

AN ORDINANCE FOR THE PURPOSE OF SETTING STANDARDS FOR OUTDOOR LIGHTING

A. Purpose

The intent and purpose of this ordinance is to regulate outdoor lighting so that exterior lights minimize sky glow, glare and light pollution. Adherence to the standards contained in the ordinance should lower energy cost, yet illuminate surroundings without causing annoyance to the public and users of property near the light source by reason of glare and light spill over.

B. Applicability

The ordinance shall apply to outdoor lighting that is constructed or installed after the effective date of the ordinance. The ordinance does not apply to any exterior lighting in existence on the effective date of the ordinance, but it is intended to apply when existing outdoor lighting is changed by adding, or relocating or increasing illumination.

Exterior lighting installed upon a building or on a lot at a single-family residence or duplex is not subject to this ordinance. Apartment buildings having three or more residential units are subject to the within ordinance.

C. Definitions.

Cutoff Fixture - An outdoor light fixture shielded or constructed in such a manner that no more than two and one half (2½) percent of the total light emitted by the fixture is projected above the horizontal plane of the fixture.

Flood Lamp - A form of lighting designed to direct its output in a specific direction with a reflector formed from the glass envelope of the lamp itself. Such lamps are so designated by the manufacturers and are typically used in residential outdoor area lighting.

Flood Light - A form of lighting designed to direct its output in a diffused, less specific direction, with reflecting or refracting elements located external to the lamp.

Footcandle (FC) - A quantitative unit measuring the amount of light cast onto a given point, measured as one *lumen* per square foot.

Full Cutoff Fixture - An outdoor light fixture shielded or constructed in such a manner that it emits no light above the horizontal plane of the fixture.

Glare - The effect produced by a *light source* within the visual field that is sufficiently brighter than the level to which the eyes are adapted, to cause annoyance, discomfort, or loss of visual performance and visibility.

IESNA - The Illuminating Engineering Society of North America, a non-profit professional organization of lighting specialists that has established recommended design standards for various lighting applications.

Internal Refractive Lens - A glass or plastic lens installed between the lamp and the sections of the outer fixture globe or enclosure. Refractive refers to the redirection (bending) of the light as it goes through the lens, softening and spreading the light being distributed from the *light source* thereby reducing direct glare.

Light Source - The element of a lighting fixture that is the point of origin of the lumens emitted by the fixture.

Light Trespass - Effects of light that strays from the intended purpose and becomes an annoyance, a nuisance, or a deterrent to visual performance. As such, light trespass should always be considered negative, unlike spill light which can have positive or negative attributes. Light trespass is the encroachment of light causing annoyance, loss of privacy, or other nuisance.

Light Pollution - Spill light which, because of quantitative or directional characteristics, results in annoyance, distraction, or a reduction in the ability to see essential information, such as a traffic signal or the night sky.

Lumen - The amount of light which falls upon an area of one square meter, every point of which is one meter distant from a source of one candela. Therefore, a one-candela source produces a total of 12.57 lumens

Maintained Footcandles - Illuminance of lighting fixtures adjusted for a maintenance factor accounting for dirt build-up and lamp output depreciation. The maintenance factor used in the design process to account for this depreciation cannot be lower than 0.72 for high-pressure sodium and 0.64 for metal halide and mercury vapor.

Medium Base - The size of lamp socket designed to accept a medium or Edison base lamp.

Outdoor Sports Field - An area designed for active recreation, whether publicly or privately owned, including but not limited to baseball/softball diamonds, soccer fields, football fields, golf courses and ranges, tennis courts, racetracks, and swimming pools.

Outdoor Performance Area - An area permanently dedicated to the public presentation of music, dance, theater, media arts, storytelling, oratory, or other performing arts, whether publicly or privately owned, including but not limited to amphitheaters and similar open or semi-enclosed structures.

Right-of-Way - An interest in land to the City which provides for the perpetual right and privilege of the City, its agents, franchise holders, successors, and assigns to construct, install, improve, reconstruct, successors, and assigns to construct, install, improve, reconstruct, remove, replace, inspect, repair, maintain, and use a public street, including related and customary uses of street rights-of-way such as sidewalks, bike paths, landscaping, mass transit facilities, traffic control, traffic control devices and signage, sanitary sewer, storm water drainage, water supply, cable television, electric power, gas, and telephone transmission and related purposes in, upon, over, below, and across the rights-of-way.

Semi-Cutoff Fixture - An outdoor light fixture shielded or constructed in such a manner that it emits no more than five (5) percent of its light above the horizontal plane of the fixture, and no more than twenty (20) percent of its light ten (10) degrees below the horizontal plane of the fixture.

Shielding - A design feature or a device that is applied to a luminaire to prevent its luminous output from being visible from selected locations or horizontal and/or vertical angles.

Sky Glow - The brightening of the night sky that results from the reflection of radiation (visible and non-visible), scattered from the constituents of the atmosphere (gaseous molecules, aerosols, and particulate matter), in the direction of the observer. It comprises two separate components:

natural sky glow that part of the sky glow which is attributable to radiation from celestial sources and luminescent processes in the earth's upper atmosphere.

artificial sky glow that part of the sky glow which is attributable to man-made sources of radiation (e.g., outdoor electric lighting), including radiation that is emitted directly upwards and radiation that is reflected from the earth's surface.

Spill Light - light emitted by a lighting installation which falls outside the boundaries of the property or right-of-way on which the installation is located.

Vehicular Canopy - A roofed, open, drive-through structure designed to provide temporary shelter for vehicles and their occupants while making use of a business' services.

Wall Pack - A type of light fixture typically surface-mounted on a vertical wall surface.

Wide-body Refractive Globe - A translucent lamp enclosure used with some outdoor fixtures to provide a decorative look (including but not limited to acorn- and carriage light-style fixtures). "Wide-body" refers to a wider than average size globe (greater than 15.75" in diameter). "Refractive" refers to the redirection (bending) of the light as it goes through the lens, rendering the light fixture more effective. Wide-body refractive globes are intended to soften and spread the light being distributed from the light source thereby reducing direct glare.

C. Light Measurement Technique.

Light level measurements shall be made at the property line of the property upon which the light to be measured is being generated. If measurement on private property is not possible or practical, light level measurements may be made at the boundary of the public street right-of-way that adjoins the property of the complainant or at any other location on the property of the complainant. Measurements shall be made at finished grade (ground level), with the light-registering portion of the meter held parallel to the ground pointing up. The meter shall have cosine and color correction and have an accuracy tolerance of no greater than plus or minus five (5) percent. Measurements shall be taken with a light meter that has been calibrated within the year. Light levels are specified, calculated and measured in footcandles (FC). All FC values below are maintained footcandles.

D. General Standards for Outdoor Lighting.

1. Unless otherwise specified in subsection E. through J. below, the maximum light level shall be **0.5 maintained footcandle at any property line** in a residential district, or on a lot occupied by a dwelling, congregational care or congregational living structure, and **2.0**

maintained footcandles at any public street right-of-way, unless otherwise approved by the Codes staff.

2. All floodlights shall be installed such that the fixture **shall be aimed down at least forty-five (45) degrees below horizontal**, or the front of the fixture is shielded such that no portion of the light bulb extends below the bottom edge of an external shield. Flood lights and display lights shall be positioned such that any such fixture located within fifty feet (50) of a public street right-of-way is mounted and aimed perpendicular to the right-of-way, with a side-to-side horizontal aiming tolerance not to exceed fifteen (15) degrees from perpendicular to the right-of-way.

3. All flood lamps emitting 1,000 or more lumens shall be aimed at least sixty (60) degrees below horizontal, or shielded such that the main beam from the light source is not visible from adjacent properties or the public street right-of-way.
4. **All wall pack fixtures shall be cutoff type fixtures.**
5. Service connections for all freestanding fixtures installed after application of this ordinance shall be installed underground.
6. Within Thoroughfare and Special Highway Overlay Districts, all outdoor lighting fixtures shall be at minimum semi-cutoff fixtures.
7. Ground mounted luminaries lighting building facades, steeples, trees, billboards, signs, flags, etc. (vertical surfaces illuminated from the bottom up) **SHALL NOT exceed 175 watts.**

E. Lighting in Parking Lots and Outdoor Areas.

1. Other than floodlights and flood lamps, all outdoor area and parking lot lighting fixtures generating more than 5,000 initial lumens **SHALL be cutoff fixtures**, or comply with subsection 3. below.
2. The mounting height of all outdoor lighting, except outdoor sports field lighting and outdoor performance area lighting, **shall not exceed forty-one (41) feet** above finished grade, unless approved by the Codes staff as having no adverse effect. Refer to subsection H.1. below for light levels.
3. Exceptions:
 - a. Non-cutoff fixtures may be used when the maximum lumen output generated by each fixture does not exceed 5000 initial lamp lumens per fixture.
 - b. All metal halide, mercury vapor, fluorescent, induction, white high pressure sodium and color improved high pressure sodium lamps used in non-cutoff fixtures shall be coated with an internal white frosting inside the outer lamp envelope.
 - c. All metal halide fixtures equipped with a medium base socket must utilize either an internal refractive lens or a wide-body refractive globe.
 - d. All non-cutoff fixture open-bottom lights shall be equipped with full cutoff fixture shields that reduce glare and limit uplight.

F. Lighting for Vehicular Canopies.

Areas under a vehicular canopy shall have a maximum point of horizontal illuminance of **thirty (30) initial footcandles (FC)**. Areas outside the vehicular canopy shall be regulated by the standards of subsection D.1. above. Lighting under vehicular canopies shall be designed so as not to create glare off-site. Acceptable methods include one or more of the following:

1. Recessed fixture incorporating a lens cover that is either recessed or flush with the bottom surface (ceiling) of the vehicular canopy.
2. Light fixture incorporating shields, or shielded by the edge of the vehicular canopy itself, so that light is restrained to five degrees or more below the horizontal plane.
3. Surface mounted fixture incorporating a flat glass that provides a cutoff fixture or shielded light distribution.
4. Surface mounted fixture, typically measuring two feet by two feet, with a lens cover that contains at least two (2) percent white fill diffusion material.
5. Indirect lighting where light is beamed upward and then reflected down from the underside of the vehicular canopy. Such fixtures shall be shielded such that direct illumination is focused exclusively on the underside of the vehicular canopy.
6. Other method approved by the Codes staff.

G. Outdoor Sports Field/Outdoor Performance Area Lighting

1. The mounting height of outdoor sports field and outdoor performance area lighting fixtures shall not exceed eighty (80) feet from finished grade unless the Codes Administrator states in writing that the height of the lighting fixtures should have no adverse effect on surrounding property.

H. Lighting of Outdoor Display Areas. (i.e. Automobile Dealerships)

1. Parking lot outdoor areas shall be illuminated in accordance with the requirements for subsection E. above. Outdoor display areas shall have a maximum point of illuminance of **thirty (30) initial footcandles (FC)**.
2. All light fixtures shall meet the IESNA definition of cutoff fixtures. Forward throw fixtures (type IV light distribution, as defined by the IESNA) are required within twenty-five (25) feet of any public street right-of-way. Alternatively, directional fixtures (such as flood light) may be used

provided they shall be aimed and shielded in accordance with subsections D.1. and D.2. of this ordinance.

I. Sign Lighting.

Lighting fixtures illuminating signs shall be aimed and shielded so that direct illumination is focused exclusively on the sign in accordance with subsection D.7.

J. Lighting of Buildings and Landscaping.

Lighting fixtures shall be selected, located, aimed, and shielded so that direct illumination is focused exclusively on the building facade, plantings, and other intended site features and away from adjoining properties and the public street right-of-way in accordance with subsection D.7.

K. Permits

- a. Installation or change of outdoor lighting as defined above require a permit to be issued by the Codes Administrator.
- b. The Codes Administrator may allow an applicant for a permit involving outdoor lighting to submit an informal or hand drawn diagram for exterior lighting changes on existing buildings so long as such diagram describes the illuminating devices, lamp fixtures, raised foundations and various devices that are in compliance with this code.

L. Nonconformities.

1. Following application of this regulation, the installation of outdoor lighting, replacement of outdoor lighting, and changes to existing light fixture wattage, type of fixture, mounting, or fixture location shall be made in strict compliance with this Code. Any new construction not conforming to these lighting ordinances shall be subject to delays in obtaining the certificate of occupancy and/or financial penalties.
 - a. Optional methods of conformance to these regulations may be obtained by capping, shielding or painting existing luminaires in order to conform to the definition of "semi-cutoff", as listed in Section B, "Definitions".

M. Penalties

Upon the Codes Administrator becoming aware that exterior lighting is in violation of this Code, the Codes Administrator shall issue an order directing the owner or contractor to stop the violation. In the event that the owner or contractor, their agents, or employee(s) continue in violation, then the Codes Administrator shall

seek enforcement of the Code in the Court of Common Pleas in the judicial system of the State of South Carolina or in the alternative the Codes Administrator may charge the owner or contractor their agent(s) or employee(s) with a misdemeanor. Upon conviction the Court shall impose a fine or punishment authorized by law for the commission of a misdemeanor.