

ORDINANCE NO. 2004 - 4

**AN ORDINANCE OF THE HILLTOWN TOWNSHIP BOARD OF SUPERVISORS AMENDING THE HILLTOWN TOWNSHIP CODE OF ORDINANCES, PART II (GENERAL LEGISLATION) CHAPTER 160, PROVIDING FOR ADDITIONAL REGULATIONS REGARDING NON-RESIDENTIAL LIGHTING.**

The Hilltown Township Board of Supervisors upon review by the Hilltown Township Planning Commission and Bucks County Planning Commission hereby enacts and ordains the following Ordinance:

**Article 1**

**Section 160-11, Definitions of Words, Terms, and Phrases**, is revised to add the following (all section paragraph numbering is revised to insert the words, terms, and phrases alphabetically):

- Candela – The SI unit of luminous intensity. One candela is one lumen per steradian (lm/sr).
- Candlepower – Luminous intensity expressed in candelas.
- Cutoff Angle (of a luminaire) – The angle, measured up from nadir, between the vertical axis and first line of sight at which the bare source is not visible.
- Direct Light – Light emitted directly from the lamp, off of the reflector or reflector diffuser, or through the refractor or diffuser lens, of a luminaire.
- Fixture – The assembly that houses the lamp or lamps and can include all or some of the following parts: a housing, mounting bracket or pole socket, lamp holder, ballast, reflector or mirror, and/or refractor or lens.
- Flood or Spot Light – Any light fixture or lamp that incorporates a reflector or refractor to concentrate the light output into a directed beam in a particular direction.
- Footcandle – A unit of illuminance. One footcandle is one lumen per square foot (lm/ft<sup>2</sup>).
- Fully Shielded Lights – Outdoor light fixtures shielded or 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, is projected below the horizontal plane through the fixture's lowest light-emitting part as certified by a photometric test report.
- Glare – The sensation produced by luminances within the visual field that is sufficiently greater than the luminance to which the eyes are adapted to cause annoyance, discomfort, or loss in visual performance or visibility.
  - a. Blinding Glare: Glare that is so intense that for an appreciable length of time after it has been removed, no object can be seen.
  - b. Direct Glare: Glare resulting from high luminances or insufficiently shielded light sources in the field of view.
  - c. Disability Glare: The effect of stray light in the eye whereby visibility and visual performances are reduced.

- d. Discomfort Glare: Glare that produces discomfort. It does not necessarily interfere with visual performance or visibility.
- e. Reflected Glare: Glare resulting from reflections of high luminances in polished or glossy surfaces in the field of view.

Height of Luminaire – Height of a luminaire shall be the vertical distance from the ground directly below the centerline of the luminaire to the lowest direct-light-emitting part of the luminaire.

Illuminance – Quantity of light measured in footcandles or lux.

Illumination – An alternative term for illuminance. Commonly used in a qualitative or general sense to designate the act of illuminating or the state of being illuminated.

Indirect Light – Direct light that has been reflected or has scattered off of other surfaces.

Lamp – The component of luminaire that produces light. A generic term for man-made source of light, i.e. a light bulb.

Light – Radiant energy that is capable of exciting the retina and producing a visual sensation. The visible portion of the electromagnetic spectrum extends from about 380 to 770 nanometers.

Light Loss Factor (LLF) – The ratio of illuminance for a given area to the value that would occur if lamps are operated at their initial rated lumen output and if no system variation or depreciation had occurred.

Light Trespass – The shining of light produced by luminaire beyond the boundaries of the property on which it is located.

Lumen – A standard unit of luminous flux. Photometrically, it is the luminous flux emitted within a unit solid angle (one steradian) by a point source having a uniform luminous intensity of one candela. One footcandle is one lumen per square foot. For the purposes of this Ordinance, the lumen-output values shall be the initial lumen output ratings of a lamp, as specified by the manufacturer of the lamp. (light bulb)

Luminaire – A complete lighting unit consisting of one or more lamps together with the fixture; other parts designed to control the light distribution; and other mechanical and electrical components.

Luminaire, Cutoff – A luminaire whose candlepower per 1,000 lumens does not numerically exceed 25 (2.5%) at an angle of 90 above nadir (horizontal), and 100 (10%) at a vertical angle of 80 above nadir.

Luminance – The physical and measurable quantity corresponding to the brightness of a surface in a specific area from which light is emitted or reflected (e/g. a lamp, luminaire, reflecting material). Can be measured in candelas per square meter ( $\text{cd}/\text{m}^2$ ) or luxes.

Luminous Flux (radiant flux or power) – The time rate of flow of radiant energy evaluated in terms of a standardized visual response.

Luminous Intensity – The luminous flux per unit solid angle in the direction in question. May be expressed in candelas or lumens per steradian ( $\text{lm}/\text{sr}$ ).

Lux - The standard unit of illuminance. One lux is one lumen per square meter ( $\text{lm}/\text{m}^2$ ).

Nighttime – The hours between the end of evening civil twilight and the beginning of morning civil twilight. Civil twilight ends in the evening when the center of sun's disk is 6 degrees below the horizon.

Outdoor Lighting – The nighttime illumination of an outside area or object by any man-made device located outdoors that produces light by any means.

Outdoor Lighting, Temporary – Outdoor lighting that is used for a period of less than thirty (30) days, with at least 90 days passing before being used again annually for a period of thirty (30) days or less.

Steradian, sr (unit of solid angle) – The solid angle subtended at the center of a sphere by an area on the surface of the sphere equal to the square of the sphere radius.

## Article 2

**Section 160-41, Glare**, is deleted in its entirety and replaced with the following:

### **Section 160-41, Non-residential Lighting.**

- A. Findings, Purpose, and Intent.
  1. Adequate and effective lighting of streets, buildings, parking lots, and other facilities is important for comfort, safety, and commerce. Wasteful, inefficient, or inappropriate lighting, however, is a significant environmental problem. Excessive lighting wastes energy; intrudes upon neighboring properties; is a nuisance to pedestrians, cyclists, and motorists on adjacent roadways; disturbs wildlife habitats; impairs human experience of the night sky; and negatively affects the quality of life of our communities.
  2. Through these regulations, the Township desires to manage outdoor lighting so that its safety, security, and economic benefits are maintained while minimizing dangerous glare, energy waste, light pollution, and trespass.
  3. The following requirements for outdoor lighting installations promote public safety and welfare during the nighttime while minimizing the adverse effects of glare and light trespass often associated with outdoor lighting. Outdoor lighting should be used only where needed; used only when needed; and only that type of lighting which is necessary and proper should be used. This Ordinance is intended to implement these principles of good lighting design by regulating the shielding, height, illumination levels, and other aspects of outdoor lighting so that Township residents may continue to enjoy the highest quality of life.
- B. Applicability. Requirements of this Ordinance shall apply to all outdoor lighting installations for commercial, institutional, and industrial uses as follows:
  1. Outdoor lighting installations that are designed, constructed, erected, or otherwise placed into operation after the effective date of this Ordinance.

2. Alterations, rehabilitations, or renovations to existing outdoor lighting installations, which are commenced after the effective date of this Ordinance, and/or which involve the complete replacement of an existing lighting system with a new lighting system.
3. Non-Applicability. The requirements of this Ordinance shall not apply to lighting installations operating before the effective date of this section, except for any lighting installation that creates a safety hazard as deemed by the Township. Routine maintenance of these pre-existing outdoor lighting installations shall not have to comply with the requirements of this section. Routine maintenance includes the following:
  - a. Replacement of lamps that are burned-out or inoperative.
  - b. Replacement/repair of damage or inoperative luminaire components such as ballasts, igniters, lenses, reflectors, refractors, sockets, or photocell controls.
4. Exemptions. The requirements of this Ordinance shall not apply in the following circumstances:
  - a. Where superseded by State or Federal law.
  - b. Temporary emergency lighting used by police, fire, emergency medical services, public works, or other public safety services.
  - c. Hazard/Warning lights required by local, State, or Federal regulations.
  - d. Lighting of public streets.

C. Adoptions by Reference.

1. Adoption. Hilltown Township hereby adopts, for the purpose of establishing rules and regulations for the construction, alteration, design, layout, installation, and use of outdoor lighting, specifications within the "IESNA Lighting Handbook" Ninth Edition, published by the Illuminating Engineering Society of North America ("IESNA") and hereby incorporates such recommended practices as fully as if set forth at length herein, except such portions as are hereinafter deleted, modified, or amended.
2. Amendments. The recommended practices of the Lighting Handbook hereby adopted are amended as follows:
  - a. All the recommendations made in the Lighting Handbook shall be considered mandatory requirements. For the purposes of this Ordinance, the words "should", "may", "can", etc. shall be read as "shall" or "must"; the words "recommend" or "recommendation" shall be read as "require" or "requirement"; the phrase "it is recommended" shall be read as "it is required"; the phrase "it is not recommended" shall be read as "it is prohibited."
  - b. Where the Lighting Handbook provides for alternatives, this Ordinance requires that the safest alternative, as determined by the Township, be used.

3. General Design Requirements. The design calculations for outdoor lighting installations shall be in accordance with the Lighting Handbook. This includes, but is not limited to, technical definitions, terminology, calculation methods, and procedures, photometric classifications, and photometric testing procedures. Illuminance selection should be based on the usage of the area to be illuminated, the level of activity, and nighttime security requirements.
4. Illumination Levels. Illumination shall have intensities and uniformity ratios in accordance with the current recommended practices of IESNA as contained in the Lighting Handbook.

D. General Regulations.

1. All outdoor lighting, whether or not required by this Ordinance shall be aimed, located, designed, fitted, and maintained so as not to present a hazard to drivers or pedestrians by impairing their ability to safely traverse, i.e., blinding or disabling glare, and so as not to create a nuisance by projecting or reflecting objectionable light onto a neighboring use or property.
2. Floodlights and spotlights, when permitted, shall be installed and/or aimed so that they do not project their output at neighboring residences, adjacent uses, directly skyward or onto a public roadway.
3. Except as otherwise permitted in this section, all lighting fixtures shall meet IESNA full cutoff criteria. No lighting shall be permitted that results in glare beyond an angle of thirty (30) degrees from the vertical plane, measured from the light source or results in glare beyond the property boundaries upon which the luminaire is located.
4. Except as otherwise permitted in this section, fixtures meeting IESNA full cutoff criteria shall not be mounted in excess of twenty (20) feet above finished grade. Fixtures not meeting IESNA "full cutoff" criteria shall not be mounted in excess of sixteen (16) feet above grade.
5. Fixtures shall be of a type and design appropriate to the lighting application. Use of searchlights, flashing strobe lights, and laser lights is prohibited.
6. Unless the Board of Supervisors specifically approves all-night lighting, e.g., for safety or security, all outdoor lighting shall be controlled by automatic switching devices such as time clocks or combination motion detectors and photocells, to permit extinguishing lighting between 11 PM and 7 AM.
7. Where all-night safety or security lighting is to be provided, the lighting intensity levels shall not exceed 25% of the levels normally permitted by this Ordinance for the use. All-night safety or security lighting includes the following:

- a. Lighting essential for the deterrence of break-ins. This type of lighting is limited to exterior door locations.
  - b. Lighting controlled by motion sensors/detectors. This type of lighting is to be used to deter vandalism and theft and shall be placed in locations where the sensors will not be tripped on a reoccurring basis and shall be installed and/or aimed so that they do not project their output at neighboring residences, adjacent uses, directly skyward, or onto a public roadway.
  - c. Lighting used in conjunction with surveillance cameras. This type of lighting is limited to illuminating automatic teller machines, deposit boxes, building entrances, and parking lot/driveway entrances. Fixtures used for this type of lighting shall be designed, fitted, and aimed so as not to project their output beyond the objects intended to be illuminated.
- 8. Vegetation screens shall not be employed to serve as the primary means for controlling glare from lighting facilities. Rather, glare control shall be achieved primarily through the use of such means as cutoff fixtures, shields, and baffles, and appropriate application of fixture mounting height, wattage, aiming angle and fixture placement.
  - 9. Except as otherwise permitted in this Ordinance, the intensity of illumination projected onto any non-residential property from another property shall not exceed 0.2 vertical footcandles, measured at grade at the property, and the intensity of illumination projected onto a residential property from another property shall not exceed 0.1 vertical footcandles, measured at grade at the property line.
  - 10. Electrical feeds for lighting standards shall be run underground, not overhead.
  - 11. Lighting standards within parking areas shall be placed a minimum of five (5) feet outside paved areas; on concrete pedestals at least thirty (30) inches above the pavement; or suitably protected by other means approved by the Township.
  - 12. Fixtures and ancillary equipment shall be maintained so as always to meet the requirements of this section.
- E. Requirements for Outdoor Area and Roadway Lighting Installations.
- 1. This subsection applies to all outdoor lighting installations employed for nighttime area illumination of parking lots, car sales lots, yards, private driveways and streets, walkways, bikeways, cartways, entryways, and similar areas or lots.
  - 2. Use of Cutoff Luminaires Required. All luminaires employed in outdoor area and roadway lighting installations shall be the cutoff luminaire type.
    - a. The candlepower distribution classification of the luminaire as a cutoff type shall be in accordance with the Lighting Handbook. The manufacturer of the luminaire shall provide certification of the cutoff

classification based on photometric testing performed in accordance with the Lighting Handbook and the applicable testing procedures referenced therein. The requirement for the use of cutoff luminaire types shall include, but is not limited to, the following outdoor area and roadway lighting configurations:

- (1) Pole-mounted luminaires.
  - (2) Luminaires mounted on the exterior of buildings and structures.
  - (3) Luminaires mounted on or within exterior canopies of building and structures.
  - (4) Pedestal-or bollard-mounted luminaires.
- b. Cutoff luminaires shall be mounted plumb and level in accordance with the intended application of their design. For the purposes of this requirement, the photometric nadir of the luminaire (zero degree vertical angle of the candlepower distribution) shall be oriented plumb and vertical angle of 90 degrees above nadir (horizontal) shall be oriented level. Cutoff luminaires shall not be installed in a canted or tilted position which permits candlepower distribution above the horizontal.
- c. Luminaires which do not meet the strict definition for cutoff luminaires, yet employ advanced or alternative technology which causes the photometric performance to approach that of cutoff luminaires, may be approved by the Township, on a case-by-case basis. Such luminaires include, but are not limited to, period-style luminaires with refractive globes and internal cutoff reflectors.
3. Maximum Maintained Illuminance Levels. The maximum maintained illuminance levels permitted at the property line(s) during the nighttime, produced by the sum of all outdoor area lighting installations on a lot, shall be as measured at grade in Horizontal Footcandles or Horizontal Lux according to Table 5.4.
- a. Exceptions:
- (1) Outdoor roadway lighting installations intended for the nighttime illumination of public roadways, streets, highways, alleys, cartways, and the like.
  - (2) Designated vehicular, cyclist, and pedestrian entries/exists between properties and public roadways, streets, highways, alleys, cartways, and the like; provided that the excepted area of illumination (maintained illuminance levels at grade higher than permitted in Table 5.4) is limited to the said property and the adjoining pavement and right-of-way of public roadways, streets, highways, alleys, cartways, and the like. The excepted area of illumination shall not extend beyond fifty (50) feet from the centerline of the designated entry/exist in any direction along the property line(s) of the said property.

4. Table 5.4

<b>MAXIMUM MAINTAINED ILLUMINANCE LEVELS                      PERMITTED AT PROPERTY LINES                      PRODUCED BY OUTDOOR AREA LIGHTING INSTALLATIONS</b>		
For outdoor area lighting installations to which the requirements of Subsection 5.3 apply:	Maximum maintained illuminance level permitted at property line measured at grade in Horizontal Footcandles	Maximum maintained illuminance level permitted at property line measured at grade in Horizontal Lux
Outdoor area lighting installation is located on said property and property line adjoins a public roadway or public right-of-way	0.5	5.4
Outdoor area lighting installation is located on said property and property line adjoins a non-residential property	0.2	2.2
Outdoor area lighting installation is located on said property and property line adjoins a residential property	0.1	1.1

5. **Illumination Under Outdoor Canopies.** All outdoor lighting installations which illuminate the area under outdoor canopies shall comply with the requirements of this subsection. All canopy lighting shall be accomplished using flat-lens full-cutoff fixtures aimed straight down and shielded in such a manner that the lowest opaque edge of the fixture shall be level with or below the light source. Canopies themselves may not be illuminated, however, with the exception of the portion which is classified as a sign. Outdoor canopies include, but are not limited to, the following applications:
  - a. Fuel island canopies associated with service stations and convenience stores.
  - b. Exterior canopies above storefronts in shopping centers and malls.
  - c. Exterior canopies above driveways and building entrances.
  - d. Pavilions and gazebos; (not including those accessory to a residential dwelling).
  
6. **Design Submittal and Approval Requirements.** The design for all outdoor area and roadway lighting installations shall be submitted for review and approval by the Township. Such a lighting plan shall conform with the requirements of the Township Subdivision and Land Development Ordinance for lighting plans.



F. Requirements for Outdoor Sign Lighting, Outdoor Lighting of Facades of Buildings and Structures, and Outdoor Landscape Lighting.

1. Applicability of Requirements. The requirements of this subsection apply to all outdoor lighting installations employed for nighttime illumination of signs, billboards, the facades of buildings and structures, fountains, trees, shrubs, vegetation, and the like.
2. Use of Glare Shields Required For Non-Cutoff Luminaire Types. Where non-cutoff luminaires such as floodlights are used to meet the lighting design objectives for outdoor sign, billboard, façade, and/or landscape lighting, the luminaires shall be equipped with glare shields, visors, barndoors, and other similar shielding accessories as required to ensure that the candlepower distribution from all lighting installations shall be cut off at all angles beyond those required to restrict direct illumination to within the perimeter of the sign or billboard being illuminated.
3. Externally illuminated signs, billboards, and facades shall be lighted by fixtures mounted at the top of the sign and aimed downward.
4. Fixtures used for architectural lighting, e.g., façade, fountain, feature, and landscape lighting, shall be designated, fitted, and aimed so as not to project their output beyond the objects intended to be illuminated.
5. All outdoor lighting falling under the requirements of this subsection shall be extinguished between 11 PM and 7 AM. This restriction does not apply to uses that are open between the hours of 11 PM and 7 AM, in which case the lighting must be extinguished when the non-residential use is closed.

G. Requirements for Residential Outdoor Lighting.

1. Applicability of Requirements. The requirements of this subsection apply to all outdoor lighting installations located on residential lots developed with a single family dwelling, or farm.
2. Use of Glare Shields Required For Non-Cutoff Luminaire Types. All non-cutoff luminaires such as floodlights shall be equipped with glare shields, visors, barndoors, and other similar shielding accessories as required to meet the following criteria:
  - a. For area lighting applications, the candlepower distribution from all lighting installations shall be cut off at and above the horizontal (level).
  - b. For all other applications, the candlepower distribution from all lighting installations shall be cut off at all angles beyond those required to restrict direct illumination to within the area or surface being illuminated.

H. Temporary Outdoor Lighting.

1. **Applicability of Requirements.** The requirements of this subsection apply to all outdoor lighting installations which are employed on a temporary basis not exceeding thirty (30) days in duration. Temporary lighting installations include, but are not limited to, seasonal or holiday displays, carnivals, community fairs, traveling circuses, sales/promotional displays, and the like.
2. **Use of Glare Shields Required For Non-Cutoff Luminaire Types.** All non-cutoff luminaires such as floodlights shall be equipped with glare shields, visors, barndoors, and other similar shielding accessories as required to meet the following criteria:

The candlepower distribution from all lighting installations shall be cut off at all angles beyond those required to restrict direct illumination to within the perimeter of the area, surface, object, or feature being illuminated.

I. Maximum Permitted Illumination.

1. Total outdoor light output for all commercial, institutional, and industrial uses shall not exceed the lumens/acre set forth in Table 9-2. The values in this table are the upper limits. Property owner shall only install those fixtures necessary to meet the minimum outdoor lighting needs of the use.
2. Table 9-2.

Total Allowed Illumination based on Type of Fixture	Zoning District		
	VC, PC-1, PC-2, LI, HI, Q	CR-1, CR-2, MHP	RR
Fully Shielded and Not Fully Shielded	100,000 lm/ac	50,000 lm/ac	10,000 lm/ac
Not Fully Shielded	10,000 lm/ac	10,000 lm/ac	1,000 lm/ac

- J. **Lighting Plan.** Any plan to install and/or alter outdoor lighting must submit a lighting plan for the Township's review and approval prior to issuance of a zoning permit and construction of the outdoor lighting installation. The lighting plan must include all the

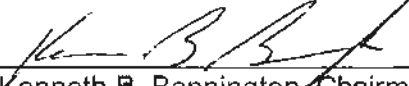
information necessary for the Township to ensure that the outdoor lighting complies with the requirements of this section.

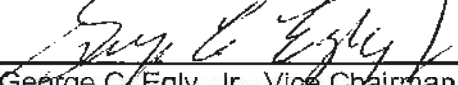
**Article 3**


Effective Date. This Ordinance shall take effect five (5) days after enactment.

**ENACTED AND ORDAINED** this 28<sup>th</sup> day of June A.D., 2004 by the Board of Supervisors of Hilltown Township.

HILLTOWN TOWNSHIP  
BOARD OF SUPERVISORS

  
Kenneth B. Bennington, Chairman

  
George C. Egly, Jr., Vice Chairman

  
Richard J. Manfredi, Supervisor