

SECTION 817. LIGHTING STANDARD FOR SITE PLANS

1. Purpose and Intent

The purpose of this law is to provide specific guidelines for site plan applications and standards in regards to lighting, in order to maximize the effectiveness of site lighting, to avoid unnecessary upward illumination and illumination of adjacent properties, and to reduce glare.

Lighting plans for development activities when unregulated can become obtrusive and impact the character, safety and quality of life of the Village. Obtrusive aspects such as glare, light trespass, energy waste, and sky glow, can have serious consequences for the public health, safety and welfare.

Careless lighting practices can have a serious negative impact on public safety. Glare and excessive contrast caused by poorly shielded luminaries and over lighting compromise everyone's ability to see. As eyes age they become particularly sensitive to these disabling effects. It is commonly known that many citizens are reluctant to drive at night, but it is not so widely known that a large portion of the problem of poor night vision originates with poor lighting practices. In extreme cases glare can cause traffic warning signs to become unreadable, and can wash out obstacles and people on streets and roadways making them harder to see.

Light Trespass involves the unwanted shedding of light off the property of the development and can be an annoyance to neighbors trying to enjoy the outside use of their property at night. In residential areas this can be an invasion of the rights of neighbors to enjoy their property and in commercial or industrial areas can overwhelm and void the proper use of lighting on another property.

Energy waste can occur when light is uncontrolled and directed other than on the target area. Unwanted sidewise dispersion can cause glare, and upward and sidewise dispersion creates lost light that is no longer available for the target area, thus requiring higher wattage bulbs to achieve targeted illumination levels leading to unnecessary wasteful use of electric power in detriment to the environment.

Improper use of up-lighting can also be a safety issue, as light is not efficiently shown on target areas, thus creating a possibility of less well lit night scenes that could hinder the detection of criminal or mischievous behavior and the presence of obstacles or dangerous walking areas.

Finally, up-lighting also creates a glow which can be observed at nighttime by looking upwards at night in to the sky. In 2003 in the downtown Village area, most stars are invisible. On side streets, a few become visible. In the open country many more become visible. This example shows how our present lighting practices have stolen and impaired the ability of Village residents to enjoy the star filled night sky. A small matter to some but an important quality of life event for many.

This Standard was created so that Development could continue in the Village of Arcade without creating the lighting problems listed below.

2. Definitions

A. Foot-Candle

A unit of measure for illuminance. A unit of illuminance on a surface that is everywhere one foot from a uniform point source of light of one candle and equal to one lumen per square foot.

B. Full Cut-Off Type Fixture

A luminaire or light fixture that; by design of the housing, does not allow any light dispersion or direct glare to shine above a 90 degree, horizontal plane from the base of the fixture. Full cut-off fixtures must be installed in a horizontal position as designed, or the purpose of the design is defeated, and disability glare will result.

C. Glare

Line-of-sight contact by a person's eye with a direct light source.

D. Horizontal Illuminance

The measurement of brightness from a light source, usually measured in foot-candles or lumens, which is taken through a light meter's sensor at a horizontal position.

E. Shielded Fixture

Fixtures that are shielded in such a manner that light rays emitted by the fixture, either directly from the lamp or indirectly from the fixture, are projected below a horizontal plane running through the lowest point in the fixture where light is emitted.

F. Uplighting

Any light source that distributes illumination above a 90-degree horizontal plane.

G. U. Ratio

Uniformity ratio, describing the average level of illumination in relation to the lowest level of illumination for a given area. Example: U. ratio = 4:1 for the given area, the lowest level of illumination (1) should be no less than 25% or “4 times less” than the average (4) level of illumination.

3. Signs And Lighting

A detailed drawing should be provided with the site plan showing locations, size, height, orientation, fixture type, wattage, designs and plans for all illuminated signs and outdoor lighting. For site plans showing a high level of illumination, the Planning Board may require the developer to submit an iso-lux plan indicating levels of illumination in foot-candles at ground level and certifying that they are in compliance with this standard.

4. Site Plan Standards

A. All exterior lights and illuminated signs shall be designed, located, installed and directed in such a manner as to prevent objectionable light at (and glare across) the property lines and glare at any location on or off the property. The “maintained horizontal illuminance shall be observed as shown in the table below. The original table was created from recommendations set by the Illuminating Engineering Society of North America (IES). Newer versions by the IES for these specifications are not binding unless specifically enacted into this code by the Village. Refer to that society’s publications for any definitions. All parking area lighting will be full cut-off type fixtures.

IES PARKING LOT LEVELS OF ACTIVITY (EXAMPLES)	IES MAINTAINED HORIZONTAL ILLUMINANCE RECOMMENDATIONS (FOOTCANDLES)					
	General Parking & Pedestrian			Vehicle Use Area Only		
	Ave	Min	U. Ratio	Ave	Min	U. Ratio
HIGH Major League Athletic Events Major Cultural or Civic Events Regional Shopping Centers Fast Food Facilities	3.6	0.9	4:1	2.0	0.67	3:1
MEDIUM Community Shopping Centers Cultural, Civic or recreational Events Office Parks Hospital Parking Transportation Parking (Airports, Commuter Lots, Etc..) Residential Complex Parking	2.4	0.6	4:1	1.0	0.33	3:1
LOW Neighborhood Shopping Industrial Employee Parking Educational Facility Parking Church Parking	0.8	0.2	4:1	0.5	0.13	4:1

IES states: "This recommendation is based on the requirement to maintain security at any time in area where there is a low Level of nighttime activity." Local interpretation and application of IES Parking Lot Levels of Activity Examples not specifically identified or quantified:

Level Of Activity	
Regional shopping centers containing retail space of 300,000 square feet or greater.	HIGH
Community shopping centers containing retail space of 5,000 to 299,999 square feet.	MEDIUM
Neighborhood shopping containing retail space of less than 5,000 square feet.	LOW
Fast Food Facilities (means only with customer seating capacity of 40 or greater).	HIGH
Automotive Dealerships	HIGH
Entertainment theaters. sports arenas	HIGH

- B. Uplighting is prohibited. Externally lit signs, display, building and aesthetic lighting must be lit from the top and shine downward. The lighting must be shielded to prevent direct glare and/or light trespass. The lighting must also be, as much as physically possible, contained to the target area. Internally lighted signs are acceptable. Internally lighted signs are allowed only in the Highway Commercial (HC), Highway Commercial/Light Industrial (LC/LI), Neighborhood Commercial (NC) and Light Industrial (LI) Districts.
- C. All building lighting for security or aesthetics will be full cut-off or a shielded type, not allowing any upward distribution of light. Floodlighting is discouraged, and if used, must be shielded to prevent:
 - 1. Glare for drivers or pedestrians
 - 2. Light trespass beyond the property line, and
 - 3. Light above a 90 degree horizontal plane. Wallpack type fixtures are not acceptable.
- D. Adjacent to residential property, no direct light source will be visible at the property line at ground level or above.
- E. All non-essential lighting will be required to be turned off after business hours, leaving only the necessary lighting for site security. ("Non-essential" can apply to: display, aesthetic, parking and sign lighting.)
- F. Upward flagpole lighting is permitted for federal state and local government flags only, and provided that the maximum lumen output is 1300 lumens. Flags are encouraged to be taken down at sunset to avoid the need for lighting.

G. Permitted Non-conforming Uses:

1. No outdoor lighting fixture or use which was lawfully installed on implemented prior to the enactment of this Code shall be required to be removed or modified. However, no modifications or replacement shall be made to a con-conforming fixture unless the fixture thereafter conforms to the provisions of this Code, except that identical lamp replacement is allowed.
2. Temporary Lighting, as described below, used for no more than 45 days within a calendar year. Temporary Lighting is lighting which does not conform to the provisions of this Code, and is intended for uses, which by their nature are of limited duration; e.g. holiday decorations, civic events, or construction projects.