

*Staff comments are in italics below.*

## **5.25 Outdoor Lighting**

*The opening paragraph has been removed and will be relocated to the staff report and the legislative memo to City Council. Justifications or the reasoning behind codes are not typical in the UDC.*

### **5.25.1 Purpose**

The purpose of this Lighting Ordinance is to:

- A. Minimize adverse impacts of lighting such as light trespass, glare and skyglow.
- B. Protect the natural environment from artificial light at night.
- C. Promote energy efficiency.
- D. Foster an environment that supports and/or enhances commerce and lawful nighttime activities.

### **5.25.2 Applicability**

- A. All lighting that causes exterior illumination after sunset and before sunrise shall be subject to the requirements of this Section 5.25.
- B. Permits for new construction of single-family and two-family residences, and applications for all site plan projects, shall include lighting plans showing location, type, height, CCT, CRI, Lumen output, Illuminance, and number of all Luminaires and exterior lighting control systems. The applicant shall provide sufficient information to verify that lighting conforms to the provisions of Section 5.25.

*This covers all new construction, including all types of site plans (for administrative amendment, planning commission, city council, and special exception use) plus single- and two-family new homes (which do not require a site plan).*

- C. For all electrical permits for exterior lighting, applications shall provide sufficient information to verify that the proposed lighting conforms to the provisions of Section 5.25.

*Modified to require all electrical permits for new lighting fixtures to comply with this ordinance. Previously required all single-family building permits to fully shield. It would be extremely cumbersome to require contractors applying for storm windows or a porch railing repair to also shield their light fixtures.*

*Also, please note that electrical permits are not required for “minor repair work”. Minor repair work is defined as “electrical wiring that has a value of \$100.00 or less”. If a homeowner is replacing one or two light fixtures herself, then it would be easy to determine a permit is not required. Once a licensed electrician is hired, this value is likely exceeded by default.*

### **5.25.3 Exemptions**

The following Luminaires and lighting system are exempt from the provisions of this Lighting Ordinance.

- A. Any temporary light installation on private property is permitted for a total of 90 days in one calendar year. Examples include seasonal decorative lighting and lighting for temporary public art installations, screenings, performances, and art fairs. Commercially installed temporary decorative lighting that is not in compliance with shielding and light trespass limits specified in Section E.2a and E.2b shall not exceed 1000 Lumens per parcel.

*“Commercially installed” lighting is assumed by staff to mean wrapping buildings and/or large trees in holiday lights. This could occur on a business (like Lewis Jewelers’ old location) or a residence (like the huge pine trees on West Huron and Miller Streets that are in private yards). This topic needs discussion from the Planning Commission.*

*1000 lumens = a 75 watt bulb = 2000 string lights*

*2000 string lights = approximately 600 feet of lights*

*This would go around a stand alone 40’x80’ building less than three times*

*It is reasonable that lighting for things like art or craft shows or a festival with a band on stage on private property would have a commercial installer do the work. Is 1000 Lumens enough? Perhaps there could be a lesser number of days commercial installations may be left up, like 2-4 weeks, without or with a higher lumen limit?*

- B. Lighting for flags of the United States of America and the State of Michigan.
- C. Any light installation determined by the Historic District Commission to contribute to the historic character of a property listed in a local or state historic district or on the National Register of Historic Places.

*Staff believes this paragraph is necessary in case a conflict arises between this code and the Historic Preservation chapter, but expects it to be used rarely. No historic lighting fixtures have been identified in 14 years of reviewing applications. It would apply only to lighting installed before 1945.*

#### **5.25.4 Exterior Lighting Specifications**

##### **A. Color Spectrum Management**

- 1. All permanent non-residential and multi-family lighting installations shall have a minimum Color Rendering Index (CRI) of 70.
- 2. All permanent non-residential and multi-family lighting installations shall have a Correlated Color Temperature (CCT) of no greater than 3000 K.

##### **B. Luminaire Design and Installation**

- 1. Light Trespass
  - a. Light Trespass beyond the property line shall at no time exceed 0.1 Foot-Candle onto any property that is in a Residential Zoning District or zoned PL Public Land, or in the public right of way.
  - b. In the D1 Downtown Core and D2 Downtown Interface districts, the total Illuminance from all sources at the property line shall not exceed 8 Foot-Candles.
  - c. In all other zoning districts, Light Trespass beyond the property line shall at no time exceed 2 Foot-Candles onto any property.

- d. Except in D1 Downtown Core and D2 Downtown Interface districts, Illuminance shall be measured at any point within the receiving property, including at any height above grade at the property line.
- 2. No Luminaire in any district shall cause Glare onto any property in a Residential Zoning District or zoned PL Public Land, or onto the public right of way.
- 3. Where lighting targets primarily the ground or horizontal targets, including but not limited to parking areas, loading docks, recreational areas, and site entrances, Luminaires shall meet Fully Shielded criteria, so that no light will cause Light Trespass as specified in Section 5.25.5.B.1, or Glare.
- 4. Where lighting targets primarily features above grade or vertical targets, including but not limited to architectural features, signs, landscaping, fountains, and sculptures, Luminaires shall be partially shielded and shall be installed and aimed to minimize their output past the object being illuminated, skyward or otherwise. Such lighting shall not cause Light Trespass as specified in Section 5.25.5.B.1, or Glare.
- 5. The maximum average Illuminance on a building facade shall be 1 Foot-Candle on any property in a Residential Zoning District or zoned PL Public Land, and 3 Foot-Candles on any property in any other zoning district, as measured at a distance of 10 feet from the facade, provided that the Illuminance does not violate the light trespass limit specified above in Section 5.1.5.B.1. The measurement shall be made facing the facade. Facade illumination from above, rather than below, is strongly encouraged and must be shielded from glare as specified above in Section 5.25.5.B.3.

*This will sometimes be difficult to enforce. Some neighboring buildings are closer than 10 feet from a building façade; light from streetlights or nonconforming neighboring properties could inflate the reading. Staff understands that this was intended for decorative lighting, but as written applies to any lighting on any façade, like a light over a door that is 3' from the property line in an R1D district (6' from the neighboring house). If 1 Foot-Candle will accommodate a reasonable entry light, this may not be a concern.*

- 6. Decorative Building Façade and Landscape Illumination
  - a. For properties in a Residential Zoning District or zoned PL Public Land, Illumination for building facades and/or landscapes whose primary purpose is decorative or for advertising is prohibited between 12:00 am and 6:00 am.
  - b. In all other districts, it is prohibited between 12:00 am and 6:00 am except during Business Hours. The lighting shall be controlled by an automated timer system.
- 7. Motion-activated lighting systems shall not be activated by movement beyond the property boundary.

8. Under-canopy lighting for such applications as gasoline service stations, hotel or theater marquees, or Drive Through Facilities shall be Fully Shielded. The average maintained Illumination in the area directly below the canopy shall not exceed 20 Foot-Candles, with no value exceeding 30 Foot-Candles.
9. Wall- or pole-mounted floodlights shall be aimed no higher than 45 degrees below horizontal, and they must comply with shielding and Light Trespass limits as specified in Section 5.25.5.B.1 and 5.25.5.B.2.

*Added "Wall- or pole- mounted" to distinguish from ground mounted landscape or uplights on facades.*

10. The following lighting systems are prohibited: Any dynamically changing lights, including strobe lights, or lights that are programmed to be flashing, blinking, or moving.

*Moved here from an earlier stand-alone section.*

#### **C. Parking Lots**

1. Parking lots shall not exceed maximum Illuminances at all unobstructed points of 6 Foot-Candles at any time after sunset and before sunrise. Illuminances shall be measured facing upward, three feet above the lot surface.
2. Lighting for parking areas and vehicular and pedestrian traffic ways on sites that contain no residential uses shall be extinguished nightly beyond Business Hours. For after-hours site safety lighting, or uses with no Business Hours, lighting after sunset and before sunrise shall not be in excess of 2 Foot-Candles.

*Staff removed the section on private outdoor recreation facilities. Their numbers are limited – Golf & Outing, the Racquet Club, private school fields, three subdivision facilities -- and staff believes they should install their fixtures to comply with this ordinance (unless there is a compelling reason we are not aware of).*

#### **5.25.6 Indoor Lighting**

Indoor lighting shall not be the source of exterior Light Trespass or Glare as specified in Section 5.1.5.B.1 and 5.1.5.B.2 above.

## Article VI: Nonconformities

### 5.33 Special Standards

#### 5.33.6 Nonconforming Lighting Installations

Nonconforming lighting installations may be used, maintained, or repaired in the same form and type as they existed at the time they became nonconforming. Upon the first occurrence of any of the following, all exterior lighting installations shall be brought into compliance with Section 5.25 Outdoor Lighting:

- A. An application for any site plan or plat, or an electrical permit for an exterior modification;

*This previously required fixtures to be made conforming with any building permit for an exterior modification, which staff believes strongly is too onerous to enforce. Staff has modified this to apply to any exterior electrical permit, such as a permit for a new lighted sign, or new mechanical equipment like an air conditioning unit or commercial ventilation system that requires electricity to operate.*

- B. Issuance of a certificate of occupancy for a property previously determined by the Building Official to be abandoned for at least six (6) months;

*The removed item C in this section stated that the replacement of at least 10% of the site exterior lumen or wattage lighting load would trigger the need for compliance with this section. What this means is unclear to staff. If it means changing lightbulbs, staff has no way of knowing when that work is being performed. If it requires an electrical permit, it is now captured under item A.*

*The removed item D in this section would require all exterior lighting to be in compliance on July 31, 2029. An end date only 9 years away would mean a required crush of city-wide enforcement at that time to bring thousands of properties into compliance.*

## Article VIII: Definitions

### 5.37.2 Specific Terms

#### Business Hours

The period from one-half hour before to one-half hour after established hours of operation.

#### Color Rendering Index (CRI)

A standard measure of how closely the color spectrum of a light source corresponds to that of a pure thermal spectrum, for sources having C CT < 5000 K. A value of CRI = 100 indicates perfect correspondence.

#### Correlated Color Temperature (CCT)

Quantity describing the perceived color of light. It is specified by the temperature of a pure thermal spectrum having the same perceived color. The corresponding thermal temperature is ordinarily given in degrees Kelvin.

#### Foot-Candle

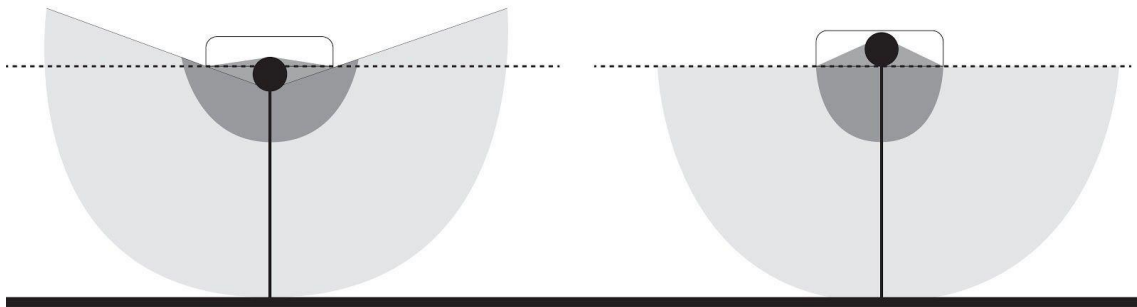
A measurement of light intensity. One Foot-Candle is enough light to saturate a one-foot square with one lumen of light. This brightness is measurable with a light meter.

*Definition simplified.*

### **Fully Shielded**

Designation for a Luminaire from which no light is emitted at or above a horizontal plane drawn through the lowest light-emitting portion.

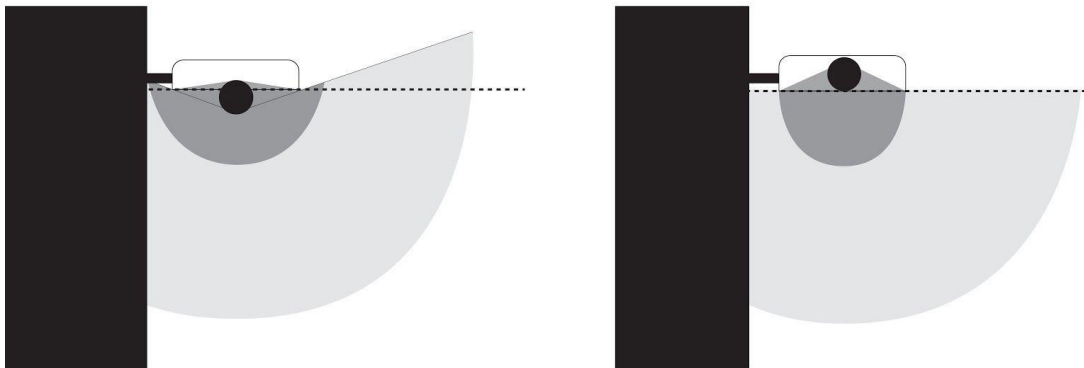
POLE LIGHT



NON-COMPLIANT LIGHT

COMPLIANT FULLY SHIELDED

WALL MOUNTED LIGHT



NON-COMPLIANT LIGHT

COMPLIANT FULLY SHIELDED

### **Glare**

Excessive brightness from a light source whose contrast against the background causes impaired vision or physical discomfort.

### **Illuminance**

The intensity of light falling at a given place on a lighted surface, measured in Foot-Candles; illumination.

*Removed "lux" because it is not used or defined in the ordinance.*

### Light Trespass

Light that is cast beyond the boundary of the property on which the lighting installation is sited.

### Lumen

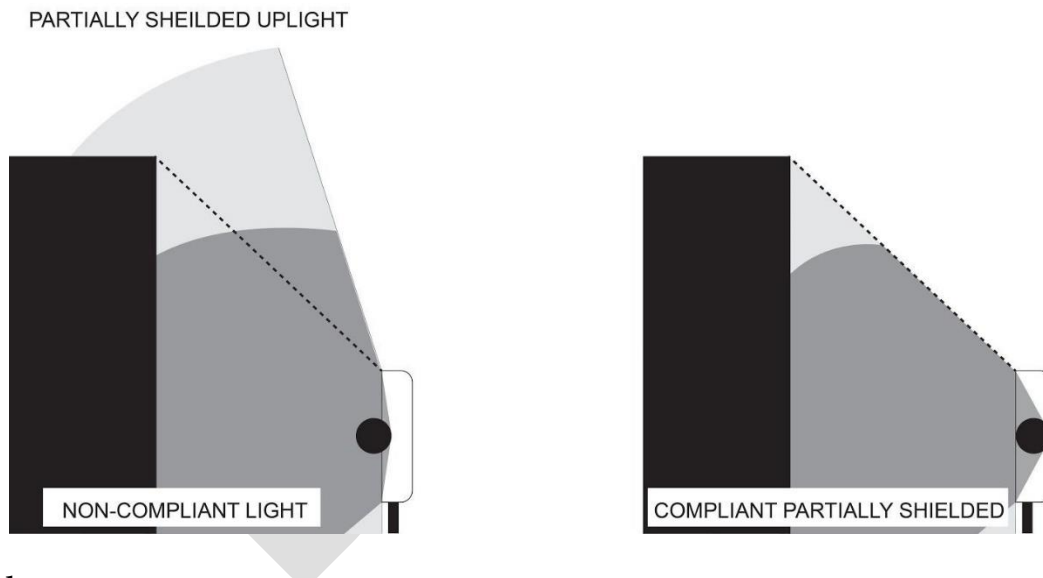
The measure of brightness from a light source; a unit measuring the power per solid angle of visible light emitted by a source. A 60-watt incandescent bulb produces about 800 Lumens.

### Luminaire

A complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply, excluding the mounting surface or pole.

### Partially shielded

Designation for a Luminaire from which some light is emitted at or above a horizontal plane drawn through the lowest light-emitting portion, for the purpose of illuminating specific targets above grade. Any light from the Luminaire that is not illuminating the target must be fully shielded.



### Skyglow

Unnatural brightening of the night sky due to artificial light at night.

*It would be helpful if the illustrations could be made a bit more intuitive. Maybe have a sample with the parts labeled (bulb, shield, dashed line, dark v light?) Also, shielded spelling needs to be corrected on the last examples.*