

12/06

2006 IECC/Comm 63—Lighting:

1. If the IECC requirements are not to be used for a commercial building, what national standard can be substituted for demonstrating compliance with lighting? Are there limitations when taking such action?

ANSWER: IECC 501.2 references ASHRAE/IESNA 90.1-2004. Yes, the limitations are that lighting shall be addressed entirely by IECC or ASHRAE requirements, and the designer may not mix and match between the two sets of rules. Additionally, Comm 63.0501 requires that Wisconsin amendments for lighting systems and dual switching be applicable immaterial of which of the two (2) sets of requirements are used.

2. In order to determine the interior lighting power allowance in watts per square foot in the area of a building addition or building alteration, which Table in the code is required to be used?

ANSWER: IECC Table 505.5.2

3. A public building will have lighting on a main exterior entrance and an exit door. Both the entrance and the exit have 3 feet wide doors. Using IECC 505.6.2, what is the Exterior Lighting Unit Power Allowance for this building assuming no other allowances are defined?

ANSWER: IECC 505.6.2 Main Entry 3 ft x 30 Watts/linear ft of door width = 90 watts; Exit 3 ft x 20 Watts/linear ft of door width= 60 watts;  
Total Exterior Lighting Power Allowance  $90 + 60 = 150$  watts. IECC 505.6.2 allows for 5% increase thus  $150 \times 1.05 = 157$  watts. NOTE that the designer may choose to light the main entrance using 100 watts, and the exit with 40 watts and still meet the code because he did not exceed the Exterior Lighting Power Allowance allowed by code.

4. True or False: When calculating the interior lighting power for lighting in high rise residential building, dwelling units that provide complete independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking, and sanitation may be excluded from the calculated interior lighting power of the building.

ANSWER: IECC 505.1 True

5. True or False: When calculating the interior lighting power, lighting for exit signs is excluded from the calculated interior lighting power of the building.

ANSWER: IECC 505.5.1 does not indicate exit signs as being exempted. However, ASHRAE 90.1-2004 could be used per IECC 501.2 to show compliance, assuming all ASHRAE lighting requirements are met along with those defined in Comm 63.0501. ASHRAE exempt exit signs.

6. A fixture uses an incandescent bulb. The bulb to be used in the fixture is rated for 75 watts. The fixture is rated for a maximum of 250 watts. What should the installed wattage be listed as?

ANSWER: IECC 505.5.1.1 250 watts. Note that a standard porcelain based incandescent fixture is rated for a maximum of 600 watts if not labeled for a lower value.

7. Exactly 30 linear feet of track lighting will be installed. The designer is proposing to install a total luminaire wattage of 1,000 watts. What should the installed wattage be listed as?

ANSWER: IECC 505.5.1.4 The wattage of track lighting shall be the larger of the following 2 values; 30 watts per foot of track-- 30 watts x 30 ft = 900 watts, OR the total luminaire wattage proposed to operate on the track, in this case 1,000 watts. The designer shall list the larger of the 2 values, in this case it has been determined to be 1,000 watts.

8. Public areas with switches that are accessible only to authorized personnel are exempt from the interior lighting control requirements. True or False?

ANSWER: IECC 505.2.1 Exception 1 True

9. True or False: Controls to reduce lighting are required in an enclosed office area which uses over 0.6 watts per square foot of light for the space using multiple luminaires. The area shall be controlled so that the load for the lights may be reduced by at least one-half while maintaining a reasonably uniform level of illuminance throughout the area.

ANSWER: IECC 505.2.2.1 True

10. True or False: Daylit area for a window always means the space on the floor that is daylit by vertical glazing. The daylit area has the length of 15 feet, or the distance on the floor, perpendicular to the glazing, to the nearest 60-inch or higher opaque partition, whichever is less; and a width of the window plus either 2 feet on each side, the distance to an opaque partition, or one-half the distance to the closest skylight or vertical glazing whichever is least.

ANSWER: IECC 63.0505(1)(b) False The daylit area could also be calculated using a method acceptable to the department.

11. A 1,600 ft<sup>2</sup> square room which uses 1.3 watts/sf and has 1 window on 3 of its 4 exterior walls. How many light reduction controls per IECC 505.2.2.1 are required? How many daylit area controls per Comm 63.0505(2) are required?

ANSWER: The code requires a minimum of 1 light reduction control for the area not considered to be daylit areas. See IECC 505.2.2.1. Note that 1 light reduction control could consist of two toggle switches, a dimmer switch, or an occupancy sensor. The code requires a minimum of 1 daylit area control that controls only luminaires in the daylit area(s). See Comm 63.0505(1). Note that the designer may choose to install 3 separate daylit area controls, one per window, but that is NOT required by the code.

12. Using IECC, determine the Interior Lighting Power Allowance associated with a conference meeting room.

ANSWER: IECC Table 505.5.2 a Conference Meeting Room is not defined, so find the next closest. A Town Hall @ 1.0 watts/ft<sup>2</sup> which addresses large groups of people, would seem an appropriate match. With appropriate justification, there may be other area types that could be used such as office.

13. If I have a retail area which displays jewelry in cases and shelves involving 200 sf of the retail area's total 1,000 sf space, what is the interior lighting power allowance for the area?

ANSWER: IECC Table 505.5.2 for retail lists 1.5 W/sf. However, footnote b is associated with the Retail entry. "...An additional 3.9 W/sf times the actual case or shelf area for displaying and selling jewelry, china or silver, shall be added to the interior lighting power determined in accordance with this (retail) line item. With this in mind, the interior lighting power allowance inclusive of a 200 sf display

area can be determined to be  $(1,000 \text{ sf} \times 1.5 \text{ W/sf}) + (200 \text{ sf} \times 3.9 \text{ W/sf}) = 1,500 + 780 = 2,280 \text{ Watts}$ . The additional wattage addressed by footnote b may not be used anywhere else within the building.

14. Yes or No: The Exterior Lighting Power Allowance (ELPA) on a commercial building is determined to be 1,700 watts. The Interior Lighting Power Allowance for the same building is determined to be 5,000 watts. The designer has 700 watts which he will not use from the ELPA which he would like to use toward the installation of lighting on the inside of the building. Can the designer trade-off a portion of the exterior lighting power allowance with the interior lighting power allowance?

ANSWER: IECC 505.5, 505.5.2 & 505.6 No.

15. Are outdoor athletic facilities, including the playing area and seating areas, exempted from the exterior lighting requirements?

ANSWER: IECC 505.6.2 Yes. Note that enclosed areas such as the toilet rooms, concession stands, storage areas, etc would still be required to follow the requirements of the lighting code, if lighting is installed, and would not be exempt.

16. Are daylighting controls required if the lighting density is less than 0.8 watts/sf in an interior enclosed space of over 250 sf?

ANSWER: Comm 63.0505(2) No, the lighting density is less than 0.8 watts/sf

17. If a 400 watt high pressure sodium light fixture installed, what would be the installed wattage required to be accounted for in the installed lighting calculations?

ANSWER: IECC 505.5.2 400 watts (bulb) + 65 watts (ballast wattage dependant on fixture manufacturer & ballast used) = 465 watts/fixture

18. True or False. Occupancy sensors may be used as an automatic shut off device in order to meet IECC 505.2.2.2?

ANSWER: True

19. What is the minimum number of automatic shut-off controls required for a 14,000 sf single story factory building, assuming no exemptions are met and occupancy sensors are not used.

ANSWER: IECC 505.2.2.2 Item 1. One automatic shut off is allowed to control a factory area up to 25,000 sf all requirements of this section are met. Therefore, a minimum of one (1) is required.

20. True or False: The need for tandem wiring changes if electronic high-frequency ballasts are installed instead of magnetic ballasts?

ANSWER: IECC 505.3 Exception 1 True

21. What is the maximum wattage allowed per side of an internally illuminated exit sign?

ANSWER: IECC 505.4 5 watts/per side