Chapter 8. TREE PROTECTION & LANDSCAPING

8.1 Purpose and Intent

Tree Protection and landscaping are essential components of the built urban form of the Town. The purpose of this section is to regulate the protection, preservation, installation, and long-term management of trees and shrubs within the Town of Knightdale.

Landscape requirements are intended to minimize potential nuisances such as visual impacts from adjacent properties; transmission, noise, dust, odor, litter, and glare of lights; provide for a separation of space and establish a sense of privacy, promote the preservation of open space, and to mitigate adverse grade changes between adjacent properties.

The appropriate use of existing and supplemental landscaping enhances the aesthetic appearance of new development and blends new development with the natural landscape. The use of native evergreen and deciduous plant materials blend the built environment with new construction while maintaining the aesthetic character of the Town.

Existing landscaping should be retained where possible to preserve the established tree canopy:

A. To aid in preserving ecological balance by contributing to the preservation of wildlife habitat, the promotion of natural diversity, air quality, groundwater recharge, energy conservation, and storm water runoff, while reducing noise, glare, and heat.

B. To encourage the proper use of land by promoting an appropriate balance between the built environment and preservation.

C. To preserve and improve property values and promote private and public investment through the preservation and protection of existing tree canopy, providing transition between incompatible uses, and along roadways.

D. To preserve and protect the identity and character of Knightdale and to enhance the business economy.

E. To preserve and enhance the ecological, aesthetic, and economic value by having ample vegetation, especially healthy shade trees, specimen trees, significant vegetation, and tree canopies.

F. To recognize the economic and environmental value gained from the preservation of existing healthy vegetation and undisturbed soils.

G. To promote water conservation through preserving natural areas, encouraging good soil management and encouraging the use of native and drought tolerant plant materials.

8.2 Applicability

A. Expansions: These regulations shall apply to all newly developed properties as well as expansion or changes in use which result in the expansion of gross floor area of an existing building and/or parking and loading area of over 25%. Uses which expand over 25% shall be brought into full compliance for the entire project. All development plans shall comply with the provisions of this section.

B. Change of Use: If the zoning district classification changes for an existing use or parcel, then the parcel shall comply with the landscaping requirements of this Chapter or, at a minimum, the intent of this Chapter as prescribed by the Administrator. The owner or developer may need to install additional plant material on the parcel in order to meet the intent of this Chapter, especially on developed sites, or to bring the parcel up to the standards for the type of perimeter landscaping which would be required under this Chapter.

C. Protection of Vegetation During Design: Through the protection of trees and existing vegetation, the Town encourages new development to be creative in design and placement of buildings, structures, parking and other impervious surfaces as to preserve natural features and to compliment the existing topography when practical.

D. Exemptions:

1. Any lot less than 2 acres shall be exempt from the tree protection provisions of this chapter. ***Subdivision of property to circumvent these requirements is not permitted.***

2. **Timbering and Silviculture.** Normal forestry activity on forestland that is taxed on the basis of its present-use value as forestland under Article 12 of Chapter 105 of the General Statutes or that is conducted in accordance with a forest management plan that is prepared or approved by a forester registered in accordance with Chapter 89B of the General Statutes shall be exempt from the tree protection provisions of this Chapter.

   If a forest landowner harvests timber and they believe they will be developing the lot within the next three (3) to five (5) years, it is particularly important to maintain any buffers that might be required under current zoning. The landowner should also be reminded in such instances that protected trees as listed in Section 8.5(A) or any canopy required under Section 8.11 will have to be accounted for. Timbering and silviculture may not be used to circumvent the requirements of this chapter for development. Forest land owners should keep a record of when the tract was harvested since that date may come into question should a development plan be submitted to the Town in the future.

   In cases where the harvest results in the removal of all or substantially all of the trees that fall within required buffers, or fails to account for protected trees under Town regulations governing development of the tract of land, the Administrator may deny a building permit or refuse to approve a site or subdivision plan for either a period of up to three (3) years if it was not a willful violation of the Town's regulations, or up to five (5) years if it was a willful violation of the Town's regulations.

E. Modifications to Standards: Where necessary to accommodate creativity in site design, or where topographic or physical site conditions are not feasible, the Administrator may modify these requirements, provided that the type and amount of landscaping or other features are equivalent in effectiveness.

8.3 General Provisions

A. Existing Vegetation, Fences, Walls, and Berms: The use of existing trees or shrubs to satisfy the landscaping requirements of this Section is strongly encouraged. Existing significant vegetation within the landscaped area shall be preserved and credited toward standards for the type of perimeter landscaping required, unless otherwise approved by the Town of Knightdale at the time of site plan approval. Existing berms, walls, or fences within the landscaped area but not including chain link fencing, may be used to fulfill the standards for the type of perimeter landscaping required, provided that these elements are healthy and/or in a condition of good repair. Other existing site features within the required perimeter landscaped area which do not otherwise function to meet the standards for the required landscaping shall be screened from the view of other properties or removed, as determined during review and approval of the site plan.

B. Installation of New Vegetation and Other Features: New plant material should complement existing vegetation native to the site. If existing significant vegetation and other site features do not fully meet the standards for the type of landscaping required, then additional vegetation and/or site features (including fences) shall be planted or installed within the required landscaping area. The use of indigenous, native and/or regionally grown species of trees, shrubs, vines, groundcovers and perennials is encouraged in order to make planted areas compatible with existing native habitats.

C. Grading and Development in Required Landscape Areas: The required landscaping shall not contain any development, impervious surfaces, or site features that do not function to meet these standards or that require removal of existing significant vegetation. No grading, development, or land-disturbing activities shall occur within this area if forest canopy, specimen trees, or significant vegetation exists within the buffer yard, unless approved by the Administrator. If grading within a buffer yard is proposed, slopes of 1:3 or less are encouraged to ensure the proper transition of grades to the adjacent property and to facilitate landscaping and maintenance.

D. Easements & Right-of-Ways: Nothing shall be planted or installed within an underground or overhead utility easement or a drainage easement without the consent of the Town and the easement holder at the time of site plan approval.

E. Protection during Surveying: No tree greater than twelve (12) inches in diameter at breast height (DBH) located on public property or within a required tree protection area shall be removed for the purpose of surveying without an approval from the Administrator.

F. Tree Trimming: Every owner of any tree overhanging any street or right-of-way within the Town shall prune the branches so that such branches shall not obstruct the light from any street lamp or obstruct the view of any street intersection and so that there shall be a clear space of eight (8) feet above the surface of the street or sidewalk. Said owners shall remove all dead, diseased or dangerous trees, or broken or decayed limbs which constitute a menace to the safety of the public. The Public Works Director

is authorized to remove and/or trim trees and shrubs from public properties and public rights-of- ways. North Carolina Department of Transportation is authorized to remove and or trim trees and shrubs in the public right of ways owned by the State of North Carolina. Approval is required to trim a tree in a tree save area, required landscaping area, or buffer yard more than 25 percent of its overall canopy.

G. **Trimming and Removal by Utility Companies:** Trees to be removed from the public right-of-way by electric utilities and other overhead utilities must be replaced by such entity in equal quantity and minimum caliper size with an approved species.

H. **Tree Topping:** Tree topping shall be prohibited on all trees on public property, designated right-of-ways, required tree save areas, landscaping, and transitional yards unless otherwise approved by the Land Use Review Board. Trees severely damaged by storms or other causes, or certain trees under utility lines or other obstructions where other pruning practices are impractical may be exempted from this article at the determination of the Administrator.

I. **Removal of Dead Trees on Public Property:** Approval by the Administrator shall be issued for trees that are dead, infected by disease, or determined to be a hazard to public safety and welfare. Should any tree designated in a tree save area, required landscaping area, or buffer yard die, the owner shall replace it within 180 days with a tree (s) equal size.

J. **Tree Removal on Private Property:** The Town shall have the right to cause the removal of any dead or diseased trees on private property when such trees constitute a hazard to life and property, or harbor insects or disease which constitutes a potential threat to other trees in the Town. The Land Use Administrator or their designee will notify in writing the owner(s) of such trees. Removal shall be done at the owner(s) expense within sixty (60) days after the date of service of notice. In the event of failure of the owner(s) to comply with such provisions, the Town shall have the authority to remove such trees and charge the cost of removal on the owner's property taxes.

K. **Stumps:** All stumps of trees shall be removed or shall be ground up.

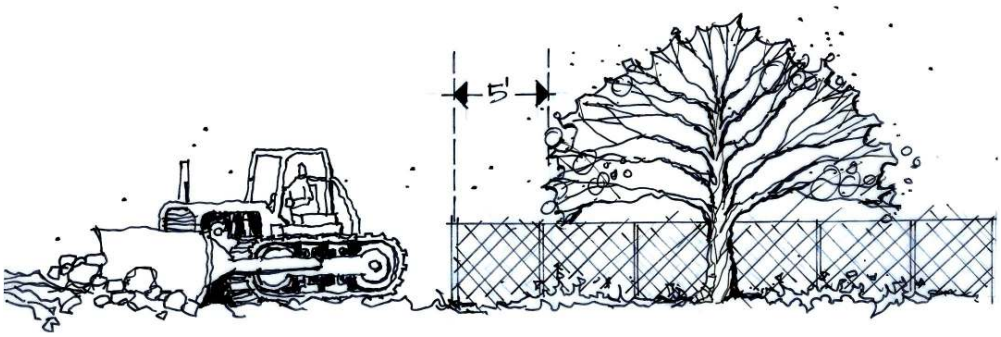
L. **Use of Off-Site Landscape Easements:** Permanent off-site landscape easements may be used to meet required buffer yards provided that the size or shape of the parcel significantly restricts the ability to reasonably use the property and meet the buffer yard requirements. These easements must be recorded prior to or in conjunction with the approval of the site or subdivision plan.

M. **Pre-Construction Conference:** Prior to the commencement of any activities requiring a building or zoning permit an on-site pre-construction conference shall take place with the developer and the Administrator to review procedures for the protection and management of all landscape elements that are to remain as identified on the landscape plan (see Section 16.8).

N. **Protective Measures During Construction:** Protective barricades shall be placed around all protected trees designated to be saved prior to the start of development activities or grading in accordance with Section Standard 2.10 of the Town of Knightdale *Standard Specifications and Details Manual.* Protective barricades shall remain in place until development activities are completed. The area within the protective

barricade shall remain free of all building materials, dirt or other construction debris, construction traffic, storage of vehicles and materials, and mass grading.

Except for driveway access points, sidewalks curb and gutter; no paving with concrete or other impervious materials within five (5) feet of a tree drip line shall be allowed unless otherwise approved. Where grading within a tree dripline cannot be avoided, cut and fill shall be limited to ¼ to ½ of the area within the dripline, and tree roots must be pruned with clean cuts at the edge of the disturbed area. No fill shall be placed within the dripline of a tree without venting to allow air and water to reach the roots.



O. Combustible Landscaping Materials Prohibited: No pine straw or any other material with a fire rate of spread more than 24 inches per minute as determined by the most recent study of the National Institute of Standards and Technology shall be placed, kept or stored within ten feet of buildings with any portion of the exterior wall covered with combustible material. Single-family residential homes are exempt from this prohibition.

P. Conflicts / Appeals: The Land Use Review Board shall hear and decide all matters in the event of a conflict with property owners with regard to tree removal in the public rights-of-way or on public property.

8.4 Landscape Plan

A. Applicability: A landscape plan shall be required prior to any site disturbance. The plan must contain the information detailed in Section 16.8. Minor changes or additions to existing development or approved plans may be submitted via an abbreviated site plan. An abbreviated site plan shall be allowed when a proposed change is physically limited to only a portion of the site. An abbreviated site plan shall include, but not be limited to, items listed in Section 16.8. The Administrator shall determine when an abbreviated site plan may be submitted for a detailed site plan and what items must be included.

B. Revisions to Approved Landscape Plans: Due to lack of plant availability, approved landscape plans may require minor revisions. Minor revisions to landscape plans may be approved by the Administrator if:

1. There is no reduction in the quantity of plant material.
2. There is no significant change in size or number of plant materials.
3. The new plants are of the same general category (i.e., large shade trees, small trees, shrubs, groundcover) and have the same general design characteristics (mature height, crown spread) as the materials being replaced.

4. Decisions of the Administrator regarding alternate methods of compliance may be appealed to the Land Use Review Board.

C. Alternative Plans

1. The Administrator shall review the alternate proposal and advise the applicant of the disposition of the request within 15 working days of submission by the applicant. An appeal of the staff's decision may be made to the Land Use Review Board.
2. Requests for a delay in complying with this Ordinance due to poor weather conditions for planting will be considered following written request directed to the Administrator in accordance with Section 8.11.E.

8.5 Tree Protection

A. Required Tree Save Areas: Trees and existing vegetation shall be preserved in accordance with the table below. Exceptions to tree protection in Tier 2 and Tier 3 areas shall be reviewed by the Land Use Review Board on a case-by-case basis.

	Priority Tree Save Area	Required Protection
Tier 1	Floodways Required Stream Buffers Required Buffer Yard Slope Areas Greater than 25% Wetlands	All Vegetation and Soil to Remain Undisturbed *In some cases, limited disturbance may occur within the areas to be protected provided all necessary approvals are obtained. Such activities include, but are not limited to the following:* 1. *Mitigation of development activities.* 2. *Restoration of previously disturb areas.* 3. *Utility installations and emergency public safety activities.* 4. *Construction of a trail or pedestrian walkway that will provide public access.* 5. *Required Street or Driveway connections.*
Tier 2	100 Year Floodplains Front Setback Areas Required Landscaping Areas Required Open Space Slope Areas of 15-25%	All Trees Greater than 12" DBH **
Tier 3	All Other Locations	All Trees Greater than 24" DBH **

*** Replacement trees, if permitted, shall be planted at a rate of 1 tree per 12" DBH. Required street trees, parking lot landscaping, residential landscaping and buffer yard plantings may not be counted towards replacements. Replacement trees should be incorporated into open space amenities wherever possible.*

B. Credits for Optional Preservation of Existing Trees in Parking Areas: Trees that are saved in a parking lot area (other than those in Tier 1 or Tier 2 Tree Save Areas in Section B above) can be used towards the interior tree landscape requirement in

Section 8.10. Note that each tree preserved will require a minimum pervious area around it equal to an area measuring five (5) feet beyond the drip line.

Size of Preserved Trees	Deduction from Required Plantings
For Each Tree 6-12" DBH	One (1) Required Parking Lot Tree
For Each Tree 13-24" DBH	Two (2) Required Parking Lot Trees
For Each Tree 25" DBH or Greater	Three (3) Required Parking Lot Trees

8.6 Buffers and Screening

A. Required Buffer Yards: A buffer yard is intended to give spatial separation and to decrease visual contact between incompatible uses. To further this intent, at least 40%, but no more than 60% each of canopy trees and understory trees and shrubs, and at least 80% of shrubs must be evergreen. Buffer yards shall be required in accordance with the table below when any use is being established on a property that abuts an existing developed lot or less intense zoning district.

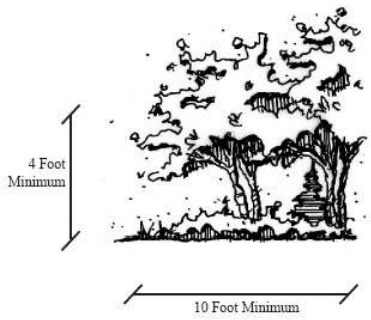
Buffer yards are intended to be constructed along the perimeter of the property; however, when there is irregular topographic conditions such as the perimeter of the property is at a lower grade than the use being screened, the Administrator may require the relocation of the required buffer yard in order to better serve its purpose.

		Adjacent District				
		OSP RR GR3 GR8	**UR12 RMX**	**NMX TC**	**HB**	**MI**
District of Proposed Development	**OSP RR GR3 GR8**					
	UR12 RMX	B				
	NMX TC	C	A			
	HB	D	C	B		
	MI	D	D	D	C	

Note 1: *A Type D Buffer Yard is required for the complete length of all property adjacent to Highways/Freeways in a SHOD District.*

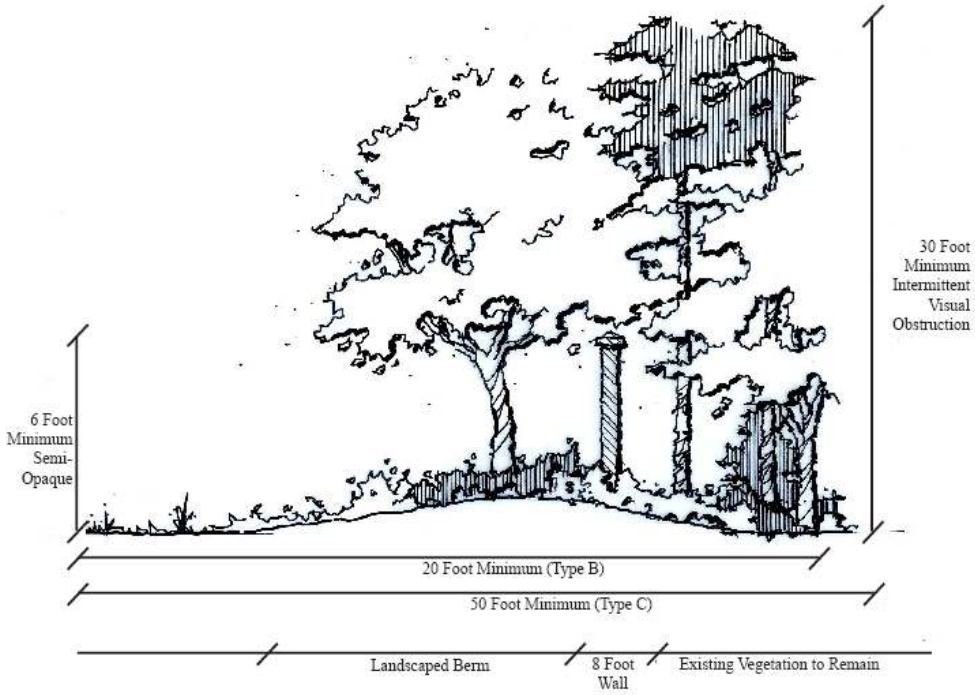
	Buffer Yard not required by Proposed Development

B. Buffer Yard Types

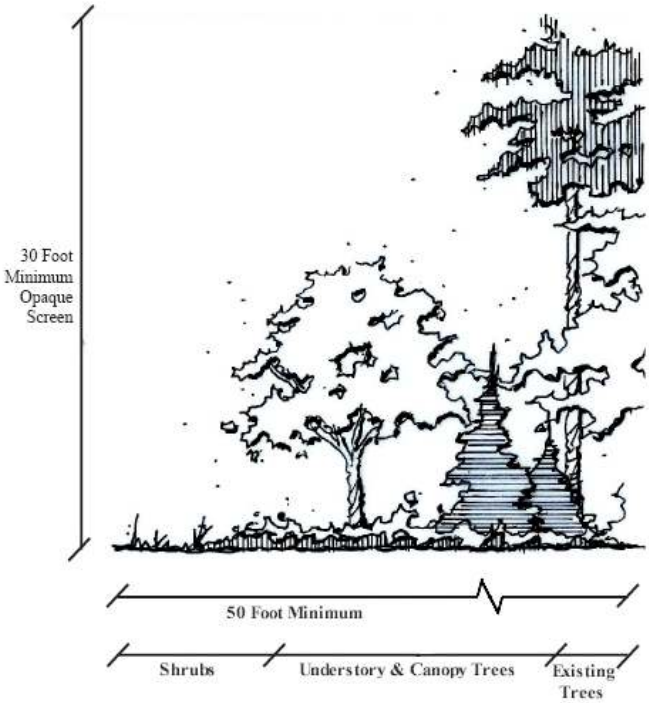
1. Type A Buffer Yard	
a. Minimum Width	10 feet
b. Minimum Height & Opacity	Ground to 4 feet - *Semi-Opaque Screen* 4-30 feet - *Intermittent Visual Obstruction*
c. Maximum Horizontal Openings	5 feet - *Semi-Opaque Screen Areas* 20 feet - *Intermittent Visual Obstruction Areas*
d. Performance Standard  	A buffer which is ten (10) feet in width and contains screening materials which at maturity provide semi-opacity from the ground to a height of four (4) feet as well as intermittent visual obstruction from a height of four (4) feet up to a height of thirty (30) feet. Vegetative screening materials within intermittent visual obstruction areas shall contain horizontal openings no greater than twenty (20) feet in width upon the plants' maturity.
e. Required Plantings	For every 100 linear feet, there shall be at least three (3) Canopy Trees, two (2) Understory Trees and 20 shrubs. Depending on the species chosen, additional trees or shrubs may be necessary to meet the performance standard in subsection "d" above.

2. Type B Buffer Yard	
a. Minimum Width	20 feet
b. Minimum Height & Opacity	Ground to 6 feet – *Semi-Opaque Screen* 6-30 feet – *Intermittent Visual Obstruction*
c. Maximum Horizontal Openings	5 feet – *Semi-Opaque Screen Areas* 20 feet – *Intermittent Visual Obstruction Areas*
d. Performance Standard	A buffer which is twenty (20) feet in width and contains screening materials which at maturity provide semi-opacity from the ground to a height of six (6) feet, and intermittent visual obstruction from a height of six (6) feet up to a height of thirty (30) feet. Vegetative screening materials within intermittent visual obstruction areas shall contain horizontal openings no greater than twenty (20) feet in width; and vegetative screening materials within semi-opaque areas shall contain horizontal openings no greater than five (5) feet in width upon the plants' maturity.
e. Required Plantings	For every 100 linear feet, there shall be at least three (3) Canopy Trees, five (5) Understory Trees and 20 shrubs. Depending on the species chosen, additional trees or shrubs may be necessary to meet the performance standard in subsection "d" above.

3. Type C Buffer Yard	
a. Minimum Width	50 feet
b. Minimum Height & Opacity	Ground to 6 feet – *Semi-Opaque Screen* 6-30 feet – *Intermittent Visual Obstruction*
c. Maximum Horizontal Openings	5 feet – *Semi-Opaque Screen Areas* 20 feet – *Intermittent Visual Obstruction Areas*
d. Performance Standard	A buffer which is fifty (50) feet in width and contains screening materials which at maturity provides semi-opacity from the ground to a height of six (6) feet, and intermittent visual obstruction from a height of six (6) height up to a height of thirty (30) feet. Vegetative screening materials within intermittent visual obstruction areas shall contain horizontal openings no greater than twenty (20) feet in width; Vegetative screening materials within semi-opaque areas shall contain no horizontal openings greater than five (5) feet in width upon the plants' maturity.
e. Required Plantings	For every 100 linear feet, there shall be at least three (3) Canopy Trees, five (5) Understory Trees and 20 shrubs. Depending on the species chosen, additional trees or shrubs may be necessary to meet the performance standard in subsection "d" above.



4. Type D Buffer Yard	
a. Minimum Width	50 feet
b. Minimum Height & Opacity	Ground to 30 feet – *Opaque*
c. Maximum Horizontal Openings	None permitted
d. Performance Standard	A buffer which is fifty (50) feet in width and contains screening materials which at maturity provides opacity from the ground to a height of thirty (30) feet. Vegetative screening materials within opaque areas shall contain no horizontal openings upon the plants' maturity.
e. Required Plantings	For every 100 linear feet, there shall be at least five (5) Canopy Trees, eight (8) Understory Trees and 40 shrubs. Depending on the species chosen, additional trees or shrubs may be necessary to meet the performance standard in subsection "d" above.



C. **Fences, Walls, and Berms:** Fences or walls with earthen berms may be substituted for half of the shrub requirement in all buffer types. In addition, existing vegetation within the buffer shall be maintained and may receive partial or total credit towards screening requirements. All berms, if provided, shall not exceed a slope with maximum rise of one (1) foot to a run of two (2) feet, a maximum height of four (4) feet and a maximum width of 40% of the required buffer width. All berms, regardless of size, shall be stabilized with a ground cover or other suitable vegetation or permanent slope retention device. Berms taller than four (4) feet shall be approved by the Administrator on a case by case basis, but shall conform to the slope and width restrictions as previously detailed.

8.7 Residential Landscaping

Each single-family or two-family residential lot shall contain a minimum of one (1) large shade tree for each two thousand (2,000) square feet of lot area or fraction thereof up to 20,000 square feet in lot area. Any portion of the residential lot occupied by a recorded utility easement shall not be included as part of the total lot area. Existing trees remaining on the lot after development that meet the above requirements may be credited toward this requirement.

The location of planting to account for physical conditions may be adjusted by the Administrator. The use of existing vegetation to satisfy this requirement is encouraged. Supplemental plantings may be required in addition to native materials. Existing large shade trees over 6 inches in caliper as measured at DBH (Diameter Breast Height) may be counted towards fulfilling this requirement. Required street trees may not be counted towards the fulfillment of this requirement. All other trees required under this Chapter shall be planted within the private lot. This requirement shall be noted on the approved Preliminary Plat and Final Plat.

8.8 Street Tree Plantings

A. All commercial, institutional and residential development shall be required to have street trees along all public rights-of-way in accordance with the Street Classification and Design as illustrated in Chapter 17. Street trees shall not be required for streets in the Open Space Preserve (OSP) or Rural Residential (RR) zoning districts.

B. Large shade trees shall be installed at a minimum average distance of 40 feet on-center in a planting strip a minimum of six (6) feet in width. Where overhead utilities exist prior to development, small trees may be substituted.

C. Street trees shall be placed at least ten (10) feet from light poles and twelve (12) feet from electrical transformers in order to allow these utilities to be safely serviced (small trees may be placed within five feet of such devices). A minimum of 300 square feet of pervious ground area per large shade tree shall be provided.

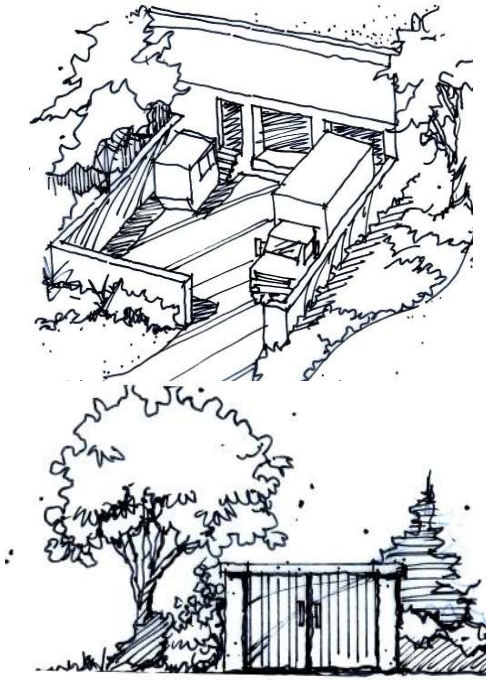
D. Street trees shall be deciduous hardwoods and shall meet the standards set forth in the American Standard for Nursery Stock by the American Association of Nurserymen as well as the criteria set forth in Section 8.11.

8.9 Parking Lot Screening

A. Applicability: Perimeter yard of all parking areas visible from the street. (except one and two family homes)

B. Minimum Planting: Semi-Opaque Screen from the ground to at least a height of three (3) feet for screening of car lights and glare. (Minimum width: 10 ft).

C. Performance Standard: This type functions as a semi-opaque screen around the parameter of a parking lot from the ground to at least three (3) feet for the screening of car lights and glare. This shall only be required along the parking area that fronts the public right-of-way or any side of a parking lot that is not protected by a Type A buffer yard. The location of such yards shall be determined by the Administrator upon review. Effective screening devices may include solid decorative brick walls, wood fences, earth berms, tight evergreen hedges which shall reach the required height within two (2) years of planting, or any combination of the above. Groundcover, exclusively, shall be planted in the sight triangle on each side of drives or streets.



Images depicting appropriate screening requirements of dumpsters (above) and loading areas (below) in accordance w/ Section 8.9.D.

D. Screening of Open Storage, Above Ground Utilities, and Dumpsters: Any open storage of merchandise, equipment, tractor trailers, materials or goods other than those on display for retail sales, above ground utilities and dumpster areas shall be screened from view from any street right-of-way in accordance with the ratios (but not necessarily the minimum dimension) prescribed for Type C Buffer Yards in Section 8.6.B.3, except for in the MI District where such areas shall be screened from view from any internal street right-of-way with a Type A Buffer yard as prescribed in Section 8.6.B.1.

8.10 Parking Lot Landscaping

A. Applicability: Interiors of all parking areas with more than 16 parking spaces.

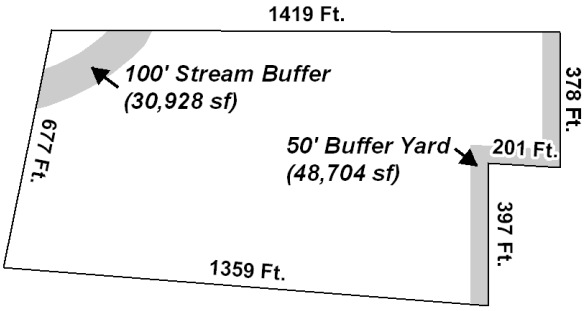
B. Minimum Plantings: No parking space shall be more than 60 ft from the base of a large shade tree. In addition, landscape areas shall be provided at the end of each parking row and shall contain a large shade tree.

C. Performance Standard: This type functions as a tree ceiling over a parking area providing shelter from sun and rain and minimizing the impact of runoff by providing "green" surface area on which to collect. Large maturing shade trees shall be planted in a manner that provides shade for the entire parking area at maturity. All landscaped areas shall be separated from parking spaces. The use of differing species around the parking area is encouraged to promote diversity in the overall urban tree canopy. The use of existing vegetation to satisfy this requirement is encouraged. Supplemental plantings may be required in addition to native materials.

8.11 Overall Tree Canopy

A. Applicability: To preserve and maintain appropriate undisturbed tree cover, and where needed, require the provision of replacement tree cover on development sites.

B. Tree Cover Area: All new development on lots or parcels over two (2) acres must meet the following tree cover requirement during the initial master plan process. A tree cover area equal to the perimeter of the development in feet multiplied by 20 shall be maintained on site up to a maximum tree cover area consisting of 10 percent of the entire site. Any required landscape buffer yards and vegetated stream buffer zones may be credited toward this requirement. In the event that the required tree cover area cannot be met with required landscape buffer yards and vegetated stream buffer zones, additional space must be set aside.



Example:
1,419+378+201+397+1,359+677 ft. = 4,431 ft. perimeter

4,431 ft. x 20 ft. = 88,620 square feet of tree cover area

88,620 ft. / 1,044,132 total square feet = **4.3% of total lot area** (< 10% maximum)

88,620 sf – 30,928 sf – 48,704 sf = **8,988** sf additional space required

In this additional space, preference is given to preserving existing trees rather than utilizing new plantings.

C. Performance Standards for Additional Space:

1. **Mature Forest:** *(100% of calculated additional space required)* If not directly adjacent to stream buffer zones or landscape buffer yards, each preserved tree cover area of mature forest must be at least 2,500 square feet with no dimension less than 50 feet wide. To qualify, the average tree canopy height must exceed 25 feet.

2. **Maturing Forest:** *(110% of calculated additional space needed)* If not directly adjacent to stream buffer zones or landscape buffer yards, each preserved tree cover area of maturing forest must be at least 2,500 square feet with no dimension less than 50 feet wide. To qualify, the average tree canopy height must exceed 12 feet.

3. **Re-planted Areas:** *(125% of calculated additional space needed)* If not directly adjacent to stream buffer zones or landscape buffer yards, each re-planted tree cover area must be at least 2,500 square feet with no dimension less than 50 feet wide. To qualify, trees must meet the standards for new plantings as found in Section 8.12(B), and the area must be vegetated with 3 native canopy trees and 5 native understory trees per 500 square feet.

8.12 General Installation and Maintenance Standards

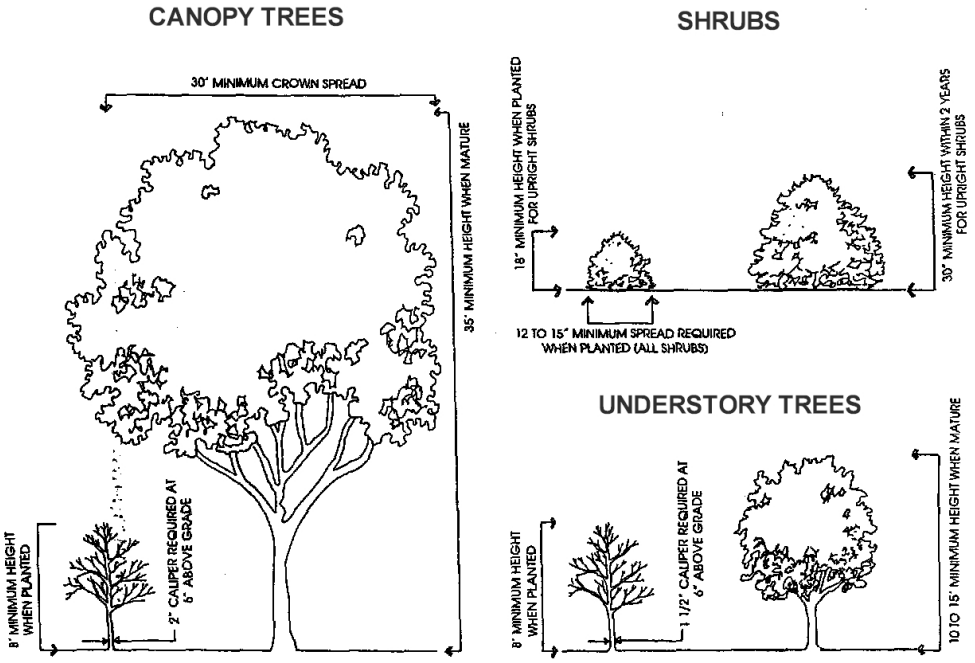
A. Plant Material Classifications:

1. **Canopy Trees:** Canopy trees must be a locally adapted species with an expected mature height of 35 feet or greater and an expected mature crown spread of at least 30 feet or greater. Canopy trees may be deciduous or evergreen. In the case of overhead power lines, relief from the canopy tree requirement, in accordance with Section 8.12.B.8, may be given by the Administrator.

2. **Understory Trees:** When mature, understory trees should be 10 to 15 feet or higher. Understory trees may be deciduous or evergreen.

3. **Shrubs:** All shrubs must have a minimum spread of 12 to 15 inches when planted. At least 80% of the required shrubs must be evergreen.

4. **Groundcover:** All required groundcover type plants must be a minimum of 1-1/2 to 2-1/2 inch pots with a four (4) inch minimum length. Groundcover must be planted with on-center spacing equivalent to the average mature spread for each particular species.



B. Standards for New Plantings

1. Landscaping should be of sufficient size so that mature appearance will be achieved within three to five years of installation.

2. Where new landscape materials are to be installed, the type of material used shall be complimentary to plant materials existing on the property and on adjoining properties. Use of native plant materials is encouraged.

3. The use of drought tolerant vegetation that is native to the area is encouraged, especially in parking lots, to reduce dependency upon irrigation.

4. All portions of the landscaping area not planted with shrubs and trees or covered by a wall or other screening device shall be planted with ground cover and/or grass, or covered with natural mulch with a minimum depth of two (2) inches.

5. All new plant material shall be of good quality, free from disease, installed in sound manner, mulched (3-4 inch layer) and meet the standards set forth in the American Standard for Nursery Stock by the American Association of Nurserymen. All new trees shall also be properly guyed and staked at the time of planting. Contractor shall warrant all new plant material for 1 year from time of installation. The selection of plants, planting methods, minimum height, root ball and container size, number of branches, and width, shall conform to the American Standard for Nursery Stock published by the American Association of Nurserymen for that type of tree or shrub at the time of installation.

6. Groves of trees are encouraged. Adequate drainage and mulching shall be provided for planting medians and islands. Each large shade tree shall be provided with a minimum pervious ground area of 300 square feet for root growth (exception: Street Trees) and should be planted on slopes not to exceed 1:4 horizontal to vertical distance. All tree installations shall be in accordance with Town of Knightdale Standard Specifications & Construction Details.

7. At installation, canopy trees shall not be less than eight (8) feet in height with a minimum two (2) inch caliper. Understory trees shall be a minimum of 1-1/4 inch caliper and have a minimum height of six (6) feet. Evergreen trees of any type shall not be less than six (6) feet in height with a minimum two (2) inch caliper. Multi-stemmed trees of any type shall have at least three (3) stalks and not be less than eight (8) feet in height. All caliper requirements are as measured six (6) inches above grade. Installation and construction practices shall be utilized which preserve and replace existing topsoil or amend the soil to reduce compaction.

8. Where canopy trees are required and overhead utility lines exist, understory trees planted one (1) per 20 linear feet shall be substituted with the approval of the Administrator.

9. All required shrubs at installation shall be at least three (3) gallons in container size and eighteen (18) inches above ground level and shall reach the height required for performance within two (2) years after installation. Installation and construction practices shall be utilized which preserve existing topsoil or amend the soil to reduce compaction.

10. No trees or shrubs shall be planted within the sight distance triangle at an intersection, or driveway access point**.** Groundcover is permissible.

11. Landscaped areas within parking lots shall be separated from parking spaces, driveways, and maneuvering areas by an eighteen (18) inch standard curb designed to minimize damage by vehicles to plants located in the landscaped area. For an area to be considered as satisfying the landscaping provision of this Ordinance, it must contain a minimum contiguous area of 300 square feet.

C. Preservation of Existing Vegetation During Construction

Existing vegetation shall be preserved in accordance with Section 8.3(N) and the Town of Knightdale *Standard Specifications and Details Manual.* To prevent unintended compaction of soil, storage of construction materials and equipment shall not be allowed outside areas identified as the limits of construction activity.

D. Irrigation

The use of irrigation is permitted in all required landscaping areas as required by this Chapter. The use of moisture metering devices and automatic timers is required. The use of xeriscape practices and drip irrigation is also encouraged, unless otherwise required.

1. The use of irrigation systems for lawn turf is generally discouraged but may be permitted if connected to a private well, other private water source, or public reclaimed water system.

2. If automatic irrigation systems are permitted, moisture sensor regulators, soil moisture regulators, or drip irrigation shall be used.

3. Irrigation systems may connect to the main water connection for the building and installed in accordance with the Town's Standards Specifications and Construction Details unless otherwise restricted through other Town ordinances or policies.

E. Installation Time and Permitted Delays

1. **Time Limit:** All landscaping, mulching and seeding, shall be completed in accordance with the approved site plan prior to issuance of a Certificate of Occupancy for the site.

2. **Requests for Delay:** Requests for a delay in complying with this Section due to poor weather or planting conditions will be considered following a written request directed to the Administrator. Certificates of Occupancy will be issued with the approval of a request for planting delay, if deemed reasonable. Such request for a delay shall note the timeframe during which the planting shall be completed. A bond shall be posted in accordance with Subpart 3 below. Failure to comply will result in penalties provided for in Section 8.9 and Section 18.3.

   a. Extensions may be granted due to unusual environmental conditions such as drought, ice, over saturated soil (deep mud), or inappropriate planting, provided that the developer or the property owner provide the Town with a surety bond ensuring the installation of the remaining landscape materials. In such cases, the Town may issue a Temporary Certificate of Occupancy for a period of 30 to 180 days, relative to the next planting season.

   b. Exceptions may be granted due to circumstances beyond the developer's or property owner's control, such as incomplete construction or utility work to occur in a proposed landscaped area within 30 days after expected site completion. Exceptions may be granted provided that the developer or property owner submits a letter from the utility company to the Town stating the estimated installation date, and provides a cash bond to ensure installation of the required landscaping. In such cases, the Town of Knightdale may issue a temporary Certificate of Occupancy for a period not to exceed 30 days.

3. **Bonds:** Any bond posted as surety for exceptions shall be accompanied by documentation of the estimated cost of the remaining landscaping and installation to be completed. This documentation may be a landscaping contractor's bid or contract, a nurseryman's bill, or a similar document. The amount of the bond shall be one and one-quarter (1.25) times the cost of the plant material yet to be installed, based on the highest estimate received. The Administrator is authorized to release part of any security posted as the improvements are completed and approved by the Town of Knightdale. Such funds shall be released within ten (10) days after planting has be completed and approved by the Administrator. Once the time has matured on the Temporary Certificate of Occupancy the Town of Knightdale has the authority to cash such bond in and complete the work.

F. Maintenance

1. **Maintenance Responsibility:** The owners of the property shall be responsible for the preservation and maintenance of all vegetation and physical features required by this Section in a healthy growing condition, for replacing them when necessary, and for keeping the area free of refuse and debris. All plant materials should be allowed to reach their mature size and maintained at their mature size. All required landscaped areas shall be free of refuse and debris in accordance with the site or subdivision and shall be maintained so as to prevent debris from washing onto streets and sidewalks.

2. **Inspection of Sites:** The Administrator may inspect the site once a year after the issuance of a permanent certificate of occupancy in order to ensure compliance with the approved site plan and to ensure that the landscape is properly maintained. The Administrator may issue a Notice of Violation to comply with the provisions of this ordinance if warranted upon an inspection under the provisions of Section 8.11 of this chapter.

   A Certificate of Occupancy shall not be issued unless the landscaping required under this Chapter is installed in accordance with these standards and in accordance with the approved site plan or subdivision plat.

3. **Replacement of disturbed and damaged vegetation**

   a. The disturbance of any landscaped area or vegetation required by this Chapter shall constitute a violation of the site or subdivision plan. All disturbed landscaped areas and vegetation shall be replanted to meet the standards of this Section as well as the approved site plan.

   b. Any dead, unhealthy, missing vegetation, or vegetation disfigured by severe pruning, shall be replaced with vegetation which conforms to the standards of this Section. In the event that any required vegetation is severely damaged due to an unusual weather occurrence or natural catastrophe, the owner shall have one growing season to replace or replant after reconstruction is complete.

   c. Where the vegetation that has been disturbed or damaged on the site at the time the development was approved, all replacement vegetation shall meet the standards set forth in this Chapter taking into account any unique site conditions and significant vegetation remaining within the landscaped area. Trees or vegetation that die within one year of construction completion shall be removed and replaced with new vegetation of equal or greater size.

   d. Existing vegetation required to be preserved that has been damaged or destroyed during the course of development activity may be subject to civil penalty and replaced in accordance with the requirements of Section 8.11 and Chapter 18 of this ordinance.

4. Steps for Replacement of Vegetation

Replacement consists of one or a combination of any of the following measures:

a. A replanting plan denoting the proposed installation shall be submitted to the Town of Knightdale for approval. The Administrator may elect to present the replanting plan to the Land Use Review Board for final approval.

b. Replace damaged or destroyed vegetation in both buffer yard and or interior landscaped areas with an equal amount of new vegetation according to the size of vegetation removed. Any tree with a caliper of at least 8 inches at DBH which is damaged or removed shall be replaced with one or more trees which have a caliper of at least two and one half inches and a cumulative caliper equal to or greater than the original tree. Trees damaged or destroyed less than 8 inches at DBH shall be replaced to satisfy the performance criteria of this Section. Understory plantings may also be required to restore the buffer performance criteria for the disturbed area. A re-vegetation plan denoting the proposed installation shall be submitted to the Town of Knightdale for approval. The Administrator may elect to present the re-vegetation plan to the Land Use Review Board. This requirement may be modified by the Administrator based upon site conditions.

c. For all other cases where existing vegetation is damaged or removed, the type and amount of replacement vegetation required shall be of the type and amount that is necessary to provide the type of landscaping required under this Section or interior preservation area identified on the landscape plan.

8.13 Emergencies

In the case of emergencies such as windstorms, ice storms, fire, or other disasters, the requirements of this Ordinance may be waived by the Town during the emergency period so that the requirements of this Ordinance will in no way hamper private or public work to restore order in the Town. This shall not be interpreted to be a general waiver of the intent of this Ordinance.

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