

Page 24 - User Guide

IX. TABLES - TABLE C BUG RATING - User's Guide

Work on the BUG system started in 2005 when the IES upgraded the roadway cutoff classification system. The original system, which included the ratings full cutoff, cutoff, semi-cutoff and non cutoff, had been designed as a rating system focused on brightness and glare control. However, with increasing demand for control of uplight and light trespass in addition to glare, IES realized that a more comprehensive system was needed. In response, IES developed TM-15 *Luminaire Classification System for Outdoor Luminaires*.

As this is a relatively new rating system, and many people may not be familiar with it, more explanation of how the rating system works is provided here. For example, some people are familiar with terms such as "full cutoff" and they may expect the MLO to include those terms. It will be very important that all groups recognize that older terms and concepts are inadequate for the complex tasks of controlling light pollution. It is recommended that the new rating system adopted in TM-15, as followed herein and provided by the MLO, be used intact and exclusively.

BUG requires downlight only with low glare (better than full cut off) in lighting zones 0, 1 and 2, but allows a minor amount of uplight in lighting zones 3 and 4. In lighting zones 3 and 4, the amount of allowed uplight is enough to permit the use of very well shielded luminaires that have a decorative drop lens or chimney so that dark sky friendly lighting can be installed in places that traditional-appearing luminaires are required. BUG typically cannot be used for residential luminaires unless they have been photometrically tested. For non-photometrically tested residential luminaires, shielding description is used instead.

The lumen limits established for each lighting zone apply to all types of lighting within that zone. This includes, but is not limited to, specialty lighting, façade lighting, security lighting and the front row lighting for auto dealerships. BUG rating limits are defined for each luminaire and

31 -Re-wording

It is recommended that the new rating system provided by defined in IES TM-15 as expressed here in the MLO be used intact and exclusively.

ACCEPTED

The 3rd paragraph begins "BUG requires downlight only with low glare (better than full cutoff) in lighting zones 0, 1, and 2, but allows a minor amount of uplight in lighting zones 3 and 4." But as written, the MLO does in fact permit some uplight in zone 2 -- U1 is not "downlight only". And, in my humble opinion, U3 (1000 lumens of uplight) is not a "minor amount of uplight" by any stretch of the imagination! (As mentioned above, the MLO should require U0 in all zones.)

RESPONSE:

Accept in Part: The uplight values in TM-15 have been revised to only include light in the 90 to 180.

IX. TABLES - TABLE C BUG RATING (cont.) - User's Guide

are based on the internal and external design of the luminaire, its aiming, and the initial lamp luminaire lumens of the specified lamp(s). The BUG rating limits also take into consideration the distance the luminaire is installed from the property line in multiples of the mounting height (See Table C).

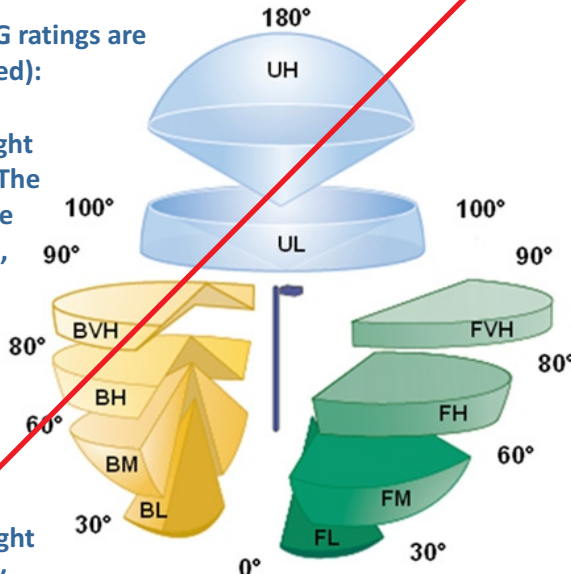
The three components of BUG ratings are based on IES TM-15-07 (revised):

Backlight, which creates light trespass onto adjacent sites. The B rating takes into account the amount of light in the BL, BM, BH and BVH zones, which are in the direction of the luminaire OPPOSITE from the area intended to be lighted.

Uplight, which causes artificial sky glow. Lower uplight (zone UL) causes the most sky glow and negatively affects professional and academic astronomy. Upper uplight (UH) not reflected off a surface is mostly energy waste. The U rating defines the amount of light into the upper hemisphere with greater concern for the light at or near the horizontal angles (UL, FVH and BVH solid angles.)

Glare, which can be annoying or visually disabling. The G rating takes into account the amount of frontlight in the FH and FVH zones as well as BH and BVH zones.

BUG ratings apply to the Lighting Zone of the property under consideration.



#10 - In explaining the BUG system (page 25) and the significance of uplight, the description reads "Lower uplight zone (UL) causes the most sky glow and negatively affects professional and academic astronomy." That's true as far as it goes; however, the negative effects of uplight are hardly limited to "academic astronomy". Instead, the user's guide should articulate that all uplight (especially "UL" but also "UH") both wastes energy and contributes to sky glow that deprives everyone (not only academic astronomers) of the enjoyment, or even awareness, of the wonder, beauty, and heritage of the night sky, as well as impacting birds and other wildlife that are distracted by upward-directed light.

Mentioning only professional/academic astronomy would probably serve to make uplight – especially "UL" uplight – seem of scant concern to civic leaders in the overwhelming majority of municipalities without nearby professional observatories!

People reading the user's guide are likely to be confused that both LZ 0 and LZ 1 require a U0 rating, while the comparison discussion on page 26 mentions that no light above 90 degrees is allowed in LZ 0 but 20 lumens of uplight is allowed in LZ 1.

(It looks like the uplight limits in Table C, page 24, were originally going to track along with the zones, e.g. LZ0->U0, LZ4->U4, etc. but the U values in Table C were revised downward while the accompanying user guide text on page 26-27 was not changed to correspond.)

Also, the comparison/roughly equivalent wording is not clear. For example, does it mean a 75W incandescent bulb has an approximate output of 500 lumens or 1000 lumens?

RESPONSE:

Accepted in Part: TM-15 has been revised to exclude 80 to 90 degree zone from the uplight value.

TABLE E PERFORMANCE METHOD - User's Guide

The allowable light levels for these uses defined in Table E may be used to set a prescriptive lighting allowance for these uses in each lighting zone. It should be noted that the lighting allowance defined in Table E is only applicable for the area defined for that use and cannot be transferred to another area of the site.

For some uses, such as outdoor sales, the jurisdiction is encouraged to define a percentage of the total hardscape area that is eligible for the additional lighting allowance. For example, a set percentage of a car dealership's lot may be considered a display area and receive the additional lighting allowance where the remainder of the lot would be considered storage, visitor parking, etc. and cannot exceed the base light levels defined in Table A.

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