



5 LANDSCAPING

5.1 PURPOSE AND INTENT

Intent. Landscaping is an essential element of the site design process and is an important feature in promoting the public health, safety, comfort, convenience and general welfare of the Town and its Extraterritorial Jurisdiction. Landscaping is intended to:

- A. mitigate incompatibilities between adjacent land uses;
- B. reduce the negative impacts of higher intensity land uses on lesser intensity adjacent land uses;
- C. provide a critical visual and noise buffering effect between higher intensity districts and lower intensity districts;
- D. increase tree canopy in residential use districts;
- E. lessen the impact of development on the environment by reducing glare and heat buildup;
- F. promote the creation of landscape islands within vehicular areas to enhance pedestrian safety; and,
- G. break up large expanses of pavement so as to reduce impervious surface area, storm water run-off and the level of pollutants from nonpoint sources.

5.2 APPLICABILITY AND ADMINISTRATION

5.2.1 REQUIRED LANDSCAPE AREAS

Within the Town and its Extraterritorial Jurisdiction, all new developments and all additions to existing development (i.e., building additions, parking area expansions, installation of free standing signs, etc.) shall provide landscaping as required by this chapter for such new development or addition.

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5.2.2 LANDSCAPE PLAN REQUIREMENTS

- A. Identification of Landscape Requirements Fulfilled by the Landscape Plan.** All landscape plans shall include a list of proposed landscape materials and notation of which of the following landscape requirements is intended to be met by the landscape materials indicated on the landscape plan:
1. perimeter buffer;
 2. vehicle parking area screening;
 3. interior vehicle parking area;
 4. foundation landscaping; and
 5. street trees.
- B. Variety of Plant Species Required.** No single species of landscape material, except grass shall constitute more than 25% of the plant material of its type installed on a single development site or within a subdivision with detached residential lots. This restriction may be modified by the Administrator on sites smaller in size than 2 acres provided that an acceptable variety of plant material is proposed.
- C. Site Lines.** Landscaping is prohibited in sight distance triangles, only ground covers that do not interfere with sight lines.
- D. Submission of a Preservation Landscape Plan,** if applicable, in accordance with the requirements of Section 4.4 Tree Preservation Areas.
- E. Identification of Landscape Materials indicated on Landscape Plan.** All landscape plans shall also include a list of proposed landscape materials, with quantities and calculations demonstrating how the plan meets the perimeter buffer landscaping standards per 100-foot increment, vehicle parking area screening, interior vehicle parking area landscaping, foundation landscaping and street trees as stipulated in this chapter.
- F. Tree requirements for detached residential lots.** All new detached residential lots shall be required to plant 1 tree per 5,000 square feet of lot area. Trees must be sized according to table 5.6-1.

5.2.3 ALTERNATE LANDSCAPE PLAN APPROVAL

If site conditions exist that make the landscape requirements of this chapter impractical, the Administrator, upon request by an applicant, shall have

the authority to modify the landscape requirements of this chapter and approve an alternative landscape plan so long as the alternative plan:

- A. maintains the total quantity of plant material otherwise required and is similar in quality, size, durability, and hardiness;
- B. is appropriate to the site and its surroundings;
- C. is consistent with the intent and purpose of this chapter;
- D. provides landscaping that is equal or better than normal compliance;
- E. safety considerations make alternative compliance necessary.
- F. Such alternative landscape plan approval shall not modify the landscape requirements of this chapter pertaining to required perimeter buffer between Residential Use Districts and Commercial & mMixed-Use or Employment/ Campus Use Districts.
- G. If the Administrator disapproves of a proposed alternative landscape plan, the applicant may, within 5 business days, appeal the Administrator's decision by filing an Administrative Appeal with the Board of Adjustment, stating the reasons and justification for the appeal. Such petition shall be filed consistent with the provisions of Chapter 11 of this UDO.

5.2.4 MINOR REVISIONS TO LANDSCAPE PLAN

An approved landscape plan in need of minor revisions to the specified plant materials due to seasonal planting problems, lack of plant availability, or other reasons to be demonstrated by the applicant may be revised if the requested revisions meet the following criteria:

- A. No reduction in the quantities of overall plant materials.
- B. No significant change in size or location of plant materials.
- C. New plant materials fall within the same general functional category of plants (shade trees, ornamental trees, evergreens, etc.) and have the same general design characteristics (mature height, spread, etc.) as the plant materials being replaced.
- D. The proposed new plant materials are considered appropriate with respect to elements necessary for good survival and continued growth.

- E. The proposed new plant materials are considered appropriate with respect to elements necessary for good survival and continued growth.

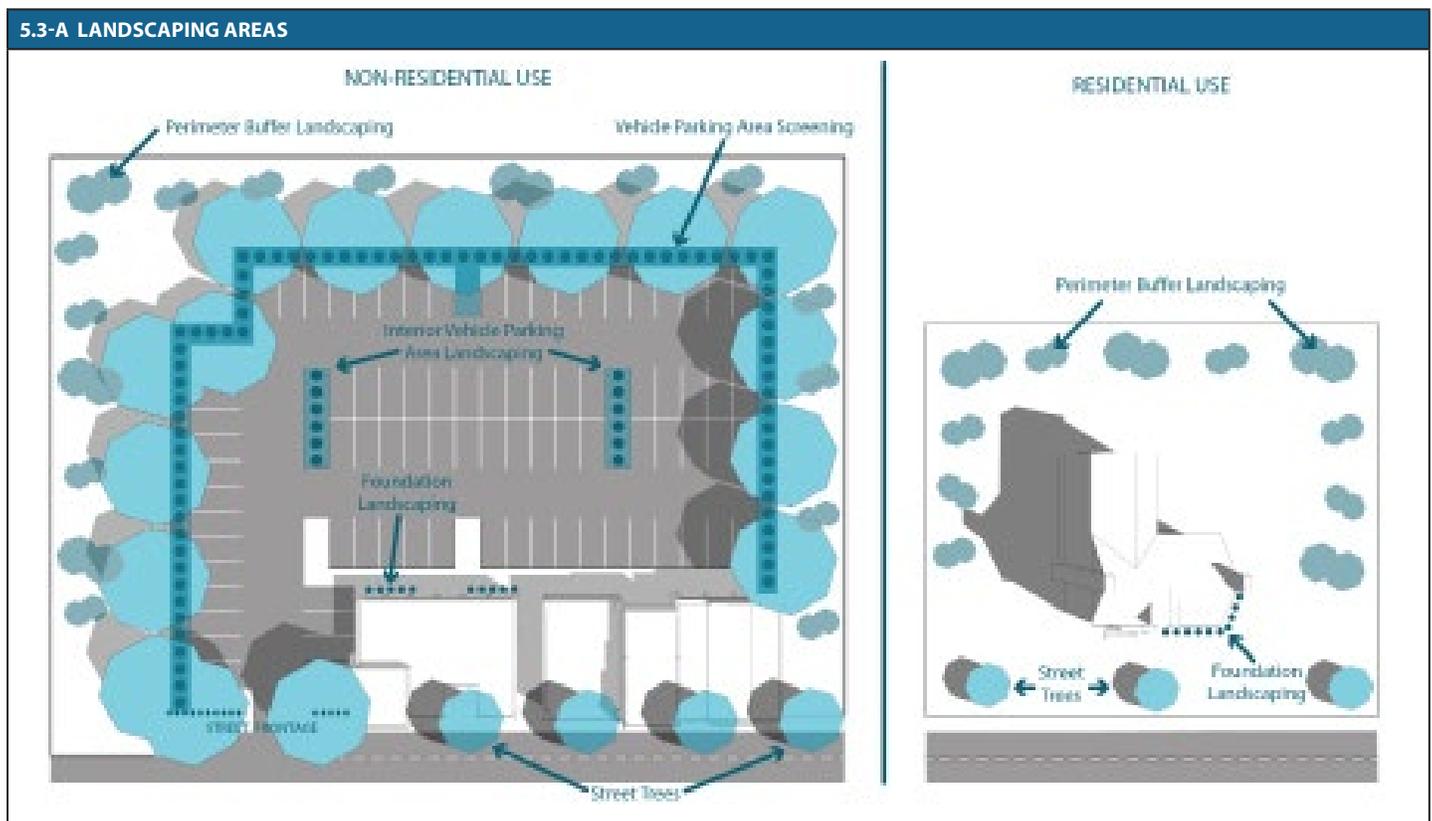
A letter shall be submitted to the Administrator requesting a minor revision for plant substitution. The letter shall include a list of the quantities, types, and sizes of the original plants and the proposed substitution(s), the location of the substitute plants on the plan.

- C. interior vehicle parking area;
- D. foundation landscaping;
- E. street trees.

5.3 LANDSCAPE STANDARDS BY LOCATION

Section 5.3 is organized into the required landscape areas, which consist of the following 5 locational types as shown in Figure 5.3-A. These standards apply to all new development where applicable locational types exist:

- A. perimeter buffer landscaping;
- B. vehicle parking area screening;



5.3.1 PERIMETER BUFFER

A. Perimeter Buffer Types. Perimeter buffers are divided into three types of opacity to provide a progression of screening options suitable to a variety of landscaping and buffering needs between districts. The types are described below and summarized in Table 5.3-1.

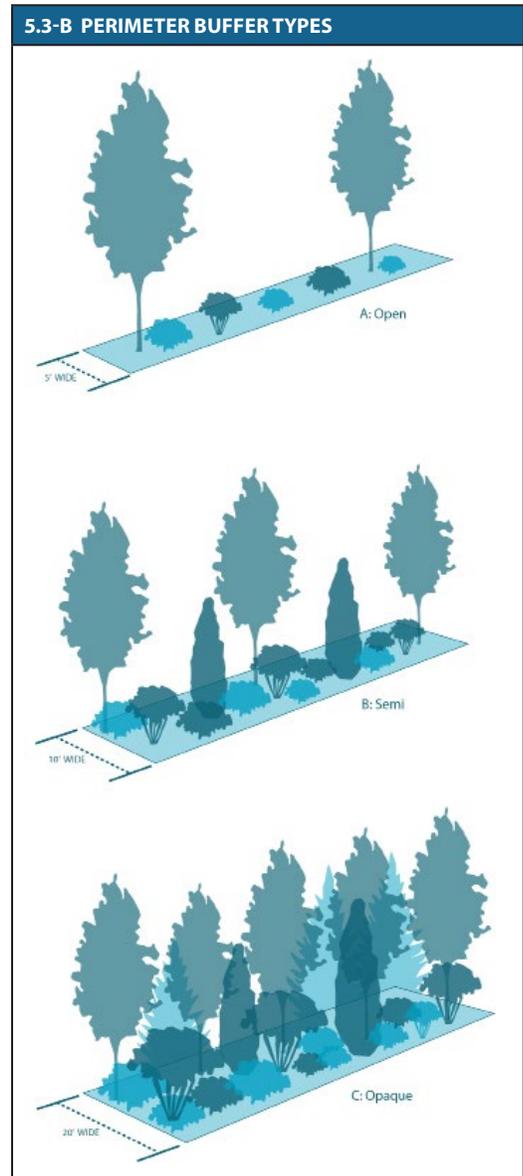
TABLE 5.3-1: PERIMETER BUFFER TYPES AND STANDARDS

Type	A: Open	B: Semi	C: Opaque
Opacity	0	40%	80%
Deciduous Tree/ft*	2/100'	3/100'	5/100'
Percent Evergreen	0	40%	80%
Shrubs/ft*	5/100'	10/100'	20/100'
Height of Buffer	0'	4'	8'
Width of Buffer	5'	10'	20'

** Deciduous trees and shrubs shall be provided for each 100-foot segment of the site perimeter, or proportionally for a fraction of 100 feet.*

- 1. Type A: Open.** Open landscaping creates a pleasant visual experience but provides a minimal visual or sound barrier and is therefore intended for use on lots where the district of the abutting lots includes permitted uses with similar intensities, lights, sounds and regular operations and would have minimal, if any, negative impact on adjacent properties. Type A landscaping requires a majority of the plants to be of a large deciduous tree variety with ability to add color, interest or heavier visual screening, if desired.
- 2. Type B: Semi.** Semi-Opaque landscaping creates a partial visual and sound barrier and is intended for use on lots where the district of the abutting lots includes permitted uses that may be similar in land use intensity, but may still contain lights, sounds and regular operations which may adversely impact adjacent properties. Type B landscaping requires a mixture of plants with sufficient evergreen content to provide some year-round buffering. Any evergreen species that drops its lower branches shall not be permitted as “evergreen” trees in a Type B area.

- 3. Type C: Opaque.** Opaque landscaping shall be designed to create a substantial sound and visual barrier from grade to at least 8 feet above grade at time of planting. Type C landscaping is intended to be placed on lots in higher intensity districts which abut lots located in lesser intense districts that may be adversely impacted by the lights, sounds and regular operations of the higher intensity district. Type C landscaping requires significant use of evergreen varieties to provide year-round buffering accented with deciduous trees or shrubs/hedge plants. Any evergreen species that drops its lower branches shall not be permitted as “evergreen” trees in a Type C area.



B. Required Perimeter Buffer

All required perimeter buffers shall be landscaped in compliance with the requirements in Table 5.3-2.

TABLE 5.3-2. REQUIRED PERIMETER BUFFER

		Subject Property Use District												
		RR	SR	NR	MCR	MXR	NMX	DMX	RMX	CB	SP	INMX	BRT	HI
Abutting Property Use District	RR	A	A	A	B	B	B	N1	C	C	C	C	C	C
	SR	A	A	A	B	B	B	N1	C	C	C	C	C	C
	NR	A	A	A	B	B	B	N1	C	C	C	C	C	C
	NCR	A	A	A	A	A	B	N1	B	B	C	C	C	C
	MXR	A	A	A	A	A	B	N1	B	B	C	C	C	C
	NMX	A	A	A	A	A	A	N1	B	B	C	C	C	C
	DMX	A	A	A	A	A	A	N1	B	B	C	C	C	C
	RMX	A	A	A	B	B	A	N1	A	A	B	B	B	B
	CB	A	A	A	B	B	A	N1	A	A	B	B	B	B
	SP	A	A	A	B	B	A	N1	A	A	A	A	A	A
	IVMX	A	A	A	B	B	A	N1	A	A	A	A	A	A
	BRT	A	A	A	B	B	A	N1	A	A	A	A	A	A
	HI	A	A	A	B	B	A	N1	A	A	A	A	A	A
	NC540	See Chapter 4 - Conservation Buffer Area (N2)						N1	See Chapter 4 - Conservation Buffer Area (N2)					
	NC55	See Chapter 4 - Conservation Buffer Area (N2)						N1	See Chapter 4 - Conservation Buffer Area (N2)					
Th-fare	A	A	A	A	A	A	N1	B	B	B	B	B	B	
PUD	Determined by Administrator						N1	Determined by Administrator						

N1: Large Deciduous Trees planted 40 feet on-center.
 N2: Perimeter Buffer needs to meet opacity requirements of type B and supplemented if sufficient vegetation does not exist in Conservation Buffer Area.

5.3.2 VEHICLE PARKING AREA SCREENING

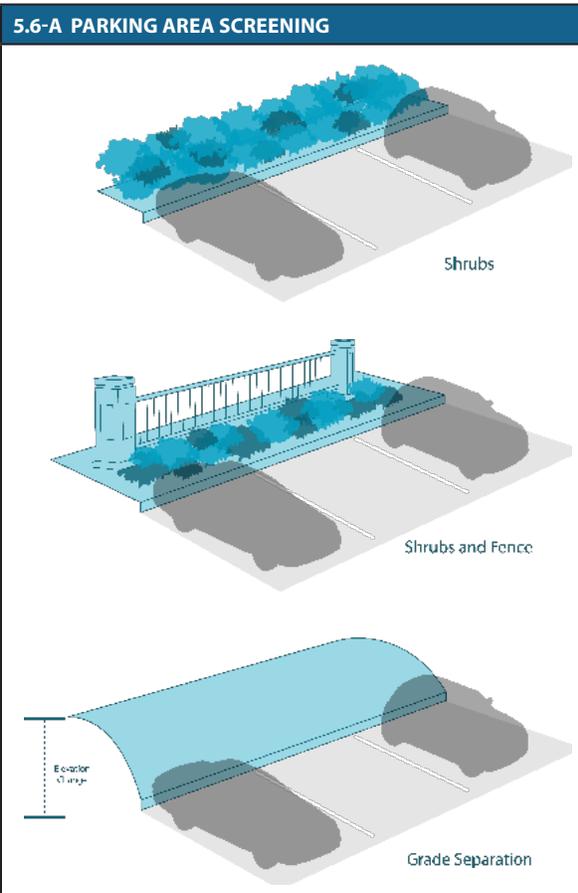
A. Applicability. This section shall apply to all new surface, vehicle parking areas (with the exception of detached dwelling unit driveways) and expanded surface vehicle parking areas shall be subject to the regulations of this chapter. Vehicle parking areas shall include areas used for the parking or display of automobiles, vehicles, boats, truck or farm equipment associated with a dealership or leasing business. Vehicle parking areas shall not include areas used for off-street loading areas, semi-truck maneuvering areas and semi-truck parking areas.

B. Requirement. If a vehicle parking area is located in a front yard; in a side yard adjacent to a Residential Use District; or in a rear yard adjacent to a Residential Use District, the edge of the parking area facing such street or Residential Use District shall be screened by one of the following:

- Shrubs:** A compact row of shrubs/hedge plants planted 3 feet on-center and a minimum of 24 inches in height at the time of planting;
- Shrubs and fence, wall, or berm:** Shrubs/hedge plants in combination with an ornamental, masonry wall, or earthen berm,

provided that the total amount of plant material is at least 50% of what would be required under this chapter if no wall, fence or berm were installed; or,

3. **Grade Separation:** The surface elevation of the parking area is at least 3 feet below the elevation of the lot line located along such yard, and where the minimum elevation separation is represented by an average slope of not less than 25% percent from the lot line to the edge of the parking area.



5.3.3 INTERIOR VEHICLE PARKING AREA

- A. All such vehicle parking areas shall include at least one interior landscape island for 10 parking spaces, or fraction thereof. Each interior landscape island:
 1. shall measure a minimum of 8 feet in width and a minimum of 17 feet in length;
 2. shall contain at least 1 large or small deciduous tree or 1 large evergreen tree (provided, however, loblolly pines or other trees which drop branches as they grow shall

be prohibited in interior landscape islands), plus 4 shrubs/hedge plants. All trees and shrubs/hedge plants shall comply with the minimum size at time of planting required by this chapter;

3. may be:
 - a. located individually at the ends of parking bays and function to define vehicular circulation and pedestrian traffic patterns; or,
 - b. aggregated into one or more landscape areas which shall function to: preserve existing trees; create boulevard treatments; create landscape features; or, create common open space areas for passive recreational activities.
 - c. designed to allow stormwater treatment with curb cut.
- B. Space devoted to interior landscape islands shall be in addition to any required perimeter buffer landscaping, vehicle parking area screening or required foundation landscaping.
- C. Any vehicle parking area containing over 100 parking spaces shall include a landscape strip to separate the parking spaces from any major interior access drives as follows:
 1. minimum width of each landscape strip:
 - a. not including a lengthwise walkway, the landscape strip shall be at least 5 feet; or,
 - b. including a lengthwise walkway, the landscape strip shall be at least 12 feet, and such walkway shall be designed in compliance with the regulations of Section 8.4;
 2. each landscape strip shall include deciduous trees or evergreen trees (provided, however, loblolly pines or other trees which drop branches as they grow shall be prohibited in such landscape strips) planted with a maximum spacing of not more than 40 feet on-center supplemented with groupings of at least 5 shrubs/hedge plants planted between the trees;
 3. each landscape strip shall include ground cover consisting of grass, mulch, chipped bark, pine straw or other natural forms of ground cover; and,

4. when landscape strips extend for more than 10 parking spaces, such landscape strips shall be provided with a crosswise walkway to facilitate pedestrian and shopping cart movement.
5. In order to provide adequate visibility for safe vehicular and pedestrian movement within a parking area, plant materials located within 5 feet of the back of curb / edge of pavement of an interior landscape island located at a critical turning point within a parking area shall be selected or maintained with a growth pattern not to exceed 36 inches above grade.

5.3.4 FOUNDATION LANDSCAPING

A. Location.

1. Foundation landscaping is required along any facade facing a street or parking area, as well as 25% of the adjacent facade.
2. Plant materials may be permitted in above ground planters.
3. Landscaping shall be designed to reinforce personal safety and visibility according to the principles of crime prevention through environmental design.

B. Type.

1. **Trees.** At least one overstory tree, deciduous or evergreen, for every 5,000 square feet of landscaped area outside the structure, parking area, or loading area, or one small tree, deciduous or evergreen, for every 3,000 square feet outside the structure, parking area, or loading area, or a proportional combination.
2. **Shrubs.** At least one large shrub, 1.5 medium shrubs, or 2 small shrubs for every 1,000 square feet of landscaped area outside the building, parking area, or loading area, or a proportional combination.
 - a. Shrubs are not required in Employment / Campus Use Districts where buildings are located greater than 300 feet from the street and are separated from the street by Type B or C perimeter buffers.

5.3.5 STREET TREES

In addition to perimeter buffers, street trees shall be planted along all streets in accordance with this section.

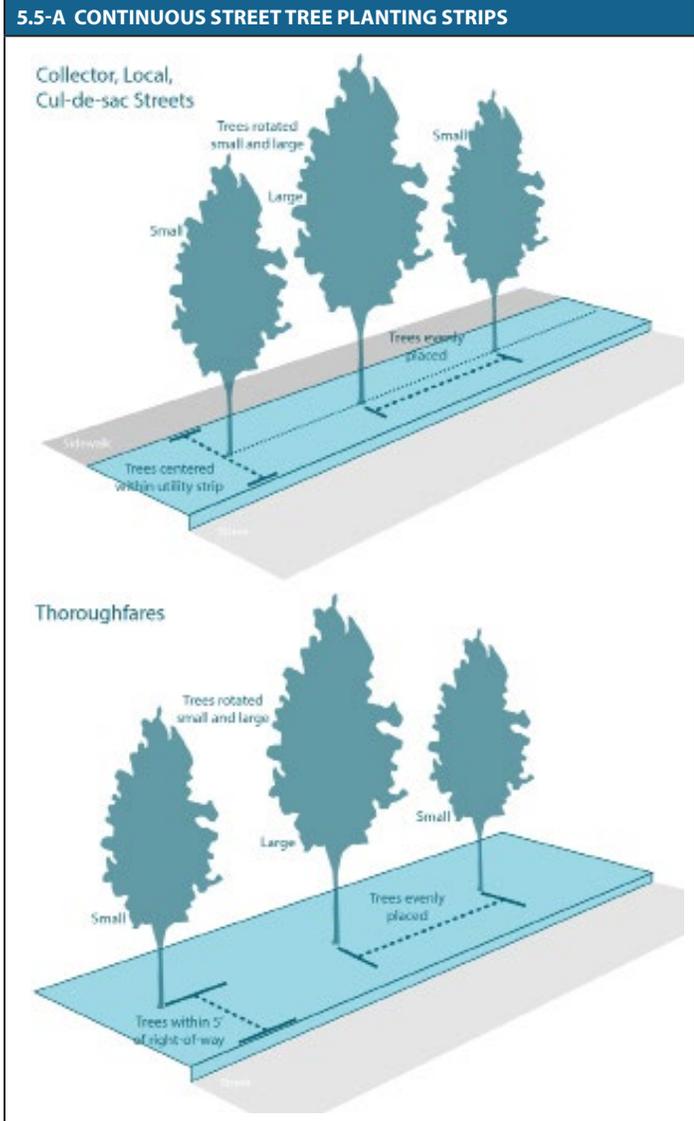
A. Type, Size, and Spacing.

1. Collector, Local and Cul-de-sac Streets.
 - a. Projects utilizing less than a 20 foot setback:
 - i. Shall install deciduous trees of a species appropriate to the setting and as specified by the approved street tree list of this chapter;
 - ii. Spacing shall be a minimum of 30 feet from center of trunk to 45 feet from center of trunk.
 - b. Projects utilizing a 20 foot or greater setback:
 - i. Spacing shall be a minimum of 50 feet from center of trunk to 65 feet from center of trunk.
2. Thoroughfares
 - a. Shall be required to install deciduous trees as specified by the approved street tree list of this chapter, or as further specified in the Comprehensive Plan Thoroughfare Planting Plan. Where existing overhead utilities interfere with part of the landscape area, the large deciduous tree requirement may be substituted by installing small deciduous trees.
 - b. Minimum size at planting shall be 2.5 inch caliper as specified in Table 5.7-1.
 - c. Spacing of trees shall be a minimum of 40 feet from center of trunk; maximum 60 feet from center of trunk.

B. Location.

1. Collector, Local, and Cul-de-sac Streets. Trees shall be located in the public right-of-way centered within the utility strip between the sidewalk and curb or centered between right-of-way line and curb if no sidewalk is present.
 - a. If an alternate landscape plan is approved with trees outside the right-of-way, a street tree maintenance easement shall be provided on the final plat.

- Thoroughfares: trees shall be located within 5 feet from the right-of-way line on the private property side.



- C. Distance.** Distance from the following site conditions shall be adhered to:
- Intersections: All trees shall be located a minimum of 50 feet from the point of tangency of curb radii at street intersections and outside of site distance triangle in accordance with the Engineering Design and Construction Standards.
 - Street Lights: All trees shall be located a minimum of 25 feet from the base of all street light poles.
- D. Quality.** For the purposes of this section, trees shall be nursery grown, single stem varieties, typical of their species or variety, freshly dug,

normally shaped, heavy and well branched; with full foliage when in leaf and shall have healthy, well developed root systems. Trees must be self-supporting, with straight trunks and with a single intact leader. All wounds present at the time of digging must exhibit callusing, with the bark at the edges of any such wound tight and intact. No abrasions or unhealed cuts are allowed on the trunks of trees. All trees furnished shall be free of any insect infestations and diseases.

All trees planted to meet the street tree requirement must be well matched specimens.

In order to maintain a high quality of urban streetscape, each street must contain at least 2 species of trees with a similar canopy. No more than 55% of a single species shall be used on each street.

E. Approved street trees list.

TABLE 5.5-1: APPROVED STREET TREE SPECIES

Scientific Name	Common Name
<i>Acer saccharinum</i>	Sugar Maple
<i>Acer X freemanii</i>	Freeman Maple
<i>Aesculus X carnea "Briotii"</i>	Ruby Red Horse Chestnut
<i>Carpinus caroliniana</i>	American Hornbeam
<i>Carya cordiformis</i>	Bitternut Hickory
<i>Carya glabra</i>	Pignut Hickory
<i>Carya ovata,</i>	Shagbark Hickory
<i>Castanea mollissima</i>	Chinese Chestnut
<i>Celtis laevigata</i>	Sugar Hackberry
<i>Celtis occidentalis</i>	Common Hackberry
<i>Diospyros virginiana</i>	Persimmon
<i>Fagus grandifolia</i>	Beech
<i>Fraxinus americana</i>	White Ash
<i>Fraxinus pennsylvanica</i>	Green Ash
<i>Ginkgo biloba</i>	Ginkgo
<i>Gleditsia tricanthos inermis "Shademaster"</i>	Shademaster Honeylocust
<i>Gymnocladus dioicus</i>	Kentucky Coffeetree
<i>Liriodendron tulipifera</i>	Tulip-Poplar
<i>Magnolia acuminata</i>	Cucumber Magnolia
<i>Metasequoia glyptostroboides</i>	Dawn Redwood
<i>Nyssa sylvatica</i>	Black Gum
<i>Ostrya virginiana</i>	Hophornbeam

Quercus alba	White Oak
Quercus coccinea	Scarlet Oak
Quercus Falcata	Southern Red Oak
Quercus laurifolia	Laurel Oak
Quercus lyrata	Overcup Oak
Quercus nuttalli	Nuttall Oak
Quercus palustris	Pin Oak
Quercus phellos	Willow Oak
Quercus robur "Fastigiata"	Fastigiante English Oak
Quercus rubra	Northern Red Oak
Quercus rubra maxima	Eastern Red Oak
Quercus shumardii	Shumard Oak
Quercus stellate	Post Oak
Quercus velutina	Black Oak
Taxodium distichum	Bald Cypress
Tilia cordata	Little Leaf Linden
Ulmus parvifolia	Lacebark Elm
Zelkova serrata	Japanese Zelkova
Magnolia grandiflora	Southern Magnolia
Pinus thunbergiana	Japanese Black Pine
Quercus laurifolia	Laurel Oak
Quercus virginiana	Live Oak
Tsuga canadensis	Canadian Hemlock
Tsuga caroliniana	Carolina Hemlock
Cercis canadensis	Eastern Redbud
Cercis chinensis	Chinese Redbud
Chionanthus retusus	Chinese Fringetree
Chionanthus virginicus	Fringetree
Cornus florida	Flowering Dogwood
Cornus kousa	Kousa Dogwood
Cornus kousa X florida	Rutger's Hybrid Dogwood
Corylus Americana	American Hazelnut
Cotinus coggyria	Smoketree
Crataegus phaenopyrum	Washington Hawthorne
Crataegus viridis 'Winter King'	Green Hawthorne
Halesia carolina	Carolina Silverbell
Lagerstroemia indica	Crape-Myrtle
Magnolia liliflora	Lily Magnolia

Magnolia soulangiana	Saucer Magnolia
Magnolia stellata	Star Magnolia
Magnolia tripetala	Umbrella Tree
Magnolia X loebneri "Merrill"	Merrill Magnolia
Oxydendrum arboreum	Sourwood
Pistacia chinensis	Chinese Pistache
Prunus cerasifera "Pissardii"	Purpleleaf Plum
Prunus serrulata kwanzan	Kwanzan Cherry
Prunus subhirtella pendula	Weeping Cherry
Prunus X "Okame"	Okame Cherry
Prunus yedoensis	Yoshino Cherry
Acer buergeranum	Trident Maple
Acer campestre	Hedge Maple
Acer griseum	Paperbark Maple
Acer palmatum	Japanese Maple
Acer truncatum	Purplebow Maple
Carpinus betulus	European Hornbeam
Carpinus caroliniana	American Hornbeam
Ulmus parvifolia	Chinese Elm
Chanaecyparis obtusa "Filicoides"	Hinoki Flasecypress

5.4 GENERAL LANDSCAPE STANDARDS

A. Ground Cover. Ground cover within landscape areas may consist of grasses; preserved existing natural vegetation (i.e., thickets); mulch, chipped bark, pine straw; wildflowers; wild grass areas; or other natural forms of ground cover. Upon Administrator approval, loose stone, rock or gravel may be used as a landscaping accent but shall not exceed 20% of the required landscape area in which it is used.

B. Drought Tolerant Species Selection. All landscape plans shall be designed to incorporate water conservation materials and techniques through application of xeriscape landscaping principles, including but not limited to:

1. use of low water demanding plants and turf (i.e., bermuda or centipede grass) where practical;
2. use of re-use water supplies for irrigation;
3. minimizing the use of high irrigation turf;
4. limiting the use of high-irrigation turf (i.e., fescue) to areas of high-use, high-visibility and high functional needs; and,
5. use of mulches to reduce evaporation rates.

Xeriscape landscaping principles shall not include: artificial turf or plants; mulched or gravel beds without live plant materials; paving of areas not required for walkways, plazas or parking areas; bare ground, weed covered or infested surfaces; or, any landscaping that does not comply with the regulations of this Section.

C. Structural SCMs. Structural SCMs as contained in Section 8 of the Town’s Engineering Design and Construction Standards may be placed within required landscape areas when no other reasonable alternative exists, and provided that the performance standards of the required landscape areas can be maintained. Bioretention areas may be placed without additional justification provided the amount of plant material required by this chapter for all landscape areas is maintained.

D. Utility Equipment Screening. All utility equipment and facilities associated with on-site electric, cable, telephone, gas or other

similar utility, including ground-based electrical transformers and power meters, shall be screened, to the extent possible, with evergreen landscape material or other acceptable alternative approved by the Administrator. This requirement applies to both residential and non-residential developments. Areas around equipment and facilities shall remain clear based on each utility company’s guidelines.

5.4.1 PROHIBITED SPECIES

The following species are prohibited.

TABLE 5.4-1: PROHIBITED SPECIES	
Scientific Name	Common Name
Rank 1 - Severe Threat	
<i>Ailanthus altissima</i> (Mill.) Swingle	Tree of Heaven
<i>Albizia julibrissin</i> Durz.	Mimosa
<i>Alliaria petiolata</i> (Bieb.) Cavara & Grande	Garlic-mustard
<i>Alternanthera philoxeroides</i> (Mart.) Griseb.	Alligatorweed
<i>Celastrus orbiculatus</i> Thunb.	Asian bittersweet
<i>Elaeagnus angustifolia</i> L.	Russian olive
<i>Elaeagnus umbellata</i> Thunb.	Autumn olive
<i>Hedera helix</i> L.	English ivy
<i>Hydrilla verticillata</i> (L.f.) Royle	Hydrilla
<i>Lespedeza bicolor</i> Turczaninow	Bicolor lespedeza
<i>Lespedeza cuneata</i> (Dum.-Cours.) G. Don	Sericea lespedeza
<i>Ligustrum sinense</i> Lour.	Chinese privet
<i>Lonicera fragrantissima</i> Lindl. & Paxton	Fragrant honeysuckle
<i>Lonicera japonica</i> Thunb.	Japanese honeysuckle
<i>Microstegium vimineum</i> (Trin.) A. Camus	Japanese stilt-grass
<i>Murdannia keisak</i> (Hassk.) Hand.-Mazz.	Asian spiderwort
<i>Myriophyllum aquaticum</i> (Vell.) Verdc.	Parrotfeather
<i>Paulownia tomentosa</i> (Thunb.) Sieb.& Zucc. ex Steud.	Princess tree
<i>Persicaria perfoliata</i> (Linnaeus) H. Gross	Mile-a-minute vine
<i>Phragmites australis</i> (Cav.) Trin. ssp. australis	Common reed
<i>Pyrus calleryana</i> Decne.	Bradford pear
<i>Reynoutria japonica</i> Houttuyn (Polygonum cuspidatum)	Japanese knotweed
<i>Pueraria montana</i> (Lour.) Merr.	Kudzu
<i>Rosa multiflora</i> Thunb.	Multiflora rose
<i>Salvinia molesta</i> Mitchell	Aquarium water-moss

TABLE 5.4-1: PROHIBITED SPECIES	
<i>Vitex rotundifolia</i> L.f.	Beach vitex
<i>Wisteria sinensis</i> (Sims) DC	Chinese wisteria
Rank 2 - Significant Threat	
<i>Ampelopsis brevipedunculata</i> (Maxim.) Trautv	Porcelain-berry
<i>Arthraxon hispidus</i> (Thunb.) Makino	Hairy jointgrass
<i>Bambusa</i> spp.	Exotic bamboo
<i>Berberis thunbergii</i> DC	Japanese barberry
<i>Broussonetia papyrifera</i> (L.) L'Her. ex Vent.	Paper mulberry
<i>Cardiospermum halicacabum</i> L.	Balloonvine
<i>Cayratia japonica</i> (Thunb. ex Murray) Gagnep.	Bushkiller
<i>Centaurea biebersteinii</i> DC	Spotted knapweed
<i>Clematis terniflora</i> DC (=C. <i>diocoreifolia</i>)	Leatherleaf clematis
<i>Conium maculatum</i> L.	Poison hemlock
<i>Coronilla varia</i> L.	Crown vetch
<i>Dioscorea oppositifolia</i> L.	Air-potato
<i>Eichhornia crassipes</i> (Mart.) Solms	Water-hyacinth
<i>Euonymus alata</i> (Thunb.) Sieb.	Burning bush
<i>Euonymus fortunei</i> (Turcz.) Hand. – Mazz.	Winter creeper
<i>Ficaria verna</i> ssp. <i>ficariiformis</i> (F.W. Schultz) B. Walln. (=Ranunculus <i>ficaria</i>)	Lesser Celandine
<i>Glechoma hederacea</i> L.	Gill-over-the-ground, ground ivy
<i>Humulus japonicus</i> Siebold & Zuccarini	Japanese Hops
<i>Lamium purpureum</i> L.	Henbit
<i>Ligustrum japonicum</i> Thunb.	Japanese privet
<i>Ligustrum vulgare</i> L.	Common privet
<i>Lonicera maackii</i> (Rupr.) Maxim.	Amur bush honeysuckle
<i>Lonicera morrowii</i> A. Gray	Morrow's bush honeysuckle
<i>Lonicera standishii</i> Jaques	Standish's Honeysuckle
<i>Lonicera</i> ×bella [<i>morrowii</i> × <i>tatarica</i>]	Hybrid Bush Honeysuckle
<i>Lygodium japonicum</i> (Thunb. ex Murr.) Sw.	Japanese climbing fern
<i>Lythrum salicaria</i> L.	Purple loosestrife
<i>Mahonia beali</i> (Fortune) Carriere	Leatherleaf Mahonia
<i>Miscanthus sinensis</i> Andersson	Chinese silver grass
<i>Morus alba</i> L.	White mulberry
<i>Myriophyllum spicatum</i> Komarov	Eurasian watermilfoil
<i>Nandina domestica</i> Thunb.	Nandina
<i>Persicaria longiseta</i> (de Bruijn) Moldenke (=Polygonum <i>caespitosum</i> Blume)	Oriental ladies-thumb

TABLE 5.4-1: PROHIBITED SPECIES	
<i>Persicaria maculosa</i> S.F. Gray (=Polygonum <i>persicaria</i> L.)	Lady's thumb
<i>Phyllostachys</i> spp.	Exotic bamboo
<i>Poncirus trifoliata</i> (L.) Raf.	Hardy-Orange
<i>Pseudosasa japonica</i> (Sieb. & Zucc. ex Steud.) Makino ex Nakai	Arrow bamboo
<i>Rhodotypos scandens</i> (Thunb.)	Makino jetbead
<i>Rubus phoenicolasius</i> Maxim.	Wineberry
<i>Solanum viarum</i> Dunal	Tropical soda apple
<i>Sorghum halepense</i> (L.) Pers.	Johnson grass
<i>Spiraea japonica</i> L.f.	Japanese spiraea
<i>Stellaria media</i> (L.) Vill.	Common chickweed
<i>Veronica hederifolia</i> L.	Ivyleaf speedwell
<i>Vinca major</i> L.	Bigleaf periwinkle
<i>Vinca minor</i> L.	Common periwinkle
<i>Wisteria floribunda</i> (Willd.) DC	Japanese Wisteria
<i>Xanthium strumarium</i> L.	Common cocklebur
Rank 3 - Lesser Threat	
<i>Ajuga reptans</i> L.	Bugleweed
<i>Allium vineale</i> L.	Field garlic
<i>Artemisia vulgaris</i> L.	Mugwort, common wormwood
<i>Arundo donax</i> L.	Giant reed
<i>Baccharis halimifolia</i> L.	Silverling, groundsel tree
<i>Bromus catharticus</i> Vahl	Bromegrass, rescue grass
<i>Bromus commutatus</i> Schrad.	Meadow brome
<i>Bromus japonicus</i> Thunb. ex Murray	Japanese bromegrass
<i>Bromus secalinus</i> L.	Rye brome
<i>Bromus tectorum</i> L.	Thatch bromegrass, cheat grass
<i>Buddleia davidii</i> Franch.	Butterfly bush
<i>Chicorium intybus</i> L.	Chicory
<i>Chrysanthemum leucanthemum</i> L.	Ox-eye daisy
<i>Cirsium vulgare</i> (Savi) Ten.	Bull thistle
<i>Daucus carota</i> L.	Wild carrot, Queen Anne's-lace
<i>Dipsacus fullonum</i> L.	Fuller's teasel
<i>Egeria densa</i> Planch.	Brazilian elodea, Brazilian water-weed
<i>Fatoua villosa</i> (Thunb.) Nakai	Hairy crabweed

TABLE 5.4-1: PROHIBITED SPECIES

Festuca pratensis Huds.	Meadow fescue
Ipomoea quamoclit L.	Cypressvine morningglory
Kummerowia stipulacea (Maxim.)	Makino Korean clover
Kummerowia striata (Thunb.) Schindl.	Japanese clover
Liriope muscari (Dcne.) Bailey	Liriope, Lilyturf
Lysimachia nummularia L.	Moneywort, creeping Jenny
Melilotus albus Medik.	White sweet clover
Melilotus officinalis (L.) Lam.	Yellow sweet clover
Najas minor All.	Brittle naiad
Pastinaca sativa L.	Wild parsnip
Perilla frutescens (L.) Britt.	Beefsteakplant
Populus alba L.	White poplar
Senecio vulgaris L.	Ragwort
Setaria faberi R.A.W. Herm.	Nodding foxtail-grass
Triadica sebifera (L.) Small	Chinese tallowtree
Tussilago farfara L.	Coltsfoot
Vicia sativa L.	Garden vetch

5.5 FENCES, WALLS, AND BERMS

5.5.1 GENERAL

A fence, wall or berm may be used in conjunction with required landscaping subject to the following regulations.

- A. **Location.** A fence, wall or berm shall be located in such a manner as to not interfere with any regulations of Section 7.66 - Sight Distance Requirements of this UDO, and shall not encroach upon any platted easements unless specifically authorized by the terms of the easement or by written consent of the agency in whose favor the easement is granted, and in the case of a Town Easement, authorized by the Administrator.
- B. **Design.** A fence, wall or berm shall be designed to not interfere with any walkway or pedestrian/bikeway system serving the site.

5.5.2 FENCE AND WALLS WITHIN PERIMETER BUFFERS

- A. When a fence or wall is used in conjunction with required perimeter buffer landscaping, the fence or wall must be installed at a minimum of 10 feet from the right-of-way.

- B. When an opaque fence or wall which is a minimum of 6 feet in height is used within the perimeter buffer, the required landscaping for that portion of the perimeter may be reduced by up to 25% of the required landscaping.

5.5.3 BERM REGULATIONS

A. Height.

1. Within the front yard or front perimeter buffer, a berm shall have a maximum height not to exceed:
 - a. Residential Use District – 6 feet;
 - b. Commercial & Mixed-Use District – 3 feet; or,
 - c. Employment / Campus Use District – 6 feet.
2. Within the side or rear yard or perimeter buffer, a berm shall have a maximum height not to exceed 10 feet.

B. Design.

1. Each berm shall have a minimum crown width of 2 feet;
2. Each berm shall have a side slope of not greater than 3 feet horizontal to 1 foot vertical;
3. Each berm shall be planted and covered with live vegetation; and,
4. A retaining wall may be used on the side of the berm facing away from the public right-of-way or away from the side lot line or rear lot line.

5.6 INSTALLATION & MAINTENANCE

5.6.1 INSTALLATION

- A. **Installation Required.** All landscaping required by this Section shall be installed prior to commencement of the use on the lot or the issuance of a Certificate of UDO Compliance. If seasons and weather conditions are not appropriate for the installation of landscaping immediately prior to commencement of the use or the issuance of a Certificate of UDO Compliance, a performance bond, or other surety acceptable to the Town, shall be provided

to the Administrator, in compliance with the provisions of Section 11.14 – Construction Drawings of this UDO. All landscaping required by this Section shall be installed within the first 3 months of the next planting season after the use of the lot is commenced.

The months of June, July and August are not appropriate for the installation of landscaping, unless an adequate irrigation system is installed and operated as part of the landscape plan.

- B. Live Vegetation.** All landscape materials installed as required by this Section shall be living vegetation.
- C. Landscape Material Size at Installation.** Materials for all landscape plans under the requirements of this UDO shall comply with the minimum size as shown in Table 5.7-1 at time of planting.

TABLE 5.6-1: REQUIRED PLANT SIZE	
Landscape Material	Minimum Size
Overstory Deciduous Trees	2 1/2 inch diameter
Ornamental Deciduous Trees	1 1/2 in diameter
Overstory Evergreen Trees	6 feet
Small Evergreen Trees	4 feet
Large Shrubs	36 inches or #5 container
Medium Shrubs	24 inches or #3 container
Small Shrubs, Native Grasses, or Perennial Flowers	18 inches or #3 container

- D. Street Tree Installation.**
 1. Trees must be installed prior to commencement of the use on the lot or the issuance of a Certificate of UDO Compliance.
 2. At the time of installation the nursery tags must remain on the street trees and a written statement must be submitted to the Administrator to certify that the correct species of tree(s) has been installed.
 3. Trees shall be installed with root guards in accordance with the Town’s Engineering Design & Construction Standards.
 4. Replacement and Maintenance shall be in accordance with Section 5.6.2 of this UDO.

- E. Certificate of Installation.** Within 30 days of the installation of plant materials, a registered landscape architect shall submit written certification to the Administrator stating that healthy plant material was properly installed in accordance with the locations, quantities, minimum sizes, and species indicated on the approved landscaped plan.
- F. Required 1-Year Warranty.** All landscape materials, including street trees, that do not live for 1 year after installation shall be replaced. The installer shall provide the Town with a maintenance bond.
- G. Bonding for Installation.** When a performance bond, or other acceptable surety, is provided in compliance with the provisions of Section 11.14 – Construction Drawings of this UDO, the Administrator may issue a Certificate of UDO Compliance even though all required landscaping has not yet been installed. The performance bond shall be accompanied by a documentation of the estimated cost of the remaining landscaping to be completed. The documentation of estimated cost may include a landscaping contractor’s bid or contract, a nursery’s bill or similar document. The performance bond shall be for an amount equal to 1 ½ times the cost of the plant materials plus installation for the plant materials yet to be installed, based upon the highest estimate provided.

5.6.2 MAINTENANCE

- A. The owner shall be responsible for:**
 1. The maintenance of all required landscaping by keeping lawns mowed, all plants maintained as disease-free, all planting beds groomed and kept weed free (except in areas of preserved existing natural vegetation (i.e., thickets), and kept free from trash, debris and other objectionable materials;
 2. The replacement of any required planting, which is removed or dies after the date of planting. Such replacement shall occur during the next planting season; and,
 3. The replacement of any tree in a tree preservation area which is removed or dies after the date of approval of a Preservation Landscape Plan. Such replacement shall occur during the next planting season.

4. Maintenance that damages plant material is prohibited.
 5. Tree topping is prohibited.
- B. Failure to maintain required landscape areas shall constitute noncompliance of this UDO enforceable under the provisions of Chapter 12 – Noncompliance & Enforcement.

HOLLY SPRINGS

North Carolina