



PROPOSED RULE MAKING

CR-102 (June 2012)

(Implements RCW 34.05.320)

Do NOT use for expedited rule making

Agency: Washington State Building Code Council

- Preproposal Statement of Inquiry was filed as WSR 13-07-078; or
- Expedited Rule Making--Proposed notice was filed as WSR _____; or
- Proposal is exempt under RCW 34.05.310(4) or 34.05.330(1).

- Original Notice
- Supplemental Notice to WSR _____
- Continuance of WSR _____

Title of rule and other identifying information: (Describe Subject)

Amendments to WAC 51-11C and WAC 51-11R, the Washington State Energy Code, Commercial and Residential provisions

Hearing location(s):

September 20, 2013

October 18, 2013

Center Place Event Center
2426 N. Discovery Place
Spokane Valley, WA 99216

DES Presentation Room
1500 Jefferson SE
Olympia, WA 98504

Date: Sept. 20/Oct 18 Time: 10 a.m

Submit written comments to:

Name: Ray Allshouse
Address: PO Box 41449
Olympia, WA 98504-1449
e-mail sbcc@ga.wa.gov
fax (360) 586-9088 by (date) October 25, 2013

Assistance for persons with disabilities: Contact

Peggy Bryden by September 9, 2013

TTY () _____ or (360) 407-9280

Date of intended adoption: November 8, 2013

(Note: This is NOT the effective date)

Purpose of the proposal and its anticipated effects, including any changes in existing rules:

Makes editorial changes to the following sections of the residential energy portion of the Washington State Energy Code:

Section C301.1/R301.1 is amended to move Ferry, Okanogan, Pend Oreille, and Stevens counties from Climate Zone 6B to Climate Zone 5B. This would allow those four counties to share training and other resources with Spokane County, as previously done under the 2009 code. This is coordinating with the Emergency Rule as filed in WSR 13-14-069.

Section C402.3.1 and Tables C402-1 through C402-4 are amended to create a prescriptive path method to increase the wall glazing area above base code levels without going through the Total Building Performance method. This would allow a continuation of current building practices modified slightly to achieve more energy savings than under the 2009 code while still remaining economically viable. This is coordinating with the Emergency Rule as filed in WSR 13-14-070.

Table C402.2 is modified to correct language in footnote c to coordinate with the language in Table C402.1.

Section C408.3 is amended to provide an exception to commissioning for smaller, simpler lighting systems. This was intended to be included in the original rule adopted in November but was erroneously left out.

Reasons supporting proposal: RCW 19.27A.025 and RCW 19.27A.045

Statutory authority for adoption: RCW 19.27A.025, 19.27A.045

Statute being implemented: RCW 19.27, 19.27A and 34.05

Is rule necessary because of a:

- Federal Law? Yes No
 - Federal Court Decision? Yes No
 - State Court Decision? Yes No
- If yes, CITATION:

DATE
June 14, 2013

NAME (type or print)
C. Ray Allshouse

SIGNATURE

TITLE
Council Chair

CODE REVISER USE ONLY

**OFFICE OF THE CODE REVISER
STATE OF WASHINGTON
FILED**

DATE: July 23, 2013

TIME: 4:40 PM

WSR 13-15-160

Agency comments or recommendations, if any, as to statutory language, implementation, enforcement, and fiscal matters:

None.

Name of proponent: (person or organization) State Building Code Council

- Private
- Public
- Governmental

Name of agency personnel responsible for:

Name	Office Location	Phone
Drafting..... Krista Braaksma	Post Office Box 41011, Olympia WA 98504-1449	(360) 407-9278
Implementation.... Krista Braaksma	Post Office Box 41011, Olympia WA 98504-1449	(360) 407-9278
Enforcement..... Local Jurisdictions		()

Has a small business economic impact statement been prepared under chapter 19.85 RCW or has a school district fiscal impact statement been prepared under section 1, chapter 210, Laws of 2012?

Yes. Attach copy of small business economic impact statement or school district fiscal impact statement.

A copy of the statement may be obtained by contacting:

Name:
Address:

phone
fax
e-mail

No. Explain why no statement was prepared.

The substantive portions of the proposed rule were written in response to petitions to provide economic relief to two sectors of the building industry. The first is reclassifying Climate Zone 6B as Climate Zone 5B; the second to allow a prescriptive path to increase the percentage of glazing allowed in above grade walls. The remainder of the rule provides minor corrections to provisions to clarify intent and have no cost impact or further reduce the cost of compliance. Because the proposed rules mitigate the effect of the 2012 Energy Code and reduce costs rather than imposing new requirements, there is no negative economic impact on small businesses in the state.

Is a cost-benefit analysis required under RCW 34.05.328?

Yes A preliminary cost-benefit analysis may be obtained by contacting:

Name:
Address:

phone () _____
fax () _____
e-mail _____

No: Please explain: A cost-benefit analysis is not required under RCW 34.05.328. The State Building Code Council is not a listed agency under RCW 34.05.328 (5)(a)(i). This rule is not considered to be substantive; its function is to provide economic relief in certain instances and make some non-editorial corrections to the text.

AMENDATORY SECTION (Amending WSR 13-04-055, filed 2/1/13, effective 7/1/13)

WAC 51-11R-30100 Section R301-Climate zones.

R301.1 General. Climate zones from Table R301.1 shall be used in determining the applicable requirements from Chapter 4. Locations not in Table R301.1 (outside the United States) shall be assigned a climate zone based on Section R301.3.

R301.2 Warm humid counties. Warm humid counties are identified in Table R301.1 by an asterisk.

R301.3 International climate zones. The climate zone for any location outside the United States shall be determined by applying Table R301.3(1) and then Table R301.3(2).

**TABLE R301.1
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID
DESIGNATIONS BY STATE AND COUNTY**

Key: A - Moist, B - Dry, C - Marine. Absence of moisture designation indicates moisture regime is irrelevant. Asterisk (*) indicates a warm humid location.

WASHINGTON

5B Adams	4C Grays	Harbor 4C Pierce
5B Asotin	4C Island	4C San Juan
5B Benton	4C Jefferson	4C Skagit
5B Chelan	4C King	5B Skamania
4C Clallam	4C Kitsap	4C Snohomish
4C Clark	5B Kittitas	5B Spokane
5B Columbia	5B Klickitat	((6B)) 5B Stevens
4C Cowlitz	4C Lewis	4C Thurston
5B Douglas	5B Lincoln	4C Wahkiakum
((6B)) 5B Ferry	4C Mason	5B Walla Walla
5B Franklin	((6B)) 5B Okanogan	4C Whatcom
5B Garfield	4C Pacific	5B Whitman
5B Grant	((6B)) 5B Pend Oreille	5B Yakima

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

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AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-402131 Equation C402-1-Target UA_t.

Equation C402-1

Target UA_t

$$UA_t = U_{\text{radt}}A_{\text{radt}} + U_{\text{mrt}}A_{\text{mrt}} + U_{\text{rat}}A_{\text{rat}} + U_{\text{mwt}}(A_{\text{mwt}} + \frac{A_{\text{mwbgt}}}{A_{\text{mwbgt}}}) + U_{\text{mbwt}}(A_{\text{mbwt}} + \frac{A_{\text{mbwbgt}}}{A_{\text{mbwbgt}}}) + U_{\text{sfwt}}(A_{\text{sfwt}} + \frac{A_{\text{sfwbgt}}}{A_{\text{sfwbgt}}}) + U_{\text{wfw}}(A_{\text{wfw}} + \frac{A_{\text{wfwbgt}}}{A_{\text{wfwbgt}}}) + U_{\text{fint}}A_{\text{fint}} + U_{\text{fjt}}A_{\text{fjt}} + F_{\text{st}}P_{\text{st}} + F_{\text{srt}}P_{\text{srt}} + U_{\text{dst}}A_{\text{dst}} + U_{\text{drt}}A_{\text{drt}} + U_{\text{vgt}}A_{\text{vgt}} + U_{\text{vgmt}}A_{\text{vgmt}} + U_{\text{vgmot}}A_{\text{vgmot}} + U_{\text{vgdt}}A_{\text{vgdt}} + U_{\text{ogt}}A_{\text{ogt}}$$

UA_t = The target combined specific heat transfer of the gross roof/ceiling assembly, exterior wall and floor area.

Where:

U_{radt} = The thermal transmittance value for roofs with the insulation entirely above deck found in Table C402.1.2.

U_{mrt}	=	The thermal transmittance value for metal building roofs found in Table C402.1.2.
U_{rat}	=	The thermal transmittance value for attic and other roofs found in Table C402.1.2.
U_{mwt}	=	The thermal transmittance value for opaque mass walls found in Table C402.1.2.
U_{mbwt}	=	The thermal transmittance value for opaque metal building walls found in Table C402.1.2.
U_{sfmt}	=	The thermal transmittance value for opaque steel-framed walls found in Table C402.1.2.
U_{wfmt}	=	The thermal transmittance value for opaque wood framed and other walls found in Table C402.1.2.
U_{fmt}	=	The thermal transmittance value for mass floors over unconditioned space found in Table C402.1.2.
U_{jft}	=	The thermal transmittance value for joist floors over unconditioned space found in Table C402.1.2.
F_{st}	=	The F-factor for slab-on-grade floors found in Table C402.1.2.
F_{srt}	=	The F-factor for radiant slab floors found in Table C402.1.2.
U_{dst}	=	The thermal transmittance value for opaque swinging doors found in Table C402.2.
U_{drt}	=	The thermal transmittance value for opaque roll-up or sliding doors found in Table C402.2.
U_{vgt}	=	The thermal transmittance value for vertical fenestration with nonmetal framing found in Table C402.3 which corresponds to the proposed vertical fenestration area as a percent of gross exterior wall area. <u>*Buildings utilizing Section C402.3.1.3 shall use the thermal transmittance value specified there.</u>

- U_{vmt} = The thermal transmittance value for vertical fenestration with fixed metal framing found in Table C402.3 which corresponds to the proposed vertical fenestration area as a percent of gross exterior wall area. *Buildings utilizing Section C402.3.1.3 shall use the thermal transmittance value specified there.
- U_{vmot} = The thermal transmittance value for vertical fenestration with operable metal framing found in Table C402.3 which corresponds to the proposed vertical fenestration area as a percent of gross exterior wall area. *Buildings utilizing Section C402.3.1.3 shall use the thermal transmittance value specified there.
- U_{vgt} = The thermal transmittance value for entrance doors found in Table C402.3 which corresponds to the proposed vertical fenestration area as a percent of gross exterior wall area. Buildings utilizing Section C402.3.1.3 shall use the thermal transmittance value specified there.
- U_{ogt} = The thermal transmittance for skylights found in Table C402.3 which corresponds to the proposed skylight area as a percent of gross exterior roof area.
- A_{fmt} = The proposed mass floor over unconditioned space area, A_{fm} .
- A_{fjt} = The proposed joist floor over unconditioned space area, A_{fj} .
- P_{st} = The proposed linear feet of slab-on-grade floor perimeter, P_s .
- P_{srt} = The proposed linear feet of radiant slab floor perimeter, P_{rs} .
- A_{dst} = The proposed opaque swinging door area, A_{ds} .
- A_{drt} = The proposed opaque roll-up or sliding door area, A_{dr} .

and

If the vertical fenestration area as a percent of gross above-grade exterior wall area does not exceed the maximum allowed in Section C402.3.1.3:

- A_{mwt} = The proposed opaque above grade mass wall area, A_{mw} .

A_{mwbgt}	≡	<u>The proposed opaque below grade mass wall area, A_{mw}.</u>
A_{mbwt}	=	The proposed opaque above grade metal building wall area, A_{mbw} .
A_{mbwbgt}	≡	<u>The proposed opaque below grade metal building wall area, A_{mbwbg}.</u>
A_{sfmt}	=	The proposed opaque above grade steel framed wall area, A_{mfw} .
$A_{sfmtbgt}$	≡	<u>The proposed opaque below grade steel framed wall area, A_{mfwbg}.</u>
A_{wfmt}	=	The proposed opaque above grade wall wood framed and other area, A_{wfwbg} .
$A_{wfmtbgt}$	≡	<u>The proposed opaque below grade wall wood framed and other area, A_{wfwbg}.</u>
A_{vgt}	=	The proposed vertical fenestration area with nonmetal framing, A_{vg} .
A_{vgmt}	=	The proposed vertical fenestration area with fixed metal framing, A_{vgm} .
A_{vgmot}	=	The proposed vertical fenestration area with operable metal framing, A_{vgmo} .
A_{vgdt}	=	The proposed entrance door area, A_{vgd} .

or

For buildings utilizing Section C402.3.1.3, vertical fenestration area as a percent of gross exterior above-grade wall may not exceed the amount allowed by that section. For all other buildings, if the vertical fenestration area as a percent of gross above-grade exterior wall area exceeds the maximum allowed in Section C402.3.1, the area of each vertical fenestration element shall be reduced in the base envelope design by the same percentage and the net area of each above-grade wall type increased proportionately by the same percentage so that the total vertical fenestration area is exactly equal to the allowed percentage per Section C402.3.1 of the gross above-grade wall area. The target wall area of a given wall type shall be the sum of the proposed below grade area and the increased above-grade area.

and

If the skylight area as a percent of gross exterior roof area does not exceed the maximum allowed in Section C402.3.1:

A_{radt}	=	The proposed roof area with insulation entirely above the deck, A_{rad} .
A_{mrt}	=	The proposed roof area for metal buildings, A_{mr} .
A_{rat}	=	The proposed attic and other roof area, A_{or} .
A_{ogat}	=	The proposed skylight area, A_{ogor} .

or

If the skylight area as a percent of gross exterior roof area exceeds the maximum allowed in Section C402.3.1, the area of each skylight element shall be reduced in the base envelope design by the same percentage and the net area of each roof type increased proportionately by the same percentage so that the total skylight area is exactly equal to the allowed percentage per Section C402.3.1 of the gross roof area.

*Note: The vertical fenestration area does not include opaque doors and opaque spandrel panels.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-402132 Equation C402-2-Proposed UA_p .

Equation C402-2

Proposed UA_p

$$UA_p = U_{rad}A_{rad} + U_{mr}A_{mr} + U_{ra}A_{ra} + U_{mw}A_{mw} + U_{mbw}A_{mbw} + U_{sfbw}A_{sfbw} + U_{wfbw}A_{wfbw} + U_{fm}A_{fm} + U_{fj}A_{fj} + F_sP_s + F_{sr}P_{sr} + U_{ds}A_{ds} + U_{dr}A_{dr} + U_{vg}A_{vg} + U_{vgmf}A_{vgmf} + U_{vgmo}A_{vgmo} + U_{vgd}A_{vgd} + U_{og}A_{og}$$

Where:

- UA_p = The combined proposed specific heat transfer of the gross exterior wall, floor and roof/ceiling assembly area.
- U_{rad} = The thermal transmittance of the roof area where the insulation is entirely above the roof deck.
- A_{rad} = Opaque roof area where the insulation is entirely above the roof deck.
- U_{mr} = The thermal transmittance of the metal building roof area.
- A_{mr} = Opaque metal building roof area.
- U_{ra} = The thermal transmittance of the roof over attic and other roof area.

A_{ra}	=	Opaque roof over attic and other roof area.
U_{mw}	=	The thermal transmittance of the opaque mass wall area.
A_{mw}	=	Opaque mass wall area (not including opaque doors).
U_{mbw}	=	The thermal transmittance of the opaque metal building wall area.
A_{mbw}	=	Opaque metal building wall area (not including opaque doors).
U_{sfw}	=	The thermal transmittance of the opaque steel framed wall area.
A_{sfw}	=	Opaque steel framed wall area (not including opaque doors).
U_{wfw}	=	The thermal transmittance of the opaque wood framed and other wall area.
A_{wfw}	=	Opaque wood framed and other wall area (not including opaque doors).
U_{fm}	=	The thermal transmittance of the mass floor over unconditioned space area.
A_{fm}	=	Mass floor area over unconditioned space.
U_{fj}	=	The thermal transmittance of the joist floor over unconditioned space area.
A_{fj}	=	Joist floor area over unconditioned space.
F_s	=	Slab-on-grade floor component F-factor.
P_s	=	Linear feet of slab-on-grade floor perimeter.
F_{sr}	=	Radiant floor component F-factor.

P_{sr}	=	Lineal feet of radiant floor perimeter.
U_{ds}	=	The thermal transmittance value of the opaque swinging door area.
A_{ds}	=	Opaque swinging door area.
U_{dr}	=	The thermal transmittance value of the opaque roll-up or sliding door area.
A_{dr}	=	Opaque roll-up or sliding door area.
U_{vg}	=	The thermal transmittance of the vertical fenestration area with nonmetal framing.*
A_{vg}	=	Vertical fenestration area with nonmetal framing.*
U_{vgmf}	=	The thermal transmittance of the vertical fenestration area with fixed metal framing.
A_{vgmf}	=	Vertical fenestration area with fixed metal framing.*
U_{vgmo}	=	The thermal transmittance of the vertical fenestration area with operable metal framing.*
A_{vgmo}	=	Vertical fenestration area with operable metal framing.*
U_{vgd}	=	The thermal transmittance of the vertical fenestration area for entrance doors.
A_{vgd}	=	Vertical fenestration area for entrance doors.
U_{og}	=	The thermal transmittance for the skylights.
A_{og}	=	Skylight area.

NOTE: Where more than one type of wall, window, roof/ceiling, door and skylight is used, the U and A terms for those items shall be expanded into subelements as:

$$U_{mw1}A_{mw1} + U_{mw2}A_{mw2} + U_{sfw1}A_{sfw1} + \dots \text{etc.}$$

*NOTE: The vertical fenestration area does not include opaque doors and opaque spandrel panels.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-402133 Equation C402-3—Target SHGCA_t.

Equation C402-3

Target SHGCA_t

$$SHGCA_t = \frac{SHGC_{(t)ogt}(A_{ogt} + SHGC_{vgt}(A_{vgt} + A_{vgmt} + A_{vgmot} + A_{vgdt}))}{(A_{ogt} + A_{vgt} + A_{vgmt} + A_{vgmot} + A_{vgdt})}$$

Where:

SHGCA_t = The target combined ((specific)) solar heat gain of the target fenestration area.

SHGC_{ogt} ≡ The solar heat gain coefficient for skylight fenestration found in Table C402.3, and A_{ogt}, as defined in Equation C402-1.

SHGC_{(t)vgt} = The solar heat gain coefficient for vertical fenestration found in Table C402.3 which corresponds to the proposed total fenestration area as a percent of gross exterior wall area, and ((A_{ogt})) A_{vgt}, A_{vgmt}, A_{vgmot} and A_{vgdt} are defined under Equation C402-1. Buildings utilizing Section C402.3.1.3 shall use the SHGC value specified there. The SHGC may be adjusted for projection factors per the requirements of Section C402.3.3.

NOTE: The vertical fenestration area does not include opaque doors and opaque spandrel panels.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-402134 Equation C402-4—Proposed SHGCA_p.

Equation C402-4

Proposed SHGCA_p

$$SHGC_{A_p} = SHGC_{og}A_{og} + SHGC_{vg}A_{vg}$$

Where:

SHGC_{A_t} = The combined proposed ((specific)) solar heat gain of the proposed fenestration area.

SHGC_{og} = The solar heat gain coefficient of the skylights.

A_{og} = The skylight area.

SHGC_{vg} = The solar heat gain coefficient of the vertical fenestration.

A_{vg} = The vertical fenestration area.

NOTE: The vertical fenestration area does not include opaque doors and opaque spandrel panels.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-402200 Table C402.2—Opaque thermal envelope requirements.

Table C402.2

Opaque Thermal Envelope Requirements^{a, f}

CLIMATE ZONE	5 AND MARINE 4		6	
	All Other	Group R	All Other	Group R
Roofs				
Insulation entirely above deck	R-30ci	R-38ci	R-30ci	R-38ci
Metal buildings (with R-3.5 thermal blocks) ^{a, b}	R-25 + R-11 LS	R-25 + R-11 LS	R-25 + R-11 LS	R-30 + R-11 LS
Attic and other	R-49	R-49	R-49	R-49
Walls, Above Grade				

CLIMATE ZONE	5 AND MARINE 4		6	
	All Other	Group R	All Other	Group R
Mass ^e	R-9.5ci	R-13.3ci	R-11.4ci	R-15.2ci
Metal building	R-13 + R-13ci	R-13 + R-13ci	R-13 + R-13ci	R-19 + R-16ci
Steel framed	R-13 + R-10ci	R-19 + R-8.5ci	R-13 + R-12.5ci	R-19 + R-14ci
Wood framed and other	R-21 int	R-21 int	R-13 + R-7.5ci or R- 20 + R-3.8ci	R-21 + R-5ci
Walls, Below Grade				
Below-grade wall ^d	Same as above grade	Same as above grade	Same as above grade	Same as above grade
Floors				
Mass	R-30ci	R-30ci	R-30ci	R-30ci
Joist/framing	R-30 ^e	R-30 ^e	R-38 ^e	R-38 ^e
Slab-on-Grade Floors				
Unheated slabs	R-10 for 24" below	R-10 for 24" below	R-10 for 48" below	R-15 for 48" below
Heated slabs ^d	R-10 perimeter & under entire slab	R-10 perimeter & under entire slab	R-10 perimeter & under entire slab	R-10 perimeter & under entire slab
Opaque Doors				
Swinging	U-0.37	U-0.37	U-0.37	U-0.37
Roll-up or sliding	R-4.75	R-4.75	R-4.75	R-4.75

For SI: 1 inch = 25.4 mm. ci = Continuous insulation. NR = No requirement.

LS = Liner system—A continuous membrane installed below the purlins and uninterrupted by framing members. Uncompressed, unfaced insulation rests on top of the membrane between the purlins.

^a Assembly descriptions can be found in Chapter 2 and Appendix A.

^b Where using *R*-value compliance method, a thermal spacer block shall be provided, otherwise use the *U*-factor compliance method in Table C402.1.2.

^c ((R-5.7ci is allowed to be substituted with concrete block walls complying with ASTM C90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with materials having a maximum thermal conductivity of 0.44 Btu-in/h-ft²-F.) **Exception:** Integral insulated concrete block walls complying with ASTM C90 with all cores filled and meeting both of the following:

1 At least 50 percent of cores must be filled with vermiculite or equivalent fill insulation; and

2 The building thermal envelope encloses one or more of the following uses: Warehouse (storage and retail), gymnasium, auditorium, church chapel, arena, kennel, manufacturing plant, indoor swimming pool, pump station, water and waste water treatment facility, storage facility, storage area, motor vehicle service facility. Where additional uses not listed (such as office, retail, etc.) are contained within the building, the exterior walls that enclose these areas may not utilize this exception and must comply with the appropriate mass wall *R*-factor from Table C402.2 or *U*-factor from Table C402.1.2.

^d Where heated slabs are below grade, below-grade walls shall comply with the exterior insulation requirements for heated slabs.

^e Steel floor joist systems shall be insulated to R-38 + R-10ci.

^f For roof, wall or floor assemblies where the proposed assembly would not be continuous insulation, ((twe)) an alternate nominal *R*-value compliance options for assemblies with isolated metal penetrations of otherwise continuous insulation ((are)) is:

Assemblies with continuous insulation (see definition)	Alternate option for assemblies with metal penetrations, greater than 0.04% but less than 0.08%
R-11.4ci	R-14.3ci
R-13.3ci	R-16.6ci
R-15.2ci	R-19.0ci
R-30ci	R-38ci

Assemblies with continuous insulation (see definition)	Alternate option for assemblies with metal penetrations, greater than 0.04% but less than 0.08%
R-38ci	R-48ci
R-13 + R-7.5ci	R-13 + R-9.4ci
R-13 + R-10ci	R-13 + R-12.5ci
R-13 + R-12.5ci	R-13 + R-15.6ci
R-13 + R-13ci	R-13 + R-16.3ci
R-19 + R-8.5ci	R-19 + R-10.6ci
R-19 + R-14ci	R-19 + R-17.5ci
R-19 + R-16ci	R-19 + R-20ci
R-20 + R-3.8ci	R-20 + R-4.8ci
R-21 + R-5ci	R-21 + R-6.3ci

~~((These))~~ This alternate nominal R-value compliance ~~((options are))~~ option is allowed for projects complying with all of the following:

1. The ratio of the cross-sectional area, as measured in the plane of the surface, of metal penetrations of otherwise continuous insulation to the opaque surface area of the assembly is greater than 0.0004 (0.04%), but less than 0.0008 (0.08%).
2. The metal penetrations of otherwise continuous insulation are isolated or discontinuous (e.g., brick ties or other discontinuous metal attachments, offset brackets supporting shelf angles that allow insulation to go between the shelf angle and the primary portions of the wall structure). No continuous metal elements (e.g., metal studs, z-girts, z-channels, shelf angles) penetrate the otherwise continuous portion of the insulation.
3. Building permit drawings shall contain details showing the locations and dimensions of all the metal penetrations (e.g., brick ties or other discontinuous metal attachments, offset brackets, etc.) of otherwise continuous insulation. In addition, calculations shall be provided showing the ratio of the cross-sectional area of metal penetrations of otherwise continuous insulation to the overall opaque wall area.

For other cases where the proposed assembly is not continuous insulation, see Section C402.1.2 for determination of U-factors for assemblies that include metal other than screws and nails.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-40231 Section C402.3.1—Maximum area.

C402.3.1 Maximum area. The vertical fenestration area (not including opaque doors and opaque spandrel panels) shall not exceed 30 percent of the gross above-grade wall area. The skylight area shall not exceed 3 percent of the gross roof area.

C402.3.1.1 Increased vertical fenestration area with daylighting controls.

In Climate Zones 1 through 6, a maximum of 40 percent of the gross above-grade wall area shall be permitted to be vertical fenestration, provided:

1. No less than 50 percent of the conditioned floor area is within a daylight zone;

2. Automatic daylighting controls are installed in daylight zones;
and

3. Visible transmittance (VT) of vertical fenestration is greater than or equal to 1.1 times solar heat gain coefficient (SHGC).

EXCEPTION: Fenestration that is outside the scope of NFRC 200 is not required to comply with Item 3.

C402.3.1.2 Increased skylight area with daylighting controls. The skylight area shall be permitted to be a maximum of 5 percent of the roof area provided automatic daylighting controls are installed in daylight zones under skylights.

C402.3.1.3 Increased vertical fenestration area with high-performance fenestration. The vertical fenestration area (not including opaque doors and opaque spandrel panels) is permitted to exceed 30 percent but shall not exceed 40 percent of the gross above grade wall area, for the purpose of prescriptive compliance with Section C402.1.2 or for the target UA calculation in Equation C402-1, provided that each of the following conditions are met:

1. The vertical fenestration shall have the following U-factors:

a. Nonmetal framing (all) = 0.28

b. Metal framing (fixed) = 0.34

c. Metal framing (operable) = 0.36

d. Metal framing (entrance doors) = 0.60

2. The SHGC of the vertical fenestration shall be less than or equal to 0.35, adjusted for projection factor in compliance with C402.3.3.1.

The compliance path described in this section is not permitted to be used for the total building performance compliance path in Section C407.

AMENDATORY SECTION (Amending WSR 13-04-056, filed 2/1/13, effective 7/1/13)

WAC 51-11C-40803 Section C408.3—Lighting system functional testing.

C408.3 Lighting system functional testing. Controls for automatic lighting systems shall comply with Section C408.3.1.

EXCEPTION: Lighting systems in buildings where the total installed lighting load is less than 20kW and less than 10kW of lighting is controlled by occupancy sensors or automatic daylighting controls.

C408.3.1 Functional testing. Testing shall ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the construction documents and manufacturer's installation instructions. Written procedures which clearly describe the individual systematic test procedures, the expected systems' response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion shall be followed. At a minimum, testing shall affirm operation during normally occupied daylight conditions. The construction documents shall state

the party who will conduct the required functional testing.

Where occupant sensors, time switches, programmable schedule controls, photosensors or daylighting controls are installed, the following procedures shall be performed:

1. Confirm that the placement, sensitivity and time-out adjustments for occupant sensors yield acceptable performance.
2. Confirm that the time switches and programmable schedule controls are programmed to turn the lights off.
3. Confirm that the placement and sensitivity adjustments for photosensor controls reduce electric light based on the amount of usable daylight in the space as specified.