



STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development Standard Energy Code Proposal Form

May 2018

Log No. 044-2018 Rev

Code being amended: Commercial Provisions Residential Provisions

Code Section # **C402.4.2**

Brief Description:

This proposal clarifies Code intent and closes two loopholes in Section C402.4.2.

In buildings where some spaces are single story and others are greater than one story, this proposal clarifies that it is the intent of the Code to require skylights in the single-story spaces. For space types required to comply with this provision that have a lighting power allowance (LPA) per Section C405.4.2 that is lower than the 0.5 watts/sf threshold in C402.4.2 Exception 2, this proposal recommends requiring a lighting power density (LPD) that is 10% better than Code to be eligible for this exception to the minimum skylight requirement.

In addition, this proposal adds an exception to C405.2.1.2 Occupancy sensor control function in warehouses for spaces within warehouses that have skylights that comply with C402.4.2.

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.)

C402.4.2 Minimum skylight fenestration area. ~~For single-story buildings only, in an enclosed space~~ For buildings with single story enclosed spaces greater than 2,500 square feet (232 m²) in floor area; that are directly under a roof and with not less than 75 percent of the ceiling area with ~~have a ceiling heights greater than 15 feet (4572 mm); for no less than 75 percent of the ceiling area; these single-story spaces shall be provided with skylights and daylight responsive controls per C405.2.4. Space types required to comply with this provision include: and are used as an office, lobby, atrium, concourse, corridor, gymnasium/exercise center, convention center, automotive service, manufacturing, nonrefrigerated warehouse, retail store, distribution/sorting area, transportation, or and workshop.~~ Skylights in these spaces are required to provide a total toplit zone area not less than half 50 percent of the floor area and shall provide one of the following:

1. A minimum ratio of skylight area to toplit zone area of not less than 3 percent where all skylights have a VT of at least 0.40 as determined in accordance with Section C303.1.3
2. A minimum skylight effective aperture of at least 1 percent determined in accordance with Equation 4-5.

$$\text{Skylight Effective Aperture} = \frac{(0.85 \times \text{Skylight Area} \times \text{Skylight VT} \times \text{WF})}{\text{Toplit zone}}$$

(Equation 4-5)

where:

- Skylight area = Total fenestration area of skylights.
- Skylight VT = Area weighted average visible transmittance of skylights.
- WF = Area weighted average well factor, where well factor is 0.9 if light well depth is less than 2 feet (610 mm), or 0.7 if light well depth is 2 feet (610 mm) or greater.
- Light well depth = Measure vertically from the underside of the lowest point of the skylight glazing to the ceiling plane under the skylight.

Exceptions: Skylights above daylight zones of enclosed spaces are not required in:

1. Reserved.
2. Spaces where the designed *general lighting* power densities are less than 0.5 W/ft² (5.4 W/m²). If the lighting power allowance for a space per Sections C405.4.2 is lower than 0.5 W/ft², then the designed *general lighting* power density shall be 10 percent lower than the lighting power allowance.
3. Areas where it is documented that existing structures or natural objects block direct beam sunlight on at least half of the roof over the enclosed area for more than 1,500 daytime hours per year between 8 a.m. and 4 p.m.
4. Spaces where the daylight zone under rooftop monitors is greater than 50 percent of the enclosed space floor area.
5. Spaces where the total floor area minus the sidelit daylight zone area is less than 2,500 square feet (232 m²), and where the lighting in the daylight zone is controlled in accordance with Section C405.2.3.1.

C405.2.1.2 Occupant sensor control function in warehouses. In warehouses, the lighting in aiseways and open areas shall be controlled with occupant sensors that automatically reduce lighting power by not less than 50 percent when the areas are unoccupied. The occupancy sensor shall control lighting in each aisleway independently, and shall not control lighting beyond the aisleway being controlled by the sensor.

Exception: Warehouse occupant sensor controls are not required in toplit zones with *daylight responsive controls* complying with Section C405.2.4.

Purpose of code change:

For buildings such as schools and retail where some spaces in the building are single story (gymnasiums, warehouses, etc) and others are greater than one story, this proposal clarifies that it is the intent of this Code is to require skylights in the single-story spaces. For example, under the current Code language it could be interpreted that a single-story elementary school with a single-story gymnasium would be required to provide skylights in the gym, whereas a two-story school with a single-story gymnasium would not. This proposal applies the Code more equitably in this case, which we believe was the intent.

C402.4.2 Exception 2 allows areas with lighting power density (LPD) less than 0.5 watts/sf to take an exception to this provision. A few of the spaces types listed as being required to comply with this provision have lighting power allowances (LPA) per Section C405.4.2 that are less than 0.5 watts/sf. Examples include warehouse spaces for medium to bulky palletized items and airport concourses. Thus, these spaces are currently exempt from the minimum skylight provision without doing anything more than just meeting the code LPA. This proposal acknowledges that the intent of the Code is to require all space types listed in C402.4.2 to comply with this provision. To address this loophole, this proposal revises Exception 2 so that if the LPA is less than 0.4 watts/sf, then the proposed LPD shall be 10% better than Code to qualify for C402.4.2 Exception 2.

In addition, this proposal adds an exception to C405.2.1.2 Occupancy sensor control function in warehouses for spaces within warehouses that have skylights that comply with C402.4.2. This proposed exception is in line with the Exception to Section C405.2.2.2 Light reduction controls that states, "Light reduction controls are not required in daylight zones with daylight responsive controls complying with C405.2.4." Also, lighting power allowances for warehouse are low compared to other space types.

Your amendment must meet one of the following criteria. Select at least one:

- | | |
|---|---|
| <input type="checkbox"/> Addresses a critical life/safety need. | <input type="checkbox"/> Consistency with state or federal regulations. |
| <input checked="" type="checkbox"/> The amendment clarifies the intent or application of the code. | <input type="checkbox"/> Addresses a unique character of the state. |
| <input type="checkbox"/> Addresses a specific state policy or statute.
(Note that energy conservation is a state policy) | <input type="checkbox"/> Corrects errors and omissions. |

Check the building types that would be impacted by your code change:

- | | | |
|--|--|---|
| <input type="checkbox"/> Single family/duplex/townhome | <input checked="" type="checkbox"/> Multi-family 4 + stories | <input checked="" type="checkbox"/> Institutional |
| <input type="checkbox"/> Multi-family 1 – 3 stories | <input checked="" type="checkbox"/> Commercial / Retail | <input checked="" type="checkbox"/> Industrial |

Your name	Lisa Rosenow	Email address	lisa.rosenow@nec.net
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Your organization	NW Energy Efficiency Council	Phone number	206-624-0283
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Other contact name [Click here to enter text.](#)

Instructions: Send this form as an email attachment, along with any other documentation available, to: sbcc@des.wa.gov. For further information, call the State Building Code Council at 360-407-9278.

Economic Impact Data Sheet

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

For several details in this provision the intent of the current language is not clear, which can cause confusion and costly permitting delays. This proposal improves the Code language so it is clear when compliance with this provision is required.

In addition, this proposal recommends a reasonable exception for occupant sensor controls in warehouses that aligns with other lighting controls exceptions for spaces that are daylit and provided with daylight sensing controls. This lowers the lighting system costs for warehouses.

Since this proposal only aims to clarify the implied intent of existing Code language, no additional costs are incurred beyond what is already required.

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](#))

Indeterminate (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

NA

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) 375 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

NA

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

This proposal does not change the amount of time required by jurisdictions to verify compliance with this provision, but does potentially reduce time spent determining when compliance with this provision is required.

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