



Log No. **159**  
**TAG Modified 7/16/21**

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 #    New sections C402.2.8 & C402.2.9

Brief Description: Control of thermal bridging at concrete balconies and fenestration frames

Proposed code change text:

**C402.2.8 Above-grade exterior concrete slabs.** Above-grade concrete slabs that penetrate the *building thermal envelope*, including but not limited to decks and balconies, shall each include a minimum R-10 thermal break, aligned with the primary insulating layer in the adjoining wall assemblies. Stainless steel (but not carbon steel) reinforcing bars are permitted to penetrate the thermal break. If the Total Building Performance path, ~~the Target Performance Path,~~ or the component performance alternative in Section C402.1.5 is utilized and the thermal break required by this section is not provided where concrete slabs penetrate the *building thermal envelope*, the sectional area of the penetration shall be assigned the default U-factors from the “exposed concrete” row of Table A103.3.7.2.

**Exception:** *Mass transfer deck slab edges.*

**C402.2.9 Vertical fenestration intersection with opaque walls.** *Vertical fenestration* shall comply with items 1, 2 and 3, as applicable:

1. Where wall assemblies include *continuous insulation*, the exterior glazing layer of *vertical fenestration* and any required thermal break in the frame shall each be aligned within 2 inches laterally of either face of the *continuous insulation* layer.
2. Where wall assemblies do not include *continuous insulation*, the exterior glazing layer of *vertical fenestration* and any required thermal break in the frame shall each be aligned within the thickness of the *wall* insulation layer and not more than 2 inches laterally from the exterior face of the outermost insulation layer.
3. Where the exterior face of the *vertical fenestration* frame does not extend to the exterior face of the *opaque wall rough opening*, the exposed exterior portion of the rough opening shall be covered with either a material having an *R-value* not less than R-3, or with minimum 1.5-inch thickness wood.

Purpose of code change: Reduce heat loss through significant thermal bridges in the building envelope

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

- Addresses a critical life/safety need.
- The amendment clarifies the intent or application of the code.
- Addresses a specific state policy or statute. (Note that energy conservation is a state policy)
- Consistency with state or federal regulations.

Addresses a unique character of the state.

Corrects errors and omissions.

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

Single family/duplex/townhome

Multi-family 4 + stories

Institutional

Multi-family 1 – 3 stories

Commercial / Retail

Industrial

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Your name Duane Jonlin

Email address duane.jonlin@seattle.gov

Your organization City of Seattle

Phone number 206-233-2781

Other contact name -

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### **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](#)**)

\$1.33/square foot \$1000/ dwelling unit, only for apartments with cantilevered concrete balconies.

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

For apartments with cantilevered concrete balconies only, additional \$1,000

Zero additional cost for fenestration frame – glass plane can be aligned with insulation during detailing.

For 750 sf apartment, \$1000/750 sf = \$1.33/sf

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

0.02 KBTU/ square foot

(14.7 KWH/KBTU / dwelling unit)

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

A typical residential concrete balcony is 8 feet long and 8 inches deep =

Default U-factor for uninsulated 8" intermediate concrete slab = 0.7415.3 sf

U-factor for insulated slab = U-0.10

Additional cost for thermal break \$1000

Cost 750 sf apartment, \$1000/750 sf = \$1.33/sf

Seattle HDD = 4424

UA w/ concrete slab = 0.741 x 5.3 = 3.9 x 4424 HDD = 17,484 = 17 kBTU/3.4 = 5.14 KWH x \$0.11 x 24hr = \$13.57

UA w/ thermal break = 0.10 x 5.3 = .53 x 4424 = 2,345 = 2.3 KBTU/3.4 = 0.68 KWH x \$0.11 x 24hr = \$1.78

\$13.57 - \$1.78 = \$11.79 per year savings per balcony @750 sf per apartment = \$0.016/ sf

17 kbtu – 2.3 kbtu = 14.7 kbtu per year per balcony @750 sf per apartment = 0.02 kbtu/sf

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application: **(none)**