Pattern Outdoor Lighting Code (USA)

Standard ver. 2.0
July 2010

This document is based on the USA Pattern Code contained within the *IDA Outdoor Lighting Code Handbook*, published by the International Dark-Sky Association in 2000. It has been revised and updated by the author.

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Section 1. Purpose and Intent.

It is the intent of this Code to define practical and effective measures by which the obtrusive aspects of outdoor light usage can be reduced, while preserving safety, security, and the nighttime use and enjoyment of property. These measures are intended to curtail the degradation of the nighttime visual environment, reduce ***light trespass***, ***glare***, energy and resource waste by encouraging lighting practices that direct appropriate amounts of light where and when it is needed, increasing the use of energy-efficient sources, and decreasing the use of poorly shielded or inappropriately directed ***lighting fixtures***.

Section 2. Conformance with Applicable Codes.

All outdoor lighting shall be ***installed*** in conformance with the provisions of this Code, the Building Code, the Electrical Code, the Energy Code, and the Sign Code of the jurisdiction as applicable and under appropriate permit and inspection.

Section 3. Applicability.

3.1 New Uses, Buildings and Major Additions or Modifications. For all proposed new land uses, developments, buildings, and structures that require a permit, all outdoor lighting shall meet the requirements of this Code. All building additions or modifications of twenty-five (25) percent or more in terms of additional dwelling units, gross floor area, or parking spaces, either with a single addition or with cumulative additions subsequent to the effective date of this provision, shall invoke the requirements of this Code for the entire property, including previously installed and any new outdoor lighting. Cumulative modification or replacement of outdoor lighting constituting twenty-five (25) percent or more of the permitted ***lumens*** for the parcel, no matter the actual amount of lighting already on a non-conforming site, shall constitute a major addition for purposes of this section.

3.2 Minor Additions. Additions or modifications of less than twenty-five (25) percent to existing uses, as defined in Section 3.1 above, and that require a permit, shall require the submission of a complete inventory and site plan detailing all existing and any proposed new ***outdoor lighting fixtures***. Any new ***outdoor lighting fixtures*** on the site shall meet the requirements of this Code with regard to shielding and lamp type; the ***total outdoor light output*** after the modifications are complete shall not exceed that on the site before the modification, or that permitted by this Code, whichever is larger.

3.3 Resumption of Use after ***Abandonment***. If a property or use with non-conforming lighting is ***abandoned***, then all outdoor lighting shall be reviewed and brought into compliance with this Code before the use is resumed.

3.4 Public Roadways. Lighting for public roadways must comply with the provisions of this Code, except the ***total outdoor light output*** limits of Section 4.2.

Section 4. General Outdoor Lighting Standards.

4.1 Shielding Standards. All nonexempt ***outdoor lighting fixtures*** shall have shielding as shown in Table 4.1; outdoor ***luminous tube*** lighting does not require shielding but total output from ***partially shielded*** lighting is subject to the limits set forth in Section 4.2.

Use Codes:

A = unshielded, ***partially*** and ***fully shielded fixtures*** allowed
P = ***partially*** and ***fully shielded fixtures*** allowed
F = only ***fully shielded fixtures*** allowed
X = not allowed

Table 4.1. LIGHT FIXTURE SHIELDING STANDARDS

Land Use and Lighting Class	Lighting Zone		Notes
	LZ 1	LZ 2	
Commercial, Industrial, Mixed-use and Multi-family Residential uses			
Class 1 lighting (Color Rendition):			
Initial output ≥ 2000 ***lumens***	F	F	
Initial output < 2000 ***lumens***	F	P	3
Class 2 lighting (General Illumination):			
Initial output ≥ 2000 ***lumens***	F	F	
Initial output < 2000 ***lumens***	F	P	3
Class 3 lighting (Decorative):			1
Initial output ≥ 2000 ***lumens***	X	X	
Initial output < 2000 ***lumens***	P	P	3
Initial output < 20 ***lumens***	X	A	
Residential uses:			2
All Classes			
Initial output ≥ 2000 ***lumens***	F	F	
Initial output < 2000 ***lumens***	P	P	1,3

Notes to Table 4.1

1. Exception: seasonal decorations using typical low-wattage incandescent lamps shall be permitted in all lighting zones from Thanksgiving through 15 January.

2. For purposes of this section, residential refers to all residential land-use zoning, including all densities and types of housing such as single-family detached and duplexes, but does not include multi-family residential uses.

3. Examples of lamp types of 2,000 and 1,000 ***lumens*** and below (The acceptability of a particular light is determined by ***lumen*** output, not wattage; values listed are approximate; check manufacturer's specifications).

Lamp Type and Wattage with Outputs below 2000 ***lumens*** and 1000 ***lumens***

Lamp Type	2000 ***lumens***	1000 ***lumens***
Standard incandescent and less	100 watt	60 watt
Tungsten-halogen (quartz) and less	100 watt	60 watt
Fluorescent and less	25 watt	15 watt
Compact Fluorescent and less	26 watt	13 watt
No available High-Pressure Sodium or Metal Halide		

4.2. ***Total Outdoor Light Output*** Standards. ***Total outdoor light output*** (see definition 16.30) shall not exceed the limits in Table 4.2.

Table 4.2. MAXIMUM ***TOTAL OUTDOOR LIGHT OUTPUT*** STANDARDS

Land Use	***LIGHTING ZONE***		**Notes**
	LZ 1	***LZ 2***	
Commercial Industrial, Mixed-use and Multi-family Residential uses (***lumens*** per ***net acre***)			
total (***fully shielded*** + ***partially shielded*** + unshielded)	50,000	100,000	
partially shielded + unshielded only	5,000	10,000	
Residential uses (***lumens*** per residence)			1
total (***fully shielded*** + ***partially shielded***)	10,000	10,000	
partially shielded	3,000	3,000	

Note to Table 4.2

1. For purposes of this section, residential refers to all residential land-use zoning, including all densities and types of housing such as single-family detached and duplexes, but does not include multi-family residential uses.

4.3. Lamp Type Standards. All lamps must conform to the types listed in Table 4.3.

Lamp Types:
wLED = "warm white" light emitting diode with ***CCT*** ≤ 3500 K
HPS = high-pressure sodium
LPS = low-pressure sodium

Table 4.3. ALLOWED LAMP TYPES

LIGHTING CLASS	Allowed Lamp Types	Notes
Commercial, Industrial, Mixed-use and Multi-family Residential uses		
***Class 1 lighting* (Color Rendition):**		
All initial outputs	all types	
***Class 2 lighting* (General Illumination):**		
Initial output ≥ 2,000 ***lumens***	wLED, HPS, LPS	
Initial output < 2,000 ***lumens***	all types	
***Class 3 lighting* (Decorative):**		
All initial outputs	all types	
Residential uses (all Classes):		1
All initial outputs	all types	

Note to Table 4.3

1. For purposes of this section, residential refers to all residential land-use zoning, including all densities and types of housing such as single-family detached and duplexes, but does not include multi-family residential uses.

4.4. ***Spot Light*** Aiming Standard. ***Light Fixtures*** containing ***Spot*** or ***Flood lamps*** must be aimed no higher than 45 degrees above straight down (half-way between straight down and straight to the side) (Figure 4.4). When aimed above straight down but at less than 45 degrees, such ***light fixtures*** shall be considered ***partially shielded;*** when aimed straight down they shall be considered ***fully shielded.***

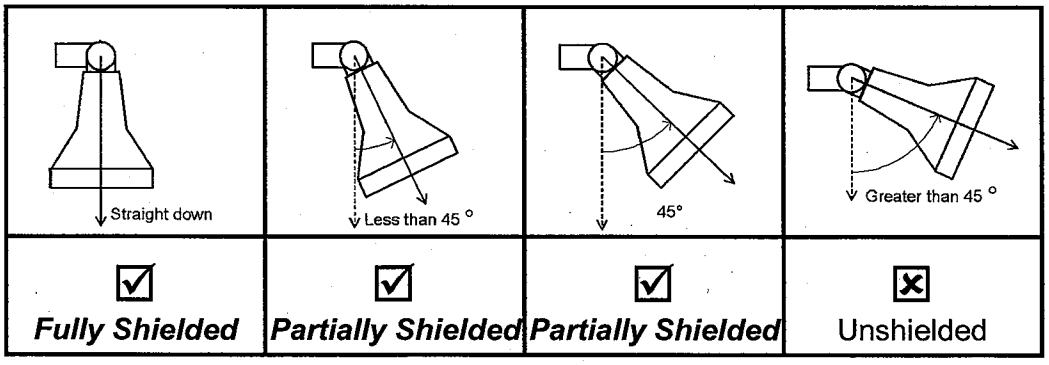


Figure 4.4. ***Spot light*** aiming

4.5. "House Side" Shielding Standard. Beyond the shielding requirements of Section 4.1, any privately or publicly owned ***outdoor light fixture*** with a lamp of initial output over 10,000 ***lumens*** located within 50 feet of any residential (including multi-family residential) property or public right-of-way shall utilize an internal or external "house-side" shield, with the ***light fixture*** and shield oriented to minimize ***light trespass*** over the adjacent property or right-of-way line (Figure 4.5). If an external shield is used, the surface of the shield facing the lamp must be a dark or flat black color.

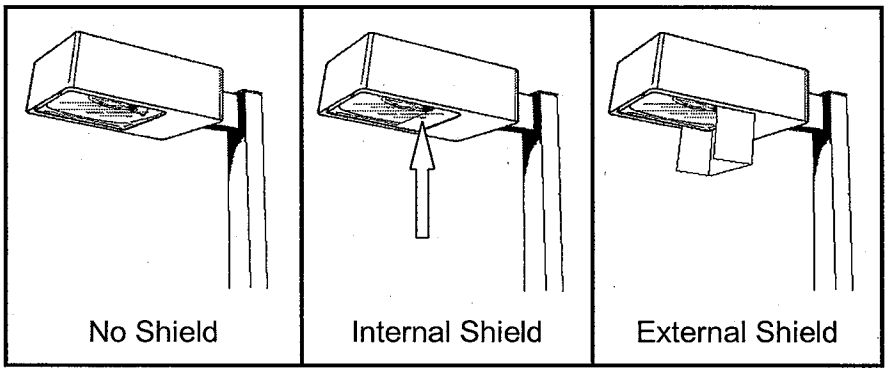


Figure 4.5. House-side shield configurations

4.6. Effective Shielding Standard. All ***light fixtures*** that are required to be ***fully shielded*** shall be installed and maintained in such a manner that the shielding is effective as described in the definition in Section 15 for ***fully shielded fixtures***.

4.7. ***Multi-Class Lighting*** Standard. ***Multi-Class lighting*** must conform to the shielding and timing restrictions, if any, that apply to the most restrictive included ***Lighting Class***.

4.8. ***Luminous Tube*** Lighting. Lighting using ***luminous tubes*** is included in the total outdoor light output calculations for the site. Lumens for neon lighting are calculated on a per foot basis, rather than per "fixture." Any unshielded neon lighting is limited by the ***partially shielded*** + unshielded lighting limits of Section 4.2.

4.9. Internally Illuminated Architecture. Any architectural element including walls, portions of buildings or canopy edges that is internally illuminated and that is not a sign or fenestration (windows or doors) shall have 100 percent of the initial lamp output of all lamps used to provide such illumination considered ***partially shielded*** lighting for the purposes of calculating ***total outdoor light output*** for the site.

4.10. Indoor Lighting. Any indoor lighting fixture within a non-residential structure containing a lamp with initial output over 2,500 lumens and mounted such that

any part of the fixture is lower than the upper edge of a window or door must be fully shielded (See Figure 4.10).

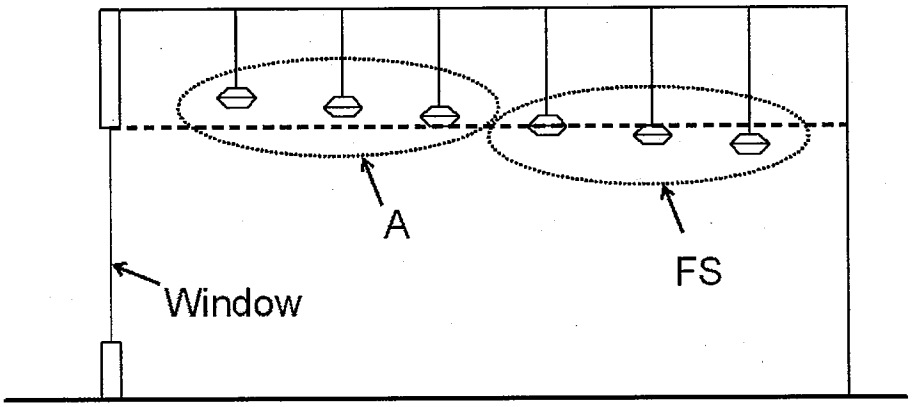


Figure 4.10. Elevation cross-section view showing required shielding for indoor non-residential lighting (FS = ***fully shielded***; A = allowed, ***fully shielded***, ***partially shielded*** or unshielded)

4.11. Time Limits.

A. ***Class 3 lighting*** shall be extinguished between 10:00pm (or when the business closes, whichever is later) and the time the business re-opens.

B. ***Class 2 lighting*** located 75 feet or more from the nearest building, ***display area*** or storage area shall be extinguished between 10:00pm (or within 30 minutes of the business closing, whichever is later) and the time the business re-opens.

Section 5. Outdoor Advertising Sign Lighting Standards.

5.1 ***Externally Illuminated Sign*** Lighting Standards. External illumination for signs, including ***billboards***, shall conform to the provisions of this Code. Such lighting shall be treated as ***Class 1 lighting*** and shall conform to the lamp source, shielding restrictions and ***total outdoor light output*** limits of Section 4 (except as provided in Section A below). All upward-directed sign lighting is prohibited.

A. Lighting for externally illuminated ***billboards*** may use up to 200 initial lamp ***lumens*** per square foot of sign face. Lighting for billboards is not included toward the ***total outdoor light output*** limits of Section 4.2.

5.2 ***Internally Illuminated Sign***, ***Neon Sign, Multicolor Fixed-Copy LED Sign*** and ***Single-Color LED Sign*** Lighting Standards.

A. Outdoor ***internally illuminated signs*** must either be constructed with an ***opaque*** background and translucent text and symbols, or with a colored background and generally LIGHTER text and symbols (Figure 5.2.A). Lamps used for internal illumination *of* ***internally illuminated signs*** shall not be counted toward the ***total outdoor light output*** limits in Section 4.2.

Light Background ☒	Colored Background ☑	Opaque Background ☑
		
		

Figure 5.2.A. ***Internally illuminated sign*** styles

B. ***Neon signs, multicolor fixed-copy LED Signs*** and ***single-color LED signs*** (Figure 5.2.B) shall be treated as ***internally illuminated signs*** for the purposes of this Code, and shall not have their outputs counted toward the ***total outdoor light output*** limits in Section 4.2. Any lighting extending beyond the area considered to be the sign area (as defined in the Sign Code of this jurisdiction) shall conform to all provisions of this Code. In particular, such lighting shall be treated as ***Class 3 lighting*** (decorative) and shall conform to the ***total outdoor light output*** limits of Section 4.

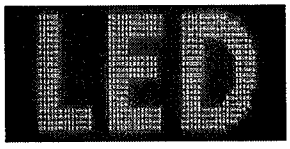
Neon	Multicolor Fixed-Copy LED	Single-Color LED
		

Figure 5.2.B. ***Neon, multicolor fixed-copy LED*** and ***single-color LED signs***

C. Other internally-illuminated panels or decorations not considered to be signage according to the sign code of this jurisdiction (such as illuminated

canopy margins or building faces), shall be considered ***Class 3 lighting*** (decorative), and shall be subject to the standards applicable for such lighting, including but not limited to the lamp source, shielding standards and ***total outdoor light output*** limits of Section 4.2.

5.3 ***Multicolor Changeable-Copy LED Sign*** Lighting Standards. Lighting for ***multicolor changeable-copy LED signs*** (Figure 5.3.A) must meet the following:

A. [ALTERNATIVE A] ***Multicolor changeable-copy LED signs*** are not permitted.

[ALTERNATIVE B] ***Multicolor changeable-copy LED signs*** must be adjusted to prevent overly bright ***luminance*** at night: automatic controls must limit night ***luminance*** to a maximum of 100 ***nits*** when the display is set to show maximum brightness white (100% full white mode). The applicant shall provide a written certification from the sign manufacturer that the nighttime light intensity has been factory pre-set not to exceed this level, and that this setting is protected from end-user modification by password-protected software or other method as deemed appropriate by the Planning Director.

Multicolor Changeable-Copy LED

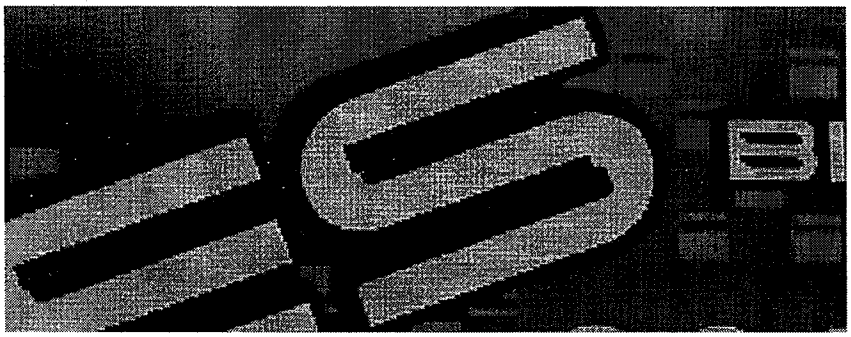


Figure 5.3.A. ***Multicolor changeable-copy LED sign***

5.4 Time Limits. Illumination for all ***on-site advertising signs*** except ***billboards***, shall be turned off by the times listed in Table 5.4 or when the business closes, whichever is later. Signs subject to time limits are required to have functioning and properly adjusted automatic shut-off timers. Light background (white, off-white, light gray, cream or yellow) ***internally illuminated signs***, ***installed*** legally before enactment of this code [enter date], may continue to be used and illuminated but must conform to the time limits as indicated.

Table 5.4. ILLUMINATED SIGN TIME LIMITS

Sign Type	*Lighting Zone*	
	LZ 1	*LZ 2*
Internally illuminated, light background	6pm	8pm
Multicolor Changeable-Copy LED	6pm	8pm
All other types	9pm	10pm

Section 6: Special Use Lighting Standards.

6.1 Recreational Facilities.

A. Class of Play: Fields designed primarily for use by municipal or amateur leagues, training, recreational or social levels, shall be considered ***Sports Class IV*** as defined by the Illuminating Engineering Society of North America (IESNA). Fields designed primarily for college, semiprofessional, professional or national levels shall be considered ***Sports Class I***, ***Sports Class II*** or ***Sports Class III*** as defined by IESNA.

B. Lighting Class and Amount: Lighting for outdoor athletic fields, courts or tracks shall be considered ***Class 1 lighting*** (Color Rendition), and shall be exempt from the ***lumens*** per acre limits of Section 4.2. ***Illuminance*** shall be designed to achieve no greater than the minimal levels for the activity as recommended by the Illuminating Engineering Society of North America (IESNA) for the ***Sports Class*** as described in Section 6.1.A.

C. Shielding:

1. Facilities designed for ***Sports Class III*** and ***Sports Class IV:*** lighting for the field shall use ***fully shielded lighting fixtures***. Where ***fully shielded fixtures*** are not available, ***lighting fixtures*** using external louvers or shields that, in the final installed configuration, extend to within 3 inches on the lowest portion of the light fixture opening are required (Figure 6.1.C.1). The fixtures shall be ***installed*** and maintained with aiming angles that permit no greater than 1% of the light emitted by each fixture to project above the horizontal.

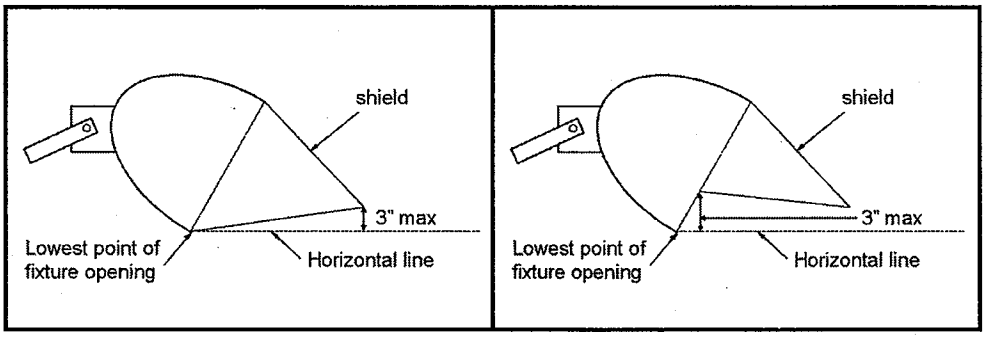


Figure 6.1.C.1. ***Sports Class III*** and ***IV*** lighting shield configurations.

2. Facilities designed for ***Sports Class I*** and ***Sports Class II:*** lighting for the field shall use ***lighting fixtures*** with internal and/or external control louvers or shields to minimize off-site ***glare*** and ***light trespass***. The fixtures shall be ***installed*** and maintained with aiming angles that permit no greater than 5% of the light emitted by each fixture to project above the horizontal.

D. Certification: Every such lighting system design and installation shall be certified by a registered engineer, architect or landscape architect as conforming to all applicable restrictions of this Code.

E. Time Limit: All field lighting shall be extinguished within 30 minutes of cessation of play, and events shall be scheduled so as to complete activity before 11pm. Illumination of the playing field, court or track shall be permitted after the time limit only to conclude a scheduled event that did not conclude before the time limit due to unusual circumstances.

6.2. ***Frontage Row of Vehicle Display Areas***

A. Lighting Class: Lighting for ***frontage row of vehicle display areas*** shall be considered ***Class 1 lighting*** (Color Rendition).

B. Shielding: All ***frontage row vehicle display area*** lighting shall utilize ***fully shielded light fixtures*** that are ***installed*** in a fashion that maintains the ***fully shielded*** characteristics.

C. ***Lumen*** Limit: ***Total outdoor light output*** for the ***frontage row of vehicle display areas*** is exempt from the ***total outdoor light output*** limits in Section 4.2, but shall not exceed 60 ***lumens*** per square foot.

D. Time Limit: The ***frontage row of vehicle display area*** lighting exceeding the ***lumens*** per acre cap of Section 4.2 shall be turned off at 10 p.m. or within thirty minutes after closing of the business, whichever is later. Lighting in the ***frontage row of vehicle display areas*** after the time limit

shall be considered ***Class 2 lighting***, and shall conform to all restrictions of this Code applicable for ***Class 2 lighting***, including the ***total outdoor light output*** limits in Section 4.2.

6.3 Service Station Canopies.

A. Lighting for service station canopies shall be considered ***Class 1 lighting*** (Color Rendition).

B. Shielding: All ***light fixtures*** mounted on or recessed into the lower surface of service station canopies shall be ***fully shielded*** and utilize flat lenses.

C. Total Under-Canopy Output: The total light output used for illuminating service station canopies, defined as the sum of all under-canopy initial bare-lamp outputs in ***lumens***, shall not exceed 60 ***lumens*** per square foot of canopy. All lighting mounted under the canopy, including but not limited to ***light fixtures*** mounted on the lower surface or recessed into the lower surface of the canopy and any lighting within signage or illuminated panels over the pumps, is to be included toward the total at full initial ***lumen*** output.

D. The ***lumen*** output of lamps mounted on or within the lower surface of a canopy is included toward the ***total outdoor light output*** limits in Section 4.2 according to the method defined for ***total outdoor light output***. Other lighting located under a canopy but not mounted on or within the lower surface is included toward the ***total outdoor light output*** limits in Section 4.2 at full initial output.

6.4 Other Lighting on Parcels with Special Uses. All lighting not directly associated with the special use areas above shall conform to the lighting standards described in this Code at all times, including but not limited to the shielding requirements of Section 4.1, the ***total outdoor light output*** limits of Section 4.2 and the lamp type standards of Section 4.3. The ***net acreage*** for the determination of compliance with Section 4.2 shall not include the area of the athletic field or ***frontage row of vehicle display area***; the area of any service station canopy shall be included in the ***net acreage***.

Section 7. Submission of Plans and Evidence of Compliance with Code, Subdivision Plats.

7.1 Submission Contents. The applicant for any permit required by any provision of the laws of this jurisdiction in connection with proposed work involving ***outdoor lighting fixtures*** shall submit (as part of the application for permit) evidence that the proposed work will comply with this Code. Even should no other such permit be required, the installation or modification of any exterior lighting (except for routine servicing and same-type lamp replacement) shall

require submission of the information described below. The submission shall contain but shall not necessarily be limited to the following, all or part of which may be part of or in addition to the information required elsewhere in the laws of this jurisdiction upon application for the required permit:

A. plans indicating the total number and location on the premises of all ***outdoor lighting fixtures***, both proposed and any already existing on the site;

B. description of all ***outdoor lighting fixtures***, both proposed and existing. The description may include, but is not limited to, catalog cuts and illustrations by manufacturers (including sections where required); lamp types, wattages and initial ***lumen*** outputs;

7.2 Additional Submission. The above required plans, descriptions and data shall be sufficiently complete to enable the designated official to readily determine whether compliance with the requirements of this Code will be secured. If such plans, descriptions and data are not sufficient, the applicant shall submit such additional evidence as reasonably requested by the jurisdiction, including certified reports of tests performed and certified by a recognized testing laboratory.

7.3 Subdivision Plats. If any subdivision proposes to have ***installed*** street or other common or public area outdoor lighting, submission of the information as described in Section 7.1 shall be required for all such lighting.

7.4 Lamp or Fixture Substitution. Should any ***outdoor light fixture*** or the type of light source therein be changed after the permit has been issued, a change request must be submitted to the designated official for approval, together with adequate information to assure compliance with this Code. Approval must be received prior to substitution.

7.5 Plan Approval. If the designated official determines that the proposed lighting does not comply with this Code, the permit shall not be issued or the plan approved.

7.6 Certification of Installation. For projects using 200,000 lumens or more a registered engineer shall certify in writing to the City that all lighting was installed in accordance with the approved plans.

Section 8. Prohibitions.

8.1 Sale of Non-Conforming Fixtures and Lamps. The installation, sale, offering for sale, lease or purchase of any outdoor lighting fixture or lamp the use of which is not allowed by this Code is prohibited.

8.2 Laser Source Light. The use of laser source light or any similar high intensity light for outdoor advertising or entertainment, when projected above the horizontal, is prohibited.

8.3 Searchlights. The operation of searchlights for advertising purposes is prohibited.

Section 9. Temporary Exemption.

9.1 Request; Renewal; Information Required. Any person may submit, on a form prepared by the jurisdiction, to the designated official, a temporary exemption request. The request shall contain the following information:

A. specific Code exemption(s) requested;
C. duration of requested exemption(s);
E. proposed location on premises of the proposed light fixture(s);
B. purpose of proposed lighting;
D. information for each light fixture and lamp combination as required in section 7.1;
F. previous temporary exemptions, if any, and addresses of premises thereunder;
G. such other data and information as may be required by the designated official.

9.2 Approval; Duration. The designated official shall have five (5) business days from the date of submission of the request for temporary exemption to act, in writing, on the request. If approved, the exemption shall be valid for not more than thirty (30) days from the date of issuance of the approval. The approval shall be renewable upon further written request, at the discretion of the designated official, for a maximum of one (1) additional thirty (30) day period. The designated official is not authorized to grant more than one (1) temporary permit and one (1) renewal for a thirty (30) day period for the same property within one (1) calendar year.

9.3 Disapproval; Appeal. If the request for temporary exemption or its extension is disapproved, the person making the request will have the appeal rights provided in Section 11.

Section 10. Other Exemptions.

10.1 Nonconformance

A. Bottom-mounted or unshielded outdoor advertising sign lighting shall not be used beginning five years after enactment of this Code.

B. All other outdoor light fixtures lawfully installed prior to and operable on the effective date of this Code are exempt from all requirements of this Code. There shall be no change in use or lamp type, or any replacement (except for same-type and same-output lamp replacement) or structural alteration made, without conforming to all applicable requirements of this Code. Further, if the property is abandoned, or if there is a change in use of the property, the provisions of this Code will apply when the abandonment ceases or the new use commences.

10.2 State and Federal Facilities. Compliance with the intent of this Code at all State and Federal facilities is encouraged.

10.3 Emergency Lighting. Emergency lighting, used by police, firefighting, or medical personnel, or at their direction, is exempt from all requirements of this code for as long as the emergency exists.

10.4 Swimming Pool and Fountain Lighting. Underwater lighting used for the illumination of swimming pools and fountains is exempt from the lamp type and shielding standards of Section 4.1, though it must conform to all other provisions of this code.

Section 11. Appeals.

Any person substantially aggrieved by any decision of the designated official made in administration of the Code has the right and responsibilities of appeal to the Advisory/Appeals Board of this jurisdiction.

Section 12. Law Governing Conflicts.

Where any provision of federal, state, county, township or city statutes, codes, or laws conflicts with any provision of this Code, the most restrictive shall govern unless otherwise regulated by law.

Section 13. Violation and Penalty.

It shall be a civil infraction for any person to violate any of the provisions of this Code. Each and every day or night during which the violation continues shall constitute a separate offense. A fine shall be imposed of not less than fifty dollars nor more than seven hundred dollars for any individual or not less than 100 nor more than ten thousand dollars for any corporation, association, or other legal entity for each offense. The imposition of a fine under this Code shall not be suspended.

Section 14. Severability.

If any of the provisions of this Code or the application thereof is held invalid, such invalidity shall not affect other provisions or applications of this Code which can be given effect, and to this end, the provisions of this Code are declared to be severable.

Section 15. Definitions.

As used in this Code, unless the context clearly indicates otherwise, certain words and phrases shall mean the following:

15.1 ***Abandoned***. Abandonment shall be determined as provided in Section _____ of the City/Town's Zoning Ordinance. [Consider "cessation of use" here instead, depending on advice of local counsel]

15.2 ***Billboard***. Any sign designed for use with changeable advertising copy and which is normally used for the advertisement of goods produced or services rendered at locations other than the premises on which the sign is located.

15.3 ***CCT***. Correlated color temperature. A numerical figure used to describe the apparent color of white or nearly white light sources such as LEDs or metal halide.

15.4 ***Class 1 Lighting***. All outdoor lighting used for, but not limited to, outdoor sales or eating areas, assembly or repair areas, advertising and other signs, recreational facilities and other similar applications where COLOR RENDITION IS IMPORTANT to preserve the effectiveness of the activity. Designation of lighting as ***Class 1 lighting*** requires a finding by the Planning Director of the essential nature of color rendition for the application. Recognized ***Class 1 lighting*** uses are: outdoor eating and retail food or beverage service areas; outdoor maintenance areas where regularly scheduled maintenance activity occurs after dark; ***display areas***; assembly areas such as concert or theater amphitheaters.

15.5 ***Class 2 Lighting***. All outdoor lighting used for, but not limited to, illumination for walkways, roadways, equipment yards, parking lots and outdoor security where GENERAL ILLUMINATION for visibility, safety or security of the grounds is the primary concern.

15.6 ***Class 3 Lighting***. Any outdoor lighting used for DECORATIVE effects including, but not limited to, architectural illumination, flag and monument lighting, and illumination of trees, bushes, etc.

15.7 ***Development Project***. Any residential, commercial, industrial or mixed-use subdivision plan or development plan which is submitted to the City for approval.

15.8 ***Display Area***. Outdoor areas where active nighttime sales activity occurs AND where accurate color perception of merchandise by customers is required. Recognized ***display area*** uses include automobile and recreational vehicle sales, boat sales, tractor sales, building supply sales, gardening or nursery sales, swap meets. Uses not on this list must be approved as ***display area*** uses by the Planning Director.

15.9 ***Frontage Row of Vehicle Display Area***. That portion of a ***display area*** used for vehicles located adjacent to the parcel frontage. Includes only the front row of vehicles adjacent to the parcel frontage; does not include the driving area located behind the parked vehicles or the remainder of the ***display area*** not adjacent to the frontage. (Figure 15.9)

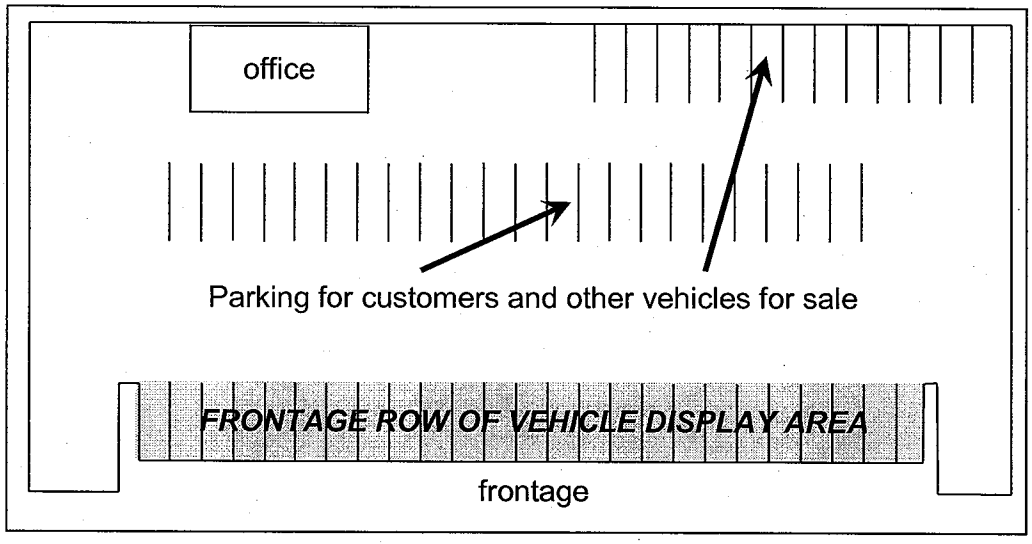


Figure 15.9. ***Frontage Row of Vehicle Display Area***

15.10 ***Flood Lamp***. See ***Spot Lamp.***

15.11 ***Footcandle***. The standard imperial unit used to measure ***illuminance***, or the amount of light falling onto a surface, such as a roadway or athletic field. One ***footcandle*** equals one ***lumen*** per square foot. One ***footcandle*** equals approximately 10 ***lux.***

15.12 ***Fully Shielded (Light Fixture)***. A ***light fixture*** 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 from any part of the ***fixture***, is projected below the horizontal. Any structural part of the ***light***

fixture providing this shielding must be permanently affixed, and part of the fixture, not part of any surrounding building or architectural elements.

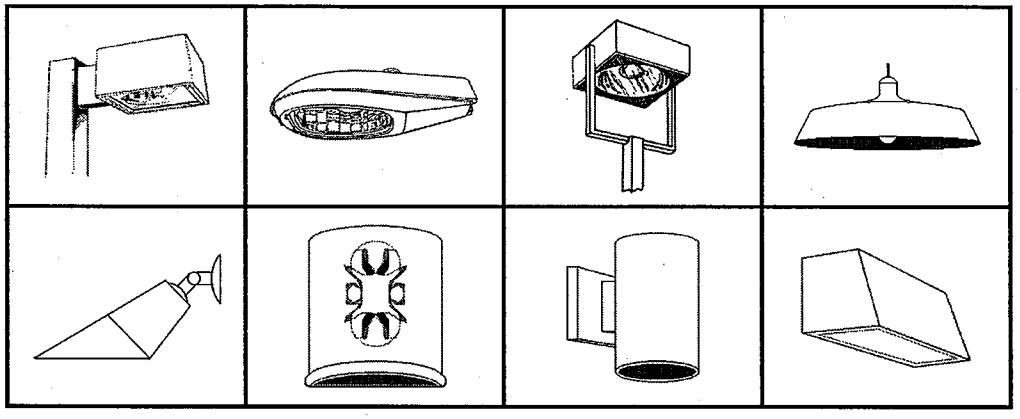


Figure 15.12a. Examples of ***fully shielded fixtures***.

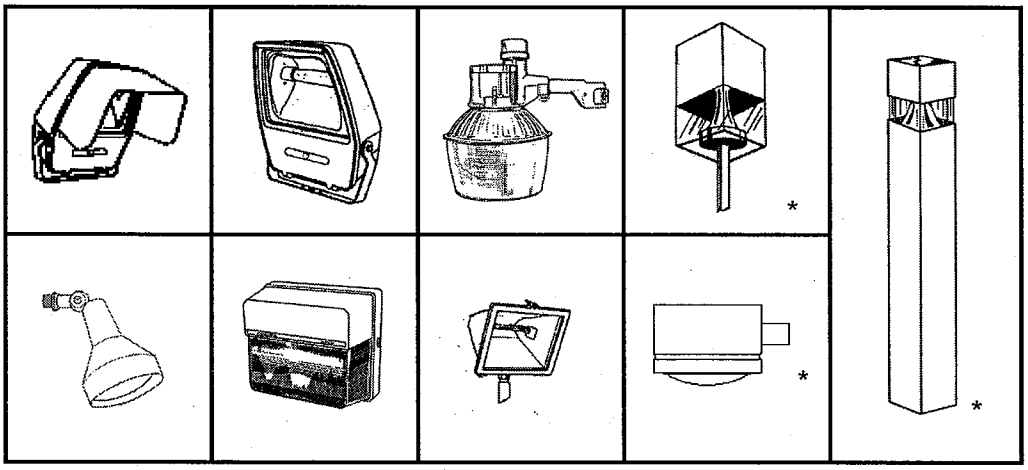


Figure 15.12b. Examples of fixtures that are NOT ***fully shielded*** (*even though the lamp in these fixtures is shielded from direct view when viewed from the side or above, reflective surfaces and/or lens covers are visible from the side).

15.13 ***Glare***. The sensation produced by a bright source within the visual field that is sufficiently brighter than the level to which the eyes are adapted to cause annoyance, discomfort, or loss in visual performance and visibility; blinding light.

15.14 ***Illuminance***. The amount of light falling onto a unit area of surface (luminous flux per unit area) - measured in ***footcandles*** or ***lux***.

15.15 ***Installed***. The attachment, or assembly fixed in place, whether or not connected to a power source, of any ***outdoor light fixture***.

15.16 ***LED***. Light emitting diode.

15.17 ***Light Fixture, Outdoor***. A complete lighting assembly (including the lamp, housing, reflectors, lenses and shields), less the support assembly (pole or mounting bracket). Includes ***luminous tubes***, lamps or similar devices, permanently ***installed*** or portable, used for illumination, decoration, or advertisement. Such devices shall include, but are not limited to lights used for:

A. parking lot or ***parking garage*** lighting;
B. roadway and driveway lighting;
C. pedestrian or walkway lighting;
D. entryway lighting;
E. recreational areas;
F. landscape lighting;
G. ***billboard***s and other signs (advertising or other);
H. ***display area*** lighting;
I. building or structure decoration;
J. building overhangs and open canopies.

For purposes of determining ***total light output from*** a ***light fixture***, lighting assemblies which include multiple lamps within a single ***light fixture*** or on a single pole or standard shall be considered as a single unit (Figure 15.18).

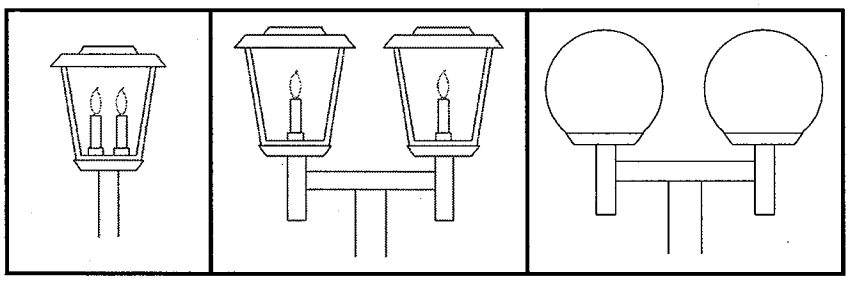


Figure 15.17. ***Light fixtures*** with multiple lamps in a single fixture (left) and on a single pole or bracket (center, right)

15.18 ***Light Trespass***. Light falling across property boundaries, onto property not containing the originating light source.

15.19 ***Lighting Zones***. The ***lighting zones*** are defined on the Lighting Zone Map, by this reference made a part of this Code. Guidelines used to guide the delineation of the ***lighting zones*** are:

A ***Lighting Zone LZ 1***. This Zone includes predominantly residential areas, including small neighborhood commercial or industrial areas mostly surrounded by residential areas

B ***Lighting Zone LZ 2***. This Zone includes urban areas with primary land uses for commercial, business and industrial activity, including urban multi-family residential areas mostly surrounded by commercial areas.

15.20 ***Lumen***. Unit of luminous flux; used to measure the amount of light emitted by lamps.

15.21 ***Luminaire***. See ***Light Fixture, (Outdoor)***.

15.22 ***Luminance***. The intensity of light reflected or emitted from a unit area of surface, such as a sign face - measured in ***nits***.

15.23 ***Luminous Tube***. A glass tube filled with a gas or gas mixture (including neon, argon, mercury or other gasses), usually of small diameter (10-15 millimeter), caused to emit light by the passage of an electric current, and commonly bent into various forms for use as decoration or signs. A "neon" tube. Does not include common fluorescent tubes or compact fluorescent lamps.

15.24 ***Lux***. The standard metric unit used to measure ***illuminance***, or the amount of light falling onto a surface, such as a roadway of athletic field. One ***lux*** equals one ***lumen*** per square meter. One ***lux*** equals approximately 0.1 ***footcandles***.

15.25 ***Multi-Class Lighting***. Any outdoor lighting used for more than one purpose, such as security and decoration, such that its use falls under the definition of two or more Classes as defined for ***Class 1, 2 and 3 Lighting***.

15.26 ***Neon Tube***. See ***Luminous Tube***.

15.27 ***Net Acreage***. The remaining area after deleting all portions for proposed and existing streets within a parcel, subdivision or multiple contiguous parcels proposed for development. For parcels including special uses listed in Section 6 that are exempted from the ***total outdoor light output*** limits of Section 4.2, the area devoted to the special use only shall also be excluded from the ***net acreage***.

15.28 ***Nit***. The standard unit used to measure the brightness of a surface, such as a sign.

15.29 ***Outdoor Light Fixture***. See ***Light Fixture, Outdoor***.

15.30 ***Opaque***. ***Opaque*** means that a material does not transmit light from an internal illumination source. Applied to sign backgrounds, means that the area surrounding any letters or symbols on the sign allows no light from an internal source to shine though it.

15.31 ***Outdoor Light Output, Total***. The initial total amount of light, measured in ***lumens***, from all lamps used in ***outdoor light fixtures***. Includes all lights and ***luminous tubes*** used for ***Class 1, Class 2, Class 3*** and ***multi-Class lighting***, and lights used for external illumination of signs, but does not include lights used to illuminate ***internally illuminated signs***, ***luminous tubes*** used in ***neon signs***, or seasonal lighting from typical low-output lamps permitted between Thanksgiving and January 15th. For lamp types that vary in their output as they age (such as high pressure sodium, fluorescent and metal halide), the initial lamp output, as defined by the manufacturer, is the value to be considered. For ***LED*** fixtures, the light output of the fixture, as defined by the manufacturer, is the value to be considered. For determining compliance with Section 4.2 [***Total Outdoor Light Output***] of this Code, the light emitted from lamps and ***luminous tubes*** is to be included in the total output as follows (see Figures 15.31a/b):

A. ***outdoor light fixtures installed*** on poles (such as parking lot ***light fixtures***) and ***light fixtures*** or ***luminous tubes installed*** on the sides of buildings or other structures, when not shielded from above by the structure itself as defined in parts B, C and D below, are to be included in the ***total outdoor light output*** by simply adding the initial ***lumen*** outputs of the lamps and tubes;

B. ***outdoor light fixtures*** and ***luminous tubes installed*** under canopies, buildings (including ***parking garage*** decks), overhangs or roof eaves where all parts of the lamp, tube or ***light fixture*** are located at least five (5) feet but less than ten (10) feet from the nearest edge of the canopy or overhang are to be included in the ***total outdoor light output*** as though they produced only one-quarter (0.25) of the lamp's rated initial ***lumen*** output;

C. ***outdoor light fixtures*** and ***luminous tubes installed*** under canopies, buildings (including ***parking garage*** decks), overhangs or roof eaves where all parts of the lamp, tube or ***light fixture*** are located at least ten (10) feet but less than thirty (30) feet from the nearest edge of the canopy or overhang are to be included in the total outdoor light output as though they produced only one-tenth (0.10) of the lamp's or tube's rated initial ***lumen*** output.

D. ***outdoor light fixtures*** and ***luminous tubes installed*** under canopies, buildings (including ***parking garage*** decks), overhangs or roof eaves where all parts of the lamp or light fixture are located thirty (30) or more feet from the nearest edge of the canopy or overhang are not to be included in the ***total outdoor light output***. Such lamps and tubes must however conform to the lamp source and shielding requirements of Section 4.

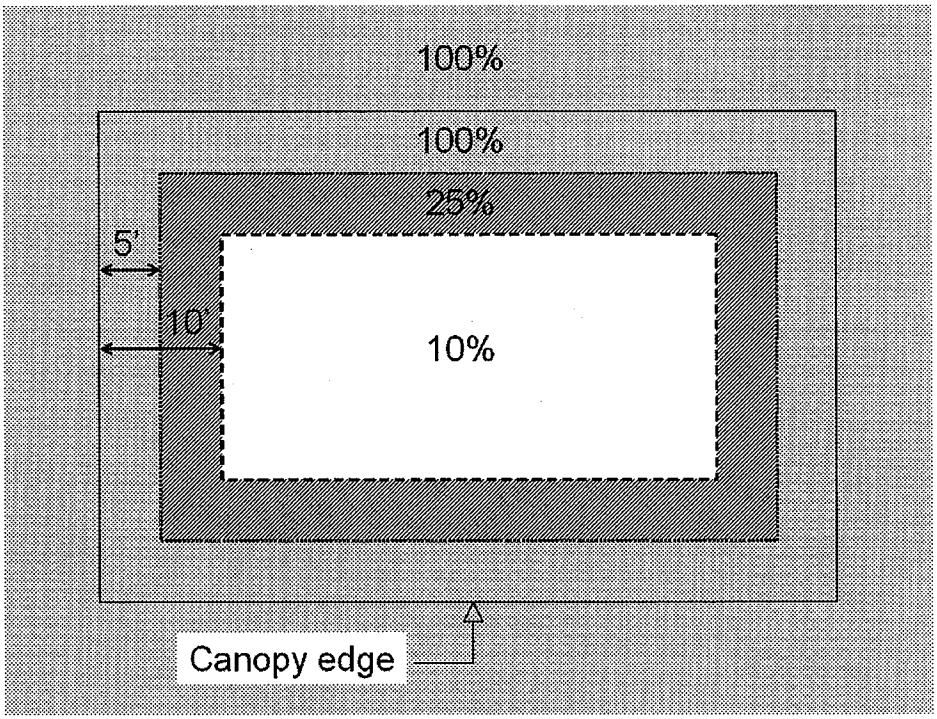


Figure 15.31a. Plan view of a canopy, showing fixture location and initial lamp output percentage counted toward ***Total Outdoor Light Output***.

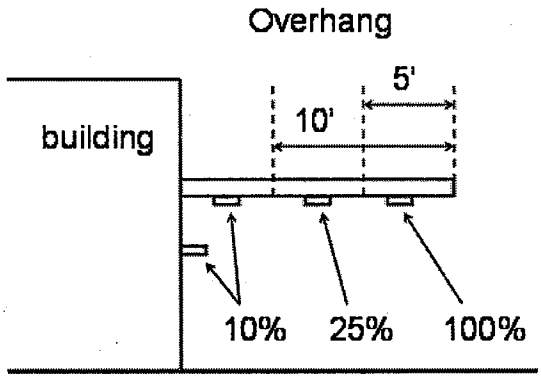


Figure 15.31b. Elevation view of a canopy or overhang attached to a building, showing location of ***fully shielded fixtures*** and initial lamp output percentage counted toward ***Total Outdoor Light Output***.

15.32 ***Parking Garage***. A multi-level or covered structure for parking that is open to the outside air. Includes parking facilities under buildings when the area is open to the outside at more locations than just the automobile entries and exits.

15.33 ***Partially Shielded*** (Light Fixture). A ***light fixture*** constructed and mounted such that most light emitted by the fixture, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the fixture, is projected below the horizontal. Light emitted at or above the horizontal direction (sideways or upwards) arises only from decorative elements or strongly colored or diffusing materials such as "honey" or colored glass or plastic. Fixtures using spot or flood lamps are considered ***partially shielded*** if the lamps are aimed no higher than 45 degrees above straight down (half-way between straight down and straight to the side).

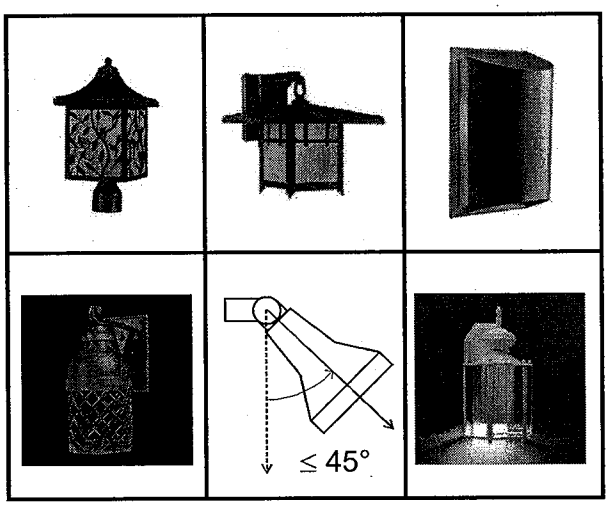


Figure 15.33. Examples of ***partially shielded fixtures***:

15.34 ***Person***. any individual, tenant, lessee, owner, or any commercial entity including but not limited to firm, business, partnership, joint venture, or corporation.

15.35 ***Searchlight***. A lighting assembly designed to direct the output of a contained lamp in a specific tightly focused direction (a beam) with a reflector located external to the lamp, and with a swiveled or gimbaled mount to allow the assembly to be easily redirected. Such lights are used commonly to sweep the sky for advertisement purposes.

15.36 ***Sign, Externally Illuminated***. A sign illuminated by light sources from the outside.

15.37 ***Sign, Internally Illuminated***. A sign illuminated by light sources enclosed entirely within the sign cabinet and not directly visible from outside the sign.

15.38 ***Sign, Multicolor Changeable-Copy LED***. A sign composed of ***LED***s of more than one color and programmable to allow changing displays.

15.39 ***Sign, Multicolor Fixed-Copy LED.*** A sign composed of ***LED***s of more than one color with a fixed (not changeable or programmable) copy display.

15.40 ***Sign, Neon***. A sign including ***luminous tubes*** formed into text, symbols or decorative elements and directly visible from outside the sign cabinet.

15.41 ***Sign, On-Site Advertising***. A sign used primarily to advertise goods or services offered on the same parcel on which the sign is located. Such a sign may include incidental non-advertising information (for example time and temperature; does not include publicly owned signs providing general interest information exclusively (such as road names or highway conditions)

15.42 ***Sports Class I/II/III/IV***. Level of sports play as defined by the Illuminating Engineering Society of North America. This level is primarily determined by the number and distance of spectators; the higher recommended illumination levels facilitate the spectator's ability to view the action. ***Sports Class IV*** is the most common level, and is typical of municipal and amateur league and social level sports, with minimal accommodations for spectators, typically including bleachers located close to the field. ***Sports Class III*** includes increased accommodation for spectators. ***Sports Class II*** and ***Sports Class I*** apply to large sports facilities where thousands of spectators may be located hundreds of feet from the field, and television broadcasting may be a consideration.

15.43 ***Spot Lamp***. A specific form of lamp designed to direct its output in a specific direction (a beam) with a reflector formed from the glass envelope of the lamp itself, and with a clear or nearly clear glass envelope: Such lamps are so designated by the manufacturers, and typically used in residential outdoor area lighting (Figure 15.43).

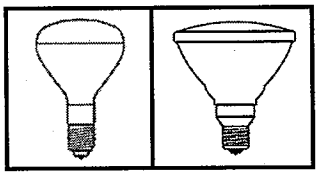


Figure 15.43. ***Spot lamps***

15.44 ***Spot Light***. A ***light fixture*** containing a ***Spot Lamp.***

15.45 ***Temporary Lighting***. Lighting which does not conform to the provisions of this Code and which will not be used for more than one thirty (30) day period within a calendar year, with one thirty (30) day extension. Temporary lighting is intended for uses which by their nature are of limited duration; for example holiday decorations, civic events, or construction projects in.