

# CHAPTER 33

## OUTDOOR LIGHTING CODE

### Table of Contents

33.01	PURPOSE AND INTENT .....	3
33.02	CONFORMANCE WITH APPLICABLE CODES .....	3
33.03	DEFINITIONS .....	3
33.04	APPLICABILITY .....	6
	(1) New Uses, Buildings, and Major Additions or Modifications .....	6
	(2) Minor Additions .....	6
	(3) Residential Fixtures .....	7
	(4) Resumption of Use After Abandonment .....	7
33.05	GENERAL OUTDOOR LIGHTING STANDARDS .....	7
33.07	SPECIAL USES .....	8
	(1) Recreational Facilities .....	8
	(2) Display Lots .....	8
	(3) Service Station Canopies .....	9
	(4) Parking Facilities .....	9
	(5) Building Lighting .....	10
	(6) Public Private Street Lighting .....	10
	(7) Building Lighting .....	11
	(8) Flag Illumination .....	11
33.08	LIGHTING PLANS .....	11
	(1) Submittal Required .....	11
	(2) Additional Submission .....	12
	(3) Subdivision Plats .....	12
	(4) Lamp or Fixture Substitution .....	12
	(5) Plan Recover .....	12
	(6) Certification .....	12
	(7) Fee .....	12
33.09	EXEMPTIONS .....	12
33.10	ENFORCEMENT AND PENALTIES .....	13

(1) Violations ..... 13  
(2) Penalties ..... 13

# OUTDOOR LIGHTING CODE

## 33.01 PURPOSE AND INTENT

The purpose of this Code is to enhance the attractiveness and livability of the community for its citizens, both during the day and at night without compromising the safety, security, and wellbeing of persons engaged in outdoor nighttime activities. It is the intent of this Code to define practical and effective measures by which the obtrusive aspects of excessive and careless outdoor light usage can be minimized. This Code is designed to curtail the degradation of the nighttime visual environment by requiring lighting practices that direct appropriate amounts of light where and when it is needed, increasing the use of energy-efficient sources, and decreasing the wastage of light, sky glow, and glare resulting from over-lighting and poorly shielded or inappropriately directed lighting fixtures.

## 33.02 CONFORMANCE WITH APPLICABLE CODES

All outdoor illuminating devices shall be installed and maintained in conformance with all other applicable provisions of the City of Middleton Code of Ordinances, including but not limited to the Building Code, the Electrical Code, the Sign Code, and the Zoning Code.

## 33.03 DEFINITIONS

As used in this Code unless the context clearly indicates otherwise, certain words and phrases shall mean the following:

### Class A Lighting

All exterior lighting used for, but not limited to, exterior sales or eating areas, assembly or repair areas, advertising and other signs, recreational facilities and other similar applications where color rendition is important to preserve the nature or purpose of the activity. Recognized Class A uses are: outdoor eating and retail food or beverage service areas; outdoor maintenance areas; display lots; assembly areas such as concert or theater amphitheaters; athletic fields; training grounds and fair grounds.

### Class B Lighting

All exterior lighting used for, but not limited to, illumination for roadways, walkways, equipment yards, parking lots, building perimeters and outdoor security where general illumination for safety and/or security of the grounds is the primary concern.

### Class C Lighting

Any exterior lighting used for decorative effects including, but not limited to, architectural illumination, flag and monument lighting and illumination of landscape trees, bushes and plants.

### Decorative Building Lighting

Lighting used primarily to enhance the building's architectural appearance through the illumination of the building.

### Decorative Landscape Lighting

Lighting used primarily to enhance the landscape through the illumination of trees, bushes, plants, flag poles and monuments.

### Display Lot or Area

Outdoor areas where active nighttime sales of automobiles, boats, tractors, building supplies, gardening or nursery products occurs, where swap meets are held or outdoor product assembly occurs and where accurate color perception of merchandise by customers is required. Uses not on this list must be approved as display lot uses by the Planning Director.

### Flood Lamp

A lamp designated as such by the manufacturer designed to direct its output in a specific direction but with a diffusing glass envelope to illuminate a wide area.

### Footcandle

The illuminance on a one square foot surface of which there is a uniformly distributed flux of one lumen. One footcandle is equal to one lumen per square foot. Unless otherwise expressly provided, footcandle measurements in this Code shall refer to ground level measurements of luminance at full maintained output as used rather than initial luminance (the amount of luminance when new).

### Cutoff Light Fixture

A lighting fixture constructed in such a manner that no light is emitted above the horizontal, and where the intensity at 80 degrees from nadir (a point directly below the light fixture) is no greater than 10% of lamp lumens.

### Shielded Light Fixture

A lighting fixture constructed in such a manner that all light emitted by the fixture, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal as determined by photometric test or certified by the manufacturer. Any structural part of the light fixture providing this shielding must be permanently affixed.

### Glare

The sensation produced by a bright source within the visual field that is sufficiently brighter than the ambient level to which the eyes cannot adapt to, thus causing annoyance, discomfort, or impairment of visual performance. The magnitude of glare may be affected by factors such as the size, position, brightness of the source, and on this brightness level to which the eyes are adapted.

### Holiday Lighting

Any low wattage seasonal decorative lighting.

### Installation

The attachment or assembly, whether or not connected to a power source, of any outdoor light fixture affixed to the ground, a building, a pole or any other supporting structure or device.

### Light Pollution

Any light spilling in any direction serving no intended purpose.

### Lighting Sources

Any lamp or manufactured device emitting energy that is capable of exciting the retina and producing a visual sensation. Such devices shall include, but are not limited to, incandescent, fluorescent, carbon arc, quartz-iodine/tungsten halogen, low pressure sodium, high pressure sodium, metal halide, mercury vapor and LED lamps.

### Light Trespass

Any light falling across property boundaries.

### Lumen

Unit of luminous flux; used to measure the amount of light emitted by lamps.

### Luminaire

The complete lighting assembly, not including the support assembly. Lighting assemblies which include multiple unshielded or partially shielded lamps on a single pole or standard shall be considered a single luminaire.

### Multi-class or Multi-use Lighting

Any outdoor lighting used for more than one purpose, such as lighting used for both security and decoration.

### Nuisance Lighting

Any excessive lighting causing glare, trespass or pollution and constituting a nuisance as defined in Chapter 17 of the Middleton Code of Ordinances.

### Opaque

Opaque means that a material does not transmit light from an internal illumination source. Applied to sign backgrounds, means that the area surrounding any letters or symbols on the sign either is not lighted from within, or allows no light from an internal source to shine through it.

### Open Parking Facility

A parking facility without an overhead covering and shall include the roof level of a multilevel parking structure or ramp.

### Outdoor Canopy

A free-standing roof structure without side walls which may or may not be attached to the roof of an adjacent building and which shall include but shall not be limited to canopies over gas station pumps or canopies at convenience stores.

### Outdoor Recreation Facility

An area designed for active recreation, whether publicly or privately owned, including, but not limited to, baseball diamonds, soccer and football fields, golf courses, tennis courts and swimming pools.

### Person

Any individual, tenant, lessee, owner, operator, or any public, private, nonprofit, or commercial entity including, but not limited to, firm, business, partnership, joint venture, association, corporation, municipality, agency or governmental agency.

### Security Lighting

Lighting for the safety of persons and property.

### Sign, Externally Illuminated

A sign illuminated by light sources from the outside the sign.

### Sign, Internally Illuminated

A sign illuminated by light sources enclosed entirely within the sign cabinet.

### Sign, Neon

A sign including luminous gas-filled tubes formed into text, symbols or decorative elements and directly visible from outside the sign cabinet.

### Sky Glow

The brightening of the night sky that results from the scattering of artificial visible radiation by the constituents of the atmosphere.

### Spot Lamp

A specific type of lamp so designated by the manufacturer designed to direct its output in a specific direction and with a clear or nearly clear glass envelope.

### Translucent

Permitting light to pass through but diffusing it so that persons, objects, etc., on the opposite side are not clearly visible.

### Uniformity Ratio

A ratio describing the uniformity of light levels across an area expressed as the ratio of average to minimum light levels. Unless otherwise specified, uniformity ratios in this Chapter shall be average to minimum and measured according to a grid across the entire area to be lighted with each square measuring four feet by four feet.

### Use, Abandonment of

The relinquishment of a property, or the cessation of a use or activity by the owner or tenant for a period of six months, excluding temporary or short term interruptions for the purpose of remodeling, maintaining, or otherwise improving or rearranging a facility. A use shall be deemed abandoned when such use is suspended as evidenced by the cessation of activities or conditions which constitute the principle use of the property.

## **33.04 APPLICABILITY**

### **(1) New Uses, Buildings, and Major Additions or Modifications**

No new land uses, developments, buildings, or structures nor any major additions or modifications to developments, buildings or structures that require a building permit or other authorization from the City, shall be approved unless all outdoor lighting fixtures on the development parcel meet the requirements of this Code. A major addition or modification is any building addition or modification that increases by fifty (50) percent or more the number of dwelling units or gross floor area or parking spaces either with a single addition or with cumulative additions subsequent to the effective date of this Code.

### **(2) Minor Additions**

Additions or modifications of less than fifty (50) percent to existing uses as described in subsection (1) above, which include changes or additions to outdoor lighting and that require a permit, shall require the submission of a complete outdoor lighting inventory and site plan detailing all existing and any proposed new outdoor lighting. Any new lighting on the site shall meet the requirements of this Code. The site luminance as measured in footcandles after the modifications are complete shall not exceed that on the site before the modification., or that permitted by this Code, whichever is larger.

### **(3) Residential Fixtures**

Any new light fixtures 2500 lumens and over, any new outdoor light fixtures above the eave, or any new light fixture attached to buildings or poles separate from the residence must comply with the provisions of this Ordinance. Examples of lamp types of 2500 lumens and less are:

- 100 Watt Standard Incandescent
- 15 Watt Cool White Fluorescent
- 15 Watt Compact Fluorescent
- 18 Watt Low Pressure Sodium
- 35 Watt High Pressure Sodium
- 18 Watt LED

### **(4) Resumption of Use After Abandonment**

If a property or use with non-conforming lighting is abandoned, then all outdoor lighting shall be reviewed and brought into compliance with this Code before the use is resumed.

## **33.05 GENERAL OUTDOOR LIGHTING STANDARDS**

Except as otherwise expressly provided elsewhere:

### **(1) Lighting Zones**

Except as specifically provided elsewhere in this Chapter, the standards applicable to a particular parcel shall depend upon its lighting zone designation which shall be determined at the time of application. Such determination shall be based upon the following criteria:

#### **(a) Zone E3 Commercial**

This zone is intended for areas where relatively high ambient light levels are expected. This includes all parcels within the B-1, B-2, B-3, B-4 and I districts except where such uses directly abut any single family residential uses.

#### **(b) Zone E2 Residential**

This zone is intended for areas where medium ambient light levels are expected. This includes the R-1, R-2, R-3 and R-3A districts and abutting areas.

#### **(c) Zone E1 Parks and Conservancy**

This zone is intended for areas where low to no ambient light is expected. This zone includes all parcels within the Ag, CO, CO-L, CO-U districts, City Parks, Conservancies and green space.

### **(2) All new outdoor lighting fixtures shall be shielded as follows:**

- (a) In all zones and for all classes of lighting where initial output of the fixture is equal to or greater than 2500 lumens, the fixture shall be fully shielded.
- (b) In lighting zones E3 and E2, where fully shielded fixtures are less than 2500 lumens, lamps shall not be aimed higher than forty-five (45) degrees above straight down when the source is visible from any off-site residential property or public roadway, park or conservancy.
- (c) Only fully shielded fixtures may be used in lighting zone E1.

### **(3) All new outdoor lighting fixtures shall be placed so as to eliminate trespass greater than 0.5 footcandles on the ground at the lot line.**

### **(4) Multi-use lighting must conform to the shielding and timing restrictions, if any, that apply to the most restrictive included use.**

### **(5) All outdoor lighting fixtures, unless expressly exempted from the terms of this Code must be installed and maintained according to approved plans.**

- (6) No pole mounted luminaire shall be higher than thirty-five (35) feet except for lighting for athletic fields.
- (7) Lighting Public Nuisance  
Nothing in this Chapter shall be construed to permit lighting that otherwise constitutes a public nuisance. Any lighting producing excessive glare, pollution or trespass may be deemed a public nuisance under Chapter 17 of the Middleton Code of Ordinances or Wis. Stats. Chap. 823 subject to the remedies provided therein.

### **33.07 SPECIAL USES**

#### **(1) Recreational Facilities**

(a) Classes of Facilities

Within this subsection, different classes of recreational facilities shall be distinguished according to the level of play they accommodate:

1. Class I and II levels of play refer to typical college, semi-professional, professional or national levels.
2. Class III or IV levels of play refer to typical amateur or municipal league, elementary to high school, training, recreational or social levels.

(b) Shielding

Fully shielded lighting is required for fields designed for Class III or IV levels of play except as provided herein. Facilities designed for Class I and II levels of play shall utilize luminaires with minimal uplight consistent with the illumination constraints of the design. Where fully shielded fixtures are not utilized, luminaires shall be:

1. Equipped with internal and/or external glare control louvers and installed so as to minimize uplight and offsite light trespass, and
2. Installed and maintained with aiming angles that permit no greater than five percent (5%) of the light emitted by each fixture to project above the horizontal.

(c) Luminance

All lighting installations shall be designed to achieve no greater than the minimal luminance levels for the activity as recommended by the Illuminating Engineering Society of North America (IESNA). Current IESNA standards applicable to such lighting shall be kept on file with the Zoning Administrator.

(d) Light Trespass

The installation shall limit light trespass to the maximum extent possible consistent with the illumination constraints of the design.

(e) Certification

Every such lighting system design and installation shall be certified by a qualified registered engineer as conforming to all applicable restrictions of this Code.

#### **(2) Display Lots**

(a) Shielding

All display lot lighting shall utilize fully shielded luminaires that are installed in a fashion that maintains the fully shielded characteristics.

(b) Luminance

The display lot shall be designed to achieve no greater than the minimal luminance levels for the activity as recommended by the Illuminating Engineering Society of North America (IESNA). Current IESNA standards shall be kept on file with the Zoning Administrator.



(c) Off-site Spill

The display lot shall limit off-site spill to a maximum of 2.0 footcandles at any location on any nonresidential property, and 0.5 footcandles at any location on any residential property, as measurable from any orientation of the measuring device.

(d) Certification

Every display lot lighting system design and installation shall be certified by a qualified registered engineer as conforming to all applicable restrictions of this Ordinance.

**(3) Service Station Canopies**

(a) Shielding

All luminaires mounted on or recessed into the lower surface of service station canopies shall be fully shielded and utilize flat lenses.

(b) Total Under Canopy Output

The total light output used for illuminating service station canopies, defined as the sum of all under-canopy initial bare-lamp outputs in lumens, shall not exceed twenty (20) foot-candles. Any luminaire located under a canopy including any lighting within signage or illuminated panels over the pumps, is to be included toward the total at full initial lumen output.

(c) Certification

Every service station canopy lighting system design and installation shall be certified by a qualified registered engineer as conforming to all applicable restrictions of this Ordinance.

**(4) Parking Facilities**

A lighting system for parking facilities and outdoor merchandizing areas shall be designed to provide the lighting intensities and uniformities described as follows:

(a) Open Parking Facilities

The illumination requirements of an open parking facility depend on the amount of usage the facility receives. Three levels of activity are hereby established as High, Medium and Low, reflecting both traffic and pedestrian activity. The following examples are nonexclusive and include:

1. High Activity

Facilities for major or league athletic events or major cultural or civic events.

2. Medium Activity

Shopping centers, retail parking areas, hospital and clinic parking areas, transportation parking (airports, commuter lots, etc.), cultural, civic or recreational events, and fast food facilities.

3. Low Activity

Employee parking, educational facility parking, office parks and church parking.

(b) Horizontal Luminance for Parking Facilities

1. Open Parking Facilities

Level of Activity	General Parking & Pedestrian Area			Vehicle use Area (Driveway)		
	Min. Footcandles on Pavement	Max. Avg. Footcandles on Pavement	Max. Uniformity Ratio (Avg. Min) (1)	Min. Footcandles on Pavement	Max. Avg. Footcandles on Pavement	Max. Uniformity Ratio (Avg. Min) (1)
High	0.6 fc	3.75 fc	5:1	0.67 fc	2.5 fc	5:1
Medium	0.4 fc	2.5 fc	5:1	0.33 fc	1.5 fc	5:1
Low	0.2 fc	1.5 fc	5:1	0.125 fc	1.0 fc	5:1

2. Covered Parking Facilities

Areas	Min Footcandles on Pavement	Min. Footcandle Avg. on Pavement	Max. Avg. Footcandles on Pavement	Max. Uniformity Ratio (Avg:Min) <sup>1</sup>
General Parking and Pedestrian Areas	1.25 fc	5 fc	9 fc	4:1
Private Controlled Entry Parking	0.75 fc	3 fc	6 fc	4:1

<sup>1</sup> Not Mandatory within four feet of the pavement edge.

**(5) Building Lighting**

- (a) Building mounted lights shall be mounted and installed so that all light is directed downward, unless the lights are decorative lighting in which case the light shall be directed toward the building.
- (b) Fixtures shall be fully shielded.
- (c) No wall packs or similar lights shall be permitted unless the cutoff angle effectively eliminates visible glare from beyond the property lines.
- (d) No lights shall be mounted above the parapet, or for pitched roofs above the eave except for motion detection security lighting, decorative building lighting.
- (e) Functional lighting shall not exceed 400 watts. Decorative building or landscape lighting shall not exceed 100 watts.
- (f) The maximum light trespass allowed on adjacent properties is one-half (.5) footcandles for residential and two (2.0) footcandles for non-residential.
- (g) If swivel mountings are used, lights may be raised a maximum of twenty (20) degrees from horizontal and must be full cutoff fixtures.

**(6) Public Private Street Lighting**

- (a) All public street lighting shall comply with this Chapter to the extent possible consistent with professionally acceptable traffic engineering standards.
- (b) All new street lamps on public and private streets shall be fully shielded. This requirement shall not be construed to apply to the repair or replacement of an existing lamp unless part of a larger project including replacement of all street lamps in the project area.
- (c) Public street lighting shall be approved by the Director of Public Works.

## **(7) Security Lighting**

Security lighting is a minimum amount of lighting required on all public, commercial, business and residential buildings containing four (4) or more separate dwellings. The purpose of security lighting is for the safety of persons and property.

- (a) Security lighting is required in all exterior/interior parking areas, service walk areas and entrance/exits.
- (b) All security lighting fixtures shall be shielded and aimed so that illumination is directed only to the designated area. In no case shall security lighting be directed above a horizontal plane through the top of the lighting fixture, and the fixture shall include shields that prevent the light source or lens from being visible from adjacent properties and roadways.
- (c) Security lighting fixtures may be mounted on poles no higher than 35 feet and located no more than five (5) feet from the perimeter of the designated secure area.
- (d) Security lights intended to illuminate a perimeter (such as a fence line) shall include motion sensors and be designed to be off unless triggered by an intruder located within five (5) feet of the perimeter.
- (e) The maximum footcandles allowed on adjacent property is one-half (0.5) for residential and two (2.0) for non-residential.
- (f) The minimum footcandles required for security lighting shall conform to the Illuminating Engineering Society of North America's (IESNA) recommendations and standards. Current IESNA standards shall be kept on file with the Zoning Administrator.
- (g) Commercial and multi-family dwelling construction sites whether new, additions or remodeling shall install the minimum security lighting in accordance with IESNA recommendations and standards to safeguard the site and materials.

## **(8) Flag Illumination**

Flag lighting shall be shielded and down-directed.

## **33.08 LIGHTING PLANS**

### **(1) Submittal Required**

Any application for design review pursuant to Section 10.99 of this Code of Ordinances shall include evidence that the proposed work will comply with this Code. The installation or modification of any exterior lighting except for routine servicing and same-type lamp replacement shall require submission of the information described below. The evidence shall include but shall not necessarily be limited to the following:

- (a) A catalog page, cut sheet or photograph of the lighting fixtures, including the mounting method.
- (b) A photometric data test report of the proposed lighting fixture graphically showing the lighting distribution in all angles vertically and horizontally around the fixture.
- (c) A plot plan showing the location of all outdoor lighting fixtures proposed, the mounting or installation height, the overall maintained illumination levels and uniformities, and the point where 0.5 horizontal footcandles occurs on the property or adjacent property at ground level. This may be accomplished by means of an isolux curve or computer printout projecting the illumination levels.

## **(2) Additional Submission**

The above required plans, descriptions and data shall be sufficiently complete to permit a determination that compliance with the requirements of this Code will be secured. If such plans, descriptions and data are insufficient to make the required determination, the applicant shall submit such additional evidence as necessary to enable such determination.

## **(3) Subdivision Plats**

If any subdivision proposes to have installed street or other common or public area outdoor lighting, submission of the information as described herein shall be required for all such lighting.

## **(4) Lamp or Fixture Substitution**

Should any outdoor light fixture or the type of light source therein be changed to a fixture or light source not substantially equal to the type of fixtures or light sources in the approved plan after the permit has been issued, a change request must be submitted to the Zoning Administrator or designee for approval, together with adequate information to assure compliance with this Code, which must be received prior to the change.

## **(5) Plan Review**

If the Zoning Administrator or designee determines that the proposed lighting does not comply with this Code, the permit shall not be issued or the plan approved.

## **(6) Certification**

For all projects where the total initial output of the proposed lighting equals or exceeds 200,000 lamp lumens, certification that the lighting, as installed, conforms to the approved plans shall be provided by a certified lighting engineer, or other similarly qualified professional acceptable to the City, before the certificate of occupancy is issued. Until this certification is submitted, approval for use of a Certificate of Occupancy shall not be issued for the project.

## **(7) Fee**

All submittals for approval of lighting plans shall be accompanied by a fee as set forth in the Fee Schedule under Section 3.12 to cover costs of processing the application. In addition to this fee, the applicant shall be required to pay all City costs relating to staff or outside consultant review of the lighting plan. The scope of review and related cost may vary depending upon the size and complexity of the plan. An itemized invoice shall be sent to the applicant for all such costs which shall be paid within thirty (30) days. If not paid, such costs shall be placed on the tax roll against the applicable property as a special charge pursuant to Wis. Stats. § 66.0627.

## **33.09 EXEMPTIONS**

### **(1) Emergency Lighting**

Emergency lighting, used by police, firefighting, or medical personnel, or at their direction, is exempt from all requirements of this Code for as long as the emergency exists.

### **(2) Swimming Pool and Fountain Lighting**

Underwater lighting used for the illumination of swimming pools and fountains is exempt from the lamp type and shielding standards provided herein, though it must conform to all other provisions of this Code.

### **(3) Holiday lighting.**

### **(4) Legally required safety lighting for towers.**

### **(5) Airfields and airports.**

## **33.10 ENFORCEMENT AND PENALTIES**

### **(1) Violations**

Any person found to have violated or caused a violation of this Code may be subject to enforcement action as provided in this section. Each day during which the violation continues shall constitute a separate offense. The City may institute appropriate action or proceedings to enjoin violations of this Code.

### **(2) Penalties**

Any person who fails to comply with the provisions of this Code shall, upon conviction thereof, forfeit no less than One Hundred Dollars (\$100.00) nor more than Five Hundred Dollars (\$500.00).