

2021 SEC Envelope Code Change Proposals

11/28/2022 version

- **Red Text: Introductory comment for each proposed change**
- **Yellow highlight: New proposals for this code**
- **Aqua highlight: Existing 2018 Seattle amendments transferred to 2021 code** (Typically, existing Seattle amendments carried forward are *not* shown in this document.)

C101.7 Vesting. Clarification requested by staff regarding vesting of TI projects.

C101.7 Vesting of initial tenant improvements. The initial tenant improvements of spaces within a building are permitted to comply with the codes applicable to the base building, if the permit applications are submitted within the 18-month timeframe specified in Section 101.3.2 of the Seattle Building Code.

Table C402.1.3 Prescriptive R-value for wood framed wall. Since R-25 std is considered equivalent for Group R, it should also be equivalent for other buildings.

Table C402.1.3
Opaque Thermal Envelope Insulation Component
Minimum Requirements, R-value Method^a, ((ⁱ))ⁱ

CLIMATE ZONE	5 AND MARINE 4	
	All Other	Group R
Walls, Above Gradeⁱ		
Mass ^h	Exterior: R-16 c.i. Interior: R-13 + R-6 ci wood stud, or R-13 + R-10 ci metal stud	Exterior: R-16 c.i. Interior: R-13 + R-6 ci wood stud, or R-13 + R-10 ci metal stud
Mass transfer deck slab edge	N/R	N/R
Metal buildings	R-13 + R-14ci	R-13 + R-14ci
Steel framed	R-13 + R-10ci	R-19 + R-8.5ci
Wood framed and other	R-13 + R-7.5ci std or R-20 + R-3.8ci std or R-25 std	R-13 + R-7.5ci std or R-20 + R-3.8ci std or R-25 std

Section C402.4 & Table C402.4 New proposal requiring 20% of vision glazing to be very low U-value, typically triple glazing. Intention is to establish triple glazing as a standard product line in Seattle, to reduce cost and lead time, before going to 100% in some future code cycle. Exception for small (<5,000 sf) buildings. Adds about 15% to cost of curtain wall, so if only applied to 20% of glazing, total cost increase will be about 3%.

C402.4 Fenestration. Fenestration shall comply with Sections C402.4 through C402.4.4 and Table C402.4. Column A values in Table C402.4 apply to a maximum of 80 percent of the total building fenestration area. The minimum 20 percent of fenestration required to meet the Column B high-performance U-factors is permitted to be met using any combination of vertical fenestration types with Column B values listed. Daylight responsive controls shall comply with this section and Section C405.2.5.

Exceptions:

1. Buildings or additions with less than 5,000 square feet of conditioned floor area are not required to provide the Column B high performance fenestration.
2. For prescriptive envelope compliance, single-pane glazing is permitted for security purposes and for revolving doors, not to exceed 1 percent of the gross exterior wall area. Where Section C402.1.5, component performance alternative, is used, the single glazing shall be included in the percentage of the total glazing area, U-factor and SHGC requirements.

**Table C402.4
Building Envelope Fenestration Maximum U-factor
and SHGC Requirements**

CLIMATE ZONE	5 AND MARINE 4 standard performance portion (max 80% of fenestration area)	High performance portion (min 20% of fenestration area)
<i>U-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical curtain walls and site-built fenestration products^a</i> <u><i>U-factors for no more than 80% of fenestration area in project</i></u>		<u><i>U-factors for no less than 20% of fenestration in project.</i></u>
Fixed ^b U-factor	((U-0.38)) U-0.34	<u>U-0.24</u>
Operable ^c U-factor	((U-0.40)) U-0.36	<u>U-0.22</u>
<i>Entrance doors^d</i>		
U-factor	U-0.60	
<u><i>U-factor for all other vertical fenestration U-factors for no more than 80% of vision glass in project.</i></u>		
Fixed U-factor	((U-0.30)) U-0.26	<u>U-0.20</u>

CLIMATE ZONE	5 AND MARINE 4 standard performance portion (max 80% of fenestration area)	High performance portion (min 20% of fenestration area)
<u>Operable or mulled windows with fixed and operable sections U- factor</u>	<u>U-0.28</u>	<u>U-0.22</u>
SHGC for all vertical fenestration		
	<u>Fixed</u>	<u>Operable</u>
PF < 0.2	0.38	<u>0.33</u>
0.2 ≤ PF < 0.5	0.46	<u>0.40</u>
PF ≥ 0.5	0.61	<u>0.53</u>
Skylights		
U-factor	((U-0.50)) <u>U-0.45</u>	
SHGC	((0.35)) <u>0.32</u>	

C402.4.1 Maximum area. Proposal to set maximum allowable glazing area by occupancy and use type, rather than a straight 30 or 35%. This gives large office and multifamily a 40% baseline. Grocery and standalone retail percentages were doubled (from ASHRAE baseline) to allow for exceptional circumstances. Also required some re-wording for Equation 4-3.

C402.4.1 Maximum area. The total building vertical fenestration area (not including opaque doors and opaque spandrel panels) shall not exceed ~~((30 percent of the total building gross above-grade wall area))~~ **the percentage of above-grade wall area permitted by Table C402.4.1.** The skylight area shall not exceed 5 percent of the total building gross roof area (skylight-to-roof ratio).

Table C402.4.1

Allowable Vertical Glazing Area Percentages

<u>Occupancy</u>	<u>Building Area Type</u>	<u>Maximum prescriptive vertical fenestration %</u>
<u>Group A-2 or B</u>	<u>Restaurant (quick service)</u>	<u>34</u>
<u>Group A-2 or B</u>	<u>Restaurant (full service)</u>	<u>24</u>
<u>Group B</u>	<u>Healthcare (outpatient)</u>	<u>21</u>

<u>Group B</u>	<u>Office (5000 ft² or smaller)</u>	<u>19</u>
<u>Group B</u>	<u>Office (5000 to 50,000 ft²)</u>	<u>31</u>
<u>Group B</u>	<u>Office (larger than 50,000 ft²)</u>	<u>40</u>
<u>Group B</u>	<u>University or college</u>	<u>30</u>
<u>Group E</u>	<u>School (primary and secondary)</u>	<u>22</u>
<u>Group I-2</u>	<u>Hospital</u>	<u>27</u>
<u>Group M</u>	<u>Grocery Store</u>	<u>7-15</u>
<u>Group M</u>	<u>Retail (standalone)</u>	<u>11-20</u>
<u>Group M</u>	<u>Retail (strip mall)</u>	<u>20</u>
<u>Group R-1</u>	<u>Hotel/motel (75 or fewer rooms)</u>	<u>24</u>
<u>Group R-1</u>	<u>Hotel/motel (more than 75 rooms)</u>	<u>34</u>
<u>Group R-2</u>	<u>Multifamily 7 stories or less</u>	<u>35</u>
<u>Group R-2</u>	<u>Multifamily 8 stories or taller</u>	<u>40</u>
<u>Group S-2</u>	<u>Warehouse (non-refrigerated)</u>	<u>6</u>
	<u>All other</u>	<u>30</u>

Equation 4-3—SHGC Rate Calculations

Proposed Total SHGCxA ≤ Allowable Total SHGCxA

Where:

- Proposed Total SHGCxA = SHGCxA-glaz-prop + SHGCxA-sky-prop
- Allowable Total SHGCxA = SHGCxA-glaz-allow + SHGCxA-sky-allow
- SHGCxA-glaz-prop = Sum of (proposed SHGCx proposed area) for each distinct vertical fenestration type **and each occupancy type**
- SHGCxA-sky-prop = Sum of (proposed SHGCx proposed area) for each distinct skylight type
- SHGCxA-glaz-allow = Sum of (code maximum vertical fenestration SHGC from Table C402.4, or Section C402.4.1.3 if applicable, x proposed area) for each distinct vertical fenestration type **and each occupancy type**, not to exceed the code maximum area
- SHGCxA-sky-allow = Sum of (code maximum skylight SHGC from Table C402.4 x proposed area) for each distinct skylight type, not to exceed the code maximum area

C402.4.1.1.2 High-performance fenestration. Decrease the required U-factor for glazing to qualify as “high-performance,” making it essentially triple glazing or equivalent, and matching the requirement for 20% of standard glazing to be triple or equivalent. Also clarifies that fixed and operable in the “all other” category can be combined, same as for fixe & operable curtain wall.

C402.4.1.1.2 High-performance fenestration. All of the following requirements shall be met:

1. All *vertical fenestration* in the building shall comply with the following *U*-factors:

a. *U*-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical curtain walls and site-built fenestration products (fixed) = ~~((0.31))~~ **0.24**

b. *U*-factor for Class AW windows rated in accordance with AAMA/CSA101/I.S.2/A440, vertical curtain walls and site-built fenestration products (operable) = ~~((0.36))~~ **0.28**

c. Entrance doors = 0.60

d. *U*-factor for all other vertical fenestration, fixed = ~~((0.23))~~ **0.20**

e. *U*-factor for all other vertical fenestration, operable, or mullied windows with fixed and operable sections = ~~((0.24))~~ **0.22**

2. The SHGC of the vertical fenestration shall be no more than 0.90 times the maximum SHGC values listed in Table C402.4.

An area-weighted average shall be permitted to satisfy the *U*-factor requirement for each fenestration product category listed in Item 1 of this section. Individual fenestration products from different fenestration product categories shall not be combined in calculating the area-weighted average *U*-factor, except that fenestration from lines a. and b. are permitted to be combined, and the fenestration from lines d and e are permitted to be combined.

C402.5.4.1 Low-rise multifamily complying with commercial energy code provisions. Clarify how to test air barrier low-rise mixed-use buildings.

C402.5.4.1 Low-rise residential building areas conforming to commercial building code requirements.

Where the residential provisions of this code require R-2 occupancy areas of 1, 2, and 3-story buildings to comply with the commercial provisions of the code, then the entire mixed-use building shall be tested to meet the standards for commercial uses.