The heightened desirability of preserving trees and other vegetative cover in densely developed or densely populated areas.

2. Approval of Landscape Plans

A. If the Plan conforms to all policies, standards, and guidelines, and there are no objections resulting from consideration of the factors listed in Section 6-11.1, above, the Plan shall be approved.

B. A site plan approved by the Planning Director shall constitute an approved Landscape Plan.

3. Rejection of Landscape Plans

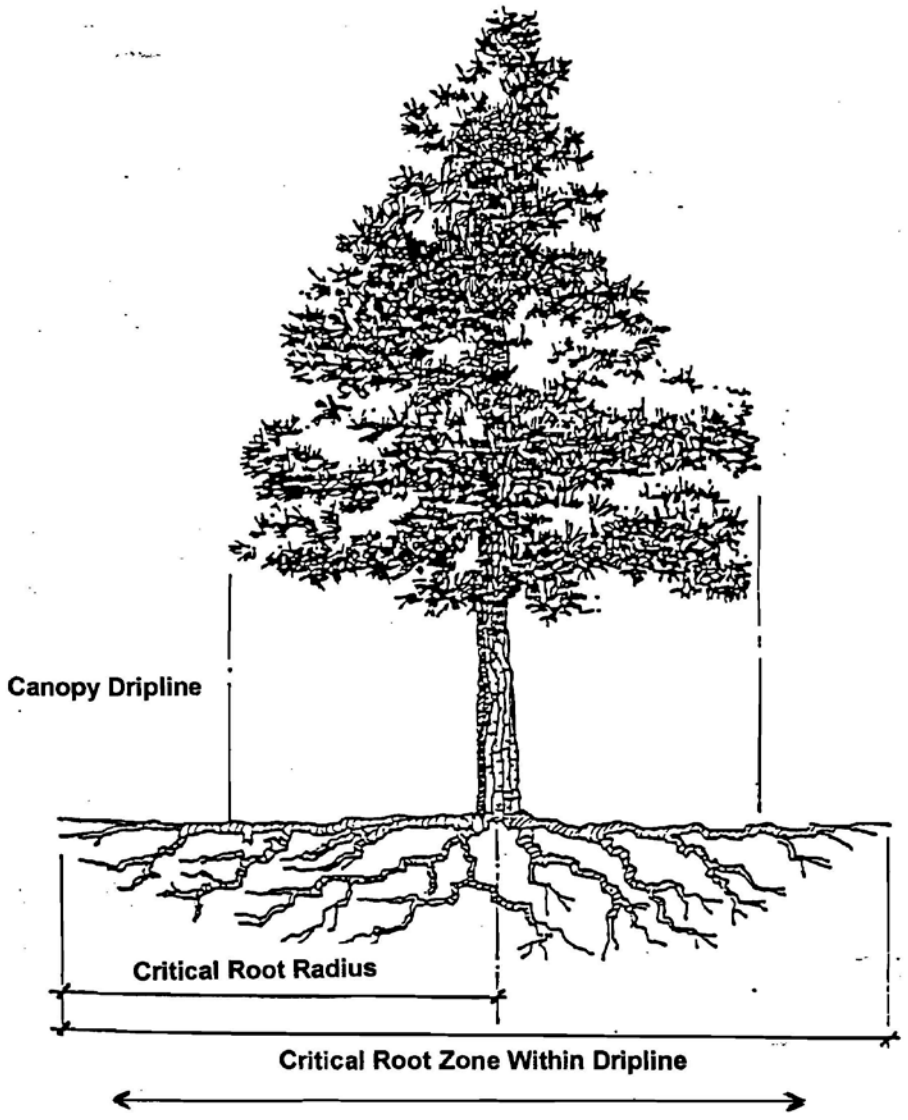
If the plan does not conform to all policies, standards, and guidelines or there is an objection resulting from the consideration of the factors listed in Section 6-11.1, above, the plan shall be rejected. The Planning Director shall require that the plan be modified to bring it into conformance with the policies, standards, and guidelines or to eliminate any objection to the plan if the plan is to be approved.

6-13 PLATES

The following Plates will illustrate and assist in the explanation of the standards and specifications in Article 6, (Landscaping and Screening) of the Spotsylvania County Design Standards Manual and Chapter 23, Article 5, Division 5 (Landscaping and Screening) of the Spotsylvania County Code.

ARTICLE 6 – LANDSCAPING AND SCREENING

Dripline - A vertical line extending from the outermost edge of the tree canopy or shrub branch spread to the ground.



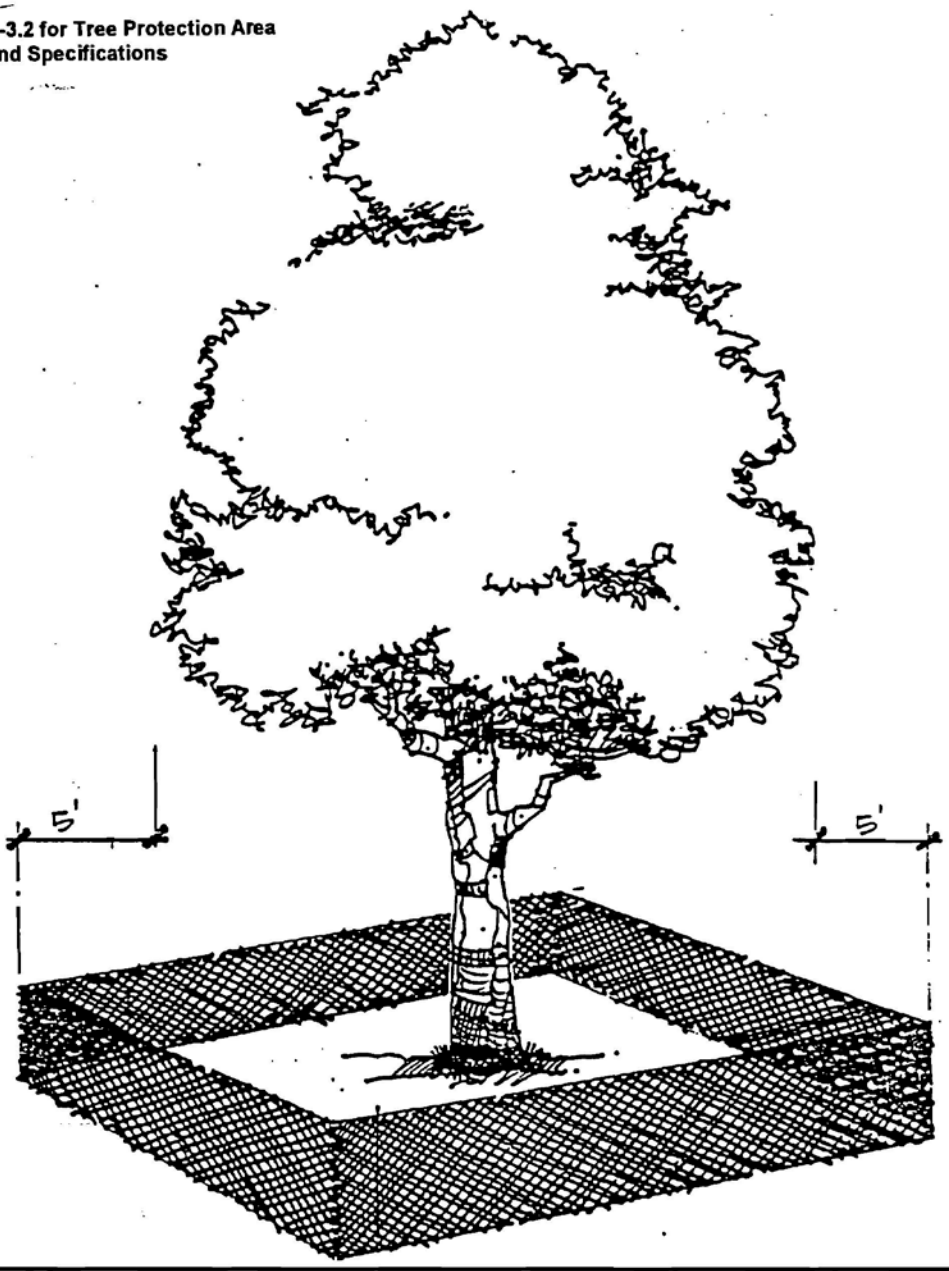
Actual Feeder Root System Extends Well Beyond The Dripline

	TREE CANOPY DRIPLINE AND CRITICAL ROOT ZONE	PLATE NO.	STD. NO.
		6-1	

SPOTSYLVANIA COUNTY PLANNING DEPARTME

Tree Protection Area (Typical)

Refer to Section 6-3.2 for Tree Protection Area Standards and Specifications



	TREE PROTECTION AREA	PLATE NO.	STD. NO.
		6–2	

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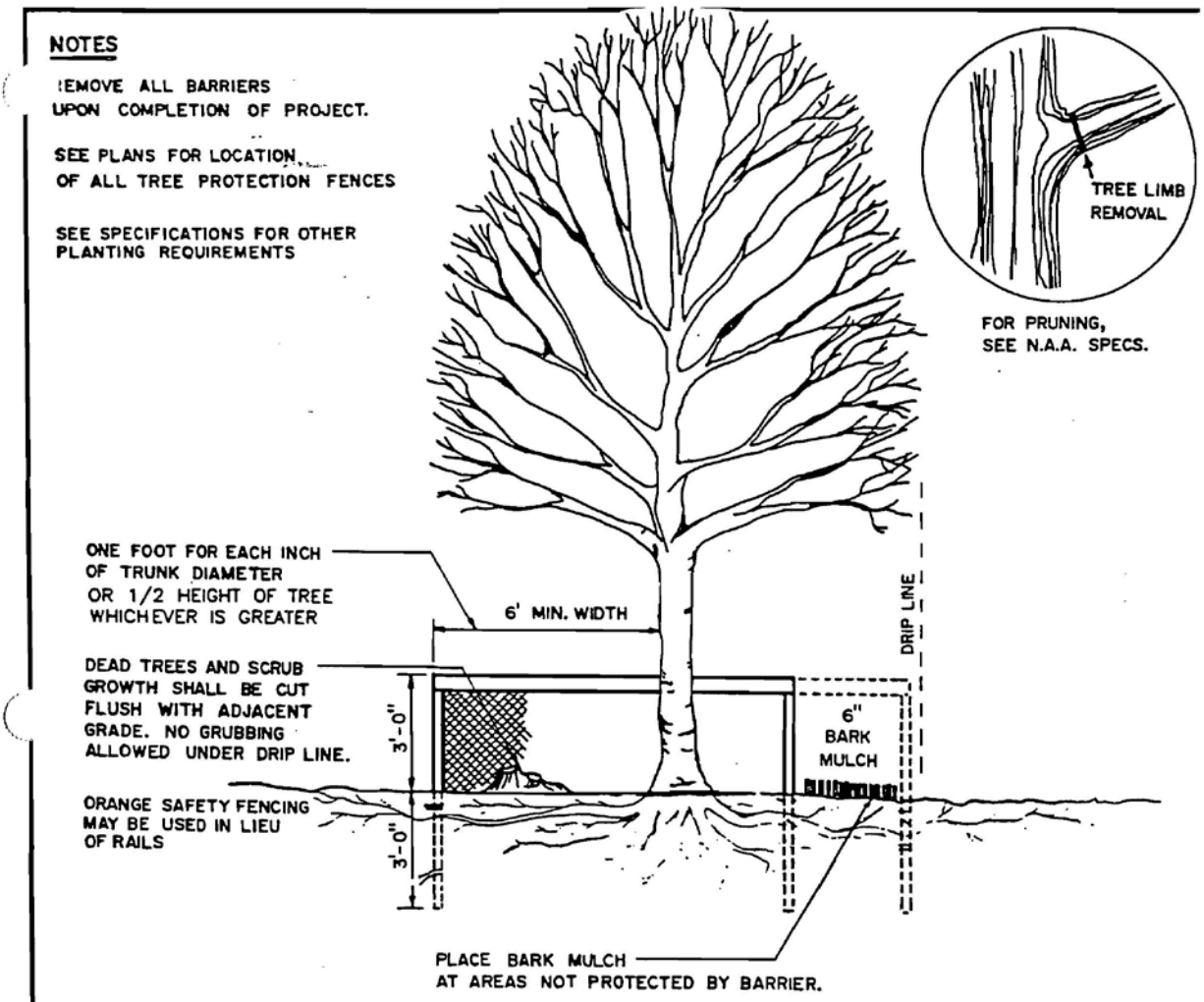

	TREE PROTECTION DETAIL	PLATE NO.	STD. NO.
		6-3	

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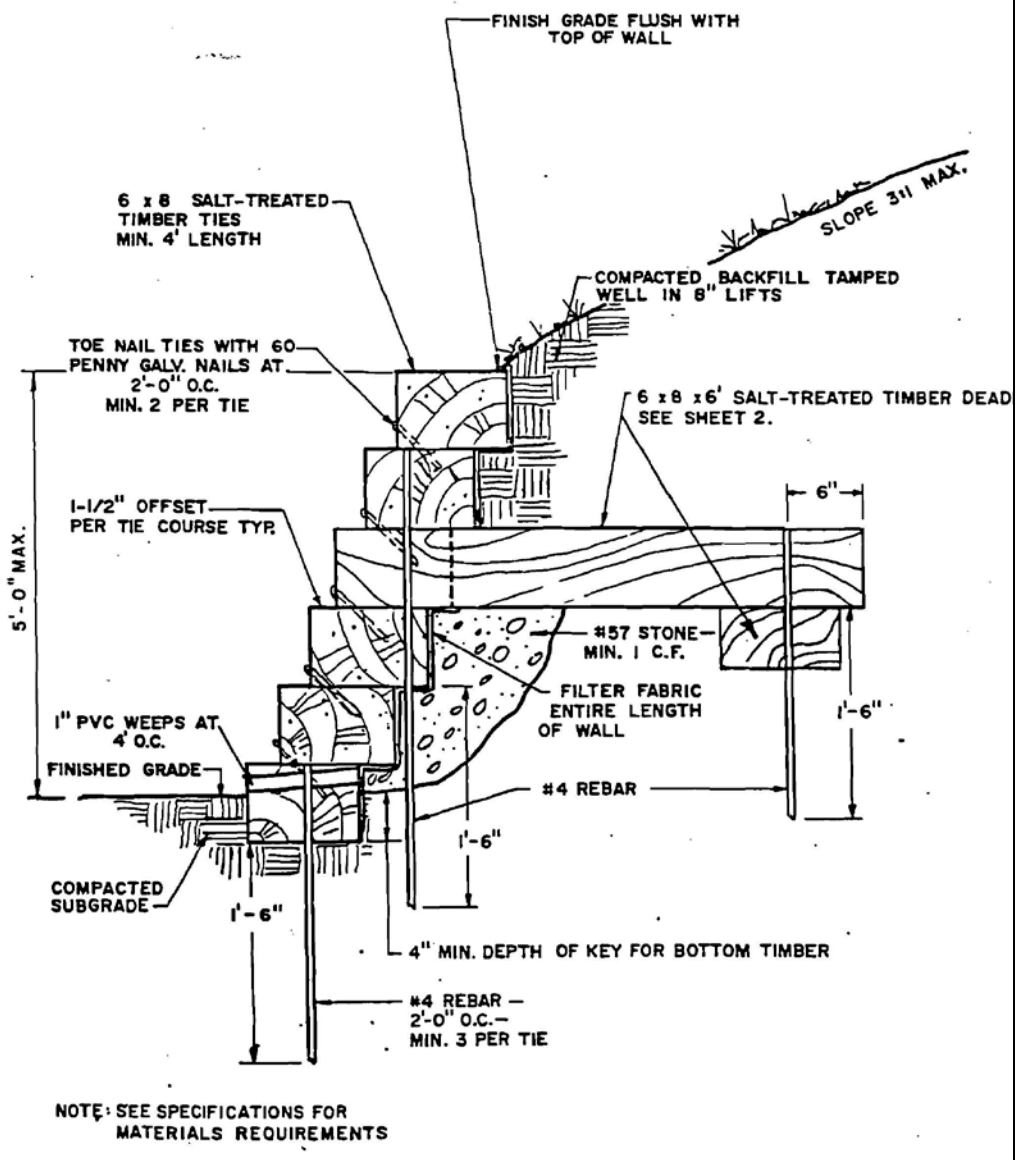
Spotsylvania County Design Standards Manua

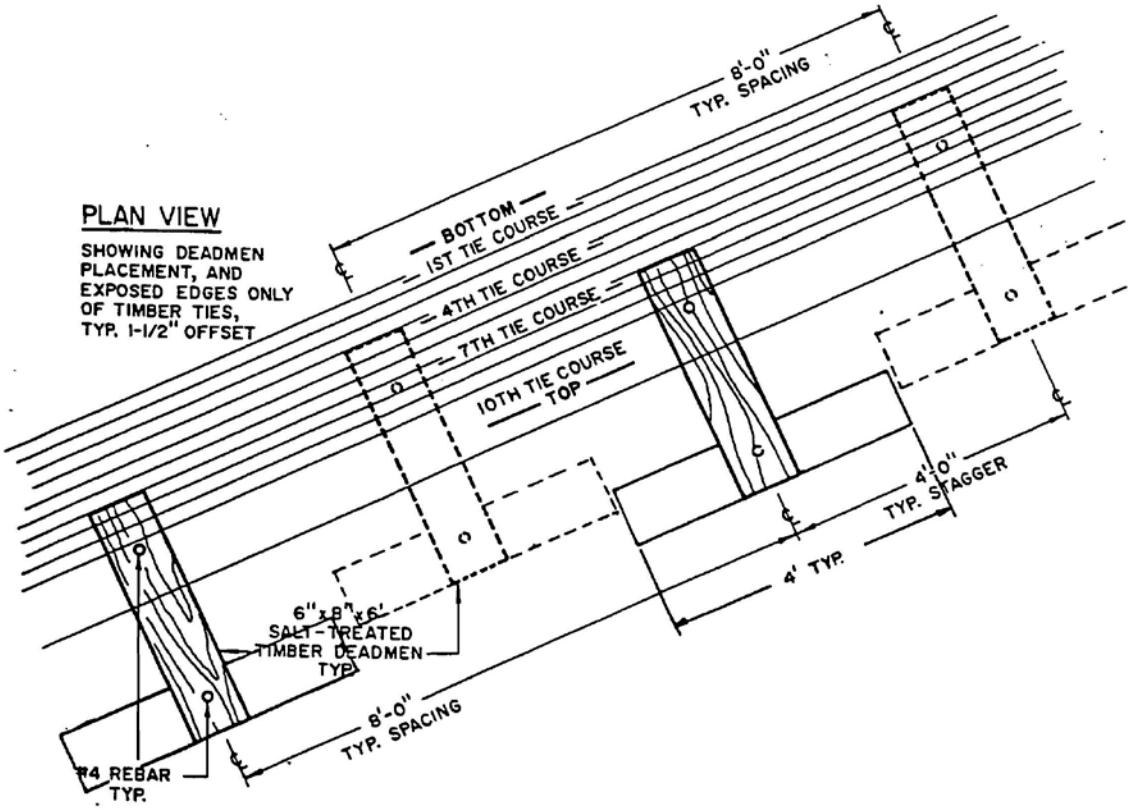


	TIMBER RETAINING WALL DETAIL	PLATE NO. 6-4

SPOTSYLVANIA COUNTY PLANNING D

DEADMEN INSTALLATION TABLE

TOTAL WALL HEIGHT — TOTAL NUMBER OF INSTALLED TIE COURSES (HEIGHT / COURSES)	NUMBER OF LEVELS OF DEADMEN	INSTALL DEADMEN AT UPPER LEVEL / LOWER LEVEL	SPACING ON EACH DEADMEN LEVEL	STAGGER BETWEEN DEADMEN LEVELS
4'-0" OR MORE — 8 OR MORE	2 LEVELS	UPPER: 7TH TIE COURSE / LOWER: 4TH TIE COURSE	8' O.C.	STAGGER 4' O.C.
3'-6" — 7	2 LEVELS	UPPER: 6TH TIE COURSE / LOWER: 4TH TIE COURSE	8' O.C.	STAGGER 4' O.C.
3'-0" — 6 2'-6" — 5	1 LEVEL	4TH TIE COURSE	8' O.C.	—
2'-0" — 4 1'-6" — 3 1'-0" — 2 6" — 1	REQUIRES NO DEADMEN			

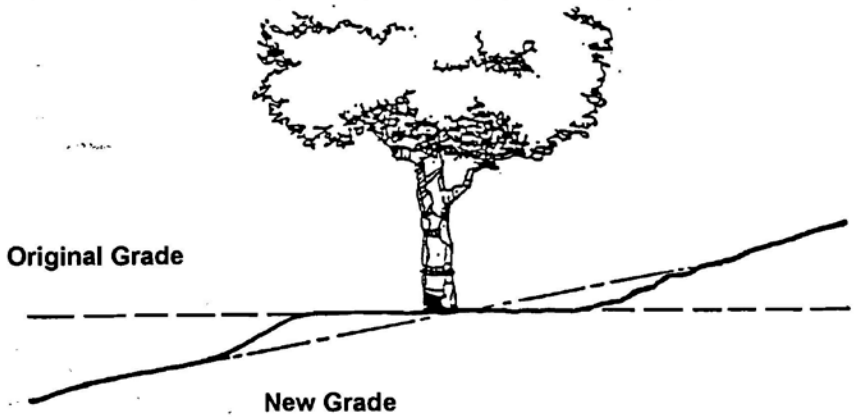


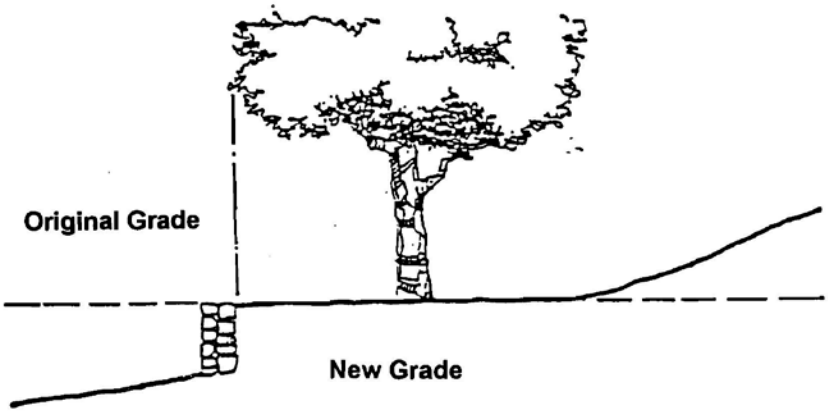
PLAN VIEW

SHOWING DEADMEN PLACEMENT, AND EXPOSED EDGES ONLY OF TIMBER TIES, TYP. 1-1/2" OFFSET

TIMBER RETAINING WALL DETAIL	PLATE NO.	STD. NO.
	6-5	

SPOTSYLVANIA COUNTY PLANNING DEPARTMEI





Lowering the Grade

When lowering the grade of the soil surrounding a protected tree, the maximum number of tree roots within the drip line shall be preserved by using any of the following methods:

(1) Terracing. The area within the drip line is left at the original grade by terracing.

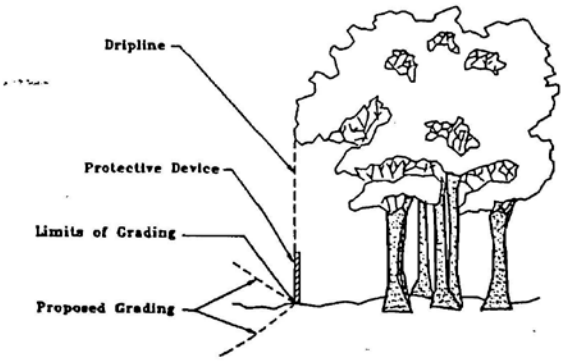
(2) Retaining wall. The area within the drip line is left at the original grade constructing a dry retaining wall. The retaining wall shall be porous to allow for aeration.

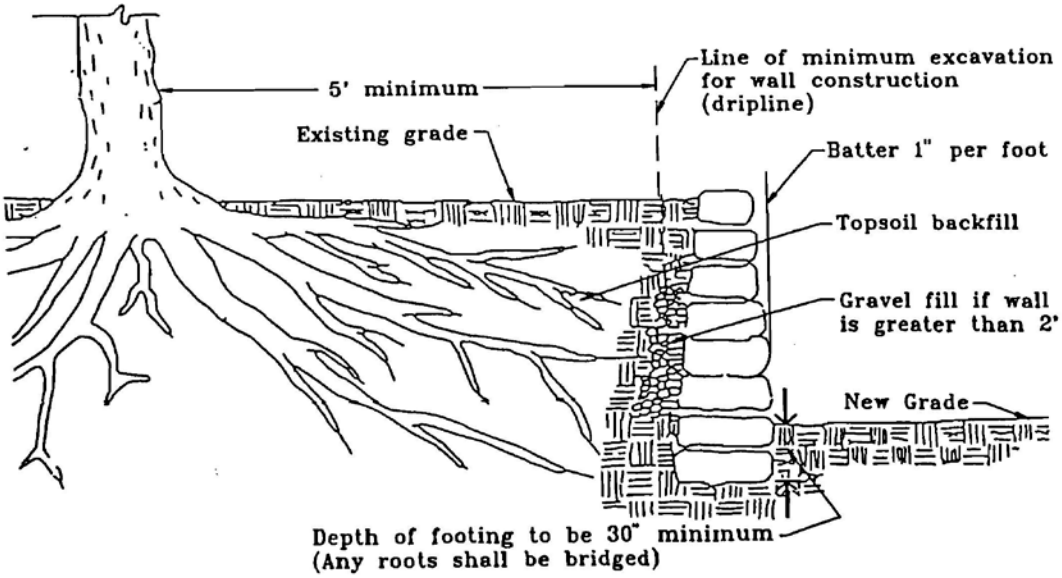
(3) Terracing and retaining wall. The area within the drip line is left at the original grade by the combined use of terracing and dry retaining wall.

Note: Refer to Plates 9-6, 10-6 and 11-6 for retaining wall details

	LOWERING GRADE DETAIL	PLATE NO.	STD. NO
		6-6	

SPOTSYLVANIA COUNTY PLANNING DEPARTME





	TREE WALL DETAIL	PLATE NO.	STD. NO.
		6-7	

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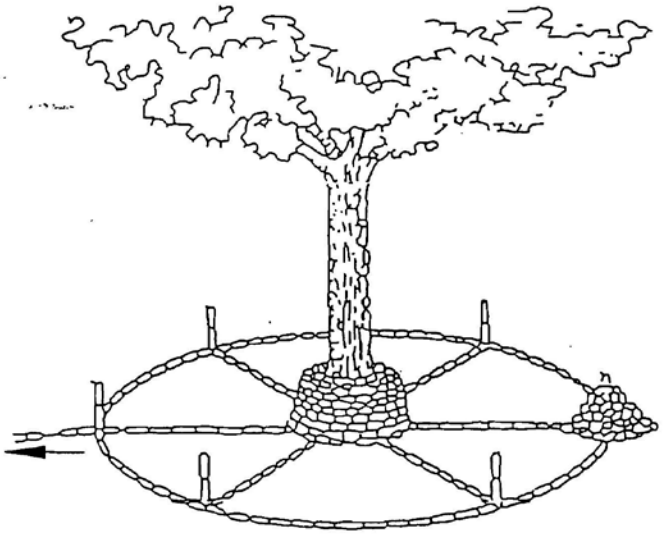
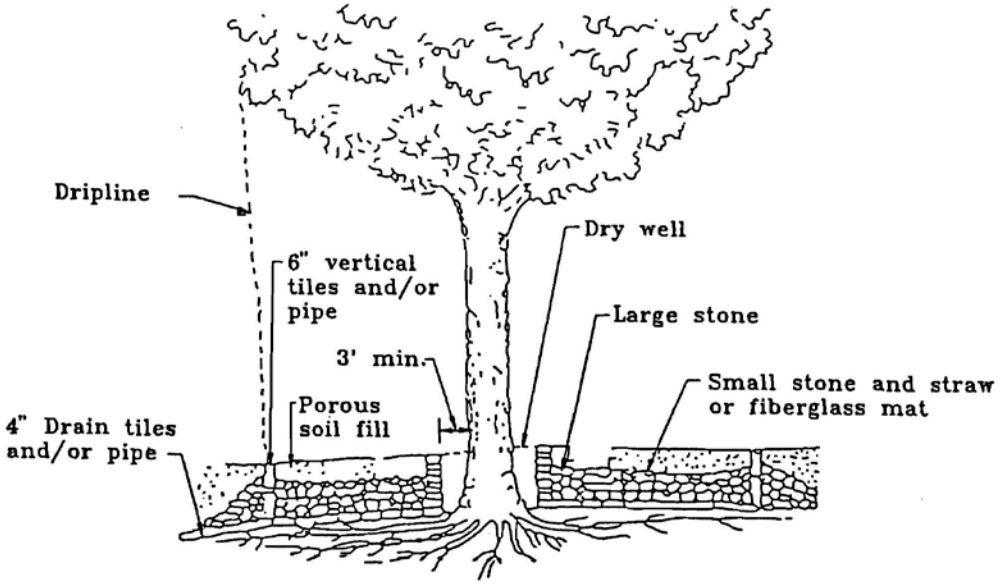


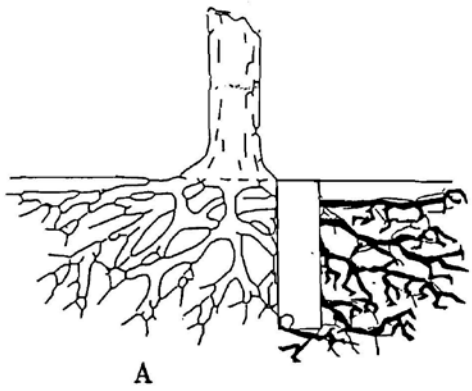
DRAINAGE PIPE LAYOUT

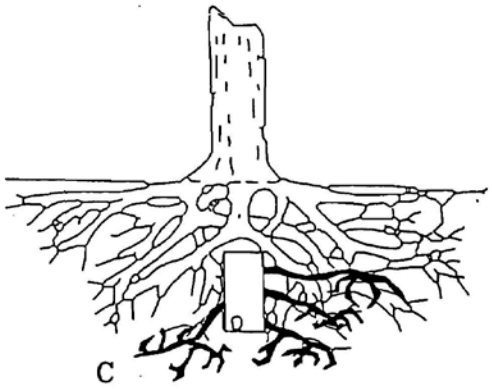


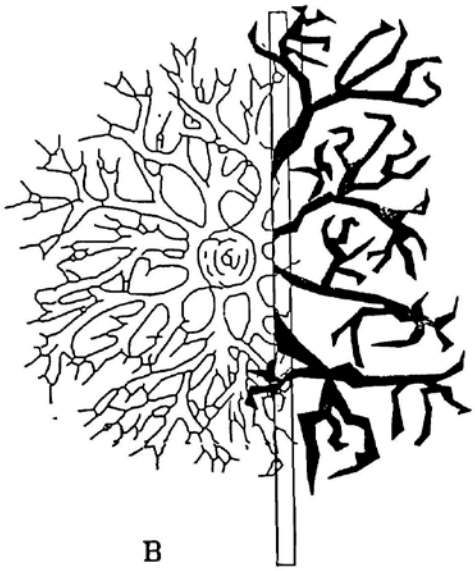
CROSS SECTION DETAIL

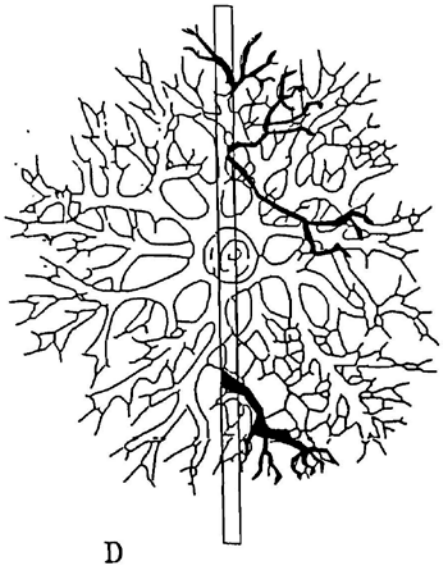
	TREE WELL DETAIL	PLATE NO.	STD. NO.
		6-8	

SPOTSYLVANIA COUNTY PLANNING DEPARTME





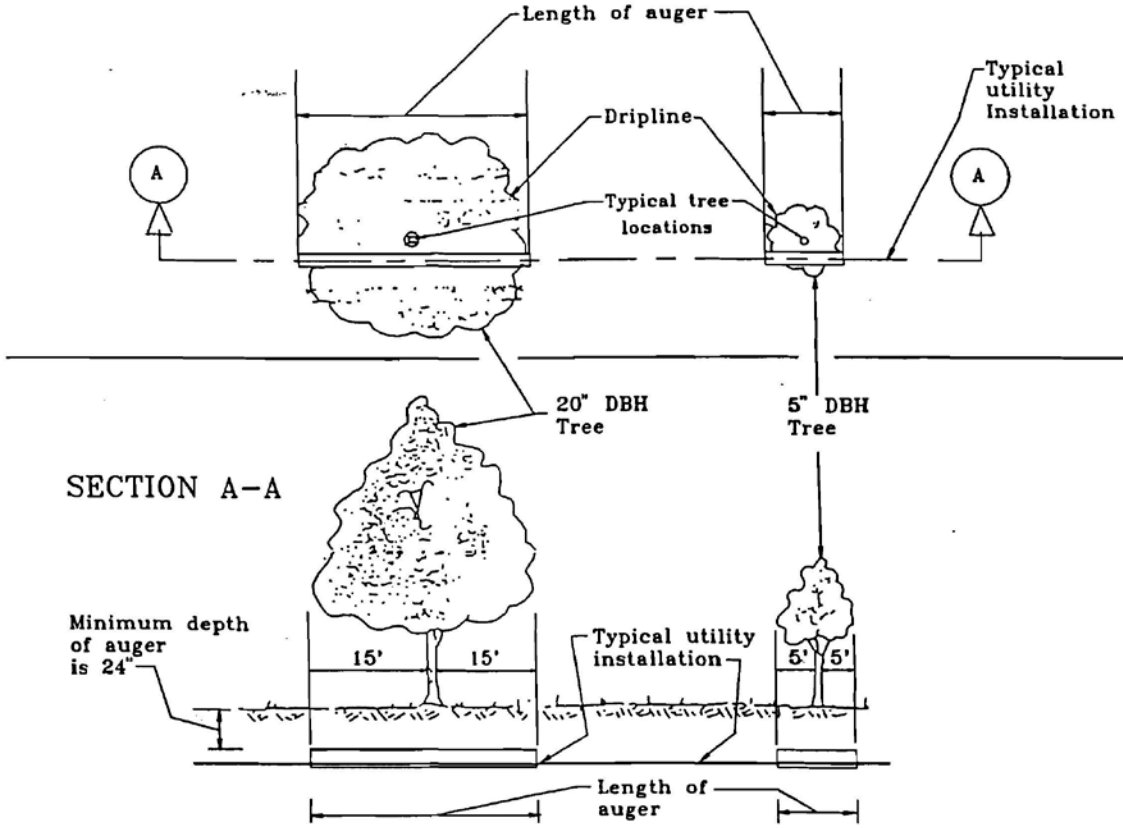




Roots severed, as indicated in solid black, by digging trenches near tree (side and top views): A and B, many roots destroyed by trenching close to tree trunk; C and D, only a few roots destroyed by trenching directly toward trunk and tunneling under base of tree.

	TRENCHING AND TUNNELLING DIAGRAM	PLATE NO.	STD. NO.
		6-9	

SPOTSYLVANIA COUNTY PLANNING DEPARTMEI



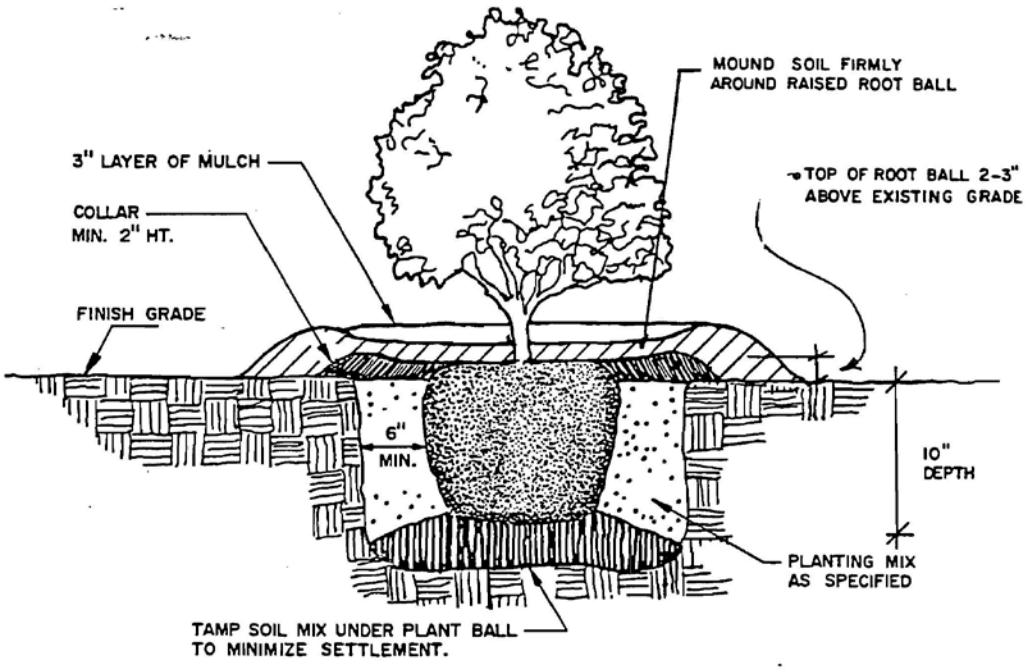
TREE DIAMETER (DBH)

0–2"	–Auger under drip line when trench is to come within 1' of the face of the tree in any direction.
3–4"	–Auger under drip line when trench is to come within 2' of the face of the tree in any direction.
5–9"	–Auger under drip line when trench is to come within 5' of the face of the tree in any direction.
10–14"	–Auger under drip line when trench is to come within 10' of the face of the tree in any direction.
15–19"	–Auger under drip line when trench is to come within 12' of the face of the tree in any direction.
20" and Over	–Contact the Urban Forestry Branch for specifications.

DBH = Diameter Breast Height, Measured at 4.5' Above Ground.
The minimum depth of auger within the root zone, as described above, shall be 24" below the soil surface.

	TUNNELLING DETAILS	PLATE NO.	STD. NO
		6-10	

SPOTSYLVANIA COUNTY PLANNING DEPARTME



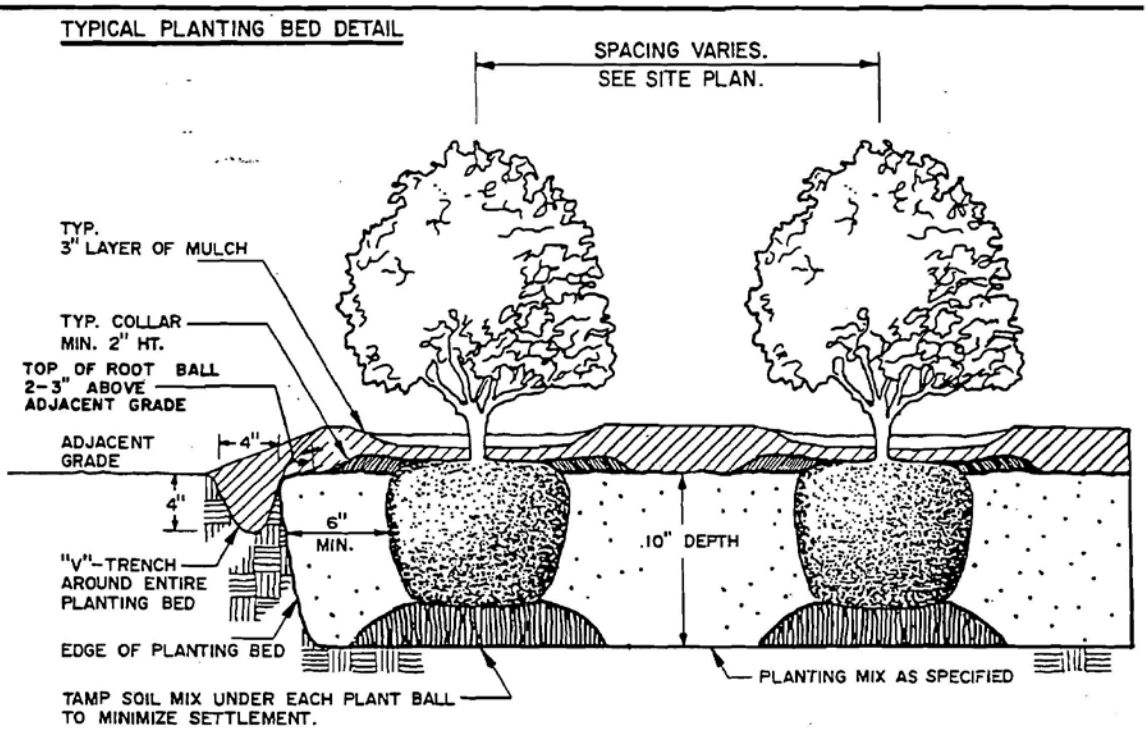
NOTES

1. OMIT COLLAR AROUND SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
2. INSTALL TOP OF PLANT BALL 2-3" ABOVE FINISH GRADE.
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND PLANT BALL.
4. SOAK PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
5. SEE SPECIFICATIONS FOR OTHER PLANTING REQUIREMENTS.

	SHRUB PLANTING DETAIL	PLATE NO.	STD. NO.
		6-11	

SPOTSYLVANIA COUNTY PLANNING DEPARTMEI

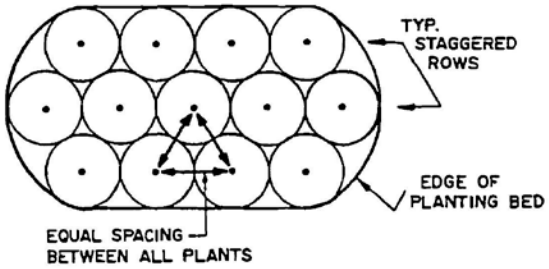
TYPICAL PLANTING BED DETAIL



NOTES

1. OMIT COLLAR AROUND EACH SHRUB WHEN IRRIGATION SYSTEM IS PRESENT.
2. INSTALL TOP OF PLANT BALL 2 3" ABOVE ADJACENT GRADE.
3. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
4. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.

TYPICAL PLANTING BED PLAN



TYPICAL BED MOUNDING

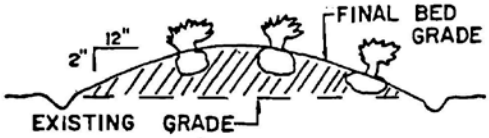
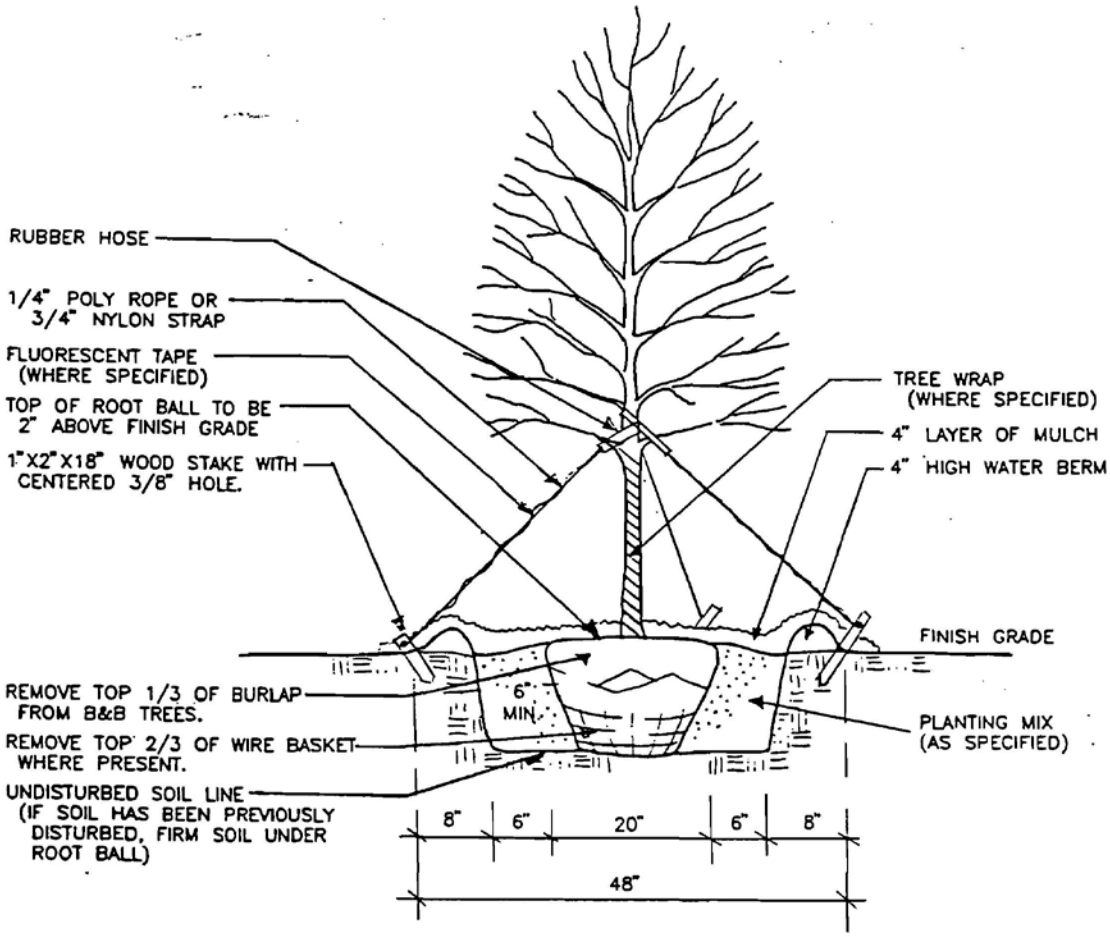


	PLATE NO.	STD. NO.
PLANTING BED DETAIL	6-12	

SPOTSYLVANIA COUNTY PLANNING DEPARTMEN

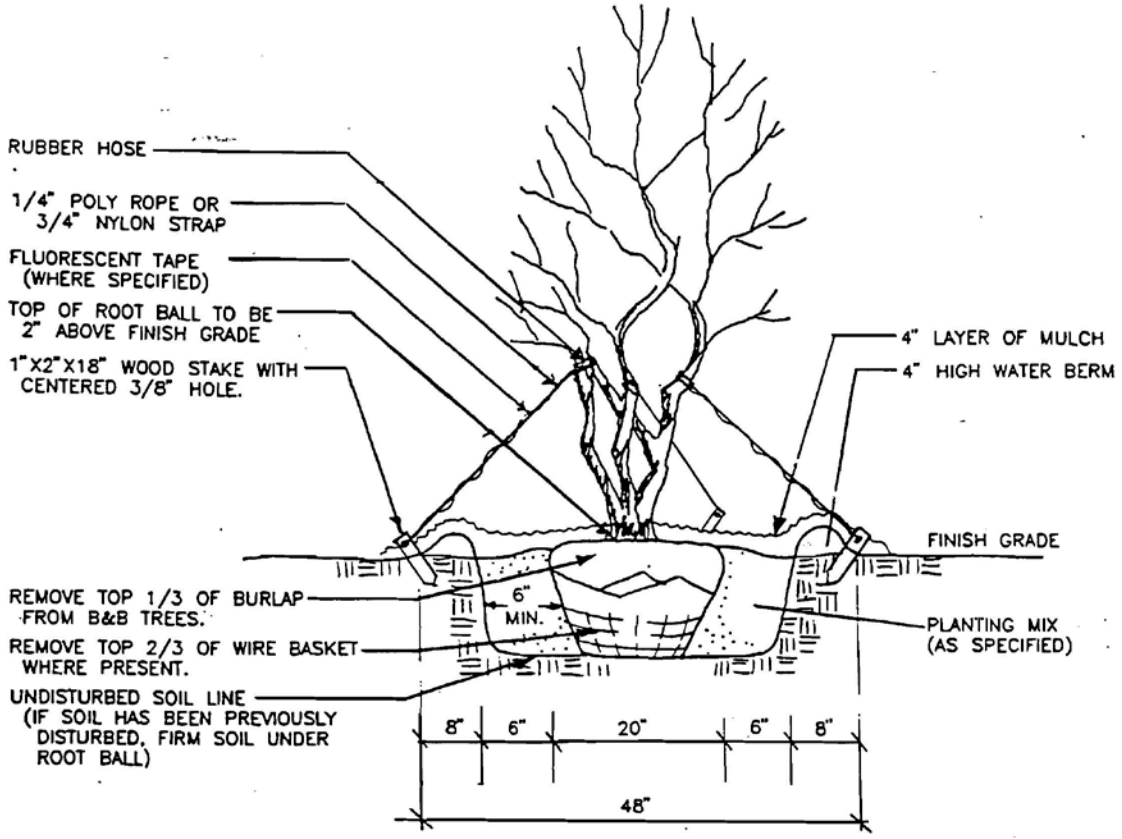


NOTES:

1. RUBBER HOSE MAY BE DELETED IF 3/4" NYLON STRAP IS USED.
2. REMOVE WIRE OR NYLON TWINE FROM BALL.
3. INSTALL TOP OF BALL 2" ABOVE FINISH GRADE.
4. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION
5. WRAP TREE TRUNK IF SPECIFIED ON PLANS. (SEE SPECS.)
6. LENGTH OF RUBBER HOSE TO BE 2/3 CIRCUMFERENCE OF TREE.
7. PLACE 2 WOOD STAKES PARALLEL TO STREET.
8. 4" SAUCER WILL BE OUTSIDE OF BACKFILL.
9. SEE SPECIFICATIONS FOR OTHER PLANTING REQUIREMENTS.

	SINGLE STEM TREE PLANTING DETAIL	PLATE NO.	STD. NO.
		6-13	

SPOTSYLVANIA COUNTY PLANNING DEPARTMEN

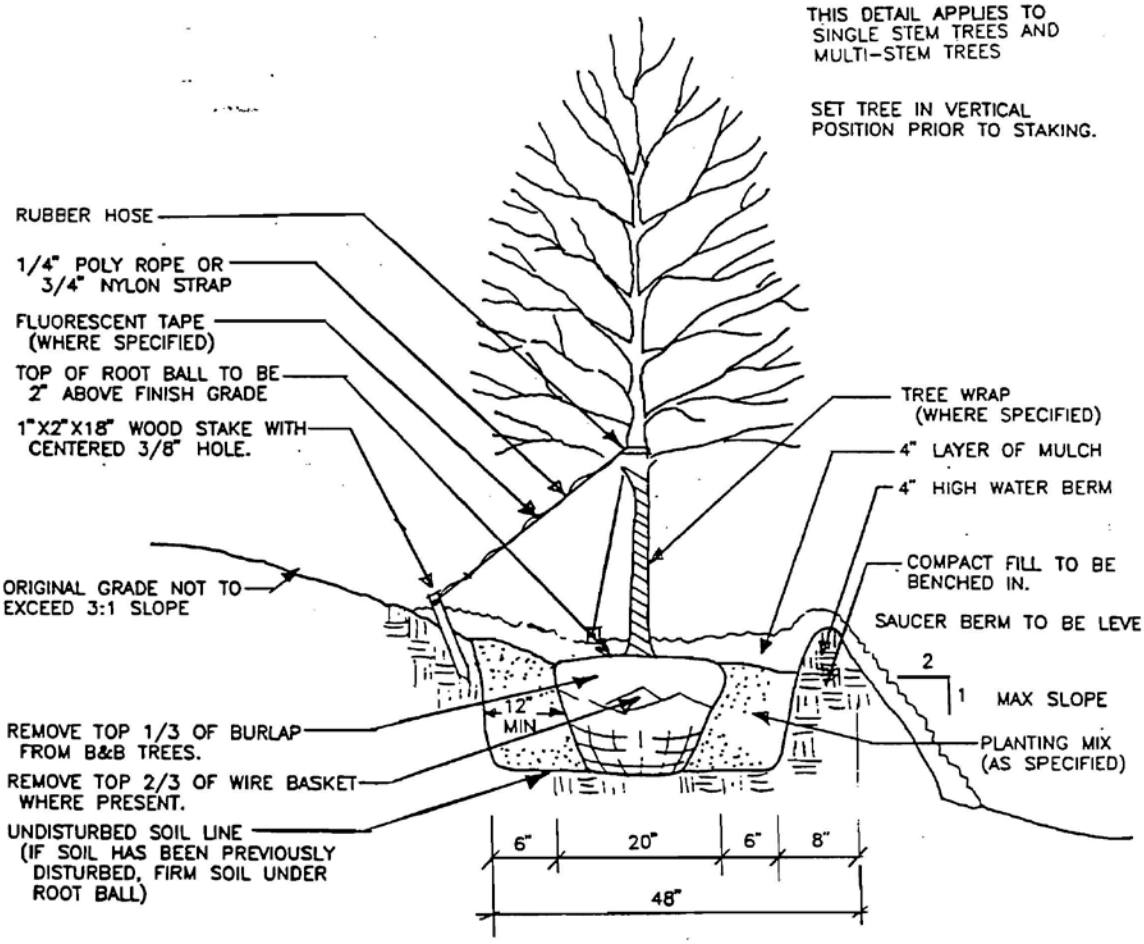


NOTES:

1. RUBBER HOSE MAY BE DELETED IF 3/4" NYLON STRAP IS USED.
2. REMOVE WIRE OR NYLON TWINE FROM BALL.
3. INSTALL TOP OF BALL 2" ABOVE FINISH GRADE.
4. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION
5. SOME SMALL MATURING TREES MAY NOT NEED STAKING. (SEE SITE PLAN)
6. LENGTH OF RUBBER HOSE TO BE 2/3 CIRCUMFERENCE OF TREE.
7. PLACE 2 WOOD STAKES PARALLEL TO STREET.
8. 4" SAUCER WILL BE OUTSIDE OF BACKFILL.
9. SEE SPECIFICATIONS FOR OTHER PLANTING REQUIREMENTS.

	MULTI–STEM TREE PLANTING DETAIL	PLATE NO.	STD. NO
		6-14	

SPOTSYLVANIA COUNTY PLANNING DEPARTME

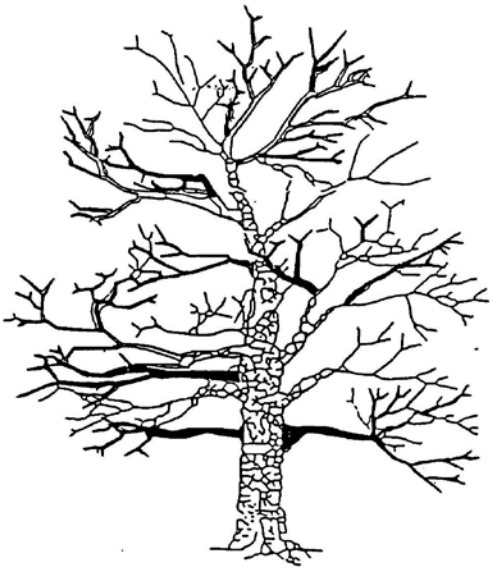


NOTES:

1. RUBBER HOSE MAY BE DELETED IF 3/4" NYLON STRAP IS USED.
2. REMOVE WIRE OR NYLON TWINE FROM BALL.
3. INSTALL TOP OF ROOT BALL 2" ABOVE ADJACENT UPHILL GRADE.
4. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION
5. SOME SMALL MATURING TREES MAY NOT NEED STAKING. (SEE SITE PLAN)
6. LENGTH OF RUBBER HOSE TO BE 2/3 CIRCUMFERENCE OF TREE.
7. PLACE 2 WOOD STAKES PARALLEL TO STREET.
8. 4" SAUCER WILL BE OUTSIDE OF BACKFILL.
9. WRAP TREE TRUNK IF SPECIFIED ON PLANS. (SEE SPECS)
10. SEE SPECIFICATIONS FOR OTHER PLANTING REQUIREMENTS.

	TREE PLANTING ON SLOPE DETAIL	PLATE NO.	STD. NO
		6-15	

SPOTSYLVANIA COUNTY PLANNING DEPARTMI

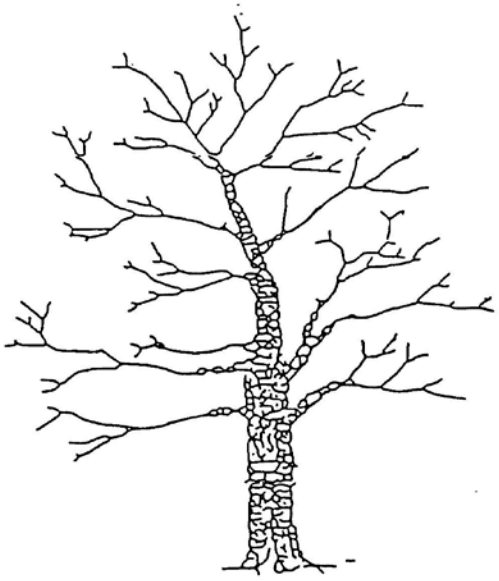


BEFORE PRUNING

Branches to be pruned are shown in outline. Cuts are to be made as shown in Plate No. 7-12.

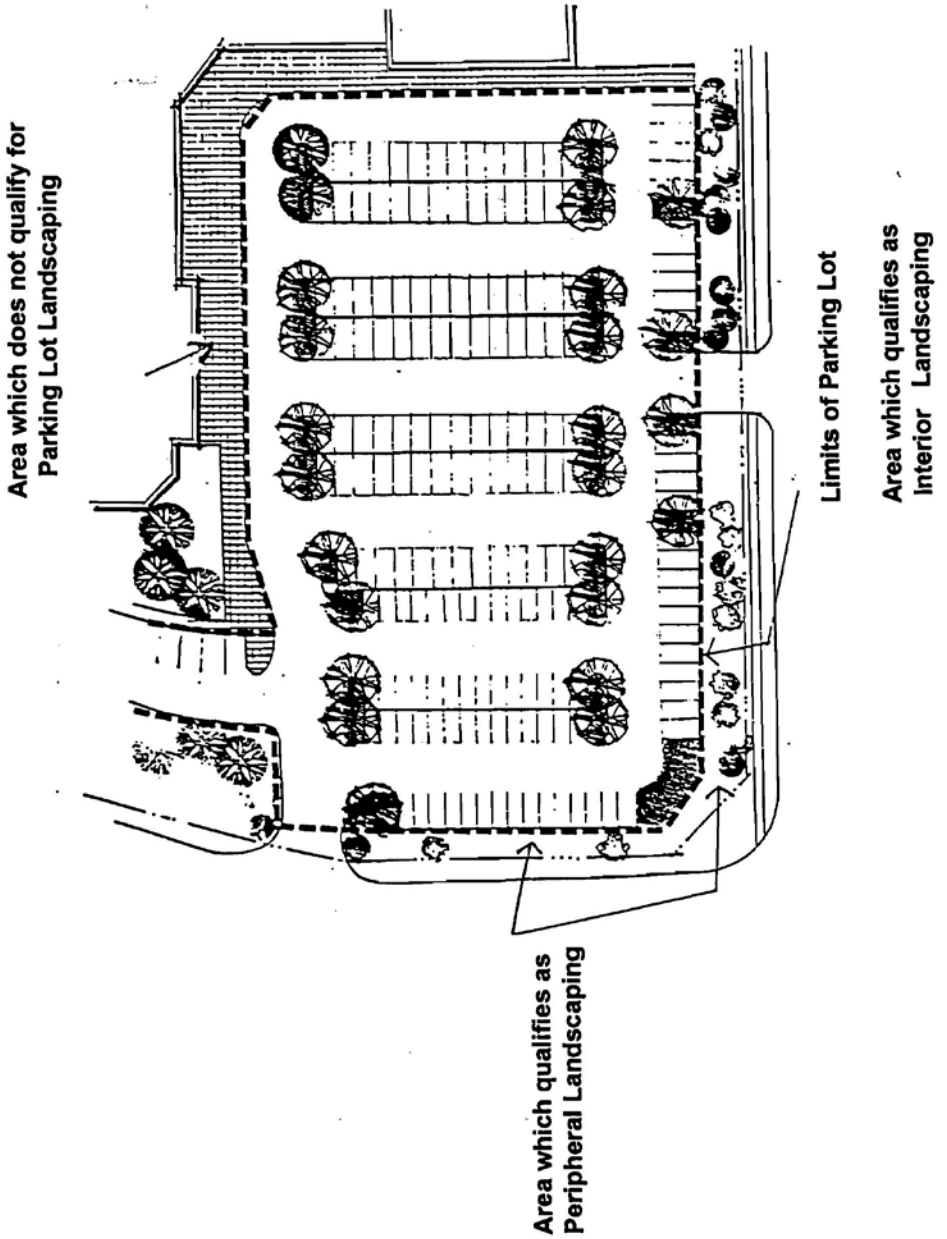
AFTER PRUNING

Covering pruning cuts with tree paint is not recommended



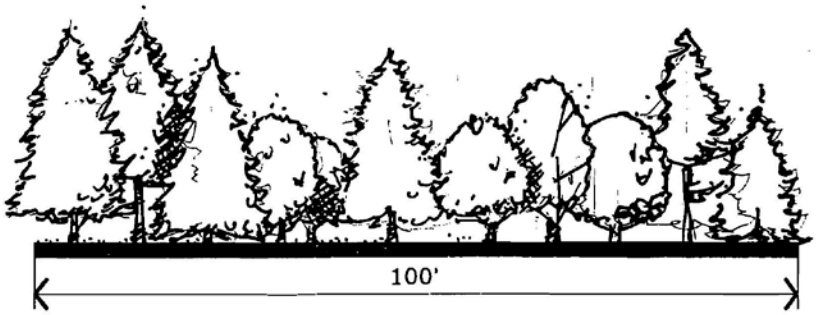
CROWN REDUCTION DIAGRAM FOR TREE PRESERVATION	PLATE NO.	STD. NO.
	6-16	

SPOTSYLVANIA COUNTY PLANNING DEPARTMEI

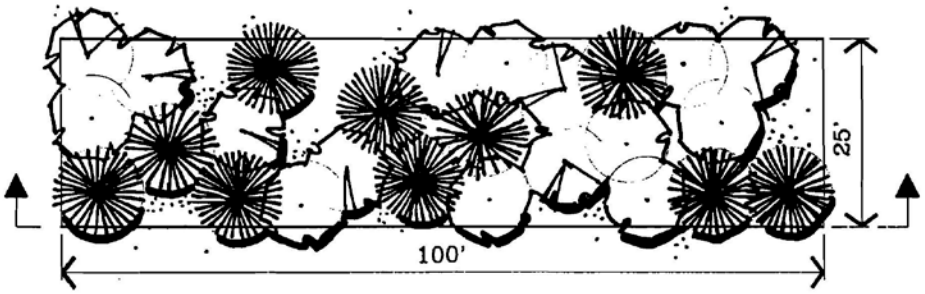


	PARKING LOT LANDSCAPING AREAS	PLATE NO.	STD. NO.
		6-17	

SPOTSYLVANIA COUNTY PLANNING DEPARTMEI



Elevation Scale: 1" = 20'



Plan View Scale: 1" = 20'

Transitional Screening 1 shall consist of an unbroken strip of open space a minimum of 25 feet wide and planted with:

(1) One large evergreen tree with an ultimate height of 40 feet or greater for every 10 linear feet, plus one medium evergreen tree with an ultimate height of 20 to 40 feet for every 5 linear feet.

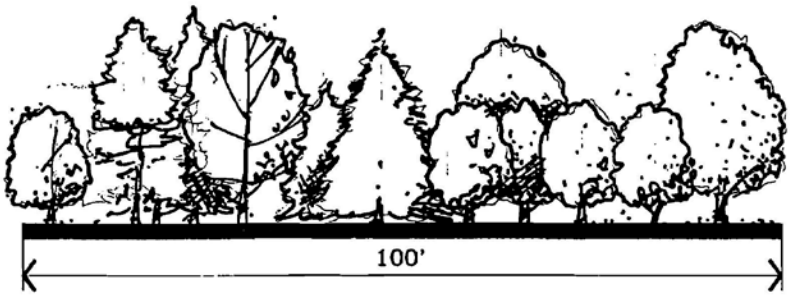
OR

(2) With approval of the Director, one large evergreen tree with an ultimate height of 50 feet or greater for every 15 linear feet, plus one medium evergreen tree with an ultimate height of 20 to 40 feet for every 5 linear feet.

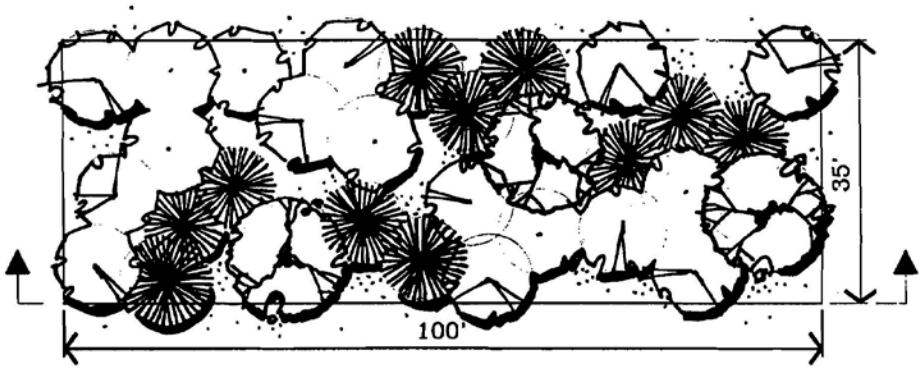
	TRANSITIONAL SCREENING 1	PLATE NO.	STD. NO.
		6-18	

SPOTSYLVANIA COUNTY PLANNING DEPARTME

Detail changing



Elevation Scale: 1" = 20'



Plan View Scale: 1" = 20'

Transitional Screening 2 shall consist of an unbroken strip of open space a minimum of 35 feet wide and planted with:

(1) One large evergreen tree with an ultimate height of 40 feet or greater for every 10 linear feet, plus one medium evergreen tree with an ultimate height of 20 to 40 feet for every 5 linear feet, plus one large deciduous tree with an ultimate height of 50 feet or greater for each 30 linear feet.

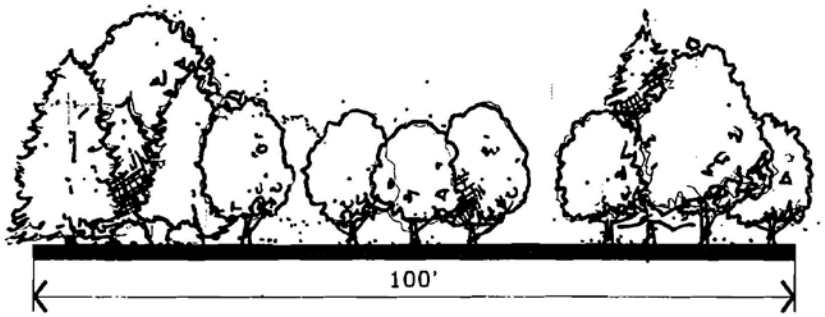
OR

(2) With approval of the Director, one large evergreen tree with an ultimate height of 50 feet or greater for every 15 linear feet, plus one medium evergreen tree with an ultimate height of 20 to 40 feet for every 5 linear feet plus one small deciduous tree with an ultimate height of 20 feet or less for each 12 linear feet.

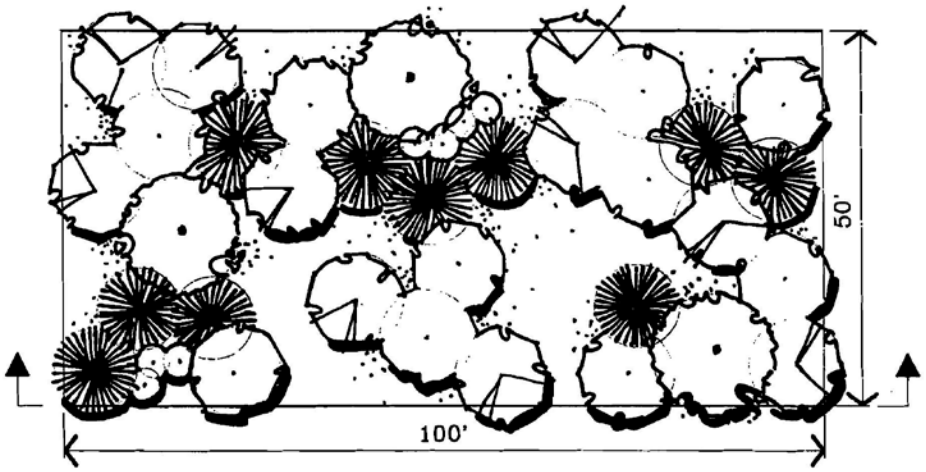
	TRANSITIONAL SCREENING 2	PLATE NO.	STD. NO
		6-19	

SPOTSYLVANIA COUNTY PLANNING DEPARTMI

Detail Changing



Elevation Scale: 1" = 20'



Plan View Scale: 1" = 20'

Transitional Screening 3 shall consist of an unbroken strip of open space a minimum of 50 feet wide and planted with:

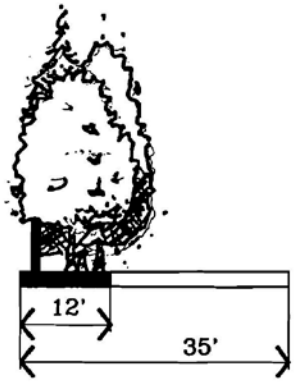
(1) One large evergreen tree with an ultimate height of 40 feet or greater for every 10 linear feet, plus one medium evergreen tree with an ultimate height of 20 to 40 feet for every 5 linear feet, plus one large deciduous tree with an ultimate height of 50 feet or greater for each 30 linear feet, plus one medium evergreen shrub with an ultimate height of 12 feet or less for every 15 linear feet.

OR

(2) With approval of the Director, one large evergreen tree with an ultimate height of 50 feet or greater for every 15 linear feet, plus one medium evergreen tree with an ultimate height of 20 to 40 feet for every 5 linear feet plus one small deciduous tree with an ultimate height of 20 feet or less for each 12 linear feet, plus 7 medium evergreen shrubs with an ultimate height of 12 feet or less for each 10 linear feet.

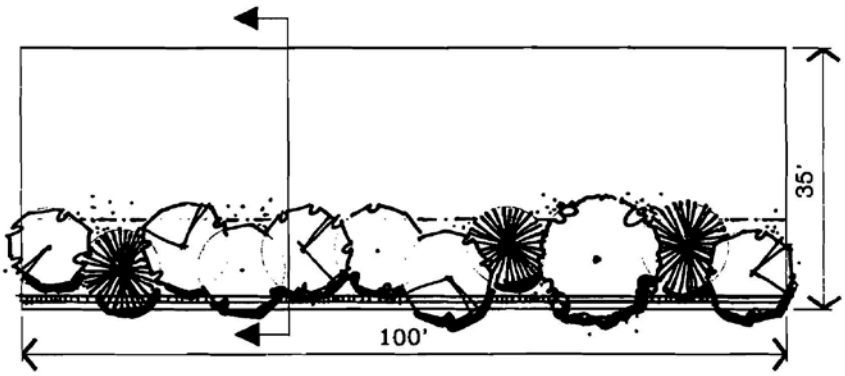
	TRANSITIONAL SCREENING 3	PLATE NO.	STD. NO
		6-20	

SPOTSYLVANIA COUNTY PLANNING DEPARTME



Elevation

Scale: 1" = 20'



Plan View

Scale: 1" = 20'

The transitional Screening yard width and planting requirements may be reduced as much as two-thirds (2/3) where the developer chooses to construct a seven (7) foot brick or architectural block wall instead of the lesser barrier indicated by the matrix. This wall may be reduced to a height of six (6) feet where the Director deems such a height will satisfy the purpose and intent of this Division.

	MODIFIED TRANSITIONAL SCREENING YARD	PLATE NO.	STD. NO.
		6-21	

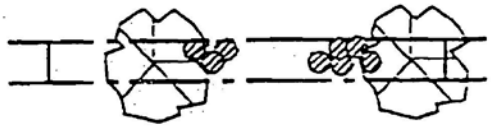
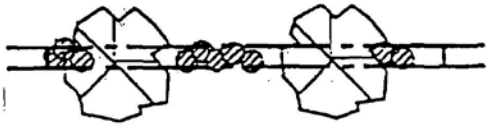
SPOTSYLVANIA COUNTY PLANNING DEPARTME

Tree Key

Canopy (Medium or Large Deciduous)

Understory (Small or Medium Deciduous)

Buffer A

Plant Material/100'	Width	
1.4 Canopy	15 feet	
1.6 Canopy	10 feet	
2 Canopy	5 feet	

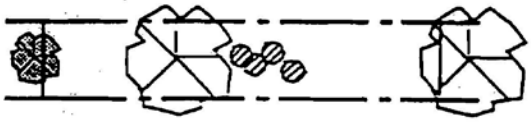
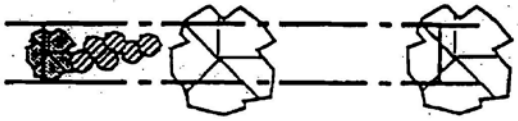
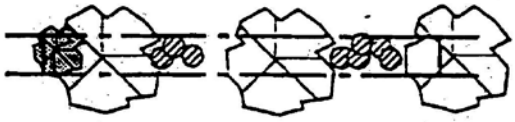
	Street Buffer A	PLATE NO.	STD. NO.
		6-22	

Tree Key

Canopy (Medium or Large Deciduous)

Understory (Small or Medium Deciduous)

Buffer B

Plant Material/100'	Width	
1.2 Canopy 0.4 Understory	20 feet	
1.5 Canopy 0.6 Understory	15 feet	
2.4 Canopy 0.8 Understory	10 feet	
3 Canopy 1 Understory	5 feet	

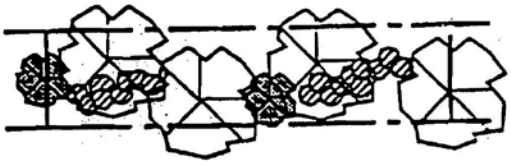
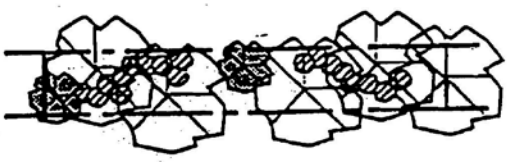
	Street Buffer B	PLATE NO.	STD. NO
		6-23	

Tree Key

Canopy (Medium or Large Deciduous)

Understory (Small or Medium Deciduous)

Buffer C

Plant Material/100'	Width	
3.5 Canopy 1.4 Understory	25 feet	
4 Canopy 1.6 Understory	20 feet	
4.5 Canopy 1.8 Understory	15 feet	
5 Canopy 2 Understory	10 feet	

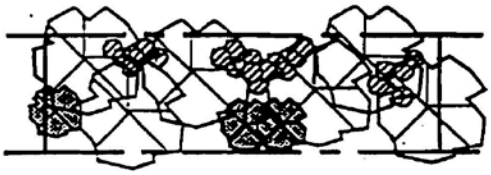
	Street Buffer C	PLATE NO.	STD. NO.
		6-24	

Tree Key

Canopy (Medium or Large Deciduous)

Understory (Small or Medium Deciduous)

Buffer D

Plant Material/100'	Width	
4.8 Canopy 2.4 Understory	35 feet	
5.4 Canopy 2.7 Understory	30 feet	
6 Canopy 3 Understory	25 feet	
6.6 Canopy 3.3 Understory	20 feet	

	Street Buffer D	PLATE NO.	STD. NO.
		6-25	

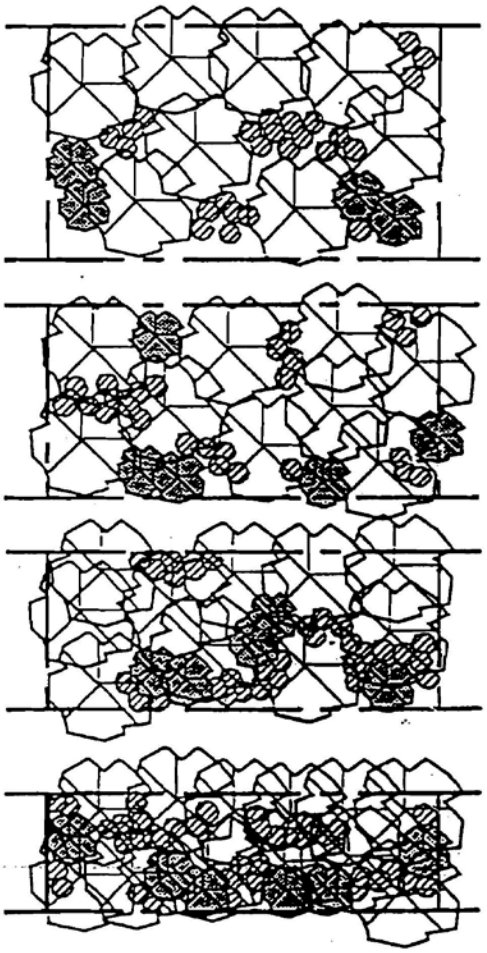
Tree Key

Canopy (Medium or Large Deciduous)

Understory (Small or Medium Deciduous)

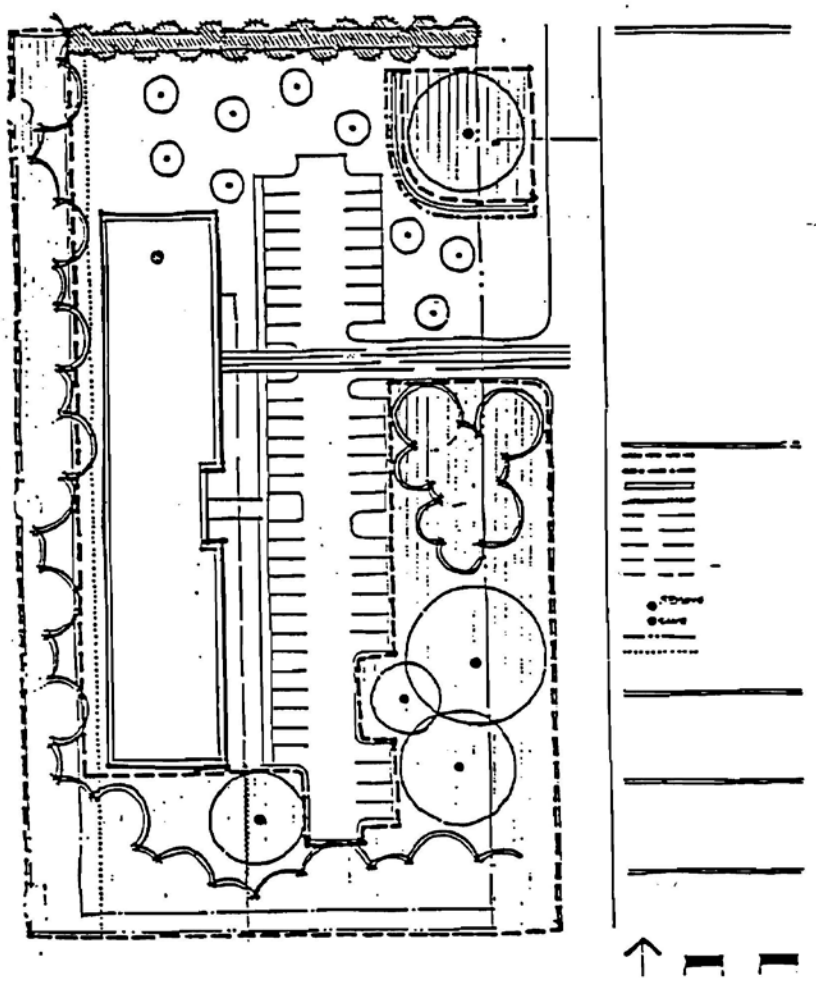
Buffer E

Plant Material/100'	Width
8 Canopy 4 Understory	60 feet
9 Canopy 4.5 Understory	50 feet
10 Canopy 5 Understory	40 feet
12 Canopy 6 Understory	30 feet



	Street Buffer E	PLATE NO.	STD. NO
		6-26	

A typical plan indicating the protection and preservation of trees within the development site in accordance with this Article.



Tree Preservation - Any area of a lot outside of the buildable area, within which existing trees and other natural vegetation are subject to regulation pursuant to Article 6-5.5 and must be clearly delineated on an approved landscape plan in order to be considered for tree cover credit.

	GENERAL TREE PRESERVATION AND PROTECTION PLAN	PLATE NO.	STD. NO.
		6-27	

SPOTSYLVANIA COUNTY PLANNING DEPARTME