

# SECTION 8

## EXTERIOR LIGHTING

### 8.01 INTENT

Exterior lighting is used to illuminate residential, commercial, industrial, PAD and public uses; parking lots, sidewalks, signs, and other elements within the City of Tiffin. When well designed and properly installed, exterior lighting can be and is very useful in improving visibility and safety, providing a sense of security, and complementing the character of the City of Tiffin. If exterior lighting is not well designed and properly installed it can be inefficient, cause glare, and create light trespass and sky glow. Light trespass falling over property lines can illuminate adjacent grounds or buildings in an objectionable manner. In order to insure that exterior lighting is well designed, and impacts on adjacent properties are limited, the following requirements are set forth controlling exterior lighting in both residential and non-residential zoning districts.

### 8.02 DEFINITIONS

**Canopy:** Any overhanging shelter or shade or other protective structure constructed in such a manner as to allow pedestrians or vehicles to pass underneath.

**Cutoff:** The point at which all light rays emitted by a lamp, light source, or luminary are completely eliminated (cutoff) at a specific angle above the ground.

**Cutoff Angle:** The angle formed by a line drawn from the direction of light rays at the light source and a line perpendicular to the ground from the light source,

above which no light is emitted.

**Exterior Lighting:** The illumination of an outside area or object by any man-made device that produces light by any means.

**Fixture:** The assembly that houses the lamp or lamps and can include all or some of the following parts: a housing, a mounting bracket or pole socket, a lamp holder, a ballast, a reflector or mirror, and/or a refractor or lens.

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

**Foot candle (FC):** A unit of illumination produced on a surface, all points of that are one (1) foot from a uniform point source of one (1) standard candle.

**Foot candle - Horizontal Measurement (HFC):** The measurement of foot candles utilizing a direct reading, portable light meter mounted in the horizontal position.

**Foot candle - Vertical Measurement (VFC):** The measurement of foot candles utilizing a direct reading, portable light meter mounted in the vertical position.

**Glare:** Light emitting from a luminaire with an intensity great enough to reduce a viewers' ability to see, cause discomfort and, in extreme cases, cause momentary blindness.

**Height of Luminary (including total eight):** The height of a luminary is the vertical distance from the ground directly below the centerline of the luminary to the lowest direct-light-emitting part of the luminary. The total height is the height of the pole, including the base and any mounting arms or other attachments where the luminary is attached, as measured from the ground directly below the highest part of the pole or any of its attachments, to the top of the pole or luminary, whichever the case may be.

**Illumination System:** The totality of the equipment installed to provide exterior lighting on a developed property. The illumination system includes all building, canopy, pole and ground mounted luminaries including all wiring, circuitry, and other devices installed to create exterior lighting.

**Lamp:** The component of a luminary that produces the actual light.

**Lamp wattage:** The amount of power of a lamp expressed in watts.

**Light: Direct:** light emitted directly from the lamp, off a reflector or reflector

diffuser, or through the refractor or diffuser lens of a luminary.

**Light, Indirect:** Direct light that has been reflected or has scattered off of other surfaces.

**Light Loss Factor:** A factor applied to lamps, which estimates the lumen output of a lamp sometime after installation. (For example, a lamp with an initial lumen rating of 10,000, which has a light loss factor of 0.7, is estimated to put out 7,000 lumens. A lamp with an initial lumen rating of 10,000, which has a light loss factor of 1.0, is estimated to put out 10,000 lumens.)

**Light Trespass:** The shining of light produced by luminaries beyond the boundaries of the property on that it is located.

**Lumen:** A unit of luminous flux. One foot-candle is one lumen per square foot. For the purpose of this Section, the lumen value is the initial lumen output rating of a lamp.

**Luminaries:** A complete lighting unit consisting of a light source and all necessary mechanical, electrical, and decorative parts.

**Luminaries, Cutoff Type:** A luminaries containing elements such as shields, reflectors, or refractor panels that direct and cutoff a direct view of the light source at a cutoff angle.

**Operating Hours:** The period of time from one hour prior to opening to one hour after closing of a non-residential establishment.

**Security Hours:** The period of time from one hour after closing to one hour prior to opening of a non-residential establishment.

**Temporary Exterior Lighting:** The specific illumination of an outside area or object by any man-made device that produces light by any means, consistent with the requirement for Temporary Uses.

### **8.03 REGULATIONS**

All public and private exterior lighting must be in conformance with the requirements as specifically established by this Section 8 and in general, exterior lighting is shaded or inwardly directed so that no direct lighting is cast upon adjacent zoning lots and adequate exterior lighting, for security purposes, is required for parking areas.

### **8.04 PROCEDURE**

#### **A. Lighting Plan Required**

A lighting plan is required for all non-residential uses in residential family zoning districts, multiple family developments other than duplexes, commercial, industrial, institutional, and public uses including uses developed by other units of local government. At the time any exterior lighting is installed or substantially modified, a lighting plan must be submitted to the Planning and Zoning Commission in order to determine whether the requirements of this Section have been met. A lighting plan is required for all special uses and planned area developments. Where a lighting plan is required, the plan must include the following:

1. A site plan showing pole locations, building mounted lights, bollard lights with schematic wiring layout and power source connection;
2. Specifications for luminaries and lamp types, poles, wiring, conduit and appurtenant construction including photographs or drawings of proposed luminaries;
3. Pole, luminaries, and foundation details including pole height, height of building mounted lights, mounting height and height of the luminaries;
4. Elevations of the site including buildings, luminaries and other structures sufficient to determine the total cutoff angle of all luminaries and their relationship to abutting parcels;

5. Lamp wattage of all luminaries proposed;
6. Photometric plans that show the foot candle - horizontal measurement internal to the site and at the property lines and the foot candle - vertical measurement at the property lines only. (Foot candle - horizontal measurements is taken along a horizontal plane at a height of three and one-half (3.5) feet above the ground. Foot-candle - vertical measurement is taken at a minimum height of three and one-half (3.5) feet above the ground but must also be required at any height along a vertical plane at a property boundary pursuant to the direction of the Zoning Administrator.) Photometric plans must be based on a light loss factor of 1.0.
7. Other information and data reasonably necessary to evaluate the required lighting plan pursuant to the request of the Planning and Zoning Commission.

#### 8.05 MEASURING LIGHT LEVELS

##### A. **Metering Equipment**

Light levels of both direct and indirect light must be measured in foot-candles with a direct reading, portable light meter. Readings must be taken only after the cell has been exposed long enough to provide a constant reading.

##### B. **Method of Measurement**

Foot-candle - horizontal measurements must be taken along a horizontal plane at a height of three and one-half (3.5) feet above the ground. Foot-candle vertical measurement must be taken at a minimum height of 3.5 feet above the ground, but it may also be taken at any height along a vertical plane along a property boundary line if required by the Planning and Zoning Commission.

#### 8.06 STANDARDS AND REQUIREMENTS

##### A. **Tables 1 and 2**

The standards and requirements set forth in Tables 1 and 2 regulate and govern the use of, design of, construction or modification of any lighting system for the purpose of illuminating exterior areas including, but not limited to, signs, parking areas, buildings, landscaping, porches, and driveways.

Table 1 sets forth whether the proposed wattage of a luminaries is permitted, not permitted or a special use. In residential zoning districts, whether a specified wattage is permitted or not permitted is based on the width of the street right-of-way abutting the proposed luminaries. In

non-residential zoning districts, the permitted wattage of proposed exterior lighting is based on whether the lighting is internal or external on the parcel, and if external (abutting a residential zoning district or street right-of-way) the setback of the proposed lighting from the property line/street right-of-way.

Uses permitted by right may be approved by the Planning and Zoning Commission pending a review of the documents submitted that meet the requirements of this Section. Uses or lighting plans that require a special use permit shall meet the requirements for special uses that provide for a public hearing held by the Planning Commission and approval by the City of Tiffin.

Table 2 sets forth the maximum allowable foot-candles to be measured both at a property line and internal to a non-residential property. The standards consider the nature of the land uses, the nature of the abutting land uses, and whether for a non-residential use the time is during hours of operation or security hours. Maximum foot-candles allowable are set for lighting internal to the property in question.

**B. Total Height and Height of Luminaries** (See definition for Height of Luminaries and Total Height and Figure B). The difference between total height and the height of the luminaries shall not exceed 4 feet.

**C. Standards for Luminaries with Cutoffs** (See Definitions and Figure C attached)

1. **Cutoff Angle.** To be considered a cutoff luminary, the cutoff angle must be 75 Degrees or less.
2. **Height:** The maximum height of cutoff luminaries, either freestanding or attached to a building or other structure, is twenty-five (25) feet as a permitted use. A luminary greater than twenty-five (25) feet shall require special use permit approval.
3. **Control of Glare:** A cutoff luminary shall be designed to shield the light source completely from observer three and one-half (3.5) feet above the ground at any point along an abutting property line.

**D. Standards for Luminaries with No Cutoffs** (See Definitions and Figure D attached)

1. **Cutoff Angle:** A luminary shall be considered to have no cutoff if it is unshielded or has a cutoff angle greater than 75 degrees.
2. **Height** The maximum permitted height of a luminary with no cutoff or with a cutoff greater than 75 degrees, that provides illumination along a property line, shall be less than the value  $3 \text{ feet} + (D/3)$ , where D is the distance in feet to the nearest property line but in no case shall exceed 16 feet. The formula used herein for determining

height of the luminaries does not preclude any luminaries or lighting system from meeting the foot candle performance standards set forth in Table 2.

3. **Control of Glare:** Any luminaries designed with no cutoff or a cutoff angle greater than 75 degrees shall be designed such that the lamp utilized is no more than 100 watts or rated for more than 10,000 lumens, whichever is less. The standards for maximum foot-candles internal and at the property line, set forth in Table 2, are still applicable. For the foot-candles - vertical measurement, the measurements shall be taken not less than three and one-half (3.5) feet above the ground line in a vertical position and vertical readings at heights greater than three and one-half (3.5) feet may be required pursuant to the direction of the Zoning Administrator. The standards for vertical foot-candles, set forth in Table 2 are applicable along the entire vertical plane along a property line.

E. **Standards for Luminaries under a Canopy (for non-residential uses)**

Luminaries mounted to the underside of a canopy, which provide overhead illumination, shall be recessed such that no part of the luminary or the lamp shall extend below the exterior edge of the canopy.

## 8.0.7 EXCEPTIONS

- A. **Public Roadway Lighting:** Luminaries used for public roadway illumination by a public transportation agency are exempt from the requirements of this Section but may be subject to the regulations of Federal or State agencies or by other intergovernmental agreements.
- B. **Emergency Lighting** all temporary emergency lighting needed by the Johnson County Sheriff, the Tiffin Volunteer Fire Department or other emergency services, as well as all vehicular luminaries, shall be exempt from the requirements of this Section.
- C. **Recreational Facilities** Because of their unique requirements for nighttime visibility and their limited hours of operation, outdoor recreational facilities (public or private) such as, but not limited to, football fields, soccer fields, baseball fields, softball fields, tennis courts, golf driving ranges, show areas and other similar uses as may be determined by the office of the Planning and Zoning Commission are exempted from certain illumination and other standards as follows:
  1. The uses set forth herein are specifically exempted from the maximum foot-candle requirements - internal to the site as outlined and established in Table 2. These uses are required to submit a lighting plan and shall be processed as special uses under the procedures in Section 11.07. These uses shall meet the requirements for maximum foot-candles at the property line.

2. The uses set forth herein shall be exempt from the height requirements as set forth in this Section. The Planning and Zoning Commission and City Council shall review the proposed pole heights during the special use permit review process.

**D. Temporary Uses** Certain temporary uses may be unable to meet the requirements of this section and the standards set forth in Tables 1 and 2. These temporary uses may be permitted subject to the approval of the Planning and Zoning Commission. The applicant for a temporary use may be required to submit the documentation required under Section 8.04 herein as a part of the application for a Temporary Use Permit.

#### 8.08: PROHIBITED LIGHTS

**A. Flickering or Flashing Lights:** The City of Tiffin City Council shall permit no flickering or flashing lights unless authorized in a lighting plan approved as a special use or planned unit development.

**B. Searchlight and Laser Source Lights:** No searchlights, laser source lights, or any similar high intensity light shall be permitted.

**C. Mercury Vapor Lamps** No lamps utilizing mercury vapor shall be permitted.

#### 8.09: NON-CONFORMING USES

**A.** Luminaries lawfully in place prior to the date of this Section but that do not conform to the requirements and standards of this Section shall be considered legal non-conforming uses.

**B.** Legal non-conforming luminaries that meet the performance standards for foot-candle levels and screening requirements of this Section but may exceed the physical standards such as height or setbacks herein may continue and are not subject to ameliorization requirements:

1. Legal non-conforming illumination systems that were not part of a specific approved lighting plan shall be brought into conformity with the criteria and standards set forth herein when the illumination system is to be replaced or modified to greater than 50 percent of its replacement value, based on the total project implementation cost. The elements for calculating the value of the illumination system are set forth below.

2. The value of the illumination system shall include the total value of the physical improvements such as luminaries, lamps, poles, wiring, and other elements and must include the value of the site area improvements where the luminaries and supporting elements are located such as parking lots, loading areas, aisles, driveways,

sidewalks, landscaped areas and others. Total replacement cost shall include the design costs for the illumination system, material costs for the system elements, and the total construction cost to install the system.

3. Legal non-conforming luminaries that exceed the foot candle standards set forth in Table 2 and/or direct light or glare towards streets, parking lots, residences or property lines and result in a problematic or dangerous condition shall be either shielded, redirected or otherwise modified to meet the requirements of this Section within 60 days of notification, or apply for an extension of the time period for compliance or apply for a variation with a specific time period for amortization.

#### **8.10: SPECIAL USES AND VARIANCES**

- A. **Special Use Permits** To receive a special use permit, a proposed lighting plan must meet the requirements of Section 8.04.
- B. **Variations.** A lighting proposal requiring a variation shall also be required to secure a special use permit .

**TABLE 1**

Lamp Wattage	Lighting in Residential Districts						Lighting in Non-Residential Districts				
	Single Family		Multiple Family		Non-Residential		External - Abutting a Residential Zoning District or Street R.O.W.				Internal
	Use		Use		Uses (Institutional, etc.)		Setback	Setback	Setback	Setback	
	Street Right-of-Way Width		Street Right-of-Way Width		Street Right-of-Way Width		Less than 40 Feet	Less than 100 Feet	Less than 200 Feet	200 Feet +	
	<80 feet	80 feet +	<80 feet	80 feet +	<80 feet	80 feet +					
0-250 (1)	P	P	P	P	P	P	P	P	P	P	
251-400	NP	SU	NP	SU	NP	P	SU	P	P	P	
401+	NP	NP	NP	NP	NP	NP	NP	NP	SU	SU	

(1) A luminary without a cutoff shall not exceed 100 watts  
P = Permitted  
SU = Special Use  
NP = Not Permitted

**TABLE 2**

MAXIMUM FOOT CANDLES AT A PROPERTY LINE - HORIZONTAL AND VERTICAL MEASUREMENT									
Residential to Residential		Non-Residential to Non-Residential				Non-Residential to Non-Residential			
Horizontal	Vertical	Horizontal		Vertical		Horizontal		Vertical	
		Security Hours	Operating Hours	Security Hours	Operating Hours	Security Hours	Operating hours	Security Hours	Operating Hours
0.25	0.5	2	5	3	10	0.25	0.5	0.5	0.5

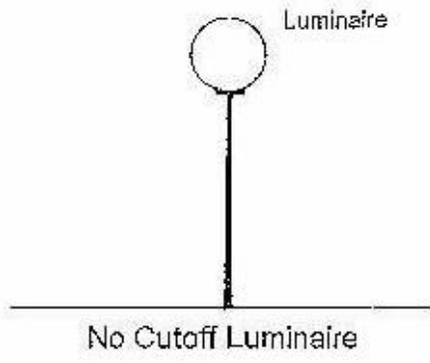
MAXIMUM FOOT CANDLES - INTERNAL - HORIZONTAL MEASUREMENT								
Residential Districts			Non Residential Districts					
Horizontal			Operating Hours			Security Hours		
Permitted	Special Use	Variation	Permitted	Special Use	Variation	Permitted	Special Use	Variation
<10	10 - <15	15+	<15	15-50	50+	3	+3 - 6	6+

Foot-candle - Horizontal Measurement: The measurement of foot-candles utilizing a direct reading, portable light meter mounted in the horizontal position.

Foot-candle - Vertical Measurement: The measurement of foot-candles utilizing a direct reading, portable light meter mounted in the vertical position.

Operating Hours: The period of time from one hour prior to opening to one hour after closing of a non-residential establishment

Security Hours: The period of time from one hour after closing to one hour prior to opening of a non-residential establishment



**Figure A: Luminaires with and without cutoffs**

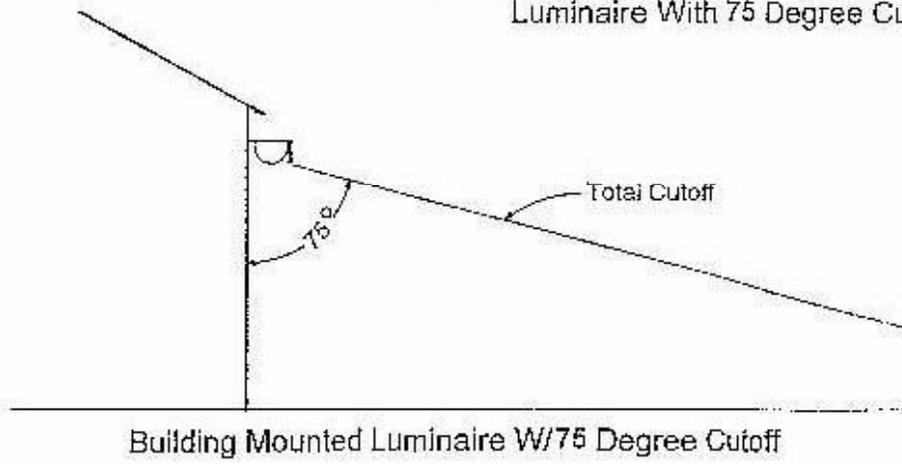
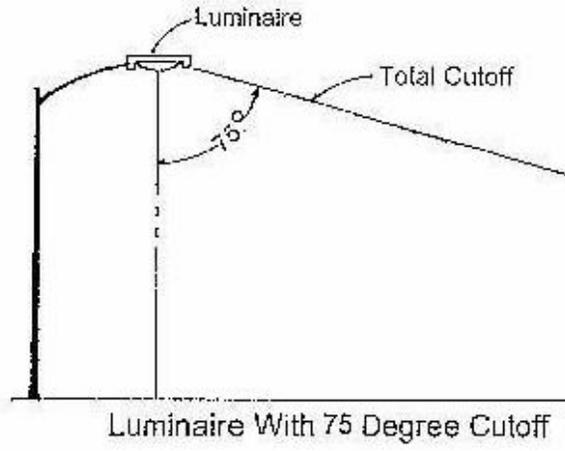
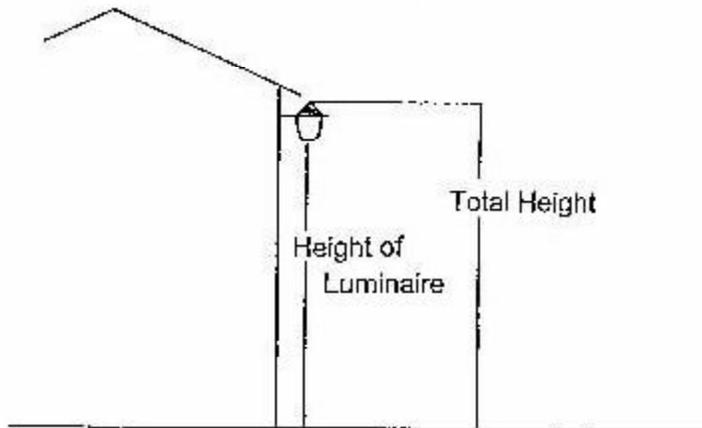
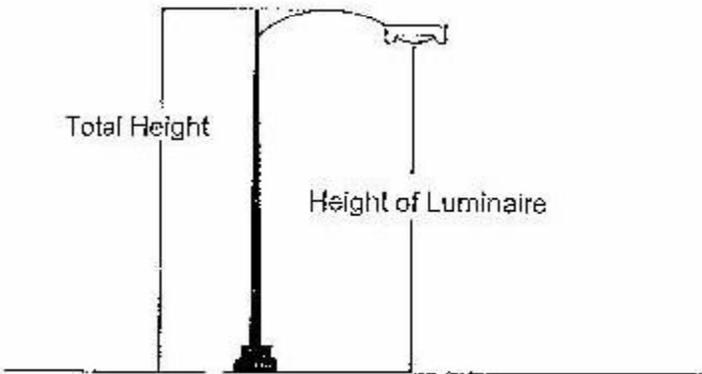
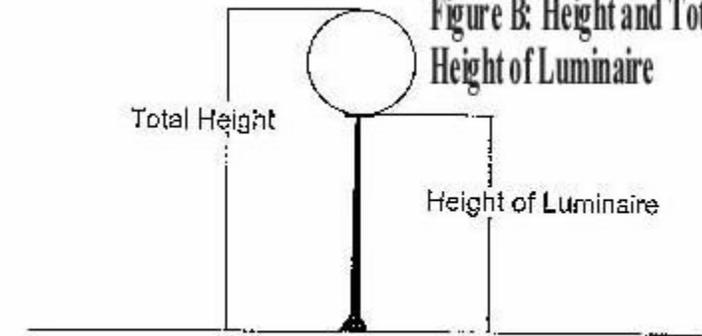
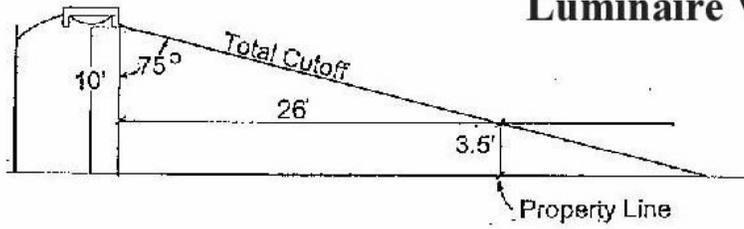


Figure B: Height and Total Height of Luminaire

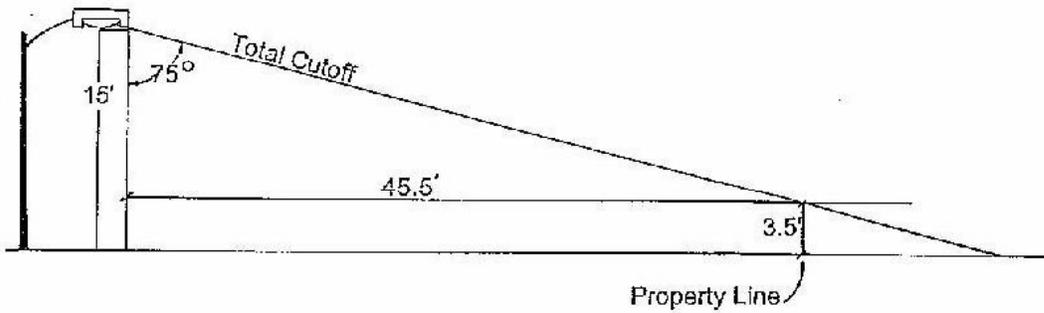


Luminaire Height = 10' +/-

**Figure C: Standards for Luminaire With Cutoffs**



Luminaire Height = 15' +/-



Luminaire Height = 20' +/-

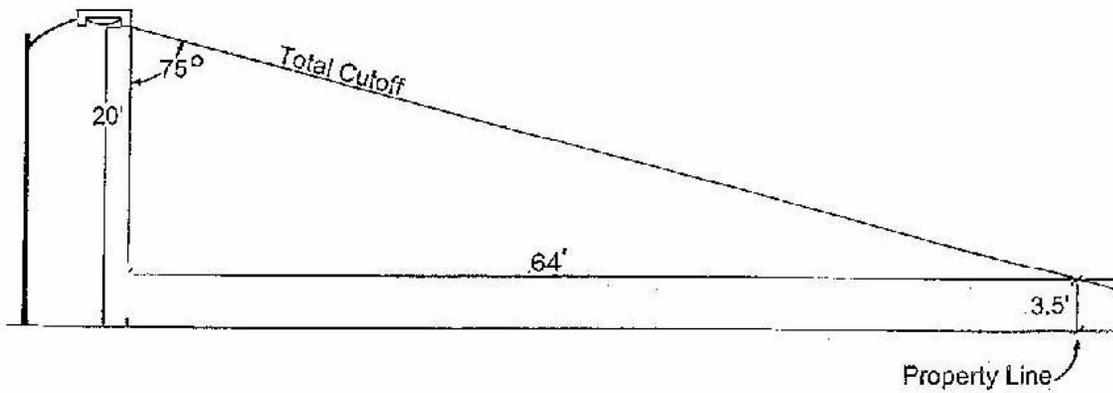
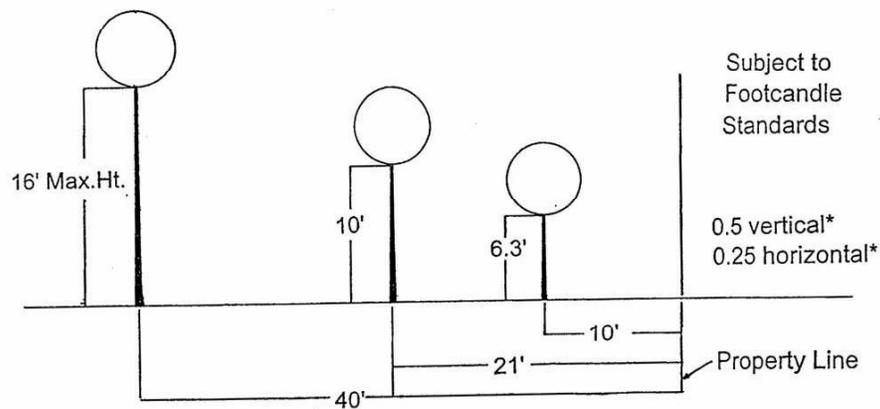


Figure D: Luminaires With No Cutoff or a Cutoff Angle Greater than 75 Degrees

- Height\* = 3 feet + D/3 (D is the distance in feet of the luminaire from the property line.)
- Maximum Height\* = 16 feet
- Maximum Watts or Lumens = 100 watts or 10,000 lumens, whichever is less (provided the luminaires meet the performance standards)

\*The performance standards set forth in Table 2 cannot be exceeded.



\*Measured 3.5' above ground.