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STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development Standard Energy Code Proposal Form

Code being amended: Commercial Provisions Residential Provisions

Code Section # Table C405.4.2(2) footnotes / C405.2.2.1 Additional interior lighting power.

Brief Description:

~~Eliminate Table C405.4.2.2.1 Additional interior lighting power footnotes c. and n. in exchange for language more consistent with ASHRAE 90.1-2019.~~

Eliminate superfluous language in code, correct typos, and clarify allowances for display and lighting for specific use as ornamentation.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

Table C405.4.2(2) INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

Integrated Draft 2021 WSEC-Commercial

**TABLE C405.4.2(2)
INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD**

COMMON SPACE-BY-SPACE TYPES ^a	LPD (w/ft ²)
Atrium - Less than 20 feet in height	0.39
Atrium - 20 to 40 feet in height	0.48
Atrium - Above 40 feet in height	0.60
Audience/seating area - Permanent ← n	
In an auditorium	0.61
In a gymnasium	0.23
In an motion picture theater	0.27
In a penitentiary	0.67
In an performing arts theater	1.16
In a religious building	0.72
In a sports arena	0.33
Otherwise	0.23
Banking activity area	0.61
Breakroom (see Lounge/breakroom)	
Classroom/lecture hall/training room	
In a penitentiary	0.89
Otherwise ^m	0.71
Computer room, data center	0.94
Conference/meeting/multipurpose	0.97
Confinement cell	0.70
Copy/print room	0.31
Corridor	
In a facility for the visually impaired (and not used primarily by the staff) ^b	0.71
In a hospital	0.71
In a manufacturing facility	0.41
Otherwise ^c ← n	0.41
Courtroom ^c	1.20
Dining area	
In a penitentiary	0.42
In a facility for the visually impaired (and not used primarily by the staff) ^b	1.27
In a bar/lounge or leisure dining ⁿ	0.86
In cafeteria or fast food dining	0.40
In a family dining area ⁿ	0.60
Otherwise	0.43
Electrical/mechanical	0.43
Emergency vehicle garage	0.52
Food preparation	1.09

COMMON SPACE-BY-SPACE TYPES ^a	LPD (w/ft ²)
Guest room ^{a,b}	0.41
Laboratory	
In or as a classrooms	1.11
Otherwise	1.33
Laundry/washing area	0.53
Loading dock, interior	0.88
Lobby ^c	
In a facility for the visually impaired (and not used primarily by the staff) ^b	1.69
For an elevator	0.65
In a hotel	0.51
In a motion picture theater	0.23
In a performing arts theater	1.25
Otherwise	0.84
Locker room	0.52
Lounge /breakroom ⁿ	
In a health care facility	0.42
Otherwise	0.59
Office	
Enclosed ≤ 250	0.74
Enclosed >250	0.66
Open plan	0.61
Parking area, interior	0.15
Pharmacy area	1.66
Restroom	
In a facility for the visually impaired (and not used primarily by the staff) ^b	1.26
Otherwise ⁿ	0.63
Sales area	1.05
Seating area, general	0.23
Stairway (See space containing stairway)	
Stairwell ⁿ ← n	0.49
Storage room	
< 50 ft ²	0.51
50-100 ft ²	0.38
All other storage	0.38
Vehicular maintenance	0.60
Workshop	1.26

Seattle excel form doesn't work

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TABLE C405.4.2(2) (continued)
 INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD

BUILDING SPECIFIC SPACE-BY-SPACE TYPES ^a	LPD (w/ft ²)		BUILDING SPECIFIC SPACE-BY-SPACE TYPES ^a	LPD (w/ft ²)
Automotive	0.60		In a high bay area (25 - 50-foot floor-ceiling height)	1.24
Convention center - Exhibit space	0.61	↔ n.	In a low bay area (< 25-foot floor-ceiling height)	0.86
Dormitory living quarters ^{a,b}	0.50		Museum	
Facility for the visually impaired ^b			In a general exhibition area	↔ n. 0.31
In a chapel (and not used primarily by the staff)	0.70		In a restoration room	1.10
In a recreation room (and not used primarily by the staff)	1.77		Performing arts theater dressing/fitting room	0.41
Fire stations ^d		↔ (Footnote doesn't go to anything)	Post office—Sorting area	0.71
Sleeping quarters	0.23		Religious building	
Gymnasium/fitness center			In a fellowship hall ⁿ	0.54
In an exercise area	0.90		In a worship pulpit/choir area ⁿ	0.85
In a playing area	0.85		Retail	
Health care facility	↔ s.n.		In a dressing/fitting room	0.51
In an exam/treatment room	1.40		In a mall concourse	0.82
In an imaging room	0.94		Sports arena—Playing area	
In a medical supply room	0.62		For a Class 1 facility ⁱ	2.94
In a nursery	0.92		For a Class 2 facility ⁱ	2.01
In a nurse's station	1.17		For a Class 3 facility ^k	1.30
In an operating room	2.26		For a Class 4 facility ^j	0.86
In a patient room ^g	0.68		Transportation	
In a physical therapy room	0.91		In a baggage/carousel area	0.39
In a recovery room	1.25		In an airport concourse	0.25
Library ^f		↔ (Footnote doesn't go to anything)	At a terminal ticket counter ⁿ	0.51
In a reading area ⁿ	0.34 0.96		Warehouse—Storage area	
In the stacks	1.10		For medium to bulky palletized items	0.33
Manufacturing facility			For smaller, hand-carried items	0.69
In a detailed manufacturing area	0.80			
In an equipment room	0.76			
In an extra high bay area (> 50-foot floor-ceiling height)	1.42			

c. For spaces in which lighting is specified to be installed in addition to, and controlled separately from, the *general lighting* for the purpose of highlighting art or exhibits, provided that the additional lighting power shall not exceed 0.4 0.2 W/ft²square foot of such spaces.

n. Additional lighting power allowance of ~~0.30~~ 0.15 W/square foot for ornamental lighting. Qualifying ornamental lighting includes luminaires such as chandeliers, sconces, lanterns, neon and cold cathode, light emitting diodes, theatrical projectors, moving lights and light color panels when any of those lights are that are specifically used in a decorative manner that does not serve as display lighting or *general lighting*.

C405.4.2.2.1 Additional interior lighting power. Where using the Space-by-Space Method, an increase in the interior lighting power allowance is permitted for specific lighting functions. Additional power shall be permitted only where the specified lighting is installed and automatically controlled separately from the *general lighting*, to be turned-off during

~~nonbusiness hours and~~ controlled in accordance with Section C405.2.6. This additional power shall be used only for the specified luminaires and shall not be used for any other purpose. [Insert carriage return]

An increase in the interior lighting power allowance is permitted for lighting equipment to be installed in sales areas specifically to highlight merchandise. The additional lighting power shall be determined in accordance with Equation 4-11:

$$\text{Additional interior lighting power allowance} = 500 \text{ watts} + (\text{Retail Area 1} \times 0.45 \text{ W/ft}^2) + (\text{Retail Area 2} \times 0.45 \text{ W/ft}^2) + (\text{Retail Area 3} \times 1.05 \text{ W/ft}^2) + (\text{Retail Area 4} \times 1.87 \text{ W/ft}^2)$$

(Equation 4-11)

Where:

- Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4.
- Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.
- Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.
- Retail Area 4 = The floor area used for the sale of jewelry, crystal and china.

Exception: Other merchandise categories are permitted to be included in Retail Areas 2 through 4, provided that justification documenting the need for additional lighting power based on visual inspection, contrast, or other critical display is *approved by the code official*.

Purpose of code change:

This Code Change Proposal amends the current code so that Washington State more closely matches ASHRAE-90.1 2019, without the specific addition of 0.75W/ft².

An increase in the *interior lighting power allowance* is permitted in the following cases:

- a. For each *space* in which lighting is specified to be installed in addition to the *general lighting* for the purpose of decorative appearance or for highlighting art or exhibits not exempted in Table 9.2.3.1, Item 11, provided that the additional lighting power shall not exceed 0.75 W/ft² of such *spaces*.

As a reminder General Lighting in the Integrated Draft is now defined as:

GENERAL LIGHTING. Interior lighting that provides a substantially uniform level of illumination throughout ~~an~~ area space. General lighting shall not include lighting that provides a dissimilar level of illumination to serve a specific application or decorative feature within such area.

Artwork illumination (display lighting) and lighting integrated within art (ornamental lighting) should be encouraged for the purpose of spatial definition, improved human experience, and general well-being. When applied selectively, as it most often is, display and ornamentation lighting has the potential to reduce the power consumption of general lighting surrounding it based on the needs of visual balance and implied hierarchy.

The problem with the code as written is that more space types in the Table C405.4.2(2) warrant the use of current footnotes c. (Display) and n. (Ornamental) lighting, e.g. primary stairways, tenant improvement open office areas, libraries at large (not just the reading room), in many health care facility areas, transportation areas, etc. The selection of pertinent areas can be subjectively interpreted, as can the difference between the lighting of artwork and lighting being the actual artwork.

Additionally, no mention of circadian stimulus lighting is mentioned in the code, a treatment in many commercial spaces now which doubles the connected load of the specific luminaire. Sometimes this lighting is the *general lighting*, and as such warrants different code language. A listing at 50% connected load will be comparable to static color temperature equivalent optical distribution luminaires.

Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost [Analysis tool](#) and [Instructions](#); use these [Inputs](#). **Webinars on the tool can be found [Here](#) and [Here](#)**)

Click here to enter text./square foot (For residential projects, also provide Click here to enter text./ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) Click here to enter text.KBTU/ square foot

(For residential projects, also provide Click here to enter text.KWH/KBTU / dwelling unit)

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

All questions must be answered to be considered complete. Incomplete proposals will not be accepted.