

## IX. TABLES (cont.) - Ordinance Text

**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.

	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
<b>Allowed Backlight Rating</b>					
<b>Greater than 2 mounting heights from property line</b>	<b>B1</b>	<b>B3</b>	<b>B4</b>	<b>B5</b>	<b>B5</b>
<b>1 to 2 mounting heights from property line and properly oriented*</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B4</b>	<b>B4</b>
<b>0.5 to 1 mounting heights from property line and properly oriented*</b>	<b>B0</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>	<b>B3</b>
<b>Less than 0.5 mounting height to property line adjacent to a street and properly oriented* **</b>	<b>B0</b>	<b>B0</b>	<b>B1</b>	<b>B2</b>	<b>B3</b>
<b>Less than 0.5 mounting height to property line and properly oriented*</b>	<b>B0</b>	<b>B0</b>	<b>B0</b>	<b>B1</b>	<b>B2</b>
<b>Allowed Uplight Rating</b>	<b>U0</b>	<b>U0</b>	<b>U1</b>	<b>U2</b>	<b>U3</b>
<b>Allowed Glare Rating **</b>	<b>G0</b>	<b>G1</b>	<b>G2</b>	<b>G3</b>	<b>G4</b>
<b>Building Mounted Luminaires only*** Greater than 2 mounting heights to any property line</b>	<b>G0</b>	<b>G1</b>	<b>G2</b>	<b>G3</b>	<b>G4</b>
<b>Building Mounted Luminaires only*** 1 to 2 mounting heights to any property line</b>	<b>G0</b>	<b>G0</b>	<b>G1</b>	<b>G1</b>	<b>G2</b>

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REQUEST #8 The meanings of the BUG ratings must be included with Table C. As is, someone has to purchase IES-TM-15 to find out what the Table C values mean. This is needlessly complicated and frustrating, and thus will mean that Table C will not be applied or enforced.

**REJECT. TM15 is responsible for the information. The 'measurement' of the BUG values are through the B-U-G levels, not the specific lumen limits. This is done through a program which will know all the relevant information needed to make a BUG determination. Municipalities do not need to have the specific values to apply the MLO.**

REQUEST #2 - This is a general suggestion that would result in more lines after the last 4 lines of Table C In the very useful webinar, Nancy Clanton mentioned that reflection must be considered, at least in the trespass standard. WRT that and the BUG ratings for wall packs, a symmetrical FCO wall pack on a diffuse wall could result in a cosine distribution reflection of half the lumens exiting the fixture aimed horizontally. This could subvert the trespass, upright and glare BUG limits. I propose that backlight limits be included in Table C, at least for locations near the property line.

**RECOMMENDATION: CLARIFY LANGUAGE.** There are a number of comments in TABLE C that ask about the backlight conditions...

Change the language in the Glare Rating section to clarify the situation.

**Building Mounted Any luminaires only\*\*\*** 0.5 to 1 mounting heights of any **ANY** property line (and not 'properly' oriented) and

\* **To be considered 'properly oriented'**, the luminaire must be mounted with the backlight portion of the output towards the nearest property line.

\*\*\* **Building mounted Any luminaires** that cannot be mounted with its' their-backlight towards ANY the property line within 2X MH away shall meet the reduced Allowed Glare Rating for all luminaires. Light from a building mounted luminaire must not exceed the B-rating in the direction to the property line.

Change to state that the basic glare rating is only permitted when the 'front' of the luminaire is oriented toward a property line the as greater than 2X MH away from the luminaire. If the 'front' of the luminaire if oriented toward the property line and less than 2X MH, then the tighter G ratings apply.

Second, an example needs to be put in the user's guide to explain what happens at property line corners. In the event of a property line corner, is it likely that the even with the fixture oriented properly to one property line, it may trip the 2X MH clause on the other property line (the one that is 90 degrees to the back of the fixture). If the head is mounted less than 2x MH from the corner of the site (to the side) it will trip the 'improperly oriented' clause, and must have a more aggressive G rating.

This addresses both the problem of improperly oriented building fixtures (wallpacks), and corner conditions where more than one property line must be considered.

<b>TABLE C-1</b>	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
<b>Allowed Backlight Rating*</b>					
2 mounting heights or greater from property line	B1	B3	B4	B5	B5
1 to less than 2 mounting heights from property line and properly ideally oriented**	B1	B2	B3	B4	B4
0.5 to 1 mounting height from property line and properly ideally oriented**	B0	B1	B2	B3	B3
<del>Less than 0.5 mounting height to property line adjacent to a street and properly oriented** ***</del>	<del>B0</del>	<del>B0</del>	<del>B1</del>	<del>B2</del>	<del>B3</del>
Less than 0.5 mounting height to property line and properly ideally oriented**	B0	B0	B0	B1	B2

REQUEST #43A - Delete the fourth row of the table. (the row with "adjacent to a street") Reason: This row is unnecessary with the addition in this second draft of note \*\* that adds the effective property line adjustment, It is a holdover from before the footnote was added and should have been deleted.

**ACCEPT.** Add \*\*\* note reference to the top of the section 'ALLOWED BACKLIGHT RATING \*\*\*' to ensure that the note is properly referenced for this section.

For general table clarity, the notes should be re-ordered to make note \*\*\* be note \*\* and vice-versa.

<b>TABLE C-2</b>	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
<b>Allowed Uplight Rating</b>	<b>U0</b>	<b>U0</b>	<b>U1</b>	<b>U2</b>	<b>U3</b>
<b>Allowed % light emission above 90° for street or Area lighting</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>

25 - In Table C, change Uplight ratings in LZ 2-4 to U0.

REASON: We understand the purpose of MLO to be reducing light pollution. Allowing direct uplight for no reason subverts that purpose.

REJECT. See comment Request #10.

#10 - Referring to Table C – Maximum Allowable Backlight, Uplight, and Glare (BUG) Ratings: The MLO permits too much uplight in the higher lighting zones. Uplight (whether defined to begin at 80 or 90 degrees above nadir) serves no useful purpose. U0 ratings should be required in all zones.

The majority of artificial sky glow worldwide, extending great distances into otherwise dark-sky areas, comes from cities and towns – the very areas likely to be designated LZ 3 or, just as likely, LZ 4. Thus, the MLO's allowable uplight ratings should not be at all lenient in the higher zones.

**REJECT. This document makes an aggressive stance against poorly considered lighting. While it doesn't eliminate all sources of skyglow, it will make a major impact in all aspects of exterior lighting that needlessly have uplight components. When uplight is desired, this document makes restrictions on the amount of uplight that forces careful design decisions to employ the use of uplight carefully.**

#7. Change Table C Allowed Uplight Rating as follows:

Allowed Uplight Rating – shoebox/cobra style: U0/U0/U1/U1/U2

Allowed Uplight Rating – Post top style: U0/U0/U1/U2/U3

Creating two categories of area luminaires recognizes the fundamentally different performance characteristics and their potential ability to limit uplight (90 – 180 degree) lumens of these two classes of luminaires. Non-roadway shoebox/cobra luminaires should really be fully shielded across the board with only the incidental 200 lumens of uplight allowed in the 90 – 180 degree zone by the U1 rating. Post top luminaires have much more incidental reflected uplight due to the nature of the luminaire and the current 90 – 180 degree U ratings for those fixtures seems reasonable to me.

I think it is clear that these proposed changes are related and dependant on one another. The only way to change the Zone 3 shoebox rating to U1 is to eliminate the UVH/BVH from the U equation. I think the change would be well worth the effort.

Again, I believe these two changes, taken together, will greatly improve the clarity and effectiveness of the MLO.

(REJECT),

but if there is a specific desire to tighten the allowances for FCO-style products, it could be done without actually changing the primary allowances, which a gamer could fall back to, and no further.

#32 - we find the BUG ratings defined in Table C to be so restrictive that it will not allow any post top style decorative lighting due to the "U" allowable. We do not believe cities and towns will adopt an ordinance so restrictive that it disallows decorative post top products that have for years enhanced their shopping and business districts.

**REJECT. Good quality post top luminaires with good glare and uplight control will meet the limits up to a certain wattage. The MLO does not restrict the application of luminaires by TYPE, which provides much more flexibility for the designer, but because of this, it does need to restrict the primary causes of light pollution (skyglow, light trespass, glare) by performance metrics. The levels established in the BUG rating system are a good balance of these factors to substantially reduce the negative impacts of exterior lighting while still permitting efficient, quality lighting equipment to be utilized. -**

<b>TABLE C-2</b>	<b>Lighting Zone 0</b>	<b>Lighting Zone 1</b>	<b>Lighting Zone 2</b>	<b>Lighting Zone 3</b>	<b>Lighting Zone 4</b>
<b>Allowed Uplight Rating</b>	<b>U0</b>	<b>U0</b>	<b>U1</b>	<b>U2</b>	<b>U3</b>
<b>Allowed % light emission above 90° for street or Area lighting</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>

#29 - Request: After redefining U, reset the U value in all LZs to 0.  
 Rationale: "No direct uplight" is the mantra that IDA has embraced for 20 years.  
 With the MLO we have the opportunity to codify it.

**Partial Accept. We are adding an alternative uplight restriction - Zero uplight allowance for all Parking and Area Lighting**

REQUEST #36 - Table C: Why stricter Glare ratings for building mounted luminaires?  
This is not explained in the User Guide, and it is puzzling to this reviewer.

REVISE LANGUAGE. See comment in REQUEST #2.  
MLO will vote later on this once the revised table is finished.

<b>TABLE C-3</b>	Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
Allowed Glare Rating	G0	G1	G2	G3	G4
<del>Building Mounted Luminaires only*** Greater than 2 mounting heights to any property line</del>	<del>G0</del>	<del>G1</del>	<del>G2</del>	<del>G3</del>	<del>G4</del>
Building Mounted Any Luminaires only not ideally oriented*** 1 to less than 2 mounting heights to any property line of concern	G0	G0	G1	G1	G2
Building Mounted Any Luminaires only not ideally oriented*** 0.5 to 1 mounting heights to any property line of concern	G0	G0	G0	G1	G1
Building Mounted Any Luminaires only not properly oriented*** less than 0.5 mounting heights to any from property line of concern	G0	G0	G0	G0	G1

REQUEST #41 IX. TABLES (cont.) – Ordinance Text

Table C – Maximum Allowable Backlight, Uplight and Glare (BUG) Ratings, pages 24-25.

Was data collected from various luminaire manufacturers for various outdoor applications, luminaires and lamp sources? **Yes**

With this data we would have quantifiable information that would enable the evaluation of these prescribed BUG ratings. Without this data, we cannot comment on these BUG ratings including:

- Are they onerously strict or perhaps too lax?
- Do they exclude particular types of luminaires?
- Do they exclude particular optical / photometric configurations?
- Would they result in our having to offer optical accessories or options to gain compliance for our installed luminaires?
- Do they exclude particular types of lamp sources?

The answers to these questions would impact our product offering as well as our optical and luminaire design techniques. Thus, these answers are of vital importance to luminaire manufacturers.

**NO ACTION REQUIRED** but responses were given.

The MLO committee reviewed over thousands of photometric data to determine the BUG lumens. All luminaire types were analyzed, ...

~~\* The luminaire must be mounted with backlight towards the property line.~~

\* 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 center-line of the public roadway or public transit corridor for the purpose of determining compliance with this section. NOTE: This adjustment is relative to Tables 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.

\*\*\* ~~Building-mounted~~ Any luminaires that cannot be mounted with their ~~its~~ backlight perpendicular to ~~the any~~ property line within 2x MH of the luminaire location shall meet the reduced Allowed Glare Ratings in Table C-3.  
~~for all luminaires. Light from a building-mounted luminaire must not exceed the B-rating in the direction to the property line.~~

REQUEST #43C - Subsection No. Table C\*\* Page No. 25 - Add to second sentence of \*\*  
"For property lines that abut public streets, roadways, highways, and public transit corridors the

REASON: For clarity, based on definitions in the MLO. Not just "roadways".

PARTIALLY ACCEPT. There needs to be a statement that a fixture is considered 'properly oriented' when the Backlight is oriented toward the NEAREST property line.

See discussion below under #43D and also #2 above for the specific recommendations to address this issue.

MLO will vote later on this once the revised table is finished.

REQUEST #43D - Subsection No. Table C\*\*\* Page No. 25

Delete footnote \*\*\* in its entirety. Delete instances of \*\*\* from the table.

REASON: This footnote is not necessary and only causes confusion. It should be assumed that fixtures that are building mounted inherently have their "backlight" direction pointing away from the property line, thus backlight ratings relative to the distance to property line cannot apply to these fixtures. This is why there are separate glare numbers for building mounted fixtures.

REJECT. See REQUEST #2 above for specific information on how this concern is being addressed.

Language has been revised so this comment is not relevant anymore.  
MLO will vote later on this once the revised table is finished.

~~\* The luminaire must be mounted with backlight towards the property line.~~

REQUEST #43B - Subsection No. Table C\* Page No. 25 - The Luminaire must be mounted with the Backlight towards the nearest property line.

REASON: "nearest" should be added for clarity for situations where the luminaire is near two legs of the property line and could not literally be oriented towards the property line because the property line is in two different directions relative to the luminaire.

ACCEPT. Further, adjust note '\*\*\*' as well.

MLO will vote later on this once the revised table is finished.

✳️\*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 center-line of the public roadway or public transit corridor for the purpose of determining compliance with this section. NOTE: This adjustment is relative to Tables 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.

\*\*\* ~~Building-mounted~~ Any luminaires that cannot be mounted with their ~~backlight~~ **perpendicular** to ~~the any~~ property line **within 2x MH of the luminaire location** shall meet the **reduced** Allowed Glare Ratings in Table C-3.  
~~for all luminaires. Light from a building-mounted luminaire must not exceed the B rating in the direction to the property line.~~

55. IX. Table C note \*\*\* ~~Building-mounted luminaires that cannot be mounted with their backlight to the property line shall meet the Allowed Glare Rating for all luminaires. Light from a building mounted luminaire must not exceed the B rating in the direction to the property line.~~  
Support: While "backlight" is defined, "intended orientation" is not. The unrealistic expectation that optical systems be installed backwards is not enforceable.

REJECT. This issue is addressed by REQUEST #2 above. MLO will vote later on this once the revised table is finished. Comment is no longer applicable to language.