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BUFFERS, LANDSCAPING AND LIGHTING

Section 8.1 Purpose

The buffering, screening, landscaping, and tree preservation requirements of this chapter establish standards to preserve and enhance the natural environment and aesthetics of the Town; provide appropriate barriers and relief from traffic, noise, heat, glare, odor and the spread of dust; reduce the impacts of stormwater runoff and erosion; and encourage the preservation of native plant communities, interconnected natural open space, and ecosystems. Furthermore, the intent is to provide a visual screen between certain uses to minimize potential nuisances, reduce the visual impact of aspects of adjacent development, and provide an enhanced sense of privacy; and to establish procedures and standards for the administration and enforcement of these regulations.

Section 8.2 Applicability

All zoning districts and uses are subject to the requirements of this chapter. All new development or substantially modified existing development shall provide landscaping, screening, buffering, and preserve trees in accordance with the standards of this chapter. Where existing vegetation is insufficient to meet the prescribed requirements or additional new landscape material is used, such new landscaping shall consist of vegetation from the Tree Species List.

All new development and substantially modified development shall be required to provide a Landscaping Plan in accordance with the standards of this chapter. The minimum requirements of this chapter shall be installed and shall be maintained in perpetuity for all developments approved or substantially modified after the adoption date of this Code.

Construction standards for some landscaping criteria, including planting and protection standards of trees and shrubs, are located in the *Waxhaw Engineering Design and Construction Standards Manual*.

Buffers described in this chapter refer to planting/landscape buffers. Stream/riparian buffers are addressed in Chapter 9.

Section 8.3 General Requirements

All buffers, landscaped areas, and tree preservation areas shall be free of structures except for ordinary projections. Improvements such as driveways, sidewalks, and greenways are allowed in buffers, landscaped areas, and tree preservation areas. Certain accessory structures are permitted to be placed within required open space areas as provided for by this chapter.

Pedestrian, bicycle, and other alternative transportation and recreation facilities shown on plans adopted by the Town shall take precedent over the strict application of the provisions contained in this chapter.

The Zoning Administrator may waive or modify the requirements of this chapter where other buffers or open space satisfy the requirements of this chapter or based on extenuating circumstances such as underground utility locations, overhead utility line location, mechanical equipment, or where strict application of the provisions would be impractical or serve no useful purpose.

Section 8.4 Street and Front, Side and Rear Landscaping Yards

Trees and other plantings shall be provided within the public right-of-way and within required front, side, and rear setbacks in accordance with the following standards:

- A. Within Right-of-Way: One medium or large maturing tree, depending upon the planting strip size, selected from the Tree Species List, shall be provided in a continuous regular pattern, between 40 to 65 feet on center within the public street right-of-way in the designated planting strip and landscaped median adjacent to all new development in all zoning districts, where existing trees do not satisfy this requirement.
- B. Front Yard Area in EC, CC, NC, TC Districts: One medium to large maturing tree, selected from the Tree Species List, shall be provided within 25 feet of the back of sidewalk in a continuous regular pattern, between 40 to 65 feet on center for developments that are setback at least 10 feet from the street right-of-way. Trees placed in the landscaped front yard should be spaced in a manner that is complementary to the placement of street trees provided within the public right-of-way. Other plantings such as shrubs may be used to enhance the aesthetics of the streetscape area within landscaped front yards to provide visual and physical separation between developments and the adjacent roadway.
- C. Front, Side, Rear Yard Areas in Major Subdivisions, Cluster Developments, and for Developments Located within the National Register Historic District in the R-1, R-3, and R-4 Residential Districts: One medium to large maturing tree shall be provided within the required front yard. Two small, medium, or large maturing trees shall be provided within the required side or rear yards; one of which shall be of the medium to large maturing variety. Four shrubs shall be provided for each required yard tree and may be located anywhere on the parcel.
- D. Street trees shall be located no closer than 40 feet from any controlled intersection to avoid visual constraints of vehicular and pedestrian traffic.

- E. Street trees shall be located no closer than 20 feet from any streetlight unless approved by the Zoning Administrator.
- F. For street sections that do not provide a designed planting strip or a landscaped front yard in the MS, TC, and NC zoning districts, one small to medium maturing tree shall be provided in a tree well located within the public sidewalk according to the following standards:
 1. The street trees shall be located in a continuous regular pattern, between 40 to 65 feet on center, along the public sidewalk.
 2. The street trees shall be selected from the Tree Species List.
 3. Sidewalks shall be of sufficient width to include a continuous, ADA-compliant pedestrian path of five feet that includes no part of the tree well.
- G. Built elements such as fences and walls may be used to enhance the character of the streetscape for developments that provide a landscape front yard. These elements shall conform to Chapter 6 - *Design Standards*.
- H. Streetscape plantings should remain consistent for a minimum of one block face utilizing the same or similar tree species and other plantings and built elements that are consistent with the aesthetics of the development and area of town.
- I. Properties located along the Corridor Overlay District (Waxhaw-Marvin Road and portions of NC 16) shall also meet landscaping requirements found in Section 4.3.1 of this Code.

Section 8.5 Parking Lot Landscaping

Landscaping shall be included in off street parking areas to provide environmental and aesthetic benefits, including the reduction of urban heat island effects, stormwater runoff rates, and visual impact to surrounding land use; and an increase of natural habitat. Small to medium maturing trees shall be used and selected from the Tree Species List; in accordance with the following standards:

- A. All parking spaces shall be within 60 feet of a qualifying tree (as defined in Chapter 13), as measured from the tree trunk to the nearest portion of the parking space.
- B. Trees and shrubs shall be placed within off street parking areas. Parking lot tree islands shall be located within the parking lot paved/curbed area. Perimeter parking lot tree islands that protrude into the edges or the corners of the lot may be used for qualifying trees if the protruding area is equal to at least two parking spaces.
- C. Within the parking lot boundary, landscape areas shall contain a minimum of 140 square feet of planting area per tree, or the area of one standard parking space per tree.

- D. Landscaping medians shall contain a minimum of 75 square feet of planting area per tree and be equal in size to a standard parking space (9'x18') for each tree.
- E. Parking lot trees shall be located no closer than 20 feet to a pole light.
- F. All tree islands shall exclude pole lighting fixtures over 4 feet in height.
- G. Additionally, one tree and 10 shrubs shall be planted an average of every 50 feet, evenly distributed, or clustered in a manner that does not permit excessively wide gaps, along the perimeter of off street parking areas that do not abut a building or public street.

Parking garages shall be excused from the Parking Lot Landscaping requirements contained in this section but shall comply with the provisions of this chapter pertaining to street and front yard landscaping, buffering, and screening.

Section 8.6 Residential Perimeter Tree Buffer

Developments containing a total of 25 or more residential units in all phases in the R-1, R-3, and R-4 districts shall provide a 25 foot perimeter landscape buffer in accordance with the following standards:

- A. The 25 foot landscape buffer shall be placed along the exterior perimeter of the entire development including those that front existing public streets.
- B. The landscape buffer shall, at a minimum, consist of trees placed every 20 to 30 feet on center and 10 shrubs per tree evenly spaced or clustered throughout the buffer.
- C. Landscaped berms may be used along public street frontages to provide additional screening to the standards in this section. Berms shall be a minimum 6 feet in height.
- D. Existing vegetation may be used to fulfill the buffer requirements and existing trees are encouraged to be preserved within the perimeter buffer area.
- E. The landscape buffer shall be held in common ownership outside of deeded lots unless a homeowners' association does not exist for the development. In such cases, the buffer may be placed on individual deeded lots but shall be placed in a permanent conservation easement as described in Section 8.12.

Section 8.7 Buffering of Non-Residential Uses

Landscape buffers shall be provided between certain zoning districts in order to reduce the potential disturbances that arise from differing land uses and the activities that occur in adjoining zoning districts. All trees provided in required buffer areas shall be selected from the Tree Species List and all shrubs shall be aesthetically compatible with the tree species provided. Buffer areas shall remain undisturbed after they are installed and shall be maintained to retain their functionality and aesthetic appeal. Buildings or structures other than ordinary projections shall not be placed within required buffers.

Buffer areas may be contained within required building setbacks to the extent possible. In instances where the required buffer width exceeds that of the required setback distance, the buffer requirement shall be satisfied by the minimum setback requirement.

Existing vegetation may be used to fulfill the buffer requirements and existing trees are encouraged to be preserved within buffer areas. Whenever possible, buffer areas should adjoin other open space in order to form contiguous, connected ecological corridors linking natural environments together.

Buffers shall be provided in accordance with the following chart. Each buffer class is described below.

		BUFFER TYPE BY ABUTTING DISTRICT							
DISTRICTS		R-1	R-3	R-4	NC	MS	TC	CC	EC
DISTRICT IN WHICH BUFFERS ARE REQUIRED	MS	*	*	*	*	*	*	*	*
	NC	A	A	A	*	*	*	*	*
	TC	B	B	A	*	*	*	*	*
	CC	C	C	B	B	*	*	*	B
	EC	D	D	D	D	*	B	B	*

*Indicates no buffer required.

Section 8.7.1 Class A Buffer

The *Class A* buffer is the least restrictive buffer category and is intended for use between zoning districts that have only a minor possibility of incompatibility and slight disturbances. A *Class A* buffer shall, at a minimum, consist of the following:

- A. An opaque fence or wall that is a minimum of 6 feet in height along the entire length of the boundary between two applicable adjoining zoning districts; or
- B. A landscaped area a minimum of 10 feet in width consisting of densely planted trees a minimum of 6 feet in height at maturity and shrubs along the entire length of the boundary between two applicable adjoining zoning districts.
 1. Buffer trees shall be planted at a minimum interval of 25 feet plus or minus 5 feet linearly on center.
 2. Shrubs shall be provided at a minimum of 3 shrubs per tree evenly distributed or clustered within the buffer in a manner that does not permit excessively wide gaps.

Section 8.7.2 Class B Buffer

The *Class B* buffer is a medium intensity buffer category intended for use between zoning districts that may have moderate levels of incompatibility leading to disturbances to one or both abutting land uses. A *Class B* buffer shall, at a minimum, consist of the following:

- A. An opaque fence or wall a minimum of 6 feet in height and a 10 foot wide landscaped area or berm along the entire length of the boundary between two applicable adjoining zoning districts.

1. Buffer trees shall be planted at a minimum interval of 40 to 65 feet on center
 2. Shrubs shall be provided at a minimum of 5 shrubs per tree, evenly distributed or clustered within the buffer in a manner that does not permit excessively wide gaps; or
- B. A landscaped area a minimum of 20 feet in width consisting of densely planted trees a minimum of 6 feet in height at maturity and shrubs along the entire length of the boundary between two applicable adjoining zoning districts.
1. Buffer trees shall be planted at a minimum interval of 20 to 30 feet on center.
 2. Shrubs shall be provided at a minimum of 7 shrubs per tree, evenly distributed or clustered within the buffer in a manner that does not permit excessively wide gaps.

Section 8.7.3 Class C Buffer

The *Class C* buffer is the second medium intensity buffer category and is intended for use between two adjacent zoning districts that may have moderate levels of incompatibility. A *Class C* buffer shall, at a minimum, consist of the following:

- A. An opaque fence or wall a minimum of 6 feet in height and a 30 foot landscaped area along the entire length of the boundary between two applicable adjoining zoning districts.
1. Buffer trees shall be planted at a minimum interval of 20 to 30 feet on center
 2. Shrubs shall be provided at a rate of 9 shrubs per tree and evenly distributed or clustered within the buffer in a manner that does not permit excessively wide gaps; or
- B. A landscaped area or berm a minimum of 40 feet in width consisting of densely planted trees a minimum of 6 feet in height at maturity and shrubs along the entire length of the boundary between two applicable adjoining zoning districts.
1. Buffer trees shall be planted at a minimum interval of 15 to 25 feet on center.
 2. Shrubs shall be provided at a rate of 11 per tree and evenly distributed or clustered along the length and width of the buffer in a manner that does not permit excessively wide gaps.

Section 8.7.4 Class D Buffer

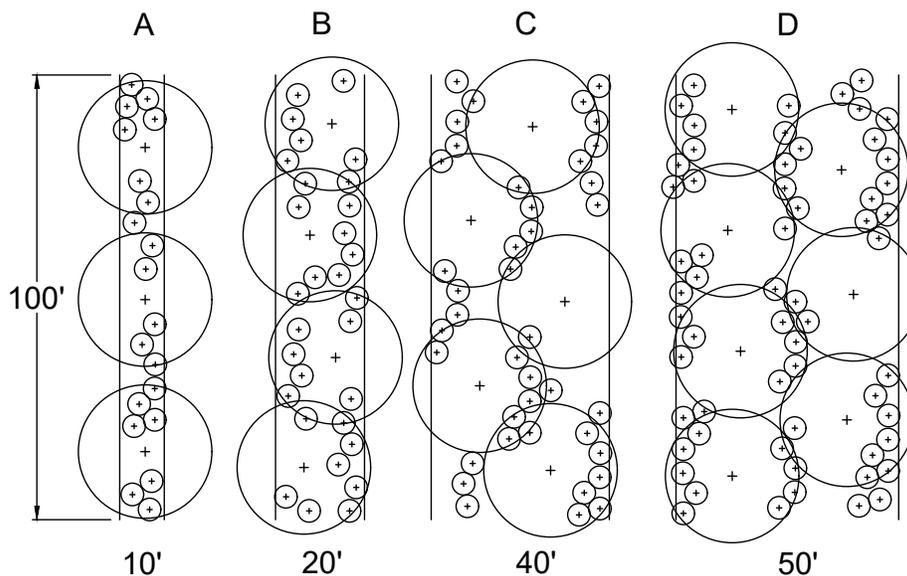
The *Class D* buffer is the most intense buffer category and is intended for use between two adjacent zoning districts that are generally regarded as incompatible. A *Class D* buffer, at a minimum, consist of the following:

- A. An opaque fence or wall a minimum of 6 feet in height and a 40 foot landscaped area along the entire length of the boundary between two applicable adjoining zoning districts.
1. Buffer trees shall be planted at a minimum interval of 15 to 25 feet on center.

2. Shrubs shall be provided at a rate of 13 shrubs per tree and evenly distributed or clustered within the buffer in a manner that does not permit excessively wide gaps; or
- B. A landscaped area or berm a minimum of 50 feet in width consisting of densely planted trees a minimum of 6 feet in height at maturity and shrubs along the entire length of the boundary between two applicable adjoining zoning districts.
1. Buffer trees shall be planted at a minimum interval of 10 to 20 feet on center.
 2. Shrubs shall be provided at a rate of 15 per tree and evenly distributed or clustered within the buffer in a manner that does not permit excessively wide gaps.

BUFFER MINIMUM REQUIREMENTS				
CLASS	A	B	C	D
WIDTH*	10' / 0	20' / 10'	40' / 30'	50' / 40'
TREES per 100 LF*	3 / 0	4 / 3	5 / 4	7 / 5
SHRUBS 100 LF*	20 / 0	30 / 20	40 / 30	60 / 40
INTENSITY	least	moderate		most

* without fence or wall / *with fence or wall*



Buffer Class Illustrations

Sample planting arrangements are shown in a loose, informal style as an example. Formal planting arrangements are also permitted.

Section 8.8 Screening

To enhance the aesthetic appeal of the Town and reduce visual disturbances to adjoining public rights-of-way, public spaces, and neighboring properties, certain site elements shall be screened from public view and from adjoining private property. These elements include, but are not limited to, the following:

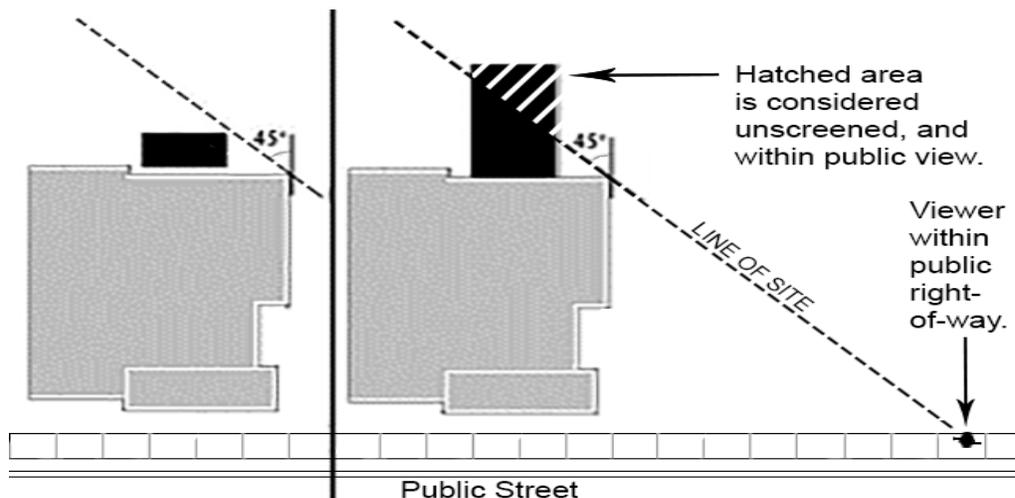
- A. Dumpsters and solid waste handling areas
- B. Service entrances and loading docks

- C. Unenclosed storage areas
- D. Mechanical equipment, utility structures, and security fencing
- E. Off-street parking areas
- F. Flood and security lighting

Section 8.8.1 Screening Standards

Screening shall be provided for each of the above site elements in accordance with the following standards:

- A. All dumpsters, solid waste handling facilities, service entrances, loading docks, and unenclosed storage areas shall be completely screened by an opaque fence or wall or dense evergreen planting that will completely conceal the area from view at maturity. A device is considered out of view of the public street if it is within the 45 degree angles projected from the building edges (see diagram).
- B. Mechanical equipment, utility structures, and security fencing shall be screened from public view and view from neighboring properties to the extent possible while still allowing for access to such devices for regular service. Screening may be accomplished by an opaque fence or wall or with evergreen plantings that will grow to fully conceal the device at maturity.
- C. Off-street parking areas visible from public rights-of-way shall be screened by a fence, wall, or evergreen plantings or a combination thereof, a minimum of 3 feet in height that effectively block the illumination of automobile headlights onto the public right-of-way. Such screens must be located outside of the public rights-of-way and shall not interfere with sight triangles.
- D. Screening of additional site features not specifically mentioned in this subsection, waivers to required screening, and additional screening methods such as berms, increased buffer widths, landscaping and tree preservations areas, etc. shall be at the discretion of the Zoning Administrator.



Section 8.9 Open Space

Open space shall be provided in order to preserve natural habitats for plants and wildlife, provide recreation space, and reduce the adverse impacts of development on the Town. The types and rate of open space shall be provided in accordance with the following standards:

- A. Developments five acres or greater in the CC and EC districts, shall dedicate a minimum of 10 percent of the interior site area as publicly accessible recreation space.
- B. Developments two acres or greater in the NC, MS, and TC districts shall dedicate a minimum of two percent of the interior site area as publicly accessible recreation space.
- C. Developments containing a total of 25 or more residential units in all phases in the R-1, R-3, and R-4 districts shall dedicate a minimum of 15 percent of the interior site area as publicly accessible recreation space.
- D. Developments can dedicate 20 percent or more area to open space to qualify for the Cluster Development requirements found in Section 5.8 of this Code.
- E. Publicly accessible recreation space may take the form of trails, parks, plazas, playgrounds, or community gardens. Such recreation space should be a focal point of the development and be centrally located so as to serve residents in the area of the development and the general public.
 - 1. The shape and dimensions of the land used for recreation space shall be deemed usable, with moderate topography and shall not be located in environmentally sensitive areas such as FEMA flood areas or wetlands or within utility rights-of-way or easements.
 - 2. Amenities shall be provided for active and passive recreation space such as seating, trash receptacles, water fountains, playgrounds, sports fields/courts, etc. in order to be deemed publicly accessible recreation space.
- F. All open space shall conform to the ownership and maintenance requirements of Section 8.12.
- G. Additional tree preservation shall be designated as open space to meet the minimum requirement. Tree preservation areas shall meet the standards of Section 8.10.
- H. Payment in-lieu of required open space may be made at the discretion of the Waxhaw Board of Commissioners in cases where the application of the open space requirements would not have a significant public benefit due to the location of the development site or unique site conditions.

Section 8.10 Tree Preservation

Tree canopy shall be preserved in order to stabilize soil, control water pollution by preventing soil erosion and reducing flooding, reduce air pollution, mitigate the urban heat island effect, reduce noise pollution, provide natural habitat for wildlife, and contribute to the unique aesthetic value of the Town. The amount of tree canopy on a proposed development's site shall be calculated prior to commencement of land disturbing activities. Tree preservation shall be provided according to the following standards.

- A. Development sites in the R-1, R-3, and R-4 districts that are calculated to be covered by 40 percent or more tree canopy area prior to development shall preserve a minimum of 30 percent of their Interior Site Area in contiguous tree preservation areas.
- B. Development sites in the CC, and EC districts that are calculated to be covered by 40 percent or more tree canopy area prior to development shall preserve a minimum of 20 percent of their Interior Site Area in contiguous tree preservation areas.
- C. Development sites in the R-1, R-3, R-4, CC, and EC districts that are calculated to be covered in less than 40 percent of tree canopy area prior to development shall preserve a minimum of 15 percent of their Interior Site Area in contiguous tree preservation areas.
- D. The baseline canopy measurements on a proposed development site shall be provided by the property owner or applicant and submitted as part of a landscape plan. The percent canopy cover may be calculated using the latest available aerial photographs and verified, if necessary, by ground measurement. The method of canopy calculation must be approved by the Union County Urban Forester.
- E. If the tree save requirement does not meet the required percentage of the total site area, additional trees must be planted. Trees planted in buffer yards and as street trees shall count towards meeting the required planting rate. Trees planted shall be a minimum of two inches in caliper and shall be 75% medium to large maturing.
- F. Where circumstances prevent locating the required tree plantings or preservation standards on site, the developer may mitigate protected tree canopy removal by planting new trees on the site whose canopy equals that of the canopy to be removed.
- G. Areas that are designated as existing rights-of-way, easements or other utility facilities and existing ponds, lakes, or streams shall be subtracted from the total property area before the tree preservation requirements are calculated.
- H. If root disturbance or construction activities occur within the drip line of any tree designated as protected, only the area that is not affected by construction activities shall be included in the calculated tree preservation areas.
- I. Tree preservation areas shall be no less than 2,500 square feet in area, no less than 10 feet in width, and contain not less than one tree. Where existing trees are insufficient to meet this standard, new trees shall be planted in order to meet this minimum requirement.

- J. Tree preservation areas shall not be located on any deeded lot.
- K. Portions of development sites that are designated as tree preservation areas shall be protected during construction and shall remain undisturbed in perpetuity. The property owner or applicant shall be responsible for the erection of any and all barriers necessary to protect any existing or installed trees from damage both during and after construction. These tree protection zones shall be clearly labeled on development plans and subject to inspection by Town officials.
- L. Where removal of existing trees is approved within tree preservation areas, new trees shall be installed in the general vicinity of the trees removed. The replacement trees shall be selected from the Tree Species List and shall cover the same or greater canopy area at time of maturity.
 - 1. A payment in lieu of tree replacement may be allowed, subject to approval by the Zoning Administrator in cases where site area is insufficient or it is otherwise impractical to replant trees on site.
 - 2. The payment shall be based on the total replacement cost of the trees. The applicant is responsible for providing price quotes and such quotes shall be certified by a North Carolina registered forester, registered Landscape Architect, or an ISA certified arborist.

Section 8.11 Heritage Trees

Trees that are 36" or larger as measured by their diameter at breast height (DBH) shall be considered heritage trees due to their extraordinary size, aesthetic and historic value to the Town. These trees shall be preserved according to the following standards:

- A. Heritage trees shall be preserved on all publicly owned or maintained property, and all privately owned land wherever feasible.
- B. Heritage trees shall be shown as a part of the landscape plan requirement. Identification of specific locations of all heritage trees shall be provided.
- C. For every heritage tree preserved in new developments, credit shall be applied toward the reduction of required Open Space at a rate of 5,000 square feet per tree on developments less than 10 acres, or 1% of required Open Space per tree on developments greater than 10 acres. Reduction of other development standards may be considered by the Zoning Administrator.
- D. The Zoning Administrator may waive or modify setback and other site dimensional and development standards in order to accommodate the preservation of Heritage trees.

Section 8.12 Maintenance and Ownership

Buffers and Open Space may be held in common ownership, in a permanent conversation easement, dedicated to the Town of Waxhaw, or to a regional conservation organization according to the following standards:

- A. Buffers and Open Space shall be held in common ownership outside of deeded lots by a homeowners association (HOA) or other property management association.
- B. Buffers and Open Space may be placed in permanent conversation easements as an alternative to common ownership.
- C. Buffers and Open Space may be dedicated to the Town of Waxhaw if they are found, by the Waxhaw Board of Commissioners, to have qualities that are valuable to the Town as a whole and in the public interest.

It shall be the responsibility of the property owner to maintain buffers, open space, street and yard landscaping, screening, etc. in good condition. All site elements described in this chapter shall be maintained in perpetuity.

- D. Any planted material that becomes damaged or diseased or dies shall be replaced by the owner within 60 days of the discovery of such condition. If the Zoning Administrator determines there are seasonal conditions that will not permit the timely replacement of the vegetation (e.g. too hot or too cold for successful replanting), the Zoning Administrator may modify the requirement until a time certain when the replanting would be successful.

Section 8.13 Forestry Activities

Forestry activities are regulated by NC GS 160D-921.

Section 8.14 Tree Species List

A list of approved trees for planting is provided to increase the likelihood of survival and reduce maintenance requirements. All trees used should be generally adapted to the normal climatic and environmental conditions of the Waxhaw area. The list is not intended as a comprehensive survey, but as a guide to plant selection for landscape plans.

All trees classified as Large or Medium maturing size shall require a minimum planting strip width of seven feet unless otherwise noted. Small maturing street trees shall require a minimum of four feet in width, unless otherwise noted or approved by the Zoning Administrator.

Typical growth rate for each plant is provided in the Tree Species List in a simplified format of Slow (S), Medium (M) and Fast (F).

Trees are classified as native to Union County (N), native to NC (NC) or Exotic (E).

LARGE MATURING - DECIDUOUS - 50 FEET OR TALLER

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Baldcypress	<i>Taxodium distichum</i>	70	25	Unique, stately tree, tolerates wet areas, may produce "knees" in wet soils.	M	NC
Beech, American	<i>Fagus grandifolia</i>	70	50	Needs space and good soils, stately tree, holds some leaves through winter.	S to M	N
Birch, River	<i>Betula nigra</i>	50	35	Chose drought resistant variety, prone to insect problems, avoid mass plantings.	M to F	N
Dawn Redwood	<i>Metasequoia glyptostroboides</i>	70	30	Underused tree, upright form, good screening.	F	E
Elm, Lacebark	<i>Ulmus parvifolia</i>	50	40	Upright and spreading, good disease resistance, interesting bark, cultivars.	M to F	E
Ginkgo	<i>Ginkgo biloba</i>	65	30	Tough tree, irregular form, best as specimen tree. Plant only males (rancid fruit).	S	E
Hackberry, Common	<i>Celtis occidentalis</i>	60	50	Large root system, underused tree.	M to F	NC
Hackberry, Sugarberry	<i>Celtis laevigata</i>	70	60	Large root system, more disease resistant.	M to F	N
Hickory, Bitternut	<i>Carya cordiformis</i>	60	40	Large nut, difficult to transplant, great tree.	F to M	NC
Hickory, Mockernut	<i>Carya tomentosa</i>	60	40	Large nut, difficult to transplant, great tree.	M	N
Hickory, Pignut	<i>Carya glabra</i>	60	35	Large nut, difficult to transplant, great tree.	M	N
Hickory, Shagbark	<i>Carya ovata</i>	60	40	Large nut, difficult to transplant, great tree.	S to M	N
Hornbeam, European	<i>Carpinus betulus</i>	50	35	Fine tree for urban uses, numerous cultivars for size and shape.	M to S	E
Kentucky Coffee-tree	<i>Gymnocladus dioicus</i>	60	40	Interesting spring color, tough, underused tree, may present litter problem.	M	NC
Magnolia, Cucumbertree	<i>Magnolia acuminata</i>	60	40	Needs space, beautiful natural area tree, profuse blooms, many cultivars.	M to F	NC
Maple, Red	<i>Acer rubrum</i>	50	40	Many cultivars for shape, disease resistance and fall color.	M to F	N
Maple, Sugar	<i>Acer saccharum</i>	60	30	Prefers partial shade, choose cultivar "Legacy" or 'Summer Proof' for heat, find disease resistant cultivars.	S to M	N

LARGE MATURING - DECIDUOUS - 50 FEET OR TALLER

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Oak Scarlet	<i>Quercus coccinea</i>	70	50	Tough and adaptable, good fall color.	S to M	N
Oak, Black	<i>Quercus velutina</i>	60	45	Tough, good form.	S	N
Oak, English	<i>Quercus robur</i>	60	50	Numerous cultivars for shape and size.	M	E
Oak, Live	<i>Quercus virginiana</i>	40	50	Short, needs wide spaces, stately tree.	M to S	NC
Oak, Nuttall	<i>Quercus nuttallii</i>	50	50	Very adaptable, colorful most of the year, some litter in fall.	M	E
Oak, Overcup	<i>Quercus lyrata</i>	50	40	More confined canopy, oval form.	M	N
Oak, Pin	<i>Quercus palustris</i>	60	40	Compact crown, great fall color, avoid high pH.	M to F	E
Oak, Post	<i>Quercus stellata</i>	45	40	Smaller crown, tough tree, unusual form, not widely available.	S	N
Oak, Shumard	<i>Quercus shumardii</i>	50	40	Pyramida-spreading at maturity, tough, good fall color.	M	N
Oak, Southern Red	<i>Quercus falcata</i>	65	50	Large shade tree, good structure, some litter in fall.	M	N
Oak, Swamp White	<i>Quercus bicolor</i>	50	40	Tough tree, white underside leaf interest, tolerates wet and dry soils, likes acidic soils.	M	NC
Oak, White	<i>Quercus alba</i>	65	60	Monarch tree, needs space, great form, some litter in fall.	M to S	N
Oak, Willow	<i>Quercus phellos</i>	65	60	Needs space, overused urban tree, prone to trunk rot.	M	N
Poplar Tulip; Yellow Poplar	<i>Liriodendron tulipifera</i>	70	40	Need space and good soil, weaker wood, plant at least 40' from structures or parking.	F	N
Sycamore; Planetree	<i>Platanus occidentalis</i>	80	50	Beautiful exfoliating bark, litter issues (fruit and leaves), may not tolerate dry sites with poor soils.	F	N
Tupeo; Blackgum	<i>Nyssa sylvatica</i>	50	30	Great fall color, shows some color all year, tough urban tree, UNDERUSED. 'Wildfire' cultivar works well in our area.	M	N
Zelkova, Japanese	<i>Zelkova serrata</i>	50	40	Tough urban tree, upright habits, many cultivars.	M to F	E

LARGE MATURING - EVERGREEN - 50 FEET OR TALLER

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Cedar, Atlas	<i>Cedrus atlantica</i>	50	30	Pyramidal in youth, spreading later, beautiful tree, cultivars.	M to S	E
Cedar, Deodar	<i>Cedrus deodara</i>	50	40	Graceful tree, needs space, numerous cultivars for color and size.	M to S	E
Cypress, Leyland	<i>Xcupressocyparis leylandii</i>	50	20	OVERUSED, prone to disease and pest, not long lived in most cases, choose varieties carefully, no mass plantings.	F	E
Hemlock, Carolina	<i>Tsuga caroliniana</i>	55	40	Needs improved soils, not very drought tolerant.	S	NC
Hinoki Falsecypress	<i>Chamaecyparis obtusa</i>	50	20	Beautiful tree, red bark, cultivars for size.	M	E
Incensecedar, California	<i>Calocedrus decurrens</i>	45	10	Tolerant of heat, great screen or specimen tree. Minimum 4' planting strips allowable.	S to M	E
Japanese Cedar	<i>Cryptomeria japonica</i>	50	20	Possible replacement for Leyland cypress, few disease problems. 'Yoshino' cultivar does not bronze in winter.	F	E
Magnolia, Southern	<i>Magnolia grandiflora</i>	60	40	Needs space, great screen, numerous cultivars for size and bloom.	S to M	NC
Norway Spruce	<i>Picea abies</i>	50	25	Locate selectively, may not tolerate heat or full sun without irrigation, needs root space.	M to F	E
Pine, Loblolly	<i>Pinus taeda</i>	70	40	Long-needle pine, may break during ice storms.	M	N
Pine, Longleaf	<i>Pinus palustris</i>	80	35	Long lustrous needles, strong wood, grows best in sandy soils.	S	NC
Pine, Shortleaf	<i>Pinus echinata</i>	60	30	Darker coloration, shorter needles than loblolly.	S to M	N
Sawara Falsecypress	<i>Chamaecyparis pisifera</i>	50	20	Upright, loose, cultivars.	M	E

MEDIUM MATURING TREES - DECIDUOUS - HEIGHT 30FT - 50FT

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Carolina Silverbell	<i>Halesia tetraptera</i>	30	25	Beautiful flower, wonderful small tree, low branching, tolerates shade.	M	NC
Cherry, Japanese	<i>Prunus serrulata</i>	40	40	Many varieties, sizes and colors, prone to disease, use sparingly	M	E
Cherry, 'Kwanzan'	<i>Prunus serrulata</i> 'Kwanzan'	20	20	Superior heat tolerance to Yoshino Cherry.	M	E
Cherry, Yoshino	<i>Prunus</i> × <i>yedoensis</i>	35	40	Does not tolerate heat well in southern NC., prone to disease, use cautiously.	F	E
Dogwood, Flowering	<i>Cornus florida</i>	35	25	Low stress tolerance, not suited for full sun, needs good soils, many cultivars for color and disease resistance	S	N
Dogwood, Kousa	<i>Cornus kousa</i>	30	20	Not as showy as Flowering Dogwood (flowers after leaf) but more tolerant of urban stress and heat. Numerous cultivars.	S	E
Honeylocust, Thornless	<i>Gleditsia triacanthos</i>	40	30	Delicate compound leaf, some problems with disease and insects, many cultivars for size and shape, requires good soils.	F	E
Hophornbeam, American	<i>Ostrya virginiana</i>	35	20	Beautiful bark, interesting structure, tough.	S	N
Hornbeam, American	<i>Carpinus caroliniana</i>	25	25	Tough tree, looks like beech, muscular trunk	S	N
Hornbeam, European	<i>Carpinus betulus</i>	50	35	Fine tree for urban uses, numerous cultivars for smaller size and shape.	M to S	E
Lacebark Elm	<i>Ulmus parvifolia</i>	40	30	Tough urban tree, tolerates stress, some cultivars.	F	E
Maple, Hedge	<i>Acer campestre</i>	30	25	Good fall color, more compact size.	S	E
Maple, Red	<i>Acer rubrum</i> (various cultivars)	40	30	Choose cultivars for size, shape, resistance and fall color	M to F	N
Maple, 'Sunset'	<i>Acer truncatum</i> × <i>platanooides</i>	30	25	Several cultivars, stress tolerant	M	E
Maple, Trident	<i>Acer buergerianum</i>	35	30	Tough, small tree, good for urban sites, fall color.	S to M	E
Oak, English	<i>Quercus robur</i>	60	50	Numerous cultivars for shape and size.	M	E

MEDIUM MATURING TREES - DECIDUOUS - HEIGHT 30FT - 50FT

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Oak, Post	<i>Quercus stellata</i>	45	40	Smaller crown, tough tree, unusual form, not widely available.	S	N
Red Horsechestnut	<i>Aesculus x carnea</i>	50	40	Profuse flowers, some litter with nuts, tough, excellent border tree.	M	E
Redbud, Eastern	<i>Cercis canadensis</i>	30	30	Great flower show, numerous varieties and cultivars for size, flower and color.	M to F	N
Sourwood	<i>Oxydendrum arboreum</i>	30	20	All season color, some insect pests.	S	N
Turkish Filbert	<i>Carylus colurna</i>	40	20	Excellent urban tree, formal habit, heat tolerant.	F	E

MEDIUM MATURING TREES - EVERGREEN - HEIGHT 30FT - 50FT

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
American Holly	<i>Ilex opaca</i>	45	20	Various cultivars.	M	N
Arborvitae, Eastern	<i>Thuja occidentalis</i>	40	15	More disease and insect problems than <i>T. plicata</i> , many cultivars.	M to F	NC
Arborvitae, Giant	<i>Thuja plicata</i>	50	20	Great conifer for screens, bagworms, various cultivars for size and color.	M	E
Atlantic Whitecedar	<i>Chamaecyparis thyoides</i>	40	20	Beautiful tree, may be hard to find, numerous cultivars for color and size.	M to F	NC
Cedar, Eastern Red	<i>Juniperus virginiana</i>	40	20	Tough, compact, columnar, substitute for Leyland Cypress, many cultivars.	M to S	N
Cypress, Arizona	<i>Cupressus arizonica</i>	40	20	Great Tree, tough, replacement for Leyland Cypress, many cultivars.	M	E
Fosteri Holly	<i>Ilex attenuata</i>	30	15	Many cultivars for size.	M	E
Hemlock, Carolina	<i>Tsuga caroliniana</i>	50	40	Needs improved soils, low drought tolerance.	S	NC
Japanese Cedar	<i>Cryptomeria japonica</i>	50	20	Substitute for Leyland cypress, few disease problems. 'Yoshino' cultivar does not bronze in winter.	F	E
Magnolia, Southern	<i>Magnolia grandiflora</i>	60	40	Needs space, great screen, numerous cultivars for size and bloom.	S to M	NC
Magnolia, Sweetbay	<i>Magnolia virginiana</i>	35	20	Beautiful semi-evergreen Magnolia, tolerates wet soils, cultivars.	M to F	NC
Southern Red Cedar	<i>Juniperus silicola</i>	30	15	Like Eastern Redcedar, smaller, tougher.	S	NC

SMALL MATURING TREES - DECIDUOUS - HEIGHT 10FT - 30FT

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Cherry, apricot, plum, etc.	<i>Prunus spp.</i>	varies	varies	Wide variety in flower color, size and shape; short lived due to disease and insect problems, use sparingly. Select for height and space requirements.	S to M	varies
Cherry, Japanese 'Kwanzan'	<i>Prunus serrulata</i> 'Kwanzan'	20	20	Excellent spring color and interesting bark. More heat tolerant the 'Yoshino' cultivar.	M	E
Crabapple, Flowering	<i>Malus spp.</i>	20	20	Short lived, profuse flowers, select disease and insect resistant cultivars, use sparingly. Fruit may be nuisance.	M	NC
Crape myrtle, (Crepe myrtle) common	<i>Lagerstroemia indica</i>	20	10	Overplanted, overpruned, tough, beautiful small blooms and exfoliating bark, endless cultivars for size and flower color.	M to F	E
Crape myrtle, Japanese	<i>Lagerstroemia fauriei</i>	25	12	Cultivars: Fantasy, Kiowa, Townhouse.	M to F	E
Crape myrtle, 'Natchez'	<i>Lagerstroemia (indica x fauriei)</i> 'Natchez'	30	35	Cinnamon bark. cross between <i>N. indica</i> and <i>N. fauriei</i>	M to F	E
Dogwood, Cornelian cherry	<i>Cornus mas</i>	20	25	Showy, tougher than <i>C. florida</i> , many cultivars for color and flower size.	M	E
Dogwood, Flowering	<i>Cornus florida</i>	20	30	White flowers in spring, red fruit and burgandy leaves. Best against ever-green background. Many cultivars for specific height, width, color and form.	S to M	N
Dogwood, Kousa	<i>Cornus kousa</i>	30	20	Resistant to anthracnose. Prolific blooms (after leaf) last longer than <i>C. florida</i> . Many cultivars.	S	E
Fringetree, American; Old Man's Beard	<i>Chionanthus virginicus</i>	20	20	Beautiful small tree, shrubby look, drought tolerant fragrant flowers.	S to M	N
Fringetree, Chinese	<i>Chionanthus retusus</i>	15	20	Spreading shape with abundant white blooms. Drought tolerant. Prune to tree form.	S	E
Hawthorn	<i>Crataegus spp.</i>	20	20	Sharp thorns, red berries, late spring bloom.		varies
Hawthorn, Cockspur	<i>Crataegus crusgalli</i>	25	25	Dense shade. White flowers in May. Red berries. Sharp thorns.	S to M	N

SMALL MATURING TREES - DECIDUOUS - HEIGHT 10FT - 30FT

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Hawthorn, Washington	<i>Crataegus phaenopyrum</i>	25	25	Heat tolerant, deciduous, fall color, native, wildlife, thorns, disease prone.	F	N
Hophornbeam, Ironwood	<i>Ostrya virginiana</i>	25	25	Good street tree. Sculptural trunk, blue-grey and smooth with muscular structure. Very dense wood.	S	N
Hornbeam, American; Musclemwood	<i>Carpinus caroliniana</i>	25	25	Tough tree, looks like Beech, muscular trunk. Good street tree.	S	N
Magnolia, Saucer	<i>Magnolia x soulangiana</i>	20	20	Select cultivar for height requirements. Prune to tree form.	M	E
Maple, Purpleblow "Norwegian Sunset"	<i>Acer truncatum x platanoides</i>	25	25	Several cultivars, stress & heat tolerant.	M	E
Maple, Amur	<i>Acer ginnala</i>	20	20	White fragrant flowers in spring. Easy to transplant, relatively pest free. Dense shade, prune to tree form.	S	E
Maple, Chalk	<i>Acer leucoderme</i>	30	25	Native. Chalky white bark on upper trunk. Similar to sugar maple; pest free; heat tolerant.	S	N
Maple, Hedge	<i>Acer campestre</i>	30	30	Good fall color, more compact size, good street tree.	S	E
Maple, Japanese	<i>Acer palmatum</i>	20	20	<i>Dissectum</i> cultivar is not a tree.	S	E
Maple, Trident	<i>Acer buergerianum</i>	30	25	Good late fall color, tolerant of urban conditions.	S to M	E
Pistache, Chinese (Chinese pistachio)	<i>Pistacia chinensis</i>	30	30	Very tough, fall color, compound leaf, tolerates pruning.	M to F	E
Redbud, Eastern	<i>Cercis canadensis</i>	25	20	Showy flower, some disease problems, tough tree, many cultivars for color and size.	M	N
Serviceberry, Downy	<i>Amelanchier arborea</i>	12	12	Low stress tolerance, showy flower, requires little pruning, some disease problems, many cultivars for flower and habit.	S	N
Serviceberry, Shadbush	<i>Amelanchier canadensis</i>	15	18	Prefers well drained soils but tolerates wide moisture range. Attracts birds. White flowers. Purple-black fruit.	M	N
Silverbell, Carolina	<i>Halesia tetraptera</i>	30	30	Beautiful flower, wonderful small tree, low branching, tolerates shade.	M	N

SMALL MATURING TREES - DECIDUOUS - HEIGHT 10FT - 30FT

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Silverbell, Florida	<i>Halesia carolina</i>	20	30	More drought tolerant than other silverbells; cold hardy in NC.	M	N
Snowbell, Japanese;	<i>Styrax japonica</i>	25	25	Not heat tolerant, clusters of large white flowers in May-June.	M	E
Sourwood	<i>Oxydendrum arboreum</i>	25	12	Fragrant showy white flowers used by bees and butterflies. Brilliant red to yellow fall color. Flower racemes into winter. Sensitive to root disturbance.	S	N
Witch hazel	<i>Hamamelis virginiana</i>	20	25	Tough, great in borders or near buildings, interesting form, <i>H. japonica</i> and <i>x intermedia</i> easier to locate.	S to M	N

SMALL MATURING TREES - EVERGREEN - HEIGHT 10FT - 30FT

Common Name	Botanical Name	Height (ft)	Width (ft)	Comments	Growth rate	Native/ Exotic
Carolina Cherry Laurel	<i>Prunus caroliniana</i>	30	20	Tough, beautiful, needs space, some cultivars. Poison wilted leaves, twigs seeds. Recommended where no overhead or visibility problems occur.	F	NC
Devilwood, Wild Olive,	<i>Osmanthus americanus</i>	20	12	Fragrant small, white flowers followed by dark blue drupes. Can be heavily pruned or hedged.	M	NC
Holly	<i>Ilex spp.</i>	varies	varies	<i>I. cornuta, glabra, opaca, verticillata, decidua, cassine, vomitoria</i> , endless varieties, explore native hollies. Select for height and space restrictions.	M to F	N
Magnolia	<i>Magnolia spp.</i>	30	20	Many cultivars for smaller size such as "Little Gem", "Wada's Memory", "Hasse".	M	NC
Magnolia, Little Gem	<i>M. Grandiflora 'Little Gem'</i>	20	10	Dwarf cultivar of Southern Magnolia.	M	E
Mountain Laurel	<i>Kalmia latifolia</i>	12	5	Low stress tolerance, beautiful border plant, requires improved soil, cultivars for size and flower color, underused. All parts poisonous if ingested. Prune to tree form.	S	N
Waxmyrtle, Southern	<i>Myrica cerifera</i>	20	10	Screening plant. Tolerates drought, heat and stress. some cultivars available. Can be pruned to tree form. Recommended where no overhead or visibility problems occur.	F	NC

Section 8.15 Lighting

It is the purpose and intent of this Exterior Lighting Section to accomplish the following:

- A. Encourage the use of lighting design practices and systems that will minimize direct illumination and light pollution
- B. Conserve energy and resources while maintaining nighttime safety, security and productivity
- C. To establish clear and comprehensive outdoor lighting standards with an emphasis on reducing glare and light trespass by requiring in most circumstances full cut-off light fixtures.
- D. To allow for outdoor lighting that is appropriate for the task and to establish light fixture height, wattage, distribution and illumination limits that will help prevent light trespass to adjacent properties.

Section 8.15.1 Exemptions

The following lighting is exempt from the requirements of this Chapter:

- A. Emergency lighting: Lighting required for public safety in the reasonable determination of public safety officials with authority.
- B. Decorative lighting: Low-wattage fixtures used for decoration, such as for the holidays, special events, and annual events, which follow architectural features on buildings.
- C. Individual residential lighting that is not reviewed as part of a plan.
- D. DOT lighting: Department of Transportation highway safety and signage luminaries, which must comply with federal standards.
- E. Municipal lighting installed for the purpose of illuminating streets, sidewalks, and multi-modal pathways.

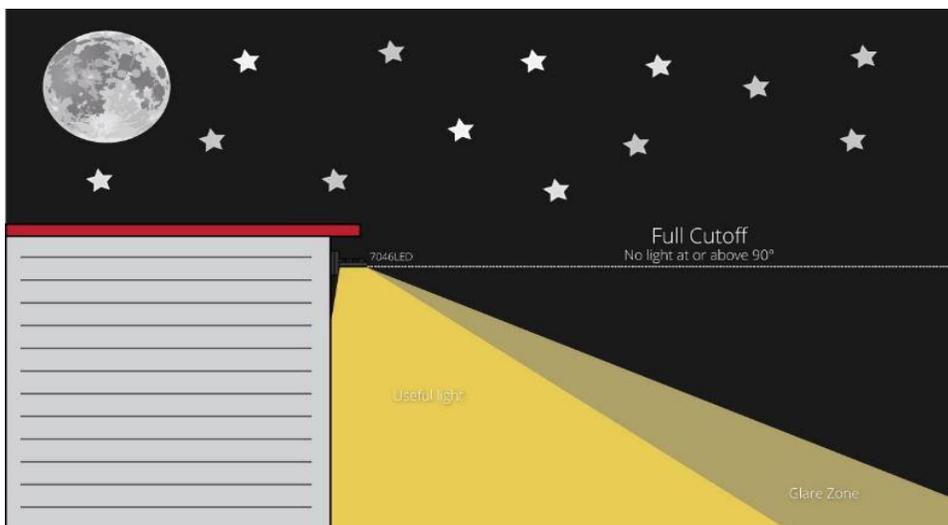
Section 8.15.2 Lighting Plan Required

A lighting plan is required for site plan approval. Any changes to the lighting plan must be approved by Zoning Administrator through a site and/or subdivision plan revision. The lighting plan shall be in accordance with IESNA standards for uniformity and show all maximum/minimum and average/minimum light levels.

The Zoning Administrator can waive this requirement for projects of one acre or less if lighting standards and locations are specified on site plan.

Section 8.15.3 Lighting Standards

- A. Street Lighting. All public streets, sidewalks, and other common areas or facilities shall be sufficiently illuminated to ensure the security of property and the safety of persons using such streets, sidewalks, and other common areas or facilities.
1. Streetlights shall be located according to the current Town of Waxhaw *Engineering Design and Construction Standards Procedures Manual - Street Lighting Policy*.
 2. Streetlights shall be of a type and rating as specified in the current Town of Waxhaw *Engineering Design and Construction Standards Procedures Manual - Street Lighting Policy*.
- B. Maximum mounted fixture height (grade to top of fixture) for all ground mounted or building mounted lighting fixtures, except those used for sporting facilities, shall be as follows:
1. Non-residential and mixed-use property – 32 feet
 2. Residential property (single or multi-family) – 20 feet
 3. Pedestrian pathways or sidewalks separate from road rights-of-way – 16 feet
- C. All lighting fixtures rated 150 watts (incandescent lamp or appropriate lumen equivalent) or less may be used without restriction to light distribution (non-cutoff classification) except when the luminaire creates direct glare perceptible to persons on a public right of way, or into the window openings of a residential dwelling unit. Care should be taken to minimize light pollution across property lines. Internal louvers or “glare shields” should be provided where the emitted light becomes a hindrance. House side shields may also be effective in reducing light trespass.
- D. All lighting fixtures rated between 175 watts and 400 watts (incandescent lamp or appropriate lumen equivalent) shall be rated as a “full cutoff” type when placed in the aiming position for which they are designed.



- E. All lighting fixtures rated above 400 watts (incandescent lamp or appropriate lumen equivalent) shall be listed as a full cutoff distribution only, and shall not emit any light above the horizontal plane of the fixture when placed in the aiming position for which they are designed. With exception of sporting facilities, the light source should not be visible from adjacent properties or the public street right-of-way.
- F. All building wall mounted lighting fixtures, or wall packs, shall be full cutoff type.
- G. All lighting fixtures illuminating building facades, steeples, trees, billboards, signs, flags, etc. (vertical surfaces lighted from the bottom up) shall not exceed 150 watts (incandescent lamp or appropriate lumen equivalent), with the exception of Department of Transportation highway signage luminaries, which must comply with federal DOT standards. Lighting fixtures shall be selected, located, aimed and shielded so that direct illumination is focused exclusively on the item being illuminated, and away from adjacent properties and the public street right-of-way. Only US, State, or local Government flags may be lit with upright.
- H. The layout of outdoor lighting fixtures shall be designed so that the poles do not interfere with other elements of the approved site plan such as trees, landscaping or parking. In general, poles shall be kept at least 20 feet away from the trunk of any large maturing tree and at least 10 feet away from any small maturing tree.
- I. All floodlights shall include top and side shielding, and be aimed at least 45 degrees below the horizontal.
- J. To eliminate unneeded lighting, exterior lighting systems are encouraged to include automatic timers, dimmers, sensors, or similar controls that will turn off lights during daylight hours and when the site is not occupied or open for business.
- K. All fixtures and lamps shall be maintained in good working order, and replacement lamps and fixtures shall match approved plans. Landscaping shall be maintained in a manner that does not obstruct security lighting while not damaging or removing required landscape materials.
- L. The use of LED or neon to outline individual windows, roof lines or buildings is permitted. For non-residential uses, light colors shall be limited to white or clear except during Town-recognized holidays or special events.
- M. Lighting shall not flash, pulsate, move or scroll.

Section 8.15.4 Lighting Standards for Specific Uses

- A. Gas and Service Station Canopies - All lighting fixtures mounted on the underside of canopies must be full-cutoff classified, being either completely recessed/flush in the canopy, or having solid sides on a surface mounted fixture (canopy edges do not qualify as shielding). The light source shall be metal halide, ceramic metal halide or LED. Lighting levels under the canopy shall be no greater than 30 foot candles. Areas outside the pump island canopy shall be illuminated as to provide proper safety to customers, but shall be limited and not exceed 20 foot candles.

- B. Motor Vehicle Dealership Standards - All lighting within a dealership display area shall be automatically reduced in light level by 25% after 11:00 PM or within one hour after close of daily business, whichever is earlier, and shall not return to full intensity before 8:00 AM. Outdoor areas where nighttime motor vehicle sales activity takes place and where accurate color perception of the vehicles by customers is required are allowed specific lighting level provisions. The display areas for new and used vehicles available for sale which are accessible to the general public during business operating hours shall not exceed 50 foot candles. Other areas of the dealership property, such as inventory storage or repair vehicle storage, which are not intended for vehicle display, shall be designed to not exceed 20 foot candles, although some portions within the site may slightly exceed this limit due to close proximity to a display area.
- C. Architectural Accent Lighting - Lighting fixtures used to accent architectural features, materials, colors, style of buildings, landscaping or art shall be located, aimed and shielded so that light is directed only on those features. Such fixtures shall be aimed or shielded to minimize light spill from the source in conformance with the luminaire standards. Accent lighting shall not generate excessive light levels, cause glare, or direct light beyond the façade onto neighboring properties, streets or night sky.
- D. Outdoor Sporting Events and Performances - The mounting height of outdoor sports field and outdoor performance area lighting fixtures shall not exceed 80 feet from finished grade. All outdoor sports field and outdoor performance area lighting fixtures shall be equipped with the manufacturer's maximum glare control package (louvers, shields, visors or similar devices). The fixtures must be aimed so that their beams are directed and fall within the primary playing field or performance area. Other on-site improvements, such as parking lots and concession or restroom facilities, should not rely on lighting from the playing fields or performance area, but shall have separate lighting designed not to exceed 20 foot candles initial lighting levels when combined with any spill light from the fields, and not create any areas of public access and use which are void of a minimum of 0.5 foot candles maintained while the facility is open to the public.

The hours of operation for the sports field lighting system for any game or event shall not exceed 8:00AM to 11:00PM. An exception to this time limit may be granted for play which has been weather delayed, or when a tournament or production is scheduled in advance with a final game or program to occur beyond 11:00 PM. The facility's property owner and management/production authority for the tournament or event are jointly responsible for providing notice of potential time extension to the Town Manager and adjacent property owners/occupants.

Lighting for playing fields or performance areas shall only be turned on when activity is scheduled and occurring. When scheduled activities are completed prior to 11:00 PM, the field or performance area lights shall be turned off (when egress lighting is separate) or reduced in light level by at least 50% within one hour after conclusion of play or other activity. When there are no scheduled activities at a sports field or performance area, then the lighting of them shall not be turned on. The security and egress illumination lighting systems may remain turned on for any amount of time deemed necessary to remove people safely.

Light levels for sports field illumination shall comply with, but not exceed IESNA standards. Where new sporting facility lighting is installed adjacent to an existing residential property, the intent shall be made for all installations to limit property line light levels to a maximum horizontal level of 3 foot candles initial, and a maximum vertical level of 1.5 foot candles at the property line of any developed residential parcel. When not installed adjacent to a residential property, light levels at the property line shall not exceed a maximum horizontal level of 4 foot candles initial and a maximum vertical level of 2 foot candles at the property line of any developed parcel or right-of-way. All possible means of shielding must be applied if this level has not been met. Owner must prove the intent has been made to meet these goals and Zoning Administrator shall make the determination on compliance.

Additional landscape screening may be necessary at select locations in order to reduce spill light on adjacent property. The lighting plan shall include a notation that the owner shall be responsible for providing additional landscaping or other visual screening along the property line which are in excess of intended limits. This additional screening shall be approved as an amended landscape plan prior to installation.

