

LIGHTING REGULATIONS

CITY OF ARVADA



AUGUST 2009

6.7 LIGHTING

The provisions of this section shall apply to all land uses in the Standard Zoning Districts, New Communities Sub-Districts, Clear Creek Sub-Districts, and PUD Districts. In the discretion of the City, or in the event there is any disagreement between the City and an Applicant as to whether proposed lighting meets the following standards, the City may require a photometric study of the proposed lighting at the Applicant's expense.

6.7.1 Intent

It is the intent of this Section to define practicable and effective measures by which the obtrusive aspects of excessive and/or careless outdoor light usage can be minimized, while preserving safety, security, and nighttime visual environment by encouraging lighting practices that direct appropriate amounts of light where needed, decrease the waste of energy associated with exterior lighting, and help reduce glare associated with the use of poorly shielded or inappropriately aimed lighting fixtures.

6.7.2 Scope

This Section designates illuminance, uniformity and spill light criteria for properties based upon the Lighting Zone (LZ) in which the property is located. The Lighting Zone designation for each property in Arvada is designated by zoning district and use in Section 6.7.5. In addition to criteria based upon Lighting Zone, this Section includes restrictions on lighting equipment, mounting conditions, and submittal requirements to demonstrate compliance. An alternate compliance process is provided for lighting equipment which meets the intent of the equipment restrictions but which may be in violation of specific regulations presented here.

6.7.3 Applicability

- A. New Construction. All exterior lighting systems newly designed, constructed, erected, or otherwise placed into operation on or after the date of adoption of this Section and any alterations, rehabilitation, relocation or renovation to existing lighting commenced after the date of adoption shall be in conformance with the requirements of this Section.

Exception: Lighting designs previously approved but not yet constructed prior to the date of the adoption of this Section may be exempted from the requirements of this Section.

- B. Existing Lighting Systems. All existing lighting systems legally installed and operative before the date of adoption shall be considered legal non-conforming systems. Non-conforming lighting may be continued, but the lighting shall not be changed to any other non-conforming lighting, structurally altered, altered in any way that increases its degree of non-conformance, or expanded or extended in scope.

6.7.4 Prohibited Lighting

- A. Types. The following types of lighting shall be prohibited from use:
1. Any light that could be construed as a traffic control device except as authorized by the state, federal or city government.

2. Searchlights and rotating beacons except by special permit.
3. Any blinking, flashing or changing intensity lighting except as part of a temporary holiday display.
4. Aerial lasers except by special permit.
5. Any light source exceeding 60,000 lumens or with an intensity in any direction of 60,000 candelas or more, except by special permit approved by the Community Development Director.

B. Exemptions. The following lighting systems are exempted from conformance with the requirements of this Section:

1. Lighting used to control and regulate the flow of pedestrian and motor vehicle movement on public rights of way.
2. Temporary lighting for construction, provided such lighting is of a temporary nature and is discontinued daily immediately upon completion of the construction work for the day. By special permit, where safety is a concern, this lighting may be allowed to remain in operation after daily construction operations are complete.
3. Lighting used as decoration for any national, state, local or religious holiday provided that the lighting is of a temporary nature and energized for no more than 90 nights per contiguous 12 month period.
4. Lighting required by law enforcement or emergency services personnel to protect life or property, provided the lighting is of a temporary nature and is discontinued immediately upon resolution of the emergency necessitating its usage.
5. Lighting required by and regulated by the Federal Aviation Administration for the purpose of air traffic control, navigation, or warning.
6. Civic monuments as determined by the Community Development Director.
7. Lighting approved by the Community Development Director as a part of a Special Events permit.

6.7.5 Establishment of Lighting Zones

The intent of the Lighting Zones (LZ) is to designate some areas of the City as being allowed to have more lighting than other areas. There are four Lighting zones designated LZ-1 through LZ-4.

A. The following Lighting Zones are hereby established:

1. Lighting Zone 1 (LZ-1)

The darkest areas, based on the overall absence of outdoor lighting, associated with undeveloped or rural areas, including community open space and other areas without roadway lighting. Lighting Zone 1 includes the following zoning districts:

A-1, C-1, R-CE, R-E, PUD-R less than 2 units/acre, NC-AG, NC-OS, NC-RA, NC-RB, NC-RC

2. Lighting Zone 2 (LZ-2)

Moderate light levels in these areas, with roadway lighting and nighttime pedestrian traffic present, but with luminous

surroundings and traffic conflict of low to moderate levels. This is the Lighting Zone that applies to most areas such as residential neighborhoods and commercial, business or retail areas that do not have high levels of nighttime pedestrian traffic. Lighting Zone 2 includes the following zoning districts:

R-L, R-SL, R-I, R-MD, R-M, PUD-R more than 2 units/acre, CC-B, Residential Uses in the PUD-BPR, Residential Uses in the NC-MU-A, Residential Uses in the NC-MU-B, Residential Uses in the NC-MU-C

3. Lighting Zone 3 (LZ-3)

Higher light levels exist in Lighting Zone 3 with increased levels of all traffic, particularly nighttime pedestrian traffic, and of existing lighting. Lighting Zone 3 includes the following zoning districts:

P-1, B-1, B-2, B-3, B-4, PUD-BP, I-1, I-2, PUD-I, CC-A, CC-C, CC-D, CC-E, NC-OF, NC-I/OF, NC-SU, Commercial and Office Uses in the PUD-BPR, Commercial and Office Uses in the NC-MU-A, Commercial and Office Uses in the NC-MU-B, Commercial and Office Uses in the NC-MU-C

4. Lighting Zone 4 (LZ-4)

The brightest areas based on the presence of lighting at high levels with high potential for pedestrian and vehicle conflicts at night. Lighting Zone 4 includes the following zoning district:

Commercial and Office Land Uses located within the PUD-BPR Zoning District within 2,640 feet of Wadsworth Bypass between I-70 and the Burlington Northern/Santa Fe Railroad.

All uses within these zones must comply with the lighting criteria within that zone, and all other general lighting requirements.

6.7.6 Lighting Zone Requirements

The following tables give the maximum allowable illuminance, minimum uniformity and spill light criteria for each of the four Lighting Zones.

A. Illuminance and Uniformity Requirements

Area	Classification	Maximum Illuminance (footcandles)	Uniformity Ratio
Major Roadway (Arterial Street)	High Pedestrian Conflict	8.5	3:1 avg:min
	Medium Pedestrian Conflict	6.5	3:1 avg:min
	Low Pedestrian Conflict	4.5	3:1 avg:min
Collector Roadway	High Pedestrian Conflict	6.0	4:1 avg:min

	Medium Pedestrian Conflict	4.5	4:1 avg:min
	Low Pedestrian Conflict	3.0	4:1 avg:min
Local Roadway	High Pedestrian Conflict	5.4	6:1 avg:min
	Medium Pedestrian Conflict	4.2	6:1 avg:min
	Low Pedestrian Conflict	2.4	6:1 avg:min
Walkways	LZ-1	1.0	10:1 avg:min
	LZ-2	2.0	10:1 avg:min
	LZ-3	4.0	4:1 avg:min
	LZ-4	6.0	4:1 avg:min
Parking – Non-residential	LZ-1	5.0	20:1 max:min
	LZ-2	7.5	20:1 max:min
	LZ-3	10.0	20:1 max:min
	LZ-4	15.0	20:1 max:min
Parking Residential	LZ-1	5.0	20:1 max:min
	LZ-2	6.0	20:1 max:min
	LZ-3	7.0	20:1 max:min
	LZ-4	7.5	20:1 max:min
Outdoor Retail	All Zones	35	20:1 max:min

Maximum illuminance values shall be horizontal measurements and initial condition at grade. For definitions of the High, Medium and Low Pedestrian Conflict Classifications refer to the most recent version of the *American National Standard Practice for Roadway Lighting*, ANSI/IESNA RP-8 and ASSHTOP.

B. Exceptions:

1. For driveways between parking areas and roadways that are allowed to be brighter than the parking area, the maximum illuminance is allowed to be as high as the roadway's maximum illuminance, and this driveway area is to be considered separate from the parking area for uniformity ratio calculation.
2. Lighting for areas where sports are played, if such lighting is no more than 125% of the values cited in the current IESNA recommended practice for that sport.

6.7.7 Spill Light

A. Maximum Permitted Spill Light

Spill light onto adjacent properties may be measured by either horizontal measurements at grade or by vertical measurements up to the height of the highest window on the property receiving the spill light. Where vertical measurements at the property boundary are impracticable, measurements at windows may be substituted.

Spill Light – Maximum Limits

Lighting Zone	Maximum Horizontal or Vertical Measured Illuminance at the property line, excluding rights of way (footcandles)
LZ-1	0.2
LZ-2	0.4
LZ-3	0.8
LZ-4	1.5

B. Exceptions

1. Spill light onto rights of way at entries to a property may be the greater of either one third (1/3) of the maximum allowed illuminance for the parking area on the property or one third (1/3) of the maximum allowed illuminance for the right of way.
2. Spill light from lighting for areas where sports are played, within one hour of when the sports are being played.
3. Historical districts.

6.7.8 Lighting Equipment Restrictions

- A. The following Lighting Equipment Restrictions apply to all Lighting Zones and zoning classifications.

Rated Lamp Lumen Restrictions

	Any Light Fixture mounted no more than 4 feet above grade	Wall or Ceiling Mount Light Fixture above 4 feet	Pole Mounted Light Fixture above 4 feet, no more than 15 feet	Pole Mounted Light Fixture above 15 feet
Unshielded	480 ¹	480 ¹	480 ¹	480 ¹
Shielded	1,800	Wall 1,800 Ceiling 3,600	10,000	20,000
Fully Shielded	10,000	10,000	20,000	30,000
Full Cut-Off	N.A.	30,000	30,000	50,000

¹ Up to 3 lamps of this lumen rating will be allowed per light fixture.

B. Distribution Constraints

House side shields shall be required for all full cutoff light fixtures installed within 2.5 mounting heights of the property line. The house side shields shall limit the light output from the fixture in the direction of the nearest property line.

Floodlights, including reflector lamps, shall not be aimed off property.

C. Lighting Pole and Fixture Constraints

1. Height Restraints - For parking areas, the maximum height of light poles shall be:

- a. 18 feet when located up to and including 50 feet from the property line of areas zoned for residential uses;
- b. 25 feet when located more than 50 feet but less than 100 feet from the property line of areas zoned for residential uses;
- c. 35 feet when located 100 feet or more from the property line of areas zoned for residential uses.

All other light fixtures shall not be mounted higher than 25'.

Exception: parking structures may have 18 foot high poles above the parking deck.

2. Mounting Method Constraints

Luminaries using lamps with more than 20,000 rated lumens shall meet the following constraints:

- a. Shall not use spider or yoke mounting configuration;
- b. Shall be mounted on dark color poles (less than 35% reflective).

3. Mounting Placement Constraints

Where light poles or bollards are used, they shall be placed:

- a. At least 3 feet away from the face of the curb (to avoid damage from car bumpers and door swings);
- b. At least 5 feet from the point where a curb transitions into a driveway, curb cut, or alley;
- c. At least 20 feet from the extended flow line of the nearest intersection.

D. Motion Detection Lighting

Automatic lights activated by movement must be mounted so that they are not triggered by pedestrians or vehicles on the right of way or adjacent properties.

6.7.9 Architectural Accent Lighting Constraints

All lighting of a specific architectural feature shall comply with the following:

- A. Non-Canopy Lighting. Building lighting may only be used to highlight important building entries or specific architectural features. General floodlighting of building facades is not permitted.

- B. Canopy Lighting. All canopy lighting (a) shall use recessed light fixtures and (b) shall not use highly reflective material on the underside.

6.7.10 Limits on Timing

For all non-residential properties, any building, service, and loading area lighting, except lighting for security purposes, shall be turned off one hour after business operations have ceased for the day and shall remain turned off until one hour before the next resumption of business operations.

6.7.11 Performance Approach

Lighting equipment that does not meet the requirements of the previous sections may be approved if:

- A. The luminaries are shown in the submittal to be fully shielded from view from anywhere off the property;
- B. Requirements for maximum illuminance, uniformity, spill light, mounting and time of use are met;
- C. Maximum surface luminance seen from anywhere off the property is less than 3000 cd/m²; and
- D. The property owner agrees in advance to take any necessary steps after installation to meet these requirements.

6.7.12 Submittal Requirements

When a new outdoor lighting covered by this Code is being installed, an outdoor lighting plan shall be submitted in conjunction with a Final Development Plan, Final Plat, Conditional Use Permit, Site Plan, or with a building permit application, whichever occurs first.

- A. All submittals shall include the following:
 1. The location and mounting height above grade of light fixtures including building mounted fixtures.
 2. The Lighting Zone of the property and all adjacent properties labeled on the plan.
 3. The location of all buildings, parking, drives, walkways and if applicable any outdoor retail areas on the lot or parcel.
 4. The type of light fixture keyed to a light fixture schedule and picture, cut sheets or line drawings of the proposed light fixtures.
 5. The quantity and type of lamp to be used in each fixture along with the lumen output of the lamp.

B. The following additional submittal requirements shall apply for all properties except single family or duplex residences, when the project includes:

1. A new building, roadway or parking lot.
2. An expansion of the parking area of more than 25% over the existing area.
3. An expansion of the building area more than 25% over the existing area.
4. For the above (Section 6.7.12 B) listed types of projects, in addition to the requirements listed in 6.7.12.A, the submittal shall include:
 - a. Manufacturer's cut sheets for each light fixture shall be submitted that include a full description of the light fixture and its photometric distribution. The cut sheets shall be keyed to the light fixture schedule and the lighting plan. Where the cut sheets do not include the requirement information it shall be added to the submittal.
 - b. Aiming angles and diagrams for all sports lighting and flood lighting fixtures.
 - c. Photometric Plan - Initial horizontal illuminance (maintenance factor = 1.0) calculated at grade using a grid of points no more than ten feet apart and covering the entire site (excluding buildings) and extending a minimum of ten feet beyond the lot or parcel property line. The maximum, average and minimum illuminance values for each specific uses area (i.e. parking area, pedestrian areas, etc.) shall be highlighted. Statistics for uniformity for each specific use area shall be included on the plan. The Community Development Director may waive the requirements for a photometric plan for small lighting systems where light equipment restrictions are met.