

Energy Code Testimony -- Lighting Issues
 Summary of Proposed Modifications
 2021 Code Adoption Cycle

Testimony From	Mod	Summary	Recommendation
Bob Gunn, Seinerger	X	<p>Summary: we support the proposed changes C405.3, with minor modifications to clarify that proposed 1.9 umol/j efficacy standard will be assessed at the lamp level where fixtures have serviceable lamps.</p> <p><i>Our understanding is the WAC is trying to align with California’s Title 24 energy code and with ASHRAE 90.1. However, the proposed language lacks the key components to correctly align the proposed language with California’s Title 24 energy code and with ASHRAE 90.1. In the New Buildings Institute’s proposal for this amendment, they state, “This efficacy requirement allows the most efficacious double-ended high pressure [sic] sodium luminaires and LED luminaires to be installed.” However, the currently proposed language would limit growers to using only LED technology. As is, the proposed language would unintentionally restrict the industry and could cost \$60 per square foot more than even efficacious double-ended high pressure sodium luminaires. This also threatens to undermine or eliminate utility rebates for early adopters of LED.</i></p>	<p>No action</p> <p>Addressed below.</p>
Nicholas Hagedorn, Hawthorne	X	<p><i>We agree with the Washington State building council that the (PPE) standard of 1.9 μmol/J is an acceptable strategy to create market transformation to more energy efficient lighting in the Controlled Environment Horticulture industry. Our concern is that the vague language used to express this will leave things open to interpretation by both regulators and cultivators which may negatively impact WA States goal of decreased carbon emissions in addition to potentially damaging the vulnerable WA cannabis industry:</i></p> <p>C405.3: All permanently installed luminaires used for plant growth and maintenance shall have a photosynthetic photon efficacy of not less than 1.7 μmol/J for greenhouses and not less than 1.9 μmol/J measured at the lamp level where luminaires have serviceable lamps for all other indoor growing spaces</p>	<p>2 - Clarification</p> <p>If no action by TAG, adopt suggested edit</p>
Amanda Falkenhagen, Rushing	X	<p>I would like to submit public review comments for the 2021 WSEC draft as noted below:</p> <p>Section C405.5.1: Suggest clarifying if the efficacy of 100 lumens/watt is based on initial lumens or delivered lumens.</p>	<p>3 - TAG Review</p> <p>C405.5.1 - If no action by TAG retain as in CR102</p>

Testimony From	Mod	Summary	Recommendation
		<p>Section C405.2.8.3: Suggest removing the struck through portion below to provide greater clarity. The current working is bulky and difficult to interpret.</p> <p>High end trim. Luminaires subject to high end trim shall be initially configured with the following:</p> <ol style="list-style-type: none"> 1. <u>Programmed to limit the initial maximum lumen output or maximum lighting power to 85 percent or less of full light output or full power from full output or to meet the target light level documented in project sequence of operations using the least amount of power.</u> 	<p>C405.2.8.3 – If no action by TAG adopt suggested edit</p>

Mike Kennedy Written Comments Specific to Lighting

Section or Table	Description	Action/Priority	Recommendation
<p>Table C405.4.2(2)— Interior lighting power allowances—Space-by-space method</p>	<p>Footnote "I" has been applied to the entire Common Space Types table. This is not what was discussed at the TAG (at the end). "I" is also applied to some of the individual categories - this is what was decided on by the TAG. Delete the "I" footnote from the header of the common Space-by-space Types table</p>	<p>EDIT / TAG 1</p>	<p>3 - TAG Review</p> <p>Need to see CCP log. Specific footnote text does not match proposed and approved CCP. Additional text has been added.</p> <p>Footnote (i) is at top, as Mike indicates.</p> <p>Footnote (g) is deleted, so Fire Stations, Patient Rooms should not have footnote.</p> <p>Transportation area – (i) for whole thing, not just terminal ticket counter.</p>

<p>Table C405.5.3(3) Individual Lighting Power Allowances for Building Exteriors</p>	<p>First row is labeled "Base site allowance". This should say "building façade" not "base site allowance". There is no base site allowance for this table.</p>	<p>TAG 1</p>	<p>2 - Clarification</p> <p>If no action by TAG, adopt suggested edit "Building facades"</p>
<p>C405.1 General</p>	<p>Reads in part: "General lighting shall consist of all lighting included when calculating the total connected interior lighting power in accordance with Section C405.4.1 and which does not require specific application controls in accordance with Section C405.2.65."</p> <p>This reads like a definition but the code already has one of those. It doesn't seem like a correct place and it's confusing having two definitions. Also, lighting in the egress path is definitely general lighting by the C202 definition but not by this section.</p> <p>Section reference C405.2.5 should be C405.2.6 and the section title is "Additional lighting controls" though the first sentence is "specific application controls". Hopefully the title of C405.2.6 will be changed to specific application controls (specified in another comment)</p>	<p>EDIT / TAG 2</p>	<p>3 - TAG Review</p> <p>Comment 1 - C405.4.1 – typo, accept edit</p> <p>Comment 2 - Review next TAG cycle</p> <p>Comment 3 – C405.2... accept change to "Specific application controls" as suggested (Clarification)</p>
<p>C405.2.2 Time switch controls</p>	<p>Reads in part: "Each area of the building that is not provided with occupant sensor controls complying with Section C405.2.1.1 shall be provided with time switch controls"</p> <p>Full off controls are required everywhere not just the areas covered by C405.2.1.1. Perhaps reword to: "Each area of the building that is not provided with occupant sensor controls configured to turn the lighting full off shall be provided with time switch control"</p>	<p>TAG 2</p>	<p>No action</p> <p>Retain CR102</p>
<p><u>C405.2.5.2 Sidelit daylight zone</u></p>	<p>Item 2 defines the secondary sidelit zone and reads in part: "and longitudinally from the edge of the fenestration to the nearest full height wall or up to 2 feet, whichever is less, as indicated in Figure C405.2.5.2(1)." The primary zone has 0.5 times the window head height rather than 2 feet and this should too. This was error in the initial print of the 2021 IECC. The figure was also in error. See most current 2021 IECC. Rather than "up to 2 feet" it should be "up to 0.5 times the height from the floor to the top of the fenestration".</p>	<p>EDIT / TAG 2</p>	<p>3 - TAG Review</p> <p>Corrected as errata for IECC, which this was intended to copy. If no action by TAG suggest edit as proposed "up to 0.5 times the height from the</p>

			floor to the top of the fenestration”
<u>Figure C405.2.5.2(1)</u>	Second figure here indicating 2 ft. is in error it should be 0.5 x H.	EDIT / TAG 2	3 - TAG Review Corrected as errata for IECC, which this was intended to copy. If no action by TAG suggest edit figure to match updated IECC plan view figure – with appropriate image resolution!
<u>C405.2.6 Additional lighting controls</u>	Item 5. Exit access. Are these luminaires exempt from all controls or not?	TAG 2	No action Retain CR102 – look at next TAG cycle
<u>C405.2.10 Parking garage lighting control</u>	The 1.5 FC exception was eliminated so all garages will need this control even if they have very low light levels. I still don't like the FC limit since it can't be plan checked and would reward a poor design but there could be an LPD limit or a limit on the percent reduction so that lighting would not need to be turned down below 0.05W/SF or some level. IECC discussions convinced me that there needs to be something	TAG 2	No action Retain CR102 – look at next TAG cycle
C405.4.1 Total connected interior lighting power	Item 12 exempts > 90l/W plant growth TASK lighting from LPD calculation. New plant growth section, C405.3, regulates permanent lighting. Should item 12 here be changed to complying with C405.3 rather than > 90l/W or is task lighting here something else?	TAG 2	3 - TAG Review Clarification – edit C405.4.1/12 to “Task lighting for plant growth or maintenance, where efficacy is in accordance with C405.3”

<p>C405.2.1.1 Occupant sensor control function</p>	<p>Reads in part: "Occupant sensor controls for the space types listed in required to comply with this section by Section C405.2.1 shall comply with all of the following".</p> <p>The space type list has moved to Table C405.2.1 has many types listed that do not need to comply with this section. To be pedantic one could say something like "in spaces required to comply with this section by Table C405.2.1". Or possibly "by Section C405.2.1". There is a note the material in C405.2.1 of the CR-102 file is not correct. This comment should be reviewed against the correct language.</p>	<p>TAG 3</p>	<p>No action</p> <p>Retain CR102</p>
<p>C405.2.1.2 Occupant sensor control function in warehouse</p>	<p>Item 3 reads:"3. Lights which are not turned off by occupant sensors shall be turned off by time schedule sweep to turn lighting off within 20 minutes of all occupants leaving the space, or comply with Section C405.2.2 to turn lighting off when the building is vacant."</p> <p>What is "time schedule sweep" that is supposed to turn the lighting off within 20 minutes? I think this should read: "Lights which are not turned off by occupant sensors shall be turned off by time switch controls complying with Section C405.2.2 when the building is vacant"</p>	<p>EDIT / TAG 3</p>	<p>2 - Clarification</p> <p>If no action by TAG, adopt suggested edit "...shall be turned off by time switch controls complying with Section C405.2.2 when the building is vacant"</p>
<p>C405.2.1.2 Occupant sensor control function in warehouse(</p>	<p>New item 5 requires manual control. This is a slippery slope as all lighting requires manual control. Why is it called out only here?</p>	<p>TAG 3</p>	<p>2 - Clarification</p> <p>Need to see CCP log, was CCP to add word "temporarily" approved?</p>
<p><u>C405.2.4 Light-reduction controls</u></p>	<p>Exception 2 refers to "special application controls", special should be "specific"</p>	<p>EDIT / TAG 3</p>	<p>2 - Clarification</p> <p>If no action by TAG, adopt suggested edit "...specific"</p>
<p><u>C405.2.5 Daylight responsive controls</u></p>	<p>Nearly every time the primary sidelit, secondary sidelit, or toplit daylight zone is mention it is not followed by "complying with Section C405.2.5.2" or C405.2.5.3 for toplit. These sections merely define where the zones are. The phrase is odd, repetitive, missing in a few places, and sometimes uses "complying" and other times "in accordance with".</p>	<p>TAG 3</p>	<p>No action</p> <p>Retain CR102 – look at next TAG cycle</p>

	<p>Suggest changing the charging section and then removing the following from the subsequent subsections:</p> <p>complying with C405.2.5.2, complying with C405.2.5.3, in accordance with C405.2.5.2, in accordance with C405.2.5.3</p> <p>Possible new charging language: "Primary and secondary sidelit zones shall be determined in accordance with C405.2.5.2. Top daylight zones shall be determined in accordance with C405.2.5.3. Daylight responsive controls complying with Section C405.2.5.1 shall be provided to control the general lighting within daylight zones in the following spaces:"</p> <p>If charging sentence not changed then:</p> <ol style="list-style-type: none"> 1) exception 2 needs a complying with xxx inserted. 2) C405.2.5.3 item 2 needs a complying with xxx inserted 3) Also, there is "complying with" and "in accordance with". <p>C405.2.5.2 and 3 just define the daylighting zone. It would be much clearer English to say "defined by" but in any case it seems like these should be standardized on one term.</p>		
<p><u>C405.2.6 Additional lighting controls</u></p>	<p>Reads in part: "C405.2.6 Additional lighting <u>Specific application</u> controls. Specific application lighting shall be provided with controls, in addition to controls required by other sections, for the following:"</p> <p>Title "Additional Lighting controls" was chosen along with the phrase "in addition to controls . ." to emphasis that these are additional controls. But this section is called specific application controls in all references and in the IECC. Now that item 1 explicitly specifies other controls it doesn't seem like there are other control requirements and the above clarifications become confusing. Title should be changed back to Specific Application controls and ", in addition to controls required by other sections," deleted unless there are other controls.</p>	<p>TAG 3</p>	<p>3 – TAG Review</p> <p>Change 1 clarification - If no action by TAG, adopt suggested edit “Specific application”</p> <p>Change 2 (strike through of “in addition...” – No action, review next code cycle</p>
<p><u>C405.2.10 Parking garage lighting control</u></p>	<p>Proposal 21-GP1-127 set these values at 50 percent and 10 minutes but document has the original value 30 percent and 20 minutes</p>	<p>EDIT 3</p>	<p>3 - TAG Review</p> <p>Language should have been accepted, check master log.</p>

C405.4.2.1 Building area method	Reads in part: "For each building area type inside the building, ". The word inside is not appropriate since one building area is not inside in the traditional sense. Replace "inside" with "in".	TAG 3	2 - Clarification If no action by TAG, adopt suggested edit "...in"
Table C405.4.2(1) Interior Lighting Power Allowances—Building Area Method	Multifamily has been changed to "Multiple family. Multifamily is used in 16 other places in this code. I would revert this to multifamily or change everywhere. Also, I'm unclear why these clarifying footnotes were removed from this table. They seemed very useful. I would undelete them and revise to: "Where dwelling or sleeping units do not comply with C405.1.1 .	TAG 3	No action Retain CR102
C405.4.2.2 Space-by-Space Method	This section that is about the space-by-space method leads off with: "Where a building has a space designated as unfinished, neither the area nor the lighting power in the space shall be calculated as part of the LPA. ". The first sentence should really be about the main section topic not some edge case. This should be moved to the end after item 3.	TAG 3	No action Retain CR102
C405.4.2.2 Space-by-Space Method	Reads in part: "If an entire space has multiple functions that necessitate a higher lighting power allowance in order to serve one of the primary functions, the higher allowance is permitted to be used" The intent of this is common practice but as written will be assumed by some to allow lumping of areas with differing uses that are in a single room. I think this is something that should be deleted but if kept try to reword. Better might be: If there are multiple primary functions for the same space that qualify as different space types, using the type with the higher allowance is permitted. This does not allow adjacent spaces with differing types to be combined.	TAG 3	No action Retain CR102 – look at next TAG cycle
Table C405.4.2(2) Interior lighting power allowances—Space-by-space method	Footnote c states "additional power shall be" in two places. IMO this should be "additional power allowance shall be"	TAG 3	2 - Clarification If no action by TAG, adopt suggested edit "...allowance"
Table C405.5.3(3) Individual Lighting Power	Consider changing title to distinguish this table from C405.5.3(2). Suggest: Individual Lighting Power Allowances for Specific Exterior Uses	TAG 3	2 - Clarification

Allowances for Building
Exteriors

**If no action by TAG, adopt
suggested edit "Lighting
Power Allowances for
Specific Exterior Uses"**