

ACTION REQUEST FORM

DATE: September 23, 2015
TO: The Honorable Mayor and City Council
FROM: A. Paul Norby, Director of Planning and Development Services

COUNCIL ACTION REQUEST:

Request for Public Hearing on an ordinance amendment proposed by the Community Development, Housing, and General Government Committee of the City Council

SUMMARY OF INFORMATION:

An ordinance amendment proposed by the Community Development, Housing, and General Government Committee of the City Council amending Chapter B of the *Unified Development Ordinances* to revise the suggested Plant Materials List. (UDO-266).

PLANNING BOARD ACTION:

MOTION ON PETITION: APPROVAL
FOR: UNANIMOUS
AGAINST: NONE
SITE PLAN ACTION: NOT REQUIRED

STAFF REPORT

DOCKET # UDO-266

STAFF: [Kirk Ericson](#)

REQUEST

This text amendment is proposed by the Community Development/Housing/General Government Committee of the Winston-Salem City Council to amend Chapter B of the *Unified Development Ordinances* (UDO) to revise the suggested plant materials list

BACKGROUND

In 2009, the Winston-Salem City Council adopted a comprehensive revision to the UDO tree preservation and planting regulations. One component of this ordinance revision involved planning staff collaborating with the City's vegetation management and urban forestry staff to revise the list of plants which developers may use to satisfy the tree planting and preservation requirements of the ordinance. Certain trees were removed from the approved species list during this process due to their status as invasive species poorly suited to our area.

Recently, planning staff was approached by a citizen who desires to further revise the UDO planting list to remove additional invasive species from this list and to add more trees well suited to our area. The citizen's focus is on encouraging the planting of local species which support wildlife and are well suited for our climate. The citizen is also proposing expanding the details included in the planting list to include information on the height, spread, growth rate, and light needs of each species.

It is worth noting that the planting list in the UDO is not exhaustive – developers may plant other species that are not on this list for ordinance credit with approval of the Director of Inspections. However, trees in the prohibited section of the list may not be planted or preserved *to satisfy ordinance requirements* (these trees may still be planted anywhere within the City or County for other purposes).

At the request of the chairman, staff shared the concepts proposed by this citizen with the Community Development/Housing/ General Government Committee (CD/H/GG) of City Council at its July 2015 meeting. Upon hearing this information, the Committee asked staff to prepare a text amendment that could implement these changes.

ANALYSIS

Staff believes the proposed ordinance will promote the planting of more locally-suited trees in accordance with the desires of Council. Staff also agrees with members of the CD/H/GG Committee that additional information pertaining to the height, spread, growth rate, and light needs of plants should be included in the planting ordinance revision, and this has been done in the attached ordinance. Such information may help developers make better decisions regarding the suitability of species on a site-by-site basis.

In preparing this amendment, Planning and Development staff also contacted City Vegetation Management staff for their input on the proposed amendment. Vegetation Management did not have any concerns with the proposed amendment and agreed that the additional information on the characteristics of allowed species would be a benefit to ordinance users.

Prior to taking this ordinance concept to the July CD/H/GG meeting, staff also contacted stakeholders (several local landscape architects, the Winston-Salem Chamber of Commerce, and the Home Builders Association of Winston-Salem) about this request and set up a meeting to discuss the proposal, which no one attended. Staff also discussed this proposal with the Winston-Salem Neighborhood Alliance at their June 2015 meeting, where it was met with generally favorable responses.

Overall, staff recommends approval of the proposed ordinance change as it will promote the planting of vegetation suited to our local climate and wildlife, while still providing the flexibility to use other plant materials where appropriate.

RECOMMENDATION

APPROVAL

CITY-COUNTY PLANNING BOARD PUBLIC HEARING MINUTES FOR UDO-266 SEPTEMBER 10, 2015

Kirk Ericson presented the staff report.

PUBLIC HEARING

FOR:

Bill Davis, 2577 Club Park Road, Winston-Salem, NC 27104

- Representing bird-friendly communities program of the Audubon of North Carolina.
- The proposed revised list materially increases the number of plants. We aren't trying to reduce the choices.
- One of the benefits of the new list is that, in addition to the current categories of large trees, small trees, etc., we now have smaller categories within each category which provide more information.
- Mr. Davis described the benefits of native plants versus non-native plants. He stated that no attempts were made to remove non-native plants from the list.
- Planting native plants helps replace some of the vegetation which is destroyed when development occurs.
- Adopting the proposed plant list will benefit the community and developers.

Susan Andrews, 110 Hearthside Drive, Winston-Salem, NC 27104

- In response to a question from Melynda Dunigan about Leyland Cypress, Ms. Andrews explained that Leyland Cypress have many issues including large size and rapid growth. Beyond that the tree has tremendous insect and fungal disease issues.
- It can be used but is not a desirable plant. There are many others on our list which can replace it.
- Since NC State released this tree, problems have been discovered. They are now reconsidering it's use as a desirable plant.
- It is not on the invasive exotic list currently but might be added at any time.
- George Bryan commented about such trees as Bradford Pears which were hailed as a desired tree several years ago and are now frowned upon. He asked about the Golden Rain Tree which the City is now using along roadways. Ms. Andrews responded that it was not on the list and was being watched for invasive qualities throughout the State.

Kimberly Brand, 315 Gloria Avenue, Winston-Salem, NC 27127

- Emphasizing native plants would be a very big win for birds.

- As an example of how important this is, Chickadee birds raise their young to the point where they can fly in two weeks. In that time the parents have to find 6,000 caterpillars to feed their young. Caterpillars are very picky eaters so using trees which encourage caterpillars is very beneficial to Chickadees.

AGAINST: None

WORK SESSION

Board members' questions were answered during the public hearing portion of the meeting. Members expressed appreciation for information about birds as well as about the trees addressed in this ordinance amendment.

MOTION: Clarence Lambe moved approval of the text amendment.

SECOND: Paul Mullican

VOTE:

FOR: George Bryan, Melynda Dunigan, Tommy Hicks, Arnold King, Clarence Lambe, Darryl Little, Paul Mullican, Brenda Smith, Allan Younger

AGAINST: None

EXCUSED: None

A. Paul Norby, FAICP
Director of Planning and Development Services

UDO-266
AN ORDINANCE AMENDING
CHAPTER B OF THE *UNIFIED DEVELOPMENT ORDINANCES*
TO REVISE THE SUGGESTED PLANT MATERIALS LIST

Be it ordained by the City Council of Winston-Salem, North Carolina, that the *Unified Development Ordinances* is hereby amended as follows:

Section 1. Chapter B, Article III of the UDO is amended as follows:

Chapter B – Zoning Ordinance
Article III – Other Development Standards

3-4 LANDSCAPING AND TREE PRESERVATION STANDARDS (W)

3-4.2.1 TREE PRESERVATION AND PLANTING (W)

- (A) Tree preservation and planting requirements where a grading permit is required for development of five (5) acres or less, development zoned PB, development entirely within Activity Centers designated in Legacy or adopted Area Plans, redevelopment of already-developed nonresidentially zoned sites containing existing nonresidential structures, and qualifying residential development zoned RS or RM-5
 - (2) Calculation of Required Tree Save Area. Calculations for Tree Save Areas (TSA) shall exclude the square footage areas for existing and proposed public street rights-of-way, existing utility easements, and existing water bodies and new water bodies required to satisfy the stormwater management requirements otherwise required by law or ordinance. The combined square footage of these areas shall be deleted from the total parcel area for new development and from the limits of disturbed areas for additional development to an already developed site before the required percentage of TSA is calculated. Tree Save Area shall be calculated as follows:
 - (a) Stands of Trees. The Tree Save Area for a stand of trees shall be calculated as the acreage that stand of trees occupies. Stands of trees shall be exempt from the species requirements of this Ordinance (Section B.3-4.10) as long as a stand of trees is determined to meet the intent of the Tree Save Area requirements of this Ordinance; however, no stand consisting primarily of species prohibited from ordinance credit in accordance with Section B.3-4.10(~~G~~)(I) shall be counted towards the Tree Save Area requirements of the Ordinance.
- (B) Tree preservation and planting requirements where a grading permit is required for development greater than five (5) acres, development which is not zoned PB, and development which is not located within Activity Centers as designated in Legacy or adopted Area Plans
 - (2) Calculation of Required Tree Save Area. Calculations for Tree Save Areas (TSA) shall exclude the square footage areas for existing and proposed public street rights-of-way, existing utility easements, and existing water bodies and new

water bodies required to satisfy the stormwater management requirements otherwise required by law or ordinance. The combined square footage of these areas shall be deleted from the total parcel area for new development and from the limits of disturbed areas for additional development to an already developed site before the required percentage of TSA is calculated. Tree Save Area shall be calculated as follows:

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3-4.10 SUGGESTED PLANT MATERIALS LIST (W)

The suggested plant materials list includes common trees and shrubs suitable for use in the Forsyth County area. Due to individual site soil, moisture, and microclimate conditions, professional expertise should be sought to determine the appropriate plant materials for any particular development project. The use of native plants is recommended where possible. Other appropriate plants not included in this list may also be used with the approval of the Director of Inspections or designee.

(A) ~~Large Variety Trees (mature height: thirty five (35) feet or greater):~~

European Black Alder	Alnus glutinosa (Pyramidalis)
Bald Cypress	Taxodium distichum (Monarch of Illinois, Shawnee Brave)
Sugar Hackberry	Celtis laevigata
Chalkbark Maple	Acer Lecoderme
Freeman Maple	Acer x freemanii (Armstrong, Autumn Blaze, Celebration, Scarlet Sentinel)
Green Mountain Sugar Maple	Acer saccharum "Green Mountain"
Hedge Maple	Acer campestre
Southern Sugar Maple	Acer Barbatum
Trident Maple	Acer buergeranum
Bur Oak	Quercus macrocarpa
Sawtooth Oak	Quercus acutissima
Shingle Oak	Quercus imbricaria
Swamp White Oak	Quercus bicolor
Northern Red Oak	Quercus rubra
Nuttall Oak	Quercus nutalli
Overcup Oak	Quercus lyrata
Green Ash	Fraxinus pennsylvanica (Marshall Seedless, Newport, Patmore, Summit, Lakeview)
Kentucky Coffeetree	Gymnocladus dioicus

Japanese Pagodatree	<i>Sophora japonica</i> (Princeton Upright, Regent)
Silver Linden	<i>Tilia tomentosa</i> (Green Mountain, Sterling)
Hybrid Elm	<i>Ulmus</i> spp. (Homestead, Pioneer, Urban)
Willow Oak	<i>Quercus phellos</i>
Sugar Maple	<i>Acer saccharum</i>
Red Maple	<i>Acer rubrum</i> (Autumn Flame, Bowhall, Karpick, Northwood, October Glory, Red Skin, Red Sunset)
Scarlet Oak	<i>Quercus coccinea</i>
Southern Magnolia	<i>Magnolia grandiflora</i>
London Plane tree	<i>Platanus acerifolia</i> (Bloodgood, Colombia, Liberty)
River Birch	<i>Betula nigra</i> (Heritage, DuraHeat)
Japanese Zelkova	<i>Serrata</i> (Green Vase, Village Green)
Tulip Poplar	<i>Liriodendron tulipifera</i>
Black Gum	<i>Nyssa sylvatica</i>
Littleleaf Linden	<i>Tilia cordata</i> (Glenleven, Greenspire)
White Oak	<i>Quercus alba</i>
Japanese Scholartree	<i>Sophora japonicum</i>
Ginkgo	<i>Ginkgo biloba</i> (Lakeview, Princeton Sentry)
English Oak	<i>Quercus robur</i> (Fastigiata)
Japanese Katsuratree	<i>Cercidiphyllum japonicum</i>
Schumard Oak	<i>Quercus schumardi</i>
Chinese Elm	<i>Ulmus parviflora</i> (Lacebark, Athena, Allee)

(B) Medium Variety Trees (mature height: twenty five (25) to thirty five (35) feet):

Sourwood	<i>Oxydendrum arboreum</i>
Thornless Honeylocust	<i>Gleditsia triacanthos</i> "Inermis"
Eastern Redbud	<i>Cercis canadensis</i>
Yoshino Cherry	<i>Prunus yedoensis</i>
Golden Rain Tree	<i>Koelreuteria paniculata</i>
Saucer Magnolia	<i>Magnolia soulangeana</i>
Weeping Cherry	<i>Prunus subhirtilla pendula</i>
Kwansan Cherry	<i>Prunus serrucata</i> "Kwansan"
Yellowwood	<i>Cladastris lutea</i>
Ironwood	<i>Carpinus carolineana</i>
Pistache	<i>Pistachia chinensis</i>
Redmond Linden	<i>Tilia americana</i> "Redmond"
American Holly	<i>Ilex opaca</i> (East Palatka, Foster's #2, Nellie R. Stevens)
Eastern Red Cedar	<i>Juniperus virginiana</i> (Emerald Sentinel, Princeton Sentry, Pendula)
Little Gem Magnolia	<i>Magnolia</i> "Little gem"
Fall Blooming Cherry	<i>Prunus autumnalis</i>
Fruitless Sweetgum	<i>Liquidambar styraciflua</i> "Rotundaloba"
European Hornbeam	<i>Carpinus betulus</i> (Fastigiata).
Hophornbeam	<i>Ostrya virginiana</i>

(C) — Small Variety Trees (mature height: less than twenty five (25) feet):

Japanese Maple	Acer palmatum
Japanese Dogwood	Cornus kousa
Flowering Dogwood	Cornus florida
Smoketree	Cotinus coggyria (Daydream, Royal Purple)
Crape Myrtle	Lagerstroemia indica (Dallas Red, Lipan, Natchez, Sioux, Tonto, Yuma)
Crabapple (var.)	Malus hybrida (var.)
Amur Maple	Acer ginnala
Wax Myrtle	Myrica Cerifer
Star Magnolia	Magnolia stellata
Japanese Tree Lilac	Syringa reticulata
Green Hawthorn	Crataegus viridis
Carolina Cherrylaurel	Prunus caroliniana
Choke Cherry	Prunus virginiana
Sargent Cherry	Prunus sargentii (Columnaris, Hillier Spire)

(D) — Streetyard and Interior Shrubs (mature height: approximately thirty six (36) inches):

(1) — Supplemental Evergreen Shrubs	
Warty Barberry	Berberis verruculosa
Dwarf Burford Holly	Ilex cornuta "Burfordii" nana
Japanese Holly (var.)	Ilex crenata (var.)
Mugo Pine	Pinus mugo
Juniper (var.)	Juniperus sp.
Euonymous (var.)	Euonymous sp.
Leatherleaf Viburnum	Viburnum rhytidophyllum
(2) — Deciduous:	
Forsythia	Forsythia sp.
Dwarf Burning Bush	Euonymous alatus "Compacta"
Thunberg Spirea	Spirea thunbergi
Viburnum (var.)	Viburnum sp.
Oakleaf Hydrangea	Hydrangea quercifolia
Japanese Flowering Quince	Chaenomeles japonic
Potentilla	Potentilla fruticosa
Oregonholly Grape	Mahonia bealei
Nandina	Nandina domestica
Dwarf Nandina	Nandina domestica nana

(E) — Primary Evergreen Shrubs and Outdoor Storage Area Screening Plants (installation height: six (6) feet):

American Holly	Ilex opaca
Burforda Holly	Ilex cornuta "Burfordii"
Nellie Stevens Holly	Ilex cornata "Nellie Stevens"
Wax Myrtle	Myrica cerifera
Hetz Juniper	Juniperus hetzi
Arborvitae	Thuja occidentalis
Eastern Red Cedar	Juniperus virginiana

Japanese Black Pine *Pinus thunbergiana*

(F) Groundcovers (planting areas, berms, wall planters):

Lily Turf *Liriope muscarii* Hybrid
 Daylily *Hemerocallis hybrida*
 Aaronsbeard *Hypericum calycinum*
 Rockspray Cotoneaster *Cotoneaster horizontalis*

(G) The following trees shall not be credited toward the requirements of Section B.3 4.2.1:

Bradford Pear *Pyrus calleryana* "Bradford"
 Silver Maple *Acer saccharinum*
 Hybrid Poplars *Populus spp.*
 Tree of Heaven *Ailanthus altissima*
 Mimosa *Albizia julibrissin*
 Royal Paulownia *Paulownia Tomentosa*
 Pine (var.) *Pinus sp.*

Abbreviations used in tables below: S = Slow; M= Moderate; R = Rapid;
 S = Sun; SH = Shade; PS = Partial Sun; D = Deciduous; E = Evergreen

(A) Large variety Trees (mature height: thirty-five (35) feet or greater):

(1) Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex opaca</u> American Holly	40-60'	20-30'	S	S-SH	Tolerates a variety of conditions, male and female plants needed for fruit, pyramidal form
<u>Juniperus virginiana</u> Eastern Red Cedar	40-50'	15-25'	M	S-PS	Tolerates a variety of conditions, pyramidal form, male and female plants needed for fruit
<u>Magnolia grandiflora</u> Southern Magnolia	60-80'	30-40'	R	S-PS	Less shade tolerant with age, attracts wildlife, fragrant spring and summer flowers
<u>Pinus taeda</u> Loblolly Pine	90-120'	30-40'	R	S	Tolerates flooding and drought, critical to Brown-headed Nuthatch
<u>Quercus laurifolia or hemisphaerica</u> Laurel Oak	60-80'	30-40'	R	S-SH	Shade tolerant, good for moist sites

(2) Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer barbatum or floridanum</u> Southern Sugar Maple	50-60'	20-35'	M	S-PS	Heat tolerant, dislikes dry, compact soil
<u>Acer rubrum</u> Red Maple	60-90'	30-50'	R-M	S-SH	Tolerates a variety of conditions, including wet soil, fall color

<u>Acer saccharum</u> Sugar Maple	<u>90-120'</u>	<u>40-60'</u>	<u>S</u>	<u>S-PS</u>	<u>Extensive root system, fall color, shade tolerant</u>
<u>Betula nigra</u> River Birch	<u>60-80'</u>	<u>30-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Lacy texture, tolerates a variety of conditions, including wet soil, tends to drop small limbs, cultivars available</u>
<u>Celtis laevigata</u> Southern Hackberry or Sugarberry	<u>70-80'</u>	<u>30-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions</u>
<u>Cladrastis kentukea</u> Yellow-wood	<u>40-50'</u>	<u>40-45'</u>	<u>M</u>	<u>S</u>	<u>Tolerates a variety of conditions, fragrant white blooms in alternate years</u>
<u>Diospyros virginiana</u> American Persimmon	<u>30-60'</u>	<u>20-25'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates dry soil, good fall color, fruit attracts wildlife. Separate male and female plants.</u>
<u>Fraxinus pennsylvanica</u> Green Ash	<u>50-120'</u>	<u>40-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions. Separate male and female plants. Many cultivars available.</u>
<u>Gymnocladus dioica</u> Kentucky Coffee-tree	<u>60-75'</u>	<u>40-50'</u>		<u>S</u>	<u>Tolerant of air pollution and drought, fall color</u>
<u>Liquidambar styraciflua</u> Sweet Gum	<u>80-120'</u>	<u>40-60'</u>	<u>R</u>	<u>S</u>	<u>Fall color, best in natural areas due to fruit drop</u>
<u>Liquidambar styraciflua</u> 'Rotundiloba' Fruitless Sweet Gum	<u>60-70'</u>	<u>20-30'</u>	<u>R</u>	<u>S</u>	<u>Pyramidal in form, does not set much fruit, tolerates clay soil</u>
<u>Liriodendron tulipifera</u> Tulip-Tree or Yellow Poplar	<u>90-120'</u>	<u>60-80'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, drops limbs, best in natural areas, host for N.C. State butterfly</u>
<u>Nyssa sylvatica</u> Black Gum	<u>50-80'</u>	<u>30-50'</u>	<u>M</u>	<u>S-PS</u>	<u>Fall color, pyramidal when young</u>
<u>Platanus occidentalis</u> Sycamore	<u>80-120'</u>	<u>40-60'</u>	<u>R</u>	<u>S-PS</u>	<u>Showy bark, tolerates a variety of conditions but needs water, best in natural areas</u>
<u>Prunus serotina</u> Wild Black Cherry	<u>60-80'</u>	<u>30-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, seeds heavily, best in natural areas</u>
<u>Quercus alba</u> White Oak	<u>80-100'</u>	<u>40-60'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Sensitive to construction damage, good fall color</u>
<u>Quercus bicolor</u> Swamp White Oak	<u>50-60'</u>	<u>50-60'</u>	<u>M-R</u>	<u>S</u>	<u>Needs acidic soil, drought resistant, intolerant of salt and air pollution</u>
<u>Quercus coccinea</u> Scarlet Oak	<u>50-80'</u>	<u>40-50'</u>	<u>R</u>	<u>S</u>	<u>Good fall color, tolerates dry, sandy soil</u>
<u>Quercus falcata</u> Southern Red Oak	<u>70-80'</u>	<u>30-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates drought</u>
<u>Quercus imbricaria</u> Shingle Oak	<u>50-60'</u>	<u>50-60'</u>	<u>S-M</u>	<u>S</u>	<u>Tolerates a variety of conditions</u>
<u>Quercus lyrata</u> Overcup Oak	<u>35-45'</u>	<u>35-40'</u>	<u>M</u>	<u>S</u>	<u>Tolerates a variety of conditions</u>
<u>Quercus macrocarpa</u> Bur Oak	<u>60-80'</u>	<u>60-80'</u>	<u>S</u>	<u>S</u>	<u>Tolerant of city conditions</u>
<u>Quercus nigra</u> Water Oak	<u>70-90'</u>	<u>30-50'</u>	<u>R</u>	<u>S</u>	<u>May retain some leaves through the winter, tolerates a variety of conditions</u>
<u>Quercus palustris</u> Pin Oak	<u>60-80'</u>	<u>40-50'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, pyramidal form, good fall color</u>

<u>Quercus phellos</u> Willow Oak	<u>80-100'</u>	<u>40-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, golden fall color</u>
<u>Quercus rubra</u> Red Oak	<u>80-90'</u>	<u>30-50'</u>	<u>R-M</u>	<u>S-PS</u>	<u>Needs moist soils, good fall color</u>
<u>Quercus shumardii</u> Shumard Oak	<u>90-100'</u>	<u>40-50'</u>	<u>R-M</u>	<u>S</u>	<u>Tolerates a variety of conditions</u>
<u>Quercus texana or nuttallii</u> Nuttall Oak	<u>60-80'</u>	<u>30-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates poorly drained soils, drought tolerant</u>
<u>Taxodium distichum</u> Bald-cypress	<u>100-120'</u>	<u>30-40'</u>	<u>R</u>	<u>S</u>	<u>Pyramidal when young, tolerates wet and dry soils, fall color, attractive trunk</u>
<u>Tilia americana</u> Southern Basswood or American Linden	<u>50-70'</u>	<u>30-45'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates drought and clay soil, intolerant of air pollution, consider 'Redmond' cultivar</u>

(3) Non-Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Cedrus deodara</u> Deodar Cedar	<u>40-70'</u>	<u>30-40'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates drought and hot, dry summers, likes acidic soil</u>
<u>Cryptomeria japonica</u> Japanese Cryptomeria	<u>50-60'</u>	<u>25-30'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, pyramidal shape, many cultivars available</u>
<u>Thuja 'Green Giant'</u> Green Giant Arborvitae	<u>40-50'</u>	<u>15-20'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, may need some wind protection, bronzes in winter</u>

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer x freemanii</u> Freeman Maple	<u>Gen. 40-70'</u>	<u>Gen. 15-40'</u>	<u>M</u>	<u>S-PS</u>	<u>A hybrid of red maple and silver maple, cultivars vary in size and characteristics</u>
<u>Cercidiphyllum japonicum</u> Katsura Tree	<u>40-60'</u>	<u>20-40'</u>	<u>M-R</u>	<u>S</u>	<u>Intolerant of hot, dry sites, fall color</u>
<u>Ginkgo biloba</u> Ginkgo	<u>50-80'</u>	<u>30-40'</u>	<u>S</u>	<u>S</u>	<u>Plant male trees to avoid messy, smelly fruit, tolerates a variety of conditions, bright yellow fall color</u>
<u>Metasequoia glyptostroboides</u> Dawn Redwood	<u>70-100'</u>	<u>15-25'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, tolerates wet soils, attractive trunk</u>
<u>Platanus x acerifolia</u> London Planetree	<u>65-80'</u>	<u>75-100'</u>	<u>M</u>	<u>S-PS</u>	<u>Good street tree, light brown exfoliating bark</u>
<u>Quercus robur 'Fastigata'</u> Upright English Oak	<u>50-60'</u>	<u>10-20'</u>	<u>S</u>	<u>S</u>	<u>Tolerates drought and air pollution, narrow, upright form</u>
<u>Sophora japonica or Styphnolobium japonicum</u> Japanese Scholartree or Japanese Pagodatree	<u>50-70'</u>	<u>50'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Resistant to air pollution and drought, but marginally heat hardy in Piedmont N.C.</u>
<u>Tilia cordata 'Greenspire'</u> Greenspire Littleleaf Linden	<u>30-40'</u>	<u>25-35'</u>	<u>S-M</u>	<u>S</u>	<u>Piedmont NC is at southern extreme of range, air pollution tolerant, cultivars available</u>

<u>Tilia tomentosa</u> Silver Linden	<u>40-70'</u>	<u>25-45'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates drought and air pollution and a variety of soil conditions</u>
<u>Ulmus parvifolia</u> Lacebark or Chinese Elm	<u>40-50'</u>	<u>40-50'</u>	<u>M-R</u>	<u>S</u>	<u>Tolerates a variety of conditions, attractive bark, a tough and durable tree</u>
<u>Ulmus hybrida</u> Hybrid Elm	<u>75-125'</u>	<u>60-120'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions; Dutch Elm disease resistant varieties available</u>
<u>Zelkova serrata</u> Japanese Zelkova	<u>50-80'</u>	<u>40-50'</u>	<u>M</u>	<u>S-PS</u>	<u>Good street tree; tolerates urban conditions well, cultivars available</u>

(B) **Medium Variety Trees** (mature height: twenty-five (25) to thirty-five (35) feet)

(1) **Native Evergreen**

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex x attenuata 'Fosteri'</u> Foster's Holly	<u>20-30'</u>	<u>10-20'</u>	<u>R</u>	<u>S-PS</u>	<u>Red fruits, male plants not needed for fruiting, best berry production in full sun</u>
<u>Magnolia virginiana</u> Sweet Bay Magnolia	<u>20-30'</u>	<u>10-15'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates some shade, good for wet sites, cultivars provide evergreen and deciduous options</u>
<u>Pinus virginiana 'Wate's Golden'</u> Wate's Golden Virginia Pine	<u>15-30'</u>	<u>10-20'</u>	<u>S-M</u>	<u>S</u>	<u>Grows in poor soils, turns golden in winter, seeds eaten by birds, especially Brown-headed Nuthatch</u>
<u>Prunus caroliniana</u> Carolina Laurel Cherry	<u>20-40'</u>	<u>15-20'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, colonizes</u>

(2) **Native Deciduous**

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Carpinus caroliniana</u> American Hornbeam or Ironwood	<u>20-30'</u>	<u>20-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Does well in moist to wet soil, attractive trunk, interesting fruit</u>
<u>Cercis canadensis</u> Eastern Redbud	<u>20-30'</u>	<u>25-35'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, many cultivars available, early spring purple/pink blooms</u>
<u>Cornus florida</u> Flowering Dogwood	<u>15-30'</u>	<u>15-20'</u>	<u>S-M</u>	<u>PS</u>	<u>Best in part shade, many cultivars available, flowers in spring, fall color and red fruit</u>
<u>Gleditsia triacanthos var. inermis</u> Thornless Honeylocust	<u>30-70'</u>	<u>30-40'</u>	<u>R</u>	<u>S</u>	<u>Range of soil types, drought tolerant;</u>
<u>Halesia tetraptera</u> Common Silverbell	<u>20-40'</u>	<u>20-35'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, showy white blooms in spring, cultivars available</u>
<u>Ostrya virginiana</u> Eastern Hop-hornbeam	<u>20-30'</u>	<u>20-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, interesting fruit</u>
<u>Oxydendrum arboreum</u> Sourwood	<u>20-30'</u>	<u>10-15'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, white summer flowers, fall color, source of sourwood honey</u>

(3) **Non-Native Evergreen**

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
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<u>Ilex x 'Nellie R. Stevens'</u> <u>Nellie Stevens Holly</u>	<u>30-40'</u>	<u>10-15'</u>	<u>R</u>	<u>S-PS</u>	<u>Red fruit, drought and heat tolerant, male and female plants (I. cornuta) needed for best fruiting, also used as a large shrub</u>
<u>Pinus thunbergii</u> <u>Japanese Black Pine</u>	<u>20'</u>	<u>20'</u>	<u>S-M</u>	<u>S</u>	<u>Select small tree cultivar from among dwarf cultivars, heat and drought tolerant</u>

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer buergerianum</u> <u>Trident Maple</u>	<u>25-35'</u>	<u>20-30'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions; good fall color</u>
<u>Acer campestre</u> <u>Hedge Maple</u>	<u>25-35'</u>	<u>25-35'</u>	<u>S</u>	<u>S</u>	<u>Tolerates drought and air pollution; shallow root system</u>
<u>Carpinus betulus 'Fastigata'</u> <u>Pyramidal European Hornbeam</u>	<u>30-40'</u>	<u>20-30'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Pyramidal when young, tolerates a range of conditions</u>
<u>Koelreuteria paniculata</u> <u>Goldenrain Tree</u>	<u>20-40'</u>	<u>15-35'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates drought and air pollution, yellow flowers in June</u>
<u>Magnolia x soulangiana or soulangeana</u> <u>Saucer Magnolia</u>	<u>15-25'</u>	<u>15-25'</u>	<u>M</u>	<u>S-PS</u>	<u>Late flowering cultivars avoid frost damage to blooms</u>
<u>Pistacia chinensis</u> <u>Chinese Pistachio</u>	<u>25-35'</u>	<u>20-30'</u>	<u>M-R</u>	<u>S</u>	<u>Drought tolerant, male and female plants needed for fruit, fall color</u>
<u>Prunus 'Kwanzan'</u> <u>Kwanzan Cherry</u>	<u>20-30'</u>	<u>15-25'</u>	<u>M</u>	<u>S-PS</u>	<u>Pink blooms in April, may be short-lived, good fall color, no fruit</u>
<u>Prunus 'Okame'</u> <u>Okame Cherry</u>	<u>15-30'</u>	<u>20-30'</u>	<u>M-R</u>	<u>S</u>	<u>Tolerates a variety of conditions, pink blooms in late winter lasting longer than most cherries</u>
<u>Prunus subhirtella 'Autumnalis'</u> <u>Fall Blooming Cherry</u>	<u>20-30'</u>	<u>15-25'</u>	<u>R</u>	<u>S-PS</u>	<u>Flowers best in full sun, flowers both in fall and late winter, may be short lived</u>
<u>Prunus subhirtella 'Pendula'</u> <u>Weeping Cherry</u>	<u>20-40'</u>	<u>15-30'</u>	<u>M</u>	<u>S</u>	<u>Tolerant of heat and clay soil; white to pinkish flowers in early spring; relatively long lived</u>
<u>Prunus x yedoensis</u> <u>Yoshino Cherry</u>	<u>30-40'</u>	<u>30-50'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, pale pink to white flowers in early spring, many cultivars available</u>

(C) Small Variety Trees (mature height: less than twenty-five (25) feet)

(1) Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex vomitoria</u> <u>Yaupon Holly</u>	<u>15-20'</u>	<u>10-20'</u>	<u>S-M</u>	<u>S-SH</u>	<u>Tolerates a variety of conditions, male and female plants needed for fruit, many cultivars available in many sizes</u>
<u>Magnolia grandiflora 'Little Gem'</u> <u>Little Gem Magnolia</u>	<u>15-20'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Dwarf cultivar of Magnolia grandiflora</u>

<u>Morella or Myrica cerifera</u> Wax-myrtle	<u>10-15'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, can colonize, many cultivars available, male and female plants needed for fruit, also can be used in shrub form</u>
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(2) Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Aesculus pavia</u> Red Buckeye	<u>10-20'</u>	<u>10-20'</u>	<u>M</u>	<u>S-PS</u>	<u>Especially attracts hummingbirds and pollinators, red flowers in spring, leaf scorch may develop in dry soils</u>
<u>Amelanchier x 'Autumn Brilliance'</u> Autumn Brilliance Serviceberry	<u>25-40'</u>	<u>20-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, rust fungus can attack fruit, early spring white blooms, fall color, other cultivars available</u>
<u>Chionanthus virginicus</u> Fringe-tree or Old Man's Beard	<u>12-20'</u>	<u>12-20'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, male and female plants needed for fruit, fragrant white flowers in spring</u>
<u>Crataegus viridis 'Winter King'</u> Winter King Green Hawthorn	<u>15-30'</u>	<u>10-20'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, has thorns, other native species available, white flowers in spring, fall color, interesting bark</u>

(3) Non-Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex cornuta 'Burfordii'</u> Burford Holly	<u>8-20'</u>	<u>5-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Drought and heat tolerant, red fruit produced without pollinator, dwarf cultivar available</u>

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer palmatum</u> Japanese Maple	<u>15-25'</u>	<u>10-25'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Avoid hot, dry and windy sites; many cultivars available</u>
<u>Chionanthus retusus</u> Chinese Fringe-tree	<u>15-25'</u>	<u>10-25'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, showy white flowers in spring</u>
<u>Cornus kousa</u> Kousa Dogwood	<u>15-30'</u>	<u>15-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Resistant to anthracnose, white flowers in May, fall color</u>
<u>Lagerstroemia indica cvs.</u> Crapemyrtle	<u>15-30'</u>	<u>6-15'</u>	<u>R</u>	<u>S</u>	<u>Summer blooms, attractive bark, overused, many cultivars (including dwarfs) available, do not top</u>
<u>Magnolia stellata</u> Star Magnolia	<u>10-15'</u>	<u>6-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Blooms best in full sun, late winter white flowers</u>
<u>Malus hybrida</u> Hybrid Crabapple	<u>15-25'</u>	<u>10-20'</u>	<u>M</u>	<u>S</u>	<u>Plant only disease resistant cultivars, many cultivars available, showy spring flowers and fall fruit</u>
<u>Prunus sargentii</u> Sargent Cherry	<u>20-40'</u>	<u>20-40'</u>	<u>R</u>	<u>S</u>	<u>One of the hardiest cherries; pink flowers; sensitive to air pollution; reddish bark</u>

<u>Prunus serrulata 'Snowgoose'</u> Snowgoose Japanese Cherry	<u>15-25'</u>	<u>15-20'</u>	<u>M</u>	<u>S-PS</u>	<u>White sprung flowers; reddish bark; may be short-lived</u>
<u>Syringa reticulata</u> Japanese Tree Lilac	<u>20-30'</u>	<u>15-20'</u>	<u>M</u>	<u>S</u>	<u>Tolerates a variety of conditions; creamy white flowers in mid-summer</u>

(D) Streetyard and Interior Shrubs (mature height thirty-six (36) inches or more):

(1) Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Agarista populifolia</u> Florida Leucothoe or Agarista	<u>8-12'</u>	<u>8-12'</u>	<u>R</u>	<u>PS</u>	<u>Tolerates a variety of conditions, but prefers moist soil</u>
<u>Ilex glabra</u> Inkberry Holly	<u>5-9'</u>	<u>5-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Drought tolerant but prefers moist soil, many cultivars available, male and female plants needed for fruit</u>
<u>Ilex vomitoria</u> Yaupon Holly	<u>10-20'</u>	<u>8-12'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, male and female plants needed for fruit, dwarf and other cultivars available</u>
<u>Illicium floridanum</u> Florida Star-anise	<u>5-8'</u>	<u>6-8'</u>	<u>M</u>	<u>PS-SH</u>	<u>Prefers moist, well-drained soil high in organic matter, many cultivars available, showy spring flowers</u>
<u>Illicium parviflorum</u> Yellow Anise-tree	<u>7-10'</u>	<u>8-10'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, can colonize, some cultivars available</u>
<u>Morella or Myrica cerifera</u> Wax-myrtle	<u>10-15'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, can colonize, many cultivars available, male and female plants needed for fruit, can reach small tree size</u>
<u>Rhododendron catawbiense</u> Catawba Rhododendron	<u>6-12'</u>	<u>6-10'</u>	<u>M</u>	<u>PS</u>	<u>Showy flowers, needs excellent drainage and organic soil, many cultivars available</u>
<u>Thuja occidentalis 'Emerald'</u> Emerald American Arborvitae	<u>6-10'</u>	<u>3-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a range of soils and conditions; good screening plant</u>

(2) Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Calycanthus floridus</u> Sweet-shrub or Carolina Allspice	<u>6-9'</u>	<u>6-12'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates a range of conditions, drought tolerant, fragrant maroon flowers in early spring, fall color, cultivars available</u>
<u>Callicarpa americana</u> American Beautyberry	<u>3-4'</u>	<u>4-5'</u>	<u>R</u>	<u>S-PS</u>	<u>Prefers moist soil, showy purplish berries in fall</u>
<u>Ceanothus americanus</u> New Jersey Tea	<u>3-4'</u>	<u>3-5'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Easy to grow in a wide range of conditions, drought tolerant, early summer flowers</u>
<u>Clethra alnifolia</u> Sweet-pepperbush	<u>4-8'</u>	<u>4-6'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Needs moist soil, fragrant white summer flowers, may colonize, fall color</u>
<u>Fothergilla gardenii</u> Witch-alder or Fothergilla	<u>3-5'</u>	<u>3-4'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, fall color, may colonize, fragrant white spring flowers</u>
<u>Fothergilla major</u> Large Witch-alder	<u>6-10'</u>	<u>5-9'</u>	<u>S</u>	<u>PS</u>	<u>Drought tolerant, cultivars include 'Mt. Airy,' white spring flowers</u>

<u>Hamamelis virginiana</u> Witch-hazel	<u>15-30'</u>	<u>15-25'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Multi-stemmed, yellow fall flowers and leaf color, tolerates heavy clay soil</u>
<u>Hydrangea arborescens</u> Smooth Hydrangea	<u>3-5'</u>	<u>3-5'</u>	<u>R</u>	<u>PS</u>	<u>Suffers in full sun and with drought, likes moist well-drained soil, attracts bees, prune in early spring, cultivars available, including 'Annabelle,' long bloom period</u>
<u>Hydrangea quercifolia</u> Oakleaf Hydrangea	<u>4-8'</u>	<u>3-8'</u>	<u>R</u>	<u>PS-S</u>	<u>Somewhat drought tolerant, attractive bark, needs mulch to keep roots cool, long bloom period in spring and summer, fall color, dwarf cultivars available</u>
<u>Ilex decidua</u> Possum-haw	<u>6-7'</u>	<u>6'</u>	<u>M</u>	<u>PS</u>	<u>Prefers moist, well-drained soil, male and female plants needed for fruit</u>
<u>Ilex verticillata</u> Winterberry	<u>6-15'</u>	<u>6-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates a range of conditions, but prefers moist soil, male and female plants needed for fruit, dwarf cultivars available</u>
<u>Itea virginica</u> Sweetspire	<u>3-6'</u>	<u>4-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates wide range of moisture, excellent fall color, fragrant white spring flowers</u>
<u>Lindera benzoin</u> Spicebush	<u>6-12'</u>	<u>6-12'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Prefers moist, well-drained soil, male and female plants needed for fruit, fall color, early spring yellowish flowers</u>
<u>Physocarpus opulifolius</u> Eastern Ninebark	<u>5-8'</u>	<u>6-10'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Drought tolerant, tough and durable, white spring flowers, attractive bark, dwarf cultivars available</u>
<u>Rhododendron calendulaceum</u> Flame Azalea	<u>4-8'</u>	<u>8-10'</u>	<u>S</u>	<u>PS</u>	<u>Good for naturalistic landscape, needs some direct sun, orange/yellow flowers in late spring, needs well-drained organic soil</u>
<u>Rhododendron periclymenoides</u> Pinxterbloom Azalea	<u>3-6'</u>	<u>4-7'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, needs some sun, pink spring flowers, needs well-drained organic soil</u>
<u>Rhododendron viscosum</u> Swamp Azalea	<u>2-8'</u>	<u>3-8'</u>	<u>M</u>	<u>PS</u>	<u>Likes moist organic soil, but tolerates some drought, fragrant white flowers in early summer</u>
<u>Sambucus canadensis</u> American Elderberry	<u>5-12'</u>	<u>5-12'</u>	<u>R</u>	<u>S</u>	<u>Likes moist soil, may colonize, white summer flowers and dark fruit</u>
<u>Vaccinium arboreum</u> Sparkleberry	<u>10-20'</u>	<u>10-15'</u>	<u>M</u>	<u>S-SH</u>	<u>Tolerates drought, needs multiple genetic strains for fruit set, fall color</u>
<u>Vaccinium stamineum</u> Deerberry	<u>3-5'</u>	<u>3-5'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought tolerant, needs acidic soil, needs multiple genetic strains for fruit set</u>
<u>Vaccinium virgatum or ashei</u> Rabbiteye Blueberry	<u>8-12'</u>	<u>6-10'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought tolerant, needs acidic soil, needs multiple genetic strains for fruit set, fall color, grown for fruit production</u>
<u>Viburnum acerifolium</u> Mapleleaf Viburnum	<u>4-6'</u>	<u>4-6'</u>	<u>M</u>	<u>S-SH</u>	<u>Tolerates drought, may colonize, needs multiple genetic strains for fruit set, white spring flowers, fall color</u>

<u>Viburnum dentatum</u> Arrow-wood Viburnum	<u>6-10'</u>	<u>6-15'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates drought but prefers moist soil, may colonize, needs multiple genetic strains for fruit set, white spring flowers, fall color, cultivars available</u>
<u>Viburnum nudum</u> Possumhaw or Southern Wild Raisin	<u>6-10'</u>	<u>6-10'</u>	<u>M</u>	<u>S-PS</u>	<u>Prefers moist to wet soil, needs multiple genetic strains for fruit set, white spring flowers, fall color, cultivars available</u>
<u>Viburnum prunifolium</u> Blackhaw Viburnum	<u>12-15'</u>	<u>8-12'</u>	<u>S-M</u>	<u>S-SH</u>	<u>Drought tolerant, needs multiple genetic strains for fruit set, white spring flowers, fall color</u>
<u>Viburnum rafinesqueanum</u> Downy Arrow-wood Viburnum	<u>4-6'</u>	<u>4-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought tolerant, needs multiple genetic strains for fruit set, white spring flowers, fall color</u>
<u>Viburnum rufidulum</u> Southern Black Haw Viburnum	<u>10-20'</u>	<u>10-15'</u>	<u>M</u>	<u>PS</u>	<u>Needs multiple genetic strains for fruit set, white spring flowers, fall color</u>

(3) Non-Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Abelia x grandiflora</u> Glossy Abelia	<u>5-8'</u>	<u>5-8'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, summer flowers, many dwarf cultivars available</u>
<u>Aucuba japonica</u> Aucuba	<u>6-10'</u>	<u>4-6'</u>	<u>S</u>	<u>PS-S</u>	<u>Needs winter shade, drought tolerant, many cultivars available</u>
<u>Berberis julianae</u> Wintergreen Barberry	<u>4-8'</u>	<u>6-8'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, has spines, good barrier plant</u>
<u>Berberis verruculosa</u> Warty Barberry	<u>3-6'</u>	<u>3-4'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerant of drought and urban conditions, tolerates a variety of soils</u>
<u>Buxus microphylla</u> Littleleaf Boxwood	<u>2-8'</u>	<u>2-8'</u>	<u>S</u>	<u>S-PS</u>	<u>Many shapes and sizes, var. japonica is often used, generally densely branched, leaves may bronze in winter</u>
<u>Buxus sempervirens</u> Common Boxwood	<u>15-20'</u>	<u>10-15'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, protect from wind, many cultivars available</u>
<u>Camellia japonica</u> Camellia	<u>8-15'</u>	<u>5-10'</u>	<u>S-M</u>	<u>PS</u>	<u>Excess sun, cold or shade can reduce flowering, many cultivars available, blooms in early spring</u>
<u>Camellia sasanqua</u> Sasanqua Camellia	<u>6-10'</u>	<u>5-7'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Drought tolerant, many cultivars available, blooms in the fall</u>
<u>Euonymus japonicus</u> Japanese Euonymus	<u>10-15'</u>	<u>5-6'</u>	<u>R</u>	<u>S-SH</u>	<u>Tolerates drought and variety of soil types, subject to scale insects</u>
<u>Ilex cornuta cvs.</u> Chinese Holly (i.e., Dw. Burford Holly)	<u>3-25'</u>	<u>4-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Favorite cultivars include Dw. Burford and Carissa hollies, many others available, red fruit when present, leaves have spines, drought and heat tolerant, male and female plants needed for fruit</u>
<u>Ilex crenata cvs.</u>	<u>4-10'</u>	<u>3-5'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Many cultivars available in varying shapes and sizes, black fruit when</u>

<u>Japanese Holly (i.e., Compacta Holly)</u>					present, generally hardy, male and female plants needed for fruit
<u>Juniperus chinensis cvs. Chinese Juniper</u>	<u>Var.</u>	<u>Var.</u>	<u>Var.</u>	<u>S</u>	Many cultivars available in varying shapes and sizes, generally heat and drought tolerant, male and female plants needed for fruit
<u>Loropetalum chinensis Loropetalum</u>	<u>6-10'</u>	<u>6-10'</u>	<u>R</u>	<u>S-PS</u>	Tolerates a variety of conditions, drought tolerant, long spring bloom period, dwarf cultivars available
<u>Osmanthus heterophyllus Tea Olive</u>	<u>8-10'</u>	<u>5-10'</u>	<u>S-M</u>	<u>S-PS</u>	Drought and heat tolerant, a good plant for screening, many cultivars available, fragrant fall flowers
<u>Osmanthus x fortunei Fortune's Osmanthus</u>	<u>15-20'</u>	<u>15-20'</u>	<u>M</u>	<u>S-SH</u>	Drought tolerant, good for screening and barriers, fragrant fall flowers
<u>Pinus mugo Mugo Pine</u>	<u>15-20'</u>	<u>25-30'</u>	<u>S</u>	<u>S-PS</u>	Varies greatly in size; tolerates clay soil, cultivars available
<u>Prunus laurocerasus Cherrylaurel</u>	<u>4-8'</u>	<u>5-8'</u>	<u>M</u>	<u>S-SH</u>	Favorite cultivars are Zabel, Otto Luyken and Schip laurel, need well-drained soil, some disease problems and scale insects
<u>Rhaphiolepis cvs. Indian Hawthorn</u>	<u>4-10'</u>	<u>4-10'</u>	<u>S</u>	<u>S-PS</u>	Tolerates a variety of conditions, drought tolerant, many cultivars available
<u>Rhododendron hybrida Evergreen Azalea</u>	<u>2-8'</u>	<u>2-10'</u>	<u>M</u>	<u>PS</u>	Many hybrids and cultivars available, needs well drained soil
<u>Sarcococca confusa Sweetbox Sarcococca</u>	<u>3-5'</u>	<u>3-5'</u>	<u>S-M</u>	<u>PS-SH</u>	Drought tolerant, fragrant flowers in late winter
<u>Viburnum awabuki 'Chindo' Chindo Viburnum</u>	<u>10-15'</u>	<u>6-8'</u>	<u>R</u>	<u>S-PS</u>	Pyramidal form, drought tolerant
<u>Viburnum rhytidophyllum Leatherleaf Viburnum</u>	<u>10-15'</u>	<u>10-15'</u>	<u>M</u>	<u>PS-SH</u>	Protect from winter wind and sun

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Chaenomeles speciosa or japonica Japanese Flowering Quince</u>	<u>5-8'</u>	<u>4-8'</u>	<u>R</u>	<u>S-PS</u>	Varied flower colors, flowers best in full sun, tolerates a variety of conditions, many cultivars available, stems often have spines
<u>Cotinus coggygria Smoketree or Smokebush</u>	<u>10-15'</u>	<u>8-12'</u>	<u>M-R</u>	<u>S</u>	Tolerates a range of soil types, drought tolerant, showy summer flowers, many cultivars available
<u>Forsythia x intermedia Border Forsythia</u>	<u>8-10'</u>	<u>10-12'</u>	<u>R</u>	<u>S-PS</u>	Tolerates a variety of conditions, blooms in early spring, best in full sun, many cultivars to choose from
<u>Hydrangea macrophylla Bigleaf Hydrangea</u>	<u>3-4'</u>	<u>4-6'</u>	<u>R</u>	<u>PSH</u>	Moist well drained soil, wilts in drought, long bloom period, needs pruning after blooming

<u>Hydrangea paniculata</u> Panicle Hydrangea	<u>6-20'</u>	<u>6-8'</u>	<u>R</u>	<u>S-PS</u>	<u>Drought tolerant, white flowers in summer, long bloom period, many cultivars available</u>
<u>Kerria japonica</u> Japanese Kerria	<u>3-6'</u>	<u>6-9'</u>	<u>M</u>	<u>PS-SH</u>	<u>Drought tolerant, early spring yellow flowers, interesting green stems, cultivars available</u>
<u>Rosa hybrida</u> Hybrid Landscape Rose (i.e., Knock Out Rose)	<u>3-4'</u>	<u>3-4'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought and disease resistant, blooms all summer, has thorns, many cultivars available</u>
<u>Spiraea cvs.</u> Spirea (excl. Spiraea japonica)	<u>Var.</u>	<u>Var.</u>	<u>Gen. R</u>	<u>S</u>	<u>Spring or summer flowering shrubs, many cultivars available, Spiraea japonica species is considered an invasive exotic in N.C.</u>

(E) Primary Evergreen Shrubs and Outdoor Storage Area Screening Plants (installation height six (6) feet or more):

(1) Native

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex opaca</u> American Holly	<u>40-60'</u>	<u>20-30'</u>	<u>S</u>	<u>S-SH</u>	<u>Tolerates a variety of conditions, male and female plants needed for fruit, pyramidal form, cultivars available</u>
<u>Ilex x attenuata 'Fosteri'</u> Foster's Holly	<u>20-30'</u>	<u>10-20'</u>	<u>R</u>	<u>S-PS</u>	<u>Red fruits, male plants not needed for fruiting, best berry production in full sun</u>
<u>Juniperus virginiana</u> Eastern Red Cedar	<u>40-50'</u>	<u>15-25'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, pyramidal form, male and female plants needed for fruit</u>
<u>Morella or Myrica cerifera</u> Wax-myrtle	<u>10-15'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, can colonize, many cultivars available, male and female plants needed for fruit, can reach small tree size</u>
<u>Prunus caroliniana</u> Carolina Laurel Cherry	<u>20-40'</u>	<u>15-20'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, colonizes</u>
<u>Thuja occidentalis</u> American Arborvitae	<u>Var.</u>	<u>Var.</u>	<u>Gen. S</u>	<u>S</u>	<u>Many cultivars in countless shapes and sizes, some tolerate part shade, some reach small tree size</u>

(2) Non-Native

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex cornuta 'Burfordii'</u> Burford Holly	<u>8-20'</u>	<u>5-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Leaves have spines, drought and heat tolerant, red fruit without pollinator, dwarf cultivar available</u>
<u>Ilex x 'Nellie R. Stevens'</u> Nellie Stevens Holly	<u>30-40'</u>	<u>10-15'</u>	<u>R</u>	<u>S-PS</u>	<u>Red fruit, drought and heat tolerant, male cultivar (I. cornuta) needed for best fruiting, also used as a large shrub</u>
<u>Juniperus chinensis cvs.</u> Chinese Juniper cultivars	<u>5-7'</u>	<u>8-10'</u>	<u>M</u>	<u>S</u>	<u>Tolerates a variety of conditions, including drought and air pollution</u>

<u>Pinus thunbergii</u> Japanese Black Pine	<u>20'</u>	<u>20'</u>	<u>S-M</u>	<u>S</u>	Select small tree cultivar from among dwarf cultivars, heat and drought tolerant
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(F) **Groundcovers** (planting areas, berms, wall planters):

(1) Native

<u>Plant Name</u>	<u>Deciduous/ Evergreen</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Carex pensylvanica</u> Pennsylvania Sedge or Oak Sedge	<u>Semi-E</u>	<u>.5-1'</u>	<u>.5-1'</u>	<u>M</u>	<u>PS-SH</u>	Plant in moist or dry soil, easy to grow and drought tolerant
<u>Carex plantaginea</u> Seersucker Sedge	<u>E</u>	<u>.5-1'</u>	<u>.5-1'</u>	<u>M</u>	<u>PS</u>	Needs moist soil
<u>Chrysogonum virginianum</u> Green-and-Gold	<u>Semi-E</u>	<u>.5-1'</u>	<u>.75- 1.5'</u>	<u>M</u>	<u>PS-SH</u>	Needs good drainage, yellow spring blooms
<u>Fragaria virginiana</u> Wild Strawberry	<u>D</u>	<u>.25- .75'</u>	<u>.75-1'</u>	<u>M-R</u>	<u>S-PS</u>	Native, prefers full sun, fruit is small but flavorful
<u>Heuchera americana</u> or <u>villosa</u> American Alumroot	<u>E</u>	<u>1-2'</u>	<u>1-2'</u>	<u>M</u>	<u>PS-SH</u>	Attractive mottled foliage and small flowers on long wiry stems, prefers moist to average well-drained soil, many cultivars available
<u>Juniperus horizontalis</u> Creeping Juniper	<u>E</u>	<u>1-2'</u>	<u>3-4</u>	<u>M-R</u>	<u>S</u>	Tolerates a variety of conditions, drought tolerant, cultivars available, native to NE US
<u>Mitchella repens</u> Partridge-berry	<u>E</u>	<u>.25'</u>	<u>1'+</u>	<u>S-M</u>	<u>PS-SH</u>	White spring flowers, red fall fruit, prefers moist organic soil
<u>Pachysandra procumbens</u> Allegheny-spurge	<u>E</u>	<u>.5-1'</u>	<u>1-2+'</u>	<u>M</u>	<u>PS-SH</u>	Drought tolerant, very interesting winter leaf, early spring bloom
<u>Phlox stolonifera</u> Creeping Phlox	<u>E</u>	<u>.5-1'</u>	<u>.75- 1.5'</u>	<u>R</u>	<u>PS-SH</u>	Prefers light shade and moist soil, spring blooms, many cultivars available
<u>Phlox subulata</u> Moss Phlox	<u>E</u>	<u>.25-.5'</u>	<u>1-2+'</u>	<u>M</u>	<u>S</u>	Good drainage important, drought tolerant, late winter through spring bloom period, many cultivars available

(2) Non-Native

<u>Plant Name</u>	<u>Deciduous/ Evergreen</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Cephalotaxus harringtonia</u> 'Prostrata' Prostrate Japanese Plum Yew	<u>E</u>	<u>2-3'</u>	<u>2-5'</u>	<u>S</u>	<u>S-PS</u>	Drought tolerant, can be used for a ground cover
<u>Cotoneaster dammeri</u> cvs. Bearberry Cotoneaster	<u>E</u>	<u>1-2'</u>	<u>3-6'</u>	<u>S-R</u>	<u>S-PS</u>	Needs good drainage, but tolerates poor soils and drought once established; white flowers in spring and small red fruit
<u>Cotoneaster salicifolius</u> cvs. Willowleaf Cotoneaster	<u>Semi-E</u>	<u>1-1.5'</u>	<u>5-6'</u>	<u>M</u>	<u>S-PS</u>	Drought tolerant, tolerates a variety of conditions; foliage

						turns purplish red in winter, white flowers in spring and small red fruit
<u>Hemerocallis</u> spp. Daylily	<u>D</u>	<u>.75-3'</u>	<u>2-3'</u>	<u>R</u>	<u>S-PS</u>	Tolerates a variety of conditions, summer heat and humidity tolerant, needs dividing, summer blooms, many cultivars available including repeat bloomers
<u>Hypericum calycinum</u> Aaronsbeard	<u>Semi-E</u>	<u>1-1.5'</u>	<u>1.5-2'</u>	<u>M-R</u>	<u>S-PS</u>	Tolerates a variety of conditions, blooms best in full sun
<u>Juniperus conferta</u> Shore Juniper	<u>E</u>	<u>.75-1.5'</u>	<u>6-8'</u>	<u>R</u>	<u>S</u>	Tolerates a variety of conditions, drought tolerant, many cultivars available
<u>Juniperus procumbens</u> Japanese Garden Juniper	<u>E</u>	<u>1-1.5'</u>	<u>10-12'</u>	<u>S</u>	<u>S</u>	Tolerates a variety of conditions, doesn't like wet soils, very hardy, 'Nana' is a popular dwarf cultivar
<u>Liriope muscari</u> Lily-Turf or Liriope	<u>Semi-E</u>	<u>1-1.5'</u>	<u>.75-1'</u>	<u>R</u>	<u>S-PS</u>	Tolerates a variety of conditions, summer flowers, stays green through the winter but needs cutting back in early spring, cultivars available
<u>Microbiota decussata</u> Russian Arborvitae	<u>E</u>	<u>.5-1.5'</u>	<u>3'-8'</u>	<u>M</u>	<u>S-PS</u>	More shade tolerant than some other junipers, foliage turns bronze-purple in fall and winter
<u>Ophiopogon japonicus</u> Mondo	<u>Semi-E</u>	<u>.75-1.3'</u>	<u>1'</u>	<u>R</u>	<u>PS-SH</u>	Tolerates a variety of conditions, cultivars available, colonizes
<u>Pachysandra terminalis</u> Japanese Pachysandra	<u>E</u>	<u>.5-1'</u>	<u>1-1.5'</u>	<u>R</u>	<u>PS-SH</u>	Tolerates a variety of conditions but needs well-drained soil, cultivars available
<u>Rubus pentalobus</u> or <u>calycinum</u> Creeping Raspberry	<u>E</u>	<u>.5-1'</u>	<u>3-6'</u>	<u>M</u>	<u>S-PS</u>	Tolerates variety of conditions, leaves turn burgundy in fall and winter
<u>Sarcococca hookeriana</u> var. <u>humilis</u> Dwarf Sweetbox	<u>E</u>	<u>1-1.5'</u>	<u>2-4'</u>	<u>S-M</u>	<u>PS-SH</u>	Drought tolerant, good for shady areas, fragrant winter flowers

(G) Ornamental Grasses

(1) Native:

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Andropogon gerardii</u> Big Bluestem or Turkeyfoot	<u>4-6'</u>	<u>2-3'</u>	<u>S</u>	Tolerates a wide variety of conditions, drought tolerant, needs sun
<u>Andropogon virginicus</u> Broomsedge	<u>3-4'</u>	<u>2-3'</u>	<u>S</u>	Drought tolerant
<u>Muhlenbergia capillaris</u> Pink Muhlygrass or Hairgrass	<u>2-3'</u>	<u>2-3'</u>	<u>S-PS</u>	Tolerates a wide variety of conditions, showy pink flowers in summer through fall, cultivars available
<u>Panicum virgatum</u> Switchgrass	<u>3-6'</u>	<u>2-3'</u>	<u>S-PS</u>	Tolerates a wide variety of conditions, wet to dry, good fall color, many cultivars available
<u>Schizachyrium scoparium</u> Little Bluestem	<u>2-3'</u>	<u>1-2'</u>	<u>S</u>	Tolerates a wide variety of conditions, drought tolerant, cultivars available

<u>Sorghastrum nutans</u> Yellow Indiangrass	<u>3-5'</u>	<u>1-2'</u>	<u>S</u>	<u>Tolerates a wide variety of conditions, good fall color</u>
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(2) Non-Native:

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Calamagrostis x acutiflora 'Karl Foerster'</u> Feather Reed Grass	<u>3-5'</u>	<u>1.2-2.5'</u>	<u>S</u>	<u>Fall color, good for medium to wet soils</u>
<u>Pennisetum alopecuroides</u> Fountain Grass	<u>2.5-5'</u>	<u>2.5-5'</u>	<u>S-PS</u>	<u>Tolerates a wide variety of conditions, good fall color, many cultivars available</u>
<u>Pennisetum orientale 'Karley Rose'</u> Oriental Fountain Grass	<u>2-3'</u>	<u>2-3'</u>	<u>S-PS</u>	<u>Drought tolerant, deep pink plumes last from early summer to fall</u>

(H) Vines

(1) Native:

<u>Plant Name</u>	<u>D/E</u>	<u>Height</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Bignonia capreolata</u> Cross-vine	<u>Semi-E</u>	<u>35-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Orange-red flowers attract hummingbirds, colonizes, flowers best in full sun, cultivars available</u>
<u>Campsis radicans</u> Trumpet-creeper	<u>D</u>	<u>25-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Orange/red blossoms attract hummingbirds, very aggressive colonizer</u>
<u>Clematis virginiana</u> Virgin's-bower or Woodbine	<u>D</u>	<u>12-20'</u>	<u>R</u>	<u>S-PS</u>	<u>White blooms in the summer; will bloom in some shade; don't confuse with Sweetautumn Clematis, an invasive exotic</u>
<u>Gelsemium sempervirens</u> Carolina Jessamine	<u>E</u>	<u>12-20'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Yellow flowers in spring, tolerates a variety of conditions, cultivars and other species available</u>
<u>Lonicera sempervirens</u> Coral Honeysuckle	<u>Semi-E</u>	<u>10-15'</u>	<u>R</u>	<u>S</u>	<u>Orange/red flowers, attracts hummingbirds, small red fruit, tolerates a variety of conditions, tolerates part shade but needs sun to flower</u>
<u>Parthenocissus quinquefolia</u> Virginia-creeper	<u>D</u>	<u>10-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Good fall color and fall black fruit, colonizes</u>
<u>Wisteria frutescens</u> American Wisteria	<u>D</u>	<u>15-30'</u>	<u>R</u>	<u>S</u>	<u>Replacement for invasive exotic Chinese and Japanese Wisterias, lavender flower clusters in late spring, sporadically re-blooms, cultivars available</u>

(2) Non-Native:

<u>Plant Name</u>	<u>D/E</u>	<u>Height</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Campsis grandiflora</u> Chinese trumpetvine	<u>E</u>	<u>30'</u>	<u>R</u>	<u>S</u>	<u>Large orange blossoms, attracts hummingbirds, hybrids available</u>
<u>Clematis hybrida</u> Clematis	<u>D</u>	<u>5-20'</u>	<u>M</u>	<u>S</u>	<u>Roots need to be shaded, many cultivars available; don't confuse with Sweetautumn Clematis, an invasive exotic</u>

<u>Hydrangea anomala subsp. petiolaris</u> Climbing Hydrangea	<u>D</u>	<u>30-50'</u>	<u>R</u>	<u>PS-SH</u>	<u>Flowers best with some sun, growth slow until plant is established, white flowers in late spring</u>
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(I) The following trees shall not be credited toward the requirements of Section B.3-

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Plant Name
<u>Acer saccharinum</u> Silver Maple
<u>Ailanthus altissima</u> Tree of Heaven
<u>Albizia julibrissin</u> Mimosa
<u>Paulownia tomentosa</u> Royal Paulownia
<u>Pinus strobus</u> White Pine
<u>Pinus virginiana</u> Virginia Pine
<u>Populus spp.</u> Hybrid Poplars
<u>Pyrus calleryana cultivars</u> Bradford and Chanticleer Pear and other Cultivars

3-4 LANDSCAPING AND TREE PRESERVATION STANDARDS (F)

3-4.10 SUGGESTED PLANT MATERIALS LIST (F)

The suggested plant materials list includes common trees and shrubs suitable for use in the Forsyth County area. Due to individual site soil, moisture, and microclimate conditions, professional expertise should be sought to determine the appropriate plant materials for any particular development project. The use of native plants is recommended where possible. Other appropriate plants not included in this list may also be used with the approval of the Director of Inspections or designee.

(A) — ~~Large Variety Trees (mature height: thirty five (35) feet or greater):~~

Willow Oak	Quercus phellos
Sugar Maple	Acer saccharum
Red Maple	Acer Rubrum
Scarlet Oak	Quercus coccinea
Southern Magnolia	Magnolia grandiflora
London Plane tree	Platanus acerifolia
River Birch	Betula nigra
Japanese Zelkova	Zelkova serrata
Tulip Poplar	Liriodendron tulipifera
Pin Oak	Quercus palustris
Black Gum	Nyssa sylvatica
Littleleaf Linden	Tilia cordata
White Oak	Quercus alba

Japanese Scholartree	Sophora japonicum
Gingko	Gingko biloba
English Oak	Quercus robur
Japanese Katsuratree	Cercidiphyllum japonicum
Schumard Oak	Quercus schumardi
Chinese Elm	Ulmus parviflora

(B) Medium Variety Trees (mature height: twenty five (25) to thirty five (35) feet):

Bradford Pear	Pyrus calleryana "Bradford"
Mountain Silverbell	Halesia monticola
Sourwood	Oxydendrum arboreum
Thornless Honeylocust	Gleditsia triacanthos "Inermis"
Eastern Redbud	Cercis canadensis
Mountain Ash	Sorbus americana
Yoshino Cherry	Prunus yedoensis
Golden Rain Tree	Koelreuteria paniculata
Saucer Magnolia	Magnolia soulangeana
Weeping Cherry	Prunus subhirtilla pendula
Kwansan Cherry	Prunus serrucata "Kwansan"
Yellowwood	Cladastris lutea
Ironwood	Carpinus carolineana
Pistachio	Pistachia chinensis
Redmond Linden	Tilia americana "Redmond"
American Holly	Ilex opaca

(C) Small Variety Trees (mature height: less than twenty five (25) feet):

Japanese Maple	Acer palmatum
Japanese Dogwood	Cornus kousa
Flowering Dogwood	Cornus florida
Smoketree	Cotinus coggyria
Crape Myrtle	Lagerstroemia indica
Crabapple (var.)	Malus hybrida (var.)
Amur Maple	Acer ginnala
Russian Olive	Eleaegnus angustifolia
Wax Myrtle	Myrica Cerifer
Star Magnolia	Magnolia stellata

(D) Streetyard and Interior Shrubs (mature height: approximately thirty six (36) inches):

(1) Evergreen:	
Warty Barberry	Berberis verruculosa
Dwarf Burford Holly	Ilex cornuta "Burfordii" nana
Japanese Holly (var.)	Ilex crenata (var.)
Mugo Pine	Pinus mugo
Juniper (var.)	Juniperus sp.
Euonymous (var.)	Euonymous sp.
Leatherleaf Viburnum	Viburnum rhytidophyllum
(2) Deciduous:	
Forsythia	Forsythia sp.
Dwarf Burning Bush	Euonymous alatus "Compacta"
Thunberg Spirea	Spirea thunbergi

Viburnum (var.)	Viburnum sp.
Oakleaf Hydrangea	Hydrangea quercifolia
Japanese Flowering Quince	Chaenomeles japonica
Potentilla	Potentilla fruticosa
Oregonholly Grape	Mahonia bealei
Nandina	Nandina domestica
Dwarf Nandina	Nandina domestica nana

(E) Outdoor Storage Area Screening Plants (installation height: six (6) feet):

American Holly	Ilex opaca
Burford Holly	Ilex cornuta "Burfordii"
Nellie Stevens Holly	Ilex cornuta "Nellie Stevens"
Red Tip Photinia	Photinia glabra
Wax Myrtle	Myrica cerifera
Hetz Juniper	Juniperus hetzi
Arborvitae	Thuja occidentalis
Eastern Red Cedar	Juniperus virginiana
Japanese Black Pine	Pinus thunbergiana

(F) Groundcovers (planting areas, berms, wall planters):

Lily Turf	Liriope muscarii
Creeping Lilyturf	Liriope spicata
Hybrid Daylily	Hemerocallis hybrida
Periwinkle	Vinea minor
English Ivy	Hedera helix
Purpleleaf Winter creeper	Evonymus fortunei coloratus
Aaronsbeard	Hypericum calycinum
Rockspray Cotoneaster	Cotoneaster horizontalis

Abbreviations used in tables below: S = Slow; M= Moderate; R = Rapid;
S = Sun; SH = Shade; PS = Partial Sun; D = Deciduous; E = Evergreen

(A) Large variety Trees (mature height: thirty-five (35) feet or greater):

(1) Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex opaca</u> <u>American Holly</u>	<u>40-60'</u>	<u>20-30'</u>	<u>S</u>	<u>S-SH</u>	<u>Tolerates a variety of conditions, male and female plants needed for fruit, pyramidal form</u>
<u>Juniperus virginiana</u> <u>Eastern Red Cedar</u>	<u>40-50'</u>	<u>15-25'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, pyramidal form, male and female plants needed for fruit</u>
<u>Magnolia grandiflora</u> <u>Southern Magnolia</u>	<u>60-80'</u>	<u>30-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Less shade tolerant with age, attracts wildlife, fragrant spring and summer flowers</u>
<u>Pinus taeda</u> <u>Loblolly Pine</u>	<u>90-120'</u>	<u>30-40'</u>	<u>R</u>	<u>S</u>	<u>Tolerates flooding and drought, critical to Brown-headed Nuthatch</u>

<u>Quercus laurifolia or hemisphaerica</u> Laurel Oak	<u>60-80'</u>	<u>30-40'</u>	<u>R</u>	<u>S-SH</u>	<u>Shade tolerant, good for moist sites</u>
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(2) Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer barbatum or floridanum</u> Southern Sugar Maple	<u>50-60'</u>	<u>20-35'</u>	<u>M</u>	<u>S-PS</u>	<u>Heat tolerant, dislikes dry, compact soil</u>
<u>Acer rubrum</u> Red Maple	<u>60-90'</u>	<u>30-50'</u>	<u>R-M</u>	<u>S-SH</u>	<u>Tolerates a variety of conditions, including wet soil, fall color</u>
<u>Acer saccharum</u> Sugar Maple	<u>90-120'</u>	<u>40-60'</u>	<u>S</u>	<u>S-PS</u>	<u>Extensive root system, fall color, shade tolerant</u>
<u>Betula nigra</u> River Birch	<u>60-80'</u>	<u>30-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Lacy texture, tolerates a variety of conditions, including wet soil, tends to drop small limbs, cultivars available</u>
<u>Celtis laevigata</u> Southern Hackberry or Sugarberry	<u>70-80'</u>	<u>30-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions</u>
<u>Cladrastis kentukea</u> Yellow-wood	<u>40-50'</u>	<u>40-45'</u>	<u>M</u>	<u>S</u>	<u>Tolerates a variety of conditions, fragrant white blooms in alternate years</u>
<u>Diospyros virginiana</u> American Persimmon	<u>30-60'</u>	<u>20-25'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates dry soil, good fall color, fruit attracts wildlife. Separate male and female plants.</u>
<u>Fraxinus pennsylvanica</u> Green Ash	<u>50-120'</u>	<u>40-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions. Separate male and female plants. Many cultivars available.</u>
<u>Gymnocladus dioica</u> Kentucky Coffee-tree	<u>60-75'</u>	<u>40-50'</u>		<u>S</u>	<u>Tolerant of air pollution and drought, fall color</u>
<u>Liquidambar styraciflua</u> Sweet Gum	<u>80-120'</u>	<u>40-60'</u>	<u>R</u>	<u>S</u>	<u>Fall color, best in natural areas due to fruit drop</u>
<u>Liquidambar styraciflua 'Rotundiloba'</u> Fruitless Sweet Gum	<u>60-70'</u>	<u>20-30'</u>	<u>R</u>	<u>S</u>	<u>Pyramidal in form, does not set much fruit, tolerates clay soil</u>
<u>Liriodendron tulipifera</u> Tulip-Tree or Yellow Poplar	<u>90-120'</u>	<u>60-80'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, drops limbs, best in natural areas, host for N.C. State butterfly</u>
<u>Nyssa sylvatica</u> Black Gum	<u>50-80'</u>	<u>30-50'</u>	<u>M</u>	<u>S-PS</u>	<u>Fall color, pyramidal when young</u>
<u>Platanus occidentalis</u> Sycamore	<u>80-120'</u>	<u>40-60'</u>	<u>R</u>	<u>S-PS</u>	<u>Showy bark, tolerates a variety of conditions but needs water, best in natural areas</u>
<u>Prunus serotina</u> Wild Black Cherry	<u>60-80'</u>	<u>30-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, seeds heavily, best in natural areas</u>
<u>Quercus alba</u> White Oak	<u>80-100'</u>	<u>40-60'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Sensitive to construction damage, good fall color</u>
<u>Quercus bicolor</u> Swamp White Oak	<u>50-60'</u>	<u>50-60'</u>	<u>M-R</u>	<u>S</u>	<u>Needs acidic soil, drought resistant, intolerant of salt and air pollution</u>
<u>Quercus coccinea</u> Scarlet Oak	<u>50-80'</u>	<u>40-50'</u>	<u>R</u>	<u>S</u>	<u>Good fall color, tolerates dry, sandy soil</u>
<u>Quercus falcata</u> Southern Red Oak	<u>70-80'</u>	<u>30-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates drought</u>

<u>Quercus imbricaria</u> Shingle Oak	<u>50-60'</u>	<u>50-60'</u>	<u>S-M</u>	<u>S</u>	<u>Tolerates a variety of conditions</u>
<u>Quercus lyrata</u> Overcup Oak	<u>35-45'</u>	<u>35-40'</u>	<u>M</u>	<u>S</u>	<u>Tolerates a variety of conditions</u>
<u>Quercus macrocarpa</u> Bur Oak	<u>60-80'</u>	<u>60-80'</u>	<u>S</u>	<u>S</u>	<u>Tolerant of city conditions</u>
<u>Quercus nigra</u> Water Oak	<u>70-90'</u>	<u>30-50'</u>	<u>R</u>	<u>S</u>	<u>May retain some leaves through the winter, tolerates a variety of conditions</u>
<u>Quercus palustris</u> Pin Oak	<u>60-80'</u>	<u>40-50'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, pyramidal form, good fall color</u>
<u>Quercus phellos</u> Willow Oak	<u>80-100'</u>	<u>40-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, golden fall color</u>
<u>Quercus rubra</u> Red Oak	<u>80-90'</u>	<u>30-50'</u>	<u>R-M</u>	<u>S-PS</u>	<u>Needs moist soils, good fall color</u>
<u>Quercus shumardii</u> Shumard Oak	<u>90-100'</u>	<u>40-50'</u>	<u>R-M</u>	<u>S</u>	<u>Tolerates a variety of conditions</u>
<u>Quercus texana or nuttallii</u> Nuttall Oak	<u>60-80'</u>	<u>30-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates poorly drained soils, drought tolerant</u>
<u>Taxodium distichum</u> Bald-cypress	<u>100-120'</u>	<u>30-40'</u>	<u>R</u>	<u>S</u>	<u>Pyramidal when young, tolerates wet and dry soils, fall color, attractive trunk</u>
<u>Tilia americana</u> Southern Basswood or American Linden	<u>50-70'</u>	<u>30-45'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates drought and clay soil, intolerant of air pollution, consider 'Redmond' cultivar</u>

(3) Non-Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Cedrus deodara</u> Deodar Cedar	<u>40-70'</u>	<u>30-40'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates drought and hot, dry summers, likes acidic soil</u>
<u>Cryptomeria japonica</u> Japanese Cryptomeria	<u>50-60'</u>	<u>25-30'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, pyramidal shape, many cultivars available</u>
<u>Thuja 'Green Giant'</u> Green Giant Arborvitae	<u>40-50'</u>	<u>15-20'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, may need some wind protection, bronzes in winter</u>

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer x freemanii</u> Freeman Maple	<u>Gen. 40-70'</u>	<u>Gen. 15-40'</u>	<u>M</u>	<u>S-PS</u>	<u>A hybrid of red maple and silver maple, cultivars vary in size and characteristics</u>
<u>Cercidiphyllum japonicum</u> Katsura Tree	<u>40-60'</u>	<u>20-40'</u>	<u>M-R</u>	<u>S</u>	<u>Intolerant of hot, dry sites, fall color</u>
<u>Ginkgo biloba</u> Ginkgo	<u>50-80'</u>	<u>30-40'</u>	<u>S</u>	<u>S</u>	<u>Plant male trees to avoid messy, smelly fruit, tolerates a variety of conditions, bright yellow fall color</u>
<u>Metasequoia glyptostroboides</u> Dawn Redwood	<u>70-100'</u>	<u>15-25'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, tolerates wet soils, attractive trunk</u>

<u>Platanus x acerifolia</u> London Planetree	<u>65-80'</u>	<u>75-100'</u>	<u>M</u>	<u>S-PS</u>	<u>Good street tree, light brown exfoliating bark</u>
<u>Quercus robur 'Fastigata'</u> Upright English Oak	<u>50-60'</u>	<u>10-20'</u>	<u>S</u>	<u>S</u>	<u>Tolerates drought and air pollution, narrow, upright form</u>
<u>Sophora japonica or Styphnolobium japonicum</u> Japanese Scholartree or Japanese Pagodatree)	<u>50-70'</u>	<u>50'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Resistant to air pollution and drought, but marginally heat hardy in Piedmont N.C.</u>
<u>Tilia cordata 'Greenspire'</u> Greenspire Littleleaf Linden	<u>30-40'</u>	<u>25-35'</u>	<u>S-M</u>	<u>S</u>	<u>Piedmont NC is at southern extreme of range, air pollution tolerant, cultivars available</u>
<u>Tilia tomentosa</u> Silver Linden	<u>40-70'</u>	<u>25-45'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates drought and air pollution and a variety of soil conditions</u>
<u>Ulmus parvifolia</u> Lacebark or Chinese Elm	<u>40-50'</u>	<u>40-50'</u>	<u>M-R</u>	<u>S</u>	<u>Tolerates a variety of conditions, attractive bark, a tough and durable tree</u>
<u>Ulmus hybrida</u> Hybrid Elm	<u>75-125'</u>	<u>60-120'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions; Dutch Elm disease resistant varieties available</u>
<u>Zelkova serrata</u> Japanese Zelkova	<u>50-80'</u>	<u>40-50'</u>	<u>M</u>	<u>S-PS</u>	<u>Good street tree; tolerates urban conditions well, cultivars available</u>

(B) Medium Variety Trees (mature height: twenty-five (25) to thirty-five (35) feet)

(1) Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex x attenuata 'Fosteri'</u> Foster's Holly	<u>20-30'</u>	<u>10-20'</u>	<u>R</u>	<u>S-PS</u>	<u>Red fruits, male plants not needed for fruiting, best berry production in full sun</u>
<u>Magnolia virginiana</u> Sweet Bay Magnolia	<u>20-30'</u>	<u>10-15'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates some shade, good for wet sites, cultivars provide evergreen and deciduous options</u>
<u>Pinus virginiana 'Wate's Golden'</u> Wate's Golden Virginia Pine	<u>15-30'</u>	<u>10-20'</u>	<u>S-M</u>	<u>S</u>	<u>Grows in poor soils, turns golden in winter, seeds eaten by birds, especially Brown-headed Nuthatch</u>
<u>Prunus caroliniana</u> Carolina Laurel Cherry	<u>20-40'</u>	<u>15-20'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, colonizes</u>

(2) Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Carpinus caroliniana</u> American Hornbeam or Ironwood	<u>20-30'</u>	<u>20-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Does well in moist to wet soil, attractive trunk, interesting fruit</u>
<u>Cercis canadensis</u> Eastern Redbud	<u>20-30'</u>	<u>25-35'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, many cultivars available, early spring purple/pink blooms</u>
<u>Cornus florida</u> Flowering Dogwood	<u>15-30'</u>	<u>15-20'</u>	<u>S-M</u>	<u>PS</u>	<u>Best in part shade, many cultivars available, flowers in spring, fall color and red fruit</u>
<u>Gleditsia triacanthos var. inermis</u> Thornless Honeylocust	<u>30-70'</u>	<u>30-40'</u>	<u>R</u>	<u>S</u>	<u>Range of soil types, drought tolerant;</u>

<u>Halesia tetraptera</u> Common Silverbell	<u>20-40'</u>	<u>20-35'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, showy white blooms in spring, cultivars available</u>
<u>Ostrya virginiana</u> Eastern Hop-hornbeam	<u>20-30'</u>	<u>20-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, interesting fruit</u>
<u>Oxydendrum arboreum</u> Sourwood	<u>20-30'</u>	<u>10-15'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, white summer flowers, fall color, source of sourwood honey</u>

(3) Non-Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex x 'Nellie R. Stevens'</u> Nellie Stevens Holly	<u>30-40'</u>	<u>10-15'</u>	<u>R</u>	<u>S-PS</u>	<u>Red fruit, drought and heat tolerant, male and female plants (I. cornuta) needed for best fruiting, also used as a large shrub</u>
<u>Pinus thunbergii</u> Japanese Black Pine	<u>20'</u>	<u>20'</u>	<u>S-M</u>	<u>S</u>	<u>Select small tree cultivar from among dwarf cultivars, heat and drought tolerant</u>

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer buergerianum</u> Trident Maple	<u>25-35'</u>	<u>20-30'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions; good fall color</u>
<u>Acer campestre</u> Hedge Maple	<u>25-35'</u>	<u>25-35'</u>	<u>S</u>	<u>S</u>	<u>Tolerates drought and air pollution; shallow root system</u>
<u>Carpinus betulus 'Fastigata'</u> Pyramidal European Hornbeam	<u>30-40'</u>	<u>20-30'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Pyramidal when young, tolerates a range of conditions</u>
<u>Koelreuteria paniculata</u> Goldenrain Tree	<u>20-40'</u>	<u>15-35'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates drought and air pollution, yellow flowers in June</u>
<u>Magnolia x soulangiana or soulangeana</u> Saucer Magnolia	<u>15-25'</u>	<u>15-25'</u>	<u>M</u>	<u>S-PS</u>	<u>Late flowering cultivars avoid frost damage to blooms</u>
<u>Pistacia chinensis</u> Chinese Pistachio	<u>25-35'</u>	<u>20-30'</u>	<u>M-R</u>	<u>S</u>	<u>Drought tolerant, male and female plants needed for fruit, fall color</u>
<u>Prunus 'Kwanzan'</u> Kwanzan Cherry	<u>20-30'</u>	<u>15-25'</u>	<u>M</u>	<u>S-PS</u>	<u>Pink blooms in April, may be short-lived, good fall color, no fruit</u>
<u>Prunus 'Okame'</u> Okame Cherry	<u>15-30'</u>	<u>20-30'</u>	<u>M-R</u>	<u>S</u>	<u>Tolerates a variety of conditions, pink blooms in late winter lasting longer than most cherries</u>
<u>Prunus subhirtella 'Autumnalis'</u> Fall Blooming Cherry	<u>20-30'</u>	<u>15-25'</u>	<u>R</u>	<u>S-PS</u>	<u>Flowers best in full sun, flowers both in fall and late winter, may be short lived</u>
<u>Prunus subhirtella 'Pendula'</u> Weeping Cherry	<u>20-40'</u>	<u>15-30'</u>	<u>M</u>	<u>S</u>	<u>Tolerant of heat and clay soil; white to pinkish flowers in early spring; relatively long lived</u>
<u>Prunus x yedoensis</u> Yoshino Cherry	<u>30-40'</u>	<u>30-50'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, pale pink to white flowers in early spring, many cultivars available</u>

(C) Small Variety Trees (mature height: less than twenty-five (25) feet)

(1) Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex vomitoria</u> Yaupon Holly	<u>15-20'</u>	<u>10-20'</u>	<u>S-M</u>	<u>S-SH</u>	<u>Tolerates a variety of conditions, male and female plants needed for fruit, many cultivars available in many sizes</u>
<u>Magnolia grandiflora</u> 'Little Gem' Little Gem Magnolia	<u>15-20'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Dwarf cultivar of Magnolia grandiflora</u>
<u>Morella or Myrica cerifera</u> Wax-myrtle	<u>10-15'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, can colonize, many cultivars available, male and female plants needed for fruit, also can be used in shrub form</u>

(2) Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Aesculus pavia</u> Red Buckeye	<u>10-20'</u>	<u>10-20'</u>	<u>M</u>	<u>S-PS</u>	<u>Especially attracts hummingbirds and pollinators, red flowers in spring, leaf scorch may develop in dry soils</u>
<u>Amelanchier x</u> 'Autumn Brilliance' Autumn Brilliance Serviceberry	<u>25-40'</u>	<u>20-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, rust fungus can attack fruit, early spring white blooms, fall color, other cultivars available</u>
<u>Chionanthus virginicus</u> Fringe-tree or Old Man's Beard	<u>12-20'</u>	<u>12-20'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, male and female plants needed for fruit, fragrant white flowers in spring</u>
<u>Crataegus viridis</u> 'Winter King' Winter King Green Hawthorn	<u>15-30'</u>	<u>10-20'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, has thorns, other native species available, white flowers in spring, fall color, interesting bark</u>

(3) Non-Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex cornuta</u> 'Burfordii' Burford Holly	<u>8-20'</u>	<u>5-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Drought and heat tolerant, red fruit produced without pollinator, dwarf cultivar available</u>

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Acer palmatum</u> Japanese Maple	<u>15-25'</u>	<u>10-25'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Avoid hot, dry and windy sites; many cultivars available</u>
<u>Chionanthus retusus</u> Chinese Fringe-tree	<u>15-25'</u>	<u>10-25'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, showy white flowers in spring</u>

<u>Cornus kousa</u> Kousa Dogwood	<u>15-30'</u>	<u>15-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Resistant to anthracnose, white flowers in May, fall color</u>
<u>Lagerstroemia indica cvs.</u> Crapemyrtle	<u>15-30'</u>	<u>6-15'</u>	<u>R</u>	<u>S</u>	<u>Summer blooms, attractive bark, overused, many cultivars (including dwarfs) available, do not top</u>
<u>Magnolia stellata</u> Star Magnolia	<u>10-15'</u>	<u>6-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Blooms best in full sun, late winter white flowers</u>
<u>Malus hybrida</u> Hybrid Crabapple	<u>15-25'</u>	<u>10-20'</u>	<u>M</u>	<u>S</u>	<u>Plant only disease resistant cultivars, many cultivars available, showy spring flowers and fall fruit</u>
<u>Prunus sargentii</u> Sargent Cherry	<u>20-40'</u>	<u>20-40'</u>	<u>R</u>	<u>S</u>	<u>One of the hardiest cherries; pink flowers; sensitive to air pollution; reddish bark</u>
<u>Prunus serrulata 'Snowgoose'</u> Snowgoose Japanese Cherry	<u>15-25'</u>	<u>15-20'</u>	<u>M</u>	<u>S-PS</u>	<u>White sprung flowers; reddish bark; may be short-lived</u>
<u>Syringa reticulata</u> Japanese Tree Lilac	<u>20-30'</u>	<u>15-20'</u>	<u>M</u>	<u>S</u>	<u>Tolerates a variety of conditions; creamy white flowers in mid-summer</u>

(D) Streetyard and Interior Shrubs (mature height thirty-six (36) inches or more):

(1) Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Agarista populifolia</u> Florida Leucothoe or Agarista	<u>8-12'</u>	<u>8-12'</u>	<u>R</u>	<u>PS</u>	<u>Tolerates a variety of conditions, but prefers moist soil</u>
<u>Ilex glabra</u> Inkberry Holly	<u>5-9'</u>	<u>5-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Drought tolerant but prefers moist soil, many cultivars available, male and female plants needed for fruit</u>
<u>Ilex vomitoria</u> Yaupon Holly	<u>10-20'</u>	<u>8-12'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, male and female plants needed for fruit, dwarf and other cultivars available</u>
<u>Illicium floridanum</u> Florida Star-anise	<u>5-8'</u>	<u>6-8'</u>	<u>M</u>	<u>PS-SH</u>	<u>Prefers moist, well-drained soil high in organic matter, many cultivars available, showy spring flowers</u>
<u>Illicium parviflorum</u> Yellow Anise-tree	<u>7-10'</u>	<u>8-10'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, can colonize, some cultivars available</u>
<u>Morella or Myrica cerifera</u> Wax-myrtle	<u>10-15'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, can colonize, many cultivars available, male and female plants needed for fruit, can reach small tree size</u>
<u>Rhododendron catawbiense</u> Catawba Rhododendron	<u>6-12'</u>	<u>6-10'</u>	<u>M</u>	<u>PS</u>	<u>Showy flowers, needs excellent drainage and organic soil, many cultivars available</u>
<u>Thuja occidentalis 'Emerald'</u> Emerald American Arborvitae	<u>6-10'</u>	<u>3-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates a range of soils and conditions; good screening plant</u>

(2) Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Calycanthus floridus</u> Sweet-shrub or Carolina Allspice	<u>6-9'</u>	<u>6-12'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates a range of conditions, drought tolerant, fragrant maroon flowers in early spring, fall color, cultivars available</u>

<u>Callicarpa americana</u> American Beautyberry	<u>3-4'</u>	<u>4-5'</u>	<u>R</u>	<u>S-PS</u>	<u>Prefers moist soil, showy purplish berries in fall</u>
<u>Ceanothus americanus</u> New Jersey Tea	<u>3-4'</u>	<u>3-5'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Easy to grow in a wide range of conditions, drought tolerant, early summer flowers</u>
<u>Clethra alnifolia</u> Sweet-pepperbush	<u>4-8'</u>	<u>4-6'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Needs moist soil, fragrant white summer flowers, may colonize, fall color</u>
<u>Fothergilla gardenii</u> Witch-alder or Fothergilla	<u>3-5'</u>	<u>3-4'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, fall color, may colonize, fragrant white spring flowers</u>
<u>Fothergilla major</u> Large Witch-alder	<u>6-10'</u>	<u>5-9'</u>	<u>S</u>	<u>PS</u>	<u>Drought tolerant, cultivars include 'Mt. Airy,' white spring flowers</u>
<u>Hamamelis virginiana</u> Witch-hazel	<u>15-30'</u>	<u>15-25'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Multi-stemmed, yellow fall flowers and leaf color, tolerates heavy clay soil</u>
<u>Hydrangea arborescens</u> Smooth Hydrangea	<u>3-5'</u>	<u>3-5'</u>	<u>R</u>	<u>PS</u>	<u>Suffers in full sun and with drought, likes moist well-drained soil, attracts bees, prune in early spring, cultivars available, including 'Annabelle,' long bloom period</u>
<u>Hydrangea quercifolia</u> Oakleaf Hydrangea	<u>4-8'</u>	<u>3-8'</u>	<u>R</u>	<u>PS-S</u>	<u>Somewhat drought tolerant, attractive bark, needs mulch to keep roots cool, long bloom period in spring and summer, fall color, dwarf cultivars available</u>
<u>Ilex decidua</u> Possum-haw	<u>6-7'</u>	<u>6'</u>	<u>M</u>	<u>PS</u>	<u>Prefers moist, well-drained soil, male and female plants needed for fruit</u>
<u>Ilex verticillata</u> Winterberry	<u>6-15'</u>	<u>6-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Tolerates a range of conditions, but prefers moist soil, male and female plants needed for fruit, dwarf cultivars available</u>
<u>Itea virginica</u> Sweetspire	<u>3-6'</u>	<u>4-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates wide range of moisture, excellent fall color, fragrant white spring flowers</u>
<u>Lindera benzoin</u> Spicebush	<u>6-12'</u>	<u>6-12'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Prefers moist, well-drained soil, male and female plants needed for fruit, fall color, early spring yellowish flowers</u>
<u>Physocarpus opulifolius</u> Eastern Ninebark	<u>5-8'</u>	<u>6-10'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Drought tolerant, tough and durable, white spring flowers, attractive bark, dwarf cultivars available</u>
<u>Rhododendron calendulaceum</u> Flame Azalea	<u>4-8'</u>	<u>8-10'</u>	<u>S</u>	<u>PS</u>	<u>Good for naturalistic landscape, needs some direct sun, orange/yellow flowers in late spring, needs well-drained organic soil</u>
<u>Rhododendron periclymenoides</u> Pinxterbloom Azalea	<u>3-6'</u>	<u>4-7'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, needs some sun, pink spring flowers, needs well-drained organic soil</u>
<u>Rhododendron viscosum</u> Swamp Azalea	<u>2-8'</u>	<u>3-8'</u>	<u>M</u>	<u>PS</u>	<u>Likes moist organic soil, but tolerates some drought, fragrant white flowers in early summer</u>
<u>Sambucus canadensis</u> American Elderberry	<u>5-12'</u>	<u>5-12'</u>	<u>R</u>	<u>S</u>	<u>Likes moist soil, may colonize, white summer flowers and dark fruit</u>
<u>Vaccinium arboreum</u> Sparkleberry	<u>10-20'</u>	<u>10-15'</u>	<u>M</u>	<u>S-SH</u>	<u>Tolerates drought, needs multiple genetic strains for fruit set, fall color</u>
<u>Vaccinium stamineum</u> Deerberry	<u>3-5'</u>	<u>3-5'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought tolerant, needs acidic soil, needs multiple genetic strains for fruit set</u>

<u>Vaccinium virgatum</u> or <u>ashei</u> Rabbiteye Blueberry	<u>8-12'</u>	<u>6-10'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought tolerant, needs acidic soil, needs multiple genetic strains for fruit set, fall color, grown for fruit production</u>
<u>Viburnum acerifolium</u> Mapleleaf Viburnum	<u>4-6'</u>	<u>4-6'</u>	<u>M</u>	<u>S-SH</u>	<u>Tolerates drought, may colonize, needs multiple genetic strains for fruit set, white spring flowers, fall color</u>
<u>Viburnum dentatum</u> Arrow-wood Viburnum	<u>6-10'</u>	<u>6-15'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates drought but prefers moist soil, may colonize, needs multiple genetic strains for fruit set, white spring flowers, fall color, cultivars available</u>
<u>Viburnum nudum</u> Possumhaw or Southern Wild Raisin	<u>6-10'</u>	<u>6-10'</u>	<u>M</u>	<u>S-PS</u>	<u>Prefers moist to wet soil, needs multiple genetic strains for fruit set, white spring flowers, fall color, cultivars available</u>
<u>Viburnum prunifolium</u> Blackhaw Viburnum	<u>12-15'</u>	<u>8-12'</u>	<u>S-M</u>	<u>S-SH</u>	<u>Drought tolerant, needs multiple genetic strains for fruit set, white spring flowers, fall color</u>
<u>Viburnum rafinesqueanum</u> Downy Arrow-wood Viburnum	<u>4-6'</u>	<u>4-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought tolerant, needs multiple genetic strains for fruit set, white spring flowers, fall color</u>
<u>Viburnum rufidulum</u> Southern Black Haw Viburnum	<u>10-20'</u>	<u>10-15'</u>	<u>M</u>	<u>PS</u>	<u>Needs multiple genetic strains for fruit set, white spring flowers, fall color</u>

(3) Non-Native Evergreen

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Abelia x grandiflora</u> Glossy Abelia	<u>5-8'</u>	<u>5-8'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, summer flowers, many dwarf cultivars available</u>
<u>Aucuba japonica</u> Aucuba	<u>6-10'</u>	<u>4-6'</u>	<u>S</u>	<u>PS-S</u>	<u>Needs winter shade, drought tolerant, many cultivars available</u>
<u>Berberis julianae</u> Wintergreen Barberry	<u>4-8'</u>	<u>6-8'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, has spines, good barrier plant</u>
<u>Berberis verruculosa</u> Warty Barberry	<u>3-6'</u>	<u>3-4'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerant of drought and urban conditions, tolerates a variety of soils</u>
<u>Buxus microphylla</u> Littleleaf Boxwood	<u>2-8'</u>	<u>2-8'</u>	<u>S</u>	<u>S-PS</u>	<u>Many shapes and sizes, var. japonica is often used, generally densely branched, leaves may bronze in winter</u>
<u>Buxus sempervirens</u> Common Boxwood	<u>15-20'</u>	<u>10-15'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, protect from wind, many cultivars available</u>
<u>Camellia japonica</u> Camellia	<u>8-15'</u>	<u>5-10'</u>	<u>S-M</u>	<u>PS</u>	<u>Excess sun, cold or shade can reduce flowering, many cultivars available, blooms in early spring</u>
<u>Camellia sasanqua</u> Sasanqua Camellia	<u>6-10'</u>	<u>5-7'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Drought tolerant, many cultivars available, blooms in the fall</u>
<u>Euonymus japonicus</u> Japanese Euonymus	<u>10-15'</u>	<u>5-6'</u>	<u>R</u>	<u>S-SH</u>	<u>Tolerates drought and variety of soil types, subject to scale insects</u>

<u>Ilex cornuta</u> cvs. <u>Chinese Holly (i.e., Dw. Burford Holly)</u>	<u>3-25'</u>	<u>4-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Favorite cultivars include Dw. Burford and Carissa hollies, many others available, red fruit when present, leaves have spines, drought and heat tolerant, male and female plants needed for fruit</u>
<u>Ilex crenata</u> cvs. <u>Japanese Holly (i.e., Compacta Holly)</u>	<u>4-10'</u>	<u>3-5'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Many cultivars available in varying shapes and sizes, black fruit when present, generally hardy, male and female plants needed for fruit</u>
<u>Juniperus chinensis</u> cvs. <u>Chinese Juniper</u>	<u>Var.</u>	<u>Var.</u>	<u>Var.</u>	<u>S</u>	<u>Many cultivars available in varying shapes and sizes, generally heat and drought tolerant, male and female plants needed for fruit</u>
<u>Loropetalum chinensis</u> <u>Loropetalum</u>	<u>6-10'</u>	<u>6-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, long spring bloom period, dwarf cultivars available</u>
<u>Osmanthus heterophyllus</u> <u>Tea Olive</u>	<u>8-10'</u>	<u>5-10'</u>	<u>S-M</u>	<u>S-PS</u>	<u>Drought and heat tolerant, a good plant for screening, many cultivars available, fragrant fall flowers</u>
<u>Osmanthus x fortunei</u> <u>Fortune's Osmanthus</u>	<u>15-20'</u>	<u>15-20'</u>	<u>M</u>	<u>S-SH</u>	<u>Drought tolerant, good for screening and barriers, fragrant fall flowers</u>
<u>Pinus mugo</u> <u>Mugo Pine</u>	<u>15-20'</u>	<u>25-30'</u>	<u>S</u>	<u>S-PS</u>	<u>Varies greatly in size; tolerates clay soil, cultivars available</u>
<u>Prunus laurocerasus</u> <u>Cherrylaurel</u>	<u>4-8'</u>	<u>5-8'</u>	<u>M</u>	<u>S-SH</u>	<u>Favorite cultivars are Zabel, Otto Luyken and Schip laurel, need well-drained soil, some disease problems and scale insects</u>
<u>Raphiolepis</u> cvs. <u>Indian Hawthorn</u>	<u>4-10'</u>	<u>4-10'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, drought tolerant, many cultivars available</u>
<u>Rhododendron hybrida</u> <u>Evergreen Azalea</u>	<u>2-8'</u>	<u>2-10'</u>	<u>M</u>	<u>PS</u>	<u>Many hybrids and cultivars available, needs well drained soil</u>
<u>Sarcococca confusa</u> <u>Sweetbox Sarcococca</u>	<u>3-5'</u>	<u>3-5'</u>	<u>S-M</u>	<u>PS-SH</u>	<u>Drought tolerant, fragrant flowers in late winter</u>
<u>Viburnum awabuki</u> 'Chindo' <u>Chindo Viburnum</u>	<u>10-15'</u>	<u>6-8'</u>	<u>R</u>	<u>S-PS</u>	<u>Pyramidal form, drought tolerant</u>
<u>Viburnum rhytidophyllum</u> <u>Leatherleaf Viburnum</u>	<u>10-15'</u>	<u>10-15'</u>	<u>M</u>	<u>PS-SH</u>	<u>Protect from winter wind and sun</u>

(4) Non-Native Deciduous

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Chaenomeles speciosa</u> or <u>japonica</u> <u>Japanese Flowering Quince</u>	<u>5-8'</u>	<u>4-8'</u>	<u>R</u>	<u>S-PS</u>	<u>Varied flower colors, flowers best in full sun, tolerates a variety of conditions, many cultivars available, stems often have spines</u>

<u>Cotinus coggygria</u> <u>Smoketree or Smokebush</u>	<u>10-15'</u>	<u>8-12'</u>	<u>M-R</u>	<u>S</u>	<u>Tolerates a range of soil types, drought tolerant, showy summer flowers, many cultivars available</u>
<u>Forsythia x intermedia</u> <u>Border Forsythia</u>	<u>8-10'</u>	<u>10-12'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, blooms in early spring, best in full sun, many cultivars to choose from</u>
<u>Hydrangea macrophylla</u> <u>Bigleaf Hydrangea</u>	<u>3-4'</u>	<u>4-6'</u>	<u>R</u>	<u>PSH</u>	<u>Moist well drained soil, wilts in drought, long bloom period, needs pruning after blooming</u>
<u>Hydrangea paniculata</u> <u>Panicle Hydrangea</u>	<u>6-20'</u>	<u>6-8'</u>	<u>R</u>	<u>S-PS</u>	<u>Drought tolerant, white flowers in summer, long bloom period, many cultivars available</u>
<u>Kerria japonica</u> <u>Japanese Kerria</u>	<u>3-6'</u>	<u>6-9'</u>	<u>M</u>	<u>PS-SH</u>	<u>Drought tolerant, early spring yellow flowers, interesting green stems, cultivars available</u>
<u>Rosa hybrida</u> <u>Hybrid Landscape Rose (i.e., Knock Out Rose)</u>	<u>3-4'</u>	<u>3-4'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought and disease resistant, blooms all summer, has thorns, many cultivars available</u>
<u>Spiraea cvs.</u> <u>Spirea (excl. Spiraea japonica)</u>	<u>Var.</u>	<u>Var.</u>	<u>Gen. R</u>	<u>S</u>	<u>Spring or summer flowering shrubs, many cultivars available, Spiraea japonica species is considered an invasive exotic in N.C.</u>

(E) Primary Evergreen Shrubs and Outdoor Storage Area Screening Plants (installation height six (6) feet or more):

(1) Native

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex opaca</u> <u>American Holly</u>	<u>40-60'</u>	<u>20-30'</u>	<u>S</u>	<u>S-SH</u>	<u>Tolerates a variety of conditions, male and female plants needed for fruit, pyramidal form, cultivars available</u>
<u>Ilex x attenuata 'Fosteri'</u> <u>Foster's Holly</u>	<u>20-30'</u>	<u>10-20'</u>	<u>R</u>	<u>S-PS</u>	<u>Red fruits, male plants not needed for fruiting, best berry production in full sun</u>
<u>Juniperus virginiana</u> <u>Eastern Red Cedar</u>	<u>40-50'</u>	<u>15-25'</u>	<u>S</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, pyramidal form, male and female plants needed for fruit</u>
<u>Morella or Myrica cerifera</u> <u>Wax-myrtle</u>	<u>10-15'</u>	<u>8-10'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates wet to dry soils, can colonize, many cultivars available, male and female plants needed for fruit, can reach small tree size</u>
<u>Prunus caroliniana</u> <u>Carolina Laurel Cherry</u>	<u>20-40'</u>	<u>15-20'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, colonizes</u>
<u>Thuja occidentalis</u> <u>American Arborvitae</u>	<u>Var.</u>	<u>Var.</u>	<u>Gen. S</u>	<u>S</u>	<u>Many cultivars in countless shapes and sizes, some tolerate part shade, some reach small tree size</u>

(2) Non-Native

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Ilex cornuta 'Burfordii'</u> Burford Holly	8-20'	5-10'	S-M	S-PS	Leaves have spines, drought and heat tolerant, red fruit without pollinator, dwarf cultivar available
<u>Ilex x 'Nellie R. Stevens'</u> Nellie Stevens Holly	30-40'	10-15'	R	S-PS	Red fruit, drought and heat tolerant, male cultivar (I. cornuta) needed for best fruiting, also used as a large shrub
<u>Juniperus chinensis cvs.</u> Chinese Juniper cultivars	5-7'	8-10'	M	S	Tolerates a variety of conditions, including drought and air pollution
<u>Pinus thunbergii</u> Japanese Black Pine	20'	20'	S-M	S	Select small tree cultivar from among dwarf cultivars, heat and drought tolerant

(F) Groundcovers (planting areas, berms, wall planters):(1) Native

<u>Plant Name</u>	<u>Deciduous/ Evergreen</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Carex pensylvanica</u> Pennsylvania Sedge or Oak Sedge	Semi-E	.5-1'	.5-1'	M	PS-SH	Plant in moist or dry soil, easy to grow and drought tolerant
<u>Carex plantaginea</u> Seersucker Sedge	E	.5-1'	.5-1'	M	PS	Needs moist soil
<u>Chrysogonum virginianum</u> Green-and-Gold	Semi-E	.5-1'	.75-1.5'	M	PS-SH	Needs good drainage, yellow spring blooms
<u>Fragaria virginiana</u> Wild Strawberry	D	.25-.75'	.75-1'	M-R	S-PS	Native, prefers full sun, fruit is small but flavorful
<u>Heuchera americana or villosa</u> American Alumroot	E	1-2'	1-2'	M	PS-SH	Attractive mottled foliage and small flowers on long wiry stems, prefers moist to average well-drained soil, many cultivars available
<u>Juniperus horizontalis</u> Creeping Juniper	E	1-2'	3-4'	M-R	S	Tolerates a variety of conditions, drought tolerant, cultivars available, native to NE US
<u>Mitchella repens</u> Partridge-berry	E	.25'	1'+	S-M	PS-SH	White spring flowers, red fall fruit, prefers moist organic soil
<u>Pachysandra procumbens</u> Allegheny-spurge	E	.5-1'	1-2+'	M	PS-SH	Drought tolerant, very interesting winter leaf, early spring bloom
<u>Phlox stolonifera</u> Creeping Phlox	E	.5-1'	.75-1.5'	R	PS-SH	Prefers light shade and moist soil, spring blooms, many cultivars available
<u>Phlox subulata</u> Moss Phlox	E	.25-.5'	1-2+'	M	S	Good drainage important, drought tolerant, late winter through spring bloom period, many cultivars available

(2) Non-Native

<u>Plant Name</u>	<u>Deciduous/ Evergreen</u>	<u>Height</u>	<u>Spread</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<i>Cephalotaxus harringtonia</i> <u>'Prostrata'</u> Prostrate Japanese Plum Yew	<u>E</u>	<u>2-3'</u>	<u>2-5'</u>	<u>S</u>	<u>S-PS</u>	<u>Drought tolerant, can be used for a ground cover</u>
<i>Cotoneaster dammeri</i> cvs. Bearberry Cotoneaster	<u>E</u>	<u>1-2'</u>	<u>3-6'</u>	<u>S-R</u>	<u>S-PS</u>	<u>Needs good drainage, but tolerates poor soils and drought once established; white flowers in spring and small red fruit</u>
<i>Cotoneaster salicifolius</i> cvs. Willowleaf Cotoneaster	<u>Semi-E</u>	<u>1-1.5'</u>	<u>5-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Drought tolerant, tolerates a variety of conditions; foliage turns purplish red in winter, white flowers in spring and small red fruit</u>
<i>Hemerocallis</i> spp. Daylily	<u>D</u>	<u>.75-3'</u>	<u>2-3'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, summer heat and humidity tolerant, needs dividing, summer blooms, many cultivars available including repeat bloomers</u>
<i>Hypericum calycinum</i> Aaronsbeard	<u>Semi-E</u>	<u>1-1.5'</u>	<u>1.5-2'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, blooms best in full sun</u>
<i>Juniperus conferta</i> Shore Juniper	<u>E</u>	<u>.75-1.5'</u>	<u>6-8'</u>	<u>R</u>	<u>S</u>	<u>Tolerates a variety of conditions, drought tolerant, many cultivars available</u>
<i>Juniperus procumbens</i> Japanese Garden Juniper	<u>E</u>	<u>1-1.5'</u>	<u>10-12'</u>	<u>S</u>	<u>S</u>	<u>Tolerates a variety of conditions, doesn't like wet soils, very hardy, 'Nana' is a popular dwarf cultivar</u>
<i>Liriope muscari</i> Lily-Turf or Liriope	<u>Semi-E</u>	<u>1-1.5'</u>	<u>.75-1'</u>	<u>R</u>	<u>S-PS</u>	<u>Tolerates a variety of conditions, summer flowers, stays green through the winter but needs cutting back in early spring, cultivars available</u>
<i>Microbiota decussata</i> Russian Arborvitae	<u>E</u>	<u>.5-1.5'</u>	<u>3'-8'</u>	<u>M</u>	<u>S-PS</u>	<u>More shade tolerant than some other junipers, foliage turns bronze-purple in fall and winter</u>
<i>Ophiopogon japonicus</i> Mondo	<u>Semi-E</u>	<u>.75-1.3'</u>	<u>1'</u>	<u>R</u>	<u>PS-SH</u>	<u>Tolerates a variety of conditions, cultivars available, colonizes</u>
<i>Pachysandra terminalis</i> Japanese Pachysandra	<u>E</u>	<u>.5-1'</u>	<u>1-1.5'</u>	<u>R</u>	<u>PS-SH</u>	<u>Tolerates a variety of conditions but needs well-drained soil, cultivars available</u>
<i>Rubus pentalobus</i> or <i>calycinum</i> Creeping Raspberry	<u>E</u>	<u>.5-1'</u>	<u>3-6'</u>	<u>M</u>	<u>S-PS</u>	<u>Tolerates variety of conditions, leaves turn burgundy in fall and winter</u>
<i>Sarcococca hookeriana</i> var. <i>humilis</i> Dwarf Sweetbox	<u>E</u>	<u>1-1.5'</u>	<u>2-4'</u>	<u>S-M</u>	<u>PS-SH</u>	<u>Drought tolerant, good for shady areas, fragrant winter flowers</u>

(G) Ornamental Grasses

(1) Native:

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Andropogon gerardii</u> Big Bluestem or Turkeyfoot	<u>4-6'</u>	<u>2-3'</u>	<u>S</u>	<u>Tolerates a wide variety of conditions, drought tolerant, needs sun</u>
<u>Andropogon virginicus</u> Broomsedge	<u>3-4'</u>	<u>2-3'</u>	<u>S</u>	<u>Drought tolerant</u>
<u>Muhlenbergia capillaris</u> Pink Muhlygrass or Hairgrass	<u>2-3'</u>	<u>2-3'</u>	<u>S-PS</u>	<u>Tolerates a wide variety of conditions, showy pink flowers in summer through fall, cultivars available</u>
<u>Panicum virgatum</u> Switchgrass	<u>3-6'</u>	<u>2-3'</u>	<u>S-PS</u>	<u>Tolerates a wide variety of conditions, wet to dry, good fall color, many cultivars available</u>
<u>Schizachyrium scoparium</u> Little Bluestem	<u>2-3'</u>	<u>1-2'</u>	<u>S</u>	<u>Tolerates a wide variety of conditions, drought tolerant, cultivars available</u>
<u>Sorghastrum nutans</u> Yellow Indiangrass	<u>3-5'</u>	<u>1-2'</u>	<u>S</u>	<u>Tolerates a wide variety of conditions, good fall color</u>

(2) Non-Native:

<u>Plant Name</u>	<u>Height</u>	<u>Spread</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Calamagrostis x acutiflora 'Karl Foerster'</u> Feather Reed Grass	<u>3-5'</u>	<u>1.2-2.5'</u>	<u>S</u>	<u>Fall color, good for medium to wet soils</u>
<u>Pennisetum alopecuroides</u> Fountain Grass	<u>2.5-5'</u>	<u>2.5-5'</u>	<u>S-PS</u>	<u>Tolerates a wide variety of conditions, good fall color, many cultivars available</u>
<u>Pennisetum orientale 'Karley Rose'</u> Oriental Fountain Grass	<u>2-3'</u>	<u>2-3'</u>	<u>S-PS</u>	<u>Drought tolerant, deep pink plumes last from early summer to fall</u>

(H) Vines

(1) Native:

<u>Plant Name</u>	<u>D/E</u>	<u>Height</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Bignonia capreolata</u> Cross-vine	<u>Semi-E</u>	<u>35-50'</u>	<u>R</u>	<u>S-PS</u>	<u>Orange-red flowers attract hummingbirds, colonizes, flowers best in full sun, cultivars available</u>
<u>Campsis radicans</u> Trumpet-creeper	<u>D</u>	<u>25-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Orange/red blossoms attract hummingbirds, very aggressive colonizer</u>
<u>Clematis virginiana</u> Virgin's-bower or Woodbine	<u>D</u>	<u>12-20'</u>	<u>R</u>	<u>S-PS</u>	<u>White blooms in the summer; will bloom in some shade; don't confuse with Sweetautumn Clematis, an invasive exotic</u>
<u>Gelsemium sempervirens</u> Carolina Jessamine	<u>E</u>	<u>12-20'</u>	<u>M-R</u>	<u>S-PS</u>	<u>Yellow flowers in spring, tolerates a variety of conditions, cultivars and other species available</u>
<u>Lonicera sempervirens</u> Coral Honeysuckle	<u>Semi-E</u>	<u>10-15'</u>	<u>R</u>	<u>S</u>	<u>Orange/red flowers, attracts hummingbirds, small red fruit, tolerates a variety of conditions, tolerates part shade but needs sun to flower</u>

<u>Parthenocissus quinquefolia</u> Virginia-creeper	<u>D</u>	<u>10-40'</u>	<u>R</u>	<u>S-PS</u>	<u>Good fall color and fall black fruit, colonizes</u>
<u>Wisteria frutescens</u> American Wisteria	<u>D</u>	<u>15-30'</u>	<u>R</u>	<u>S</u>	<u>Replacement for invasive exotic Chinese and Japanese Wisterias, lavender flower clusters in late spring, sporadically re-blooms, cultivars available</u>

(2) Non-Native:

<u>Plant Name</u>	<u>D/E</u>	<u>Height</u>	<u>Growth Rate</u>	<u>Light Needs</u>	<u>Comments</u>
<u>Campsis grandiflora</u> Chinese trumpetvine	<u>E</u>	<u>30'</u>	<u>R</u>	<u>S</u>	<u>Large orange blossoms, attracts hummingbirds, hybrids available</u>
<u>Clematis hybrida</u> Clematis	<u>D</u>	<u>5-20'</u>	<u>M</u>	<u>S</u>	<u>Roots need to be shaded, many cultivars available; don't confuse with Sweetautumn Clematis, an invasive exotic</u>
<u>Hydrangea anomala subsp. petiolaris</u> Climbing Hydrangea	<u>D</u>	<u>30-50'</u>	<u>R</u>	<u>PS-SH</u>	<u>Flowers best with some sun, growth slow until plant is established, white flowers in late spring</u>

(I) The following trees shall not be credited toward the requirements of Section B.3-

4:

<u>Acer saccharinum</u> Silver Maple
<u>Ailanthus altissima</u> Tree of Heaven
<u>Albizia julibrissin</u> Mimosa
<u>Paulownia tomentosa</u> Royal Paulownia
<u>Pinus strobus</u> White Pine
<u>Pinus virginiana</u> Virginia Pine
<u>Populus spp.</u> Hybrid Poplars
<u>Pyrus calleryana cultivars</u> Bradford and Chanticleer Pear and other Cultivars

Section 2. This ordinance shall be effective upon adoption.

August 28, 2015

Mr. Arnold G. King
Chair, City-County Planning Board
City Hall, 101 N. Main Street
Winston-Salem, N.C. 27101



Dear Chairman King and Members of the Planning Board:

The purpose of this letter is to explain the reasons for proposing a new list of recommended plants for substitution in the Winston-Salem and Forsyth County Unified Development Ordinance.

The primary motivations for the proposed changes are to delete invasive exotic plants and plants that are not readily available or well-suited to our climate, and to emphasize the use of native plants. There are numerous reasons for these changes, some of which are set out below. Non-native plants are included on the List, however, because they may be especially good for urban landscapes or because they are popular and widely used. Native plants should be used, though, whenever possible.

Invasive exotic plants (non-native plants which spread aggressively in Piedmont N.C.) are not included on the list because they can alter environments and crowd out native plants. The list of invasive exotic plants in North Carolina includes Burning Bush (*Euonymus alatus*), English Ivy (*Hedera helix*), Russian Olive (*Elaeagnus angustifolia*) and Bradford and Chanticleer Pear (*Pyrus calleryana* cvs.). Comprehensive listings of invasive exotic plants can be found at the following websites:

<http://www.ncsu.edu/goingnative/howto/mapping/invxse/index.html>

<http://www.ncwildflower.org/invasives/invasives.htm>.

Plants that are not readily available or are disease prone include Chalkbark Maple (*Acer leucoderme*), Amur Maple (*Acer ginnala*) and Red Tip Photinia (*Photinia glabra*). Plants that do not grow well in our area include Choke Cherry (*Prunus virginiana*), Potentilla (*Potentilla fruticosa*) and Mountain Ash (*Sorbus americana*).

Because of the importance of native plants to birds and pollinators, the proposed Plant List separates native plants from non-natives. **Almost all native plants are significantly beneficial to birds and pollinators, thereby attracting them.** One study has shown that native woody plants support 4 times as much insect biomass and 35 times as much caterpillar biomass as non-native woody plants. (Douglas Tallamy, *Bringing Nature Home*, 2009). The City encourages developers to use native plants and to do what they can to preserve our natural environment. Consider these factors:

- Native plants provide food, cover and nesting sites for our birds, butterflies and small mammals. Many non-native plants are not suitable for these purposes. For example, many butterflies lay eggs only on certain native plants. Without these plants, there are fewer butterflies and fewer caterpillars to feed the birds, especially their young, which must have the protein that a diet of

caterpillars and insects provides. Also, fruits and berries provided by native plants are often much higher in energy and food value than fruits and berries from non-native plants, and native berries are ripe when the birds need them, especially for fall migration.

- Many pollinators, beneficial insects and even soil organisms depend on native plants and cannot adjust to non-native plants.
- Properly placed native plants, once established, generally require less long term care and watering than do non-native plants. These plants are adapted to local weather conditions.
- Planting native plants in and around land developments can help to offset the escalating loss of natural habitats resulting from such developments.
- Attracting birds, butterflies and other wildlife enhances the aesthetics of an environment, thereby making a development a more desirable place to live or work.

Of course, planting native plants in a development does not preserve the natural environment, but it does provide many of the above benefits to birds and pollinators, and is preferable to the sterile landscape that may result from planting non-native varieties. **Our hope is that developers will, first, consider leaving native plants on development sites before simply removing all vegetation and, secondly, plant native species whenever possible.**

Not all plant nurseries sell native plants, but many do. For a listing of sources for native plants see the following web site: <http://www.ncsu.edu/goingnative/>. This site is offered as a guide, and other sites may have more complete listings. Audubon North Carolina is expanding a pilot program to increase the number of nurseries carrying native plants in our area, and this list is growing quickly:

<http://nc.audubon.org/bird-friendly-native-plants-year-program-growers-and-retailers>

The proposed Ordinance contains limited details which can help with plant selections. Additional details can be found at various web sites. For example, North Carolina State University has the following web sites providing additional information:

For trees: <http://www.ces.ncsu.edu/depts/hort/consumer/factsheets/trees-new/index.html>

For shrubs: http://www.ces.ncsu.edu/depts/hort/consumer/factsheets/shrubs/scientific_namesa-c.html

For groundcovers:

<http://www.ces.ncsu.edu/depts/hort/consumer/factsheets/groundcover/groundcoverindex.html>.

North Carolina provides a spreadsheet with comprehensive information for 400 recommended bird-friendly native plants for North Carolina:

<http://nc.audubon.org/birds-0/guide-bird-friendly-native-plants-north-carolina>

Paragraph references in the proposed Ordinance are consistent with the paragraph references in Chapter B, Article III, Section 3.4-10 of the Unified Development Ordinance. Please note that the information in the proposed Ordinance represents generally accepted averages, and that experience may differ depending on growth conditions. The “Growth Rate” abbreviations are S (slow), M (moderate) and R (rapid). For “Light Needs,” abbreviations are S (sun), PS (part sun to part shade) and SH (shade). Finally, for groundcovers and vines, there is a column differentiating evergreen (E) and deciduous (D) plants.

Because new varieties of plants are introduced to the market regularly, and plants currently deemed desirable may become invasive exotics or unsuitable to our climate, and plant nomenclature may change over time, we recommend that the information in the proposed Ordinance be re-evaluated and updated by staff to keep the plant list current with the best management practices for landscape plants in our region.

We hope you and the City-County Planning Board will support adopting the proposed Ordinance.

Very truly yours,

Bill Davis
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