

# ARTICLE 3.09 DARK SKY ORDINANCE

## Division 1. Generally

### Sec. 3.09.001 Title

This article, together with the amendments thereto, shall be known and may be cited as the city dark sky ordinance. (Ordinance 128-03-07-08, sec. 1.1, adopted 7/8/03)

### Sec. 3.09.002 Purpose

The general purpose of this article is to protect and promote the public health, safety and welfare, the quality of life, and the ability to view the night sky, by establishing regulations and a process of review for exterior lighting. This article establishes standards for exterior lighting in order to accomplish the following:

- (1) To protect against direct glare and excessive lighting;
- (2) To provide safe roadways for motorists, cyclists and pedestrians;
- (3) To protect and reclaim the ability to view the night sky, and thereby help the quality of life;
- (4) To prevent light trespass in all areas of the city;
- (5) To promote efficient and cost-effective lighting;
- (6) To ensure that lighting can be provided where needed to promote safety and security;
- (7) To allow for flexibility in the style of lighting fixtures;
- (8) To provide lighting guidelines;
- (9) To provide assistance to property owners and occupants in bringing nonconforming lighting into conformance with this article; and
- (10) To work with other jurisdictions within the county to meet the purposes of this article.

(Ordinance 128-03-07-08, sec. 1.2, adopted 7/8/03)

### Sec. 3.09.003 Scope; effective date; existing lighting

All sections of this article shall be effective July 8, 2003. All exterior lighting installed after the effective date of this article in any and all zoning districts in the city shall be in conformance with the requirements established by this article and any other applicable ordinances. All existing

lighting installed prior to the effective date of this article in any and all zoning districts in the city shall be addressed as follows:

(1) All existing lighting located on a subject property that is part of an application for a city subdivision plat, building permit or special use permit is required to be brought into conformance with this article. Conformity shall occur prior to issuance of a certificate of occupancy, final inspection, or final plat recording, when applicable. For other permits, the applicant shall have a maximum of thirty (30) days from the date of permit issuance to bring the lighting into conformance.

(2) No nonconforming lighting shall be repaired or renovated at a cost in excess of fifty percent (50%) of the replacement cost of the total lighting structure, unless such lighting is brought into conformity with this article. No nonconforming lighting shall be repaired or renovated where the effect of such repair or renovation shall be to enlarge or increase the structure of the nonconforming lighting. For the purposes of this subsection, routine maintenance shall not be considered to be repair or renovation. For commercial properties, the city may, whenever reasonably necessary to determine the applicability of this subsection, require the owner of the nonconforming lighting to submit two (2) or more independent estimates from established lighting companies of the reproduction cost of new lighting, including its supporting structure, which is substantially the same or similar to the nonconforming lighting destroyed, damaged, dilapidated or deteriorated.

(3) In the event of a discrepancy in applicable ordinances, the most restrictive shall apply.

(Ordinance 128-03-07-08, sec. 1.3, adopted 7/8/03)

**Sec. 3.09.004 Definitions**

Unless specifically defined below, words or phrases used in this article shall be interpreted as to give them the meaning they have in common usage and to give this article its most reasonable application.

**Area light.** Light that produces over 1800 lumens (see addendum 1 for light output of various lamps). Area lights include, but are not limited to, streetlights, parking lot lights and yard lights.

**Average footcandle.** The level of light measured at an average point of illumination between the brightest and darkest areas. The measurement can be made at ground surface or at four to five feet above the ground.

**Ballast.** A device used with a discharge lamp to obtain the necessary voltage, current, and/or wave form for starting and operating the lamp.

**Building official.** The city building official.

**Bulb.** The source of electric light. To be distinguished from the whole assembly (see “luminaire”).

Candela (cd). A unit of luminous intensity.

City staff. A member or members of the city staff charged with administering regulations related to planning and zoning.

Commission. The city planning and zoning commission.

Eighty-five-degree full cutoff type fixtures. Fixtures that do not allow light to escape above an 85-degree angle measured from a vertical line from the center of the lamp extended to the ground. (See figure 2.)

Existing lighting. Any and all lighting installed prior to the effective date of this article.

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 are intended to light something outside are considered exterior lighting for the intent of this article.

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 a refractor (lens), the ballast, the housing, and the attachment parts.

Floodlight. Light that produces up to 1800 lumens (see addendum 1 for light output of various lamps) that is designed to “flood” a well-defined area with light. Generally, floodlights produce 1000 to 1800 lumens.

Flux (radiant flux). Unit of erg/sec or watts.

Footcandle. Illuminance produced on a surface one foot from a uniform point source of one candela. Measured by a light meter.

Full cutoff fixture. Fixtures, as installed, that are designed or shielded in such a manner that all light rays emitted by the fixture, either directly from the lamps or indirectly from the fixture, are projected below a horizontal plane running through the lowest point on the fixture where light is emitted. (See figure 1).

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

Holiday lighting. Festoon type lights, limited to small individual bulbs on a string, where the spacing of bulbs is not closer than three inches and where the output per bulb is no greater than fifteen (15) lumens.

Illuminance. Density of luminous flux incident on a surface. Unit is footcandle or lux.

Illuminating Engineering Society of North America (IES or IESNA). The professional society of lighting engineers, including those from manufacturing companies and others professionally involved in lighting.

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.

Lighting. Any or all parts of a luminaire that function to produce light.

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

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

Lumen. A 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 footcandle is one lumen per square foot. One lux is one lumen per square meter.

Luminaire. The complete lighting unit, including the lamp, fixture, and other parts.

Luminance. At a point and in a given direction, the luminous intensity in the given direction produced by an element of the surface surrounding the point divided by the area of the projection of the element on a plane perpendicular to the given direction. Units candelas per unit area. The luminance is the perceived brightness that we see, the visual effect of the illuminance, reflected, emitted or transmitted from a surface.

Nonessential. Lighting that is not necessary for an intended purpose after the purpose has been served. Does not include any lighting used for safety and/or public circulation purposes. Example: For purposes of this article, lighting for a business sign is considered essential during business hours, however, is considered nonessential once the business is closed.

Partially shielded. The bulb of the fixture is shielded by a translucent siding and the bulb is not visible at all. Light may be emitted at the horizontal level of the bulb (see figure 3).

Recessed. When a light is 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. Also considered a full cutoff fixture (see figure 4).

Temporary lighting. Lighting that is intended to be used for a special event for seven days or less.

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

(Ordinance 128-03-07-08, sec. 2, adopted 7/8/03)

**Sec. 3.09.005 Notification of requirements**

(a) The city permits shall include a statement asking whether the subject property of the proposed work includes any exterior lighting.

(b) Within thirty (30) days of the enactment of this article, the city staff shall send a copy of the dark sky ordinance with a cover letter to all local electricians and local electric suppliers listed in the local 2003 telephone books, as well as to the Bulverde area chambers of commerce.

(Ordinance 128-03-07-08, sec. 4, adopted 7/8/03)

**Sec. 3.09.006 Lighting on city rights-of-way and city-owned property**

The city will commit to changing all lighting within the city rights-of-way and on city-owned property to meet the requirements of this article through the franchise agreement with the power company and/or through the light conformance schedule adopted by resolution by the council.  
(Ordinance 128-03-07-08, sec. 5, adopted 7/8/03)

**Sec. 3.09.007 Violations; penalty; appeals and variances**

(a) Violations and legal actions. If, after investigation, the city staff finds that any provision of this article is being violated, the city staff shall give notice by hand delivery or by certified mail, return receipt requested, of such violation to the owner and/or to the occupant of such premises, demanding that the violation be abated within thirty (30) days of the date of hand delivery or of the date of mailing of the notice. The city staff shall be available to assist in working with the violator to correct said violation. If the violation is not abated within the thirty-day period, the city staff may institute actions and proceedings, either legal or equitable, to enjoin, restrain or abate any violations of this article and to collect the penalties for such violations.

(b) Penalty. Any person knowingly, intentionally, recklessly, or through criminal negligence as those terms are defined in article 6.03, Texas Penal Code, violating any provisions of this article shall be punishable by a civil penalty of not less than one dollar (\$1.00) nor more than one thousand dollars (\$1,000), and each day of violation after the expiration of the thirty-day period provided in subsection (a) of this section shall constitute a separate offense for the purpose of calculating the civil penalty. Nothing in this article shall operate to prevent the city from seeking

other remedies available at law, including but not limited to restraining orders and/or injunctive relief.

(c) Appeals. Any person aggrieved by a decision of an administering employee in the application of this article may appeal the decision to the city council in accordance with the procedures applicable to appeals of decisions under the city's zoning and subdivision ordinances. The city council will hear and decide appeals in accordance with the provisions applicable to appeals under the city's zoning and subdivision regulations.

(d) Variances. A relaxation of the terms of this article may be permitted where such variance will not be contrary to the public interest and where, because of conditions peculiar to the property and not the result of the actions of the applicant, a literal enforcement of this article would result in unnecessary and undue hardship.

(Ordinance 128-03-07-08, sec. 6, adopted 7/8/03)

Secs. 3.09.008–3.09.030 Reserved

## **Division 2. Lighting Criteria**

Sec. 3.09.031 Applicability

The commission, the building official and/or the city staff shall have the authority to require new lighting, and existing lighting pursuant to [section 3.09.003](#), to meet the recommendations and guidelines, in addition to the requirements, of this article. (Ordinance 128-03-07-08, sec. 3, adopted 7/8/03)

Sec. 3.09.032 Submission of lighting plans

All applications for design review, conditional use, subdivision and/or building permits shall include lighting plans showing the location, type, height and lumen output of all proposed and existing fixtures. The applicant shall provide enough information to verify that lighting conforms to the provisions of this article. The city staff, commission and/or building official shall have the authority to request additional information in order to achieve the purposes of this article. (Ordinance 128-03-07-08, sec. 3.A, adopted 7/8/03)

Sec. 3.09.033 Permitted fixtures; shielding

All exterior lighting shall be full cutoff fixtures with the light source fully shielded, with the following exceptions:

(1) Luminaires that have a maximum output of two hundred sixty (260) lumens per fixture, regardless of number of bulbs (equal to one twenty-watt incandescent light), may be left unshielded provided the fixture has an opaque top to keep light from shining directly up (see figure 5).

(2) Luminaires that have a maximum output of one thousand (1,000) lumens per fixture, regardless of number of bulbs (equal to one sixty-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 (see figure 3).

(3) Floodlights with external shielding may be angled provided that no light escapes above a twenty-five-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 (see figure 6). Floodlights with directional shielding are encouraged (see figure 7). Photocells with timers that allow a floodlight to go on at dusk and off by eleven p.m. are encouraged.

(4) Holiday lights as defined in [section 3.09.004](#) are exempt from the requirements of this article for the six and one-half month period from November 1st to April 15th, except that flashing holiday lights are prohibited on commercial properties. Flashing holiday lights on residential properties are discouraged. Holiday lights are encouraged to be turned off after bedtime and after close of businesses.

(5) 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.

(6) Vehicular lights and all temporary emergency lighting needed by the fire and police departments or other emergency services shall be exempt from the requirements of this article.

(Ordinance 128-03-07-08, sec. 3.B, adopted 7/8/03)

**Sec. 3.09.034 Light trespass**

It is the intent of this article to eliminate and prevent light trespass through the proper installation of lighting fixtures. All existing and/or new exterior lighting shall not cause light trespass and shall be such as to protect adjacent properties from glare and excessive lighting. (Ordinance 128-03-07-08, sec. 3.C, adopted 7/8/03)

**Sec. 3.09.035 IESNA guidelines for footcandle output**

The commission may require that any new lighting or existing lighting that comes before them meet standards for footcandle output as established by IESNA. (Ordinance 128-03-07-08, sec. 3.D, adopted 7/8/03)

**Sec. 3.09.036 Turning off lights when not in use**

All nonessential 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 that is desired for security purposes. (Ordinance 128-03-07-08, sec. 3.E, adopted 7/8/03)

**Sec. 3.09.037 Area lights**

(a) All area lights, including streetlights and parking area lighting, shall be full cutoff fixtures and are encouraged to be eighty-five-degree full cutoff type fixtures. Streetlights shall be in accordance with the light conformance schedule adopted by the city council. Streetlights shall be high pressure sodium, low pressure sodium or metal halide, unless otherwise determined by the council that another type is more efficient. Streetlights along residential streets shall be limited to a seventy-watt high pressure sodium (hps) light. Streetlights along nonresidential streets or at intersections shall be limited to one hundred (100) watts hps, except that lights at major intersections on state highways shall be limited to two hundred (200) watts hps. If the council permits a light type other than high pressure sodium, then the equivalent output shall be the limit for the other light type. For example: a one-hundred-watt high pressure sodium lamp has a roughly equivalent output as a fifty-five-watt low pressure sodium lamp, or a one-hundred-watt metal halide lamp. Electrical providers shall notify the city of intention to install area and/or street lights, providing specifications for the lights indicating compliance with all provisions of this article.

(b) Parking area lights are encouraged to be greater in number, lower in height and lower in light level, as opposed to fewer in number, higher in height and higher in light level. Parking lot lighting shall not exceed IESNA recommended footcandle levels.

(c) All freestanding area lights within a residential zone, except streetlights, shall be mounted at a height equal to or less than the value  $3 + (D/3)$ , where D is the distance in feet to the nearest property boundary.

(Ordinance 128-03-07-08, sec. 3.F, adopted 7/8/03)

**Sec. 3.09.038 Luminaire mounting height**

Freestanding luminaires shall be no higher than twenty-five (25) feet above the stand/pole base, except that luminaires used for playing fields shall be exempt from the height restriction provided all other provisions of this article are met and the light is used only while the field is in use, and except that streetlights used on major roads may exceed this standard if necessary as determined by the city council, as advised by a lighting engineer. Building-mounted luminaires shall be attached only to walls, and the top of the fixture shall not exceed the height of the parapet or roof, whichever is greater. (Ordinance 128-03-07-08, sec. 3.G, adopted 7/8/03)

**Sec. 3.09.039 Uplighting**

Uplighting is prohibited in all zoning districts, except in cases where the fixture is shielded by a roof overhang or similar structural shield from the sky. Commercial uses require a prepared lighting plan stamped by a state-licensed architect or engineer that ensures that the light fixture(s) will not cause light to extend beyond the structural shield, except as specifically permitted in this article. (Ordinance 128-03-07-08, sec. 3.H, adopted 7/8/03)

**Sec. 3.09.040 Flagpoles**

Upward flagpole lighting is permitted for governmental flags only, provided that the maximum lumen output is one thousand three hundred (1,300) lumens. Flags are encouraged to be taken down at sunset to avoid the need for lighting. (Ordinance 128-03-07-08, sec. 3.I, adopted 7/8/03)

**Sec. 3.09.041 Service stations**

The average footcandle lighting level for new and existing service stations is required to be no greater than thirty (30) footcandles, as recommended by the IESNA for urban service stations. (Ordinance 128-03-07-08, sec. 3.J, adopted 7/8/03)

**Sec. 3.09.042 Canopy lights**

All lighting shall be recessed sufficiently so as to ensure that no light source is visible from or causes glare on public rights-of-way or adjacent property. (Ordinance 128-03-07-08, sec. 3.K, adopted 7/8/03)

**Sec. 3.09.043 Landscape lighting**

Lighting of vegetation is discouraged and shall be in conformance with this article. Uplighting is prohibited. (Ordinance 128-03-07-08, sec. 3.L, adopted 7/8/03)

**Sec. 3.09.044 Towers**

All radio, communication and navigation towers that require lights shall have dual lighting capabilities. For daytime the white strobe light may be used, and for nighttime only red lights shall be used. (Ordinance 128-03-07-08, sec. 3.M, adopted 7/8/03)

**Sec. 3.09.045 Temporary lighting**

Temporary lighting that conforms to the requirements of this article shall be allowed. Nonconforming temporary exterior lighting may be permitted by the city staff only after considering the public and/or private benefits which will result from the temporary lighting, any annoyance or safety problems that may result from the use of the temporary lighting, and the duration of the temporary nonconforming lighting. The applicant shall submit a detailed description of the proposed temporary nonconforming lighting to the city staff. The city staff shall provide written notice of said request to owners of property immediately adjacent to the subject property. Said notice shall inform adjacent property owners they may comment on the request during a period of not less than ten (10) days after mailing of the notice and prior to final action on said request. (Ordinance 128-03-07-08, sec. 3.N, adopted 7/8/03)

**Sec. 3.09.046 Neon lights**

Neon lights are only permitted pursuant to the sign ordinance (article 3.08 of this chapter). (Ordinance 128-03-07-08, sec. 3.O, adopted 7/8/03)

**Sec. 3.09.047 Figures and information sheets**

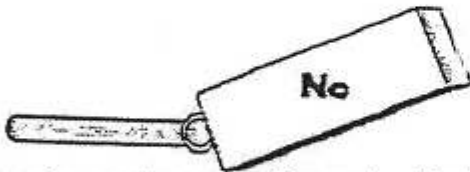
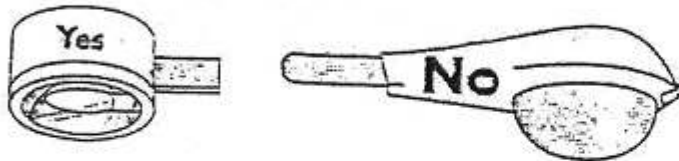
The figures and information sheets at the end of this article shall be incorporated into this article as guidelines for the public and the city for use in meeting the intent of this article. The figures

and information sheets only serve as examples. The city does not endorse or discriminate against any manufacturer or company that may be shown, portrayed or mentioned by the examples. Additional information is provided at the city hall. (Ordinance 128-03-07-08, sec. 3.P, adopted 7/8/03)

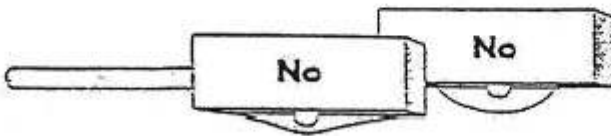
Figure 1  
 What is a True "Full Cutoff" Outdoor Lighting Fixture?



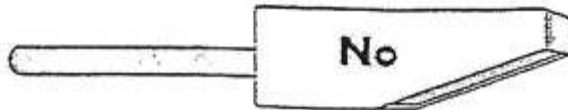
Flat glass lens, eliminates or minimizes direct glare, no upward throw of light. The housing for these fixtures is available in many styles.



Same fixture as above mounted incorrectly - defeating the horizontal mounting design. The fixture now produces direct glare, and can also produce uplight at steeper mounting angles.



Known as just "Cut-off." Center "drop" or "sag" lens with or without exposed bulb, produces direct glare.



Forward-Throw Style. Exposed bulb in the forward direction produces some direct glare.

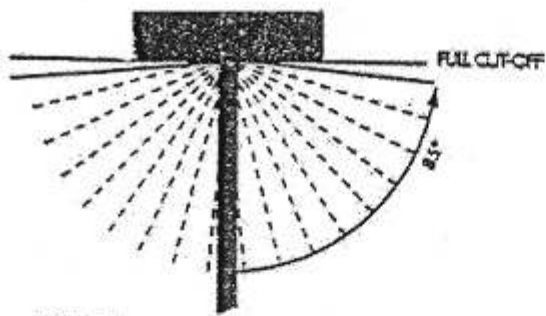


FIGURE 2  
85° Full Cut-Off Fixture



FIGURE 3  
Partially Shielded  
(translucent siding - bulb not visible)

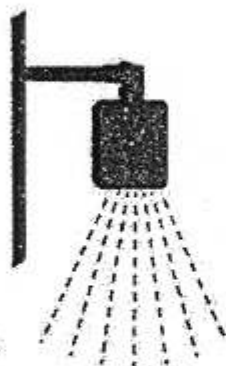


FIGURE 4  
Shielded

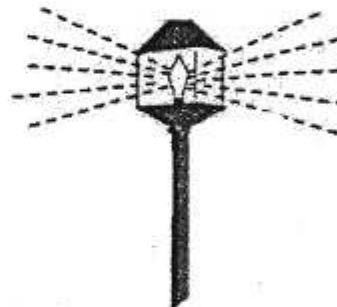


FIGURE 5  
Unshielded with Opaque Top  
(less than 290 lumens)

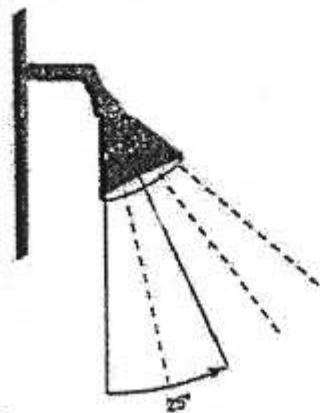


FIGURE 6  
Angle of Flood Light  
with External Shielding

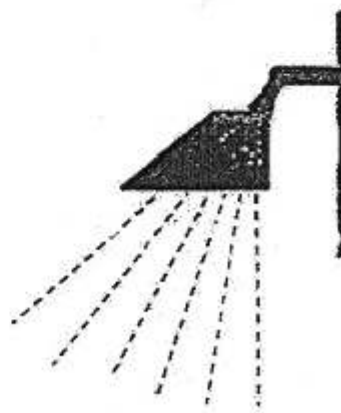


FIGURE 7  
Directional Flood Light

Figure 8  
NEMA Head Fixtures



Without Shield



With Shield

ADDENDUM 1. INITIAL RATED LIGHT OUTPUT OF VARIOUS LAMPS

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

Lamp Type	Lamp Wattage	Initial Lumen Output
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 amp (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
Mercury vapor lamp (white deluxe) (Syl.)	100	4500
Mercury vapor lamp (white deluxe) (Syl.)	175	8500
Mercury vapor lamp (white deluxe) (Syl.)	250	11100
Mercury vapor lamp (white deluxe) (Syl.)	400	20100
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