

AN ORDINANCE

AMENDING CHAPTER 35 OF THE CITY CODE OF SAN ANTONIO, TEXAS, BY ADDING SECTION 35-339.04 "MILITARY OVERLAY LIGHTING DISTRICTS" TO ARTICLE III, DIVISION 4 "OVERLAY DISTRICTS" AND ADDING SECTION 35-498 "VIOLATIONS OF MILITARY OVERLAY LIGHTING DISTRICTS REGULATIONS" TO ARTICLE IV, DIVISION 11 "ENFORCEMENT, VIOLATIONS AND PENALTIES."

* * * * *

WHEREAS, night training is vital to the missions of the various military bases, camps and installations in and around the City of San Antonio; and

WHEREAS, the continued viability of the various military bases, camps and installations for such training purposes is critical to the readiness of the United States military, and the vitality of the City of San Antonio's economy; and

WHEREAS, the Zoning Commission held a public hearing on November 18, 2008 at which time parties in interest and citizens were given an opportunity to be heard regarding establishing provisions for a new zoning district named Military Lighting Overlay District; and

WHEREAS, the Zoning Commission has submitted a final report to the City Council recommending the adoption of the Military Lighting Overlay District for the City of San Antonio; and

WHEREAS, joint land use studies may be conducted to determine, among other things, the impact of lighting on military installations; and

WHEREAS, the need to regulate the installation and use of outdoor lighting is necessary in the City of San Antonio within five (5) miles of the boundaries of military bases, camps and installations; **NOW THEREFORE:**

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF SAN ANTONIO:

SECTION 1. Chapter 35, Article III, Division 4 of the City Code of San Antonio, Texas, entitled "Overlay Districts," is hereby amended by adding section 35-339.04 entitled "Military Lighting Overlay Districts" as follows:

Sec. 35-339.04. Military Lighting Overlay Districts

STATEMENT OF PURPOSE

The purpose of this Ordinance is to establish regulations to regulate outdoor lighting impacting military operations within a five (5) mile zone surrounding Camp Bullis/Camp Stanley, Randolph Air Force Base, and Lackland Air Force Base.

Specific purposes of these lighting districts are as follows:

- To reduce glare and potential distractions from night time training exercises occurring within this area.
- To balance the needs of the military, the City of San Antonio and property owners regarding responsible development including outdoor lighting within this area.

Designation Criteria. To be designated as a military lighting overlay district, an area must be within a five (5) mile zone surrounding Camp Bullis/Camp Stanley, Randolph Air Force Base, and Lackland Air Force Base; provided, however, that if a Joint Land Use Study determines that lighting regulations are required in a smaller area than a designated district, the City shall initiate a rezoning to remove properties outside the zone of impact from a military lighting overlay district.

(a) Zoning Process and Classification

- (1) This section establishes a military lighting overlay district, specifies the general purposes of the military lighting overlay district and the scope of the standards within that district.
- (2) The military lighting overlay district is established as an overlay to the regular base zoning districts.
- (3) The Planning and Development Services Department shall coordinate with other appropriate departments or agencies in order to evaluate land use, traffic and other development related issues in determining the necessity of establishing a military lighting overlay district. All parties in interest and citizens shall have an opportunity to be heard at a public hearing in accordance with Chapter 211 of the Local Government Code.
- (4) The zoning designation for the military lighting overlay district shall consist of a base zone symbol and the military lighting overlay district symbol "MLOD" as a suffix. Military lighting overlay districts shall be numbered sequentially to distinguish among different districts, i.e., "MLOD-1", "MLOD-2", etc.

(b) District Standards.

(1) As used in this article, the following terms shall be defined as follows:

A *Candela*: The unit of measure indicating the luminous intensity (candlepower) of a light source in a specific direction.

B *Digital Sign*: Catho-ray tube (CRT), flat panel liquid-crystal display (LCD), plasma, aerial imaging, projector or other electronic devices that are at the end-point of a digital signage system, presenting the content to include: Dynamic Signs, Electronic Signs, Digital Media Advertising, as well as signs within a Digital Signage Network, In-store TV Network, Captive Audience Network, Narrowcasting Network, Out-of-home Media Network, Digital Media Network, and Advertising Network.

C *Direct light*: Light emitted directly from the lamp, off of the reflector diffuser, or through the refractor or diffuser lens of a luminaire.

D *Exempted Nonconforming luminaires*: Any existing luminaires which were lawfully in place according to all applicable City Ordinances at the time, but which do not now comply with all applicable regulations as of the effective date of District designation.

E *Foot-candle (fc)*: A unit of light measurement equal to one lumen per square foot.

F *Full cutoff (FCO)*: Describes a luminaire light distribution where 100 candela per 1,000 lamp lumens (ten percent) may emit at all vertical angles beginning at 80 degrees up from nadir to less than 90 degrees, and 0 (zero) candela per 1,000 lamp lumens (zero percent) is allowed at 90 degrees (horizontal plane) and all angles above. This applies to all horizontal angles around the luminaire. A full cutoff luminaire is also fully shielded. (See Exhibit 2 (two)).

G *Fully shielded*: A lighting 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 luminaire, is projected below the horizontal plane as determined by photometric test or certified by the manufacturer. A fully shielded fixture is not necessarily full cutoff.

H *Glare*: A luminance produced by bright sources in the field-of-view superimposed on the image in the eye reducing contrast and hence visibility.

- I "IESNA" (or "IES"): An acronym for the Illuminating Engineering Society of North America. The IESNA makes recommendations for outdoor lighting but does not set outdoor lighting community standards which are set through local regulations.
- J Illuminance: The quantity of light arriving at a surface measured in foot-candles.
- K Intermittent lighting: Luminaires that do not remain on for more than five minutes.
- L Lumen: A unit of luminous flux. For purposes of this Ordinance, the lumen-output values shall be the initial lumen output ratings of a lamp. The lumen rating associated with a given lamp is generally indicated on its packaging or may be obtained from the manufacturer.
- M 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 supply.
- N Luminous flux: A quantitative expression of the brilliance of a source of visible light which is electromagnetic energy within the wavelength range of approximately 390 nanometers (nm) to 770 nm. This quantity is measured in terms of the power emitted per unit solid angle from an isotropic radiator, a theoretical point source that radiates equally in all directions in three-dimensional space.
- O Nadir: The direction pointing vertically down from the lowest light emitting part of the luminaire (see Exhibit 2 (two) for an example).
- P Nit: A unit of illuminative brightness equal to one candle per square meter, measured perpendicular to the rays of the source.
- Q Outdoor lighting: Illumination of an outside area or object by any man-made device that is located outdoors and produces light.
- R Temporary outdoor lighting: Lighting for a specific unusual purpose of an outside area or object by any man-made device that produces light for a period not to exceed ninety (90) days.
- S Trespass lighting: Light emitted by a luminaire that falls outside the boundaries of the property on which the luminaire is sited.

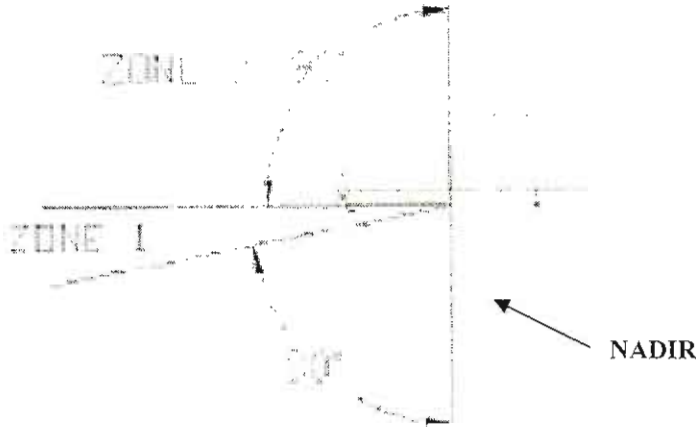


Exhibit 2

- (2) All public and private outdoor lighting installed after the effective date(s) of individual outdoor lighting overlay district ordinances shall conform to the requirements established by this Ordinance.
- (3) Any luminaire that is aimed, directed, or focused so as to cause direct light from the luminaire to be directed toward an adjacent military base, camp or installation is prohibited. Such luminaire must be redirected or its light output controlled to eliminate such conditions.
- (4) For properties situated at or above one thousand two hundred (1,200) feet in elevation (above sea level), and which are situated within one (1) mile from the perimeter of the affected military installation, all lighting shall be fully screened from the affected military installation(s).

(5) Residential Lighting

SEE 'LIGHT POLL
REDUCTION'
P 101/102/104
FROM
LEED
THE NUMBER
HERE
IS 10 TIMES
GREATER THAN
THE LEED
RECOMMENDATION

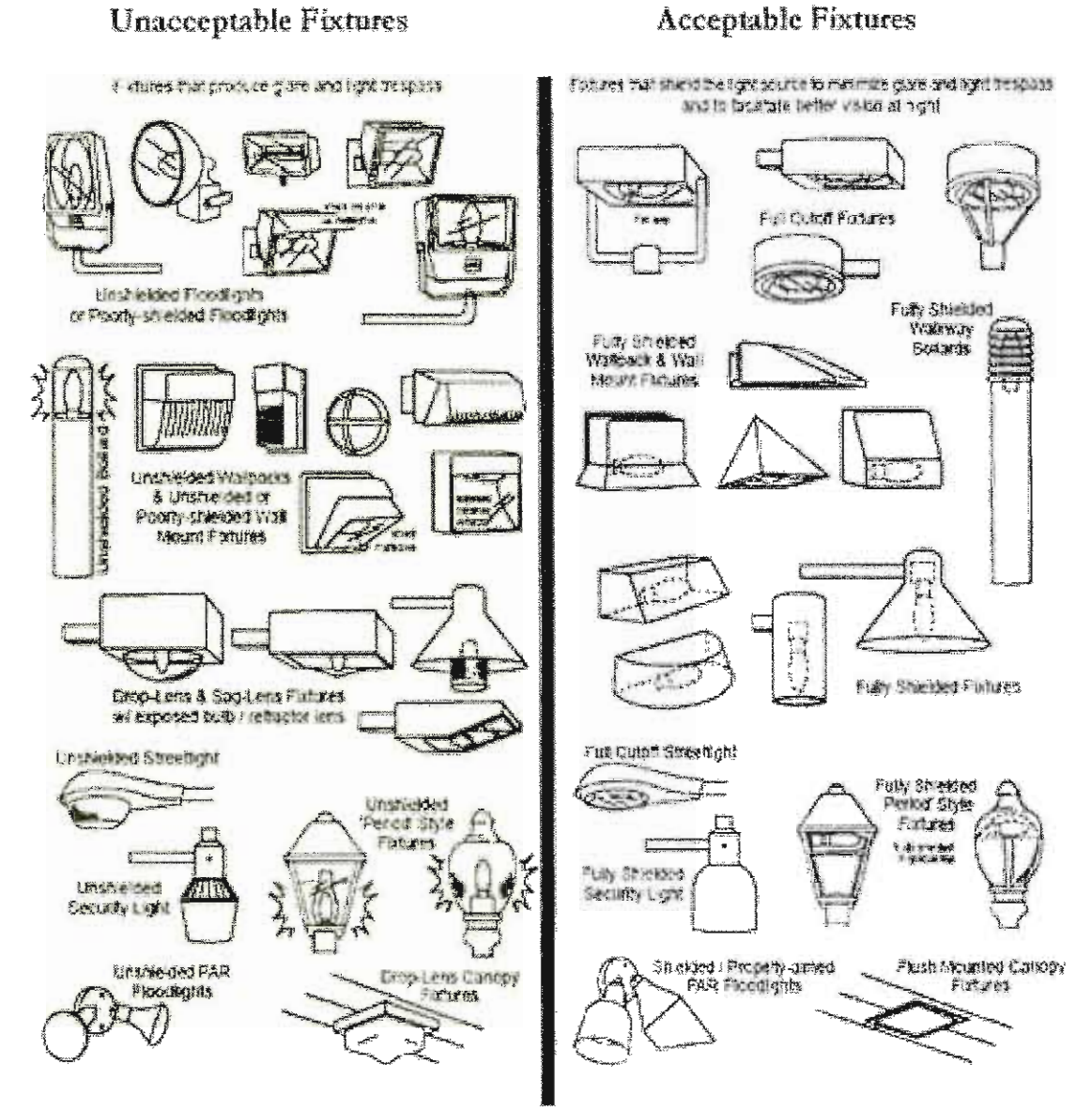
- A No trespass lighting within residential areas may exceed one and one half (1½) foot-candles at the property line, with the exception of intermittent lighting which can be up to two (2) foot-candles.
- B All lighting within residential areas must comply with Commercial lighting subsections (6) A - E below.

(6) Commercial lighting.

- A All lighting fixtures installed on any commercial property shall be fitted to render them full cutoff (no light output emitted above 90 degrees at any lateral angle around the fixture.) See "Acceptable Fixture" designation as shown in Exhibit 3. Documentation to prove full cutoff status of outdoor lighting must be provided to the City from the manufacturer or firm handling the installation of said outdoor lighting.

SEE P 101/102/104 ATTACHMENTS FROM
USGBC LEED REFERENCE GUIDE

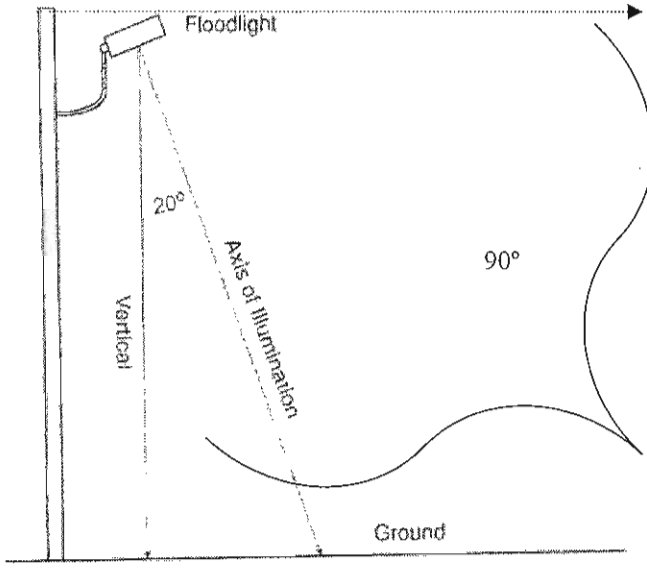
Exhibit 3
Acceptable vs. Unacceptable Fixture Examples



- B. For lighting horizontal tasks such as roadways, sidewalks, entrances and parking areas, fixtures must meet "full cutoff" criteria (no light output emitted above 90 degrees at any lateral angle around the fixture).
- C. Intermittent lighting must be of the "motion sensor" type that stays on for a period of time not to exceed five (5) minutes and has a sensitivity

setting that allows the luminaire to be activated only when motion is detected on the site.

- D. All trespass lighting shall not exceed two and one-half (2½) foot-candles measured at the property line, except that residential trespass lighting is regulated in subsection b(5)A above.
- E. Floodlight fixtures must be aimed so as to prevent direct radiation of light into the open sky at any angle above the horizontal plane as shown in Exhibit 4 and verified using a tool such as shown in Exhibit 5.



Horizontal plane is parallel to the ground and perpendicular to the vertical line

A floodlight may not be so positioned as to direct illumination at or above the 90° angle of the horizontal plane.

3-10
10/10/10
HIGHER THAN
LEEDS RECOMMENDATION
JEE
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101/102/104

Exhibit 4

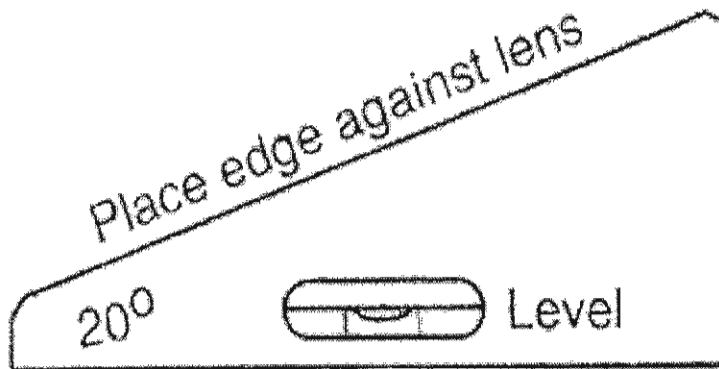


Exhibit 5: This is a tool for aiming lights such as the floodlight represented in Exhibit 4. This tool would verify the angle of 20° by placing the upper edge of the tool against the floodlight lens and adjusting the floodlight so that a level parallel to the bottom edge shows level.

- F. With the exception of lighting which is required for security and safety such as parking lot illumination, businesses must turn off outdoor lights emanating illumination levels exceeding ½ foot-candle (fc) after 11:00 p.m.

(7) Service stations and other outdoor facilities lighting:

- A Outdoor sales and service station canopies must utilize canopy lights that are fully recessed into the canopy or are fully shielded by the canopy.

- B The following average maintained illuminance levels for service stations must not be exceeded:

<u>Service Station Component</u>	<u>Lighting Level</u>
<u>Approach</u>	<u>2.0 fc</u>
<u>Driveway</u>	<u>2.0 fc</u>
<u>Pump Island</u>	<u>10.0 fc</u>
<u>Building Façade</u>	<u>3.0 fc</u>
<u>Service Areas</u>	<u>3.0 fc</u>
<u>Landscape Highlights</u>	<u>2.0 fc</u>

Note: fc = foot-candle

(8) Parking lot lighting:

- A All parking lots and structures' lighting luminaires must be equipped with full cutoff shielding and shall not exceed a maximum illumination level of an average of twenty (20) foot-candles.

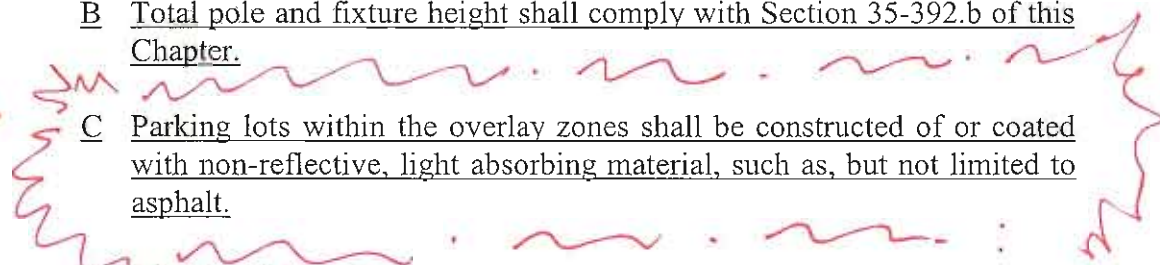
- B Total pole and fixture height shall comply with Section 35-392.b of this Chapter.

- C Parking lots within the overlay zones shall be constructed of or coated with non-reflective, light absorbing material, such as, but not limited to asphalt.

- D After 11:00 p.m., at least 50% of the parking lot and structures' lighting luminaires must be turned off, and any lights remaining may be set utilizing a motion detector system or dimmer.

(9) Outdoor electric sign lighting.

ADDRESS THIS CONCERN WITH LIGHTING + PARKING LOT SIZE NOT PAVING. DARK PAVING CREATES URBAN HEAT ISLAND EFFECT DURING THE DAY. THIS WOULD BE NOT ENVIRONMENTALLY RESPONSIBLE SEE P 89/91 LEED ATTACHMENT.



SEE ATTACHMENT PAGE 89/91 FROM LEED REFERENCE GUIDE

A Lighting fixtures used to illuminate an on-premise or off-premise sign must conform to the requirements specified in this Ordinance.

B The illumination of any billboard or advertising sign, whether on-premise or off-premise, between ~~11:00~~ ^{9:00 PM} p.m. and sunrise is not allowed, except instances that meet one of the following criteria:

a. On-premise signs may remain illuminated between ~~11:00~~ ^{9:00 PM} p.m. and sunrise only while the business is open to the public and the sign cabinets shall be constructed with opaque backgrounds allowing only for illumination of the copy (letters), or

b. On or off-premise signs may remain illuminated between 11:00 p.m. and sunrise only if no light is emitted above a horizontal plane and the light emitted does not constitute trespass lighting, as herein defined. All exterior means of illumination shall be situated in a "top down" position as depicted in Exhibit 4.

C Digital signs shall comply with daytime intensity levels and 80% of nighttime intensity levels for off-premise digital signs as outlined in Chapter 28, section 28-125 (b)(3) and reproduced below:

INTENSITY LEVELS (NIITS)		
COLOR	DAYTIME	NIGHTTIME
Red Only	3,150	1,125
Green Only	6,300	2,250
Amber Only	4,690	1,675
Full Color	7,000	2,500

D Any illumination device energized between 11:00 p.m. and sunrise which exceeds the limits of this chapter falling outside the boundaries of the property on which it is sited constitutes trespass lighting and is prohibited.

OFF-PREMISE
E. DIGITAL BILLBOARD SIGNS ARE HEREBY PROHIBITED IN THE OVERLAY DISTRICT.

(10) Street lighting.

A This subsection regulates the illumination levels for street lights that are installed on any street and must follow the American National Standard Practice for Roadway Lighting under the IESNA.

B Street light illumination must follow the guidelines in paragraph D of this subsection unless a licensed professional engineer, trained and

WHY SO LATE?

experienced in the science of illumination engineering, deems other illumination levels based on IESNA standards more appropriate for existing conditions and staff concurs with this assessment.

- C All standard streetlights must utilize full cutoff optics (FCO) type luminaires that are installed level to the ground in two intersecting perpendicular planes (see Exhibit 6), and should be horizontally level in all directions.

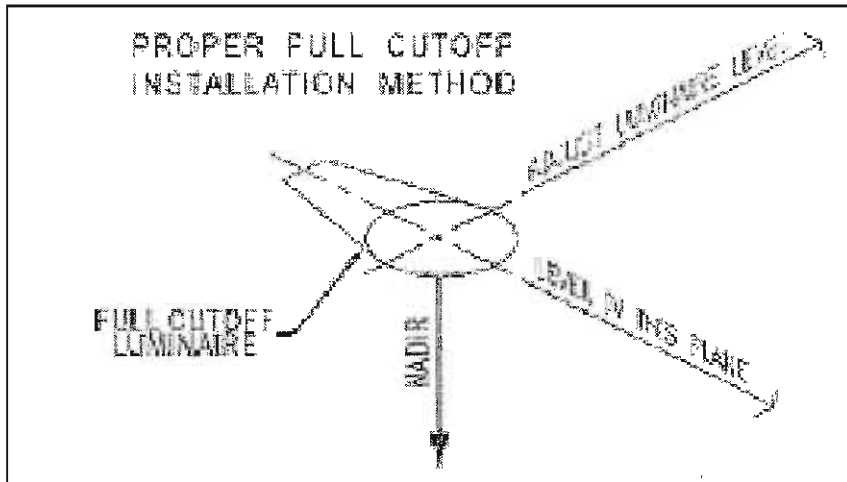


Exhibit 6 .

- D New ornamental street lights must be classified as either IES "Full Cutoff" or IES "Cutoff" as determined by a valid photometric report. This report must be generated for the specified model by a qualified testing lab (testing to IES standards) and must include a full vertical evaluation through 180 degrees, otherwise that fixture will be unacceptable.

(11) Tower and Structure Lighting. See FCC or FAA regulations.

(12) Other Prohibited Lighting. Unless authorized by the City Council by specific Ordinance for a special event:

A the use of laser source light or any similar high intensity light, such as used for outdoor advertising or entertainment, when projected above the horizontal plane is prohibited; and

B the operation of searchlights for any purposes is prohibited.

(13) Unmanned Teller Machine lighting. Unmanned automatic teller machines (ATMs) shall comply with the requirements as listed in section 59.307, Texas Finance Code and this Article by utilizing fully shielded or full cutoff luminaires as appropriate.

(14) Exemptions. The following outdoor lighting instances are exempt from the lighting requirements of this Ordinance:

A All legal outdoor lighting in place prior to the effective date of this section. (But see Section 15 below).

B Outdoor lighting for which light is produced directly by the combustion of fossil fuels.

C Outdoor lighting used during law enforcement, fire, and medical activities and for meteorological data gathering purposes.

D Outdoor lighting employed during emergency or night-time repairs of roads and utilities.

E Lighting required by law to be installed on motor vehicles.

F Lighting required for the safe operation of aircraft.

G Outdoor lighting installed on Federal and State facilities; however, voluntary compliance is encouraged.

H Temporary exemptions: Any individual may submit a written request to the Director for temporary lighting and obtain a temporary electrical permit. The request for temporary lighting must contain the following information in addition to information required to obtain a temporary electrical permit:

a. Proposed use and location of the outdoor light requested.

b. Type of lamp(s) to be used, including manufacturer's part number and initial lumens.

c. Type of light fixture used, including manufacturer's model number and specification (cut) sheets indicating photometric distribution data stated in iso foot-candle diagrams.

d. Starting and ending dates for temporary lighting use.

e. Contact information including name of requester, affiliation (if applicable), address and telephone number.

f. And such other information the Director may require.

CLARIFY...
IS THIS FOR
FLAMES &
REFINERIES
& TIRE LIKE?

(15) Maintenance and repair of legal nonconforming luminaires.

A. All luminaires lawfully in place prior to the date of this Ordinance shall have legal nonconforming status.

B. Minor repair and maintenance of legal nonconforming luminaires up to 50% of the replacement value is allowed, however any alteration in excess of 50% shall terminate the nonconforming status and at that time all standards of this Ordinance must be met.

(16) Administration. The Director shall administer this Ordinance.

(17) Variances and Special Exceptions.

A. The Board of Adjustment may grant a variance to the requirements of this Ordinance where a literal enforcement of the provisions will result in unnecessary hardship. A variance request must be submitted to the City in writing that sets out the basis for the request. No variance can be granted unless it meets the approval criteria outlined in 35-482(e).

B. A special exception to the requirements of this Ordinance may be granted by the Board of Adjustment where a plan's lighting design does not meet strict design standards but alternative methods may be used which meet the intent of the Code.

SECTION 2. Chapter 35, Article IV, Division 11 of the City Code of San Antonio, Texas, entitled "Enforcement, Violations and Penalties" is hereby amended by adding section 35-498 entitled "Violations of Military Overlay Lighting District Regulations" as follows:

Sec. 35-498. Violations of Military Overlay Lighting District Regulations

(a) **Violations Defined.** It shall be unlawful for any person, firm or corporation to erect, construct, enlarge, alter, repair, move, improve or convert any illumination device of any type, or cause the same to be done, contrary to or in violation of any provision of this chapter. Any person, firm or corporation shall be deemed guilty of a separate offense for each and every day or portion thereof during which any violation of any provision of this chapter is committed, continued, or permitted.

(b) **Enforcement.** The Director shall give written notice of noncompliance to the owner/tenant or their agent or other person in control of the property on which an outdoor lighting violation exists. Service shall be made on the owner/tenant or their agent or other person in control of the property:

TOO HIGH!
←
SHOULD BE NOT
MUCH MORE THAN NEW
BULD COSTS.

10% 15% ??

- (1) In person or by registered or certified mail, return receipt requested; or
- (2) If personal service cannot be obtained or the address of the owner/tenant or their agent or other person in control of the property is unknown, by posting a copy of the notice on the premises on which the violation exists or by publishing the notice in a newspaper with general circulation in the City.
- (c) **Penalties.** Any person who violates the provisions of this chapter upon conviction shall be guilty of a Class C misdemeanor and shall pay such penalties as the court may decide not to exceed five hundred dollars (\$500.00). Each day's continued violation shall constitute a separate violation. Payment of any penalty herein provided shall not relieve a person, firm or corporation from the responsibility of correcting the conditions consisting of the violation.

SECTION 3. All other provisions of Chapter 35 of the City Code of San Antonio, Texas, shall remain in full force and effect unless expressly amended by this Ordinance.

SECTION 4. Should any Article, Section, Part, Paragraph, Sentence, Phrase, Clause, or Word of this ordinance, or any appendix thereof, for any reason, be held illegal, inoperative, or invalid, or if any exception to or limitation upon any general provision herein contained be held to be unconstitutional or invalid or ineffective, the remainder shall, nevertheless, stand effective and valid as if it had been enacted and ordained without the portion held to be unconstitutional or invalid or ineffective.

SECTION 5. Notice of these changes to the Unified Development Code shall not require the publication in an official newspaper of general circulation in accordance with Chapter 35, Article IV, Division 1, Table 403-1.

SECTION 6. The publishers of the City Code of San Antonio are authorized to amend said Code to reflect the changes adopted herein, to correct typographical errors and to index, format and number paragraphs to conform to the existing code.

SECTION 7. The City Clerk for the City of San Antonio is hereby directed to publish notice of this ordinance in a newspaper published in the City of San Antonio, Texas, as required by Article 2, Section 17 of the City Charter of San Antonio, Texas.

SECTION 8. This Ordinance shall be effective on December xxxxx, 2008.

PASSED AND APPROVED this xx day of December 2008.

M A Y O R

ATTEST:

City Clerk

APPROVED AS TO FORM:

Office of the City Attorney

City Attorney

SS	WE	EA	MR	EQ	ID
Credit 8					

Light Pollution Reduction

1 Point

Intent

Minimize light trespass from the building and site, reduce sky-glow to increase night sky access, improve nighttime visibility through glare reduction, and reduce development impact on nocturnal environments.

Requirements

FOR INTERIOR LIGHTING

The angle of maximum candela from each interior luminaire as located in the building shall intersect opaque building interior surfaces and not exit out through the windows.

OR

All non-emergency interior lighting shall be automatically controlled to turn off during non-business hours. Provide manual override capability for after hours use.

AND

FOR EXTERIOR LIGHTING

Only light areas as required for safety and comfort. Do not exceed 80% of the lighting power densities for exterior areas and 50% for building facades and landscape features as defined in ASHRAE/IESNA Standard 90.1-2004, Exterior Lighting Section, without amendments.

All projects shall be classified under one of the following zones, as defined in IESNA RP-33, and shall follow all of the requirements for that specific zone:

LZ1 — Dark (Park and Rural Settings)

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.01 horizontal and vertical footcandles at the site boundary and beyond. Document that 0% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down).

LZ2 — Low (Residential Areas)

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.10 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 10 feet beyond the site boundary. Document that no more than 2% of the total initial designed fixture lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

LZ3 — Medium (Commercial/Industrial, High-Density Residential)

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.20 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 5% of the total initial designed fixture

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lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

LZ4 — High (Major City Centers, Entertainment Districts)

Design exterior lighting so that all site and building mounted luminaires produce a maximum initial illuminance value no greater than 0.60 horizontal and vertical footcandles at the site boundary and no greater than 0.01 horizontal footcandles 15 feet beyond the site. Document that no more than 10% of the total initial designed site lumens are emitted at an angle of 90 degrees or higher from nadir (straight down). For site boundaries that abut public rights-of-way, light trespass requirements may be met relative to the curb line instead of the site boundary.

Potential Technologies & Strategies

Adopt site lighting criteria to maintain safe light levels while avoiding off-site lighting and night sky pollution. Minimize site lighting where possible and model the site lighting using a computer model. Technologies to reduce light pollution include full cutoff luminaires, low-reflectance surfaces and low-angle spotlights.

Table 1: ASHRAE 90.1-2004 Lighting Power Densities for Building Exteriors (Table 9.4.5)

	Applications	Lighting Power Densities
Tradable Surfaces (Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas may be traded.)	Uncovered Parking Areas	
	Parking Lots and drives	0.15W/ft ²
	Building Grounds	
	Walkways less than 10 feet wide	1.0W/linear foot
	Walkways 10 feet wide or greater	
	Plaza areas	0.2W/ft ²
	Special Feature Areas	
	Stairways	1.0W/ft ²
	Building Entrances and Exits	
	Main entries	30W/linear foot of door width
	Other doors	20W/linear foot of door width
	Canopies and Overhangs	
	Canopies (free standing and attached and overhangs)	1.25W/ft ²
	Outdoor Sales	
Open areas (including vehicle sales lots)	0.5W/ft ²	
Street frontage for vehicle sales lots in addition to "open area" allowance	20W/linear foot	
Non-Tradable Surfaces (Lighting power density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "Tradable Surfaces" section of this table.)	Building Facades	0.2W/ft ² for each illuminated wall or surface or 5.0W/linear foot for each illuminated wall or surface length
	Automated teller machines and night depositories	270W per location plus 90W per additional ATM per location
	Entrances and gatehouse inspection stations at guarded facilities	1.25W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")
	Loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.5W/ft ² of uncovered area (covered areas are included in the "Canopies and Overhangs" section of "Tradable Surfaces")
	Drive-up windows at fast food restaurants	400W per drive-through
	Parking near 24-hour retail entrances	800W per main entry

MUCH LOWER
 ↓
 COMPARE
 TO
 CITY
 GUIDELINES

Manual override capabilities that enable lights to be turned on for after-hours use must be included in the design.

Exterior Lighting Power Density

Design the project's exterior lighting to achieve lighting power densities that are less than the requirements set forth in

ASHRAE 90.1-2004, Section 9, Table 9.4.5. Lighting for exterior areas, such as parking lots, building grounds and plazas, should be designed to achieve an overall lighting power density that is 20% below the referenced standard. Building façade and landscape feature lighting should be designed to achieve an overall

Heat Island Effect

Non-Roof

1 Point

Intent

Reduce heat islands (thermal gradient differences between developed and undeveloped areas) to minimize impact on microclimate and human and wildlife habitat.

Requirements

OPTION 1

Provide any combination of the following strategies for 50% of the site hardscape (including roads, sidewalks, courtyards and parking lots):

- Shade (within 5 years of occupancy)
- Paving materials with a Solar Reflectance Index (SRI)² of at least 29
- Open grid pavement system

OR

OPTION 2

Place a minimum of 50% of parking spaces under cover (defined as underground, under deck, under roof, or under a building). Any roof used to shade or cover parking must have an SRI of at least 29.

Potential Technologies & Strategies

Shade constructed surfaces on the site with landscape features and utilize high-reflectance materials for hardscape. Consider replacing constructed surfaces (i.e., roof, roads, sidewalks, etc.) with vegetated surfaces such as vegetated roofs and open grid paving or specify high-albedo materials to reduce the heat absorption.

Table 1: Solar Reflectance Index (SRI) for Standard Paving Materials

Material	Emissivity	Reflectance	SRI
Typical New Gray Concrete	0.9	0.35	35
Typical Weathered* Gray Concrete	0.9	0.20	19
Typical New White Concrete	0.9	0.7	86
Typical Weathered* White Concrete	0.9	0.4	45
New Asphalt	0.9	.05	0
Weathered Asphalt	0.9	.10	6

* Reflectance of surfaces can be maintained with cleaning. Typical pressure washing of cementitious materials can restore reflectance close to original value. Weathered values are based on no cleaning.

values will be used as the effective shaded area. Calculate the effective shaded area (S).

- Sum the open space paving, high reflectance paving and shaded areas to get the qualifying area (Q) (See **Equation 1.**)

(Note that each surface should be counted only once. For example, a 10 square foot area that is 55% pervious, has an SRI of 30 and is shaded by a tree contributes only 10 square feet to the total.)

- The total qualifying area must be greater than or equal to 50% of the total hardscape area (T), as in **Equation 2.**

Option 2

- Calculate the total number of parking spaces for the project.
- Calculate the number of parking spaces that are under cover (including underground, under the building, and under shade structures. This number must equal at least 50% of the total number of parking spaces.

Exemplary Performance

Projects may be awarded an innovation point for exemplary performance by

Equation 1

$$Q = (O + R + S)$$

Equation 2

$$Q > T/2$$

demonstrating that either, 1) a minimum of 100% of non-roof impervious surfaces have been constructed with high-albedo materials and/or open grid paving and/or will be shaded within five years; OR 2) 100% of the on-site parking spaces have been located under cover.

Submittal Documentation

This credit is submitted as part of the **Construction Submittal.**

The following project data and calculation information is required to document credit compliance using the v2.2 Submittal Templates:

- Provide project site drawings, highlighting the location of specific paving materials, landscape shading, and/or underground or covered parking.

AND

Option 1

Provide the following data in the submittal template:

- The measured reflectance and emittance of each paving material installed on-site (to calculate the SRI—OR—the actual SRI for each paving material installed on-site—OR—the default SRI value for typical materials from **Table 1.**