



# Recommended Illumination Levels for various tasks. \*

**TABLE OF LIMITS OF INITIAL ILLUMINATION**  
measured in footcandles (fc) at ground level

<u>Task Area</u>	<u>Maximum:</u>
1. Parking Lots	4 fc
2. Active Building Entrance	5 fc
3. Sidewalks	4 fc
4. Signs	2 fc

**FOOTCANDLE: ("FC")** – Is the basic unit of illuminance (the amount of light falling on a surface). Footcandle measurement is taken with a light meter. One footcandle is equivalent to the illuminance produced on one square foot of surface area by a source of one candle at a distance of one foot. Horizontal footcandles measure the illumination striking a horizontal plane. Footcandle values can be measured directly with illuminance meters calibrated for low light levels.

**GUIDELINES FOR INITIAL LUMEN LEVELS**  
for different fixture heights:

<u>Mounting Height (Feet)</u>	<u>Recommended Fixture Lumen Maximums</u>
6	1000 lumens
8	600 - 1,600 lumens
10	1,000 - 2,500 lumens
12	1,600 - 2,500 lumens

**LUMEN** – A unit used to measure the actual amount of light that is produced by a bulb. The lumen quantifies the amount of light energy produced by a lamp at the lamp, not by the energy input, which is indicated by the "wattage". For example, a 75-watt incandescent lamp can produce 1000 lumens while a 70-watt high-pressure sodium lamp produces 6000 lumens. Lumen output is listed by the manufacturer on the packaging.

\* **IESNA:** Recommended Practices (RP-33-99), the Illuminating Engineering Society of North America (IESNA), Lighting for Exterior Environments. The Illuminating Engineering Society of North America (IES or IESNA), is an organization that publishes lighting recommended practices.

# Guidelines for Exterior Lighting



The Planning Board has established guidelines for exterior lighting as part of site plan review. These guidelines have been developed as a result of the Board's experience with lighting plans and in consultations with lighting professionals nationwide, in order to meet our community standards.





# Good lighting practices help to:

## Promote Safety

Brighter does not necessarily mean better! If not designed and installed correctly glare can result, reducing the effectiveness of lighting, contributing to accidents, and hindering visibility. Lighting that is too bright interferes with the eye's ability to adapt to darker areas.

## Save Money

Often lights do not need to be as bright as you might think! Many of the fixtures approved for use by the Planning Board are much more cost-effective in the long run because they are more energy efficient.

## Conserve Natural Resources

Inappropriate or excessive lighting wastes and pollutes our limited natural resources because it uses excess electrical energy by burning our limited supply of fossil fuels.

## Be Better Neighbors

Excessive or misdirected lighting can intrude on the privacy of others when light or glare trespasses over property lines.

## Retain Rural Character and Reduce Skyglow

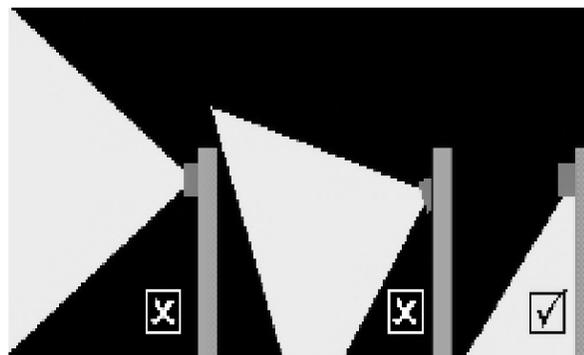
Our clear view of the dark starry night sky is a hallmark of our rural character. Stray and excessive lighting contribute to "light pollution" and unnatural "sky glow".

## Preserve Wildlife

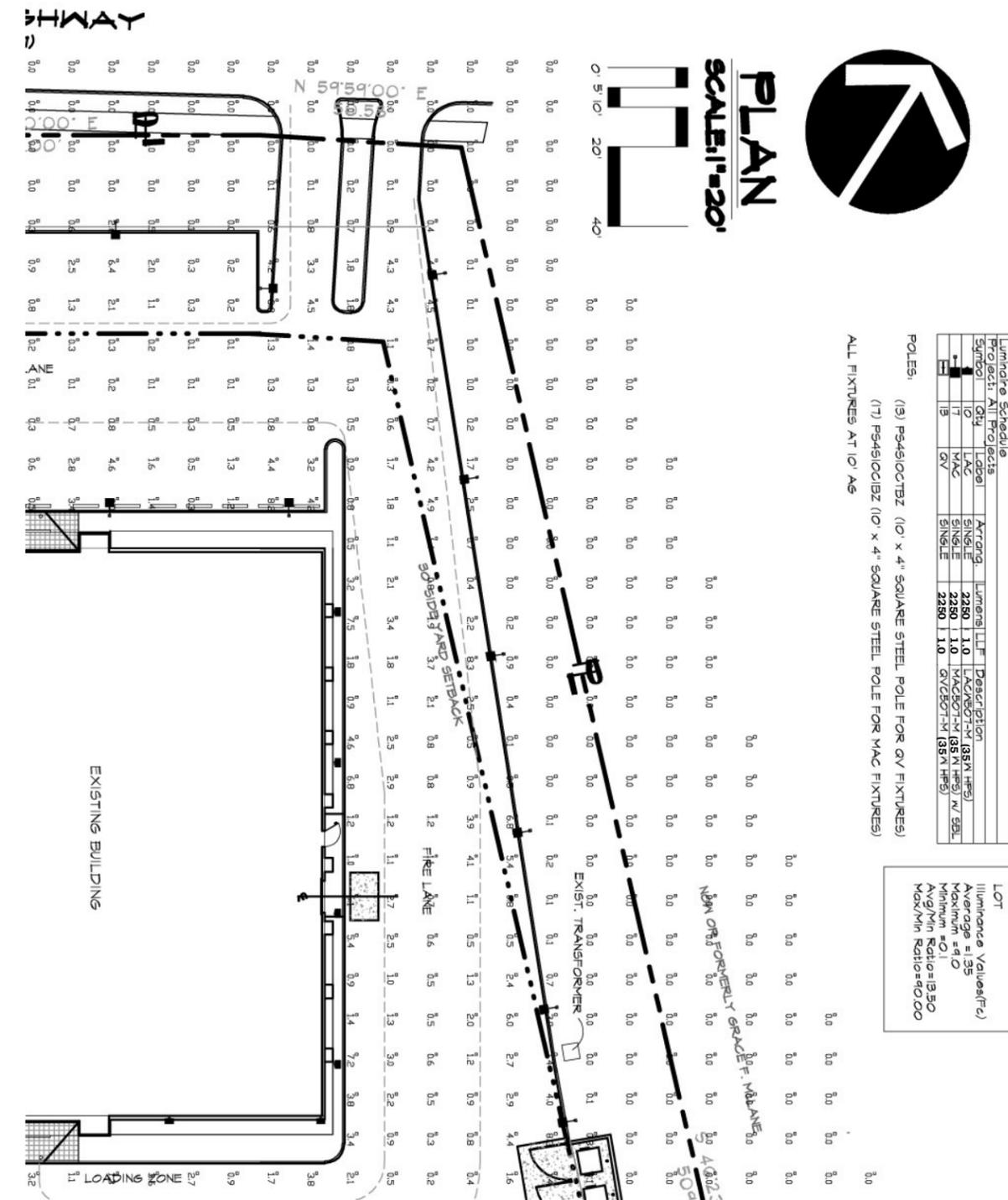
Research studies indicate that artificial night lighting can disrupt the migrating, feeding and breeding habits of many wildlife species, as well as growth patterns of trees.

## Reduce Health Risks

Recent research has also indicated that intrusive lighting may disrupt sleeping patterns in humans and may reduce the production of melatonin, a beneficial hormone.



### Figure 4: Sample Point By Point Initial Illuminance Calculation:





# Lighting Plan Submission Requirements

Please provide the Planning Board with the following information to enable us to evaluate the Site Plan for proper exterior lighting:

The Lighting Plan should be depicted on a site plan that indicates the location of each current and proposed outdoor lighting fixture. This plan will need to be stamped and certified by a licensed professional, such as an architect or engineer. Many lighting manufacturers can provide lighting layouts showing point by point initial illuminance calculations on prepared site plans to conform to Planning Department requirements.

- The lighting plan should include a KEY to the proposed lighting that provides the following information:
  - ♦ **Lighting fixture locations** including parking lots, walkways, building mounted, signs and all other exterior lighting equipment.
  - ♦ **Lighting fixture schedule** indicating manufacturer name and catalog number, lamp source type (i.e. HPS), wattage and initial lumens, photometric distribution type (full cut-off), mounting height and shielding descriptions. (See sample chart to be placed on plans, figure 3)
  - ♦ **Types of controls and control schedule** with proposed hours of operation for each luminaire.
  - ♦ **Iso-footcandle plots** for the proposed fixtures if there are a limited number of fixtures. For many fixtures (more than four) or areas of overlap it may be necessary to include a point by point illuminance calculation as noted below.
  - ♦ Depending on the size of the area to be illuminated and the number of fixtures proposed, the Board may request a **point by point illuminance** (lighting levels in footcandles) calculation at a 10 foot grid (maximum) with summary indicating all initial footcandle levels on the lighting plan, noting the maximum, average and minimum. All exterior luminaries on the property shall be included in the calculation. Property line illuminance calculations must also be shown. Light loss factor (LLF) must equal 1.0 for these calculations (See sample, figure 4).
- Lighting manufacturer-supplied **product information sheets** that include photographs of the fixture, and indicated the photometric distribution type "full cut off" of the luminaire (light fixture).

Figure 3: Sample chart to be placed on lighting plans

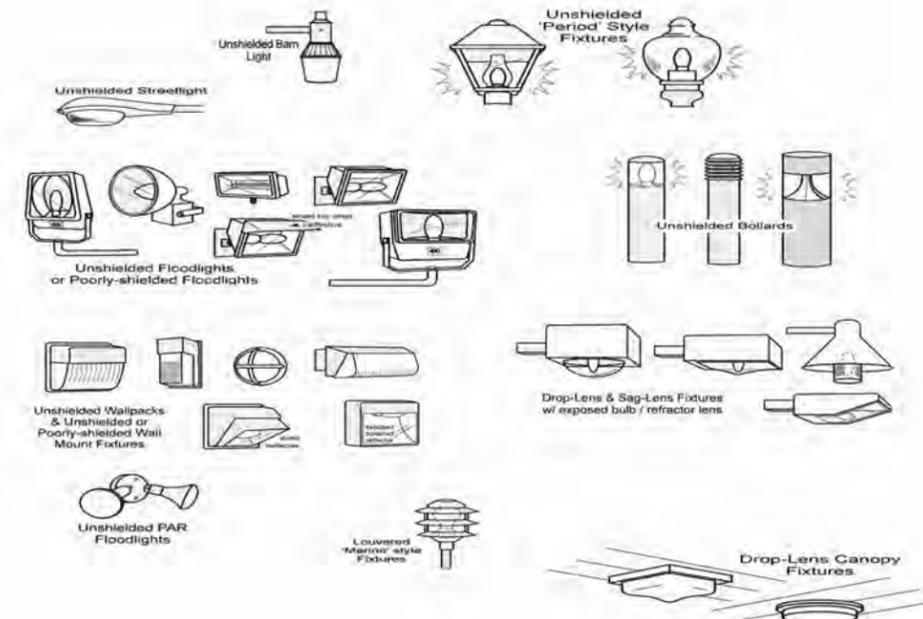
Lighting Schedule									
Symbol	Quantity	Bulb type	Wattage	Lumens	Height	LLF	Description (inc. brand and model #)	Photometric dist. type	type of controls
∅	3	fluorescent	23	1500	8'	1	Glarebuster (model # GB-1000)	full cut-off	motion sensor
Δ	2	incandescent	60	900	7'	1	Sea Gull Chatham Wall Lantern (# 8463D-44 )	full cut-off	timer (6pm-10pm)



# Full Cut-off Fixtures are Acceptable Fixtures



# Unshielded / Partially Shielded Fixtures that are unacceptable



In addition: a catalogue of sample full cut off fixtures (manufacturers cut sheets) is available for review at the Town of East Hampton Planning Board office.



# How to Develop an Acceptable Lighting Plan

**1. Identify where and when lighting is needed. Plans must confine and minimize lighting to the extent necessary to meet safety purposes.** Define the areas for which illumination is planned, itemizing each (e.g. parking lot, doorways, walkways, signage, foliage) with the anticipated hours of use. Outdoor lighting should be limited to parking areas, walkways and entries and other circulation areas. Landscape lighting is discouraged. Façade lighting is also discouraged.

**2. Direct light downward by choosing fully shielded Light Fixtures.** Required photometric distribution type for lighting fixtures is a fully shielded IESNA (Illuminating Engineering Society) "Full cut off". (See Figure 2) Top mounted sign lighting is permitted with fully shielded lighting fixtures aimed toward the sign. The light fixture should be positioned such that the light source is not visible from off the property line including the roadway.

**3. Select the correct Light Source (bulb type).** Lamps (light bulbs) with a color temperature of 3000K or less (warm color) are required. Recommended lamps for lighting that are not on motion sensors include high pressure sodium, metal halide and induction. Recommended lamps on motion sensors include compact fluorescent and induction. Incandescent lamps may be used but are very energy inefficient. LED light sources may be used if the LED brightness is not visible off the property. Mercury Vapor, neon and laser are not allowed.

**4. Utilize "shut off" controls such as timers, motion detectors, etc.** Install automatic controls or turn off lights when not needed for anticipated pedestrian use. Motion sensors should be aimed and adjusted such that lights are not triggered by motion off the property. Also consider dimming controls for LED and fluorescent lights. All lights are to be extinguished no later than one half hour after close of business. Do not use "dusk-to-dawn" sensors, without a shut off control. Lights alone will not serve to "protect" property and are a poor "security" device. Examine other means of protecting property.

**5. Limit the height of fixtures.** Light fixtures shall be mounted at the lowest practical height, taking in to account the area to be illuminated and the relationship between the mounting height and the number of fixtures required to illuminate that area. Light fixtures shall not be mounted at a height

greater than twelve (12) feet above natural grade unless a greater mounting height is required by the nature of the use or the size of the structure (e.g. boat storage buildings, multiple dwelling units and commercial garages).

**5. Limit light crossing the property lines.** Do not allow light to exceed the property lines. Light levels at the property line should not exceed 0.1 footcandles adjacent to businesses, and 0.05 fc at residential property boundaries.

**6. Use the correct amount of light.** Light levels should not exceed recommended values. (See Attached Recommended Illumination Levels for various tasks). Light levels should not be in excess of 5 footcandles on any lit surface. (Specify light levels and uniformity ratios, in accordance with current IESNA Recommended Practices, "Lighting for Exterior Environments" RP-33 and "Lighting for Parking Facilities" RP-20.

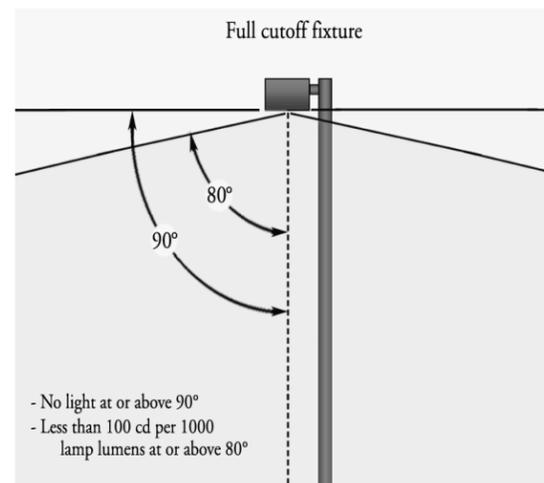
**7. Ask for Assistance** Your local lighting sales representative can assist you in obtaining the necessary information. The Planning Department staff are also available Monday through Friday from 1:00-4:00pm to provide assistance. They can be reached at (631) 324-2178

**8. Keep in mind:** Light sources installed will be checked and compared with those approved before a Certificate of Occupancy can be issued.

Figure 2:

## Definition of "Full Cut Off" and "Fully Shielded" Fixtures

♦ "Full Cut Off" fixtures do not allow any light at or above the fixture (the horizontal plane running through the lowest point of the fixture). No more than 10% of the light output can be emitted within the first 10 degrees below the same horizontal plane as determined by a photometric test or certified by a manufacturer.



♦ Manufacturers and their representatives can provide lighting product sheets with photographs of light fixtures, as well as literature confirming the independently tested photometric characteristics of their products.

♦ Photometric plots for different heights, light sources, and wattages, and photometric file data in "IES" format for computer calculations are often available upon request or through manufacturers' websites.

♦ "Full cut off" fixtures must be installed properly, so that the bottom of the fixture is level with the ground (figure 2).

\* If the manufacturer is unable to provide the photometric characteristics for a fixture, the following definition needs to be met: "Full Cut Off": A classification for a light fixture designed and installed so that no light is emitted at or above a horizontal plane running through the lowest point of the fixture. No more than 10% of the light output can be emitted within the first 10° below the same horizontal plane as determined by a photometric test or certified by a manufacturer.

