



**TEMPLATE FOR  
DEVELOPING  
MUNICIPAL  
DARK SKY ZONING  
REGULATIONS IN  
CONNECTICUT**  
*with USER'S GUIDE*

February 2024

# ***User's Guide***

The rules are a starting point for municipalities interested in regulating or guiding lighting design and application to reduce light pollution. It was developed by Lights Out Connecticut for CT towns, cities, villages, and downtown areas seeking to reduce light pollution through a new or updated lighting policy. Municipalities that adopt these regulations will help resident and businesses to save energy and money, reduce associated carbon emissions, reduce light pollution, and minimize wildlife disruption.

**These model regulations can be adopted in whole or in part—and adapted to suit the needs of the individual community. They are not retroactive.**

In recent years, momentum has been growing to protect the night sky from over illumination. Excessive nighttime lighting results in increased energy consumption and greenhouse gas emissions as well as disrupted ecosystems and plant and animal behavior. Some studies have also pointed to negative human health impacts, including disruption of sleep patterns and the endocrine system.

According to a 2023 study, artificial light at night (ALAN) is increasing at a rate of 9.6 percent per year globally. Leading organizations from the American Medical Association to the United Nations recognize light pollution as an emerging issue for human health and the conservation of wildlife.

Several communities in Connecticut have already adopted nighttime lighting regulations to limit light pollution. However, these rules vary considerably in their language and stringency, which can be confusing for designers, engineers, and code officials who work in multiple jurisdictions. Therefore, there is a need for a common basis and standard, for limiting artificial nighttime lighting across communities in our state, which these model regulations aim to provide.

These model regulations are intended to provide clarity and accuracy for CT towns and cities on current lighting best practices, to guide their rule-making process. These standards are consistent with existing CT state law and the CT State Building Code.

These regulations are informed by the lighting rules adopted by different CT towns and cities as well as the [Five Principles for Responsible Outdoor Lighting](#) developed by IES and DarkSky. The Five Principles establish the primary bases for limiting excessive nighttime lighting: 1) usefulness, 2) shielding, 3) intensity, 4) adaptability, and 5) color.

**LIGHT TO PROTECT THE NIGHT**  
Five Principles for Responsible Outdoor Lighting




**USEFUL**  **ALL LIGHT SHOULD HAVE A CLEAR PURPOSE**  
Before installing or replacing a light, determine if light is needed. Consider how the use of light will impact the area, including the wildlife and the environment. Consider using reflective paints or self-illuminous markers for signs, curbs and steps to reduce the need for permanently installed outdoor lighting.

**TARGETED**  **LIGHT SHOULD BE DIRECTED ONLY TO WHERE NEEDED**  
Use shielding and careful aiming to target the direction of the light beam so that it points downward and does not spill beyond where it is needed.

**LOW LIGHT LEVELS**  **LIGHT SHOULD BE NO BRIGHTER THAN NECESSARY**  
Use the lowest light level required. Be mindful of surface conditions as some surfaces may reflect more light into the night sky than intended.

**CONTROLLED**  **LIGHT SHOULD BE USED ONLY WHEN ITS USEFUL**  
Use controls such as timers or motion detectors to ensure that light is available when it is needed, dimmed when possible & turned off when not needed

**COLOR**  **USE WARMER COLOR LIGHTS WHERE POSSIBLE**  
Limit the amount of shorter wavelength (blue-violet) light to the least amount needed

Most often, these guidelines will be adopted as an ordinance to modify an existing zoning code or other municipal code. Therefore, they are conceived of and written as a model ordinance. However, the text—and its various parts—can easily be adapted to fit other municipal building laws and sustainability measures.

In 2011, the International Dark Sky Association (now DarkSky) and the Illuminating Engineering Society of North America (IES) released a Model Lighting Ordinance, which was the result of extensive efforts by national lighting experts to identify prevailing best practices. However, its complexity and identification of multiple lighting zones requiring different standards did not always match community intent for a straightforward, easy-to-follow law.

This document emphasizes the importance of both reviewing lighting plans during the permitting process and enforcing rules to ensure compliance.

# Section 1. Dark Sky Zoning Regulations

## A. PURPOSE AND INTENT

The purpose of these regulations is to set specific lighting standards in order to reduce glare, raise public awareness of energy conservation, avoid sky glow caused by upward illumination, avoid light trespass onto adjacent properties and public streets, improve public safety through proper lighting, and reduce light pollution, which is known to contribute to wildlife mortality, reduced visibility of the night sky, and adverse impacts to human health.

## B. APPLICABILITY OF REGULATIONS

Whenever an applicant is required to obtain a building permit or whenever exterior lighting is added, replaced, or altered (whether temporary or permanent), the project shall meet these requirements. These regulations apply to the installation or replacement of outdoor and indoor lighting fixtures at commercial, industrial, and residential properties and subdivisions.

## C. SUBMITTAL REQUIREMENTS FOR COMMERCIAL PROPERTIES AND SUBDIVISIONS

1. Projects at commercial properties and subdivisions subject to lighting regulations shall submit the following:
  - a. A site plan indicating the location of all outdoor lighting fixtures.
  - b. A description of each lighting fixture. This description may include, but not be limited to, manufacturer's catalog cuts and drawings (including sections if requested), lamp types, lamp color ratings and lumen output ratings.
  - c. A project lighting plan indicating how the lighting complies with the requirements set out in the Connecticut State Building Code for outdoor and indoor lighting.
  - d. Photometric plans, prepared, stamped and signed by a licensed professional engineer qualified in outdoor lighting, depicting the location of all outdoor lighting fixtures and building-mounted lighting fixtures and a maximum ten-foot by ten-foot grid of both the initial and maintained lighting levels on the site, including any impact on adjacent properties.
  - e. The project lighting plan shall indicate how lighting has been coordinated with any associated landscaping plan to prevent site planning conflicts.
  - f. Any other information the governing authority may determine is necessary to ensure that the proposed lighting complies with the provisions of these requirements.

## D. INTERIOR LIGHTING STANDARDS AT COMMERCIAL PROPERTIES

1. **STATE-LEVEL STANDARDS.** All interior lighting must comply with the requirements of the the Connecticut State Building Code, which incorporates the 2021 International Energy Conservation Code rules on occupancy sensing (C405.2.1), time-switch controls (C405.2.2) and light-reduction controls (C405.2.3).

## E. OUTDOOR LIGHTING STANDARDS AT COMMERCIAL PROPERTIES

1. **STATE-LEVEL STANDARDS.** All exterior lighting must comply with the requirements of the Connecticut State Building Code, which incorporates the Light Pollution Controls amendment to the International Building Code (Sec. 2703), requiring all exterior luminaires to be full cutoff with limited exceptions, and the 2021 International Energy Conservation Code rules on exterior lighting controls (C405.2.7).
2. **DIRECTED LIGHT.**
  - a. **Shielded.** When mounted, the light-emitting part of the outdoor light fixture must emit the light exclusively downward.
  - b. **Light Trespass.** Direct Light from the luminaire shall not be visible at any point along the property line at a height of greater than 5 feet.
  - c. Lighting fixtures for building security or any display purposes shall be:
    - i. top downward (not upward or sideways), and
    - ii. full cut off or fully recessed (flush mounted).
  - d. **Illumination of Signs.** All new or replacement sign lighting shall use light fixtures positioned above the sign and pointed downwards. Uplighting of signs and internal illumination of signs is prohibited. Sign lighting requirements apply to both a freestanding and a sign attached to a building. These requirements do not apply to temporary signs of 30 days or less.
  - e. **Mounting Height Limit.** The mounting height for parking lot lighting shall be 20 feet or less, except that any parking lot light located 50 feet or less from an adjacent property line shall have a mounting height of 16 feet or less.
3. **ILLUMINATION LEVELS.**
  - a. At its brightest illumination level, as depicted on the manufacturer's specification sheet, no outdoor light shall exceed the level of illumination as contained in the [Recommended Practices of the Illuminating Engineering Society](#).
  - b. Parking lots, sidewalks and other areas accessible to pedestrians and automobiles on properties with four or more units, mixed-use development, and non-residential development shall be illuminated with uniform and adequate intensity. Typical standards to achieve uniform and adequate intensity are:

- i. Average horizontal maintained illumination shall not be more than three foot-candle,
- ii. Maximum-to-minimum ratio shall be between 6:1 and 10:1, but not more than 10:1.

**4. USE OF LIGHT CONTROLS.**

- a. Photocells or photocontrols shall be used to extinguish all outdoor lighting automatically when sufficient daylight is available.
- b. All outdoor lighting shall be fully extinguished or be motion sensor operated by 11:00 p.m. or from 1 hour after the close of business until 1 hour before the business reopens, whichever is earlier, or the wattage output for the outdoor lights shall be reduced by at least 75%, or a motion sensor shall turn off outdoor lights after 15 minutes of no activity.
- c. All outdoor lighting fixtures necessary for security purposes shall be activated by motion-sensor devices that turn the light off after 15 minutes of no activity.
- d. All outdoor light fixtures necessary for off-hour access shall be activated by motion-sensor controls.

**5. CORRELATED COLOR TEMPERATURE (CCT).**

- a. All light sources shall have a correlated color temperature of 2700K or less as rated on the manufacturer's specification sheet.
- b. For areas adjacent to waterways or nature preserves, only lights with a CCT rating of 2000K, 18000K, or amber or less shall be used.

**6. EXEMPT LIGHTING.** The following types of lights are exempt from these regulations:

- a. Critical lighting used by the Police Department, Fire Department or Emergency Services.
- b. Historical statues and monuments.
- c. Traditional temporary seasonal/holiday lighting from November to January.
- d. Short-term lighting authorized by a special event permit, for a fair, carnival or similar function.

**7. PROHIBITED LIGHTING.** The following types of lights are prohibited in all districts:

- a. Strips of light intended to outline or highlight a structure, whether composed of linear light tubes or a sequence of individual illumination sources.
- b. Light sources that oscillate or vary in intensity or color to the degree that the modulation is perceptible to the human eye.
- c. Lasers.
- d. Luminous tube lights.
- e. Searchlights.
- f. Illumination of entire buildings. Facade illumination shall be limited to security lighting or lighting of specific architectural features.
- g. Electronic sign boards (i.e. digital billboards) and dynamic electronic signs.

- h. Floodlights that project above the horizontal plane.
- i. Billboards and roof-top signs.

**8. SPORTS FIELD LIGHTING.**

- a. Where outdoor playing fields or other special outdoor activity areas are to be illuminated, lighting fixtures shall be specified, mounted and aimed so that:
  - i. their beams fall within the primary playing area and immediate surroundings,
  - ii. no direct illumination is visible off the site.
- b. Illumination levels shall not exceed the specified lighting levels in the table below:

SPORT	SPECTATOR SEATING CAPACITY	MAXIMUM LED HORIZONTAL ILLUMINATION	SPORT	SPECTATOR SEATING CAPACITY	MAXIMUM LED HORIZONTAL ILLUMINATION
BASEBALL	500 or under	Infield: 15 fc Outfield: 10 fc	FOOTBALL	500 or under	15 fc
	Over 500 & under 2500	Infield: 25 fc Outfield: 15 fc		Over 500 & under 2500	20 fc
	Over 2500 & under 5000	Infield: 35 fc Outfield: 20 fc		Over 2500 & under 5000	35 fc

- c. Controls shall be used to dim sports field lighting during practices, so lighting levels, regardless of the number of spectator seats, does not exceed the lighting levels specified for 500 and under seating capacity.
- d. All power for field lighting shall be reduced by at least 75% one hour after the conclusion of each game and be turned off within two hours after the conclusion of the game.

**9. BOAT LOAUNCH AND DOCK LIGHTING.**

- a. All lighting intended to illuminate an area used as a boat launch or a dock shall have a manufacturer’s BUG rating of U0 and, when installed, the light emitting part of the fixture shall be pointed straight down.
- b. Nautical dock surface lighting shall have a maximum mounting height of 48” from the surface of the dock.
- c. Unshielded lighting intended to serve as a nautical dock pilot light shall be attached directly to the piling and use the lowest level of light sufficient for the intended purpose.

## F. OUTDOOR LIGHTING AT RESIDENTIAL PROPERTIES

1. All newly installed luminaires shall be full cutoff and designed, located, installed and directed in such a manner as to:
  - a. Prevent light trespass onto adjacent properties;
  - b. Confine light to the target area;
  - c. Use the lowest level of light sufficient for the intended purpose;
  - d. Emit light with a rating of correlated color temperature of 2700K or less;
  - e. Be controlled with a timer or motion sensor that:
    - i. Turns lights off from 11pm to 6am, or
    - ii. Turn lights off after 15 minutes of no activity, or
    - iii. Reduces the power output by 75% after 15 minutes of no detected activity.
2. String lighting (or holiday lighting) is permitted subject to the following requirements:
  - a. It shall be used primarily to illuminate patio areas.
  - b. It shall be extinguished by 11:00 p.m.

## G. OUTDOOR LIGHTING AT SUBDIVISIONS

"Subdivision" means the division of a tract or parcel of land into three or more parts or lots for the purpose, whether immediate or future, of sale or building development, expressly excluding development for municipal, conservation or agricultural purposes, and includes re-subdivision.

1. Any outdoor lighting fixture proposed and installed within any subdivision, whether residential or commercial, shall:
  - a. be fully shielded,
  - b. have a correlated color temperature of 2700K CCT or less, and
  - c. Be controlled with a timer or motion sensor to:
    - i. Turns lights off from 11pm to 6am, or
    - ii. Turn lights off after 15 minutes of no activity, or
    - iii. Reduces the power output by 75% after 15 minutes of no detected activity.

## H. STREET LIGHTING REQUIREMENTS

1. Any streetlight fixture proposed for installation within any subdivision, whether residential or commercial, shall:
  - a. be fully shielded, and
  - b. have a correlated color temperature of 2700K or less.
  - c. be controlled by a dimmer that from 10PM until 5AM either:
    - i) reduces the energy output for the streetlights by at least 75% or
    - ii) turns the streetlight off.

2. Streetlight installation or placement shall be limited to locations where the need for a streetlight has been determined, based on objective criteria. *(Adoption of a municipal streetlight warranting policy is recommended for establishing the objective criteria.)*
3. Prior to streetlight installation or replacement, the Town or City Engineer shall determine whether reflective roadway markings or reflective signage are appropriate and safe for the situation in lieu of street lighting. Reflectorized roadway markings, lines, warning signs, informational signs or other passive means shall be utilized in place of street lighting except at intersections of two or more streets or highways.

## I. ENFORCEMENT

These regulations shall be enforced by the Zoning Enforcement Officer or Building Inspector empowered to inspect any exterior lighting and, for any violation of these Regulations, issue an order in writing for violations to be corrected or terminated.

## DEFINITIONS

**BUG** – Stands for “backlight, uplight, and glare.” *Backlight* is the light directed behind the fixture, *uplight* is any light directed upward above the horizontal plane of the luminaire, and *glare* is the amount of light emitted from the luminaire at high angles.

**Correlated Color Temperature (CCT)** – A specification of the color appearance of light emitted by a light source, measured in degrees Kelvin (K). Higher Kelvin ratings appear bluer in color, while lower Kelvin ratings appear more amber in color. For comparison purposes, candle light has a color temperature of approximately 1800 Kelvin.

**Dimmer** – A dimmer is a device connected to a light fixture and used to lower the brightness of the light.

**Direct Light** – Light that is visible from either the light source or reflected off the fixture’s housing.

**Facade Lighting** – Facade lighting is used to illuminate the exterior facade of a building.

**Fixture** – A gas-powered, battery-powered, solar-powered or electrically powered device that is secured to a wall, ceiling, pole, or post that is used to hold one or more lamps (or jets) and is intended to emit light.

**Flood Light** – Any light fixture or lamp that incorporates a reflector or a refractor to concentrate light output into a directed beam in a particular direction.

**Foot-candle** – A unit of illuminance. One footcandle is one lumen per square foot (lm/ft<sup>2</sup>).

**Full Cutoff** – Fully shielded or emitting no light above the lowest light-emitting horizontal plane of the fixture.

**Glare** – The effect of visual discomfort resulting from insufficiently shielded light sources shining horizontally in the field of view; intense and sometimes blinding light that reduces visibility.

**Illumination level** – The measured amount of illumination after approximately one hundred (100) hours of burn-in time.

**Landscape Lighting** – The outdoor illumination system in public or private spaces for purposes of enhancing safety, security, aesthetics, event applications, and recreation.

**Light Pollution** – A form of excessive nighttime light that can cause adverse effects and degrade environmental quality.

**Light Trespass** – 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.

**Luminaire** – The complete lighting unit designed to distribute the light, position and protect the light sources, and connect the light sources to the power supply. A light fixture consists of a lamp, a ballast, and a lens. Another word for a “light fixture.”

**Maintained Illumination** – The amount of illumination below which the light level is not supposed to fall throughout system life measured at seventy percent (70%) of rated lamp life.

**Motion-Sensor Device** – A motion-sensor device is programmed to turn on when motion is detected and to turn off typically after 15 minutes of no activity.

**Mounted Fixture Height** – The height of a complete fixture from the top point of any part of the fixture to the ground directly below where the supporting pole or wall or other support structure meets the ground surface.

**Outdoor Lighting** – The night-time illumination of an outside area or object by any manufactured device located outdoors that produces light by any means.

**Recessed Light Fixture** – Recessed lighting is mounted and installed into the precise hole in the ceiling or overhang. Fixtures emit downward light from the hole in the ceiling.

**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.

**Artificial sky glow** – That part of the sky glow which is attributable to artificial 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.

**Subdivision** – The division of a tract or parcel of land into three or more parts or lots for the purpose, whether immediate or future, of sale or building development, expressly excluding development for municipal, conservation or agricultural purposes, and includes resubdivision.

**Temporary Lighting** – Any lighting fixture or instrument producing light that can be moved or relocated in a moment’s notice and not exceed 30 continuous days of use in a calendar year.

**Timer** – A light-switch timer is an electronic mechanism that controls lighting within any environment. Often installed to save energy, they can be controlled either manually or electronically via a digital display.

**Watts** – The measure of the amount of energy (electricity) an electrical lamp uses.