



# Planting Manual

2015 2nd Revised Edition



**LEXINGTON**

Prepared By THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT

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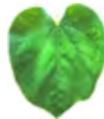
# Document Navigation

This is an Interactive PDF, meaning that this Planting Manual has been designed for an “interactive” user-experience. See the description below to learn how to engage the 3 buttons within the footer area to go to ‘Next Page’, ‘Previous Page’, and up to ‘Table of Contents’.

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I

## INTRODUCTION



## **INTRODUCTION**

This *Planting Manual* has been written to provide information to the community to assist in the installation of plant materials in the public right-of-way, on private property, and in open spaces. The current manual supersedes the prior 1983 *Planting Manual* with current information and practices which have been brought about in part by new ordinances or regulations. It reflects current horticultural practices as well as local availability of landscape materials. In its preparation, emphasis has been placed on the following concepts:

- All plant materials should be hardy and as trouble-free as possible.
- You are encouraged to use native species.
- Use species that are tolerant of urban conditions.
- Plants that overgrow areas need to be replaced with smaller species.
- Do not use plant material that is short-lived and/or has a tendency to cause problems such as damage to underground utilities.
- Do not use invasive species.

Another consideration is the appropriateness of use. A strong attempt has been made to determine which types of plant materials will accomplish specific goals. For example, specific plant materials are identified to be used for street trees or screening. In summary, the right plant material, the right location, the right technique.

Trees and shrubs designated as “native” in this manual are species that are found naturally in one or more of the physiographic regions within the Commonwealth of Kentucky (Bluegrass, Knobs, Appalachian Plateaus, Cumberland Mountains, Pennyrile, Shawnee Hills, and Mississippi Embayment). In the interest of providing for greater diversity within our urban forest, the list was not limited to only Bluegrass Region species.

The *Planting Manual* is twofold in purpose. The first objective is to inform the general public about plant materials and characteristics for public right-of-way, private property, and open spaces. *Under current ordinances, it is the responsibility of the abutting property owner to plant, maintain, remove, and replace street trees.* This *Planting Manual* will help in determining: what kind of tree to plant, how to care for the tree, where and when it should be planted, and how to prune it. There are suggested plants to consider for planting in other parts of your property. The plant list contains screening and perimeter plantings, and desired plants for open space areas. The plants for open space use that are recommended are not for Greenway Use designated as such by the Lexington-Fayette Urban County Government.

The second objective is to ensure that the intent of the Landscape Buffer section of the *Zoning Ordinance* and *Subdivision Regulations* is being met. The *Planting Manual* provides specifications for plant materials, a list of acceptable plants with information on landscape design, plant characteristics, and uses. There are also recommendations and guidelines on street tree planting, how to deal with plants in utility easements, and techniques for tree preservation.

**In order to clarify the relationship of the *Planting Manual* to requirements of the *Zoning Ordinance* and *Subdivision Regulations*, the following excerpts from the latter are included.**



**A. ZONING ORDINANCE – ARTICLE 18:**

**LANDSCAPE AND LAND USE BUFFERS**

1-1 INTENT – The intent of this article is to improve the appearance of vehicular use areas (VUAs) and property abutting public rights-of-way; to require buffering between incompatible land uses; and to protect, preserve and promote the aesthetic appeal, characteristics and value of the surrounding neighborhoods; to promote public health and safety through the reduction of noise pollution, air pollution, visual pollution, air temperature, and artificial light glare.

1-2 SITES AFFECTED

18-2(a) New Sites – No new site development, building, or structure shall hereafter be constructed or vehicular use area created or used unless landscaping is provided as required by the provisions of this Article.

18-2(b) Existing Sites – No building, structure, or vehicular use area (VUA) shall be expanded, moved, or removed and/or reconstructed unless the minimum landscaping required by the provision of this article is provided for the property to the extent of its alteration or expansion, but not for the entire property.

18-2(c) Change of Use – No use shall be changed to another use for which *Zoning Ordinance* requires additional parking over and above that required for the previous use, unless vehicular use area perimeter landscaping as required by this Article is provided for such additional parking. The provisions of this section shall be effective regardless of whether or not new construction will be necessary to meet the parking requirements, such additional required parking shall be deemed to be on the perimeter for as much as possible of the existing vehicular use area. Where the previous use had no required parking, perimeter landscaping shall be provided for the entire vehicular use area serving the new use. Interior landscaping shall not be required where only the use of the property is changed and no new construction or reconstruction is proposed.

18-2(d) Change of Zone – No use of an existing building, structure, or vehicular use area shall be commenced subsequent to change in zoning unless property perimeter landscaping as required herein has been provided.

1-3 WHERE LANDSCAPE MATERIALS REQUIRED – This section describes the minimum requirements that shall be met in regard to interior and perimeter landscaping for vehicular use areas, perimeter landscaping for non-compatible land use areas, and landscaping for service areas.

**B. ZONING ORDINANCE – ARTICLE 26:**

**TREE PROTECTION STANDARDS**

26-1 PURPOSE – The Lexington-Fayette Urban County Government recognizes the importance of trees as a vital component in counterbalancing the effects of an urban setting by providing cooling shade, by reducing noise and glare, by significant contribution to urban aesthetics, by improving air quality through carbon dioxide reduction and replenishing oxygen to the atmosphere, by improving surface drainage and reducing the effects of storm drainage flooding, by filtering non-point source pollution from area streams, by stabilizing soil thereby minimizing erosion, and providing habitat for wildlife. The purpose of this article is to establish standards and procedures for county wide tree protection and planting in new developments.



26-3 APPLICABILITY OF STANDARDS – The standards in this article shall be applied to all major subdivision and development plans. All developments shall be required to demonstrate compliance with these standards through either preservation of healthy trees present on the site or, if sufficient existing trees to be preserved do not meet these standards, through planting of new trees in accordance with this article. No development plan or subdivision plan shall be approved unless it is in compliance with the standards herein (see Article 26-5(c), Agricultural Standard Exemptions). Any areas that qualify as Environmentally Sensitive Areas under Article 6-10 of the Subdivision Regulations will be subject to the more restrictive regulations under that section.

26-4(c) FINAL DEVELOPMENT PLAN AND PRELIMINARY SUBDIVISION PLAN

REQUIREMENTS – A Tree Preservation Plan (TPP) shall be required to be filed as a part of any initial application for approval of a preliminary subdivision or final development plan. If the TPP is not provided at the time of filing in a full and complete form, the plan application shall not be considered as properly filed and may be rejected for submittal by the Division of Planning. This report shall contain the following map and text information at a minimum:

1. The information contained in the Tree Inventory Map, in a final form based upon formal field review information obtained since the preliminary development plan.
2. Proposed tree protection areas, including required buffers.
3. Proposed tree removal areas, including justification for removal and any mitigation measures to be taken.
4. Generalized planting plan and location for new trees as required in this Article (including trees required to satisfy other LFUCG landscaping requirements – see Articles 26-5(a) and 26-7). Sites not required to prepare a landscape plan per Article 18 of the Zoning Ordinance shall show planting requirements per the LFUCG *Planting Manual* and/or the LFUCG Stormwater Manual for riparian planting areas.
5. Sufficient information on proposed limits of grading, cut and fill areas, equipment storage areas, retaining walls, and, where appropriate, proposed detention areas, lot locations and similar activities, so that the impact on tree areas can be assessed.
6. Existing and preliminary easement locations for utilities and other purposes including types; i.e., above or underground.
7. Post-development canopy coverage and the methodology used under Article 26-5(d).

26-5(a) SITES WITH INSUFFICIENT TREES – It is recognized that some sites do not have a sufficient number of trees to meet the tree canopy standards as established above. In those situations, the existing trees on the site are to be retained to the maximum extent feasible, and additional trees are to be planted to meet the minimum canopy requirements. Any trees required to be planted and maintained by any other Article of the Zoning Ordinance and Land Subdivision Regulations shall be counted in determining compliance with the provisions of this section. Street trees required by the Subdivision Regulations, trees required by Article 18 of the Zoning Ordinance, and other trees planted on the property may be counted toward the canopy coverage requirements with the credit to be as established by Section 26-5(e), as well as all trees planted in and adjoining retention basins, when done in accordance with the LFUCG Stormwater Manual. Floodplain reforestation, when done in accordance with said Stormwater Manual, may be fully counted as the actual square footage of the land area to be reforested.

26-5(e) CALCULATION OF TREE CANOPY COVER – Tree canopy cover may be determined by one of the following:



1. Existing Canopy Area:

- a. By calculating the percent of cover in relation to developable area using aerial photography interpretation.
- b. By field measurement of the square footage of the existing tree canopy using the following formula:  
 $C = \pi R^2$ , where  
 $C =$  canopy area in square feet, and  
 $R =$  the radius of the canopy measured in feet

2. New Canopy Credit

In areas where the predevelopment canopy is less than the canopy required by Article 26-5, a landscape credit shall be used to determine post development canopy for trees that are to be planted. Trees shall be planted in accordance with the landscaping requirements set forth in Article 18-4(c) PLANTS, of the Zoning Ordinance and the LFUCG *Planting Manual* for the following sizes of trees. Landscape credit is given for planted trees only. The following credits represent categories of trees only, not installation sizes:

- a. Each Small Tree – 100 square feet
- b. Each Medium Tree – 400 square feet
- c. Each Large Tree – 750 square feet

## C. SUBDIVISION REGULATIONS

### 6-910 LANDSCAPE AND TREE PLANTING-STANDARDS

6-910(a) Landscape and Land Use Buffers – All land subdivision plans shall conform to the requirements of Article 18 of the *Zoning Ordinance*.

6-910(b) Street Tree Plantings – Shall be required on all collector and local streets in all new residential subdivisions in accordance with the following provisions:

- (1) Type and Number – Trees to be planted shall be deciduous and shall have a root growth pattern that minimizes potential damage to street and utility facilities. A listing of approved trees is included in the *Planting Manual*. Trees shall be required at the standard of one (1) tree per 45 feet of street frontage for large trees, 35 feet for medium size trees, and 25 feet for small trees, as determined by the Urban County Government Landscape Examiner.
- (2) Location Criteria – Two options shall be permitted at the developer’s discretion. The first option shall be to place the trees within a 5-foot planting easement to be located immediately adjacent and parallel to the public right-of-way. The second option shall be to plant the trees within the public right-of-way between street curb and the sidewalk in the area commonly called the “utility strip.”
- (3) Planting Requirement – The cross section to be utilized and tree type shall be determined at the time of commission action on the preliminary subdivision plan, and shall be reflected on the final subdivision plan. The final subdivision plan shall also contain a note stating that the street tree required herein either within the right-of- way or designated easement shall be maintained by the property



owner in accordance with Section 6-10(b)(4) herein below. A note stating that no tree may be removed without the approval of the LFUCG Urban Forester shall also appear on the final plan.

- (4) Maintenance – The owner of the property shall be responsible for the continued proper maintenance of all street trees and shall keep them in proper, neat, and orderly appearance free from refuse and debris, at all times. Topping trees or the severe cutting of live limbs to stubs, removing more than the current season's growth on the exterior of the tree's crown to such a degree that the canopy has been changed shall not be permitted for the maintenance of trees required by this Section.

In meeting the intent of the *Zoning Ordinance* and *Subdivision Regulations*, developer shall use the Plant Materials List in the *Planting Manual*. The following excerpt from Article 18 of the *Zoning Ordinance* present the intent more clearly.

**ZONING ORDINANCE - ARTICLE 18-6:**  
**PLANTING MANUAL AND PLANT MATERIALS LIST**

Developers shall refer to the *Planting Manual* which is available at the office of the Division of Planning for minimal requirements in meeting provisions of this Article. Any materials, which are not on the Plant Materials List, shall be considered on an individual basis to determine the suitability of the specific plant in the proposed location. A plant not on the Plant Materials List shall be permitted only upon the expressed approval of the appropriate agency.

**EXPLANATORY COMMENTS ON ARTICLE 6-10 OF THE SUBDIVISION REGULATIONS LANDSCAPE AND TREE PLANTING STANDARDS:**

One should note that this section applies to the planting of street trees in conjunction with new development, rather than previously developed property. The intent of specifying street trees on the preliminary subdivision plan is to create a unified design for the subdivision, thus specific trees should be noted by the plant name. The choice of plants shown on the plan is to be required in development; therefore, acceptable alternatives should be identified when preparing the plan. Design consideration should be given to a list large enough for flexibility in planting, yet small enough for unity in design. Developers are encouraged to plant street trees in a tree planting easement behind the sidewalk (see 6-10(b)(2) and to protect newly planted trees from construction injury. This list and specific trees noted on the plan are reviewed by the LFUCG Urban Forester for the Planning Commission as part of the subdivision plan review process. It is the responsibility of the developer to plant, maintain or replace street trees planted to fulfill these requirements for the first year. Also, during the first year after planting, the nursery or developer who installs the plant shall provide a one-year guarantee. After that year period, it is the responsibility of the property owner to maintain street trees. Once property owners assume responsibility, the provisions of Article 17(B) of the Code of Ordinances regulate treatment of street trees. The LFUCG Urban Forester administers and enforces the ordinance which requires property owners to maintain street trees. Any proposed street tree plantings and/or removals require a permit to be issued by the Urban Forester.



**NOTE: Call Before You Dig: 1-800-752-6007 or 811 (This is to locate underground utility lines and avoid causing dangerous situations).**

#### UNACCEPTABLE PLANT MATERIALS

The Acceptable List is not all inclusive. However, there are plant materials that, due to their longevity, problems with underground utilities, undesirable fruit/thorns or susceptibility to disease shall not be used in any circumstances to meet any ordinance requirements and are annotated in the Unacceptable Plant List. Under no circumstances will these plants be approved.

#### **D. PLANT LIST AND NOMENCLATURE**

##### Plant List

Plants shall be listed in alphabetical order according to scientific name. Directly below the scientific name or names are cultivars that shall be considered acceptable. In the appendix of the *Planting Manual*, an index by scientific names and common names of acceptable and unacceptable plants are listed in alphabetical order for quick reference.

All plant material shall be divided into size groups as used by the Landscape Ordinance:

- Group "A": LT - Large Trees (Over 50 Feet in Height)
- Group "B": MT - Medium Trees (25 to 50 Feet in Height)
- Group "C": LST - Large Shrubs or Small Trees (10 to 25 Feet in Height)
- Group "D": MS - Medium Shrubs (6 to 10 Feet in Height)
- Group "E": SS - Small Shrubs (4 to 6 Feet in Height)
- Group "F": LS - Low Shrubs (1-1/2 to 4 Feet in Height)
- Group "G": GC - Ground Cover (Below 1-1/2 Feet in Height)

The sizes of individual plant material shall be based on the normal size commonly found in the urban landscape, not the size frequently found in the wild. Michael A. Dirr's *Manual of Woody Landscape Plants*, current edition, shall be used as the main source to determine plant sizes.

All acceptable plant material shall be hardy to central Kentucky (USDA Zone 6A), with minimal winter damage. All acceptable plants shall be relatively maintenance free, unless stated elsewhere in the *Planting Manual*. All plant material shall be suited to full sun/partial shade and tolerate slightly acid/neutral soil. All acceptable plant material shall be non-invasive. Native plants are preferable.

Information on each plant is divided into two categories – plant characteristics and plant uses. Plant characteristics refer to the physical attributes of a plant, including height, spread, form, urban tolerance, disease and insect tolerance, and density (for shrubs only). Plant uses refer to the appropriate use of trees; this includes street trees, property perimeter trees, vehicular use area perimeter trees, vehicular use area interior trees, as well as use in the sight triangle, utility easements, naturalized planting in open spaces, and possibly as a screen. Uses involving shrubs include property perimeter screening, service area screening, as well as use in the sight triangle, as a ground cover, and in open spaces.

All plant material not in the acceptable plant list shall be considered on an individual basis to determine the suitability of that specific plant. However, any



plant material on the unacceptable plant list shall not be used in any circumstance. A plant not otherwise listed shall be accepted only upon the expressed approval of the appropriate authority. The decision of the suitability of such a plant shall be based on unique cultural conditions, sites with limited space, and possible combination of plants. Unique or unusual circumstances that might have a bearing on the suitability of plants shall be presented to the LFUCG Urban Forester and/or Division of Building Inspection for their consideration. Plant material in the acceptable plant list shall be used according to the specific use categories annotated in the *Planting Manual*. If an acceptable plant is not annotated in the specific categorical use, that species is considered unacceptable for that purpose.

### Plant Nomenclature

The names of plants given in this section conform to those set forth in *Standardized Plant Names*, 1942 edition, prepared by the American Joint Committee on Horticulture Nomenclature, and the USDA Plant Database available online at <http://plants.usda.gov/plants/index.html>. These sources are excellent references and are approved by the American Committee on Horticulture, Society of American Foresters, and the American Society of Landscape Architects.

Plant names that are not included will conform to those set forth in *Hortus III*. Names of plants not included in either source conform generally to those accepted in the nursery trade.

Each plant is identified by genus, species and variety or cultivar. Genus is a closely related group of plants with similar characteristics. Similarity of flowers and fruits is the most widely used feature although roots, stems, buds, and leaves are also used. Species is a subdivision for a genus and consists of plants with many more similarities than do the members of a genus.

Variety is a sub-classification of a species and refers to naturally occurring plants that display characteristics that are distinctly different from those of the species. A cultivar is also a sub-classification of a species and is similar in many respects to a variety, but is cultivated and is an abbreviation for cultivated variety. Unlike varieties, cultivars cannot be reproduced from seed and must be reproduced vegetatively.

Example:        Gleditsia..... Genus  
                      triacanthos..... Species  
                              var. inermis ..... Variety  
                                      ‘Shademaster’...Cultivar

In August 1990, the LFUCG Corridors Commission adopted a goal for Corridors projects to emphasize the unique Bluegrass landscape. One major objective is encouragement and re-establishment of native Bluegrass plant species. That objective is incorporated in this revised *Planting Manual*. It is strongly encouraged to incorporate the use of native vegetation in any planting design. For ease of determination, native species are indicated by an asterisk (\*) in this manual.

The list of species recommended here is more extensive than in the 1983 *Planting Manual* (which primarily discussed street trees) because some highway corridors and cloverleaves have conditions appropriate for species that may be unsuitable for street sides, and because open spaces and passive parks are



good locations for an even wider variety of plant materials. Some common native species have proven adaptable to infertile compacted soils and roadside slopes that are not able to be mowed and are recommended for use on such sites. Other native trees not suitable for streets because of fruits, nuts, or large seed pods are very desirable in naturalized parks and open spaces where such attributes encourage wildlife.



II

**PLANT USES**



## II **PLANT USES**

### **A. STREET TREES**

Most street tree plantings occur in urban areas where there is an intense use of the land. One major function of urban street trees is to provide a continuous, unified pattern throughout the urban landscape. Street trees reduce the massive scale of urban streets and add a touch of greenery to an otherwise concrete world. They are also used to soften the hard vertical lines of buildings. One of the most noticeable effects of street trees is the production of cooling shade. In addition to temperature reduction, glare, noise and air pollution also can be reduced through the introduction of street trees into the urban environment.

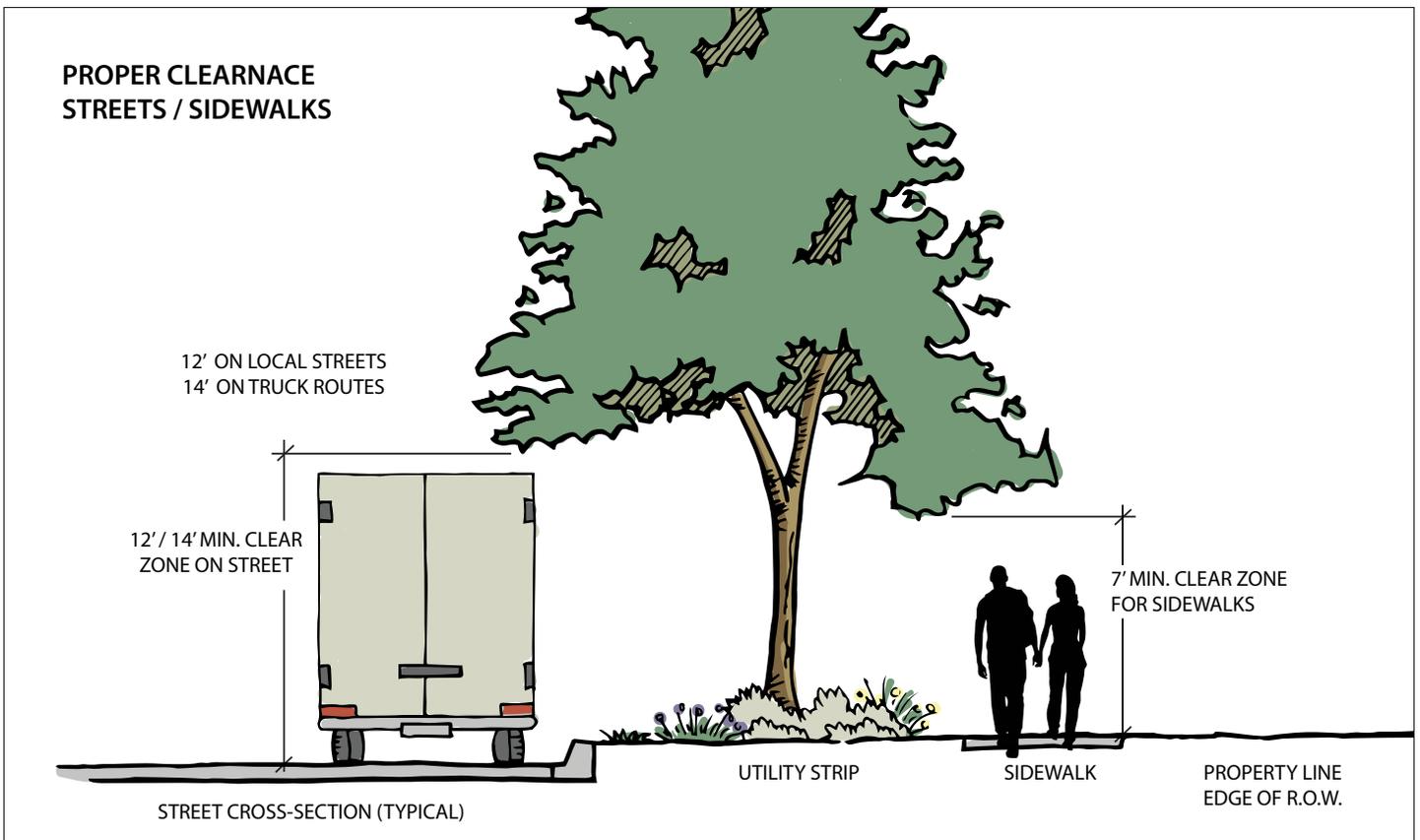
The majority of street trees are located in urban settings, and therefore, must be able to withstand urban stress. Urban stress is a combination of physical and cultural conditions that tend to restrict tree growth. Typical urban stress conditions include heat and drought, salt sprays used for de-icing, limited soil volume, compacted soils, adverse soils, and numerous types of air pollution. Street trees are usually unprotected from heavy storms and must be able to resist strong winds, snow, and ice. Urban stress conditions can vary from city to city and even within a city the conditions vary. The more hostile the environment, the more limited the selection of tolerant trees.

In addition to tolerance of urban stress, another important consideration is the degree of maintenance required. Trees which require high maintenance are very time-consuming and costly in the long run. Trees which constantly litter the ground can cause slippery conditions and prove to be a safety hazard. Trees relatively free of insect, disease and physiological problems shall be preferred for urban use if otherwise desirable.

Ideal street trees typically exhibit a straight trunk, rounded or upright oval form, and symmetrical branching pattern. Branching should be high enough to allow both vehicular and pedestrian passage. Branch height as measured from the ground to the lowest branch shall be a minimum of 7 feet over sidewalks, 12 feet on local streets, and 14 feet on truck routes. Although trees with naturally high branching patterns are preferred, trees with low branching patterns can be pruned to eliminate lower branches.



Diagram #1



Trees that have been limbed-up at least 5 feet may be located within in the sight triangle when approved by the Division of Traffic Engineering and the Division of Building Inspection. Acceptable trees are included in the plant list.

Trees shall be required at the standard of one (1) tree per 45 feet of street frontage for large trees, 35 feet for medium size trees, and 25 feet for small trees.

The desired form and spread is normally determined by the space available for development. Trees with oval to columnar forms shall be used for narrowstreets where space is limited.

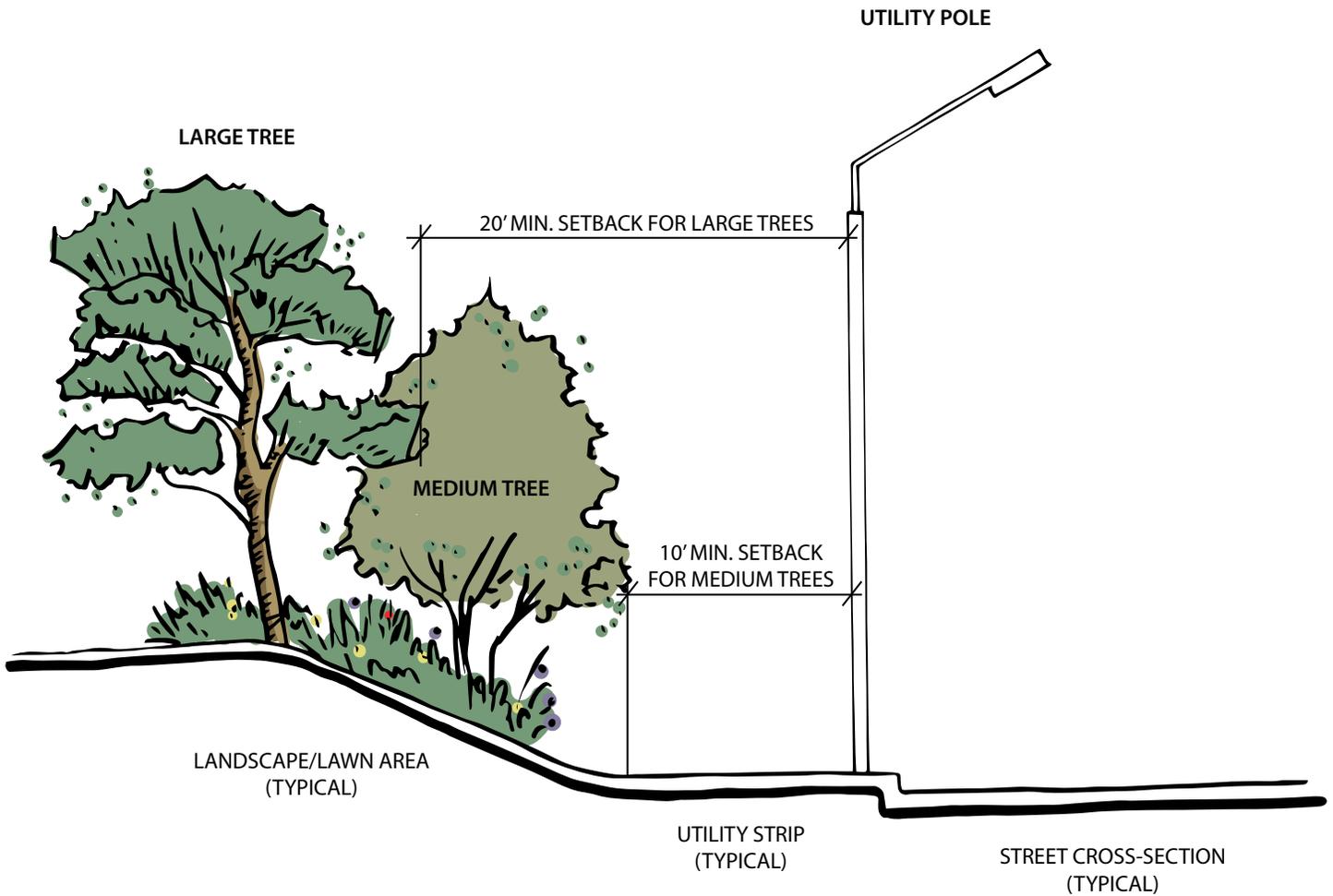
Ideal street trees shall be long-lived with a moderate growth rate. Street trees are required to be a minimum 1 ¾ inch diameter at time of planting.

Street trees in suburban areas do not face the same difficulties as those in high density urban areas, but their general requirements shall be essentially the same. Small flowering trees may be used effectively in conjunction with smaller buildings. Principal hazards that threaten suburban street trees include damage by cars, delivery trucks and snow removal equipment, abuse by animals and people and the widening of streets in the growing communities.

The proper placement of trees shall eliminate most of these hazards as well as eliminating interference with utility lines, street lighting, and trafficsignals.



Diagram #2



In addition to choice of species, the spacing between trees can be altered to add variation in height, form, texture, and color. A DIVERSITY IN THE SPECIES WILL ALSO REDUCE THE DANGER OF LOSING AN ENTIRE PLANTING OF SINGLE SPECIES. Entire monoculture stands can be devastated if hit by a blight, insect infestation, or some other condition to which it is susceptible.

To help insure that a street tree has the opportunity to develop an adequate root system without damaging sidewalks or curbs, a minimum planting strip width has been established. Refer to the specifications of the Street Trees Ordinance in Article 17B of the Code of Ordinances and Article 6-10 of Subdivision Regulations.

## **B. SIGHT TRIANGLE**

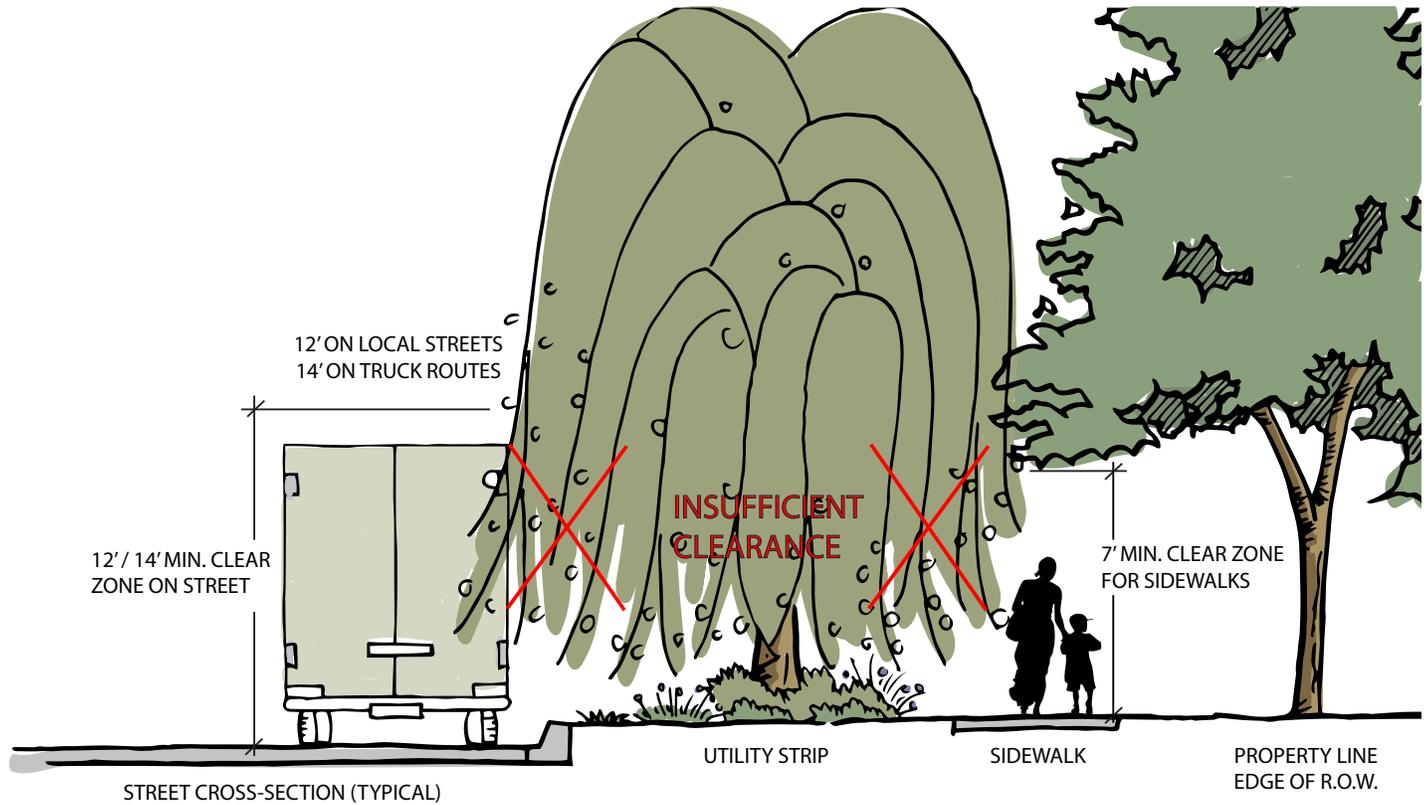
The use of plant material in a sight triangle is intended to provide aesthetic appeal while not unduly limiting or restricting visibility, whether as a pedestrian or a passenger in a vehicle. Plants shall not reduce or limit visibility to such an extent that a safety hazard is presented. Plants normally considered as effective screens shall be unacceptable for use in the sight triangle.

Trees used in a sight triangle shall have a minimum branching clearance of five feet from the ground to the first branch. Trees with a naturally high branching pattern are preferred, but trees with low branching may be pruned to eliminate lower branches. Trees with normally low branching patterns that would be adversely affected by heavy pruning shall be unacceptable. Trees with descending branches shall not be acceptable, (e.g. pin oak).

Refer to Article 3.3 of the *Zoning Ordinance* dealing with sight triangles for the sight distances at street and driveway intersections. Normally there can be no obstructions allowed in the sight triangle; however, trees can be planted when approved by the Division of Building Inspection and the Division of Traffic Engineering of the Urban County Government.



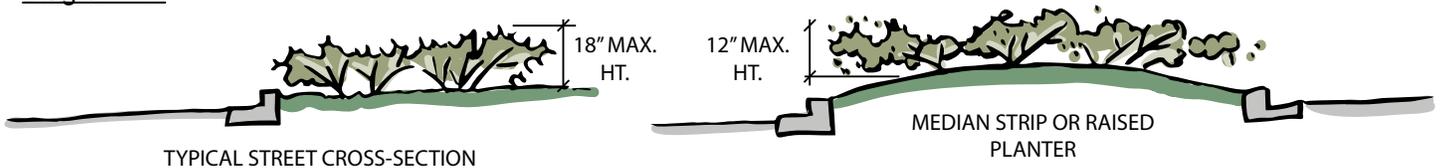
Diagram #3:



Do not plant street trees in the right of way within 75 feet of an intersection. Planting may be done within 75 feet of an intersection only behind the sidewalk.

All shrubs or groundcovers used in the sight triangle shall be a maximum of 18 inches tall. No large or medium shrubs shall be acceptable for use in the sight triangle because of height. Low shrubs shall be acceptable only if they do not exceed the 18-inch height limit. Shrubs that slightly exceed this height limit may be considered for use, but only with the approval of the Division of Building Inspection and the Division of Traffic Engineering. Plant materials used in medians or raised planters in the sight triangle shall be a maximum of 18 inches in height from the edge of the pavement.

Diagram #4:



### C. SCREENS

Screens are used as visual controls to block objectionable views, reduce glare and reflection, define and create outdoor space, provide a sense of privacy, and direct views in the landscape. Plants are also used as screens to control and reduce wind, control drifting snow, and in some cases reduce noise. Screens are usually designed to serve a functional use but they also have an aesthetic impact. Screen plantings are almost always mass plantings, typically arranged in a linear pattern. Massed plantings can have a tremendous visual impact on an area.

Ideal plantings for screens display narrow, upright forms which allow them to be planted closely together. The branching pattern shall be dense, fine textured, and branch all the way to the ground. The trees should be tough, durable, and relatively maintenance free. Evergreens create



the best screens, but are usually costlier and slower growing than deciduous plants. Both shall be acceptable if they have a minimum opacity of 70 percent during the summer and 50 percent during other times of the year.

Most large shrubs shall be acceptable for screening if they meet the opacity requirements. However, some species become open and large with the passing of years and shall be unacceptable as a screen to meet any ordinance requirement.

#### **D. PROPERTY PERIMETER SCREENING**

Property perimeter screens refer to screens used to minimize the impact between conflicting land uses. Acceptable plants shall meet opacity requirements and be a minimum of 6 feet in height. Potential plants shall be either large or medium shrubs, or evergreen trees.

#### **E. VEHICULAR USE AREA PERIMETER SCREENING**

Screening used as a buffer between any vehicular use area, including parking lots, access roads, or service roads, shall be referred to as a vehicular use perimeter screen. All acceptable plants shall meet the minimum sizes specified in Article 18-3(a)(2) of the Zoning Ordinances. Potential plants shall be either large, medium, or occasionally low shrubs; no other plant material shall be acceptable.

#### **F. SERVICE AREA SCREENING**

Screening used to minimize the impact of utility areas, such as dumpsters, is referred to as a service area screen. The average height of the plant material shall be a minimum of one foot more than the height of the surface to a maximum height of 8 feet. Potential plants include large and medium shrubs. No other plants shall be acceptable.

#### **G. INTERIOR LANDSCAPING FOR VEHICULAR USE AREAS**

This type of landscaping is intended to minimize the impact of large paved areas on the visual and macro climate environment. The clustering of contiguous trees dispersed throughout paved areas visually breaks up or screens the large open areas while the tree canopies will reduce heat build-up from the paving in summer months. Potential plants include trees from the large tree, medium tree, and large shrubs or small tree categories, which exhibit high branching characteristics. No other plant material shall be acceptable.

#### **H. OVERHEAD AND UNDERGROUND UTILITY COMPATABILITY**

Overhead utility lines can be incompatible with plant materials and require extensive trimming or topping in order to be safe. As a general rule only small species category trees should ever be planted near overhead utilities and set back 5 feet. Medium category species shall be set back no closer than 10 feet from overhead utilities. Large category species shall be set back no closer than 20 feet from overhead utilities.

To facilitate underground utility access, it is important to place plant material certain distances from underground utility lines. If material is placed too close to underground utilities access is hindered. Utility easements allow companies to remove the vegetation if obstructing line access. Also, if the material is planted too close, significant root damage could occur due to future trenching. Small trees should be placed no closer than 10 feet from underground utilities, medium trees 15 feet and large trees 25 feet.



## **I. GROUND COVER**

Ground covers are planted in beds or en masse and offer alternatives to grass in many situations. On hillsides, ground covers control erosion while eliminating dangerous mowing on slopes. Many ground covers survive in the shade, poor soils and other adverse conditions better than grasses. See the Acceptable Plant List for generally low lying plant materials which are acceptable for ground covers and for use in the sight triangle.

## **J. OPEN SPACE/GREENWAYS**

Open space areas are areas in city parks, greenways, riparian zones (areas adjacent to streams, creeks, lakes, ponds, and wetlands), and other large open spaces not constricted by urbanization. Many native species, due to the unique stresses of urbanization, are not suitable for street trees or other city uses but will thrive in open settings and are strongly recommended for use. Open space areas provide vital benefits to the community such as air pollution control, stormwater management, wildlife habitat, recreational opportunities, and aesthetic enhancement. Planting in open space areas requires specific reforestation and site preparation techniques and any person seeking to attempt such measures should seek technical assistance from the LFUCG Urban Forester, Kentucky Division of Forestry, or the Natural Resource Conservation Service. In some areas, however, open space designated by the Urban County Government as environmentally sensitive (riparian zones, forest stands etc.), native species are to be used only and must be coordinated and approved by the LFUCG Urban Forester.

## **K. ARTICLE 26 COMPLIANCE**

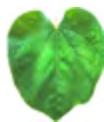
Article 26, the Tree Protection Ordinance requires additional plantings of trees in new developments which do not meet the canopy coverage requirements set forth in the Ordinance. The post development canopy coverage is first met with residual trees on site before development and must meet a minimum of 30 percent coverage of the net developable area in residential areas, 20 percent in commercial, and 10 percent in industrial areas.

The article requires the creation of a tree preservation plan and credits for tree planting to meet the canopy requirements. This manual designates specific planting requirements. The species are annotated in the plant lists in this manual and are subject to the approval of the appropriate authority.



III

## PLANT CHARACTERISTICS



### III

## PLANT CHARACTERISTICS

### A. PLANT TYPE

Each acceptable plant material is designated as either deciduous (D) or evergreen (E). This is essential since only specific plant types can meet ordinance requirements such as winter opacity or triangle visibility.

### B. HEIGHT

Height of plant materials is given in ranges because dimensions vary depending on site conditions, climate, temperature, and how well plants adapt to these conditions. For example, under ideal conditions, a plant may reach a height of up to 20 feet, but because of conditions at a specific site, the same tree may be limited to a height of just 10 feet. Limited room for root growth also restricts maximum height. Such areas include raised planters, parking lots, streets or areas where there is considerable competition between plants. Plants that tolerate pruning may be kept to a smaller size.

If overcrowding of plants occurs, extra maintenance may be required. Spacing shall be based on the average mature size of the selected tree species. Plantings for screens or barriers may be placed closely together in order to increase the opacity or denseness of a planting.

It shall be advisable to consult with professionals in determining the mature height of selected tree species.

### C. SPREAD

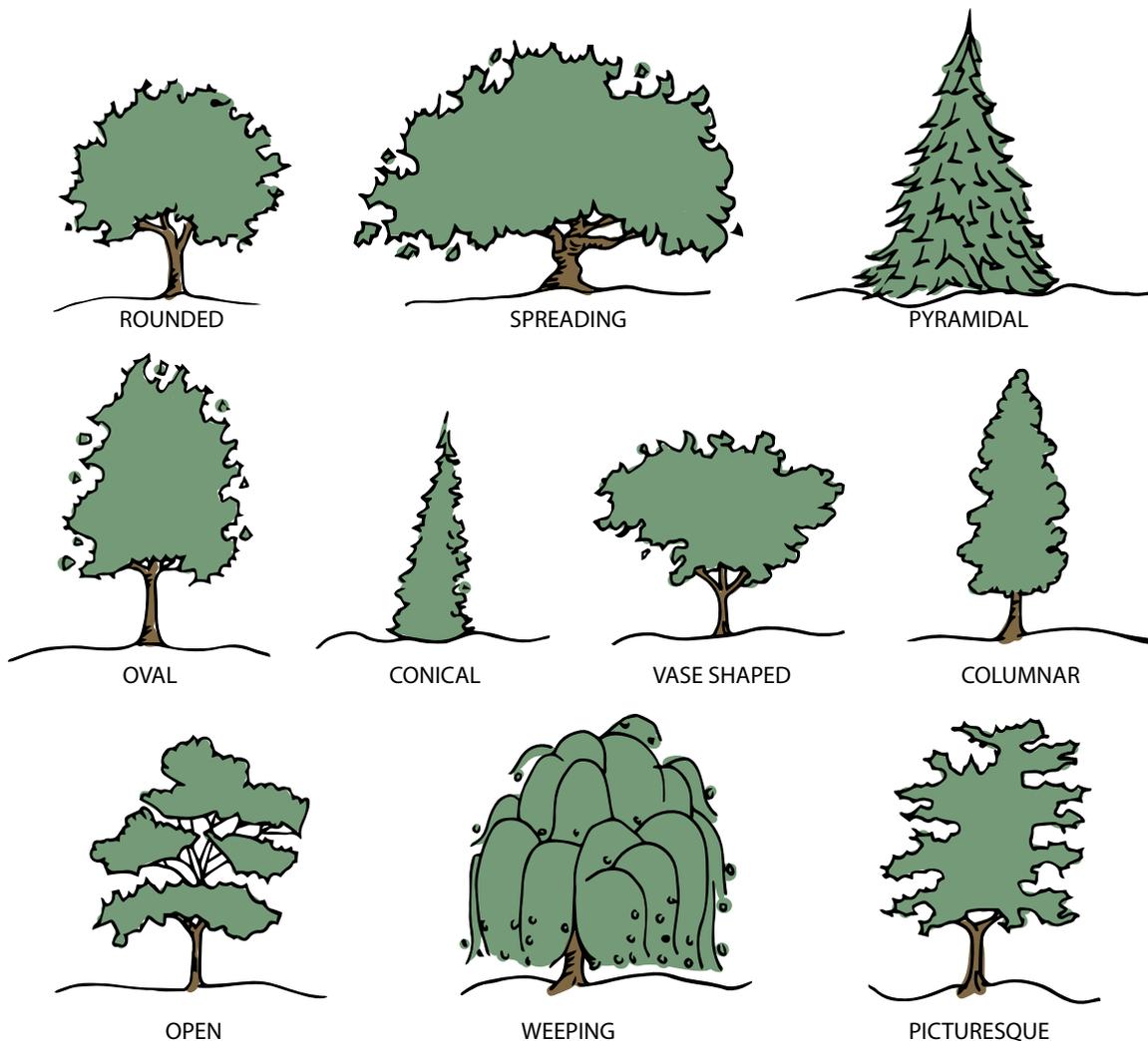
Spread refers to the width of a tree's mature crown. Plants with wide, spreading crowns emphasize horizontal features. In contrast, plants with narrow crowns emphasize the vertical lines. Spread partially determines the suitability of a plant for a particular site. Plants with wide-spreading forms require a large area to develop. Upright forms are used effectively where space is limited. All plants shall be allowed ample room to develop. Spread shall be measured in feet, with the average mature spread of the plant indicated. Spread is normally listed as a range because of its variability.

### D. FORM

Form is generally referred to as the outline of the crown, but includes much more. Form shall be determined by the line, direction, and arrangement of branches and twigs. Form has mass and volume since trees project in all directions: upward, downward, and sideways. The form of a plant shall be typical of the species at the time of installation, but may be altered to create a desired effect as long as the plant still meets ordinance requirements.



## TREE FORMS



### **E. URBAN TOLERANCE**

A plant tolerant of urban conditions must be able to withstand a variety of adverse conditions, including air pollution, poor and infertile soils, compacted soils, heat and drought, and other similar conditions. Plants that have relatively few problems shall be considered to be urban tolerant.

### **F. DISEASE AND INSECT TOLERANCE**

Disease and insect problems affect all trees to some extent. Some problems are barely noticeable and exert little effect on a tree's health. Disorders can restrict the tree's growth, cause gradual decline in health, and eventually lead to the tree's death. The severity of a problem depends on the type of tree, condition of the tree, type of disorder, time of year, immediate weather conditions, along with many other factors. Disorders that are frequent, widespread, or highly destructive should greatly limit the use of a particularly susceptible tree species, e.g. tip blight on Austrian pines.

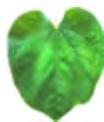
### **G. DENSITY**

Density refers to quantity of foliage and branching and is measured by comparing positive space to negative space. Positive space includes all tree characteristics perceived when the tree is viewed as two-dimensional silhouette with dense branching and foliage. Negative space is space that appears between branching and foliage. It is the open area through which the sky and background can be seen. The greater the amount of negative space, the less the apparent density.



**IV**

**PLANTING SPECIFICATIONS**



## IV PLANTING SPECIFICATIONS

### **A. PLANT SELECTION**

Choose species that provide desirable benefits and thrive in an urban environment. There are many conditions which dictate the plant's ability to survive and care should be taken in making sure the right tree is planted in the right place. Environmental conditions play a big part in the ability of a plant to grow. Some examples of the conditions to assess include whether the site has sun or shade, north facing or south facing aspect, shallow or deep soils, wet areas or is well drained, pH of soil, soil texture and structure, high salt, compacted soil, etc. It is not enough to simply plant a tree anywhere; care must be taken to ensure that conditions are right for that species if long term viability of the plant is to occur. If habitat is a consideration, species may be targeted to accentuate the desired habitat attempted. Consult appropriate professional assistance before attempting any species selection.

### **B. PLANT QUALITY**

All plant materials shall conform to the standards set forth in the current edition of *American Standards for Nursery Stock*. Plants shall be typical of their species and variety and have normal, well-developed branching structure and a vigorous fibrous root system. Branches shall diverge from the trunk at a wide angle except in varieties that normally grow upright (columnar forms). Plants shall be healthy, vigorous and free from insects and diseases. Trunk and stems shall be firm with no indication of fungal cankers, galls, insect borers, die back, frost cracks, sun scald, or other defects.

All plants shall be commercially grown and no plants from the wild shall be acceptable except for open space plantings with the approval of the LFUCG Urban Forester. Plants shall be grown under climatic conditions similar to those of Fayette County, Kentucky (Hardiness Zones 5-6).

Trees shall not be acceptable if their central leader has been cut. Hedges shall not be pruned prior to installation. Any necessary pruning to form a hedge shall begin immediately after installation. Trees to be planted shall not have any recent pruning cuts over ¾ inch in diameter. Multiple branches, one over the top of another, shall not have been removed within the same growing season.

### **C. PLANT SIZE**

All plants shall equal or exceed the minimum acceptable size as required by Article 18 of the Zoning Ordinance. Plant height shall be measured before pruning with branches in a normal position. No plant shall be pruned back to such an extent that it no longer meets the required size specifications. All measurements shall be taken at the time of planting.

All deciduous trees shall have a minimum height of 10 feet and a minimum caliper of 1-3/4 inches as measured 6 inches above the root ball. They shall have a minimum clearance of 5 feet from the ground to the first branch. Evergreen conifers shall be a minimum of 5 feet in height with a minimum caliper of 1-1/2 inches as measured 6 inches above the root ball. All shrubs shall have a minimum height of 24 inches with other height requirements for specific ordinance uses. All vines shall be a minimum of 12 inches in length. Groundcovers have no minimum height requirement, but all plants shall be at least 1-year-old and of sufficient size to have 75% complete coverage after two complete growing seasons.



Method of Measurement

Trees and shrubs are measured by caliper or diameter breast height (DBH), and height, and spread. All methods of measurements shall be consistent with the specifications set forth by the *American Standards for Nursery Stock*. Height shall be the governing measurement for all evergreen trees, deciduous shrubs, and evergreen shrubs. Low, spreading evergreen shrubs are measured according to average spread.

Groundcover plants shall be measured by specified age and pot size. Vines shall be measured by average length or spread, unless used as a ground cover.

Residual trees retained for Article 26 of the Zoning Ordinances shall be measured by DBH (4.5 feet above ground). This insures measurement above buttress roots.

Caliper is defined as the diameter of the trunk of the tree. The caliper of trees over 6 feet in height is measured 6 inches above the ground. Trees over 4 inches in caliper are measured 12 inches above the ground. Mature trees greater than 12 inches shall be measured by DBH.

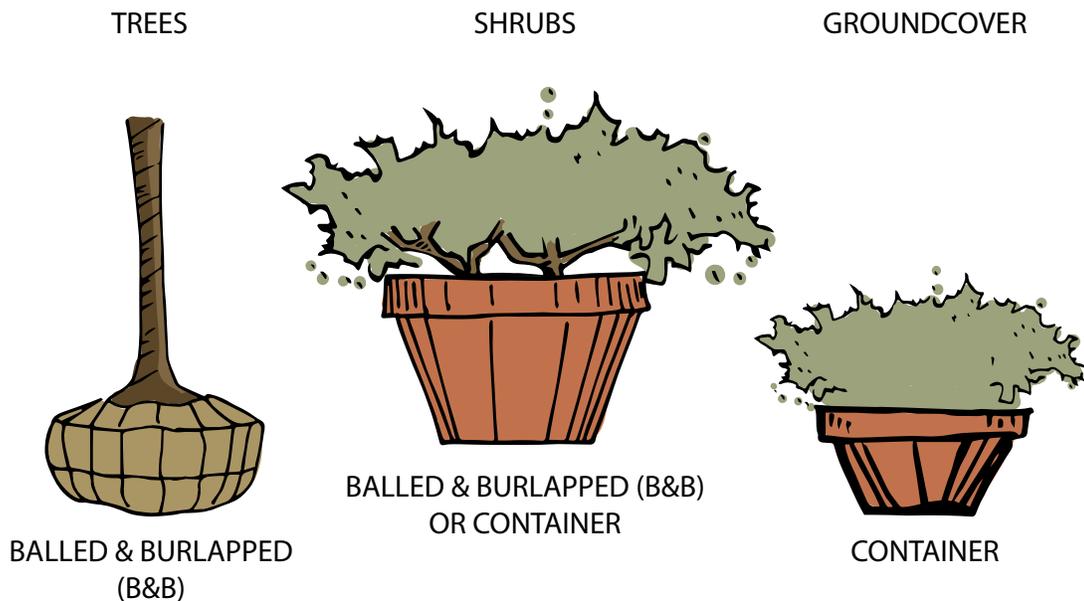
**D. ROOT SYSTEM**

All deciduous and evergreen trees shall be balled and burlapped (B&B) or container grown. No bare root trees shall be acceptable with the exception of certain open space plantings and with the approval of the LFUCG Urban Forester. Each root ball shall be firm and compact and wrapped with natural burlap and bound securely with non-synthetic twine, or cord, or wire mesh. Wire baskets are acceptable but baskets must be removed from all rootballs 24 inches in diameter or less. Larger rootballs must have the upper two rows of wire removed after being placed in the planting hole.

Evergreen and deciduous shrubs shall be balled and burlapped or container grown for smaller shrubs, no bare rooted shrubs shall be acceptable. Ground covers and vines shall be container grown and shall be well balanced, well established plants. Bare root groundcovers shall be acceptable, but only with specific approval of the landscape examiner.

The minimum sizes of balls, ball depths, and ball diameter shall be in accordance with recommended balling and burlapping specifications as set forth in the current edition of *American Standards of Nursery Stock*. All containers shall meet the standards set forth in the same publication, and shall be sufficiently rigid to hold the ball shape protecting the rooting mass.

Diagram #6



**E. ROOTING SYSTEMS SHALL MEET NURSERY STANDARDS**

All balled and burlapped plants which cannot be planted immediately shall be upright and heeled in and protected with mulch or other accepted material. All container grown plants and bare-root ground covers shall be protected from drying winds and sun. All plants shall be properly watered and maintained as necessary until time of installation. No plants shall be bound or tied with wire or rope unless necessary to facilitate handling. Any plants damaged prior to installation for any reason shall be rejected.

**F. TIME OF PLANTING**

**The most satisfactory time for transplanting is from October 1 to December 15 for fall planting, and from March 1 to May 15 for spring planting.** Deciduous trees generally need to be in their dormant season (either after leaf fall or just before leaf flush) for successful transplanting. Exact dates vary according to location and environmental conditions and change from one year to the next.

Fall planting should be done after leaf drop but early enough to allow the roots to regenerate so they can support the plant during winter. Planting must be done before the soil freezes, and while warm enough to permit new root growth. Fall planting has the advantage of favorable soil temperature, normally adequate moisture, and time for some root regeneration before the following spring. Planting in areas with excessive winds should be delayed until spring to avoid critical winter damage. Some trees do not adapt well to fall planting. These include: oak, poplar, blackgum, and magnolia. The appropriate planting season for a specific plant species depends on the growth stage of the plant, hardiness, the inherent nature of the species, and the microclimate of a site.

**TREE TRANSPLANTING**

<u>SPRING</u>	<u>FALL</u>
Bald-Cypress	Arborvitae
Beech	Ash
Birch	Basswood
Blackgum	Black Locust
Catalpa	Buckeye
Cherry	Corktree
Dogwood	Crabapple
Fir	Elm
Golden Raintree	Ginkgo
Hawthorn	Hackberry
Hemlock	Honeylocust
Hickory	Japanese Pagoda Tree
Hophornbeam	Juniper
Hornbeam	Katsura
Larch	Kentucky Coffeetree
Magnolia	Linden
Mountain Ash	Maple
Oak	Mulberry
Pear	Osage Orange
Planetree	Pine
Yellow-Poplar	Redbud
Sassafras	Serviceberry
Sourwood	Spruce
Sweetgum Walnut Willow	
Yellowwood Zelkova	



Spring planting should occur before leaves or flower buds start to open. Spring planting has the advantages of ample soil moisture and ensures that sufficient roots are established before freezing weather.

### **G. ANTITRANSPIRANTS**

Antitranspirant spray shall be applied to foliage at the manufacturer's recommended rate, on all deciduous plants when transplanted in foliage. Antitranspirants are foliage sprays that reduce the amount of water loss through the surface of the leaf. The spray dries and forms a protective coating on the leaf that lasts for several weeks before eventually wearing off. They are effective for reducing stress caused by lack of moisture, especially during the winter months. Evergreens may be protected from winter desiccation and damage when the spray is applied. Some evergreen species are intolerant of antitranspirants. Be sure to check label recommendations.

If leaves are growing when spray is applied, the coating cracks and become ineffective for retaining moisture. There are several antitranspirants available and all are essentially waxes, resins, and plastics.

### **H. SEEDING AND SODDING**

All exterior ground areas except surfaces occupied by buildings, structures, paving, mulching, plant material, and areas to be left undisturbed, shall be seeded or sodded in an acceptable manner according to local nursery standards. All seeds shall be purchased from a reputable supplier and shall bear the current season's certificates of weight, purity, and germination. All sod shall be commercially grown in Kentucky or neighboring areas, strongly rooted and free of pernicious weeds.

#### Seeding

Prior to seeding, the entire site shall be stripped of existing sod and thoroughly cleaned of stones and other debris over two inches in diameter from the top two inches of soil. Soil shall be cultivated to a minimum depth of three to four inches to overcome compaction resulting from construction operations. Moderately steep slopes shall only be cultivated immediately prior to seeding to reduce the possibility of erosion.

#### Diagram #7



A complete fertilizer, such as 10-10-10 or 20-10-10, shall be applied evenly to the surface and thoroughly mixed into the top two inches of topsoil. Normal application is 1 to 2 pounds of actual nitrogen per 1000 square feet. Fertilizer shall be uniform in composition, dry and free flowing. All areas to be seeded or sodded shall be fertilized.



In areas where the soil is acidic, ground limestone may be added to raise the pH. Soil tests can be obtained through the Fayette County Cooperative Extension Service. Alkaline pH (higher than 7.0) does not cause a problem for turf.

The seed for lawn areas shall be applied at the manufacturer's suggested rate in an acceptable manner that provides a uniform distribution. Seeding shall be done under favorable conditions with minimal wind, one-half of the seed being sown in a direction at right angles to the other. After seeding, the surface shall be lightly raked, rolled, and thoroughly watered. Seeded area shall be covered with a loose layer of clean wheat or oat straw so that the soil is covered approximately 50 percent. Straw shall be kept moist until grass is established. Straw may be left in place.

Any seeded areas that do not show a prompt germination shall be reseeded at approximately fifteen day intervals until an acceptable stand of grass is assured. Seeded areas shall be watered daily (if possible) until the grass is well established. Hydro-seeding, including the application of lime and fertilized by the same method, shall be acceptable.

Special care must be taken to prevent erosion or washouts on steep slopes that have been seeded. A combination of seeding and sodding or another method shall be acceptable subject to the approval of the Division of Engineering. An erosion reducing net to hold the grass in place shall also be acceptable.

Seed mixtures should be similar to surrounding areas if mature sod exists. If serious erosion hazards exist, then add ¼ pound/1000 square feet of a turf type Perennial Ryegrass. (*Lolium perenne*). If the surrounding area contains tall fescue, or if mature sod is not present on the site, then seed with 6 pounds/1000 square feet of Kentucky 31 tall fescue (*Festuca arundinacea*). Refer to the Fayette County Agriculture Extension Agent for recommended varieties.

Seeding shall be done between February 15 and April 15 or from August 15 to September 30. Grass seed sown during other times of the year have a limited chance of surviving without special care.

### Sodding

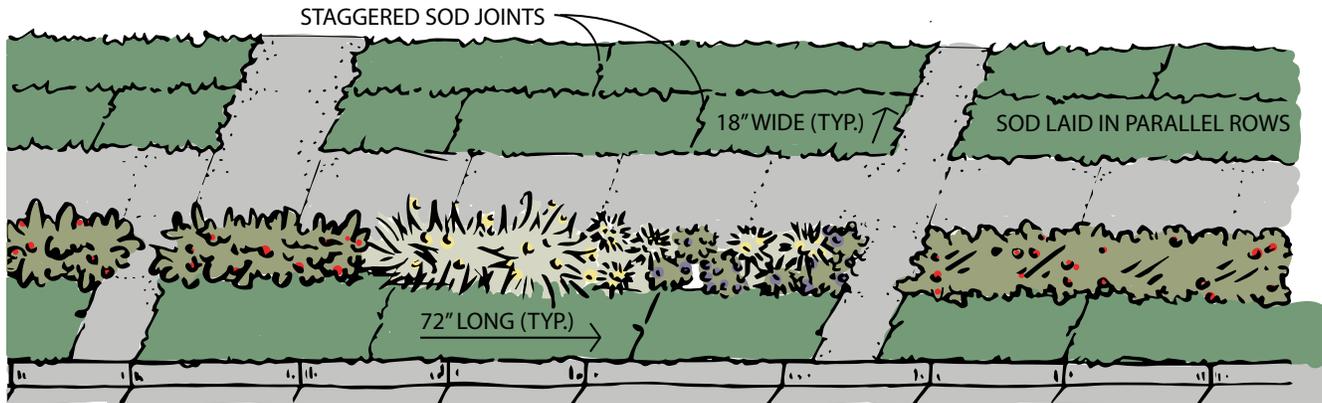
Sod shall be nursery grown, uniformly cut between ¼ inch and ½ inch of roots. It shall be well rooted practically free from weeds or undesirable grasses. It shall be mowed to a height not to exceed 3 inches at the time of installation.

Soil shall be prepared and fertilized before sodding, as described for seeding. Large stones, roots, or other foreign material shall be removed prior to installation of sod.

Sod shall be laid so that no voids occur, and in such a manner that the joints between individual sod pieces of adjoining rows do not coincide. It shall be laid on topsoil at the required finished grade. To decrease desiccation and firm the surface, the sod must be completely soaked immediately after laying.



Diagram #8



All sod shall be laid within 48 hours after it's cut from the nursery. Sod may be placed any time the ground is not frozen, but summer sodding requires heavy watering for 1 to 3 weeks. All sod shall be thoroughly watered until the root system is established. Browned-out sod that receives insufficient water must be replaced immediately.

Sod shall always be laid across a slope. Sod on steep slopes shall be staked down by driving wooden pegs through the sod and into the soil as required to stabilize the sod. Wooden pegs shall be 2 inches by 10 inches, sharpened at one end. Wire pegs shall be unacceptable.

## I. **PLANTING METHODS**

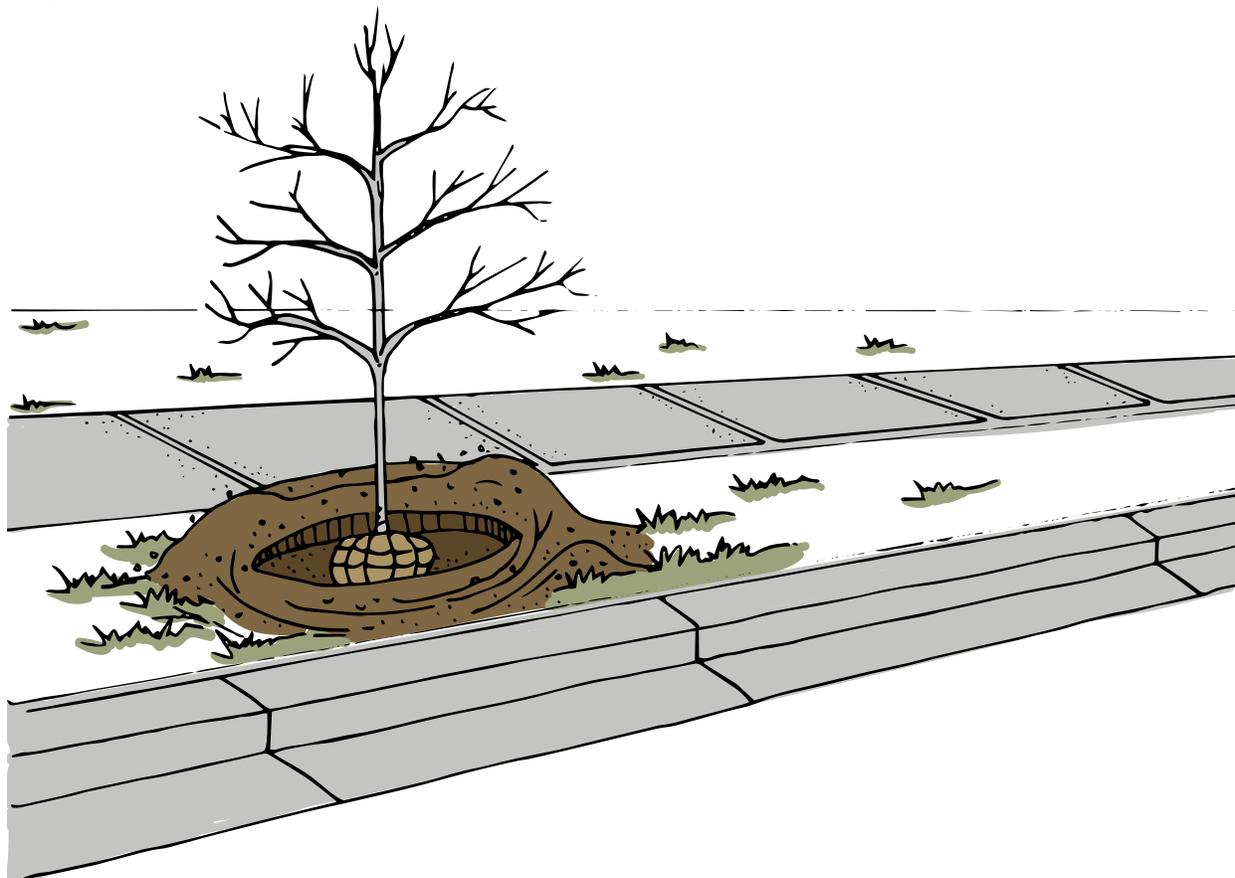
### 1. Planting Within Sidewalk Areas (no open space)

To determine the type of tree for planting in a public right-of-way (between the street and sidewalk), the following shall apply:

<u>SPECIES CATEGORY</u>	<u>MINIMUM WIDTH OF EASEMENT</u>
Large	7 Feet
Medium	5 Feet
Small	7 Feet



Diagram #9



The sidewalk area provides the greatest challenge to the tree planter. It is strongly encouraged to plant the trees in a tree planting easement behind the sidewalk on the lawn to facilitate proper root growth. Road soil compaction can lead to stunted root growth threatening long term survival and increase the potential for uprooting of the tree.

The area for a large or medium tree should be at least 48 square feet, with four feet being the minimum width. After the appropriate permission has been obtained, use a cement cutter to cut the pavement and remove the surface and sub-base. Excavate all of the soil in the resulting tree area to a depth of 24 to 30 inches. In soil of moderate to poor drainage, install an aeration ring and a drain sump.

To keep the root ball from sinking into the fresh backfill (a major cause of decline in newly planted trees), construct a compacted mound under the root ball and set the root ball in the area so the top is at the same level as the sidewalk. Fill the area with the same soil that was taken out (do not add soil amendments except in heavy clay soils where soil amendments and remedial drainage are necessary). Finally, cover the area around the tree with 2 to 4 inches of bark mulch.

In areas with high pedestrian traffic, brick or stone and sand-set pavers can be added to the surface of the area. Set the root ball and the soil volume lower as required.

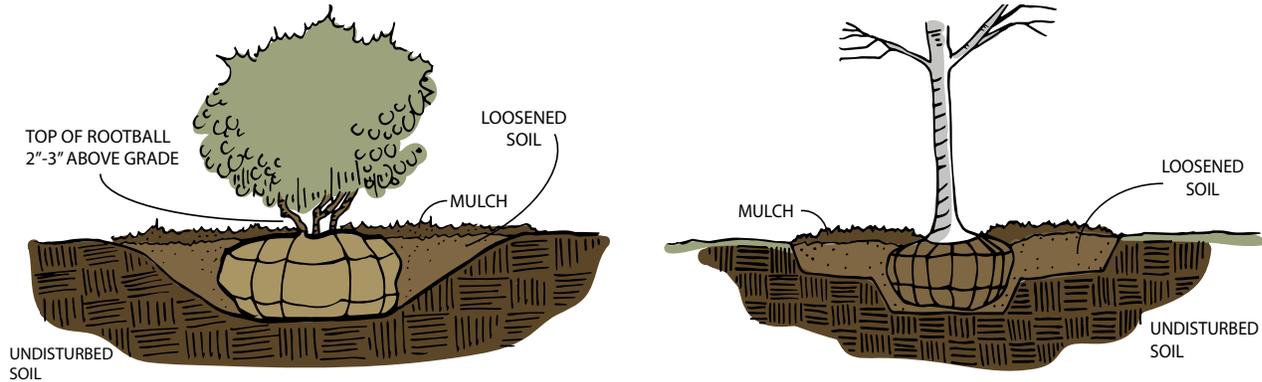
## 2. Planting in Lawns

Planting location selection – It is important to recognize there are factors which dictate where a tree should be planted; size and spread of tree, house location, utility easements, environmental factors, etc. In the plant list, spread and height of tree are annotated. Always be aware of the potential size of a planted tree at maturity when making a site selection. A minimum distance of ten (10') feet from building structures is recommended.



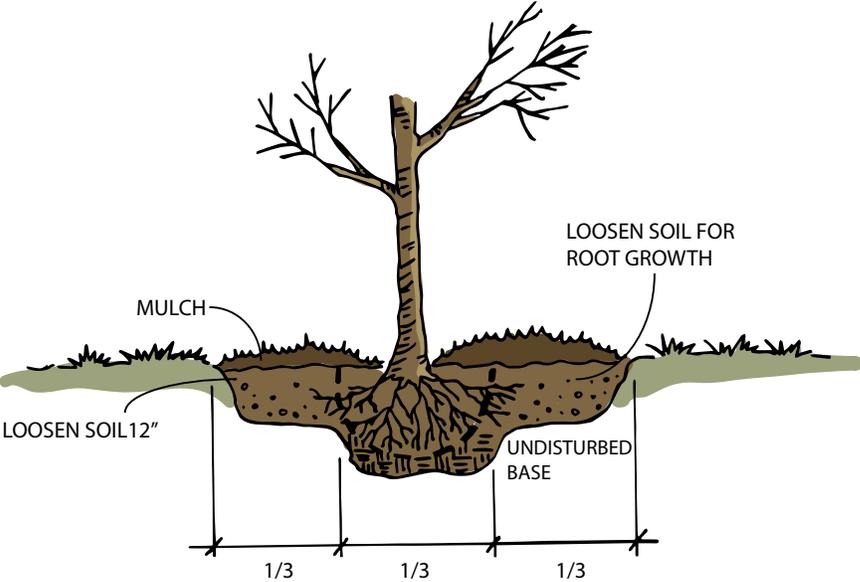
Digging the hole – The planting hole must be considerably wider than the roots or root ball; three times wider is best. The sides should slope gradually, making the hole saucer- shaped or bowl-shaped. Do not dig any deeper than the depth of the root ball because the tree needs firm support below to stabilize it. Planting a tree too deep can kill it. The root flare of the tree should be visible after planting.

Diagram #10



Drainage – In poorly drained, compacted soils, drainage must be provided. More urban trees die from root drowning than from drying out. Before planting the tree, test drainage of the planting hole by pouring a few gallons of water in the bottom. If the water does not soak in after an hour, there probably is a drainage problem. Near a slope, small drains may be able to run water to some lower point. On level ground, planting the tree on a slight mound may be necessary to get the root system out of the saturated soil.

Diagram #11



Carefully place the plant in the planting hole to insure that the soil ball is not broken in the process. The hole should be backfilled with the soil removed from the hole. Soil amendments, such as peat moss, should not be used, since they discourage root growth into the surrounding soil. When approximately two-thirds of the hole has been backfilled, the hole shall be filled with water and the soil allowed to settle around the roots. After the water has been absorbed, soil shall be added to bring the soil level to finished grade. An acceptable watering alternative shall be the use of a proper deep-watering procedure immediately after planting.

All balled and burlapped plants shall have the top one-third of the burlap removed from the top of the ball after the position of the plant is stabilized. This shall be done after the hole has been partially backfilled but before watering. No burlap shall be pulled from under the ball under any condition. All wire and surplus binding from top of the balls shall be removed. All nylon or other strings, twines, or ropes shall be cut and removed so as to avoid possible girdling of the plant. All non-degradable containers shall be removed and the roots of all container grown plants shall be sliced or loosened prior to planting. All synthetic or rot-proof burlap materials must be removed.

### 3. Planting for Article 26 Compliance

Developers are encouraged to plant the required trees in groupings to accentuate habitat. A 10% reduction in the number of trees required is given to do this. For example, a developer is required to plant 10,000 square feet of new tree canopy per the landscaping credit provided below. If the developer groups these trees, the required planting will only be 9,000 square feet. The proposed grouping must be annotated to its size and location in the Tree Preservation Plan and approved by the LFUCG Urban Forester.

The Ordinance specifies a landscaping credit given to developers to determine the numbers of tree required by planting. A large species category tree receives 750 square feet of credit, medium 400 square feet, and small 100 square feet. See the plant suitability lists for species in each category.

This *Planting Manual* sets forth the species selection and planting requirements for Article 26. Developers shall consult this manual for ensuring the compliance to Article 26. Any departure from the procedures of this manual can only be done through an amendment of the Tree Preservation Plan and submitted to the Division of Planning for review. Planting installation requirements are set forth in Section B of this chapter for lawn areas and apply as the planting requirements for Article 26.

Planting designs in the tree preservation plan for single family detached developments will be approved and enforced by the LFUCG Urban Forester. Planting designs for commercial and multi-family residential developments will also be set forth in the tree preservation plan and reviewed by the LFUCG Urban Forester but shall be approved and enforced by Building Inspection.

### 4. Reforestation Practices (Forest Generation and Riparian Area Restoration)

Attempting reforestation measures involves significant effort and planning. The attempt to ecologically create a forest utilizes markedly different methods and is done only in open space areas large enough to incorporate such methods. In order to successfully complete such a project and ensure survivability of the stand, technical assistance from the LFUCG Urban Forester, the Cooperative Extension Service at the Department of Forestry, the Kentucky Division of Forestry, or the Natural Resource Conservation Service shall be consulted. For modern reforestation practices, consult the Kentucky Division of Forestry Kentucky's *Tree Planting Manual* and Karl Wenger's *Forestry Handbook*; 2<sup>nd</sup> Edition.

Plantings in riparian areas in accordance with Article 26 provisions shall be construed to be a reforestation operation and will follow the guidelines set forth in the above paragraph and Division of Engineering stormwater manual practices. Such operations will also be annotated in the Tree Preservation Plan and approved by the Urban Forester.



## J. TOPSOIL

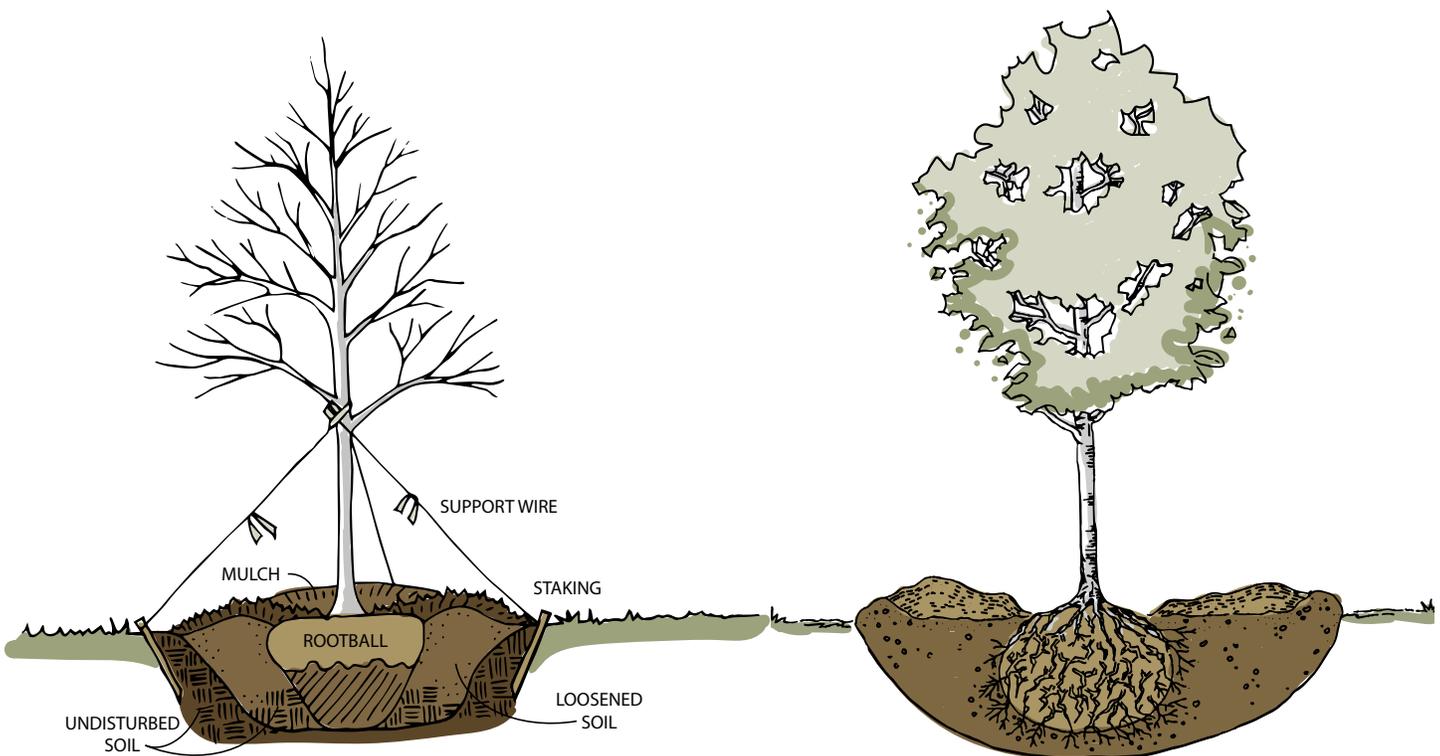
All topsoil shall be free from rocks, debris, noxious weeds, excessive weed or plant waste, subsoil, heavy clay, roots and stumps, or any other material that may be harmful to plant growth or hinder planting operations. Topsoil should not be used when muddy or when temperatures are below freezing. Topsoil should be a natural, fertile, loam possessing characteristics common to productive soils in the Bluegrass region. It should have appropriate pH after any amendments and shall not contain any toxic substances.

## K. STAKING AND WRAPPING

### Staking

If grown, harvested and planted properly, large trees do not require staking. Evergreen conifers less than three feet in height and deciduous trees less than five feet do not require staking or bracing. If staking is necessary recommended guidelines include soft strap-like material and two stakes at least 6' tall driven 2' into the soil outside of the planting area.

### Diagram #12



### Wrapping

Research shows wrapping trees is not warranted and can be detrimental. Loose screening is acceptable but should be removed the following spring. Most trees do not require winter wraps.



## L. MULCHING

Mulches conserve moisture by reducing surface evaporation and allow better infiltration of water by preventing crusting of the soil. Soil structure is improved and maintains a uniform, favorable soil temperature that encourages fibrous root development. Mulching also helps to control weeds, reducing the amount of maintenance required and improving the appearance of an area.

All plants, including trees, shrubs, and groundcovers shall be mulched within two days after installation. Mulching shall consist of a 2 inch to 3 inch layer of acceptable material with a minimum depth of 2 inches, except for groundcover plantings which require a minimum depth of 1 inch. **DO NOT ALLOW MULCH TO BANK UP AGAINST THE TREE TRUNK.**

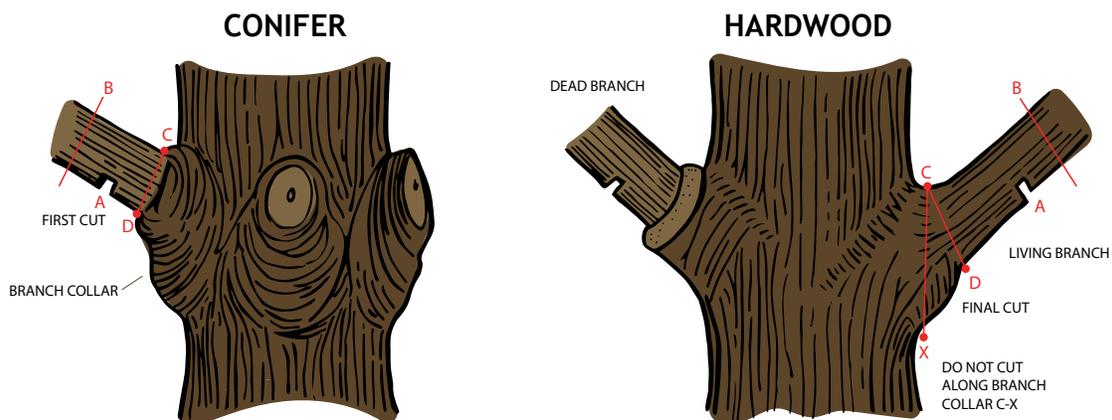
Acceptable mulches include: shredded bark, wood chips, and pine needles. Quality mulch is coarse in texture and does not mat down. Grass clippings are unacceptable for use as mulch.

## M. PRUNING

All pruning shall be done in accordance with standard horticultural practices to preserve the natural character of the plant. Pruning should be done with a definite purpose and not as an automatic routine. Improper pruning is usually detrimental to the plant and can be permanently damaging. Prune with particular care. Proper pruning cuts may make the difference between a tree having a long, healthy life or a short life.

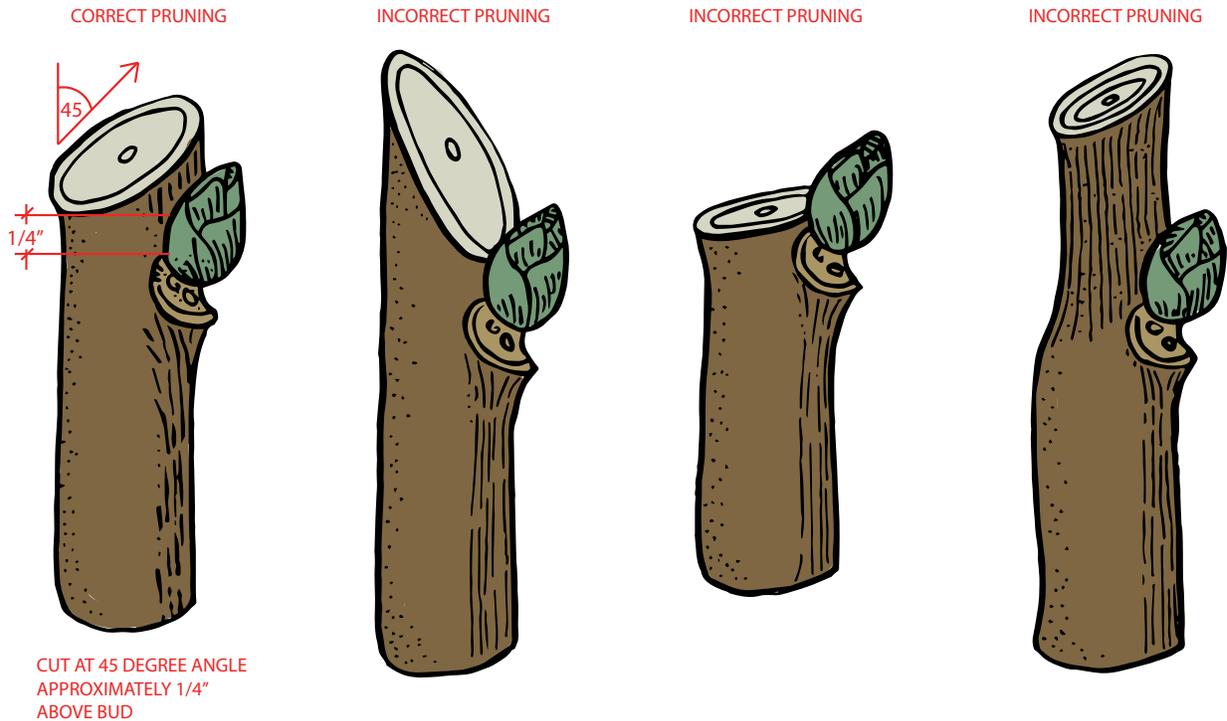
When pruning a newly planted tree, remove only dead and injured branches and those that are crossing and in contact with other branches. It has been shown that excessive pruning or cutting back reduces the leaf surface area and therefore the amount of carbohydrates produced by photosynthesis (food needed for tree growth). Also, hormones that promote regeneration and root growth are formed in the branch tips. By cutting back branches, the production site for these hormones is removed and root growth is decreased. Do not cut back the top to match the root loss when transplanting.

Diagram #13



Pruning cuts in living wood shall be clean and shall not bruise or tear the bark or leave large, prominent stubs which would prevent the wound from closing. A proper cut just outside the branch collar allows quicker, more efficient callus formation “healing” than cuts made flush with the branch. When tipping cuts are necessary they shall be made at a 45-degree angle, approximately ¼ inch above a bud growing in the desired.

#### Diagram #14



Dead and injured branches can be pruned any time. Always use sharp tools. Dull saws and pruners are harder to use and make poor cuts. Make clean cuts with no splintering or bark tearing. Always use equipment safely. Never prune near utility wires. Call insured professionals for work near wires, for hazardous trees, or for pruning larger trees. To ensure a high level of professionalism, select an arborist certified by the International Society of Arboriculture.

Do not allow anyone to climb your tree with spikes.

### Tree topping is prohibited!

#### N. TIPPING CUT

The terminal leader shall not be pruned from a tree that normally develops a central leader. All newly planted trees shall be pruned to a single leader unless a multiple leader is desired. Lower branches shall be eliminated only when interfering with traffic or to meet ordinance requirements. Sucker growth from the base of the tree at soil level or below shall be removed. All twig or leaf growth below the union where budding or grafting has taken place shall be removed.

Trees and shrubs that flower before June shall be pruned immediately after flowering, while late flowering plants shall be pruned in the winter or early spring. Plants valued for their fruit shall be pruned in the winter or early spring after the fruit develops. Evergreens can be pruned any time the wood is not frozen. Most evergreens, including broad leaf evergreens, require only minimal pruning except to remove dead or broken branches.

Evergreens should be pruned only on one-year-old wood and two-year-old wood should be avoided if possible as it is unlikely to produce new growth. When possible late summer pruning should be avoided for trees or shrubs since new growth may be encouraged that will not be sufficiently hardened to prevent winter damage.



Both evergreen and deciduous hedges shall be pruned wider at the base than at the top to allow adequate light. Hedges pruned narrower at the base than at the top often experience the die back of lower branches that limits its value for screening. Pruning is effective for increasing the density of a hedge. Groundcovers seldom require pruning except to control the pattern of growth.

Research indicates that wound dressings and pruning sealants are not recommended. Paint only promotes insects and decay. Orange (amber) shellac is the only pruning sealer considered not to be hazardous to plants. It must be applied at least three times per year until the wood has closed.

#### **O. WOUNDING**

Wounding young, vigorous trees is not as serious as on old trees. The growth rate on old trees may be so slow that wounds may never close over. Protruding stubs or other obstructions which restrict the closing capacity of the tree shall be pruned and properly shaped to allow the growth of new callus tissue. The only time to treat any wound by shaping jagged edges is immediately after it occurs. Wounds shall be inspected and retreated as necessary, a minimum of once per year until the wound is completely closed.

#### **P. WATERING**

Proper watering throughout the first two years following planting often means the difference between success and failure. All plants shall be thoroughly soaked immediately after installation. Soil around all trees shall be watered a minimum of every 7 to 10 days unless adequate rainfall occurs a minimum of 1 inch per week entering the soil. Adequate soil moisture must be maintained at all times. Soil moisture should be monitored for 2-3 years after planting. Watering is best accomplished in the evening and early morning hours.

Watering should be done through a deep watering system, soaker hose, or other slow delivery device which allows for infiltration of water into the soil profile and conserves water. Typical sprinkler systems or hoses are excellent grass waterers but provide little water to tree root systems due to the slow infiltration rates of clay soils. Water delivered through sprinklers often simply runs off into driveways especially under dry conditions when clay soils and mulch exhibit hydrophobic characteristics.

Raised planters, small planting pits, and other areas where root growth is restricted place additional stress on trees and require additional watering as well as drainage.

#### **Q. FERTILIZATION**

It is unlikely that any nutrient is limiting the growth of the tree immediately after trans-planting. Insufficient water is the most limiting factor after transplanting. Fertilization should be delayed until a season or two after the tree is planted (longer for large trees). Once roots have regenerated, fertilize trees with a nitrogen fertilizer at the rate of 1 to 2 pounds of actual nitrogen per 1000 square feet per year. Time-released fertilizer can be used to reduce the frequency of required applications and prevent fertilizer burning of the foliage.

The amounts of phosphorus, potassium, and other nutrients in soils vary, and these nutrients may not need to be added. Proper soil testing will determine what other elements are required. Always apply fertilizers evenly over the entire root zone, and remember that the roots can grow well beyond the side branches in only a few years.



Fertilizers combined with insecticides or other pesticides should not be used.

A soil test is required before any fertilizing is done. Plant growth is limited by nitrogen deficiencies more often than by any other element and 2-1-1, 3-1-1, 3-1-2, or a similar ratio of nitrogen to phosphate to potash is usually recommended. A complete fertilizer (5- 10-5) is frequently used for generalized fertilizing, but overlooks the specific requirements of individual plants.

Fertilizer shall be applied on the surface and watered in on plants that have been established 2 to 4 years. Established trees seldom require annual fertilizing unless in very poor, infertile soils. Evergreens seldom require fertilizing and shall not exceed a rate one-half (1/2) that recommended for deciduous trees when they are fertilized.

Fertilizer should be applied during late fall after the tree is dormant. Summer applications increase the danger of winter damage since the added nutrients often extend the growing period.

## **R. MAINTENANCE**

Maintenance shall include all necessary watering, cultivating, re-mulching, weeding, pruning, monitoring for disease and insects and control as necessary, replacement of unacceptable material, straightening plants which lean, adjustment of plants which settle or are planted too high, and any other procedure consistent with good horticultural practice necessary to insure normal, vigorous and healthy growth of all plant materials. Any damage resulting from planting operations shall be repaired immediately. Proper maintenance increases the chance of plants to achieve normal growth, which reduces the number of plants that must be replaced.

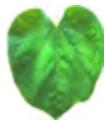
## **S. PLANT ALTERATIONS**

After initial approval, any change in plant species or plant location is unacceptable without approval of the appropriate authority. In the event that under-ground construction work or obstructions are encountered in preparation of planting areas, alternate locations may be approved by the Division of Building Inspection. If proof is submitted that specific plants or sizes are unobtainable, the nearest equivalent size or variety may be considered as an alternative.



V

## TREE PRESERVATION



## V

### **TREE PRESERVATION**

Trees provide many benefits to people, and they help to maintain the quality of life in our city. In addition to human enjoyment, trees provide essential habitat for wildlife, improved air quality, water quality enhancement, and other environmental benefits. Although people receive many benefits from trees, they seldom realize that their activities may injure or kill a tree. Healthy trees contribute to an improved quality of life, but an unhealthy tree is both unsightly and hazardous. Since trees are easily disturbed by changes in their environment, one should consider the following before disrupting the trees' surrounding.

#### **A. ARTICLE 26 COMPLIANCE**

Article 26 of the Zoning Ordinances—specifies tree preservation in new development. Minimum canopy retention requirements are set forth in the article and comprise 30% canopy retention for residential uses, 20% commercial, and 10% industrial. In the ordinance, preservation measures are standardized.

#### **B. EVALUATION**

In evaluating trees for preservation, an onsite meeting shall be scheduled with the LFUCG Urban Forester. Preservation criteria, methods of protection, and assessment of conditions can be best determined by a natural resources professional trained in assessing the value of present trees. Utilizing the LFUCG Urban Forester, a professional forester or arborist will be advantageous in determining proper preservation protocol.

In preparing the Tree Preservation Plan (TPP), it is suggested to use a professional for preservation identification areas and landscaping credit determination. If additional information on tree preservation is needed, consult the LFUCG Urban Forester and the Urban Forestry Resource Evaluation Study (Bibliography, page A-7).

#### **C. LOCATION OF TREES**

The location of each tree should be analyzed with respect to its relative location in the landscape. Before building a structure near trees, ask yourself these questions:

- Will the tree provide shade where it is wanted, or will it block out desired sunlight?
- Will the tree protect the structure from winter winds, or will it block out the summer breezes?
- Will the tree screen an unpleasant view, or will it block out a desirable view?
- Is the tree in adequate health and viable?
- Is the building far enough from the tree not to impair the root structure significantly?
- Where are the proposed utilities and will they impact any tree stands?

#### **D. SPECIES**

A tree's species determines if its characteristics are desirable for the proposed situation. A benefit of retaining indigenous trees is they are acclimatized to the area and resistant to environmental stresses while transplanted trees may tend to succumb to stress. However, shallow rooted trees can hinder the growth of lawns and gardens while deep-rooted trees have the potential for blocking storm and sanitary sewer lines. Proper consideration of preservation areas in the design and knowledge of species physical characteristics will minimize any future problems. Consult the tables in this manual, or ask a professional before deciding which trees are best to retain. Justification for removal of any trees on the site is to be annotated in the TPP.



## **E. SIZE, AGE and VIGOR**

When considering the size, age and vigor of a tree, keep these points in mind:

- Large and old trees can be designated as significant and receive priority to retain but can be adversely impacted so care must be made for protection.
- A small tree can be replaced easily, and replacing it may be cheaper than saving it.
- Annual twig growth, amount of dead material and the size and color of leaves are indications of health and vigor. Compare the tree with other trees of the same species.

After consultation with the LFUCG Urban Forester and approval for removal is obtained, remove all undesirable trees before construction begins. Use a professional with experience in tree removal so that remaining trees will not be damaged.

The trees chosen to be saved are required to be protected from the following:

- Construction equipment
- Grade changes
- Excavation for utilities
- Cutting and filling
- Paving
- Footers for the house or wall
- Storage of equipment and/or supplies

## **F. PROTECTION FROM MACHINERY**

Most of the damage caused by machinery occurs to the root system from compaction although there is often damage to the trunk and low hanging branches.

## **G. PROTECTION FROM GRADE CHANGES**

Grade changes, either raising or lowering the grade, greatly affects the amount of oxygen, water and nutrients in the soil that are available to the tree. Oxygen, water and nutrients are necessary for the tree's survival, so any alterations in grade must be planned properly to avoid detrimental impact on existing trees. Changes in drainage patterns outside the TPA can also have detrimental effects on the survival of existing trees.

## **H. TREE PROTECTION GUIDELINES**

Tree Protection Areas (TPA) are required in Article 26 to ensure protection of trees retained on site. The following is an excerpt from Article 26 detailing tree protection during construction standards:



## **I. ZONING ORDINANCE – ARTICLE 26: TREE PROTECTION STANDARDS**

1-11 – All areas designated for existing tree preservation on the Tree Preservation Plan shall be protected during construction activity. The boundary of the TPA shall be designed to protect each tree, tree stand, and riparian zone before, during, and after construction. The landowner is responsible for ensuring the physical layouts of the TPA as shown in the TPP are installed as approved. TPA shall be added to all applicable plan drawings and amendments including construction drawings submitted to the Division of Engineering. A TPA may vary widely in shape but must extend a minimum of 10 feet beyond the existing tree canopy along the outer edge of the tree stand. The TPA shall provide the following protection measures:

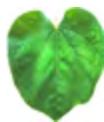
1. Fencing at least three (3) feet tall, clearly visible with signage posted every one hundred (100) feet, and lettered with three (3) inch high letters clearly identifying the TPA shall be used to surround all tree protection areas. The tree protection fencing shall be placed at a distance equal or greater than the critical root zone of the tree(s) to be protected. Any proposed TPA areas less than the minimal standards can only be delineated with the approval of the Urban Forester. Written approval by the Urban Forester that the TPA requirements have been installed shall be provided to Division of Engineering prior to approval of an erosion control plan and/or the issuance of any grading permit or other construction activity. The fencing shall be maintained and remain standing until issuance of the Certificate of Occupancy or until the Urban Forester has determined the construction activity has ceased to the point the fencing may be removed or that the fence may be relocated to permit final grading provided the activity will not adversely affect the health of the protected tree(s).
2. No vehicles, construction materials, equipment, fuel, or temporary/permanent earth fill shall be placed in a TPA. There shall not be any movement of any vehicles into or within a TPA. No nails, ropes, cable, signs, or fencing are to be attached to a tree within a TPA.
3. Where construction activity is permitted within a TPA, the Urban Forester shall be notified before the starting date of the work so that the Division may be present to ensure minimal disturbance and compliance with the provisions of the Tree Protection Plan.
4. Alternative protection methods may be used if determined by the Urban Forester to provide equal or greater tree protection.

The distance required to place tree protection fencing is equal or greater than the critical root zone defined in the Ordinance as a circular area surrounding a tree of which the center of the circle is the center of the trunk. The radial measurement is 1 foot per inch up to 24 inches DBH and 1.5 feet per inch DBH for trees over 24 inches DBH.



**VI**

**WILDFLOWERS**



## VI

### WILDFLOWERS

Wildflowers have specific soil requirements that need to be identified. Some wildflowers will tolerate difficult conditions, but good soil (sandy loam) and well drained (no standing water) sites produce the best results. Heavy clay soils tend to hold water even on sites that have been graded evenly for drainage.

Sites must be chosen carefully to reduce the chance of failure. A soil test for plasticity (does the damp soil compress into a solid or roll into a thread 1/8 inch without breaking) can eliminate sites that have heavy clay soils. An examination of plants growing on the site can reveal the predominate soil type. Plants of the pioneer seral community (weeds) usually are the first to grow in a disturbed site and may indicate difficult soil conditions. Other conditions which should disqualify a site are: standing water or soggy turf, (indicating poor permeability), rocky or gravelly soils (indicating unconsolidated fill), discarded construction bedrock, thin soil cover and worn or eroded soils. When obvious soil deficiencies are identified and avoided, a better crop of flowers will result.

A more complete description of site selection, plant selection, preparation, planting, and maintenance follows this introduction, but experience has proven much work can be eliminated by taking care in the initial site selection process. A simple soil analysis, which describes the soil structure and nutrients, can show whether the prospective wildflower site will support the intensity and type of flower desired.

#### **A. SITE SELECTION**

The initial question for prospective wildflower plots should be location followed by a specific site analysis of topography, soil conditions, geologic and subsurface limitations, pollution, sun exposure, and accessibility for maintenance.

The ideal soil is sandy loam with good permeability, average fertility and enough depth to allow root growth. A basic test for clay can be conducted by using a slip test (rolling damp soil into 1/8" rolls) to determine if there is excessive clay. Soils of more than 50% clay should be avoided because of poor permeability, and limited soil aeration. Seed growth is inhibited by very dense soils that do not allow germination. A more sophisticated soil test can also be performed by laboratories (University of Kentucky Cooperative Extension Service) for soil texture. If soil tests indicate acid soils, then add lime until a pH of 6.5-7 is attained. Fertilization is not recommended because it stimulates weed growth, but if planting in an area with a high probability of erosion or if severe nutrient deficiencies are evident, a low nitrogen fertilizer with a ratio of 1-3-2 may be used. Sand must not be mixed with the surface soil when preparing the site to improve permeability.

This region has problems with shallow limestone bedrock that can increase the speed of subsurface drainage and inhibit root growth. A simple test should be made for soil depth with a metal rod. Soil depths of less than 12", flooding sinkholes and excessively rocky soil should be avoided.

Urban sites are difficult for most plantings because of air and water pollution, road salt spray, auto emissions, and construction debris. The site must be above direct runoff from the pavement with potential winter salt. All plantings should be located at least 25 feet from the edge of the pavement and 10 feet from roadside drainage swales. Sites that are located uphill can avoid contamination even during the winter.

Wildflowers require full sun. The exceptions usually do not produce large showy flowers. The best location is a south or southeastern facing slope that receives full sun for a minimum of eight



hours of the day. Some filtered sun through trees is acceptable as long as the plants receive full sun during the middle of the day. New trees should not be planted which shade existing wildflowers.

The wildflowers will not have to be maintained as regularly as turf but will require mowing once or twice a year. This means that a mowing machine must have access to the site and that the site should be less than 3:1 slope to allow mowing. Avoid planting (except certain specialized species) against or above rock ledges, channeled drainage ditches, culverts, tree or fence lines which would make mowing or planting difficult.

## **B. WILDFLOWER SEED SELECTION**

A small selection of native or non-native annuals are usually mixed with the wildflower seeds to ensure first year color and reduce competing weeds. These include Corn Poppy, Cornflower, Rose Mallow, California Poppy and other annuals which are temporary for the first season. Perennials are the permanent flower matrix and should include a good mix of mainly native species that flower throughout the year. The Lexington-Fayette Urban County Government plantings have used a variety of plants grown locally, which are better adapted to this climate and soil.

## **C. PLANTING**

The site should be chosen that reduces planting problems and planted with seeds in good contact with the soil according to accepted horticultural practices. Most wildflowers can be planted from September through May, depending on the soil temperature, moisture, existing plant cover and plant type. Perennials usually do not predominate the first year after planting but fill in following seasons. Fall plantings will receive more rain and mature more but spring is still acceptable.

Seeding depth varies from surface to 1/8 inch deep. If planted too deeply, the seed will not grow. A shallow depth should be the rule. Light raking of fine soils is all that is necessary to cover seed. Heavy clay soils smother seeds. A wildflower seeder is the best device for correct and uniform planting depth. Seed sown too deep is the main cause of poor germination.

Most wild flowers germinate between 55 and 75 degrees Fahrenheit. A steady temperature will give best results (usually from April to June). This is when most flowers start growing, provided that there is enough water and oxygen (correct soil depth). With soil temperatures extremely high or low, germination is prevented.

The site will probably have existing grasses or ground cover that must be removed with a non-selective herbicide during warm fall or spring weather. A preliminary mowing will remove excessive grass material and allow the herbicide to be more effective. There may be a minimum wait after spraying to eliminate any residual herbicide. The site can be planted without an herbicide if a wildflower seeder can be used on closely mowed turf. However, competition from existing species can be significant.

The seed bed should be lightly tilled, after spraying to a maximum depth of one inch to prevent dormant weed seeds from being tilled to the surface. A flail mower is preferred to a conventional disk because it creates a more even seed bed and does not disturb the site as deeply.

A seed/sand mixture of 1:4 should be used, for hand broadcasting, to increase volume and aid in even distribution. Distribute seed as evenly (avoid windy days) as possible the length of the site and then sow the remaining seed perpendicular to the first. The sand should be slightly moist to reduce dust and adhere to the seed. Press the seed into the soil by rolling. A wildflower seeder is always preferable to hand seeding.



The site can be covered with a light mulch of finely ground bark, straw or residual twig litter. Straw may contain weed seeds and is not the preferred material. Mulch should be very fine and spread to a depth of ½ inch to 1 inch. This can aid seed germination. Organic antiwash fabric also can be used on steeper slopes but is more expensive.

#### **D. MAINTENANCE**

Watering is not needed, especially if the seed is planted in the fall. The site should be checked for weeds during the late winter and early spring when they are easiest to remove. Usually large weeds such as Canadian Thistle, Ragweed, Wild Lettuce, Iron Weed, and Milkweed can be easily identified and removed with hand tools. If allowed to grow, weeds shade out desired species. Smaller undesirable grasses are harder to eliminate and may need to be selectively sprayed with a grass herbicide. This is usually not needed because these lower grass species are not tall enough to destroy the effect of the plot.

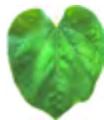
A plot with too many weeds means site preparation unearthed weed seeds or the site is too low and wet or in a drainage swale that washed away the new seed. Poor soils also limit success by not allowing seed germination or holding excessive moisture. In either case, the site may have to be replanted or moved to a better location.

A well planted, well-chosen site should not create a constant maintenance problem. The flowers should be well adapted to the local climate and soil conditions and re-seed themselves annually. The flowers should be mowed at a height of 4 to 6 inches after seeds are ripe and ready to be released for new growth next season.



**VII**

**ACCEPTABLE  
PLANT MATERIALS**



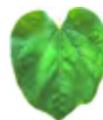
**A. LARGE TREES**

**A/LT LARGE TREES (Over 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
<u>Abies concolor</u> White Fir	E	30' to 50'	15' to 30'	Pyramidal	X	X			X				X			Can be used as a screen between conflicting land uses; doesn't meet other ordinance requirements because of low branch pattern; best used in large areas where there is room for plant development.
* <u>Acer negundo</u> Box Elder	D	30' to 50'	30' to 50'											X	X	Riparian zone only plantings. Will naturally seed in if no mow zone is established by stream.
* <u>Acer saccharinum</u> Silver Maple	D	50' to 70'	40' to 50'												X	Surface roots, especially in compacted soil. Don't cut into heartwood – decays rapidly – otherwise a tough tree.
* <u>Acer saccharum</u> Sugar Maple	D	60' to 75'	50' to 60'	Rounded	X	X	X	7'+	X	X	X			X	X	One of best larger lawn and shade trees; not for downtown or other crowded areas. Possible use in suburban areas as a street tree. Intolerant of road salt. Subspecies 'Nigrum' is more drought tolerant.
<u>Alnus glutinosa</u> Black Alder	D	40' to 60'	20' to 40'	Pyramidal to Oval	X	X			X	X	X			X	X	Good tree for any wet or clay soils; tolerates most adverse conditions. Nitrogen fixator. Can be invasive in wet areas.
* <u>Aesculus glabra</u> Ohio Buckeye	D	40' to 70'	20' to 40'	Rounded										X	X	All parts poisonous if ingested.
* <u>Aesculus octandra (A. flava)</u> Yellow Buckeye	D	60' to 75'	20' to 40'	Oval										X	X	All parts poisonous if ingested.

\* = Native Species



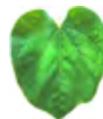
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* <u>Betula lenta</u> Sweet Birch		40' to 50'	30' to 40'	Pyramidal To Rounded					X	X	X			X	X	Intolerant of polluted urban areas; best birch for yellow fall color good for large, naturalized areas. Nice bark.
* <u>Betula nigra</u> River Birch	D	40' to 70'	40' to 60'	Oval to Rounded		X			X	X	X			X	X	More adaptable and disease resistant than other birch trees; handsome tree; good for wet areas.
<u>Carpinus betulus</u> European Hornbeam 'Asplenifolia' 'Columnaris' 'Fastigiata'	D	40' to 60'	30' to 50'	Oval		X			X	X	X				X	Must be limbed up to meet <i>Landscape Ordinance</i> requirements; outstanding specimen tree; there are many excellent cultivars that deserve use.
* <u>Carya cordiformis</u> Bitternut Hickory	D	50' to 75'	20' to 30'	Irregular										X	X	Can be planted by streams.
* <u>Carya glabra</u> Pignut Hickory	D	50' to 60'	25' to 35'	Oval										X	X	
* <u>Carya illinoensis</u> Pecan	D	70' to 100'	40' to 75'	Oval										X	X	
* <u>Carya laciniosa</u> Shellbark Hickory	D	60' to 80'	20' to 30'	Spreading										X	X	
* <u>Carya ovata</u> Shagbark Hickory	D	60' to 80'	40' to 60'	Oblong										X	X	Can be planted by streams.
* <u>Catalpa speciosa</u> Northern Catalpa	D	40' to 60'	20' to 40'	Irregular										X	X	Surface roots.
* <u>Celtis laevigata</u> Sugar Hackberry	D	60' to 80'	50' to 60'	Rounded	X	X	X	7'+	X	X	X			X		Wonderful shade tree. Locate where mechanical injury unlikely; tends to rot if injured.

\* = Native Species



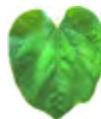
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**ACCEPTABLE PLANT MATERIALS**

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* <i>Celtis occidentalis</i> Common Hackberry 'Chicagoland' 'Prairie Pride'	D	40' to 60'	40' to 60'	Rounded		X	X	7'+						X	X	Excellent wildlife tree. 'Prairie Pride' is immune to mite that causes witches' broom.
<i>Chamaecyparis obtuse</i> Hinoki Falsecypress	E	50' to 75'	10' to 20'	Pyramidal		X			X				X			Very dense evergreen; needs moist, humid conditions and protection from wind; many cultivars but most are a smaller size.
<i>Chamaecyparis pisifera</i> Sawara Falsecypress	E	50' to 70'	10' to 20'	Pyramidal		X			X	X			X			Requires moist, humid conditions; numerous outstanding cultivars but they are a smaller size, loses beauty with age.
* <i>Diospyros virginiana</i> Common Persimmon	D	35' to 60'	20' to 35'	Oval										X	X	Establishes well on compacted soils.
* <i>Fagus grandifolia</i> ( <i>Fagus americana</i> ) American Beech	D	50' to 70'	100' to 120'	Rounded		X							X	X	X	Recommended for shade areas only. Surface roots.
<i>Fagus sylvatica</i> European Beech 'Asplenifolia' 'Fastiagata' 'Riversii' 'Rohanii' 'Rotundifolia'	D	50' to 60'	35' to 45'	Oval to Rounded		X							X		X	Doesn't meet most ordinance requirements because of low branching pattern, many excellent cultivars that could be used as a large screen; needs room to develop.
<i>Ginkgo biloba</i> (Male) Ginkgo 'Autumn Gold' 'Fastiagata'	D	50' to 80'	30' to 50'	Pyramidal to Rounded	X	X	X	7'+	X	X	X			X		Tolerates adverse conditions; excellent tree for streets and other urban uses; outstanding ornamental qualities.
* <i>Gleditsia triacanthos</i> var. <i>inermis</i> Thornless Honey Locust 'Moriane' 'Shademaster' 'Skyline'	D	50' to 75'	30' to 50'	Rounded	X		X	7'+	X	X	X			X		Only thornless cultivars are acceptable; Cultivars have less disease and insect problems than straight species; provides a light, filtered shade; widely used. Not generally recommended due to

\* = Native Species



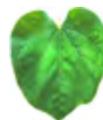
**A. LARGE TREES**

**A/LT LARGE TREES (Over 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
'Sunburst'																overplanting and disease problems. Seed pods rather unsightly and create a lot of litter. Surface roots.
* <u>Gymnocladus dioicus</u> Kentucky Coffeetree	D	60' to 75'	40' to 50'	Oval			X	7'+						X	X	Drought tolerant. Male cultivars only as street tree.
* <u>Juglans cinerea</u> Butternut	D	40' to 60'	30' to 50'	Rounded									X	X		
* <u>Juglans nigra</u> Black Walnut	D	50' to 75'	50' to 75'	Oval									X	X		
<u>Larix decidua</u> European Larch	D	70' to 75'	25' to 30'	Pyramidal			X	7'+	X	X			X		X	Nice specimen tree for large areas; intolerant of adverse conditions; messy winter appearance; does well in wet areas. Good, especially for tough sites.
* <u>Liquidambar styraciflua</u> Sweetgum 'Festival' 'Moraine' 'Happidaze' 'Rotundiloba'	D	60' to 70'	40' to 50'	Pyramidal To Oval			X	8'+	X	X	X			X	X	Excellent tree for large areas; extensive root system needs room to develop; avoid polluted areas. Fruit can be considered a nuisance. Needs pH of 6.5 or less. 'Happidaze' and 'Rotundiloba' are almost fruitless.
* <u>Liriodendron tulipifera</u> Tulip Poplar Yellow Poplar	D	70' to 90'	35' to 50'	Oval To Rounded			X	8'+	X	X	X			X	X	Can grow to 150' or taller, not for small Areas. Verticillium develops if salt gets on roots. Never in a monoculture. Honeydew/sooty mold.
* <u>Maclura pomifera</u> Osage-Orange	D	40' to 60'	20' to 40'	Rounded			X	7'+						X	X	Wood is very decay resistant. Male cultivar only for street tree.
* <u>Magnolia acuminata</u> Cucumbertree Magnolia	D	50' to 80'	50' to 80'	Pyramidal To Rounded			X	8'+	X	X	X			X	X	Develops massive spreading branches, not for polluted areas or dry soils. Does not tolerate

\* = Native Species



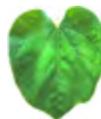
**A. LARGE TREES**

**A/LT LARGE TREES (Over 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
																compaction.
<u>Metasequoia glyptostroboides</u> Dawn Redwood	D	70' to 100'	25'	Pyramidal to Conical	X	X	X	8'+	X	X			X			Can suffer from early freeze damage; should only be used in large areas; very adaptable. Limb up for street tree.
<u>Picea abies</u> Norway Spruce	E	40' to 60'	25' to 30'	Pyramidal	X				X				X	X		Loses form with age; commonly used as a windbreak; can be pruned into a hedge.
<u>Picea glauca</u> White Spruce	E	40' to 60'	10' to 20'	Pyramidal	X				X				X			Very adaptable; tolerates adverse conditions better than other spruce trees.
<u>Picea omorika</u> Serbian Spruce	E	50' to 60'	20' to 25'	Pyramidal	X				X				X			Excellent dark green foliage; tolerates city conditions; does well in almost any urban area.
<u>Picea orientalis</u> Oriental Spruce	E	50' to 60'	20' to 30'	Pyramidal	X				X				X			Outstanding ornamental evergreen; needs protection from winter winds; low branching pattern restricts use.
<u>Picea pungens</u> Colorado Spruce	E	50' to 70'	20' to 30'	Pyramidal					X				X			Tolerates dry conditions better than other spruce; best used in large areas because of over-planting silvery-blue foliage color; not tolerant of salt or clay soils.
* <u>Pinus echinata</u> Short Leaf Pine	E	80' to 100'	25' to 35'	Pyramidal										X	X	
<u>Pinus resinosa</u> Red Pine	E	50' to 80'	20' to 40'	Pyramidal to Oval	X	X			X				X			Tolerates adverse conditions; does best farther north; develops a picturesque, symmetrical form with age.
* <u>Pinus strobus</u> White Pine	E	50' to 80'	20' to 40'	Pyramidal					X				X	X		Soft, feathery appearance because of foliage, extremely intolerant of air pollution; one of most beautiful native pines.

\* = Native Species



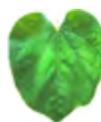
## A. LARGE TREES

### A/LT LARGE TREES (Over 50 Feet in Height)

### ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
<u>Pinus thunbergii</u> Japanese Black Pine	E	20' to 50'	Var.	Pyramidal to Irregular	X				X				X			Variable in size and spread; tolerates salt spray and poor soils.
* <u>Platanus occidentalis</u> American Sycamore	D	75' to 100'	75' to 100'	Irregular			X	8'+						X	X	Excellent floodplain tree; disease and insect problems can be serious; surface roots; good tough street trees.
<u>Platanus x acerifolia</u> London Planetree 'Bloodgood'	D	70' to 100'	60' to 80'	Pyramidal to Rounded	X		X	8'+	X	X						Tolerates adverse conditions; best used in large areas because of size; disease and insect problems can be serious; surface roots; good, tough street trees.
* <u>Prunus serotina</u> Black Cherry	D	50' to 60'	25' to 30'	Oval										X	X	
* <u>Quercus alba</u> White Oak	D	60' to 100'	50' to 80'	Rounded	X	X	X	7'+	X	X	X			X	X	Drought_tolerant.
* <u>Quercus bicolor</u> Swamp White Oak	D	50' to 60'	50' to 50'	Rounded	X		X	7'+	X	X	X			X	X	Excellent floodplain tree. Good anywhere; drought tolerant.
* <u>Quercus coccinea</u> Scarlet Oak	D	70' to 75'	40' to 50'	Pyramidal to Rounded	X	X	X	7'+	X	X	X			X		Difficult to locate commercially; outstanding ornamental tree; somewhat difficult to transplant.
* <u>Quercus falcata</u> Southern Red Oak	D	70' to 80'	50' to 70'	Rounded	X	X	X	7'+						X	X	
* <u>Quercus imbricaria</u> Shingle Oak	D	50' to 60'	40' to 60'	Oval to Rounded	X	X	X	7'+	X	X	X			X	X	Nice tree when allowed room to develop; easier to transplant than most oaks; tolerates most adverse conditions.
* <u>Quercus macrocarpa</u> Bur Oak	D	70' to 80'	70' to 80'	Irregular	X				X					X	X	Tolerates dry soils; needs large site.

\* = Native Species



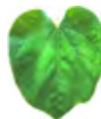
**A. LARGE TREES**

**A/LT LARGE TREES (Over 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
* <u>Quercus muehlenbergii</u> Chinkapin Oak	D	70' to 80'	80' to 100'	Rounded	X	X	X	7'+	X	X	X			X	X	
* <u>Quercus nigra</u> Water Oak	D	50' to 80'	40' to 60'	Oval to Rounded	X	X	X	7'+	X	X	X			X	X	Used extensively in the South; adaptable to moist, wet sites; leaves persist into winter.
* <u>Quercus palustris</u> Pin Oak 'Crown Rite' 'Sovereign'	D	60' to 70'	25' to 40'	Pyramidal	X				X					X	X	Limited use to floodplain areas.
* <u>Quercus phellos</u> Willow Oak	D	40' to 60'	50' to 40'	Pyramidal to Oval	X	X	X	7'+	X	X	X			X	X	Very handsome tree; widely used in South; finer textured than other oaks.
<u>Quercus robur</u> English Oak 'Fastigata'	D	60' to 80'	50' to 60'	Pyramidal to Rounded	X				X	X	X					Widely used in Europe; too large for most settings; tolerates high pH soils. Powdery mildew is a cosmetic issue.
* <u>Quercus rubra</u> Northern Red Oak	D	60' to 75'	40' to 50'	Rounded	X	X	X	7'+	X	X	X			X	X	Widely used; fast growing oak; transplants easily; valuable for a variety of landscape uses.
* <u>Quercus shumardii</u> Shumard Oak	D	40' to 60'	40' to 50'	Rounded	X	X	X	7'+	X	X	X			X	X	Not widely known and difficult to find commercially. Excellent street tree.
* <u>Robinia pseudoacacia</u> Black Locust 'Chicago Blues'	D	30' to 80'	20' to 35'	Narrow Oblong										X	X	Excellent invasive for early successional forest stage, thorny. Plant in a cornell mix; can pave right up to trunk (so can't sprout); good plaza tree. 'Chicago Blues' - thornless, no leaf miner; blue/green leaves.
* <u>Sassafras albidum</u> Sassafras	D	30' to 60'	25' to 40'	Rounded	X	X			X	X	X			X	X	May need to be limbed up for some uses. Tends to sucker.

\* = Native Species



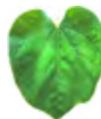
## A. LARGE TREES

### A/LT LARGE TREES (Over 50 Feet in Height)

### ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES									COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
* <i>Taxodium distichum</i> Bald Cypress 'Shawnee Brave'	D	50' to 70'	20' to 30'	Pyramidal	X	X	X	7'+	X	X	X			X	X	Often must be limbed up to meet ordinance requirements; handsome specimen tree.
* <i>Thuja occidentalis</i> American Arborvitae	E	40' to 60'	10' to 15'	Pyramidal	X	X			X				X	X		Very dense evergreen; requires considerable atmospheric moisture; numerous cultivars but most are much smaller.
* <i>Tilia americana</i> American Basswood	D	60' to 80'	30' to 60'	Rounded			X	7'+	X					X	X	Inferior to <i>T. cordata</i> (see below)
<i>Tilia cordata</i> Littleleaf Linden 'Chancellor' 'Greenspire' 'June Bride'	D	60' to 70'	30' to 50'	Oval	X		X	7'+	X	X	X	X		X		Smaller leaves (less messy) and less prone to breakage than <i>T. americana</i> (see above).
<i>Tilia x euchlora</i> Crimean Linden 'Redmond'	D	40' to 60'	20' to 30'	Oval	X	X	X	7'+	X	X	X	X				
<i>Tilia tomentosa</i> Silver Linden 'Sterling'	D	50' to 70'	30' to 50'	Oval to Rounded	X		X	5'+	X	X	X	X		X	X	More drought tolerant and tolerant of alkaline soils; Japanese beetle less of a problem.
* <i>Tsuga canadensis</i> Eastern Hemlock	E	40' to 70'	25' to 35'	Pyramidal					X				X	X	X	Very dense, low-branched evergreen; responds well to pruning; sensitive to drought and polluted environments.
<i>Tsuga caroliniana</i> Carolina Hemlock	E	45' to 60'	20' to 25'	Pyramidal	X				X				X			Tolerates city conditions better than <i>T. canadensis</i> ; intolerant of drought conditions; not well known.
* <i>Ulmus americana</i> American Elm Must be hybrid resistant to Dutch Elm Disease	D	60' to 80'	40' to 55'				X	7'+	X	X	X			X	X	Use only hybrids resistant to Dutch Elm Disease.

\* = Native Species



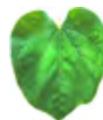
**A. LARGE TREES**

**A/LT LARGE TREES (Over 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
* <u>Ulmus rubra</u> Slippery Elm	D	40' to 60'	25' to 40'	Vase										<b>X</b>	<b>X</b>	Excellent streamside tree. Gets Dutch Elm disease.
<u>Zelkova serrata</u> Japanese Zelkova 'Village Green'	D	50' to 80'	40' to 70'	Vase-shaped	<b>X</b>		<b>X</b>	7'+	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>				Outstanding ornamental tree; has been used as a replacement for American Elm; tolerates wind and drought; excellent street tree; needs timely pruning.

\* = Native Species



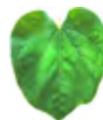
**B. MEDIUM TREES**

**B/MT MEDIUM TREES (25 to 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES									COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<i>Acer buergeranum</i> Trident Maple	D	30' to 35'	25'	Oval-Rounded to Round	X	X	X	5'+	X							Fall color; can be trained to single trunk and limbed up; popular street tree.
<i>Acer campestre</i> Hedge Maple	D	25' to 35'	25' to 35'	Rounded	X	X	X	5'+	X	X	X			X		Excellent medium-size tree; useful in areas where space is limited; attractive dark green foliage.
* <i>Acer rubrum</i> Red Maple 'Armstrong' 'Autumn Flame' 'Columnar' 'October Glory' 'Red Sunset' 'Scarlet Sentinel'	D	40' to 60'	40' to 50'	Oval			X	7'+	X	X	X	X		X	X	Numerous cultivars are superior to the straight species and should be considered for use. Requires room to develop; won't tolerate heavily polluted urban streets; preferred food of Asian Longhorn Beetle. Surface roots. For species diversity, too many already.
<i>Aesculus x</i> Carnea 'Red Horse Chestnut'	D	30' to 40'	30' to 40'	Rounded	X		X	7'+	X							Foliage tends to scorch in dry conditions
* <i>Amelanchier arborea</i> Downy Serviceberry	D	25' to 30'	10' to 15'	Rounded			X	5'+	X	X			X	X		Does best in a naturalistic planting. Only single trunks allowed for street trees.
* <i>Amelanchier laevis</i> Allegheny serviceberry	D	25' to 30'	15' to 25'	Rounded		X	X	7'+	X	X	X			X	X	Attractive multi-stemmed tree; often must be limbed up to meet ordinance requirements; possible use in sight triangle if single-stemmed forms are selected. Prefers some shade.
* <i>Carpinus caroliniana</i> American Hornbeam	D	20' to 30'	20' to 30'	Rounded		X	X	5'+	X	X	X			X	X	Full sun to partial shade; often must be limbed up to meet ordinance requirements; tolerates moist, well drained soils; interesting native tree. Can be low branched; limb up in nursery; surface roots.
<i>Cercidiphyllum japonicum</i> Katsura Tree	D	40' to	30' to	Oval to Columnar	X	X	X	7'+	X	X	X	X		X		Male forms are narrow and upright while female forms are round and

\* = Native Species



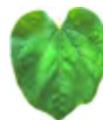
**B. MEDIUM TREES**

**B/MT MEDIUM TREES (25 to 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS		
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE	
		50'	50'													spreading; handsome tree; had to be limbed up to meet ordinance requirements. Shallow roots. Drought intolerant; must be watered in a drought.	
* <u>Cladratis kentukea</u> Yellowwood	D	30' to 50'	40' to 50'	Vase-Shaped			X	7+	X	X	X			X	X	Excellent flowers and foliage; tolerates moist soil conditions; poor branching angles often require corrective pruning; surface roots.	
<u>Corylus columa</u> Turkish Filbert	D	40' to 50'	20' to 30'	Pyramidal	X		X	5+	X	X	X					Excellent street tree.	
<u>Eucommia ulmoides</u> Hardy Rubber Tree	D	40' to 50'	40' to 50'	Rounded	X	X	X	7+	X	X	X	X		X		Virtually problem free, outstanding dark green foliage; lacking in other ornamental qualities; excellent street tree. Very drought tolerant; must cut water sprouts.	
* <u>Halesia tetraptera</u> (formerly <u>carolina</u> ) Carolina Silverbell	D	30' to 40'	20' to 35'	Oval to Rounded		X	X	5+	X	X	X			X		Prefers rich, well drained, acid soils; intolerant of adverse conditions; often must be limbed up to meet ordinance.	
* <u>Ilex opaca</u> American Holly	E	40' to 50'	18' to 40'	Pyramidal to Irregular					X					X	X	X	Needs sheltered location; some leaf minor problems; need male and female for fruit. Normally 20' to 30' in height; can be used as a large screen; must be limbed up to meet most ordinance requirements.
<u>Ilex pedunculosa</u> Longstalk Holly	E	20' to 30'	10' to 15'	Dense, Rounded	X	X			X	X				X	X	One of the hardiest red fruiting holly.	
* <u>Juniperus virginiana</u> Eastern Redcedar	E	40' to 50'	10' to 20'	Pyramidal	X	X			X					X	X	Can be used as a screen between conflicting land uses; cultivars are superior to straight species, but most are smaller in size; best used in large areas; doesn't meet other ordinance requirements because of low branching pattern.	

\* = Native Species



## B. MEDIUM TREES

### B/MT MEDIUM TREES (25 to 50 Feet in Height)

### ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
<u>Maackia amurensis</u> (aka Amur maackia)	D	20' to 30'	25'	Rounded	X	X	X	5+								Narrow diameter trunk, prune early on to remove low branches,
* <u>Nyssa sylvatica</u> Black Gum, Tupelo	D	30' to 50'	20' to 30'	Oval to Rounded	X	X	X	5+	X	X	X	X		X	X	One of the most beautiful native trees; intolerant of high pH soils difficult to transplant.
* <u>Ostrya virginiana</u> Hophornbeam	D	25' to 40'	20' to 30'	Rounded	X	X	X	5+	X	X	X	X		X	X	Good tree where space is limited; somewhat slow to establish; occasionally must be limbed up. Lovely bark and foliage; nice downtown street tree.
* <u>Oxydendrum arboreum</u> Sourwood	D	25' to 30'	20' to 25'	Pyramidal										X		Not recommended for Bluegrass soil.
<u>Parrotia persica</u> Persian Parrotia	D	20' to 40'	15' to 30'	Oval	X	X	X	5+	X	X	X					Outstanding bark and foilage color; excellent for a variety of uses although not very well known. Needs shade, good soil, uniform moisture.
<u>Phellodendron amurense</u> Cork Tree	D	30' to 45'	30' to 40'	Rounded	X	X	X	5+	X	X	X			X		Very adaptable, withstands most adverse conditions; useful in largest settings; picturesque appearance. Male only for street trees, female is invasive.
<u>Pinus cembra</u> Swiss Stone Pine	E	30' to 40'	15' to 25'	Pyramidal	X				X	X	X					Handsome evergreen; slow growth rate limits use; requires an open area with good air movement; transplants easier than most pines.
<u>Pinus parviflora</u> Japanese White Pine	D	25' to 50'	25' to 50'	Rounded	X				X				X			Develops a low-branched, wide-spreading form; tolerates most soils; good tree for small areas, slow growth rate.
* <u>Pinus virginiana</u> Virginia or Scrub Pine	E	15' to 40'	10' to 30'	Irregular Pyramidal										X	X	
<u>Prunus sargentii</u> Sargent Cherry	D	40' to	30' to	Rounded	X	X	X	5+	X	X	X			X		Tolerant of adverse conditions; one of the best large cherries for ornamental use;

\* = Native Species



## B. MEDIUM TREES

### B/MT MEDIUM TREES (25 to 50 Feet in Height)

### ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
'Columnaris'		50'	50'													fruit can be messy.
<u>Prunus subhirtella</u> Higan Cherry 'Autumnalis' var. pendula	D	20' to 40'	15' to 30'	Rounded	X	X	X	5+	X	X	X					Variable in form and flower colors; striking when in flower; numerous cultivars.
<u>Prunus yedoensis</u> Yoshino Cherry	D	20' to 40'	20' to 40'	Rounded	X	X	X	5+	X	X	X			X		Outstanding pinkish-white flowers; not common and could be hard to find commercially.
<u>Quercus acutissima</u> Sawtooth Oak	D	35' to 45'	30' to 40'	Rounded	X	X	X	7+	X	X	X			X	X	Slow growth rate limits use; lustrous dark green foliage; not widely known but deserves more use. Doesn't produce much fruit; remove lower branches as street tree.
* <u>Quercus stellata</u> Post Oak	D	40' to 50'	25' to 35'	Rounded										X	X	Shrubby
<u>Stephanolobium japonicum</u> (formerly Sophora japonica) Japanese Pagoda 'Princeton Upright'	D	30' to 40'	40' to 60'	Rounded	X		X	7+	X	X	X					Excellent flowers; adaptable to moist conditions; good tree for a variety of uses; should be used more extensively. Beans are messy and discolor concrete.
<u>Stewartia pseudo-camellia</u> Japanese Stewartia	D	20' to 35'	20' to 30'	Oval		X			X	X	X					Superb specimen tree; requires rich, moist soils; difficult to transplant; hardiest of the stewartias; hard to find commercially.
<u>Styrax japonicus</u> Japanese Snowbell	D	20' to 30'	20' to 30'	Rounded	X		X	7+	X							Likes good soil, uniform moisture and a bit of shade. Low branched.
<u>Syringa reticulata</u> Japanese Tree Lilac	D	20' to 30'	15' to 25'	Oval	X	X	X	5+	X	X	X			X		Most trouble-free lilac; more adaptable than other lilacs; spectacular white flower display.
* <u>Ulmus alata</u> Winged Elm	D	30' to 40'	20' to 30'	Rounded			X	5+						X	X	Often infected with powdery mildew. Tough trees; limb up for street trees.

\* = Native Species



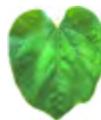
**B. MEDIUM TREES**

**B/MT MEDIUM TREES (25 to 50 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

<b>SCIENTIFIC NAME</b> Common Name 'Cultivar'	PLANT CHARACTERISTICS					PLANT USES									COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
<u>Ulmus parvifolia</u> Lacebark Elm	D	40' to 50'	40' to 50'	Rounded	X	X	X	7+	X	X	X			X		Resistant to Dutch Elm disease; often confused with <u>U. pumila</u> , but is a much superior ornamental tree. Produces lots of seedlings, but doesn't seem to move to the woods. Aggressive root system, absorbs water, nutrients and space.

\* = Native Species



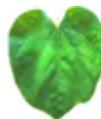
C. LARGE SHRUB OR SMALL TREE

C/LST LARGE SHRUB OR SMALL TREE (10 TO 25 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
<u>Acer tataricum</u> var. <u>ginnala</u> Amur Maple	D	15' to 18'	15' to 20'	Rounded	X	X	X	7'+	X	X	X			X	X	Handsome multi-stemmed shrub tree; withstands heavy pruning inconsistent fall color; very adaptable; tough.
<u>Acer palmatum</u> Japanese Maple 'Atropurpureum' 'Bloodgood' 'Burgundy Lace' 'Crispum'	D	15' to 25'	15' to 25'	Rounded					X	X	X					Outstanding ornamental tree; frequently used because of slow growth and need for winter protection; recommended for private use.
* <u>Acer pensylvanicum</u> Striped Maple	D	15' to 20'	12' to 20'	Rounded		X			X	X	X			X		Shrub or tree form prefers partial shade; intolerant of adverse conditions; lovely white striped bark.
<u>Aesculus parviflora</u> Bottlebrush Buckeye	D	8' to 12'	8' to 15'	Rounded		X							X	X	X	Excellent multi-stemmed shrub for shady areas; dense, compact forms are superb screens, but they require adequate room; can be kept much smaller.
* <u>Aesculus pavia</u> Red Buckeye	D	10' to 20'	10' to 20'	Rounded	X	X			X	X			X	X	X	
* <u>Alnus serrulata</u> Tag Alder	D	15' to 25'	10' to 20'	Rounded	X	X			X	X			X	X	X	Excellent for use along stream banks and in poor soil areas.
<u>Amelanchier canadensis</u> Shadblow Serviceberry	D	10' to 20'	10' to 20'	Rounded		X							X	X	X	Dense, upright shrub with erect stems tolerates wet soil better than other serviceberries; use as screen if planted close together.
* <u>Asimina triloba</u> Pawpaw	D	15' to 20'	15' to 20'	Rounded	X	X			X	X			X	X	X	Aggressive competitor. Excellent for use in stream areas.

\* = Native Species



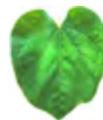
C. LARGE SHRUB OR SMALL TREE

C/LST LARGE SHRUB OR SMALL TREE (10 TO 25 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES								COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE		OPEN SPACE USE
* <u>Cercis canadensis</u> Eastern Redbud 'Flame' 'Forest Pansy' 'Oklahoma' 'Royal'	D	20' to 25'	20' to 30'	Rounded	X	X			X	X	X			X	X	Excellent native tree; graceful ascending branches, normally must be limbed up to meet ordinance requirements; showy pink-purple flowers. Best not used as street trees due to low disease resistance and short life. 'Oklahoma' has nicer foliage.
* <u>Chionanthus virginicus</u> White Fringetree	D	15' to 30'	15' to 30'	Broadly Rounded	X	X	X	7'+	X	X	X		X	X		Probably best with some afternoon shade.
* <u>Cornus alternifolia</u> Pagoda Dogwood	D	15' to 25'	20' to 30'	Rounded	X	X			X	X	X			X	X	Low branched tree or shrub; interesting horizontal branching; must be limbed up to meet ordinance requirements.
* <u>Cornus florida</u> Flowering Dogwood 'Cherokee Chief' 'Cherokee Princess' var. rubra 'White Cloud'	D	20' to 25'	20' to 30'	Rounded		X	X	7'+	X	X	X			X	X	Excellent low branched ornamental tree; must be limbed up to meet ordinance requirements; spectacular when flowering; recommended for private use.
<u>Cornus Kousa</u> Kousa Dogwood 'Milky Way'	D	15' to 20'	15' to 20'	Rounded		X	X	7'+	X	X	X		X	X	X	Possibly use if limbed up, but naturally develops a low branching structure; recommended for private use.
<u>Cornus mas</u> Corneliancherry-Dogwood	D	20' to 25'	15' to 20'	Oval to Rounded	X	X			X	X	X		X	X		Usually branches to ground; possible if limbed up; attractive yellow flower display; recommended for private use.
* <u>Crataegus crusgalli</u> Cockspur Hawthorn	D	20' to 25'	20' to 30'	Rounded	X				X				X	X		Dense, low-branched tree; numerous long, sharp thorns; excellent screen and barrier plant.
<u>Crataegus phaenopyrum</u> Washington Hawthorn	D	20' to	20' to	Oval to Rounded	X					X			X	X	X	Dense, thorny tree; thorns can limit use; often must be limbed up.

\* = Native Species



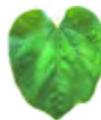
C. LARGE SHRUB OR SMALL TREE

C/LST LARGE SHRUB OR SMALL TREE (10 TO 25 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES									COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Crataegus viridis</u> Green Hawthorn 'Winter King'	D	20' to 30'	25' to 30'	Rounded	X				X	X	X		X	X		Dense, thorny tree; occasionally must be limbed up; excellent small specimen tree; thorns might limit its use.
<u>Crataegus x lavallei</u> Lavalle Hawthorn	D	15' to 25'	10' to 20'	Oval	X		X	7+	X	X	X	X	X	X		Small dense tree, essentially thornless; normally must be limbed up to meet ordinance regulations; possible use in sight triangle if limbed up.
* <u>Euonymus atropurpureus</u> Eastern Wahoo	D	12' to 24'	10' to 20'	Irregular	X				X	X			X	X	X	Susceptible to scale.
<u>Forsythia x intermedia</u> Border Forsythia	D	8' to 10'	10' to 12'	Rounded	X	X			X				X			Benefits from selective pruning of larger branches; can be kept smaller with pruning.
* <u>Hamamelis virginiana</u> Common Witchhazel	D	20' to 30'	20' to 25'	Rounded	X	X							X	X	X	Early spring blooming.
* <u>Hamamelis vernalis</u>	D	20' to 30'	20' to 25'	Rounded	X	X							X	X	X	Fall blooming.
<u>Hydrangea paniculata</u> Panicle Hydrangea	D	15' to 25'	10' to 20'	Irregular	X								X	X	X	Should probably be reserved for large out of the way areas.
<u>Ilex x attenuata</u> 'Fosteri' Foster Holly	E	10' to 20'	5' to 10'	Pyramidal	X	X			X				X	X		Dense, handsome evergreen; excellent year-round screen; possible winter damage.

\* = Native Species



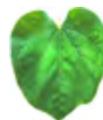
C. LARGE SHRUB OR SMALL TREE

C/LST LARGE SHRUB OR SMALL TREE (10 TO 25 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS				PLANT USES										COMMENTS	
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<u>Juniperus chinensis</u> (Cult.) Chinese Juniper (Cult.) 'Hetzii' 'Keteleeri' 'Mint Julep' 'Mount Batten' 'Pfitzeriana' 'Robusta Green'	E	12' to 25'	Var.	Varied	X				X	X			X	X		Only cultivars are acceptable; uses depend on the size, shape, and growth habit of each cultivar; dense evergreen forms.
<u>Magnolia stellata</u> Star Magnolia	D	15' to 20'	10' to 15'	Rounded		X			X				X	X		Dense shrub-like form; good screen but needs ample room; needs winter protection; avoid southern exposure.
<u>Magnolia virginiana</u> Sweetbay Magnolia	D	10' to 20'	10' to 20'	Oval		X			X	X			X	X		Large multi-stemmed shrub; better in wet soils than other magnolias, possible use if central leader forms are used.
<u>Magnolia x soulangiana</u> Saucer Magnolia	D	20' to 20'	20' to 30'	Rounded		X			X	X	X		X	X		Low-branched and normally must be limbed up to meet ordinance requirements although this destroys form; seldom used to meet landscaping requirements; but recommended highly for private use.
<u>Malus</u> (varieties) Crabapple 'Bob White' 'Coral Cascade' 'Dolgo' 'Harvest Gold' 'Red Jade' 'Red Swan' 'Snowdrift' 'Vanguard' 'White Angel'	D	10' to 25'	10' to 30'	Varied	X	X	X	7'+	X	X	X	X		X		Only disease and insect resistant cultivars are acceptable; possible use depends on branching height; often must be limbed up; valued for foliage; fruit, flowers, and variations in size and form; numerous cultivars and landscape numerous cultivars and landscape uses.
<u>Philadelphus x virginialis</u> Mockorange	D	10' to 15'	10' to 15'	Rounded	X	X								X		

\* = Native Species



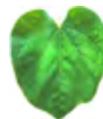
**C. LARGE SHRUB OR SMALL TREE**

**C/LST LARGE SHRUB OR SMALL TREE (10 TO 25 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES									COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Pinus densiflora</u> Japanese Red Pine 'Oculus – draconis' 'Umbraculifera'	E	10' to 15'	10' to 15'	Rounded	X				X				X			Only cultivars are acceptable in this size group; dense evergreen form; slow growing; interesting small specimen trees.
<u>Pinus mugo</u> Mugho Pine	E	15' to 20'	20' to 30'	Varied	X								X			Variable in form, although normally low, and broad-spreading; can be pruned yearly to keep dwarf.
<u>Platycladus orientalis</u> Oriental Arborvitae	E	15' to 25'	10' to 12'	Pyramidal to Oval	X	X			X	X			X			Dense evergreen form; tolerates heat and adverse soils; needs wind protection.
* <u>Prunus americana</u> American Plum	D	15' to 25'	12' to 18'	Rounded									X	X	X	
<u>Prunus angustifolia</u> Chickasaw Plum	D	12' to 20'	15' to 20'	Rounded									X	X	X	
<u>Prunus 'Hally Jolivette'</u> Hally Jolivette Cherry	D	10' to 15'	10' to 15'	Rounded									X	X		Densely branched large shrub; attractive pinkish-white flowers; wide-spreading and requires ample room; seldom used as a landscape requirement but one of the nicest cherries.
<u>Prunus serrulata (Cult.)</u> Oriental Cherry (Cult.) 'Kwanzan' 'Shirofugen'	D	15' to 20'	15' to 20'	Vase- Shaped	X				X	X	X			X		Straight species is inferior and seldom used, but there are numerous outstanding cultivars; excellent flower display. Low branched.
* <u>Prunus virginiana</u> Common Chokecherry	D	20' to 30'	18' to 25'	Rounded										X	X	
* <u>Ptelea trifoliata</u> Hoptree	D	15' to 20'	15' to 20'	Rounded	X	X			X	X			X	X		Does well in shade or sun.

\* = Native Species



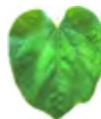
**C. LARGE SHRUB OR SMALL TREE**

**C/LST LARGE SHRUB OR SMALL TREE (10 TO 25 Feet in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS						PLANT USES									COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	STREET TREE	RECOMMENDED PLANTING STRIP WIDTH	PROPERTY PERIMETER	VEHICULAR USE AREA PERIMETER	VEHICULAR USE AREA INTERIOR	SIGHT TRIANGLE	SCREENING	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
* <i>Rhamnus caroliniana</i> Carolina Buckthorn	D	10' to 25'	10' to 25'	Oval	X	X			X	X			X	X		
* <i>Rhus typhina</i> Staghorn Sumac	D	15' to 25'	15' to 25'	Spreading	X	X			X	X			X	X		
* <i>Robinia hispida</i> Bristly Locust	D	6' to 20'	6' to 20'	Spreading										X	X	
* <i>Staphylea trifolia</i> American Bladdernut	D	10' to 15'	5' to 10'	Upright	X	X								X	X	Prefers damp, moist, well-drained soils.
<i>Taxus cuspidata</i> (Cult.) Japanese Yew (Cult.) 'Capitata' 'Intermedia' 'Nana' 'Thayen'	E	10' to 20'	10' to 30'	Varied	X	X			X				X			Only cultivars are acceptable for this group; responds well to pruning and can be kept much smaller than size listed; excellent dense hedges.
<i>Viburnum lentago</i> Nannyberry	D	15' to 18'	6' to 10'	Rounded	X	X			X	X			X	X		
<i>Viburnum opulus</i> Cranberrybush Viburnum	D	8' to 10'	10' to 15'	Oval to Rounded	X				X	X			X	X	X	Attractive fruit and flower display; very common viburnum and one of the most popular; good screen for large areas.
* <i>Viburnum prunifolium</i> Blackhaw Viburnum	D	12' to 15'	8' to 12'	Rounded	X	X			X	X			X	X	X	
<i>Viburnum rhytidophyllum</i> Leatherleaf Viburnum	E	10' to 15'	10' to 15'	Rounded	X	X							X	X	X	Blends well with other evergreens; tolerates heavy shade; best used in large areas.

\* = Native Species



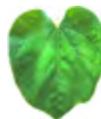
C. LARGE SHRUB OR SMALL TREE

C/LST LARGE SHRUB OR SMALL TREE (10 TO 25 Feet in Height)

ACCEPTABLE PLANT MATERIALS

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* <u>Viburnum rufidulum</u> Southern or Rusty Blackhaw	D	12' to 15'	8' to 12'	Rounded	X	X			X	X			X	X	X	
<u>Viburnum sieboldii</u> Siebold Viburnum	D	15' to 20'	10' to 15'	Rounded	X	X			X				X	X	X	Large, coarse shrub; requires ample moisture; best used in large areas.
<u>Viburnum trilobum</u> American Cranberrybush	D	8' to 12'	8' to 12'	Rounded	X	X			X	X			X	X	X	Multi-stemmed shrub; transplants easily; needs well drained moist soil, good screen for large areas.

\* = Native Species



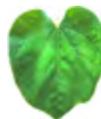
D. MEDIUM SHRUBS

D/MS MEDIUM SHRUBS (6 TO 10 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Acanthopanax sieboldian</u> Fiveleaf Aralia	D	8' to 10'	8' to 10'	Rounded	X	X	Dense	X	X	X					Erect shrub with arching branching; extremely adaptable; numerous sharp-pointed thorns that are effective for stopping circulation.
* <u>Aronia arbutifolia</u> Red Chokeberry	D	6' to 10'	3' to 5'	Oval to Columnar	X	X	Inter-Mediate	X	X	X				X	Somewhat leggy, develops a rounded crown; requires a low facer plant to be effective for screening; must be planted closely together to achieve required density.
* <u>Aronia melanocarpa</u> Black Chokeberry	D	3' to 5'	3' to 5'	Rounded	X	X	Open	X	X	X			X	X	Tends to sucker profusely and forms large colonies.
<u>Berberis julianae</u> Wintergreen Barberry	D	6' to 10'	6' to 10'	Columnar to Rounded	X	X	Dense	X	X	X				X	Semi-evergreen; numerous small thorns; excellent screen or barrier plant; hardiness is sometimes a problem.
* <u>Calycanthus floridus</u> Carolina Allspice	D	6' to 9'	6' to 12'	Rounded	X	X	Dense	X	X	X			X	X	Very fragrant flowers with a sweet strawberry scent; adaptable; does well in shade.
* <u>Cephalanthus occidentalis</u> Buttonbush	D	3' to 6'	3' to 6'	Rounded		X	Open						X	X	Best reserved for moist areas in a naturalized situation.
<u>Chaenomeles speciosa</u> Flowering Quince	D	6' to 10'	6' to 10'	Rounded	X		Dense	X	X	X					Dense, twiggy form with spiny branches; used mainly because of flower display; good barrier plant.

\* = Native Species



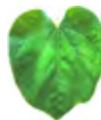
D. MEDIUM SHRUBS

D/MS MEDIUM SHRUBS (6 TO 10 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Chamecyparis pisifera</u> Sawara falseyuparis 'Cyano-virdis' 'Filifera' 'Filifera Aurea' 'Plumosa' 'Plumosa Aurea' 'Squarrosa'	F	6' to 8'	6' to 7'	Varied		X	Very Dense	X	X	X					Only cultivars are acceptable for this size group; numerous outstanding cultivars; all prefer moist, humid conditions; large variety of forms, colors, and textures.
* <u>Cornus amomum</u> Silky Dogwood	D	6' to 10'	6' to 10'	Rounded		X	Open						X	X	Best used for naturalizing in moist and net soils; prefers partially shaded areas.
<u>Cornus serica</u> Redosier Dogwood	D	7' to 9'	10'+	Rounded	X		Open	X	X	X			X	X	Very adaptable; twig blight can be a problem.
<u>Cotoneaster lucidus</u> Hedge Cotoneaster	D	5' to 10'	6' to 10'	Rounded	X	X	Dense	X	X	X					Frequently used as a hedge; handsome dark green foliage; vigorous, durable shrub.
<u>Cotoneaster multiflora</u> Many flowered Cotoneaster	D	8' to 12'	12' to 15'	Rounded	X	X	Dense	X	X	X					Develops a fountain-like appearance; somewhat difficult to transplant; attractive white flowers; requires room to develop.
<u>Euonymus alatus (Cultivar)</u> Winged Euonymus 'Compacta'	D	6' to 8'	6' to 8'	Rounded	X	X	Dense	X	X	X					Develops to a larger size than most people expect, but much more compact than straight species; excellent hedge.
<u>Forsythia suspensa</u> Weeping Forsythia	D	8' to 10'	10' to 15'	Fountain-like	X	X	Dense	X		X					Branches can be trained along a wall, fence or other structure.
<u>Fothergilla major</u> Larger Fothergilla	D	6' to 10'	5' to 8'	Pyramidal to Rounded		X	Dense	X	X	X					Requires acid soil and good drainage; attractive dark green foliage.
<u>Hamamelis vernalis</u> Vernal Witchhazel	D	6' to 10'	6' to 10'	Rounded	X	X	Dense	X	X	X				X	Neat, multi-stemmed form, smallest witchhazel; durable, adaptable plant; flowers early.

\* = Native Species



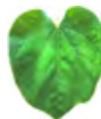
D. MEDIUM SHRUBS

D/MS MEDIUM SHRUBS (6 TO 10 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Ilex crenata</u> Japanese Holly 'Convexa' 'Microphylla' 'Rotundifolia'	F	5' to 8'	5' to 8'	Rounded	X	X	Dense		X						Slow growth rate limits use as a large screen; possible winter damage depending on cultivar; best used as a low shrub or hedge.
<u>Ilex glabra</u> Inkberry	D	6' to 8'	8' to 10'	Oval to Rounded	X	X	Dense		X						Becomes somewhat open with age, but responds well to heavy pruning; slow growth rate; many uses.
* <u>Ilex verticillata</u> Winterberry	D	6' to 9'	6' to 9'	Oval to Rounded	X	X	Dense	X	X	X	X		X	X	Excellent for wet areas; requires both male and female plant for fruit; prefers rich acid soils; slow growing.
<u>Ilex x meserve</u> Meserve Holly 'Blue Angel' 'Blue Prince' 'Blue Princess'	E	6' to 10'	6' to 10'	Varied	X	X	Dense	X	X	X					Shrubby evergreen form; seldom any winter damage; one of the hardiest and most ornamental holly; can be kept smaller by pruning.
* <u>Juniperus communis</u> Common Juniper	E	5' to 10'	8' to 12'	Varied	X		Dense	X						X	Attractive to wildlife, excellent for songbirds, cover and screen.
* <u>Kalmia latifolia</u> Mountain-laurel	E	7' to 10'	7' to 10'	Rounded			Dense		X				X		Can grow to 30' in farther south; handsome broadleaf evergreen; requires rich, moist, acid soil, somewhat difficult to grow.
* <u>Lindera benzoin</u> Spicebush	D	6' to 12'	6' to 12'	Rounded	X	X	Dense	X	X	X			X	X	Forage for wildlife, excellent open space selection.
<u>Lonicera fragrantissima</u> Fragrant Honeysuckle	D	6' to 10'	6' to 10'	Rounded	X		Dense	X	X	X					Tangled mass of branches; good hedge; very adaptable; fragrant white flowers.
<u>Myrica pensylvanica</u> Northern Bayberry	D	5' to 12'	5' to 12'	Rounded	X	X	Dense	X	X	X					Semi-evergreen; extremely adaptable; combines well with broadleaf evergreens; many uses.

\* = Native Species



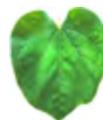
D. MEDIUM SHRUBS

D/MS MEDIUM SHRUBS (6 TO 10 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Pieris japonica</u> Japanese Pieris	F	9' to 12'	6' to 8'	Oval			Dense	X	X	X					Broadleaf evergreen; requires rich, moist, acid soil; difficult to grow; requires winter protection; highly recommended for use with other broadleaf evergreens; should only be used in protected areas.
<u>Rhododendron (Varieties)</u> Rhododendron (Var.)	E	Var.	Var.	Varied			Dense	X	X	X					Requires shade and protection from winter and wind damage; excellent plant where it will grow; blends well with other broadleaf evergreens.
<u>*Sambucus canadensis</u> American Elder	D	Var.	Var.	Spreading	X	X	Open						X	X	Best used in naturalized areas.
<u>Taxus x media</u> Anglojap Yew 'Brownii' 'Chadwickii' 'Densiformis' 'Hatfieldii' 'Hicksii' 'Wardii'	E	5' to 12'	Var.	Varied		X	Very Dense	X	X	X					Can eventually grow to 10' tall if not pruned; responds extremely well to pruning and can be kept as low as 2' to 3' tall indefinitely; makes an excellent hedge.
<u>*Viburnum dentatum</u> Arrowwood Viburnum	D	6' to 8'	6' to 12'	Rounded	X	X	Dense	X	X	X				X	Most durable viburnum; not as attractive as most viburnums; good for a hedge; suckers freely and can become unkempt.
<u>*Viburnum molle</u> Kentucky Viburnum	D	8' to 12'	8' to 12'	Rounded	X	X	Dense	X	X	X				X	
<u>Viburnum plicatum var. tomentosum</u> Cranberrybush Viburnum	D	8' to 12'	9' to 12'	Rounded	X	X	Dense	X	X	X			X		Interesting horizontal branchings, adaptable; outstanding flower display; excellent screen for large areas.

\* = Native Species



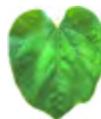
D. MEDIUM SHRUBS

D/MS MEDIUM SHRUBS (6 TO 10 Feet in Height)

ACCEPTABLE PLANT MATERIALS

<u>SCIENTIFIC NAME</u> Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Viburnum x burkwoodii</u> Burkwood Viburnum	D	8' to 10'	6' to 8'	Oval to Rounded	X	X	Inter-mediate	X	X	X					Blends well with broadleaf evergreens; somewhat unkempt in appearance and usually requires pruning; very fragrant flowers.

\* = Native Species



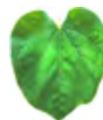
E. SMALL SHRUBS

E/SS SMALL SHRUBS (4 to 6 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Chamaecyparis obtusa</u> (cultivar) Hinoki Falsecypress 'Compacta' 'Grachs' 'Nana Gracillis'	E	5' to 7'	5' to 7'	Rounded		X	Very Dense		X						Straight species can grow to 60' or more in height; only cultivars are acceptable; thick, dark green foliage.
<u>Clethra alnifolia</u> Summersweet Clethra	D	5' to 7'	5' to 7'	Oval to Rounded	X	X	Dense		X						Good shrub for wet areas; attractive, fragrant flowers appears late in summer; very clean.
* <u>Leucothoe fontanesiana</u> Drooping Leucothoe	E	5' to 7'	5' to 7'	Weeping		X	Inter-mediate		X						Fountain-like appearance; intolerant of drought or winds; good undergrowth plant; broadleaf evergreen.
<u>Pinus mugho</u> (Cultivar) Mugho Pine (Cult.) 'Compacta' var. mugho 'Slavinii'	E	5' to 7'	5' to 7'	Varied	X		Very Dense		X						Slow-growing; cultivars seldom become large enough to meet some landscape screening requirements; excellent low evergreen screens.
* <u>Rhus aromatica</u> Fragrant Sumac	D	3' to 6'	6' to 10'	Spreading	X	X	Dense		X						Size can vary; develops into a low, spreading mound; good plant for difficult sites.
<u>Ribes alpinum</u> Alpine Currant	D	3' to 6'	6' to 9'	Rounded	X		Dense		X						Responds well to pruning and makes an excellent hedge; tolerant to adverse conditions.

\* = Native Species



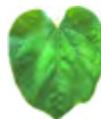
F. LOW SHRUBS

F/LS LOW SHRUBS (1-1/2 to 4 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Abelia x grandiflora</u> Glossy Abelia	D	3' to 5'	3' to 5'	Rounded to Wide-Spreading	X	X	Dense		X						Often killed back in severe winters unless protected; handsome pink flower display; blends well with broadleaf evergreens; limited hardiness.
<u>Abeliophyllum distichum</u> Korean Abelialeaf	D	3' to 5'	3' to 4'	Rounded to Wide-Spreading	X	X	Intermediate		X						Excellent early spring flower display; requires winter protection.
<u>Berberis thunbergii</u> Japanese Barberry 'Crimson Pgymy'	D	3' to 5'	4' to 7'	Rounded	X	X	Very Dense		X						Good hedge or barrier; numerous sharp, spiny thorns; 'Crimson Pygmy' seldom gets above 2-1/2' in height; very adaptable.
<u>Berberis verruculosa</u> Warty Barberry	D	3' to 5'	3' to 6'	Rounded to Wide-Spreading	X	X	Dense		X					X	Excellent low barrier or screen; lustrous, dark green foliage; possible winter damage if not protected.
<u>Buxus microphylla</u> Littleleaf Boxwood 'Compacta' var. koreana 'Tide Hill' 'Wintergreen'	E	3' to 4'	3' to 4'	Rounded	X		Very Dense		X						Handsome, compact evergreen; protect from drying winds and very low temperatures; excellent hedge or screening.
* <u>Ceanothus americanus</u> New Jersey Tea	D	3' to 4'	3' to 5'	Rounded										X	
<u>Cotoneaster horizontalis</u> Rock Cotoneaster	D	2' to 3'	5' to 8'	Wide-Spreading	X	X	Dense					X			Flat and wide-spreading; excellent ground cover for a large area.
<u>Deutzia gracilis</u> Slender Deutzia	D	2' to 4'	3' to 4'	Rounded	X	X	Intermediate		X						Very adaptable; best of the Deutzias; good flower display; use as a low hedge or screen.

\* = Native Species



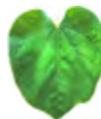
F. LOW SHRUBS

F/LS LOW SHRUBS (1-1/2 to 4 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Fothergilla gardenii</u> Dwarf Fothergilla	D	2' to 4'	3' to 4'	Rounded		X	Inter-Mediate		X						Requires moist, acid soils; handsome flowers and foliage; possible for a variety of uses.
* <u>Hypericum frondosum</u> Golden St. Johnswort	D	3' to 4'	3' to 4'	Upright		X	Inter-mediate		X				X	X	Excellent for filter strip along stream.
* <u>Hypericum prolificum</u> Shrubby St. Johnswort	D	2' to 4'	2' to 4'	Rounded	X	X	Dense		X					X	Tolerates a variety of adverse conditions; attractive bright yellow flowers add color in summer.
<u>Ilex crenata</u> Japanese Holly 'Glory' 'Green Luster' 'Helleri' 'Hetzi'	E	2' to 4'	2' to 4'	Rounded to Spreading		X	Dense		X			X			Straight species is too large for this size group, numerous outstanding evergreen cultivars; possible need for winter protection depending on cultivar; excellent for a variety of uses.
<u>Juniperus chinensis</u> var. <u>sargentii</u> Sargents Chinese-Juniper	E	1-1/2' to 2-1/2'	7' to 9'	Wide-Spreading	X	X	Very Dense					X			One of the most adaptable junipers; salt-tolerant and blight resistant; excellent evergreen ground cover.
<u>Juniperus horizontalis</u> Creeping Juniper 'Plumosa' 'Plumosa Compacta' 'Youngstown'	E	2' to 2-1/2'	6' to 10'	Wide-Spreading	X	X	Very Dense					X			Compact evergreen form; one of most popular junipers.
<u>Picea abies</u> Norway Spruce 'Nidiformis'	E	3' to 5'	4' to 5'	Rounded to Wide-Spreading			Very Dense		X						Straight species is too large for this size group; handsome birds nest shaped evergreen.
<u>Potentilla fruticosa</u> Bush Cinquefoil 'Farreri' 'Moonlight'	D	1' to 4'	2' to 4'	Rounded	X	X	Inter-mediate		X						Graceful, refined appearance; requires pruning every 2 to 3 years to keep from becoming straggly; handsome low shrub.

\* = Native Species



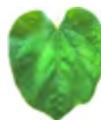
F. LOW SHRUBS

F/LS LOW SHRUBS (1-1/2 to 4 Feet in Height)

ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES							COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	TREE PROTECTION ORDINANCE	OPEN SPACE USE	
<u>Prunus laurocerasus</u> Common Laurelcherry 'Otto Luyken' 'Rotundifolia' 'Zabeliana'	E	3' to 6'	3' to 6'	Rounded to Wide- Spreading			Dense		X						Broadleaf evergreen shrub; possible winter damage; handsome when used as a hedge; withstands pruning well.
<u>Spiraea x bumalda</u> Bumalda Spirea 'Anthony Watereri'	D	2' to 3'	3' to 5'	Rounded to Wide- Spreading	X		Dense		X						Often used as a facer plant for tall, leggy screens; tolerates all but wet soils.
<u>Taxus baccata</u> English Yew 'Repandens'	E	2' to 4'	3' to 5'	Rounded to Wide- Spreading	X	X	Very Dense		X						Straight species exhibits frequent winter damage; 'Repandens' is a dwarf cultivar and is hardy.

\* = Native Species



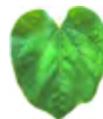
## G. GROUND COVER

### G/GC-GROUND COVER (Below 1-1/2 Fee in Height)

### ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES					COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER		GRENSPACE USE
<u>Ajuga genevensis</u> Geneva Bugle	E	4" to 12"	Variable	Wide-Spreading	X	X	Dense				X	X		Tolerates sun or shade; evergreen; easily crushed if walked on.
<u>Ajuga reptans</u> Carpet Bugle	E	4" to 12"	Variable	Wide-Spreading	X	X	Dense				X	X		Very adaptable; numerous outstanding cultivars; excellent evergreen ground cover.
<u>Arctostaphylos uva-ursi</u> Bearberry	D	6" to 12"	2' to 4'	Wide-Spreading	X	X	Dense				X	X		Thick, broad, evergreen mat; does best in poor sandy soils; excellent ground cover for adverse situations.
* <u>Bignonia (Anisostichus) capreolata</u> Crossvine	E	Var.	Var.	Climbing Vine	X	X	Intermediate				X	X		
<u>Calluna vulgaris</u> Scotch Heather	D	4" to 24"	2' to 3'	Wide-Spreading		X	Dense				X	X		Requires rich, acid soil; very exacting cultural requirements; only lower growing cultivars are acceptable for use in sight triangle; one of most beautiful ground covers.
* <u>Campsis radicans</u> Trumpet creeper	D	Var.	Var.	Climbing Vine	X	X	Dense						X	Has a tendency to take over an area.
* <u>Celastrus scandens</u> American Bittersweet	D	Var.	Var.	Twining Vine	X	X	Intermediate						X	
* <u>Clematis virginiana</u> Virginsbower	D	Var.	Var.	Climbing Vine	X	X	Intermediate				X	X		
<u>Cotoneaster adpressa</u> Creeping Cotoneaster 'Praecox'	D	12" to 18"	4' to 6'	Wide-Spreading	X	X	Intermediate				X	X		Handsome horizontal branching; roots where branches touch the soil.
<u>Cotoneaster dammeri</u> Bearberry cotoneaster 'Skogholm'	D	12" to 18"	6' to 8'	Wide-Spreading	X		Intermediate				X	X		Branches creep along the ground; vigorous and fast growing; excellent ground cover.
<u>Erica carnea</u> Spring Heath	D	6" to 18"	2' to 3'	Wide-Spreading	X		Dense				X	X		Seldom grows over 12" tall; fine textured evergreen ground cover; similar to C. vulgaris.

\* = Native Species



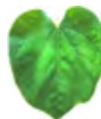
**G. GROUND COVER**

**G/GC-GROUND COVER (Below 1-1/2 Fee in Height)**

**ACCEPTABLE PLANT MATERIALS**

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES					COMMENTS	
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER		GRENSPACE USE
<u>Forsythia viridissima</u> Bronze Forsythia 'Bronxensis'	D	12" to 18"	2' to 3'	Rounded to Wide-Spreading	X	X	Inter-mediate				X	X		Straight species is too large for use; 'Bronxensis' is a dwarf cultivar; excellent foliage and early spring flowers.
* <u>Gaylussacia brachycera</u> Box Huckleberry	E	6" to 18"	Indef.	Dwarf Wide-Spreading	X	X	Dense				X	X		Requires acid, well-drained soil; full sun to partial shade.
<u>Hedera Helix</u> English Ivy	E	6" to 8"	Var.	Wide-Spreading Vine	X	X	Inter-mediate				X	X		Can be an evergreen vine or ground cover; tolerates heavy shade; excellent plant for a variety of uses.
<u>Hypericum calycinum</u> St. Johnswort	D	12" to 18"	18" to 24"	Rounded to Wide-Spreading	X	X	Inter-mediate				X	X	X	Experiences frequent winter damage; semi-evergreen depending on the weather.
<u>Juniperus conferta</u> Shore Juniper 'Blue Pacific' 'Emerald Sea'	E	12" to 18"	6' to 9'	Wide-Spreading	X	X	Very Dense				X	X		Possible winter damage; very adaptable; one of the most handsome juniper ground covers.
<u>Juniperus horizontalis</u> Creeping Juniper 'Bar Harbor' 'Blue Chip' 'Blue Mat' 'Douglas' 'Procumbens' 'Wilton'	E	12" to 24"	4' to 8'	Wide-Spreading	X	X	Very Dense				X	X		Only lowest cultivars are acceptable for use in sight triangle; very adaptable; excellent for any dry, sunny area; numerous outstanding cultivars.
<u>Juniperus sabina</u> Savin Juniper 'Arcadia' 'Broadmoor' var. tamariscifolia	E	12" to 18"	3' to 5'	Wide-Spreading	X	X	Very Dense				X	X		Straight species is of little value, but numerous outstanding cultivars; withstands adverse conditions.
<u>Liriope muscari</u> Liriope	E	12" to 18"	Var.	Wide-Spreading	X	X	Inter-mediate				X	X		Tolerates almost any type of adverse condition; attractive, fine-textured grass-like appearance.

\* = Native Species



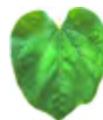
## G. GROUND COVER

### G/GC-GROUND COVER (Below 1-1/2 Fee in Height)

### ACCEPTABLE PLANT MATERIALS

SCIENTIFIC NAME Common Name 'Cultivar'	PLANT CHARACTERISTICS							PLANT USES						COMMENTS
	PLANT TYPE	HEIGHT	SPREAD	FORM	URBAN TOLERANT	DISEASE AND INSECT TOLERANT	DENSITY	PERIMETER PROPERTY SCREENING	VEHICULAR USE PERIMETER SCREENING	SERVICE AREA SCREENING	SIGHT TRIANGLE	GROUND COVER	GRENSPACE USE	
* <u>Lonicera sempervirens</u> Trumpet Honeysuckle	D	Var.	Var.	Twining Vine	X	X	Inter-mediate				X	X		
* <u>Pachistima canbyi</u> Pachistima (Mountain Lover)	E	4" to 12"	Var.	Wide-Spreading	X	X	Inter-mediate				X	X	X	
<u>Pachysandra terminalis</u> Japanese Spurge	E	0" to 10"	Var.	Wide-Spreading	X	X	Inter-mediate				X	X		
<u>Parthenocissus tricuspidata</u> Boston Ivy	E	4" to 6"	2.5' to 3.5'	Wide-Spreading Vine	X	X	Inter-mediate				X	X		Fast growing evergreen vine; likes partial shade and will cling to wall and fences.
<u>Rosa wichuriana</u> Memorial Rose	D	12" to	Var. to	Wide-Spreading	X	X	Inter-mediate				X	X		Semi-evergreen ground cover or vine; excellent for preventing soil erosion.
<u>Spiraea japonica var. alpine</u>	D	8" to 12"	2' to 3'	Rounded to Wide-Spreading	X		Inter-mediate				X	X		Very fast growing delicate, fine-textured plant; handsome pink flowers.
<u>Thymus serpyllus</u> Mother-of-thyme	D	1" to 3"	Var.	Wide-Spreading	X	X	Inter-mediate				X	X		Often dies back in winter and is used as a perennial.
<u>Vinca minor</u> Periwinkle	D	3" to 6"	Var.	Wide-Spreading	X		Inter-mediate				X	X		Excellent evergreen ground cover; handsome lilac blue flowers.
<u>Wisteria floribunda</u> Japanese Wisteria	D	Var.	Var.		X	X	Inter-mediate				X	X		Needs ample support.
* <u>Wisteria frutescens</u> American Wisteria	D	Var.	Var.		X	X	Inter-mediate				X	X		
* <u>Xanthorhiza simplicissima</u> Yellowroot	D	12" to 24"	Var.	Wide-Spreading		X	Inter-mediate					X		Suckers freely from roots; good ground cover for moist areas.

\* = Native Species

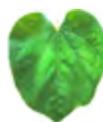


## H. WILDFLOWERS

### HERBACEOUS COVER

#### RED – PINK FLOWERING SPECIES

<u>SCIENTIFIC NAME</u> Common Name	HEIGHT	BLOOM TIME	SUN	COLOR
<u>Aquilegia canadensis</u> Wild Columbine	1'-3'	May	Full or Partial	Red - Yellow
<u>Cosmos bipinnata</u> Pink Cosmos	2'-3'	June – October	Full	
<u>Echinacea purpurea</u> Purple Coneflower	3'-4'	July	Full	Pinkish-Purple, Rust Center
<u>Eupatorium fistulosum</u> Joe-Pye Weed	5'-10'	August – September	Full	Purple - Pink
<u>Geranium maculatum</u> Crane's Bill Geranium	2'	April – May	Full	Rose – Purple
<u>Lavatera trimestris</u> Rose Mallow	3'	June – July	Full	Pink
<u>Liatris pycnostachya</u> Prairie Blazing Star	2'-3'	July	Full	Deep Pink
<u>Liatris squarrosa</u> Blazing Star	1'-2'	July – August	Full	Purple - Pink
<u>Lobelia cardinalis</u> Cardinal Flower	3'	August	Partial	Brilliant Red
<u>Lupinus perennis</u> Lupine	2'			*
<u>Paeonia</u> Peony	2'	May	Full or Partial	Pink – White - Rose
<u>Penstemon brevisepalu</u> Short Sepal Beard – Tongue	15"-30"	May – June	Partial	Pale Pink-Purple
<u>Phlox maculata</u> Meadow Phlox	20"-30"	July	Full or Partial	Reddish - Purple
<u>Phlox Paniculata</u> Fall Phlox	3'-4'	July	Full or Partial	Bright Pink
<u>Phlox pilosa</u> Prairie Phlox	1'-2'	April – May	Full	Pink – Purple
<u>Phlox subulata</u> Creeping Phlox	6"-8"	April – May	Full or Partial	Pink – White - Mauve
<u>Physostegia virginiana</u> Obedient Plant	1'-3'	August – September	Full or Partial	Pink-Violet

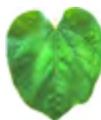


## H. WILDFLOWERS

### HERBACEOUS COVER

#### RED – PINK FLOWERING SPECIES

<b><u>SCIENTIFIC NAME</u></b> <b>Common Name</b>	<b>HEIGHT</b>	<b>BLOOM TIME</b>	<b>SUN</b>	<b>COLOR</b>
<u>Rosa carolina</u> Pasture Rose	1'-3'	June	Full or Partial	Pink, Yellow Eye
<u>Sabatia angularis</u> Rose Gentian	2'	June – July	Partial	Rose – Pink
<u>Saponaria officinalis</u> Bounding Bet	1' - 2'	June – September	Full	Pink, White
<u>Silene caroliniana</u> Wild Pink	10" – 12"	May	Full or Partial	Bright Pink
<u>Veronia altissima</u> Ironweed	4' – 7'	August – September	Full	Deep Purple Red



## H. WILDFLOWERS

### HERBACEOUS COVER

#### BLUE-PURPLE SPECIES

<u>SCIENTIFIC NAME</u> Common Name	HEIGHT	BLOOM TIME	SUN	COLOR
<u>Aster novae-angliae</u> New England Aster	2'-6'	October	Full	Purple
<u>Aster shortii</u> Short's Aster	2'-4'	September	Partial	Violet-Blue
<u>Camassia scilloides</u> Wild Hyacinth	1'-2'	May	Partial	Pale Blue
<u>Campanula americana</u> Tall Bellflower	2'-6'	July	Partial	Blue
<u>Campanula latifolia</u> Giant Bellflower	3'	July	Partial	Blue
<u>Centaurea cyanus</u> Cornflower	2'-3'	June – July	Sun	Blue
<u>Cichorium intybus</u> Chicory	1'-3'	June – September	Sun	Bright Blue
<u>Eupatorium coelestinum</u> Mistflower	1'-3'	August – October	Partial	Blue-Violet
<u>Hesperis matronalis</u> Sweet Pocket	1'-3'	May	Full or Partial	Purple, Lilac, Pink, White
<u>Liatris spicata</u> Spiked Gayfeather	3'-6'	August – September	Full or Partial	Lavender
<u>Lobelia siphilitica</u> Great Blue Lobelia	2'-3'	August – September	Partial	Blue
<u>Mertensia virginica</u> Virginia Bluebells	2'	April	Partial	Blue
<u>Monarda fistulosa</u> Bee-Balm	2'	July – August	Full	Lilac
<u>Phacelia bipinnatifida</u> Purple Phacelia	1'-2'	April – May	Partial	Purple, Blue-Violet
<u>Phlox divaricata</u> Blue Phlox	1'-2'	April – May		Blue
<u>Polemonium reptans</u> Jacob's Ladder	10"-15"	April	Partial	Blue, Blue-Violet
<u>Salvia azurea</u> Blue Sage	1'	July – September	Full	Blue
<u>Tradescantia subaspera</u> Zigzag Spiderwort	2'-4'	June	Partial	Purple
<u>Tradescantia virginiana</u> Early Spiderwort	6"-12'	June	Partial	Purple to Rose



**VIII**

**UNACCEPTABLE  
PLANT MATERIALS**





## A. LARGE TREES

- This list is created solely for use with Article 18 of the Zoning Ordinance and 6-10 of the Subdivision Regulations. Plants on this list may be very appropriate for some uses on private property as well as Article 26 compliance. But due to individual plant characteristics they are unacceptable to meet any of the Ordinance requirements. See page 1-5 for other comments on Unacceptable Plant Materials.

### A/LT LARGE TREES (Over 50 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
A/LT	No	Acer platanoides	Norway Maple	Due to verticillium issues, especially 'Crimson King'
A/LT	No	Acer saccharinum	Silver Maple	The use of this tree should be tempered because of its extensive shallow root system that will cause drain tiles to clog and sidewalks to buckle. The tree is also weak wooded which causes it to become a liability with age, often becomes too large for a street tree.
A/LT	No	Aesculus hippocastanum	Horse Chestnut	These trees are all very messy, which is caused by the large fruit and low rate of leaf drop. None of these trees are hardy in a restricted area and therefore they should not be used in an urban area.
A/LT	No	Betula papyrifera	Paper Birch	Susceptible to Bronze Birch Borer. Life expectancy in a site with some stress (i.e. street tree) is short in an urban area.
A/LT	No	Betula pendula	European White Birch	This tree is very popular, unfortunately the leaf miner and bronze Birch Borer are serious pests. Since most property owners will not take the necessary precautions it is advisable not to use this plant to meet any landscaping requirements. This tree is also intolerant of urban stress, short lived with low branching pattern.
A/LT	No	Castanea dentata Castanea mollissima	American Chestnut Chinese Chestnut	These trees are not useful for urban use because of their fruit that is a prickly involucre approximately 2-3" in diameter. The American Chestnut is also very susceptible to diseases. Flowers have an unpleasant odor. The tree is also intolerant of compacted soil.
A/LT	No	*Fraxinus americana  Fraxinus excelsior  *Fraxinus pennsylvanica	White Ash 'Autumn Purple'  Common or European Ash 'Hessei'  Green Ash	The Emerald Ash Borer kills these trees.



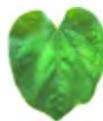
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### A/LT LARGE TREES (Over 50 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
			'Marshall's Seedless' 'Summit'	
		*Fraxinus quadrangulata	Blue Ash 'True Blue'	
A/LT	No	Ginkgo biloba (female)	Ginkgo	The female of this species is unacceptable anywhere because of its fruit. The fleshy seed is extremely messy and malodorous.
A/LT	No	Gleditsia triacanthos	Common Honey Locust	This tree is too thorny for use in the urban environment and especially to meet the ordinance requirements.
A/LT	No	Kalopanax pictus	Castor Aralia	A good shade tree but excessive thorns make this tree unacceptable.
A/LT	No	Morus alba	White Mulberry	The mulberries are unsuitable because of the fruit that they produce, which is flesh and extremely messy.
A/LT	No	Morus rubra	Red Mulberry	
A/LT	No	Pinus nigra	Austrian Pine	Highly susceptible to Diplodia tip blight.
A/LT	No	Pinus sylvestris	Scotch Pine	Not suitable for underplanting or shelter belts. Variable hardiness, habit and adaptability.
A/LT	No	Populus (all)	Poplars (all) 'White Poplar' 'Easton Lombards' 'Quaking Aspen'	All poplars are unacceptable because they are disease prone, weak wooded and their roots will clog drain tiles, and storm and sanitary sewer lines.
A/LT	No	Pseudotsuga menziesii	Douglas Fir	Many disease problems. Not suitable for dry, windy areas or underplanting or windbreaks.
A/LT	No	Quercus palustris	Pin Oak	Highly susceptible to Bacterial leaf scorch.
A/LT	No	Ulmus americana	American Elm	The elms in general are disease prone, weak-wooded and messy requiring too much maintenance to warrant



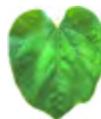
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### A/LT LARGE TREES (Over 50 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
		Ulmus carpiniflora	Smoothleaf Elm	their use. Disease resistant cultivars of <u>Ulmus americana</u> will be acceptable.
		Ulmus fulva	Red Elm	
		Ulmus pumila	Siberian Elm	



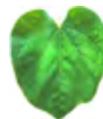
## B. MEDIUM TREES

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### B/MT MEDIUM TREES (10 to 50 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
B/MT	No	Albizia julibrissin	Mimosa Tree	The mimosa is not hardy in this area. This tree is weak wooded, and messy with seed pods littering the ground. It is not very disease and insect intolerant.
B/MT	No	Catalpa bignonioides	Southern Catalpa	Because of its weak wood and its fruit, this tree is too messy to warrant its use.
B/MT	No	Koelreuteria paniculata	Goldenraintree	Invasive
B/MT	No	Malus pumila	Common Apple	This tree is weedy and its fruit is too large to warrant the use of this tree to meet ordinance requirements. Some varieties are susceptible to disease.
B/MT	No	Paulownia tomentosa	Royal Paulownia	Messy, suffers winter damage.
B/MT	No	Pyrus calleryana (cultivars)	Callery Pear (cultivar) 'Bradford'	Approved by Planning Commission in February 2007. While this cultivar is in common use in both private and public landscaping it exhibits problems with branch separation from the main trunk.
B/MT	No	Pyrus communis	Common Pear	This tree is extremely susceptible to fireblight and its large fruit makes this tree unsuitable for urban use.
B/MT	No	Salix babylonica	Weeping Willow	Messy (always dropping small branches), weak wooded, susceptible to canker (disease), taps sewer and water lines.
B/MT	No	Sorbus (species)	Mountain Ash (species)	These trees are susceptible to a host of diseases and pests that should temper its use. Not recommended as a street tree because it is not urban tolerant and it has 1/4" fleshy seed pods. Best used in open lawn areas for private use.



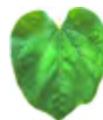
### C. LARGE SHRUB OR SMALL TREE

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#### C/LST LARGE SHRUB OR SMALL TREE (10 To 25 Feet in Height)

#### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
C/LST	No	Aralia spinosa	Devil's Walking Stick Hercules Club	Vigorous spreader which can be a maintenance problem.
C/LST	No	Eleagnus angustifolia	Russian Olive	Short lived (8 to 15 years)
C/LST	No	Euonymus alatus	Winged Euonymus or Burning Bush	Invasive species.
C/LST	No	Euonymus kiautschovica	Spreading Euonymus	Susceptible to severe winter damage or death in 10% to 20% of the winters in Lexington. Flowers attract insects.
C/LST	No	Hibiscus syriacus	Rose of Sharon	With age, this shrub loses its form and becomes somewhat scraggly. Therefore it is unacceptable to meet long term landscaping needs.
C/LST	No	Kolkwitzia amabilis	Beautybush	This shrub is unsightly when it isn't flowering and it becomes weedy unless it is maintained properly.
C/LST	No	Laburnum x watereri	Golden Chain Tree	Flowers (main reason for growing plant) are killed most winters in Lexington. Seeds are also poisonous.
C/LST	No	Lagerstroemia indica	Crepe Myrtle	This plant is not hardy to this area and any of these plants which manage to survive Lexington winters become very leggy.
C/LST	No	Ligustrum (all)	Privets (all)	Privets require a lot of maintenance in order to form a suitable hedge. If a high degree of maintenance is not provided these shrubs become leggy, and subsequently they do not meet the required opacity of the landscape ordinance. Also susceptible to severe winter damage.
C/LST	No	Lonicera fragrantissima	Fragrant Honeysuckle	Invasive species.
C/LST	No	Lonicera tatarica	Tatarian Honeysuckle	Very weedy, seed is spread by birds.



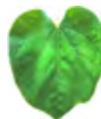
**C. LARGE SHRUB OR SMALL TREE**

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**C/LST LARGE SHRUB OR SMALL TREE (10 To 25 Feet in Height)**

**UNACCEPTABLE PLANT MATERIALS**

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
C/LST	No	Malus (selected)	Crabapples (selected) 'Almey' 'Coro varia' 'Dorothea' 'Eley' 'Hopa' 'loensis' 'Oekonomierat Echtermeyer' 'Radiant' 'Red Silver' 'Sylvestris'	Many of the crabapples are susceptible to disease and insects.
C/LST	No	Prunus cerasifera (Straight species)  Prunus persica	Cherry Plum (Straight Species)  Peach	Both of these trees experience serious disease problems and are pollution sensitive.
C/LST	No	Rhamnus catharica	Common Buckthorn	Die back on compacted, water logged, or heavy soils. Susceptible to winter die back.
C/LST	No	Rhamnus frangula	Glossy Buckthorn	This shrub experiences serious disease problems and tends to become weedy because birds drop seeds. It also has problems surviving in areas with heavy traffic because of soil compaction. Invasive species.
C/LST	No	Staphylea trifolia	American Bladdernut	This shrub suckers extensively. Unless it is maintained properly it tends to become very weedy.
C/LST	No	Vitex agnus-castus	Chastetree	The Chastree is not hardy in the Central Kentucky area.



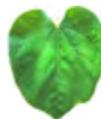
## D. MEDIUM SHRUBS

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### D/MS MEDIUM SHRUBS (6 to 10 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
D/MS	No	Berberis julianae	Wintergreen Barberry	Semi-evergreen; numerous small thorns; hardiness is sometimes a problem; invasive.
D/MS	No	Euonymus alatus (Cultivar)	Winged Euonymus 'Compacta'	Develops to a larger size than most people expect, but much more compact than straight species; invasive.
D/MS	No	Ilex cornuta	Chinese Holly	Susceptible to severe winter damage or death in 20% to 30% of the winters in Lexington. Shoots that come back from the roots have leaves with 5 spines instead of the more attractive leaves with a single spine at the top.
D/MS	No	Philadelphus coronarius	Sweet Mocarange	Like other Philadelphus this shrub becomes leggy.
D/MS	No	Photinia villosa	Oriental Photinia	Although this is an excellent specimen plant, its problems with disease limits its use to meet landscaping requirements unless it is maintained properly.
D/MS	No	Prunus glandulosa	Dwarf Flowering Almond	This shrub becomes leggy with age and it is straggly and open in the winter.
D/MS	No	Pyracantha coccinea	Scarlet Firethorn	Fruit is very susceptible to scab (disease). Superior types of pyracanthe are available.
D/MS	No	Rhamnus fragula	Glossy Buckthorn	Invasive species.
D/MS	No	Spiraea prunifolia	Bridalwreath Spirea	Spireas are straggly in general and this particular species tends to be leggy.
D/MS	No	Weigela florida	Weigela	Weigelas are not hardy to this area and they generally have large amounts of die back during winter months.



## E. SMALL SHRUBS

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### E/SS SMALL SHRUBS (4 to 6 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
E/SS	No	Berberis Koreana	Korean Barberry	Multi-stemmed form; suckers profusely and can become unkempt with age; size limits its use; invasive.
E/SS	No	Berberis thunbergii	Japanese Barberry	This popular barberry withstands drought conditions; invasive.
E/SS	No	Berberis x mentorensis	Mentor Barberry	Semi-evergreen; withstands cold and hot temperatures better than other barberries; invasive.
E/SS	No	Rhodotypos scandens	Jetbead	Invasive species.
E/SS	No	Rosa multiflora	Japanese Rose	This shrub becomes leggy after harsh winters and in general is very weedy and must have high maintenance to be kept under control.

## E. LOW SHRUBS

### F/LS LOW SHRUBS (1-1/2 to 4 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
F/LS	No	Symphoricarpos rivularis	Common Snowberry	The snowberry suckers profusely and as a consequence becomes a very weedy shrub. It is not suitable as a hedge in an urban situation.

## G. GROUND COVER

### G/GC GROUND COVER (below 1-1/2 Feet in Height)

### UNACCEPTABLE PLANT MATERIALS

PLANT GROUP/SIZE	ACCEPTABLE PLANT	SCIENTIFIC NAME	COMMON NAME 'CULTIVAR'	COMMENTS
G/GC	No	Euonymus fortunei	Wintercreeper Euonymus	Invasive.

