

DOCKETED

Docket Number:	17-BSTD-03
Project Title:	2019 Title 24, Part 11, CALGreen Rulemaking
TN #:	224801
Document Title:	Statewide Utility C&S Team Comments - On Outdoor Lighting BUG Rating Requirements
Description:	N/A
Filer:	System
Organization:	Statewide Utility Codes and Standards Team
Submitter Role:	Public
Submission Date:	9/27/2018 11:01:35 AM
Docketed Date:	9/27/2018

*Comment Received From: Statewide Utility Codes and Standards Team
Submitted On: 9/27/2018
Docket Number: 17-BSTD-03*

**Statewide Utility C&S Team - Comments on Outdoor Lighting BUG
Rating Requirements**

Additional submitted attachment is included below.

Comments on 2019 CALGreen 15-Day Language: Requirements for BUG Ratings

California Statewide Utility Codes and Standards Team

September 24, 2018

1. Introduction

The California Statewide Utility Codes and Standards Team (Statewide CASE Team) actively supports the Energy Commission to update California’s Green Building Standards (Title 24, Part 11 or CALGreen) to include new requirements or to upgrade existing requirements. The Statewide CASE Team develops code change proposals that will result in feasible, enforceable, and cost-effective enhancements to the building energy efficiency standards. Three California Investor Owned Utilities – Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison – and two publicly Owned Utilities – Los Angeles Department of Water and Power, and Sacramento Municipal Utility District – sponsored this effort.

The Statewide CASE Team appreciates the opportunity to participate in the 2019 CALGreen code development process and encourage the Energy Commission to consider the following feedback on backlight, uplight, and glare (BUG) ratings for outdoor lighting that are included in the 15-Day Language for the 2019 CALGreen standards, which The Energy Commission released for public review on September 6, 2018.¹

2. Harmonizing BUG Applicability with Title 24, Part 6

The BUG requirements in CALGreen are not consistent with BUG requirements in Title 24, Part 6. The Statewide CASE Team recommends modifying the requirements in Chapter 5 of CALGreen to harmonize with the 2016 Title 24, Part 6 requirements.

The 2016 California Building Energy Efficiency Standards (Title 24 Part 6) include mandatory requirements for uplight and glare that apply to nonresidential, high-rise residential and hotel/motel occupancies (Section 130.2(b)) and some outdoor lighting associated with low-rise occupancies (Sections 150.0(k)3Bii, 150.0(k)3C, and 150.0(k)3D).² These requirements apply to newly constructed buildings and alterations. Chapter 5 of CALGreen, which presents mandatory requirements for all commercial buildings built in California, included BUG requirements to reduce light pollution (Section 5.106.8 Light pollution reduction). The requirements in Chapter 5 of CALGreen, apply to nonresidential occupancies, but do not apply to high-rise residential, hotel/motel, or the low-rise residential occupancies. Additionally, the requirements in Chapter 5 of CALGreen only apply to newly constructed buildings, as indicated with an “[N]” preceding Section 5.106.8.

¹ BUG ratings are based on the Illuminating Engineering Society publication, Luminaire Classification System for Outdoor Luminaires (IES TM-15-11).

² Section 150.0(k)3D was deleted in the 2019 version of Title 24, Part 6.

To simplify the BUG requirements for outdoor luminaires, the Energy Commission adopted modifications to Section 130.2(b) for the 2019 Title 24, Part 6 Standards. This section now references the requirements in CALGreen using the following language, "Maximum zonal lumens for Backlight, Uplight, and Glare shall be in accordance with Title 24, Part 11, Section 5.106.8." In this manner, a single table for BUG requirements would be referenced that resides in the mandatory section of CALGreen. The changes to Title 24, Part 6, the Energy Commission already adopted, should be accompanied by corresponding changes to Title 24, Part 11 to maintain the stringency of the 2016 requirements. Table 1 presents a summary of conflicts and sources of confusion between the BUG requirements in Title 24, Part 6 and Title 24, Part 11.

Table 1: Summary of Conflicts in BUG Requirements in Title 24, Part 6 and Title 24, Part 11

Area of Conflict	Title 24, Part 6	Title 24, Part 11
Type of Construction	Applies to new construction and alterations	Only applies to new construction
Building Occupancy	Applies to nonresidential, high-rise residential, hotel/motel and some low-rise residential occupancies	Only applies to nonresidential occupancies
Luminaire Output	Applies > 6,200 initial lumens	No threshold
Exceptions	7 exceptions	4 exceptions

3. Proposed Changes to 2019 CALGreen (Title 24 Part 11)

The Statewide CASE Team recommends the following revisions to the 2019 CALGreen 15-Day Language. These revisions are intended to maintain the same stringency in regards to BUG requirements as apply to the 2016 Title 24, Part 6 Standards while removing potential areas for conflict. The Statewide CASE Team’s recommended language insertions are in red font and underlined and recommended language deletions are ~~in red font and with strikethrough~~.

SECTION 4.106

SITE DEVELOPMENT

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4.106.5 Light pollution reduction. Outdoor lighting systems for high-rise residential and hotel/motel buildings shall be designed and installed to comply with the applicable requirements in Section 5.106.8. Outdoor lighting systems for low rise residential buildings complying with Section 150.0(k)3Bii, or Section 150.0(k)3C of the *California Energy Code* shall be designed and installed to comply with the applicable requirements in Section 5.106.8.

Exceptions:

1. Luminaires that qualify as exceptions in Section 140.7 of the *California Energy Code*.
2. Emergency lighting.
3. Luminaires with less than 6,200 initial luminaire lumens.
4. Luminaires that qualify as exceptions to Section 130.2(b) of the *California Energy Code*.

SECTION 5.106

SITE DEVELOPMENT

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5.106.8 Light pollution reduction. ~~FN~~ Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the *California Energy Code* for Lighting Zones 1-4 as defined in Chapter 10 of the *California Administrative Code*; and
2. Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and
3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, or Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

Exceptions: ~~FN~~

1. Luminaires that qualify as exceptions in Section 140.7 of the *California Energy Code*.
2. Emergency lighting.
3. Building façade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.

5. Luminaires with less than 6,200 initial luminaire lumens.

6. Luminaires that qualify as exceptions to Section 130.2(b) of the *California Energy Code*.

Note: ~~FN~~ See also California Building Code, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.

TABLE 5.106.8 ~~FN~~

MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS^{1,2}

ALLOWABLE RATING	LIGHTING ZONE 1	LIGHTING ZONE 2	LIGHTING ZONE 3	LIGHTING ZONE 4
Maximum Allowable Backlight Rating³				
Luminaire greater than 2 mounting heights (MH) from property line	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	B0	B0	B1	B2
Maximum Allowable Uplight Rating				
For area lighting ⁴	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	U1	U2	U3	U4
Maximum Allowable Glare Rating⁵				
Luminaire greater than 2 MH from property line	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	G0	G0	G1	G1
Luminaire back hemisphere is less than 0.5 MH from property line	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.
2. 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.
3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.
4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet U-value limits for “all other outdoor lighting.”
5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.