

DARK SKY ORDINANCE (for CRC #9 review 09/25/2019)

ARTICLE I. - IN GENERAL.

Sec. 1 - Title.

These regulations shall be known and may be cited as the city's dark sky ordinance.

Sec. 2 - Purpose.

The general purpose of this ordinance is to protect and promote the public health, safety and welfare, the quality of life, and the ability to view the night sky, by establishing regulations and a process of review for exterior lighting. These regulations establish standards for exterior lighting in order to accomplish the following:

- (1) To protect against direct glare and excessive lighting;
- (2) To provide safe roadways for motorists, cyclists and pedestrians;
- (3) To protect and reclaim the ability to view the night sky, and thereby help the quality of life;
- (4) To prevent light trespass in all areas of the city;
- (5) To promote efficient and cost-effective lighting;
- (6) To ensure that lighting can be provided where needed to promote safety and security;
- (7) To allow for flexibility in the style of lighting fixtures;
- (8) To provide lighting guidelines; and
- (9) To work with other jurisdictions within the area to meet the purposes of this ordinance.

Sec. 3 - Scope; effective date; existing lighting.

All sections of this ordinance shall be effective _____, 2019. Exterior lighting, as defined herein, and installed after the effective date of this ordinance in the Neighborhood Commercial (C-1), Light Commercial (C-2), General Commercial (C-3), Industrial and Manufacturing (IM), Downtown Arts and Culture (DAC), Mixed Use (MU), Planned Development (PD), Public and Institutional (PI) and Airport (AD) zoning districts in the city shall be in conformance with the requirements established by this ordinance and any other applicable ordinances and, in the event of discrepancy, the most restrictive shall apply. All existing lighting installed prior to the effective date of this ordinance in all zoning districts within the city shall be considered to be "grandfathered" and may remain as is.

Sec. 4 - Definitions.

Unless specifically defined below, words or phrases used in this ordinance shall be interpreted as to give them the meaning they have in common usage and to give this ordinance its most reasonable application.

Area light: Light that produces over 1800 lumens. Area lights include, but are not limited to, streetlights, parking lot lights and yard lights.

Average footcandle: The level of light measured at an average point of illumination between the brightest and darkest areas. The measurement can be made at ground surface or at four to five feet above the ground.

Ballast: A device used with a discharge lamp to obtain the necessary voltage, current, and/or wave form for starting and operating the lamp.

Building official: The city's chief building official.

Bulb: The source of electric light. To be distinguished from the whole assembly, see "luminaire".

Candela (cd): A unit of luminous intensity.

City: The City of Kerrville, Texas.

City council: The city council of the City of Kerrville, Texas.

City manager: The city manager or designee.

City staff: A member or members of the city staff, or their designee (such as an outside consultant), charged with interpreting and administering the provisions of this ordinance.

Commission: The city's planning and zoning commission.

Eighty-five-degree full cutoff type fixtures: Fixtures that do not allow light to escape above an 85-degree angle measured from a vertical line from the center of the lamp extended to the ground, see Figure 2.

Existing lighting: All lighting installed on a property or building prior to the effective date of this ordinance.

Exterior lighting: Temporary or permanent lighting that is installed, located or used in such a manner to cause light rays to shine outside, and that is not attached to a residential or commercial building or structure.

Festoon lights: Limited to small individual bulbs on a string, where the output per bulb is no greater than fifteen (15) lumens.

Fixture: The assembly that holds the lamp in a lighting system. It includes the elements designed to give light output control, such as a reflector (mirror) or a refractor (lens), the ballast, the housing, and the attachment parts.

Floodlight: Light that produces up to 1800 lumens that is designed to "flood" a well-defined area with light. Generally, floodlights produce 1000 to 1800 lumens.

Flux (radiant flux): The time rate of flow of radiant energy (measurement unit is watts).

Footcandle: Illuminance produced on a surface one foot from a uniform point source of one candela. Measured by a light meter.

Full cutoff fixture: Fixtures, as installed, that are designed or shielded in such a manner that all light rays emitted by the fixture, either directly from the lamps or indirectly from the fixture, are projected below a horizontal plane running through the lowest point on the fixture where light is emitted, see Figure 1.

Glare: Intense light that results in discomfort and/or a reduction of visual performance and visibility.

Illuminance: Density of luminous flux incident on a surface (measurement unit is footcandle).

Illuminating Engineering Society (IES, formerly IESNA): The professional society of lighting engineers, including those from manufacturing companies and others professionally involved in lighting.

Lamp: The actual source of electric light (i.e., the bulb and its housing) as distinguished from the whole assembly (see "luminaire").

Light: The form of radiant energy acting on the retina of the eye to make sight possible.

Lighting: Any or all parts of a luminaire that function to produce light.

Light pollution: Any adverse effect of manmade light, including, but not limited to, light trespass, uplighting, the uncomfortable distraction of the eye, or any manmade light that diminishes the ability to view the night sky; often used to denote urban sky glow.

Light trespass: Light falling where it is not wanted or needed, generally caused by a light on a property that shines into the property of others.

Lumen: A unit of luminous flux; the flux emitted within a unit solid angle by a point source with a uniform luminous intensity of one candela. One footcandle is one lumen per square foot.

Luminaire: The complete lighting unit, including the lamp, fixture, and other parts.

Luminance: At a point and in a given direction, the luminous intensity in the given direction produced by an element of the surface surrounding the point divided by the area of the projection of the element on a plane perpendicular to the given direction (measurement units are candelas per unit area). The luminance is the perceived brightness that we see (i.e., the visual effect of the illuminance) reflected, emitted or transmitted from a surface.

Nonessential: Lighting that is not necessary for an intended purpose after the purpose has been served. Does not include any lighting used for safety and/or public circulation purposes (for example, lighting for a business sign is considered essential during business hours, however such lighting is considered nonessential once the business is closed).

Partially shielded: The bulb of the fixture is shielded by a translucent siding and the bulb is not visible at all. Light may be emitted at the horizontal level of the bulb, see Figure 3.

Recessed: When a light is built into a structure or portion of a structure such that the light is fully cut off and no part of the light extends or protrudes beyond the underside of a structure or portion of a structure.

Shielded: When the light emitted from the fixture is projected below a horizontal plane running through the lowest point of the fixture where light is emitted. The bulb is not visible with a shielded light fixture, and no light is emitted from the sides of the fixture. Also considered a full cutoff fixture, see Figure 4.

Temporary lighting: Lighting that is intended to be used for a special event or activity for seven (7) calendar days or less.

Uplighting: Lighting that is directed in such a manner as to shine light rays above the horizontal plane.

Sec. 5 - Notification of requirements.

- (a) The city staff shall endeavor to ask prospective development permit applicants whether or not the proposed project or site work will include any exterior lighting, and to make certain that such applicants are aware of the city's dark sky ordinance.
- (b) As required by Section 3.07 of the city's charter, city staff shall publish a public notice in the city's official newspaper to notify the general public and also prospective developers and local electricians, lighting contractors and electric suppliers of the city's dark sky ordinance.

Sec. 6 - Violations; penalty; appeals and waivers.

- (1) *Violations and legal actions.* If, after investigation, the city staff finds that any provision of this ordinance is being violated, the city staff shall give notice by hand delivery or by certified mail, return receipt requested, of such violation to the owner and/or to the occupant of such premises stating that the violation must be corrected within thirty (30) calendar days following the date of hand delivery or following the postmark date of a mailed notice. If the violation is not corrected within the 30-day period, the city staff may institute actions and proceedings, either legal or equitable, to enjoin, restrain or abate such violation of this ordinance and to collect the penalties for such violation.

- (2) *Penalty.* A violation of a provision(s) of this ordinance shall be punishable by a civil penalty as set forth in Section 1-7 of the city's Code of Ordinances.
- (3) *Appeals.* Any person aggrieved by a decision of the city staff in the interpretation and/or application of this ordinance may appeal the decision to the planning & zoning commission, who shall have the authority to hear and decide such an appeal, in accordance with the procedures applicable to appeals of decisions under the city's zoning ordinance.
- (4) *Waivers.* A waiver to a provision(s) in this ordinance may be granted by the planning and zoning commission, who shall have the authority to hear and decide such a waiver request, where such waiver will not be contrary to the public interest and where, because of conditions peculiar to the property itself and not the result of the actions of the applicant, a literal enforcement of such provision(s) within this ordinance would result in unnecessary and undue hardship.

Secs. 7–20 - Reserved.

ARTICLE II. - LIGHTING REQUIREMENTS

Sec. 21 - Submission of lighting plans.

All development and building permit applications shall include lighting plans showing the location, type, height and lumen output of all proposed and existing exterior lighting fixtures. The applicant shall provide enough information to verify that lighting conforms to the provisions of this ordinance. The city shall have the authority to request additional information in order to achieve the purposes of this ordinance.

Sec. 22 - Permitted fixtures; shielding.

All exterior lighting shall be full cutoff fixtures with the light source fully shielded, with the following exceptions:

- (1) Luminaires that have a maximum output of two hundred sixty (260) lumens per fixture, regardless of number of bulbs (equal to one twenty-watt incandescent light), may be left unshielded provided the fixture has an opaque top to keep light from shining directly up. see Figure 5.
- (2) Luminaires that have a maximum output of one thousand (1,000) lumens per fixture, regardless of number of bulbs (equal to one sixty-watt incandescent light) may be partially shielded provided the bulb is not visible and the fixture has an opaque top to keep light from shining directly up, see Figure 3.
- (3) Floodlights with external shielding may be angled provided that no light escapes above a twenty-five-degree angle measured from the vertical line from the center of the light extended to the ground, and only if the light does not cause glare or light to shine on adjacent property or public rights-of-way, see Figure 6. Floodlights with directional shielding are encouraged, see Figure 7. Photocells with timers that allow a floodlight to go on at dusk and off by 11:00pm are encouraged.
- (4) Festoon lights (such as holiday lights) as defined in section 4 of this ordinance are exempt from the requirements of this ordinance. Flashing festoon lights are discouraged. Festoon lights are encouraged to be turned off after 11:00pm and after close of businesses.

- (5) Sensor-activated security lighting may be unshielded provided it is located in such a manner as to prevent direct glare and lighting into properties of others or into a public right-of-way, and provided the light is set to only go on when activated and to go off within five (5) minutes after activation has ceased, and the light shall not be triggered by activity off the property.
- (6) Vehicular lights and temporary emergency lighting needed by city or other public agencies' emergency, utility or other personnel shall be exempt from the requirements of this ordinance.

Sec. 23 - Light trespass.

It is the intent of this ordinance to eliminate and prevent light trespass through the proper installation of exterior lighting fixtures. All existing and/or new exterior lighting shall not cause light trespass and shall be such as to protect adjacent properties from glare and excessive lighting.

Sec. 24 – Illuminating Engineering Society (IES) guidelines for footcandle output.

The city shall require that any new lighting or existing lighting meet standards for footcandle output as established by the Illuminating Engineering Society (IES).

Sec. 25 - Turning off lights when not in use.

All nonessential exterior commercial and residential lighting is encouraged to be turned off after business hours and/or when not in use. Lights on a timer are encouraged. Sensor-activated lights are encouraged to replace existing lighting that is desired for security purposes.

Sec. 26 - Area lights.

- (1) All area lights, including streetlights and parking area lighting, shall be full cutoff fixtures and are encouraged to be eighty-five-degree full cutoff type fixtures.
- (2) 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. Parking lot lighting shall not exceed Illuminating Engineering Society (IES) recommended footcandle levels, and shall not cause light trespass or light pollution.
- (3) All freestanding area lights, except streetlights, shall be mounted at a height equal to or less than the value $3 + (D/3)$, where D is the distance in feet to the nearest property boundary.

Sec. 27 - Luminaire mounting height.

Freestanding luminaires shall be no higher than twenty-five (25) feet above the stand/pole base, except that luminaires used for public facilities, parks, playing fields and other recreational facilities shall be exempt from the height restriction provided all other provisions of this ordinance are met. Streetlights used on major roads may exceed this standard. Building-mounted luminaires shall be attached only to walls, and the top of the fixture shall not exceed the height of the parapet or roof, whichever is greater.

Sec. 28 - Uplighting.

Uplighting is prohibited, except in cases where the fixture is shielded from the sky by a roof overhang or similar structural covering.

Sec. 29 - Flagpoles.

Upward flagpole lighting by a directional spotlight for each flag is permitted provided that the maximum lumen output is no greater than one thousand three hundred (1,300) lumens. The use of floodlights for flagpole lighting is prohibited. Flags are encouraged to be taken down at sunset to avoid the need for lighting.

Sec. 30 - Service stations.

The average footcandle lighting level for new and existing service stations is required to be as recommended by the Illuminating Engineering Society (IES) for urban service stations.

Sec. 31 - Canopy lights.

All lighting shall be recessed sufficiently so as to ensure that no light source causes glare on public rights-of-way or adjacent property.

Sec. 32 - Towers.

All radio, communication and navigation towers that require lights shall be exempt from this ordinance.

Sec. 33 - Temporary lighting.

Temporary lighting that conforms to the requirements of this ordinance shall be allowed. Nonconforming temporary exterior lighting may be permitted through a conditional use permit (CUP) by the city only after considering the public and/or private benefits which will result from the temporary lighting, any annoyance or safety problems that may result from the use of the temporary lighting, and the duration of the temporary nonconforming lighting.

Sec. 34 - Neon lighting.

Neon lighting is only allowed pursuant to the sign ordinance (chapter ____ of the city's Code of Ordinances).

Sec. 35 – Figures.

The following figures are incorporated into this ordinance as guidelines for the public and the city for use in meeting the intent of this ordinance. The figures only serve as examples. The city does not endorse or discriminate against any manufacturer or company that may be shown, portrayed or mentioned by the examples.

FIGURE 1

What is a True “Full Cutoff” Outdoor Lighting Fixture?



YES

Flat glass lens, eliminates or minimizes direct glare, no upward throw of light.
The housing for these fixtures is available in many styles.



NO

Same fixture as above mounted incorrectly - defeating the horizontal mounting design.
The fixture now produces direct glare and can also produce uplight at steeper mounting angles.



NO

Known as just “Cut-off.”
Center “drop” or “sag” lens with or without exposed bulb, produces direct glare.



NO

Forward-Throw Style.
Exposed bulb in the forward direction produces some direct glare.

FIGURE 2

85° Full Cut-Off Fixture

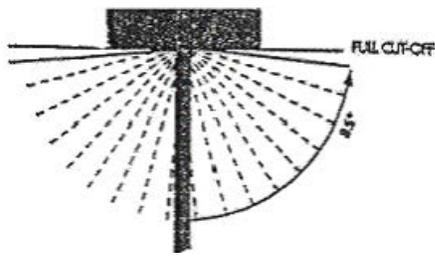


FIGURE 3

Partially Shielded
(Translucent Sliding – Bulb Not Visible)



FIGURE 4

Shielded



FIGURE 5

Unshielded with Opaque Top
(Less than 260 Lumens)



FIGURE 6

Angle of Floodlight with External Shielding



FIGURE 7

Directional Floodlight

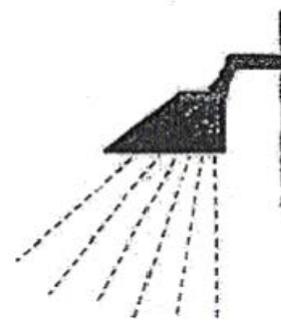


FIGURE 8

NEMA Head Fixtures (examples)



Without Shield



With Shield

DRAFT