



DENVER AMENDMENT PROPOSAL FORM FOR PROPOSALS TO THE 2019 DENVER BUILDING CODE AMENDMENTS AND THE 2021 INTERNATIONAL CODES

DENVER
THE MILE HIGH CITY

2021 CODE DEVELOPMENT CYCLE

1) **Name:** Kristen Salinas **Date:** 9/14/2021
Email: ksalinas@noresco.com **Representing (organization or self):** Denver
City Staff Proposal (check box):

2) One proposal per this document is to be provided with clear and concise information.

Is a separate graphic file provided (“X” to answer): ___ Yes or X No

3) Highlight the code and acronym that applies to the proposal

<u>Acronym</u>	<u>Code Name</u>	<u>Acronym</u>	<u>Code Name</u>
DBC-AP	Denver Building Code–Administrative Provisions	IPC	International Plumbing Code
IBC	International Building Code	IRC	International Residential Code
IECC	International Energy Conservation Code	IFGC	International Fuel Gas Code
IEBC	International Existing Building Code	IMC	International Mechanical Code
IFC	International Fire Code	DGC	Denver Green Code

AMENDMENT PROPOSAL

Please provide all the following items in your amendment proposal.

Code Sections/Tables/Figures Proposed for Revision:

Instructions: If the proposal is for a new section, indicate (new), otherwise enter applicable code section.

Section 5.3.6.2

Replacement proposals for Out of DGC into Mandatory Code

Proposal:

Instructions: Show the proposal using ~~strikeout~~, underline format.

Place an “X” next to the choice that best defines your proposal: ___ Revision ___ New Text X Delete/Substitute ___ Deletion

Denver Green Code:

Backlight and Glare.

- a. All building-mounted luminaires located less than two mounting heights from any property line or adjacent building shall meet the maximum allowable glare ratings in Table 501.3.6.2A (5.3.6.2A).
- b. All other luminaires shall meet the maximum allowable backlight and glare ratings in Table 501.3.6.2B (5.3.6.2B).

Exceptions:

1. Specialized signal, directional, and marker lighting associated with transportation.
2. Advertising signage or directional signage.
3. Lighting integral to equipment or instrumentation and installed by its manufacturer.
4. Lighting for theatrical purposes, including performance, stage, film production, and video production.
5. Lighting for athletic playing areas.
6. Lighting that is in use for no more than 60 continuous days and is not reinstalled any sooner than 60 days after being uninstalled.
7. Lighting for industrial production, material handling, transportation *sites*, and associated storage

areas.

8. Theme elements in theme/amusement parks.
9. Roadway lighting required by governmental authorities.
10. Lighting classified for and used in hazardous locations as specified in NFPA 70.
11. Lighting for swimming pools and water features.

TABLE 501.3.6.2A (TABLE 5.3.6.2A) MAXIMUM ALLOWABLE GLARE RATINGS FOR BUILDING-MOUNTED LUMINAIRES WITHIN TWO MOUNTING HEIGHTS OF ANY PROPERTY LINE^{a,b}

DISTANCE IN MOUNTING HEIGHTS TO NEAREST PROPERTY LINE	LZ0	LZ1	LZ2	LZ3
>2	G0	G1	G2	G3
≥ 1 and < 2	G0	G0	G1	G1
≥ 0.5 and < 1	G0	G0	G0	G1
< 0.5	G0	G0	G0	G0

- a. For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 ft (1.5 m) beyond the actual property line for the 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.
- b. Backlight, uplight, and glare ratings are defined based on specific lumen limits per IES TM-15 Addendum A.

TABLE 501.3.6.2B (TABLE 5.3.6.2B) MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT, AND GLARE (BUG) RATINGS^{a,b,c,d}

	LZ0	LZ1	LZ2	LZ3
Allowed Backlight Rating				
> 2 mounting heights from property line	B1	B3	B4	B5
1 to 2 mounting heights from property line	B1	B1	B2	B3
0.5 to 1 mounting height to property line	B0	B1	B1	B2
< 0.5 mounting height to property line	B0	B0	B0	B1
Allowed Uplight Rating - Luminaires ≥ 3,500 lumens	U0	U0	U0	U0
Allowed Uplight Rating - Luminaires < 3,500 lumens	U0	U0	U1	U2
Allowed Glare Rating	G0	G1	G2	G3

- a. Except where installed on a building surface, luminaires that are located at a distance of two times the mounting height of the luminaire or less from a property line shall have the backlight of the luminaire aimed toward and perpendicular to the nearest property line. Backlight is that part of the luminaire's lumen output that was used to determine the backlight rating in its final angular position.
- b. For property lines that abut public walkways, bikeways, plazas, and parking lots, the property line may be considered to be 5 ft (1.5 m) beyond the actual property line for the 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.
- c. If the luminaire is installed in other than the intended manner, or is an adjustable luminaire for which the aiming is specified, the rating shall be determined by the actual photometric geometry in the aimed orientation.
- d. Backlight, uplight, and glare ratings are defined based on specific lumen limits per IES TM-15 Addendum A.

Supporting Information (Required):

All proposals must include a written explanation and justification as to how they address physical, environmental, and/or customary characteristics that are specific to the City and County of Denver. The following questions must be answered for a proposal to be considered.

- Purpose: What does your proposal achieve?

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. Aligns glare requirements for the entire property with LEED and CALGreen.

- Reason: Why is your proposal necessary?
Reduces energy, light trespass, and impact on circadian rhythms.

- Substantiation: Why is your proposal valid? (i.e. technical justification)

Uncontrolled outdoor lighting robs us of the experience of seeing a night sky brimming with stars, but that’s not the only cost of light pollution—or even the highest. Poor lighting wastes billions of dollars per year in energy consumption and carbon emissions. There’s also a growing body of scientific evidence around the public health risk of overexposure to artificial light at night.

The International Dark-Sky Association (IDA) estimates that at least 30 percent of all outdoor lighting in the U.S. is wasted, mostly by lights that aren’t properly shielded. That adds up to about \$3 billion in wasted energy every year. Wasted outdoor lighting in the U.S. also generates about 15 million tons of carbon dioxide per year into the atmosphere.

A growing body of research suggests that light pollution may have a significant and adverse impact on human health. In 2016, the American Medical Association adopted guidance for communities on selecting among LED lighting options to minimize harmful human and environmental effects. The core concern is the effect of artificial lighting on our sleep habit and circadian rhythm is impacted negatively. Abnormal light exposure may also cause various metabolic and chronic conditions to arise. Researchers at the University of California, Irvine noted that about 10 to 15 percent of all human genes are regulated by circadian rhythms, so the disruption of these cycles can “profoundly influence human health.”

In addition, studies have shown that bright light can negatively affect nocturnal bird behaviors and patterns. Limiting excess light may help alleviate a bird’s potential disorientation around certain patterns, brightness, and colors of exterior light.

Bibliography and Access to Materials (as needed when substantiating material is associated with the amendment proposal):

<https://www.signify.com/en-us/blog/archive/innovation/what-impacts-glare-in-exterior-applications>

<https://www.voltlighting.com/learn/using-dark-sky-approved-lighting-to-reduce-light-pollution>

https://abcbirds.org/wp-content/uploads/2019/04/Bird-Friendly-Building-Design_Updated-April-2019.pdf

Other Regulations Proposed to be Affected

***For proposals to delete content from the 2019 Denver Green Code in conjunction with adding it to other mandatory Denver codes and/or regulations, only.**

Please identify which other mandatory codes or regulations are suggested to be updated (if any) to accept relocated content.

Referenced Standards:

List any new referenced standards that are proposed to be referenced in the code.

Impact:

How will this proposal impact cost and restrictiveness of code? (“X” answer for each item below)

Cost of construction: ___ Increase ___ Decrease X No Impact

Cost of design: ___ Increase ___ Decrease X No Impact

Restrictiveness: X Increase ___ Decrease ___ No Impact

Departmental Impact (City use only):

This amendment proposal increases/decreases/is neutral to the cost of plans review.

This amendment increases/decreases/is neutral to the cost of inspections.