Planning & Building Department

Land Development Code Revision
Outdoor Lighting

Chapter 3.11 – Outdoor Lighting

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3.11.1 – Purpose
The purpose of this Ordinance is to provide regulations for outdoor lighting that will: permit the use of outdoor lighting that does not exceed the minimum levels specified in IES recommended practices for night-time safety, utility, security, productivity, enjoyment, and commerce; minimize adverse offsite impacts of lighting such as light trespass, and obtrusive light; curtail light pollution, reduce skyglow and improve the nighttime environment for astronomy; help protect the natural environment from the adverse effects of night lighting from gas or electric sources; and conserve energy and resources to the greatest extent possible.

3.11.2 – Definitions

3.11.3 – Lighting area classifications
Different types of land uses, activities, and operations require different levels of ambient lighting. Lighting zones are hereby determined according to the land use district in which a particular property is located. Table _____ defines lighting area classifications by land use district map designation and describes each lighting zone in terms of its purpose and suitability for certain types and intensities of outdoor lighting.

Greenway	R-1	R-2	R-3	CC	C-H	GI	LI	PUD
LZ-1	LZ-1	LZ-1	LZ-2	LZ-2	LZ-3	LZ-3	LZ-3	Varies

*Lighting zone is established by the underlying land use district map designation.

3.11.4 – Applicability
Except as described below, all outdoor lighting installed after the date of effect of this section shall comply with these requirements. This includes, but is not limited to, new lighting, replacement lighting, or any other lighting whether attached to structures, poles, the earth, or any other location, including lighting installed by any third party. Where the provisions of this chapter conflict with other sections of the Land Development Code or other municipal codes, the more restrictive regulation shall control.

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3.11.5 – Exemptions

The following types of lighting applications and operational procedures are explicitly exempt from the requirements of this chapter.

A. Lighting within public right-of-way or easement for the principal purpose of illuminating streets or roads. No exemption shall apply to any lighting within the public right of way or easement when the purpose of the luminaire is to illuminate areas outside the public right of way or easement, unless regulated with a streetlighting ordinance;
B. Lighting for public monuments and statuary;
C. Lighting solely for signs (lighting for signs is regulated by the Sign Ordinance);
D. Repairs to existing luminaires not exceeding 25% of total installed luminaires.
E. Temporary lighting for theatrical, television, performance areas and construction sites;
F. Underwater lighting in swimming pools and other water features;
G. Temporary lighting and seasonal lighting provided that individual lamps are less than 10 watts and 70 lumens;
H. Lighting that is only used under emergency conditions;
I. In lighting zones 2, 3 and 4, low voltage landscape lighting controlled by an automatic device that is set to turn the lights off at one hour after the site is closed to the public or at a time established by the City.
J. Lighting specified or identified in a specific use permit;
K. Lighting required by federal, state, territorial, commonwealth or provincial laws or regulations.

3.11.6 – Standards for non-residential lighting

A. Prescriptive Method. An outdoor lighting installation complies with this section if it meets the requirements of subsections 1, 2, 3 below.
    1. Total Site Lumen Limit. The total installed initial luminaire lumens of all outdoor lighting shall not exceed the total site lumen limit. The total site lumen limit shall be determined using either the Parking Space Method (Table A) or the Hardscape Area Method (Table B). Only one method shall be used per permit application, and for sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens. The total installed initial luminaire lumens is calculated as the sum of the initial luminaire lumens for all luminaires.
    2. Limits of offsite impacts. All luminaires shall be rated and installed according to Table C.

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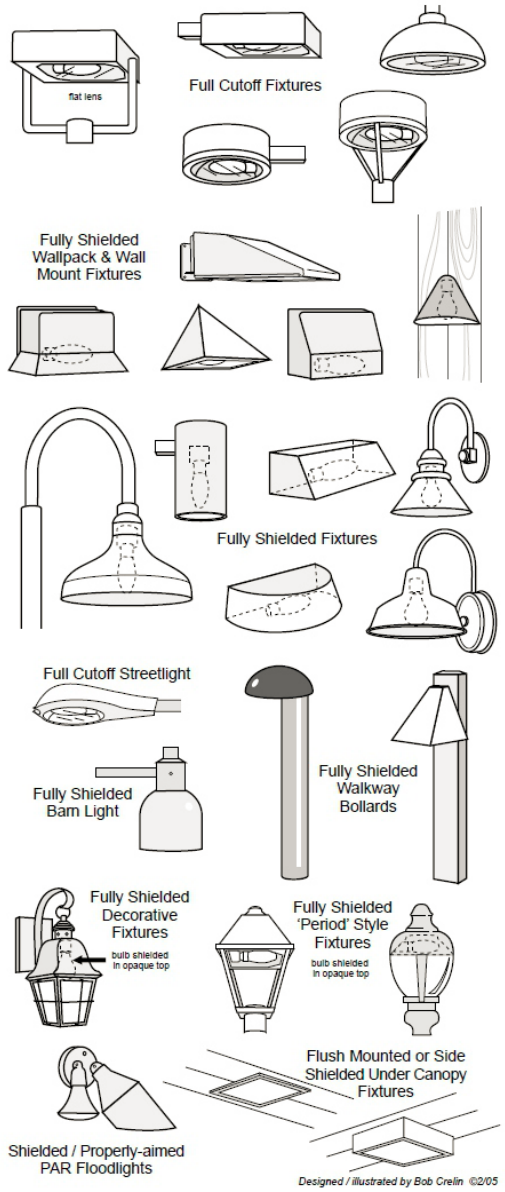
3. Full or 100% cutoff lighting. All lighting shall be full cutoff and shall not emit light above 90 degrees.
4. Exceptions. Ornamental parking lighting shall be permitted by special permit only, and shall meet the requirements of Table C-1 for Backlight, Table C-2 for Uplight, and Table C-3 for Glare, without the need for external field-added modifications.

B. Performance Method.

1. Total Site Lumen Limit. The total installed initial luminaire lumens of all lighting systems on the site shall not exceed the allowed total initial site lumens. The allowed total initial site lumens shall be determined using Tables D and E. For sites with existing lighting, existing lighting shall be included in the calculation of total installed lumens. The total installed initial luminaire lumens of all is calculated as the sum of the initial luminaire lumens for all luminaires.
2. Limits to Off Site Impacts. All luminaires shall be rated and installed using either Option A or Option B. Only one option may be used per permit application.
   a. Option A: All luminaires shall be rated and installed according to Table C.
   b. Option B: The entire outdoor lighting design shall be analyzed using industry standard lighting software including interreflections in the following manner:
      i. Input data shall describe the lighting system including luminaire locations, mounting heights, aiming directions, and employing photometric data tested in accordance with IES guidelines. Buildings or other physical objects on the site within three object heights of the property line must be included in the calculations.
      ii. Analysis shall utilize an enclosure comprised of calculation planes with zero reflectance values around the perimeter of the site. The top of the enclosure shall be no less than 33 feet (10 meters) above the tallest luminaire. Calculations shall include total lumens upon the inside surfaces of the box top and vertical sides and maximum vertical illuminance (footcandles and/or lux) on the sides of the enclosure.



iii. The proposed design complies if the total lumens on the inside surfaces of the virtual enclosure are less than 15% of the total site lumen limit; and the maximum vertical illuminance on any vertical surface is less than the allowed maximum illuminance per Table F.

3.11.7 – Standards for residential lighting.

A. General Requirements. For residential properties including multiple family residential properties not having common areas, all outdoor luminaires shall be fully shielded and shall not exceed the allowed lumen output in Table G, row 2.

B. Exceptions.
   1. One partly shielded or unshielded luminaire at the main entry, not exceeding the allowed lumen output in Table G row.
   2. Any other partly shielded or unshielded luminaires not exceeding the allowed lumen output in Table G row 3.
   3. Low voltage landscape lighting aimed away from adjacent properties and not exceeding the allowed lumen output in Table G row 4.
   4. Shielded directional flood lighting aimed so that direct glare is not visible from adjacent properties and not exceeding the allowed lumen output in Table G row 5.
   5. Open flame gas lamps.
   6. Lighting installed with a vacancy sensor, where the sensor extinguishes the lights no more than 15 minutes after the area is vacated.
   7. Lighting exempt per Section III (B.).

C. Requirements for Residential Landscape Lighting.
   1. Shall comply with Table G.
   2. Shall not be aimed onto adjacent properties.

3.11.8 – Lighting by special permit

A. High Intensity and Special Purpose Lighting. The following lighting systems are prohibited from being installed or used except by special use permit:
   1. Temporary lighting in which any single luminaire exceeds 20,000 initial luminaire lumens or the total lighting load exceeds 160,000 lumens.
   2. Aerial Lasers.
   3. Searchlights.
   4. Other very intense lighting defined as having a light source exceeding 200,000 initial luminaire lumens or an intensity in any direction of more than 2,000,000 candelas.

B. Upon special permit issued by the Department, lighting not complying with the technical requirements of this ordinance but consistent with its intent may be installed for complex sites or uses or special uses including, but not limited to, the following applications:
   1. Sports facilities, including but not limited to unconditioned rinks, open courts, fields, and stadiums.
   2. Construction lighting.
   3. Lighting for industrial sites having special requirements, such as petrochemical manufacturing or storage, shipping piers, etc.
   4. Parking structures.
   5. Urban parks

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6. Ornamental and architectural lighting of bridges, public monuments, statuary and public buildings.
7. Theme and amusement parks.
8. Correctional facilities.

C. Standards for approval of special permit for lighting
1. Has sustained every reasonable effort to mitigate the effects of light on the environment and surrounding properties, supported by a signed statement describing the mitigation measures. Such statement shall be accompanied by the calculations required for the Performance Method.
2. Employs lighting controls to reduce lighting at a Project Specific Curfew ("Curfew") time to be established in the Permit.
3. Complies with the Performance Method after Curfew.
4. The Authority shall review each such application. A permit may be granted if, upon review, the Authority believes that the proposed lighting will not create unwarranted glare, sky glow, or light trespass.

3.11.8 – Existing Lighting. Lighting installed prior to the effective date of this ordinance shall comply with the following standards.

A. Amortization. On or before [amortization date], all outdoor lighting shall comply with this Code.

B. New Uses or Structures, or Change of Use. Whenever there is a new use of a property (zoning or variance change) or the use on the property is changed, all outdoor lighting on the property shall be brought into compliance with this Ordinance before the new or changed use commences.

C. Additions or Alterations
1. Major additions. If a major addition occurs on a property, lighting for the entire property shall comply with the requirements of this Code. For purposes of this section, the following are considered to be major additions:
   a. Additions of 25 percent or more in terms of additional dwelling units, gross floor area, seating capacity, or parking spaces, either with a single addition or with cumulative additions after the effective date of this Ordinance.
   b. Single or cumulative additions, modification or replacement of 25 percent or more of installed outdoor lighting luminaires existing as of the effective date of this Ordinance.
2. Minor modifications, additions, or new lighting fixtures for non-residential and multiple dwellings. For non-residential and multiple dwellings, all additions, modifications, or replacement of more than 25 percent of outdoor lighting fixtures existing as of the effective date of this Ordinance shall require the submission of a complete inventory and site plan detailing all existing and any proposed new outdoor lighting. Any new lighting shall meet the requirements of this Ordinance.
3. Resumption of Use after Abandonment. If a property with non-conforming lighting is abandoned for a period of six months or more, then all outdoor lighting shall be brought into compliance with this Ordinance before any further use of the property occurs.

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3.11.8 – Violations and Enforcement.

3.11.9 Tables

Table A - Allowed Total Initial Luminaire Lumens per Site for Non-residential Outdoor Lighting, Per Parking Space Method.
May only be applied to properties up to 10 parking spaces (including handicapped accessible spaces).

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
350 lms/space	490 lms/space	630 lms/space	840 lms/space	1,050 lms/space

Table B - Allowed Total Initial Lumens per Site for Nonresidential
Outdoor Lighting, Hardscape Area Method. May be used for any project. When lighting intersections of site drives and public streets or road, a total of 600 square feet for each intersection may be added to the actual site hardscape area to provide for intersection lighting.

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Base Allowance				
0.5 lumens per SF of Hardscape	1.25 lumens per SF of Hardscape	2.5 lumens per SF of Hardscape	5.0 lumens per SF of Hardscape	7.5 lumens per SF of Hardscape

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Table B - *Lumen Allowances, in Addition to Base Allowance*

	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Additional allowances for sales and service facilities. No more than two additional allowances per site, Use it or Lose it.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non-sales areas. To use this allowance, luminaires must be within 2 mounting heights of sales lot area.	0	4 lumens per square foot	8 lumens per square foot	16 lumens per square foot	16 lumens per square foot
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area.	0	0	1,000 per LF	1,500 per LF	2,000 per LF
Drive Up Windows. In order to use this allowance, luminaires must be within 20 feet horizontal distance of the center of the window.	0	2,000 lumens per drive-up window	4,000 lumens per drive-up window	8,000 lumens per drive-up window	8,000 lumens per drive-up window
Vehicle Service Station. This allowance is lumens per installed fuel pump.	0	4,000 lumens per pump (based on 5 fc horiz)	8,000 lumens per pump (based on 10 fc horiz)	16,000 lumens per pump (based on 20 fc horiz)	24,000 lumens per pump (based on 20 fc horiz)

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Table C - Maximum Allowable Backlight, Uplight and Glare (BUG) Ratings. May be used for any project. A luminaire may be used if it is rated for the lighting zone of the site or lower in number for all ratings B, U and G. Luminaires equipped with adjustable mounting devices permitting alteration of luminaire aiming in the field shall not be permitted.

Table C-1	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Allowed Backlight Rating*					
Greater than 2 mounting heights from property line	B1	B3	B4	B5	B5
1 to less than 2 mounting heights from property line and ideally oriented**	B1	B2	B3	B4	B4
0.5 to 1 mounting heights from property line and ideally oriented**	B0	B1	B2	B3	B3
Less than 0.5 mounting height to property line and properly oriented**	B0	B0	B0	B1	B2

*For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section. NOTE: This adjustment is relative to Table C-1 and C-3 only and shall not be used to increase the lighting area of the site.

** To be considered 'ideally oriented', the luminaire must be mounted with the backlight portion of the light output oriented perpendicular and towards the property line of concern.

Table C - 2 Maximum Allowable Uplight (BUG) Ratings - Continued

Table C-2	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Allowed Uplight Rating	U0	U1	U2	U3	U4
Allowed % light emission above 90º for street or Area lighting	0%	0%	0%	0%	0%

Table C - 3 Maximum Allowable Glare (BUG) Ratings – Continued

Table C-3	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Allowed Glare Rating	G0	G1	G2	G3	G4
Any luminaire not ideally oriented*** with 1 to less than 2 mounting heights to any property line of concern	G0	G0	G1	G1	G2
Any luminaire not ideally oriented*** with 0.5 to 1 mounting heights to any property line of concern	G0	G0	G0	G1	G1
Any luminaire not ideally oriented*** with less than 0.5 mounting heights to any property line of concern	G0	G0	G0	G0	G1

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*** Any luminaire that cannot be mounted with its backlight perpendicular to any property line within 2X the mounting heights of the luminaire location shall meet the reduced Allowed Glare Rating in Table C-3.

Table D Performance Method Allowed Total Initial Site Lumens *May be used on any project.*

Lighting Zone	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Allowed Lumens Per SF	0.5	1.25	2.5	5	7.5
Allowed Base Lumens Per Site	0	3500	7000	14000	21000

Table E Performance Method Additional Initial Luminaire Lumen Allowances. All of the following are "use it or lose it" allowances. All area and distance measurements in plan view unless otherwise noted.

Lighting Application	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Additional Lumens Allowances for All Buildings except service stations and outdoor sales facilities. A MAXIMUM OF THREE (3) ALLOWANCES ARE PERMITTED. THESE ALLOWANCES ARE "USE IT OR LOSE IT".					
Building Entrances or Exits. This allowance is per door. In order to use this allowance, luminaires must be within 20 feet of the door.	**400**	**1000**	2000	4000	6000
Building Facades. This allowance is lumens per unit area of building façade that are illuminated. To use this allowance, luminaires must be aimed at the façade and capable of illuminating it without obstruction.	0	0	8/SF	16/SF	24/SF
Sales or Non-sales Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to qualify for this allowance, luminaires must be located under the canopy.	0	3/SF	6/SF	12/SF	18/SF
Guard Stations. This allowance is lumens per unit area of guardhouse plus 2000 sf per vehicle lane. In order to use this allowance, luminaires must be within 2 mounting heights of a vehicle lane or the guardhouse.	0	6/SF	12/SF	24/SF	36/SF
Outdoor Dining. This allowance is lumens per unit area for the total illuminated hardscape of outdoor dining. In order to use this allowance, luminaires must be within 2 mounting heights of the hardscape area of outdoor dining	0	1/SF	5/SF	10/SF	15/SF
Drive Up Windows. This allowance is lumens per window. In order to use this allowance, luminaires must be within 20 feet of the center of the window.	0	2,000 lumens per drive-up window	4,000 lumens per drive-up window	8,000 lumens per drive-up window	8,000 lumens per drive-up window
Additional Lumens Allowances for Service Stations only. Service stations may not use any other additional allowances.					
Vehicle Service Station Hardscape. This allowance is lumens per unit area for the total illuminated hardscape area less area of buildings, area under canopies, area off property, or areas obstructed by signs or structures. In order to use this	0	4/SF	8/SF	16/SF	24/SF

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allowance, luminaires must be illuminating the hardscape area and must not be within a building, below a canopy, beyond property lines, or obstructed by a sign or other structure.					
Additional Lumens Allowances for Outdoor Sales facilities only. Outdoor Sales facilities may not use any other additional allowances. **NOTICE:** lighting permitted by these allowances shall employ controls extinguishing this lighting after a curfew time to be determined by the Authority.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas and shall not exceed 25% of the total hardscape area. To use this allowance, Luminaires must be within 2 mounting heights of the sales lot area.	0	4/SF	8/SF	12/SF	18/SF
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires must be located between the principal viewing location and the frontage outdoor sales area.	0	0	1,000/LF	1,500/LF	2,000/LF

Table E - Performance Method Additional Initial Lumen Allowances (cont.)

Lighting Application	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Vehicle Service Station Canopies. This allowance is lumens per unit area for the total area within the drip line of the canopy. In order to use this allowance, luminaires must be located under the canopy.	**0**	**8/SF**	16/SF	32/SF	32/SF
Additional Lumens Allowances for Outdoor Sales facilities only. Outdoor Sales facilities may not use any other additional allowances. **NOTICE:** lighting permitted by these allowances shall employ controls extinguishing this lighting after a curfew time to be determined by the Authority.					
Outdoor Sales Lots. This allowance is lumens per square foot of uncovered sales lots used exclusively for the display of vehicles or other merchandise for sale, and may not include driveways, parking or other non sales areas and shall not exceed 25% of the total hardscape area. To use this allowance, Luminaires must be within 2 mounting heights of the sales lot area.	0	3/SF	6/SF	12/SF	18/SF
Outdoor Sales Frontage. This allowance is for lineal feet of sales frontage immediately adjacent to the principal viewing location(s) and unobstructed for its viewing length. A corner sales lot may include two adjacent sides provided that a different principal viewing location exists for each side. In order to use this allowance, luminaires	0	0	1000/LF	1500/LF	2000/LF

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must be located between the principal viewing location and the frontage outdoor sales area.					

Table F Maximum Vertical Illuminance at any point in the plane of the property line

LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
0.05 FC or 0.5 LUX	0.1 FC or 1.0 LUX	0.3 FC or 3.0 LUX	0.8 FC or 8.0 LUX	1.5 FC or 15.0 LUX

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Table G - Residential Lighting Limits

Lighting Application	LZ-0	LZ-1	LZ-2	LZ-3	LZ-4
Row 1 Maximum Allowed Luminaire Lumens* for Unshielded Luminaires at one entry only	Not permitted	420 lms	630 lms	630 lms	630 lms
Row 2 Maximum Allowed Luminaire Lumens* for each Fully Shielded Luminaire	630 lms	1,260 lms	1,260 lms	1,260 lms	1,260 lms
Row 3 Maximum Allowed Luminaire Lumens* for each Unshielded Luminaire excluding main entry	Not permitted	315 lms	315 lms	315 lms	315 lms
Row 4 Maximum Allowed Luminaire Lumens* for each Landscape Lighting	Not permitted	Not permitted	1,050 lms	2,100 lms	2,100 lms
Row 5 Maximum Allowed Luminaire Lumens* for each Shielded Directional Flood Lighting	Not permitted	Not permitted	1,260 lms	2,100 lms	2,100 lms
Row 6 Maximum Allowed Luminaire Lumens* for each Low Voltage Landscape Lighting	Not permitted	Not permitted	525 lms	525 lms	525 lms

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