# Tree Protection, Buffers & Landscaping

## 8.1 PURPOSE

It is the intent of this chapter to protect, refurbish, and improve the aesthetic appeal, scenic beauty, historic character and economic value of properties within the Town of Wake Forest. The regulations in this chapter seek to maintain an overall coverage of mature trees and existing landscaping for the community in order to:

- Maximize the economic vitality and positive community image associated with the town's mature vegetation;
- Protect and enhance property values;
- Maintain the aesthetic quality of the community as a whole;
- Moderate climate and reduce energy costs; and
- Mitigate the negative impacts of noise, glare, air and water pollution, and soil erosion on the environment of the town and on its inhabitants.

## 8.2 APPLICABILITY

### 8.2.1 GENERAL PROVISIONS

The requirements of this section shall apply to all land, public and private, in the Wake Forest zoning jurisdiction. Occupancy certificates for uses authorized by this ordinance shall not be issued until such requirements are installed, unless provided otherwise in this section.

### 8.2.2 EXEMPTIONS

The following conditions are exempt from the provisions of this chapter:

**A.** Improvements or repairs to interior and exterior features of existing structures or buildings which do not result in expansions or changes in the type of occupancy as set forth in the North Carolina Building Code.

**B.** A single-family detached dwelling on an individual lot of record.

**C.** Property covered by an active forestry management plan written by a North Carolina Registered Forester, provided documentation has been furnished to the town.

### 8.2.3 PRE-EXISTING DEVELOPMENT

**A.** Non-conforming preexisting development is subject to these standards as follows:

**1.** A change in type of occupancy, as set forth in the North Carolina Building Code;

**2.** A change in land use which requires an increase in the number of off-street parking spaces or the provision of a buffer yard;

**3.** Additions or expansions which singularly or collectively exceed 25% of the land area or gross building floor area existing at the effective date of this ordinance.

**B.** The Town of Wake Forest recognizes that designing preexisting development to meet new regulations is more difficult and expensive than applying these standards to undeveloped properties. Therefore, greater flexibility will be

afforded preexisting development in meeting the requirements of this section, in that:

1. A variance of up to 25% percent may be granted by the Administrator for planting area and dimension requirements where compliance presents hardships due to building location, lot size, or vehicular area configuration;
2. A credit for reducing required off-street parking by 1 space shall be given for the construction of each landscape island.

### 8.2.4 PROCEDURES

**A.** When an application is made for a development approval on any land to which the requirements of this section apply, a Landscape Plan shall be prepared as part of the Site Master Plan as outlined in Section 15.8. The specific requirements for a Landscape Plan are included in the checklist for Site Master Plans in the Wake Forest Manual of Specifications, Standards and Design (MSSD).

**B.** All planting materials specified by the landscape plan shall be installed prior to the issuance of the Certificate of Occupancy. An exception may be granted for a period not to exceed 180 days for the following circumstances, as determined by the Administrator:

1. The unavailability of specified plant material;
2. Weather conditions that prohibit the completion of the project or jeopardize the health of the plant material;
3. Actions or directives issued by any governing body with jurisdictional authority.

**C.** In such circumstances, the property owner or developer shall submit documentation of the estimated cost for the purchase and installation of the required planting areas and may be required to post a performance guarantee equal to the amount of the contract. The Administrator may issue a Conditional Certificate of Occupancy but shall not issue a Final Certificate of Occupancy until the planting requirements have been completed and approved.

### 8.2.5 ALTERNATE METHODS OF COMPLIANCE

**A.** Alternate landscaping plans, plant materials, planting methods or reforestation may be used where unreasonable or impractical situations would result from application of landscaping or tree preservation requirements. Such situations may result from streams, natural rock formations, topography, or other physical conditions; or from lot configuration, utility easements, unified development design, or unusual site conditions.

**B.** The Administrator may approve an alternate plan, which proposes different plant materials or methods provided that quality, effectiveness, durability, and performance are equivalent to that required by this section.

**C.** Decisions of the Administrator regarding alternate methods of compliance for landscaping and tree preservation may be appealed to the Board of Adjustment according to the provisions of Section 15.12.

## 8.3 TREE CANOPY COVERAGE REQUIREMENT

### 8.3.1 MINIMUM CANOPY COVERAGE REQUIREMENT

All parcels, regardless of land use, shall maintain a minimum tree canopy coverage according to their district classification as follows:

| District | Canopy Coverage Requirement |
|---|---|
| Rural and Suburban Districts | 2 canopy trees per 5,000 sq. ft. of parcel area, OR<br>1 canopy tree and 1 understory tree per 4,000 sq. ft. of parcel area |
| UR, RMX | 1 canopy tree per 10,000 sq. ft. of parcel area |
| NMX, RA-HC, UMX, PUD | 1 canopy tree per 10,000 sq. ft. of parcel area – may be waived or altered by the Administrator depending on lot coverage of proposed development and adequate street tree installation. |

### 8.3.2 PRIORITY TREE PROTECTION AREAS

The minimum canopy coverage requirement may be met through the retention of existing vegetation, supplemental plantings, or a combination of both; however, every reasonable effort should be made to meet the baseline canopy coverage area through the retention of existing vegetation in the following priority areas of the site:

**A.** Required buffer yards between conflicting uses (as defined in this chapter);

**B.** Thoroughfare buffers and streetyards;

**C.** Conservation easements;

**D.** Special Flood Hazard Areas;

**E.** Historic, landmark and/or specimen trees which meet the requirements of Section 8.4.3.

## 8.4 TREE PRESERVATION

### 8.4.1 CREDITS FOR TREE PRESERVATION

Credit may be applied toward the baseline tree canopy requirements by the preservation of existing trees in Priority Tree Protection Areas as well as other additional tree preservation areas on site. Credit will only be applied to existing vegetation that is healthy and meets the requirements of this section. Tree credit rates for each tree preserved shall be determined by the following methods, schedules and standards:

**A. Credit for Preservation of Wooded Areas:** In order to receive credit for wooded areas, the trees contained in these areas shall be a mixture of healthy and useful canopy and understory trees. The method for calculating tree credits in wooded areas is as follows: one tree per 700 square feet of protected area. Watercourse buffer areas and wetlands are not eligible for the tree credit and the respective amount of parcel area is exempt from the baseline tree coverage requirement.

**B. Credit for Preservation of Specimen Trees**

| Existing DBH of Preserved Tree(s) | Number/Type (Canopy or Understory) of Tree Credits |
|---|---|
| 8" + (Understory) | 2 / Understory |
| 20" – 30" | 3 / Canopy |
| 31" – 41" | 4 / Canopy |
| 42" + | 5 / Canopy |

*DBH shall be rounded off to the nearest inch.*
*Trees must be of Specimen quality. See Section 8.4.3.*

**C. All Other Trees:** All other trees preserved will receive 1 tree credit with the exception of trees less than 2.5 inches DBH and trees with less than 10 years of remaining life, as determined by the Administrator.

**D. Invasive, Dead and Unhealthy Trees**

**1.** No credit will be allowed for any invasive exotic tree, dead tree, any tree in poor health, or any tree subject to grade alterations.

**2.** The death or unhealthy state of any tree(s) used for preservation credit, within 3 years of establishing the TSA, shall require the property owner to plant new trees equal to the number of credited trees.

**3.** If any tree(s) used for preservation credit is improperly protected or determined to be hazardous, the Administrator may require new trees be planted equal to the number of credit trees.

**4.** The Administrator may require trees left outside preservations areas to be removed if improperly protected or determined to be hazardous.

**E. Land Dedication:** Land that is dedicated to the town that is part of the property being developed may be used towards the tree preservation requirement, if the dedicated land contains trees that meet the requirements above.

### 8.4.2 TREE SAVE AREAS

Trees survive the stress of construction best when they are left in stands or larger groupings. For that reason, it is encouraged that, wherever possible, the site should be designed and developed so that tree save areas (TSAs) are designated in a single, contiguous unit. In order to qualify for the purpose of meeting the requirements of this section, designated tree save areas must conform to the following standards:

**A. Minimum Dimensional Requirements:** The extent of the Critical Root Zone (CRZ) of the tree or trees at the outer edges of the tree save area shall constitute the limits of construction for the purposes of this sub-section. The CRZ is the circular area of ground surrounding a tree extending from the center of tree to the greater of

**1.** 1.5 feet per caliper inch DBH of the tree,

**2.** The dripline (furthest extent of tree canopy) of the tree, or

**3.** 6 feet.

**B. Minimum Content Requirements:** The TSA should contain, as determined by an informal site assessment, predominantly canopy tree species which are at least 2 inches in diameter at breast height (DBH) and a minimum of 10 feet in height.

**C. Maintenance & Ownership:** When a TSA is established in association with the incentives as listed in this section, it should be designated, where possible, as a dedicated open space, or in a conservation easement.

**D. Tree Removal Inside Tree Save Areas:** Trees that are in poor health or invasive, exotic species, as determined by the Administrator, may be removed from tree save areas. All tree removal within TSA must have prior approval by the Administrator pursuant to the provisions of this section. However, in an emergency situation due to storm damage, or to alleviate an imminent hazard to the health, safety and welfare of the citizens, or to repair property damage, prior approval for tree removal in previously approved designated tree save areas is not required.

**E. Flexibility in Other Requirements:** Flexibility in other design requirements will be considered on a case-by-case basis to accommodate the establishment of a TSA.

**F. Tree Save Area Incentives:** The following incentives are offered to encourage tree preservation in tree save areas.

| Action Taken | Incentive |
|---|---|
| **A. Single Family Residential** | |
| **1.** Establishment of tree save area (TSA) | Reduction of minimum lot area equal to area of TSA (up to 20% maximum reduction) |
| **2.** Establishment of a tree save area along a street | Reduction by up to 50% of required street tree plantings at the rate of one less street tree for every 200 square feet of TSA established. |
| **3.** Establishment of a tree save area in or along a required buffer yard | Reduction by up to 50% of required buffer yard plantings at the rate of 5% less plantings for every 200 square feet of TSA established. |
| **B. Multi-Family Residential or Non-Residential** | |
| **1.** Establishment of tree save area | Reduction by up to 20% of minimum parking requirement at the rate of one less parking space for each 200 square feet of TSA established |
| **2.** Establishment of a tree save area adjacent to a parking lot | Reduction by up to 50% of required parking lot plantings at the rate of one tree for each 200 square feet of TSA established |

### 8.4.3 SPECIMEN / HISTORIC TREES

It is the intent of this section to promote the preservation of trees which are of a significant enough size and/or of such a historic nature as to be an asset to the community as a whole.

**A. Specimen Trees:** Where there exists one or more Specimen Trees on property subject to the regulations of this section, every effort shall be made to preserve and protect that tree or trees, according to the protection standards as outlined in this section. For the purposes of this section, Specimen Trees shall be defined as those trees which meet one or more of the following:

**1.** Any tree in fair or better condition which equals or exceeds the following diameter sizes or which otherwise is noteworthy because of species, age, size, or other exceptional quality, uniqueness and rarity:

| Tree Type | Tree Diameter Size |
|---|---|
| Canopy | 20 inch DBH |
| Understory | 8 inch DBH (*Reference ANSI Z60.1-2004 for multi-stem trees)* |

2. A tree in fair or better condition must meet the following minimum standards:
   a. A life expectancy of greater than 10 years;
   b. A relatively sound and solid trunk with no extensive decay or hollowness, and less than 20% radial trunk dieback;
   c. No more than one major and several minor dead limbs;
   d. No major insect or pathological problem.
3. Designation as a Champion, Landmark, or Meritorious Tree by the Triangle J Council of Governments Capital Trees Program
4. Designation as a Landmark Tree by the Wake Forest Board of Commissioners

**B. Historic Trees:** Where there exists one or more designated Historic Trees on property subject to the regulations of this section, every effort shall be made to preserve and protect that tree or trees, according to the methods outlined in this section. For the purposes of this section, Historic Trees shall be defined as those trees which meet one or more of the following:

1. Designation as a Historical Tree by the Triangle J Council of Governments Capital Trees Program;
2. Designation as a Historic Tree by the Wake Forest Board of Commissioners.

**C. Designation:** Upon petition by the owner of the property on which the tree(s) is located, and the recommendation of the Wake Forest Urban Forestry Board, the Wake Forest Board of Commissioners may designate a specific tree or group of trees as either a Landmark, Historic, or both. In order to be designated as such, the following criteria must be demonstrated by the owner:

1. **Landmark Trees**
   a. Using the measurement and point system established for state and national champion trees, a nominated tree must have a point total of at least 50% of the current state champion for the particular species; or be a highly visible or recognizable tree or group of trees which has significance for the entire community; and,
   b. Must exhibit such health, condition, and form as to have a reasonable prospect of continuing useful life.
2. **Historic Trees**
   a. Must be at least 50 years old and exhibit such health, condition, and form as to have a reasonable prospect of continuing useful life; and,
   b. Must be associated with a specific and significant historic event or individual; or contribute to the character of a historic building or property.

**D. Replacement of Specimen Trees**

1. When a specimen tree is removed from a site during construction, or dies within 5 years following construction, the applicant or developer shall replace such tree on the lot with an amount of trees and/or landscaping of equal value. Valuation of the tree removed or lost shall be determined by the Administrator in consultation with a person qualified by training or experience to have expert knowledge of the subject. Valuation of trees and

vegetation shall be established in accordance with standards established by the Council of Tree and Landscape Appraisers (CTLA).

2. If replacement isn't feasible or desired, as determined by the Administrator, a monetary sum equal to the value of the lost or removed specimen tree(s) may be paid to a tree planting fund maintained by the Town of Wake Forest for the purposes of planting and maintaining trees throughout the jurisdiction of the town.

### 8.4.4 TREE PROTECTION DURING CONSTRUCTION

It is the intent of this sub-section to establish minimum standards of protection in order to ensure that trees which are to be saved remain undamaged, thus improving their long-term chances of survival.

**A. Clear Delineation:** Tree save areas, buffers or other areas where existing vegetation is to be preserved shall be delineated on the construction site as it is shown on the approved landscape plan.

1. All existing trees and vegetation that are to be preserved shall be completely enclosed with a sturdy and visible fence prior to any land disturbance. Fencing shall extend to the CRZ. In some instances, the Administrator may require an additional area of no disturbance.

2. Fencing of areas adjacent to existing and proposed roadways also is required. Fencing is required on all Town of Wake Forest and State Department of Transportation road projects that are adjacent to protected streetscapes or buffers. The tree protection fencing shall be clearly shown on the site and/or subdivision plan and shall comply with the standards in the MSSD.

3. A stop work order or notice of violation shall be issued if the project is found to be out of compliance with this section or an approved Landscape Plan.

4. All protected trees must be protected from silt with wire mesh fencing, as provided for in the MSSD, placed along the outer uphill edge of the tree protection zones at the land disturbance interface.

5. All tree fencing and erosion control measures shall be installed prior to and maintained throughout the land disturbance process and building construction and may not be removed until the authorization is given by the Town of Wake Forest.

**B. Prohibited Activities in Tree Save Areas**

1. **Land Disturbance:** There shall be no clearing, excavation, soil compaction or changes of the existing grade within the delineated tree save area or tree protection zones. Should the removal of underbrush vegetation take place, every effort should be made to minimize the disturbance.

2. **Storage of Equipment:** The storage of construction or other vehicles and/or equipment, site construction materials, portable buildings, including portable toilets, or other heavy objects is prohibited within delineated tree save areas and tree protection zones.

3. **Encroachments:** If during the course of construction, it does become necessary for activities to take place inside TSA or tree protection zones, then the Administrator shall be consulted, in advance of any activity. Such activities include but are not limited to the erection of scaffolding, vehicle movement, trenching or excavation. The Administrator shall review the most appropriate way to undertake such activities. If such an encroachment is anticipated, the following preventive measures shall be employed at a minimum:

   **a.** Where utilities must encroach upon a delineated tree save area or tree protection zone, they should be installed by tunneling, rather than by trenching. If it is necessary for roots to be disturbed, then proper root pruning procedures shall be employed.

   **b.** The removal of trees adjacent to tree saved areas can cause inadvertent damage to the protected trees. Wherever possible, it is strongly recommended to cut minimum one and one-half-foot trenches along the limits of land disturbance, so as to cut, rather than tear, roots.

   **c.** Where compaction might occur due to traffic or materials through the tree protection zone, the area must first be mulched with a minimum 6-inch layer of processed pine bark or coarse wood chips (see MSSD). Equipment or materials storage or disposal shall not be allowed within tree protection areas.

### 8.4.5 TREE REPLACEMENT STANDARDS

**A. Replacement of Damaged, Removed or Excessively Pruned Trees and Vegetation:** Any tree or vegetation (planted or preserved as part of the development requirements of this ordinance) that is damaged, removed or excessively pruned shall be replaced according to the following standards:

1. **Square Inch for Square Inch Replacement.** Where the cross-sectional (basal) area can be documented, an equal amount of new vegetation ("square inch for square inch") shall be used to quantify the required replacement vegetation. All replacement trees shall have a DBH of at least 2 inches each and a cumulative cross-sectional (basal) area equal to or greater than that of the original tree(s).

2. **Area Replacement.** For all other cases where existing vegetation is damaged or removed, the type and amount of replacement vegetation required shall be the type and amount that is necessary to provide the type of landscaped areas required under this section and/or as required by the approved landscape plan.

3. **Location of Replacement Vegetation.** Replacement vegetation should be located within the vicinity of the violation. If replacement is not practical within the vicinity, a more suitable location on the site may be selected. If no suitable location can be found, a monetary payment may be required. This monetary payment will be based on the current market price for any replacement tree(s) and/or shrubs. This payment shall be used to fund plantings on public properties.

**B. Establishment Period:** Replacement trees shall be maintained through an establishment period of at least 2 years. The applicant may be required to post a performance guarantee acceptable to the town guaranteeing the survival and health of all replacement trees during the establishment period and guaranteeing any associated replacement costs. If the replacement trees do not satisfactorily survive the establishment period in the judgment of the

Administrator, the performance guarantee will be used to purchase and install new replacement trees.

### 8.4.6 TREE CLEARING PERMIT

Pursuant to NCGS 160A-458.5(c)(1), prior to the commencement of any vegetation clearing or removal on any undeveloped property, the owner (or authorized agent) of such property must obtain a Tree Clearing Permit in accordance with the provisions of Section 15.7.1.

## 8.5 BUFFERS AND SCREENING

### 8.5.1 GENERAL PROVISIONS

**A. Buffer Yard Lot Standards**

**1.** The designated buffer yards are intended to be an aggregate dimension between the competing uses.

**2.** If a proposed use is to develop next to an undeveloped or vacant property, the proposed use will be required to designate one-half of the required buffer yard, but not less than 10 feet in width, based on the previous use or the potential use of the adjacent property. The potential use of the adjacent property will be determined by the Administrator according to the existing zoning of the undeveloped property and the potential use as shown on the Growth Strategy Map in the Wake Forest Community Plan.

**3.** If a proposed use is to develop next to an existing land use which was not previously required to create a buffer yard, the proposed use will be required to create the entire buffer yard.

**4.** Perpendicular encroachments by driveways, pedestrian-ways, and utilities are permitted, but should be minimized to the extent feasible.

**B. Credit for Existing Vegetation:** Existing vegetation in buffer yard areas, which meets the minimum standards for a tree save area (TSA) in Section 8.4.2, shall qualify for the screening requirements. Where existing vegetation is insufficient or must be removed due to construction activity, new plantings shall be used to supplement any remaining existing vegetation in order to meet the minimum screening requirements.

**C. Ownership of Buffer Yards**

**1.** Any required buffer yard, including those required as a zoning condition, for a single-family or two-family residential development shall not be credited toward meeting the minimum lot size requirements.

**2.** Where control and/or ownership of the buffer yard is by a separate entity, any disturbance, modifications, removal or damage to the buffer yard by an adjacent homeowner or resident is prohibited.

**3.** The property owner's association or owner shall be responsible for the maintenance and any violation related to the buffer yard as defined in this section.

**4.** Buffer yards may be included within residential lots only when all of the following conditions are met:

**a.** The subdivision is limited in size and has no homeowners' association; and

**b.** There is no reason for the formation of a homeowner's association other than to retain ownership and maintenance responsibilities for the buffer yard; and

**c.** The buffer is placed within a permanent conservation easement or other legal instrument dedicated to the Town of Wake Forest.

## 8.5.2 BUFFER YARD REQUIREMENTS

### A. Buffer Yard Table for Districts

**1.** The following tables illustrate the required buffer yard types for each district and the composition of each buffer yard type:

| | | Adjacent Zoning District | | | | | |
|---|---|---|---|---|---|---|---|
| | | OS, RD, GR3, GR5, GR10 | UR, RMX, ICD | NB | NMX, UMX, RA-HC | HB | LI, HI |
| District of Proposed Development | OS, RD, GR3, GR5, GR10 | X | X | X | X | A[1] | A[1] |
| | UR, RMX, ICD[2] | C | X | X | X | X | X |
| | NB[2] | B | C | X | X | X | X |
| | NMX, UMX, RA-HC | C | C | X | X | X | X |
| | HB | A | A | B | C | X | X |
| | LI, HI | A | A | A | A | B | X |
| | PUD[3] | TBD | TBD | TBD | TBD | TBD | TBD |

A = Type A Buffer; B = Type B Buffer; C = Type C Buffer; X = No buffer required

1 Only required where adjacent, more intense use is pre-existing and no equivalent buffer is provided on the adjacent property

2 Only multifamily and non-residential uses shall provide buffers between adjacent single family uses in detached homes

3 PUD District shall determine buffer yards as specified in the concept plan

### B. Street Yard Buffers

**1.** Where a development abuts a major or minor thoroughfare as identified on the Wake Forest Transportation Plan, a street yard buffer of no less than 20' in width shall be required along the edge of the right-of-way.

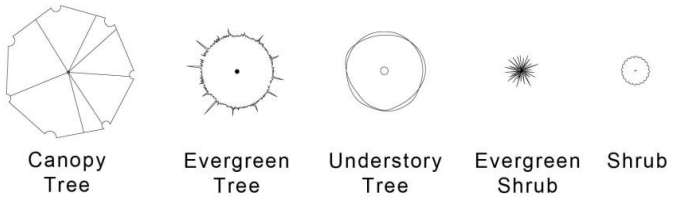
**2.** Street yard buffers shall be established using:

**a.** Existing vegetation, which meet the minimum standards for a tree save area (TSA) in Section 8.4.2; or
**b.** A 20' Type B Buffer – Option 1 in Section 8.5.3.B; or
**c.** A combination of existing vegetation and new plantings which meet the minimum requirements of a Type B Buffer – Option 1.
**d.** In a PUD, street yard buffers shall be determined in the PUD Concept Plan.

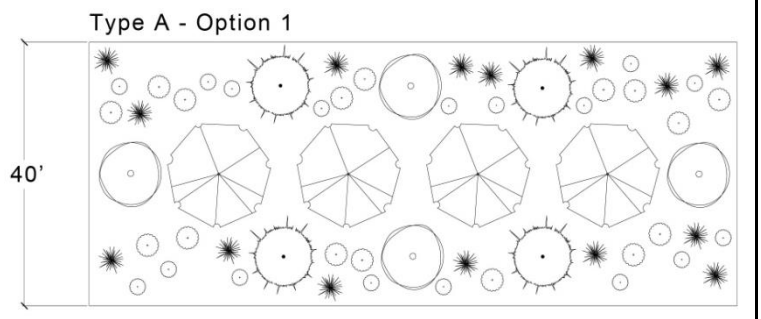
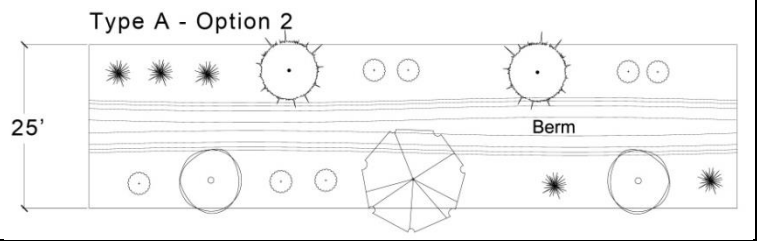
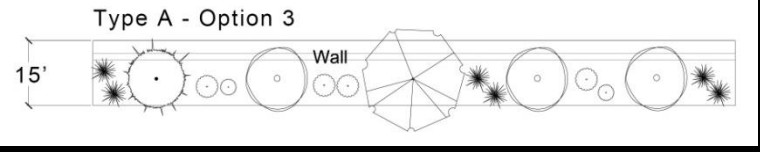
### 8.5.3 BUFFER YARD COMPOSITION

The required buffer yard types may be established using a combination yard widths, evergreen trees, canopy trees, understory trees, shrubs, fences, walls, and berms. The following tables illustrate the required elements for each buffer yard type.

**Buffer Yard Plantings**

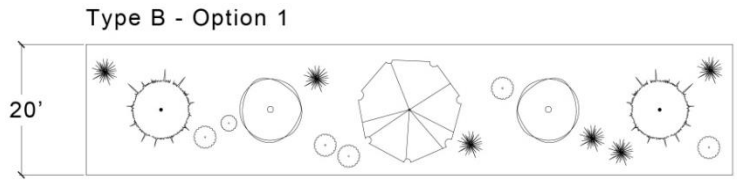
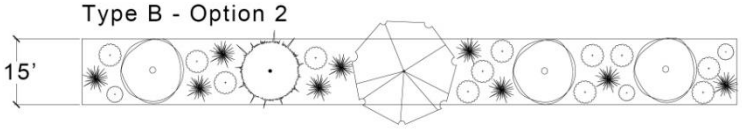


**A. Type A Buffer:** The intent of the Type A Buffer is to create a completely opaque buffer, having no horizontal openings from the ground to a height of 8 feet within 2 years of planting. A Type A Buffer can be achieved in 3 ways as specified below.

| Type A Buffer Yard Options | Minimum Depth | Minimum Plantings per 100 linear feet | Required Barrier |
|---|---|---|---|
| Option 1 | 40 feet | 4 Evergreen Trees<br>4 Canopy Trees<br>4 Understory Trees<br>48 Shrubs | Not Required |
| |  | | |
| Option 2 | 25 feet | 2 Evergreen Trees<br>1 Canopy Tree<br>2 Understory Trees<br>12 Shrubs | Berm<br>(See 8.5.4.B) |
| |  | | |
| Option 3 | 15 feet | 1 Evergreen Tree<br>1 Canopy Tree<br>3 Understory Trees<br>12 Shrubs | Fence or Wall<br>(See 8.5.4.A) |
| |  | | |

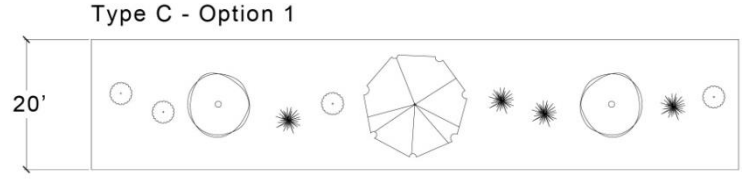
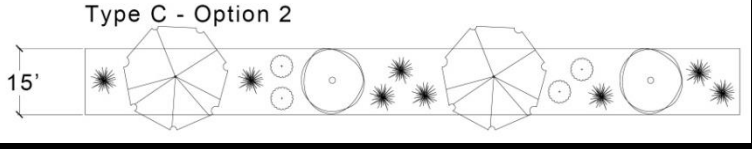
** 50% of required plantings for all options must be evergreen species*

**B. Type B Buffer:** The intent of the Type B Buffer is to create a semi-opaque buffer, having only seasonal horizontal openings, not to exceed 10% of the total width, from the ground to a height of 8 feet within 2 years of planting. A Type B Buffer can be achieved in 2 ways as specified below.

| Type B Buffer Yard Options | Minimum Depth | Minimum Plantings per 100 linear feet | Required Barrier |
|---|---|---|---|
| Option 1 | 20 feet | 2 Evergreen Trees<br>1 Canopy Tree<br>2 Understory Trees<br>12 Shrubs* | Not Required |
| |  | | |
| Option 2 | 15 feet | 1 Evergreen Tree<br>1 Canopy Tree<br>3 Understory Trees<br>24 Shrubs* | Not Required |
| |  | | |

** 50% of required shrubs for all options must be evergreen species*

**C. Type C Buffer:** The intent of the Type C Buffer is to create a semi-opaque buffer, having only seasonal horizontal openings, not to exceed 25% of the total width, from the ground to a height of 6 feet within 2 years of planting. A Type C Buffer can be achieved in 2 ways as specified below.

| Type C Buffer Yard Options | Minimum Depth | Minimum Plantings per 100 linear feet | Required Barrier |
|---|---|---|---|
| Option 1 | 20 feet | 1 Canopy Tree<br>2 Understory Trees<br>8 Shrubs* | Not Required |
| |  | | |
| Option 2 | 15 feet | 2 Canopy Trees<br>2 Understory Trees<br>12 Shrubs* | Not Required |
| |  | | |

** 50% of required shrubs for all options must be evergreen species*

### 8.5.4 ADDITIONS TO BUFFERS AND SCREENING

When it is determined that the conflict of land use is so great that the public safety is not served adequately by the minimum buffer and screening requirements in Section 8.5.2, or where there is a need to prevent a high degree of visual, audio, or physical disorder s, then the Administrator may require the installation of fencing or earthen berms in addition to the minimum required buffers and screening, according to the standards below.

**A. Fencing or Walls**: Where required as part of a buffer yard, fencing or walls must adhere to the provisions below. Nothing in this section shall prohibit the owner of a single family dwelling from constructing a separate fence along the borders of such property, provided that all required buffer plantings are maintained.

**1.** In all cases, the finished side of the fence must face the use with the lower intensity.

**2.** Permitted fence or wall materials include: masonry, stone, architectural block, stucco on masonry, wood or other similar of solid appearance.

**3.** The design of fencing or walls shall be sufficient to meet the extent of physical screening required by the Administrator.

**4.** The height of the fence shall be determined by the Administrator based on the following variables: site conditions; topography; use; and/or building height. The minimum height of a fence or wall required by this section shall be 6 feet.

**B. Berms:** Earthen berms may be required in combination with plant material and fencing for the purposes of screening. Berms shall be tapered appropriately to allow for practical maintenance.

**1.** The slope of all berms shall not exceed a 2:1 ratio (horizontal to vertical), shall have a top width at least one-half the berm height, and a maximum height of 6 feet above the toe of the berm.

**2.** All berms regardless of size, shall be stabilized. Topsoils brought in for mounds are to be mixed with native soil to avoid interfacing problems.

**3.** Berms shall be constructed as to provide adequate sight distances at intersections and along all roads.

Berms proposed to satisfy the screening requirements of this section shall be vegetated as required by this section. Use of berms as a substitute for existing healthy vegetation is strongly discouraged.

### 8.5.5 WATERCOURSE (RIPARIAN) BUFFER AREAS

All protected drainageways and surface waters shall maintain riparian buffers directly adjacent to such surface waters in accordance with the standards outlined in Section 12.7.

## 8.6 STREET TREES

It is the intent of this section to ensure that Wake Forest remains a community of tree-lined streets in order to reduce excessive noise, glare, and heat, and to ensure the aesthetic quality of the town.

### 8.6.1 STREET TREE REQUIREMENTS

**A. Location:** Street trees should be planted in the location specified for the corresponding street classification in Section 6.7. However, where not practical due to the location of utilities or other site constraints, street trees may be planted on private property upon dedication of a tree easement. Tree easements should be of a sufficient size to allow access by maintenance equipment to the entirety of the expected mature tree canopy.

**B. Minimum Number of Trees:** Street trees shall be installed according to the following minimum standards (linear feet of planting area shall exclude driveways):

**1.** At least 1 canopy tree for every 50 linear feet of planting area, or fraction thereof equal to or greater than 25 feet; or

**2.** Only when planting of canopy trees is not practical due to the location of utilities, 1 understory tree for every 35 linear feet of planting area, or fraction thereof equal to or greater than 18 feet; or

**C. Minimum Spacing**: Arrangement of and distance between trees is at the owner's option, except that the minimum spacing between trees should correspond to the expected mature spread of the adjacent trees and in no instance shall be less than:

**1.** 30 feet between canopy trees,

**2.** 20 feet between canopy trees and understory trees, and

**3.** 15 feet between understory trees.

**D. Conflict with Street Lighting:** Street trees shall be located and planted so as not to diminish the effectiveness of required street lighting, and in no instance shall street lights be located closer than:

**1.** 15 feet to canopy trees, and

**2.** 8 feet to understory trees.

**E. General Standards**

**1.** The location, species, and approximate planting date of any tree in the public right-of-way or tree easement must be approved by the Administrator prior to planting.

**2.** Street trees shall be installed according to the standards in the Wake Forest Manual of Specifications, Standards and Design (MSSD).

**3.** Trees species in major subdivisions should vary from street to street in accordance with Policy ST-3 from the Wake Forest Community Plan

**F. Additional Requirements for Special Highway Overlay (SH-O) Districts:** Additional requirements for the preservation and planting of trees in streetyards in the SH-O Districts can be found in Section 2.4.3

## 8.7 VEHICULAR USE AREA SCREENING & LANDSCAPING

### 8.7.1 SCREENING

All off-street parking, loading areas, and service areas adjacent to and/or visible from a public right-of-way and adjacent properties shall be screened from view by use of one or more of the following:

**A.** A building or buildings;

**B.** A change in topography;

**C.** A planting area a minimum of 8 feet wide planted with evergreen shrubbery placed a maximum of 5 feet on center. All shrubs shall achieve a height of 4 feet within 3 years.

**D.** Fencing, walls, or berms.

### 8.7.2 LANDSCAPING

In addition to screening requirements, canopy trees shall be installed in planting areas within parking lots to provide shade coverage for all parking spaces within vehicle service areas. Such planting areas shall meet the following requirements:

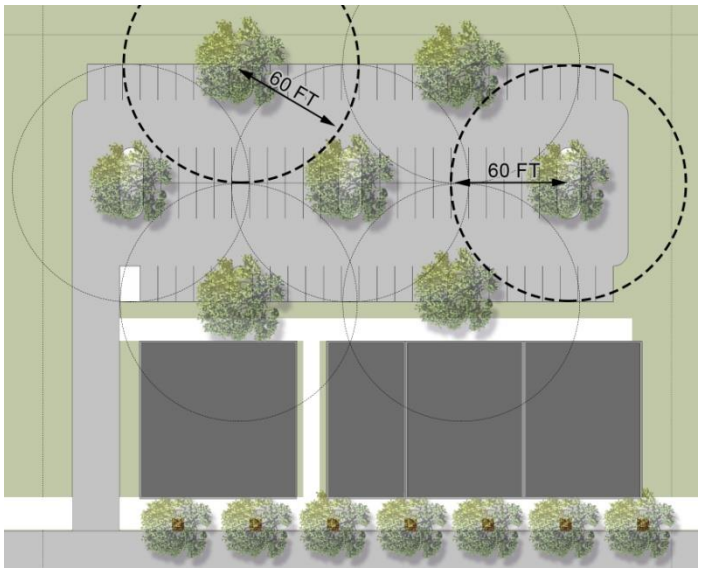
**A. Planting Area Size:** The minimum size of a planting area is dependent upon the number of canopy trees planted within it, as described below.

| Number of Canopy Trees in Planting Area | Minimum Size of Planting Area |
|---|---|
| 1 | 400 square feet |
| 2 | 700 square feet |
| 3 or more | 300 square feet per tree |

**B. Planting Area Width:** A minimum horizontal dimension of 9 feet measured from back of curb, pavement, sidewalk or other separating structure is required for all planting areas.

**C. Planting Strip Location:** A continuous linear planting strip shall be provided between each 2 parking bays.

**D. Minimum Spacing:** All parking spaces, or portions thereof, shall be within 60 feet of a planted canopy tree trunk as illustrated in the diagram at right.




**E. Groundcover:** Each planting area shall be landscaped with mulch, groundcover, or shrubs to protect against soil erosion.

**F. Barriers or Wheel Stops:** Barriers, such as wheel stops or 6-inch standard curbs, must be provided between vehicular use areas and landscaped areas.

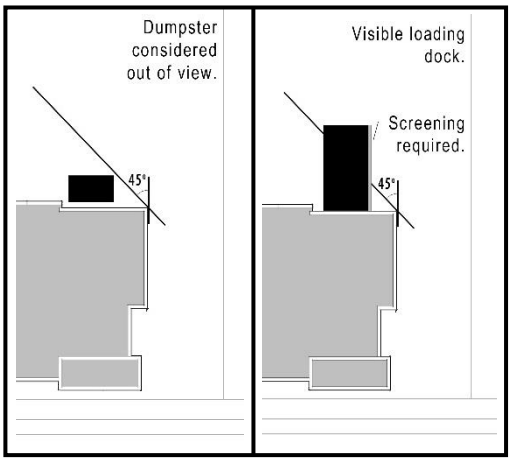
**G. Conflict with Parking Lot Lighting:** Trees shall be located and planted so as not to diminish the effectiveness of required parking lot lighting, and in no instance shall lighting be located closer than:

**3.** 15 feet to canopy trees, and

**4.** 8 feet to understory trees.

## 8.8 DUMPSTERS AND MECHANICAL UTILITIES SCREENING

### 8.8.1 REQUIRED SCREENING




**A.** All dumpsters, loading docks, outdoor storage areas and utility structures, which are visible from a public street or adjacent property line, shall be screened unless already screened by an intervening buffer yard. Such equipment shall be considered out of view if it is within the 45 degree angles projected from the building edges.

**B.** Screening shall consist of evergreen shrubs, fencing, walls or berms, and shall comply with all other standards of this section.

**C.** All screening of utilities shall comply with the requirements of the utility provider.

**D.** Where possible, enclosures for dumpsters are encouraged to be constructed with materials that are compatible with the design and materials of the principal building. Screening may be created through the use of:

**1.** Solid-wood fence, or fabricated metal fence, each with shrub plantings placed around the enclosure (they do not need to completely screen the enclosure) that grow as high, or nearly as high, as the fence to provide an attractive separation, or

**2.** Brick fence, brick/split face block, or decorative block (plantings not required).

## 8.9 GENERAL INSTALLATION AND MAINTENANCE STANDARDS

It is the intent of this section to ensure that the planting and preservation areas established to meet the requirements of this section are maintained. Minimum spacing requirements are located in Sections 8.6.1.C and 8.7.2.D.

### 8.9.1 INSTALLATION STANDARDS FOR NEW PLANTINGS

**A. Plant Species:** Plantings installed to meet the baseline vegetation requirement and other requirements of this section shall be chosen from the Official Planting List maintained by the Town of Wake Forest Urban Forestry Board. Substitutions may be made only by advance approval of the Urban Forestry Board.

**B. Variety:** When selecting species for planting, the applicant shall reference the Town of Wake Forest Urban Forest Management Plan as a guide to promote

tree diversity. Trees species in major subdivisions should vary from street to street in accordance with Policy ST-3 from the Wake Forest Community Plan.

**C. Canopy (Large Shade) Trees:** Canopy trees must be a native or locally-adapted species with an expected mature height of 40 feet or greater and an expected mature crown spread of 30 feet or greater. When planted, canopy trees must have a minimum caliper of 1.5 inches as measured at 6 inches above grade. Multi-stemmed trees shall have at least 3 stalks with a minimum 1.5 inch diameter at breast height (DBH), or approximately 4.5 feet above grade, and must be at least 8 feet in height when planted.

**D. Understory (Small) Trees:** Understory trees have an expected mature height between 20 and 40 feet. When planted, understory trees must be a minimum of 1 inch as measured at 6 inches above grade. Multi-stemmed trees shall have at least 3 stalks and must be at least 6 feet in height when planted.

**E. Shrubs:** At the time of planting, all shrubs except for shrubs planted as part of a buffer requirement shall be a minimum of 18 inches in height or spread and reach a minimum height of 36 inches and a minimum spread of 30 inches at maturity. Shrubs required in buffers shall be a minimum of 3 feet in height at time of installation measured above grade and reach a minimum of 6 feet in height at maturity and shall be spaced a minimum of 5 feet on-center.

**F. Timing of Plantings:** Any tree planted to satisfy the requirements of this chapter must be planted after October 1st and before March 31st. Any tree planted after April 1st and before September 30th will not count toward the landscape requirements of this chapter. If the project timing is such that trees to be counted toward the requirements of this chapter cannot reasonably be planted within the required October 1st to March 31st timeframe before the applicant requests a Certificate of Compliance, the Administrator may grant the applicant one additional year from the date of application for a Certificate of Compliance in which to plant such trees. In order to ensure that all such trees are planted within this one year period, the applicant shall provide the town with an improvement guarantee in accordance with the provisions of Section 6.12.

**G. Plantings near Parking and Vehicular Use Areas:** All planting areas that are adjacent to parking or vehicular use areas shall be protected from vehicular intrusion or damage from excessive vehicular lubricants or fuels.

**H. Motorist Obstruction Prohibited:** Landscaping shall not obstruct the view of motorists using any street, parking aisle, private driveway or the approach to any street intersection so as to constitute a traffic hazard or a condition dangerous to public safety.

**I. Conformance with Nursery Stock Standards:** Plant materials used in conformance with the provisions of this section shall conform to standards promulgated by the American Association of Nurseryman in "American Standards for Nursery Stock" (ANSI Z60.1-2004), as amended from time to time hereafter. All plant material shall be free of disease and pests; have good structure and branching form; be free from constricting ties; have a healthy root system without girdling roots; have a visible root collar at the time of planting; and be in vigorous health.

**J. Planting in Utility Easements:** The planting of required trees and shrubs in utility easements is discouraged, but may be permitted with written approval of the easement owner.

**K. Ground Treatment:** All tree plantings shall be mulched with 3 inches of shredded bark or 4 inches of pine straw in a 3-foot radius around the tree, or to the dripline, whichever is greater. The mulch shall be free of trash and maintained weed free thereafter. The mulch shall not cover the root collar.

**L. Trimming and Pruning:** All required plantings shall be allowed to reach their mature size and shall be maintained at their mature size. Trimming and pruning shall be done in strict accordance with the ANSI A300 standards, as amended from time to time hereafter. Topping is not an acceptable pruning practice. The Administrator may require the removal and replacement of any tree(s) that have been topped or excessively trimmed.

**M. Staking:** Staking is required only when a plant is unable to support itself with its existing root system. Examples of this are: bare rooted plants, a strong wind situation, loose soil, wet conditions, steep slopes and large size plant material. Tree ties are to be a soft, wide (minimum, 1 inch) polymer material. No knots are to be tied around the trunk that may restrict growth. Ties are to be removed after one year following installation.

**N. Soil Modification:** Soil modifications shall be required on sites where the soil is poor in quality and structure. Soil modifications may include tilling, deep ripping, addition of nutrition/fertilizer or other organic compounds, conditioning additives to effect a change in the water holding capacity of the soil, soil structure, soil texture, and Ph, such as gypsum, sand, lime, dolomite, chemicals, mulches, otherwise.

### 8.9.2 MAINTENANCE

It shall be the responsibility of the property owner(s) or assigned caretakers to ensure that all regulated landscaped areas, buffers, fencing, and tree save areas are installed, preserved, and maintained in good growing conditions, appearance, and usefulness. Damage and disturbances to these areas shall result in vegetation replacement and/or fines and other penalties. Preservation and maintenance shall include:

**A.** Any dead, unhealthy, or missing vegetation, shall be replaced with vegetation that conforms to the standards of this section and the approved site and/or subdivision plan.

**B.** All required buffers, streetyards, vehicular use areas, tree save areas and other landscaped areas shall be free of refuse and debris, shall be treated for pest/diseases in accordance with the approved site and/or subdivision plan, and shall be maintained as to prevent mulch, straw, dirt, or other materials from washing onto streets and sidewalks.

**C.** The owner(s) shall take actions to protect all plant material from damage during all facility and site maintenance operations. All plant material must be maintained in a way that does not obstruct sight distances at roadways and intersections, obstruct traffic signs or devices, and interfere with the use of sidewalks or pedestrian trails. Plant material, whether located within buffers, tree save areas, or within planted areas (required by the site and/or subdivision plan) shall not be removed, damaged, cut or severely pruned so that their intended form is impaired. Shrubs within vehicular use areas, streetyards, and street fronts may be pruned, but must maintain at least 3 feet in height.

**D.** In the event that existing required vegetation located within any buffers, tree save areas, streetyards, vehicular use or other landscape areas poses an immediate or imminent threat to improved structures on private property or public property, excessive pruning or removal of the vegetation may be

allowable provided authorization is obtained from the Administrator, and the performance standard of the landscape area is maintained consistent with this section. Replacement vegetation may be required as a condition of the permit.

**E.** In the event that any vegetation or physical element functioning to meet the standards of this section is severely damaged due to an unusual weather occurrence or natural catastrophe, or other natural occurrence, the owner may be required to replant if the requirements of the section are not being met. Replacement vegetation shall conform to the standards of this section and the approved site and/or subdivision plan.