

# CITY OF GOLETA DESIGN REVIEW BOARD OUTDOOR LIGHTING GUIDELINES



## Light what is intended, not the night sky!

**I. Introduction.** Skyglow is the atmospheric phenomenon caused by stray, ground-based light being scattered and reflected by airborne particles suspended in the atmosphere. Improperly shielded light fixtures which emit light above the horizontal plane are the main cause, but light reflected from illuminated objects and poorly directed light also contribute to skyglow. Thus, poorly conceived and installed outdoor lighting has transformed the night-time sky environment into one of sky glow instead of star glow.

Because outdoor artificial lighting is an integral part of the City of Goleta's built environment, lighting should be carefully and thoughtfully used. Quality lighting designs and effective lighting practices will help to:

- Protect against direct glare, excessive lighting, and prevent light trespass;
- Preserve the community's character and reclaim the ability to view the night-time sky;
- Protect and improve safe travel for all modes of transportation;
- Promote safety and security;
- Conserve natural resources and energy; and
- Protect quality of life and ecology of flora and fauna

**II. Applicability.** This document is intended as a source of information with recommended guidelines to assist the Design Review Board in their review of commercial, industrial, residential, and City of Goleta projects under their purview. These guidelines could also be used by the planning staff, architects, designers, and applicants to achieve a high standard of quality and efficiency in lighting towards obtaining "dark sky" standards which in turn will foster and improve lighting standards in the City of Goleta.

Information from the International Dark Sky Association ([www.darksky.org](http://www.darksky.org)), LiteLynx (<http://members.aol.com/ctstarwchr/LiteLynx.htm#index>) and other sites on the internet dealing with the prevention of light pollution was used in developing these guidelines.

### **III. General Outdoor Lighting Design Considerations**

A. Design, locate, lamp and maintain outdoor lighting in order to prevent overlighting, energy waste, glare, light trespass, and skyglow.

B. Design outdoor lighting to be an integral part of the built environment, reflecting a balance for the lighting needs with the contextual ambient light level and surrounding nighttime characteristics of our community. Lighting for commercial installations adjacent or near residential uses should be compatible with nearby residential uses. Special consideration must be given to the commercial/residential lighting transition zones.

C. Reduce development impact to the nocturnal environment by the prevention of light pollution in environmentally sensitive areas/riparian habitats, greenbelts, areas of natural beauty and rural areas close to the edge of existing or proposed residential areas.

D. Use, where practical, outdoor lighting installations timers dimmers, sensor or photocell controllers that turn the lights off during daylight hours to reduce overall energy consumption. All non-essential exterior commercial and residential lighting is encouraged to be turned off after business hours and/or when not in use. Lights on a timer are encouraged. Sensor activated lights are encouraged to replace existing lighting used for security purposes.

E. Use minimum intensity of illumination needed for the intended purpose, for the architectural style of the structure, and for the overall neighborhood or commercial area.

F. Use fixtures appropriate to the style and scale of the architecture. Fixtures on buildings shall be attached only to walls, and the top of the fixture shall not exceed the height of the parapet or roof or eave of roof. Fixtures must be installed as designed.

G. Use most energy efficient of the popular types of outdoor lighting: Low Pressure Sodium (LPS), High Pressure Sodium (HPS), and Metal Halide (MH). Other factors should be considered regarding the choice of lamps. The use of MH over HPS, at similar lumen levels, can increase energy costs by almost 40 percent. Also, MH will increase maintenance costs, since lamp life is about 50 percent less than HPS. Here is further information on the different types of lighting.

1. LPS with its deep yellow illumination, although the most energy efficient, does not provide any color rendition alone. All colors appear as varying shades of yellow/grey unless mixed with other "white" lamp sources.
2. HPS illumination provides reasonable color rendering and is commonly used for street lighting, parking lots, and security lighting.
3. MH with its white illumination offers the best color rendition. As a result, discernment is critical. Recent studies seem to suggest that MH light improves peripheral (off-axis) vision and reaction time, when compared with HPS light. This, however, appears to only apply under very low levels of light.

**IV. Definitions.** Unless specifically defined below, words or phrases used in these guidelines shall be interpreted so as to give them the meaning they have in common usage and to give this section its most reasonable application.

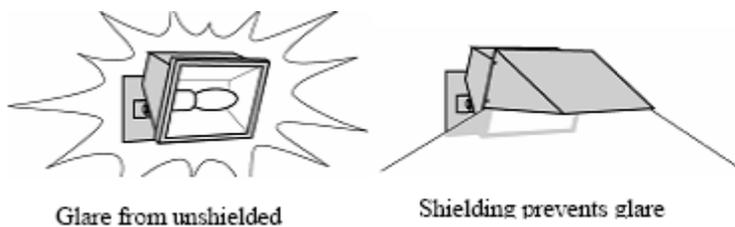
**Area light.** A luminaire equipped with a lamp that produces over one thousand eight hundred (1,800) lumens. Area lights include, but are not limited to, streetlights, parking lot lights and yard lights.

**Bulb.** The source of electric light, to be distinguished from the whole assembly (see luminaire)

**Exterior lighting.** Temporary or permanent lighting that is installed, located or used in such a manner to cause light rays to shine outside. Fixtures that are installed indoors that either are intended or light something outside are considered exterior lighting for the intent of these guidelines.

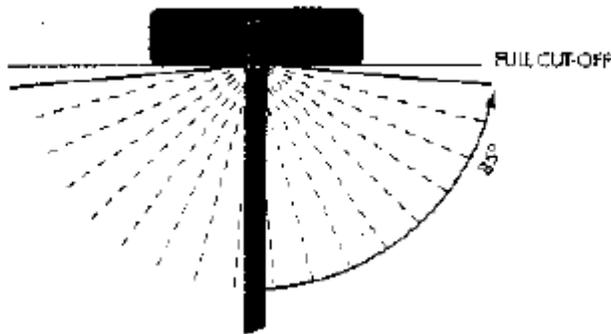
**Fixture.** The assembly that holds the lamp in a lighting system. It includes the elements designed to give light output control, such as a reflector (mirror) or refractor (lens), the ballast, housing, and the attachment parts. Also referred to as luminaire.

**Flood light.** Light that produces up to one thousand eight hundred (1,800) lumens is designed to flood a well-defined area with light. Generally, flood lights produce from one thousand (1,000) to one thousand eight hundred (1,800) lumens. Without shielding, floodlight's exposed light source (bulb) remains in direct view from most angles causing light trespass and light pollution and can be visible across great distances.



**Foot candle.** A unit of measurement for the total amount of light cast on a surface (illuminance). One foot candle is equivalent to the illuminance produced by a source of one candle at a distance of one foot.

**Full cut-off luminaire.** A luminaire designed and installed where no light is emitted at or above a horizontal plane running through the lowest point on the luminaire.



**Glare.** Intense light that results in discomfort and/or a reduction of visual performance and visibility.



**Holiday lighting.** Strings of individual lamps, where the lamps are at least three inches apart and the output per lamp is not greater than fifteen (15) lumens.

**Illuminance.** A measurement of light on the illuminated surface expressed in foot-candles (fc). **Horizontal Illuminance.** The illuminance on a horizontal plane. For example, to measure horizontal illuminance in a parking lot, the meter is laid on the pavement with sensor up. **Vertical Illuminance.** The illuminance on a vertical plane, typically used to measure glare and light trespass levels. To measure vertical illuminance, the meter is held vertically, at about five feet, sensor towards the light source.

**Hot Spots.** If the pole heights in outdoor parking areas don't allow for a reasonable spread of light, the result might be bright spots (or "hot spots") near the pole and dark areas in between or at the perimeter of the parking area. The bright areas reflect light into the sky and contribute to sky glow. In addition, non-uniform lighting levels can cause visibility problems as one drives through a given area forcing the vehicle operator's eyes to adapt to different light levels. The following reference gives information on pole spacing geometry (<http://www.darksky.org/infoshts/pdf/is078.pdf>) to minimize "hot spot" under fixtures.

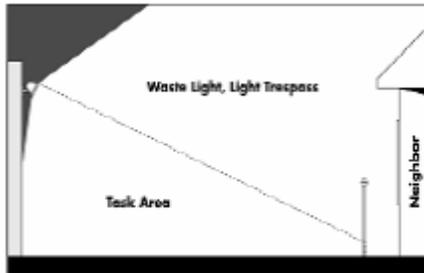
**IESNA or IES.** Illuminating Engineering Society of North America. The professional society of lighting engineers which publishes and revises, from time to time, recommended practices for various lighting applications. The City of Goleta may ultimately require that any new lighting or existing lighting meet the standards as established by IESNA.

**Lamp.** The source of electric light: the bulb and its housing. To be distinguished from the whole assembly (see "Luminaire")

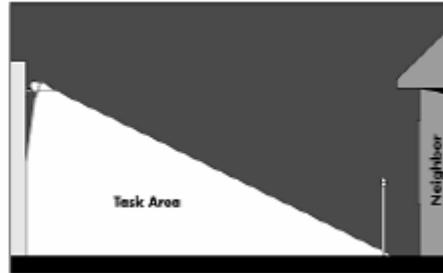
**Light.** The form of radiant energy acting on the retina of the eye to make sight possible; brightness, illumination, a lamp as defined above.

**Light pollution.** Any adverse effect of manmade light including but not limited to, light trespass, uplighting, the uncomfortable distraction to the eye, or any manmade light that diminishes the ability to view the night sky, often used to denote the urban sky glow.

**Light trespass.** Light falling where it is not wanted or needed, generally caused by a light on a property that shines on the property of others.



Light trespass from uncontrolled source



Controlled source and good aiming prevents light trespass

**Lighting.** Unit of luminous flux, the flux, emitted within a unit solid angle by a point source with a uniform luminous intensity of one candela. One foot-candle is one lumen per square foot. One lux is one lumen per square meter.

**Luminaire.** A complete lighting unit, consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power. When used, includes ballasts and photocells. Commonly referred to as “fixture”.

**Luminance.** The quantity of light (“brightness”) reflected or emitted towards an observer. Used primarily to measure internally-illuminated signs. Units are candelas per unit area.

**Lumen.** The unit used to quantify the amount of light energy produced by a lamp at the lamp. Lumen output of most lamps is listed on the packaging. For example, a 60-watt incandescent lamp produces 950 lumens while a 55-watt low-pressure sodium lamp produces 8000 lumens. See appendix for other lumen/watt relationships.

**Photometric Diagram.** A diagram depicting the location of all light poles and building mounted lighting fixtures in a specified area and a numerical grid of the maintained lighting levels that the fixture will produce in that specified area.

**Recessed.** A light built into a structure or portion of a structure such that the light is fully cut-off and no part of the light extends or protrudes beyond the underside of a structure or portion of a structure.

**Shielded.** When the light emitted from the fixture is projected below a horizontal plane running through the lowest point of the fixture where light is emitted. The bulb is not visible with a shielded light fixture, and no light is emitted from the sides of the fixture. See examples in the appendix.

**Uplighting.** Lighting that is directed in such a manner as to shine light rays above the horizontal plan.

**Uniformity Ratio.** Describes 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 time less” than the average (4) level of illumination.

**Watt.** The unit used to measure electrical power consumption of a lamp.

**V. Outdoor Lighting Plans.** An outdoor lighting plan shall be submitted in conjunction with an application for design review for all new outdoor lighting installations on commercial, industrial, City of Goleta property and certain residential applications (e.g., multi-family housing). Submittals for other types of projects may be required by the City due to project location, size, or proposed use, as necessary. An outdoor lighting plan shall include at least the following:

- A. A site plan showing the location of all buildings, parking and pedestrian areas or others where lighting is proposed on the site.
- B. The proposed location, mounting height, and aiming point and angle (if necessary) of outdoor lighting fixtures. This information should be shown on the landscape plan to demonstrate coordination of fixtures and tree plantings. The location of light fixtures and landscaping on adjacent properties and on the street right of way that effect lighting/landscaping on the project is also necessary. For pole lights, a composite drawing of the base, pole, and fixture with the drawing to extend from the ground surface adjacent to the light assembly to its highest point.
- C. Manufacturer specification sheets, cut-sheets, or other manufacturer provided information for all proposed outdoor lighting fixtures to show fixture diagrams, lamp types, wattage, initial lumen output, vertical cut-off level, and shielding information.
- D. Elevations of the building with mature landscaping, poles and fixtures superimposed. If building elevations are proposed for illumination, drawings for all relevant elevations showing the fixtures, the portions of the elevations to be illuminated, the illuminance, level of the elevations, and the aiming point for any remote light fixture;
- E. Other additional information may be required: photometric diagrams and data, color rendering index of all lamps, computer generated photometric grid showing foot-candle readings every 10 feet within the property or site and 10 feet beyond the property lines. The grid should also indicate maximum and minimum uniformity for each specific use area. Control descriptions to include types of controls (i.e., timers, motion sensors, etc.) the light fixtures to be controlled by each type and control schedule.

**VI. Exterior Lighting.** In order to comply with dark sky standards, all exterior lighting should be full cut-off with the light source downcast and fully shielded, with the following exceptions:

- A. Luminaires that have a maximum output of two hundred sixty (260) lumens per fixture, regardless of number of bulbs (equal to one twenty [20] watt incandescent light), may be left unshielded provided the fixture has an opaque top to keep light from shining directly up.

B. Luminaires that have a maximum output of one thousand (1,000) lumens per fixture, regardless of number of bulbs (equal to one sixty [60] watt incandescent light) may be partially shielded provided the bulb is not visible, and the fixture has an opaque top to keep light from shining directly up.

C. Low voltage (12 volts or less), low wattage ornamental landscape lighting fixtures, and solar operated light fixtures having self contained rechargeable batteries, where any single light fixture does not exceed 100 lumens.

D. Flood lights with external shielding may be angled provided that no light escapes above a twenty-five (25) degree angle measured from the vertical line from the center of the light extended to the ground, and only if the light does not cause glare or light to shine on adjacent property or public rights-of-way. Flood lights with directional shielding are encouraged. Photocells with timers that allow a flood light to go on at dusk and off by eleven p.m. are encouraged.

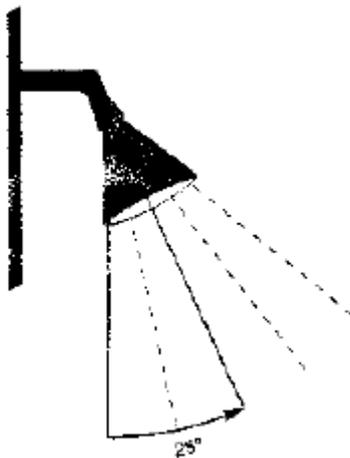


Fig 1. Angle of flood light with external shielding

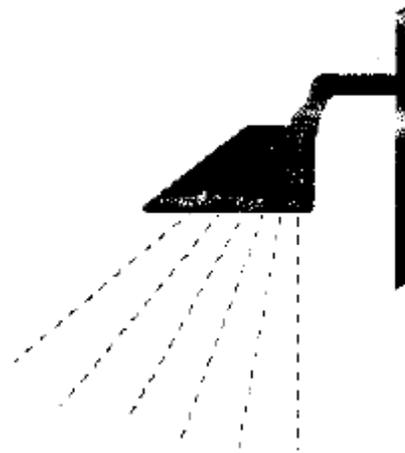


Fig. 2 Directional Floodlight

E. Holiday lights should be restricted to the period from November 1st to February 1<sup>st</sup> except that flashing holiday lights are prohibited on commercial properties. Holiday lights are encouraged to be turned off after bedtime and after close of businesses.

F. Sensor activated lighting may be unshielded provided it is located in such a manner as to prevent direct glare and lighting into properties of others or into a public right-of-way, and provided the light is set to only go on when activated and to go off within five minutes after activation has ceased, and the light shall not be triggered by activity off the property.

**VII. Area Lights.** It is recommended that all area lights under the jurisdiction of the City of Goleta be full cut-off fixtures.

A. Street lights. In the city of Goleta street lights are under the jurisdiction of Southern California Edison (SCE), except for highway safety lights located on traffic lights. DRB's preferences are that all new and replacement streetlights are cutoff luminaires that will not exceed IES illuminance recommendations.

B. Outdoor Facilities. Outdoor nighttime facilities (concerts, athletic contests, etc.) have unique lighting needs. Illumination levels vary, depending on the nature of the activity. Lighting for these facilities should allow adequate lighting for such events while minimizing sky glow, reducing glare and unwanted illumination of surrounding streets and properties, and reducing energy consumption.

C. Parking Lot Lighting. Parking lot lighting shall be designed to provide the minimum lighting necessary to ensure adequate vision, comfort and safety in parking areas and to not cause glare or direct illumination onto adjacent properties or streets.

1. The INESA Lighting Handbook lighting guidelines for open parking facilities suggest that a basic minimum level of illumination (at the darkest point of the lot) of 0.2 foot-candles is necessary to provide adequate nighttime visibility in areas of low night time activity. As the activity level increases, the minimum level of illumination should also increase. The foot-candle range in the below chart is intended to suggest choices that take into account surrounding terrain and structures (since vertical structures (trees, building walls, etc.) of dark color may absorb light). In order to prevent severe contrasts in illumination levels at various points in the parking area, a uniformity ratio (the ratio of the average level of illumination to the minimum level of illumination) of 4.1 shouldn't be exceeded because a greater disparity causes hot spots which reduce visual acuity.

Use	Foot candle	Uniformity Ratio
Multi-family parking		
a. Low vehicular/ped activity	0.2	4.1
b. Med vehicular/ped activity	0.6	4.1
High Activity e.g. regional shopping center, fast food	0.9	4.1
Medium Activity e.g. community shopping, office parks	0.6	4.1
Low Activity e.g., neighborhood shopping, church, school	0.2	4.1

From 9<sup>th</sup> edition INESA Lighting Handbook

4. While lower fixture mounting heights (i.e., 20 feet are preferred), there may be circumstances in very large parking lots that may require higher and fewer poles for aesthetic reasons and to better accomplish lighting uniformity.

5. Light trespass (the maximum vertical illumination measured at a point five feet within the property line shouldn't be any greater than 0.1 foot-candles.

6. Parking lot lights and fixtures should be located such that trees located in the parking lot don't obscure the operation of the light.



The even lighting in this parking lot facilitates visibility and the average to minimum light level ratios discourages severe lighting contrasts (i.e., “hot spots”)

**D. Exterior Display/Sales Areas.** Lighting levels on exterior display/sales areas shall be adequate to facilitate the activities taking place in such locations. Lighting of such areas shall not be used to attract attention to the business. The applicant shall designate areas to be considered display/sales areas and areas to be used as parking or passive vehicle storage areas.

1. Areas designated as parking or passive vehicle storage areas shall be illuminated in accordance with the requirements for parking areas suggested elsewhere in this section.
2. Areas designated as exterior display/sales areas shall be illuminated so that the average horizontal illuminance is no more than 5.0 foot-candles. The uniformity ratio should be no greater than 4:1. The average and minimum shall be computed for only that area designated as exterior display/sales area.
3. Light fixtures shall be located, mounted, aimed, shielded and maintained so that direct light is not cast onto adjacent streets or properties.
3. Fixtures should be mounted no more than 20 feet above grade and the concrete pedestals used to protect the light pole shall not exceed twenty-four (24") inches in height and shall be included in the overall height calculation.

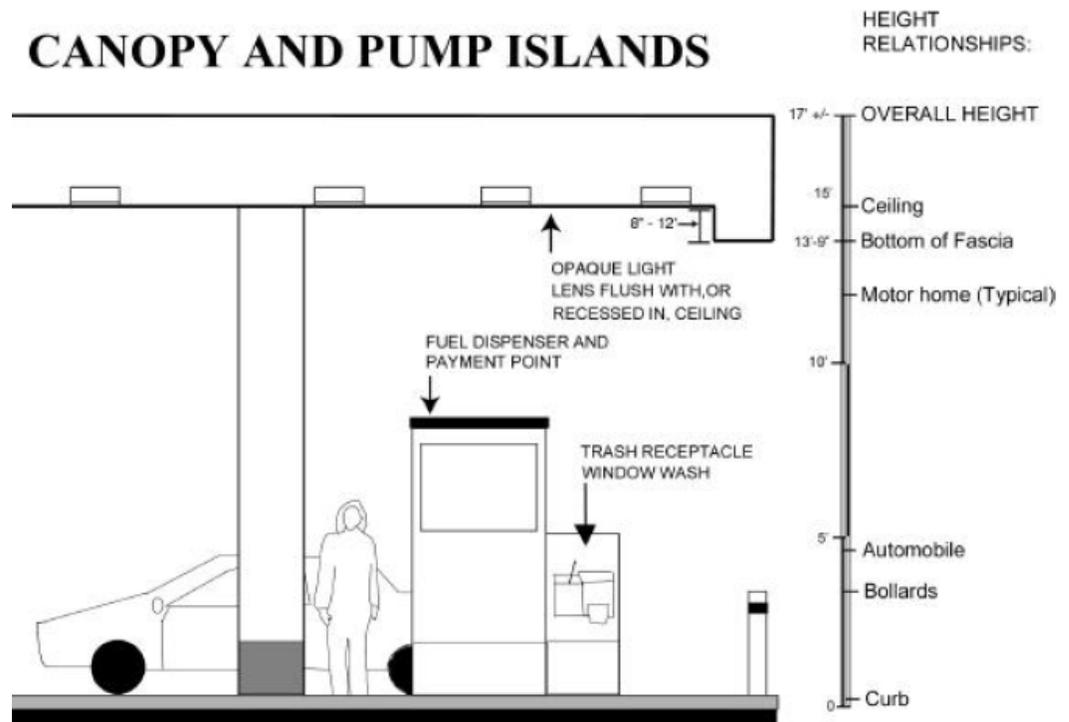
**E. Gasoline Station/Convenience Store Aprons and Canopies**

1. Lighting levels on gasoline station/convenience store aprons and under canopies shall be adequate to facilitate the activities taking place in such locations, but shall not be used to attract attention to the business.
2. Areas on the apron away from the gasoline pump islands used for parking or vehicle storage shall be illuminated in accordance with the requirements for

parking areas set forth previously. If no gasoline pumps are provided, the entire apron shall be treated as a parking area.

3. Areas around the pump islands and under canopies shall be illuminated so that the minimum horizontal illuminance at grade level is no more than 5.5 foot-candles. The uniformity ratio should be no greater than 4:1.

4. Light fixtures mounted on canopies shall be recessed so that the lens cover is recessed or flush with the bottom surface of the canopy and/or shielded by the fixture or the edge of the canopy so that light is restrained to no more than degrees beyond the vertical plane (see below diagram).



(Illustration taken from Scottsdale AZ Gas Station and Convenience Store Guidelines)

5. Lights shall not be mounted on the top or sides of the canopy, and the sides of the canopy shall not be illuminated.

6. For service stations in or next to a residential or rural area, lighting shall be of less intensity and shall be considerate of these residential or rural areas

**F. Walkways/Bikeways and Parks.** Where special lighting is to be provided for walkways, bikeways and parks, the following guidelines could apply.

1. The walkway, pathway, or ground area illuminated to a level of no more than 0.5 foot-candles.
2. The vertical illumination levels should be no more than 0.5 foot-candles.

3. Lighting fixtures shall be designed to direct light downward, and light sources should have an initial output of no more than 1000 lumens.

G. Accent, Architectural or Landscape Lighting. Generally, uplighting is recommended only for the following:

1. For national flags, statues, public art, or other objects of interest that cannot be illuminated with down-lighting, upward lighting should only be used in the form of narrow-cone spotlights that confine the illumination to the object.
2. Architectural or landscape features should only be illuminated if the lighting will enhance the design of a project, is not solely used as an attraction-getting device, and the feature is unique to the particular project due to the use of materials, colors or design characteristics which are not commonly found within the City.
3. Highlighting fixtures should be arranged so they are not generally visible from the public and in areas where there is considerable vehicle and pedestrian traffic so direct glare is avoided.

## **VIII. Signs**

### A. Externally Illuminated Signs

1. Light bulbs or lighting tubes used for illuminating a sign shall not be visible from adjacent public right-of-ways or residential properties.
2. No sign may be illuminated with fixtures not shielded from upward transmission of light. Externally illuminated signs shall be lighted only with steady, stationary, fully shielded light sources directed solely onto the sign without causing glare.
3. The intensity of sign lighting shall not exceed that necessary to illuminate and make legible a sign from the adjacent travel way or closest right-of-way and shall not be obtrusive to the surrounding area.

### B. Internally Illuminated Signs. These signs are prohibited except as follows:

1. Individual back lit letters which are silhouetted against a softly illuminated wall (reverse channel letters).
2. Individual (channel) letters with translucent faces, containing soft lighting elements inside each letter, and

C. Hours of illumination. A sign should be illuminated only during the hours of operation of the facility being identified or advertised or until 11:00 pm, whichever is later. Such signs should provide an automatic timer to comply with this section.

**VI. Prohibited Lighting.** In any future lighting ordinance, the DRB recommends that the following kinds of lighting be prohibited.

- A. Blinking, flashing, moving, revolving, flickering, changing intensity of illumination, and changing color lights.
- B. Illumination of roofs and internal illumination of awnings.
- C. Strings of small lights attached to buildings or landscape except for temporary holiday installations described previously.
- D. Mercury vapor lights
- E. Search lights, laser source lights, or any similar high-intensity light except in emergencies by police, fire, and other emergency service personnel or at their direction.

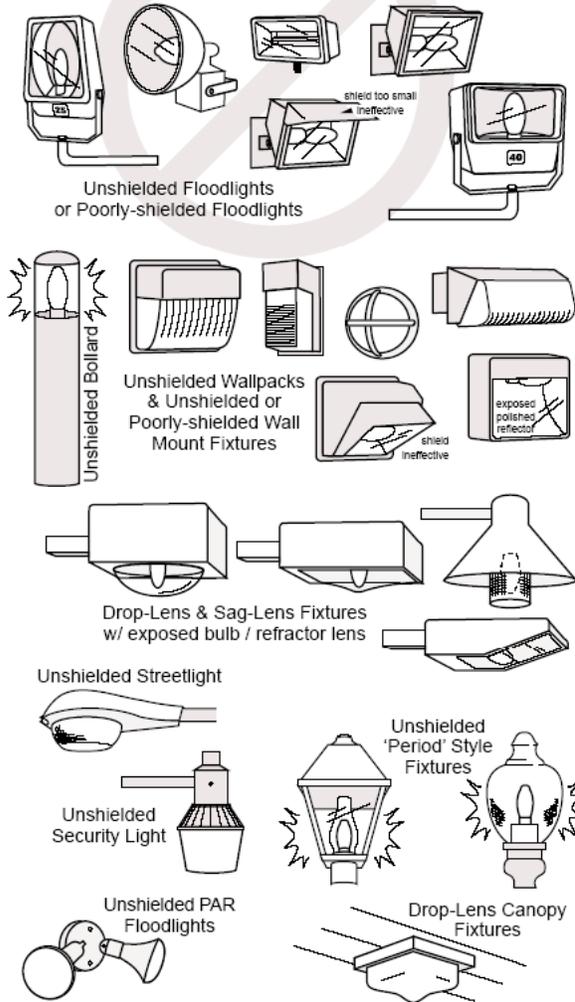
**VII. Post-installation Inspection.** The City should conduct a post-installation nighttime inspection to verify compliance with the requirements of this section, the approved lighting plan and, if appropriate, to require remedial action.

**VIII. Temporary Lighting.** Any temporary lighting that meets the standards of these guidelines is recommended to be allowed.

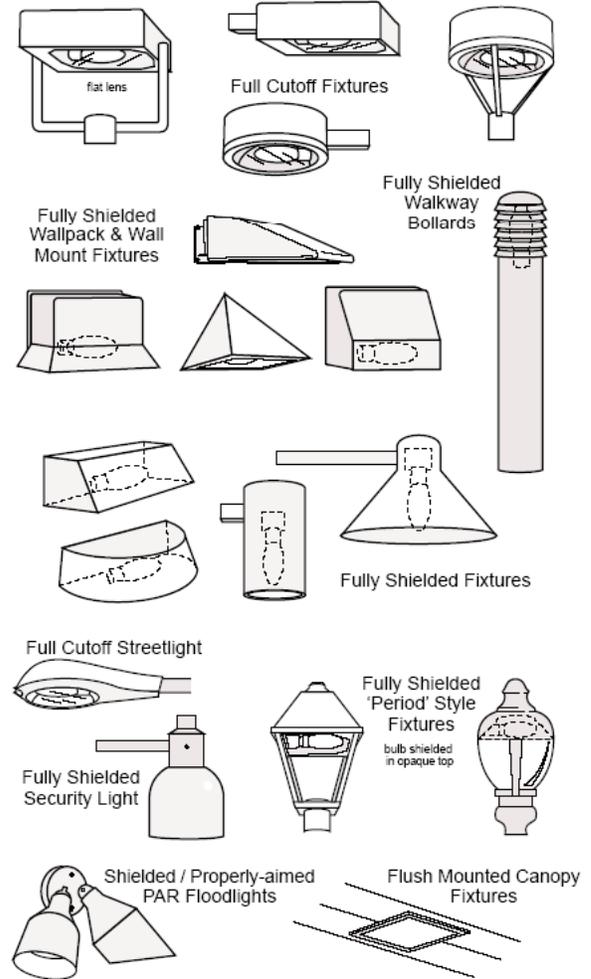
**APPENDIX**

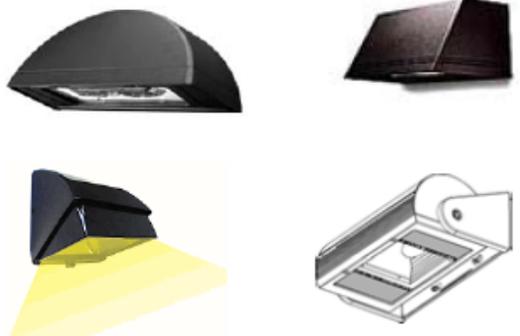
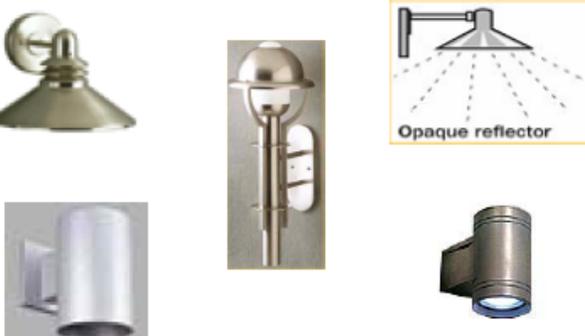
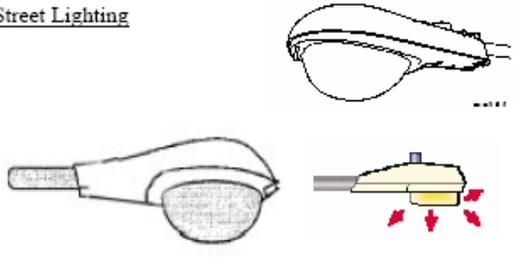
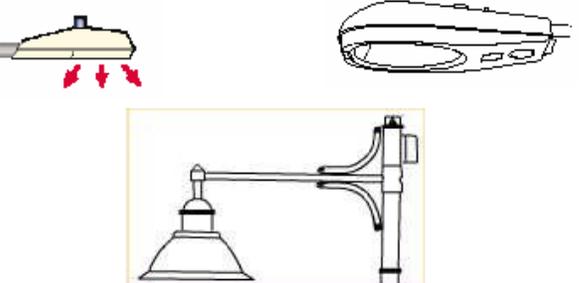
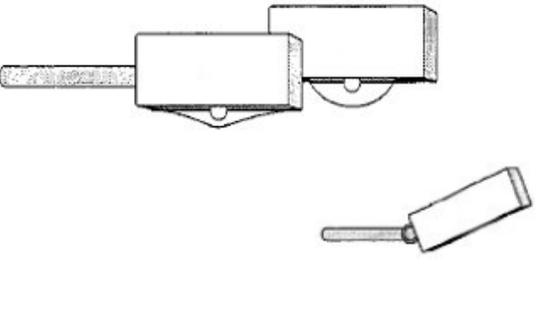
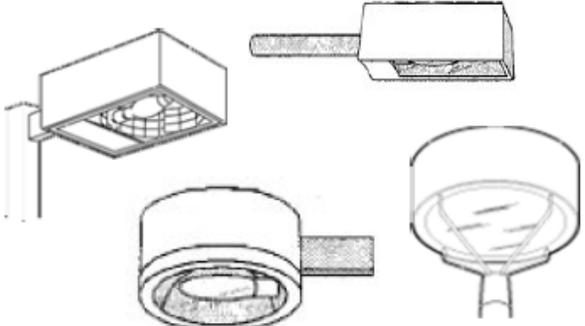
**EXAMPLES OF UNACCEPTABLE AND ACCEPTABLE LIGHTING FIXTURES**

Fixtures that produce glare and light trespass



Fixtures that shield the light source to minimize glare and light trespass and to facilitate better vision at night



Unacceptable	Acceptable
<p><u>Wall Packs</u></p>  <p>* Such fixture may be acceptable using only low output lamps (under 1,000 lumens). See 17.34.050.E.</p>	
<p><u>Decorative</u></p>  <p>* These fixtures may be acceptable if using a low wattage bulb. See 17.34.050.E.</p>	 <p>Opaque reflector</p>
<p><u>Street Lighting</u></p> 	
<p><u>Parking Lot Lighting</u></p> 	

Unacceptable	Acceptable
<p data-bbox="641 279 797 304"><u>Area Floodlights</u></p> 	 <p data-bbox="834 457 1073 520">* Hooded type floodlights still require proper aiming to prevent glare and light trespass</p>
<p data-bbox="267 600 362 625"><u>Spotlights</u></p>  <p data-bbox="267 852 753 877">* Without shielding, these types of fixture spray uncontrolled light.</p>	 <p data-bbox="834 793 1114 842">* Proper aiming is required to prevent glare and light trespass.</p>  <p data-bbox="1195 888 1390 909">Flood light with hood</p>

INITIAL RATED LIGHT OUTPUT OF VARIOUS LAMPS

(Information from Sylvania #PL-150, General Electric #9200 and Phillips #SG-100 large lamp catalogs)

LAMP TYPE OUTPUT	LAMP WATTAGE	INITIAL	LUM
INCANDESCENT LAMP (FROSTED) (Syl.)	25		235
INCANDESCENT LAMP (FROSTED) (Syl.)	40		375
INCANDESCENT LAMP (FROSTED) (Syl.)	60		890
INCANDESCENT LAMP (FROSTED) (Syl.)	100		1690
INCANDESCENT LAMP (FROSTED) (Syl.)	150		2850
INCANDESCENT FLOOD OR SPOT (G.E.)	75		765
INCANDESCENT FLOOD OR SPOT (G.E.)	120		1500
INCANDESCENT FLOOD OR SPOT (G.E.)	150		2000
QUARTZ HALOGEN LAMP (FROSTED) (Syl.)	42		665
QUARTZ HALOGEN LAMP (FROSTED) (Syl.)	52		885
QUARTZ HALOGEN LAMP (FROSTED) (Syl.)	72		1300
QUARTZ HALOGEN LAMP (FROSTED) (Syl.)	300		6000
QUARTZ HALOGEN LAMP (FROSTED) (Syl.)	500		10500
QUARTZ HALOGEN LAMP (FROSTED) (Syl.)	1000		21000
QUARTZ HALOGEN MINI FLOOD OR SPOT (G.E.) (12 volt MR-16 type)	20	260	
QUARTZ HALOGEN MINI FLOOD OR SPOT (G.E.) (12 volt MR-16 type)	42	630	
QUARTZ HALOGEN MINI FLOOD OR SPOT (G.E.) (12 volt MR-16 type)	50	895	
QUARTZ HALOGEN MINI FLOOD OR SPOT (G.E.) (12 volt MR-16 type)	75	1300	
FLUORESCENT LAMP (Phillips)	7		400
FLUORESCENT LAMP (Phillips)	9		600
FLUORESCENT LAMP (Phillips)	13		900
FLUORESCENT LAMP (Phillips)	22		1200
FLUORESCENT LAMP (Phillips)	28		1600
FLUORESCENT LAMP (G.E. cool white)	40		3150
LOW PRESSURE SODIUM LAMP (Phillips)	18		1800
LOW PRESSURE SODIUM LAMP (Phillips)	35		4800
LOW PRESSURE SODIUM LAMP (Phillips)	55		8000
LOW PRESSURE SODIUM LAMP (Phillips)	90		13500
LOW PRESSURE SODIUM LAMP (Phillips)	135		22500
LOW PRESSURE SODIUM LAMP (Phillips)	180		33000
HIGH PRESSURE SODIUM LAMP (DIFFUSE) (G.E.)	35		2250
HIGH PRESSURE SODIUM LAMP (DIFFUSE) (G.E.)	50		4000
HIGH PRESSURE SODIUM LAMP (DIFFUSE) (G.E.)	70		6400
HIGH PRESSURE SODIUM LAMP (DIFFUSE) (G.E.)	100		9500
HIGH PRESSURE SODIUM LAMP (DIFFUSE) (G.E.)	150		16000
HIGH PRESSURE SODIUM LAMP (DIFFUSE) (G.E.)	250		27500
HIGH PRESSURE SODIUM LAMP (DIFFUSE) (G.E.)	400		50000

METAL HALIDE LAMP (Coated) (G.E.)	32	2500
METAL HALIDE LAMP (Coated) (Venture)	50	3400
METAL HALIDE LAMP (Coated) (G.E.)	100	9000
METAL HALIDE LAMP (Coated) (G.E.)	175	15750
METAL HALIDE LAMP (Coated) (G.E.)	250	20500
METAL HALIDE LAMP (Coated) (G.E.)	400	36000