

Chapter 188

LIGHTING, OUTDOOR

GENERAL REFERENCES

Design and site review — See Ch. 121.

Zoning — See Ch. 278.

Subdivision — See Ch. 252.

§ 188-1. Purpose and intent.

- A. The general purpose of this chapter is to protect and promote the public health, safety and welfare, the quality of life, the Village's unique character, and the ability to view the night sky by establishing regulations and a process for review of exterior lighting.
- B. This chapter establishes standards for exterior lighting in order to accomplish the following:
- (1) To provide safe lighting on roadways for motorists, cyclists and pedestrians;
 - (2) To protect against direct glare and excessive lighting on private and public properties;
 - (3) To ensure that sufficient lighting can be provided where needed to promote safety and security;
 - (4) To prevent light trespass in all areas of the Village;
 - (5) To protect and reclaim the ability to view the night sky;
 - (6) To allow the flexibility in the style of lighting fixtures;
 - (7) To provide lighting guidelines;
 - (8) To provide assistance to property owners; institutions; and county, state, and utility facilities in bringing nonconforming lighting into conformance with this chapter.
 - (9) To use energy wisely and to conserve natural resources;
 - (10) To preserve the desired rural character of the Village; and
 - (11) To reduce excessive illumination which has been demonstrated to have a detrimental effect on the local flora and fauna that depend on the natural cycle of day and night.

§ 188-2. Definitions.

- A. Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application.
- B. As used in this chapter, the following terms shall have the meanings indicated:

AREA LIGHT — A fixture designed for illumination of a broad area. Area lights include, but are not limited to, streetlights, parking lot lights and yard lights over 1,800 lumens.

AVERAGE HORIZONTAL FOOTCANDLE — The average level of illuminance for a given situation measured at ground level with the

light meter placed parallel to the ground. It can be also determined by the "Key" on a lighting plan as provided by a lighting manufacturer's application department.

CORRELATED COLOR TEMPERATURE (CCT) — The perceived color of the light emitted by a lamp, expressed in Kelvin (K) units. Generally, the lower the Kelvin rating the "warmer" the light; the higher the rating, the "cooler" or more blue the light. Incandescent bulbs emit approximately 2,300 Kelvin.

ESSENTIAL LIGHTING — Light that is used for a specified period of time, which is necessary for location identification or public circulation purposes.

EXCESSIVE LIGHTING — Illuminance levels beyond that which is required for safety, as recommended in IESNA Recommended Practices, or higher than five FC on any lit surface unless a higher level is indicated on the Table of Limits of Illumination Levels.

EXTERIOR LIGHTING — Temporary or permanent lighting equipment that is installed, located or used in such a manner with the intention to cause light rays to shine outdoors.

FIXTURE (ALSO CALLED "LUMINAIRE") — The bulb and the assembly that holds the bulb (or lamp) in a lighting system, including reflecting elements, shielding elements, cover glass or lenses, the ballast, and the housing. For purposes of determining total light output from a luminaire or light fixture, lighting assemblies which include multiple unshielded or partially shielded lamps on a single pole or standard shall be considered as a single unit.

FLOODLIGHT — A lamp or fixture intended to light a large area, and which can produce light above the fixture. Such lamps (bulbs) may incorporate prismatic lenses that distribute the light in various directions.

FOOTCANDLE ("FC") — The basic unit of illuminance (the amount of light falling on a surface). Footcandle measurement is taken with a light meter. One footcandle is approximately equal to the illuminance produced by a light source of one candela in intensity, measured on a surface at a one-foot distance from the source. Horizontal footcandles measure the illumination striking a horizontal plane. Footcandle values can be measured directly with certain handheld incident light meters.

FULLY SHIELDED OR ZERO UPLIGHT — A fixture designed, constructed and installed in such a manner that all light emitted by it, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the fixture, is projected in a fixed direction below the horizontal. It can be identified without a manufacturer's photometric report. Also referred to as "zero uplight."

GLARE — The sensation produced by a light source within the visual field that is sufficiently brighter than the level to which the eyes are adapted, which can cause annoyance, discomfort, or loss in visual

performance and visibility. The magnitude of glare depends on such factors as the size, position, brightness of the source, and on the brightness level to which the eyes are adapted.

HID LIGHTING — A family of bulb types that are known as "high-intensity discharge," including high-pressure sodium, mercury vapor, and metal halide. These types may require a warmup time, usually require a ballast, and have a higher lumen output per watt than incandescent (or halogen) lamps.

HOLIDAY LIGHTING — Temporary strings of small individual lamps.

IESNA — Illuminating Engineering Society of North America (IES or IESNA), a private-membership organization that establishes updated standards and illumination guidelines for the lighting industry.

IESNA RECOMMENDED PRACTICES — The most current publications of the IESNA setting forth illuminance levels for different task areas, e.g., walkways, streets, sportslights, etc.

ILLUMINANCE — The density of light falling on any point of a surface, usually measured in footcandles in the United States. See "footcandle."

KELVIN — The unit of measurement used to characterize the color of light emitted by a lamp. See also "correlated color temperature."

LAMP — The generic term for an artificial light source, to be distinguished from the whole assembly (see "fixture"); commonly referred to as the "light bulb."

LED — Light emitting diodes are assembled into a lamp to emit light. LEDs are energy efficient, directional, and have a long-life for maintenance purposes. Unfiltered LEDs are high in the blue spectrum (6,000+ Kelvin) and require colored filters to produce "white" light. Also referred to as "solid state lighting."

LIGHT — The form of radiant energy acting on the retina of the eye to make sight possible.

LIGHTING ASSEMBLY — Any or all parts of a fixture that function to produce light, including the bulb, assembly, ballast, mounting features and/or pole.

LIGHT LEVEL — The illuminance on a surface, as measured by a light meter or reported in photometric calculations. Light levels are indicated in footcandle measurements on a lighting plan and may also be expressed as uniformity ratios and as isofootcandle plots.

LIGHT POLLUTION — Any adverse effect of man-made light, including but not limited to glare, light trespass, skyglow, visual clutter, wasted energy due to excessive or unnecessary lighting, or any man-made light that unnecessarily diminishes the ability to view the night sky or is disruptive to flora and fauna.

LIGHT SOURCE — The light bulb and all reflecting and refracting parts of the fixture that transmit light.

LIGHT TRESPASS — Light projected onto the property of another or into the public right-of-way when it is not required or permitted to do so. For reference, full moonlight averages 0.01 footcandle.

LUMEN — A unit used to measure the actual amount of light that is produced by a bulb. The lumen quantifies the amount of light energy produced by a lamp at the lamp, not by the energy input, which is indicated by the wattage. For example, a 75-watt incandescent lamp can produce 1,000 lumens while a 70-watt high-pressure sodium lamp produces 6,000 lumens. Lumen output is listed by the manufacturer on the packaging or can be available from the manufacturer's website.

LUMINAIRE — A fixture.

LUMINANCE — The brightness of a source of light.

MAINTAINED ILLUMINANCE — The light levels that are produced by a lamp and in a fixture after a period of time, taking the normal losses due to lamp aging and fixture dirt accumulation into account.

MOUNTING HEIGHT — The distance from level ground to the lowest light-emitting part of the fixture.

NONESSENTIAL LIGHTING — Lighting for an intended purpose when that intended purpose is not taking place.

PARTIALLY SHIELDED — A fixture, which incorporates a partial shield around the lamp, concealing the lamp from view only in certain directions.

PHOTOMETRICS — Technical test reports that indicate light distribution and performance from a fixture. Photometric reports may include candlepower distribution data, cutoff classifications, isofootcandle charts, etc. These are generally available from the fixture manufacturers as IES files or isofootcandle plots.

SHIELD or SHIELDED — An opaque device that is attached to a light fixture to prevent light from being emitted in certain directions. Auxiliary "back" or "house-side" shielding added to an already fully shielded fixture can help limit trespass where a fixture is located near a property line.

SKYGLOW — The overhead glow from light emitted sideways and upwards, including light reflected upward from the ground or other surfaces. Skyglow is caused by the reflection and scattering of various forms of light by dust, water, and other particles suspended in the atmosphere. Among other effects, skyglow reduces one's ability to view the night sky. Different sources of light, in equal quantities, can contribute differently to sky glow.

TEMPORARY LIGHTING — Lighting that is intended to be used for a limited time and removed thereafter.

UL RATING — Refers to "Underwriters Laboratory," a commercial agency that certifies the maximum safe wattage for fixtures and other

electrical devices. A UL label indicating the maximum safe wattage is affixed or imprinted on all electrical fixtures which are offered for sale.

UNIFORMITY RATIO (U RATIO) — A ratio that describes uniformity of illuminance across an area. The uniformity ratio may be a ratio of the maximum-to-minimum illuminance or the average-to-minimum illuminance. For example, if the Illuminating Engineering Society recommends an average-to-minimum ratio of 4:1 for a parking lot, the minimum illuminance should be no less than 1/4 of the average illuminance across the parking lot. Uniformity ratios meeting professional recommendations will reduce adaptation problems and promote better nighttime vision.

§ 188-3. Applicability.

- A. All exterior light fixtures installed, replaced, or repaired after the effective date of this chapter shall conform to the standards established by this chapter.
- B. All existing residential, private commercial, institutional, and utility owned or operated exterior lighting lawfully installed prior to the effective date of this chapter shall not cause light trespass and shall protect adjacent properties and beyond from glare and excessive lighting.
- C. Existing lighting in conflict with this chapter shall be classified as "nonconforming." All lighting existing or installed prior to the date of the adoption of this chapter which does not conform with the provisions of this chapter shall be exempt under the following conditions:
 - (1) Lighting that violates the light trespass limits or creates a public nuisance or hazard can be ordered removed or altered at any time.
 - (2) On the effective date of this chapter, any lighting installation which would comply by re-aiming of the fixture shall be brought in compliance with the terms of this chapter without delay.
 - (3) Upon adoption of this chapter, with any repair or replacement of any nonconforming fixture, or relocation of such fixture, that fixture shall be brought into compliance with the terms of this chapter at the completion of the repair or replacement.
 - (4) Upon installation of any new fixture, the provisions of this chapter shall fully apply. For nonresidential lighting, an inventory of existing lighting submitted to the Design Review Board by the applicant will be required when the application for installing new fixture(s), is made.
 - (5) Residential lighting shall be required to conform to the light trespass and glare provisions upon enactment of this chapter.

§ 188-4. Outdoor lighting standards.

- A. General standards for nonresidential.
 - (1) All exterior lighting shall be designed, located, and lamped in order to prevent:
 - (a) Overlighting;
 - (b) Energy waste;

- (c) Glare;
 - (d) Light trespass; and
 - (e) Unnecessary skyglow.
- (2) Canopy lights, such as service station lighting, shall be fully recessed or fully shielded and located to prevent glare and light trespass.
 - (3) Area lights. All area lights shall be fully shielded or zero uplight.
 - (4) Electrical utility companies, including their agents, shall not install, replace, re-lamp, nor repair any utility-pole-mounted fixtures after the effective date of this chapter without first receiving prior approval for such installation by the Design Review Board.
 - (a) No fixture shall exceed 3,000K.
 - (b) Every fixture shall be fully shielded, as designed and installed.
 - (c) Every fixture shall be fitted with middle-of-the-night shutoffs when the need for such lighting has been met.
 - (d) Light levels shall meet the provisions herein and shall not exceed five footcandles.
 - (5) Automatic teller machine (ATM) and other bank lighting shall be fully shielded and shall not cause glare or light trespass.
 - (6) Wall packs and floodlights that are not fully shielded are not permitted.
- B. Type of fixtures for all exterior lighting. All exterior lighting shall use fully shielded fixtures, as determined by a photometry test or certified, by the manufacturer, with the light source directed downward and with the lowest light-emitting part of the fixture level with the horizontal plane, with the following exceptions:
- (1) Unshielded residential fixtures mounted within five feet of a doorway, equal to the lumen output of one 60-watt incandescent light per fixture (900 lumens), regardless of the number of lamps in such fixtures, are allowed, provided the light trespass limitations and other provisions are met. Residential fixtures do not require photometric testing if UL rated no more than 60 watts aggregate.
 - (2) Residential floodlights that are UL rated at no more than 60 watts aggregate are permitted if angled downward and only if the fixture does not cause glare or light trespass, and beam spread does not extend beyond the intended target or across property lines. Photocells with operable timers that allow a light to go on at dusk and off by 11:00 p.m., as well as motion-sensor-activated lights for pedestrian safety and security concerns, are encouraged.
 - (3) Holiday lighting installed and lit between November 15 and January 15 of the following year.
 - (4) Residential sensor-activated fixtures, provided:
 - (a) The fixtures are operational and located in such a manner, or shielded, to prevent glare and light trespass;
 - (b) The fixtures are set to only go on when activated and to go off within five minutes after activation has ceased; and
 - (c) The sensor shall not be triggered by activity off the property.
 - (d) The fixture, regardless of the number of bulbs, is lamped no greater than 900 lumens (equivalent to 60 watts incandescent).

- (5) Vehicular lights and all temporary emergency lighting needed by the fire, ambulance, and police departments, or other emergency services are exempt.
- (6) Lighting of radio, communication and navigation towers is allowed, provided the owner or occupant demonstrates that the Federal Aviation Administration (FAA) regulations can only be met through the use of lighting that does not comply with this chapter, and that the provisions of this chapter are otherwise met. Tower lighting shall not be permitted unless required by the FAA; in which case, required lighting shall be of the lowest allowed intensity, and red, unless specifically forbidden under FAA requirements.
- (7) Neon lights, searchlights, pulse and laser lights are prohibited. Blinking, tracing or flashing lights are prohibited.
- (8) Fixtures used for municipal playing fields may be exempt from the shielding requirements when fully shielded fixtures or shielding devices are not available for the intended purpose, and provided all other provisions of this chapter are met and the light is used only while the field is being used for permitted uses. There shall be no lighting of private sporting courts or playing fields, surfaces or areas within the Village.
- (9) In situations of lighted flags which are not illuminated with downward lighting, upward lighting may be used in the form of a narrow cone spotlight, which confines the illumination to the flag. Municipal flags are exempt from this requirement.
- (10) Sign lighting equipment, provided that the light falls entirely on the surface of the sign and no glare is visible from property lines or from public streets. Top-mounted sign lights are encouraged.

§ 188-5. Placement and height of fixtures for all exterior lighting.

- A. No fixtures shall be taller than 20 feet from the ground to their tallest point. Parking area lights are encouraged to be greater in number, lower in height and lower in light level, as opposed to fewer in number, higher in height and higher in light level. (See Attachment 1.)
- B. Fixtures for municipal streetlights and playing fields shall be exempt from the height restriction, provided all other provisions of this chapter are met. Setbacks from the property line and back and side shielding are encouraged in the design process, to avoid light trespass and glare.
- C. All residential, private commercial, institutional, and utility existing and/or new exterior lighting shall be located and at a mounting height to prevent light trespass and shall protect adjacent properties from glare and excessive lighting.
- D. Privately owned or leased light fixtures located on public utility poles or located in the public right-of-way are prohibited.

§ 188-6. Illuminance and type of lamp for all nonresidential lighting.

- A. No fixture shall be located or concentrated so as to produce glare or direct illumination across the boundary property line, nor shall any such light be of such intensity as to create a nuisance or detract from the

use and enjoyment of adjacent property. The maximum illuminance at or beyond the property line that adjoins a residential parcel or public right-of-way may not exceed 0.05 FC horizontal on the ground or 0.05 FC vertical measured at a five-foot height above the ground unless another applicable law supersedes. Maximum horizontal or vertical illuminance allowed between adjacent commercial properties is 0.1 FC.

- B. The average illuminance levels listed in the Illumination Levels for Various Common Tasks, as provided in the IESNA Recommended Practices, RP-33, Lighting for Exterior Environments, shall not be exceeded for nonresidential lighting unless otherwise specified or approved by the Design Review Board. The Village recognizes that not every situation will require lighting, and excessive or unnecessary light shall be avoided. Also, appropriate lighting levels are dependent upon the general nature of the surroundings and the Design Review Board may require more or less than those listed in the IESNA Recommended Practices Guidelines. Illuminance level measurements for parking lots, sidewalks, and other walkways shall include any light from nearby side-mounted building lights, freestanding sidewalk lights affected by side-mounted building lights, and streetlights. In no instance may any lighted surface, as installed, except for nonprofessional sports fields, exceed five footcandles, as measured horizontally or vertically by a light meter.
- C. No light source shall be permitted that exceeds 3,000 Kelvin.
- D. Streetlights shall be fully shielded and shall not be lamped to exceed 3,000 Kelvin. At ground level, footcandle measurements shall not exceed professional recommendations as set by IESNA Recommended Practices, RP 8, for Roadway Lighting. [Exception to "fully shielded": replacements of historic municipal streetlights; e.g., if the fixture is an historic or decorative fixture which is part of a continuous lighting design where the replacement of the fixture piecemeal with compliant fixtures would unacceptably alter the aesthetic characteristics of the existing lighting design.]

§ 188-7. Procedures for nonresidential lighting.

- A. Any change or alteration of nonresidential exterior lighting must be approved by the Design Review Board and verified, post installation, by the Code Enforcement Officer, to insure compliance with all the provisions of this chapter. Where new installations have been designed by an illuminating engineer/professional, he or she shall also conduct a post-installation inspection to verify and certify that the installed system operates as designed.
- B. All applications for design review or site plan review, special exception permits, or building permits shall include lighting plans, fixture and controls specifications and additional documentation, if any lighting is to be used, regardless of whether the lighting is preexisting or proposed, showing the following, if requested by the DRB, in order to verify that lighting conforms to the provisions of this chapter:
 - (1) Location of each current and proposed outdoor lighting fixture indicated on a site plan.

- (2) Type of exterior lighting equipment, including cutoff characteristics, indicating manufacturer and model number.
 - (3) Lamp source type, lumen output, and wattage.
 - (4) Mounting height indicated, with distance noted to nearest property line, for each fixture.
 - (5) Shielding and all mounting details, including pole foundation description.
 - (6) Initial illuminance levels as expressed in footcandle measurements on a grid of the site showing footcandle readings in every five-foot grid. The grid shall include light contributions from all sources (i.e., pole-mounted lights, wall-mounted lights, and signs, including streetlights).
 - (7) Statement of the proposed hours when each fixture will be operated.
 - (8) Total exterior initial lamp lumens for proposed property.
 - (9) Lighting manufacturer specifications (cut sheets) with photographs of the fixtures, indicating the cutoff characteristics of the fixture.
 - (10) Detailed photometric layout, in five-foot grids, indicating footcandle measurements, with a "Key" on the lighting plan indicating the uniformity ratios as provided by the lighting manufacturer's Applications Department.
 - (11) Types of timing devices used to control on/off.
 - (12) If necessary, documentation by a lighting designer or engineer showing that the provisions can only be met with a design that does not comply with this chapter.
 - (13) Exceptions may be made for additions or replacements to existing exterior lighting installations, when the total lumens for the fixtures does not exceed a total of 4,000 initial lumens. An application shall be submitted to the Design Review Board for a permit, and shall include:
 - (a) The manufacturer's cut sheet with a photograph of the fixture(s) to assure compliance to meet the definition of "fully shielded."
 - (b) Location of the fixture(s) on a diagram of the site or on a site plan indicating the height of the fixture and the distance in feet from level ground under the fixture(s) to the nearest property line.
 - (c) The initial lumen output of the fixture(s).
 - (d) Bulb (light source) type(s).
 - (e) The Kelvin rating of the light source(s).
 - (f) Hours of operation and lighting (timing) control device.
 - (14) Upon any such application, the Design Review Board may require all preexisting lighting to be changed to conform to all the provisions of this chapter.
- C. No exterior lighting shall be altered, enlarged, moved, improved, or converted unless it conforms to a lighting plan approved by the Design Review Board.
- D. The following guidelines will be made available to applicants to facilitate compliance:

- (1) Diagrams of generally acceptable and generally unacceptable light fixtures.
- (2) Diagrams of positioning of sign lights.
- (3) Various wattage/lumen conversions.
- (4) Latest version of Illumination Levels for Various Tasks, including uniformity ratios (from IESNA Recommended Practices, Lighting for Exterior Environments, RP 33).
- (5) Diagram for setbacks for freestanding fixtures.
- (6) Educational/support information for the public and the building trades.

§ 188-8. Violations; penalties for offenses.

- A. It shall be unlawful for any person, firm or corporation to install, alter, repair, move, equip, use or maintain any lighting in violation of any of the provisions of this chapter, or to fail in any manner to comply with a notice, directive or order of the Code Enforcement Officer.
- B. Any person who shall fail to comply with a written order of the Code Enforcement Officer within the time fixed for compliance therewith and any owner, builder, architect, tenant, contractor, subcontractor, construction superintendent or their agents or any person taking part or assisting in the installation, alteration, repair, equipping, use or maintenance of any lighting in violation of any of the applicable provisions of this chapter or any lawful order, notice, directive, permit or certificate of the Code Enforcement Officer made hereunder, shall commit a violation of this chapter. Any person, firm or corporation violating any of the provisions of this chapter shall, upon conviction thereof, be subject to a fine not exceeding the sum of \$250 for any offense, and each day that a violation continues shall be deemed to constitute a separate offense.