



**BSR/ASHRAE/IES Addendum am
to ANSI/ASHRAE/IES Standard 90.1-2022**

Public Review Draft

Proposed Addendum am to Standard 90.1-2022, Energy Standard for Sites and Buildings Except Low- Rise Residential Buildings

**First Public Review (July 2024)
(Draft Shows Proposed Changes to Current Standard)**

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FOREWORD

This addendum revises the fenestration prescriptive criteria in Tables 5.5-0 through 5.5-8. The proposed changes were subjected to ASHRAE cost effectiveness analyses to show positive life cycle energy savings using an average heating and cooling scalar of 21.8 as well as engineering judgment to achieve consensus. A new footnote is added with an allowance in zones 5-7 for products installed at higher elevations to increase product availability, but this is only intended for prescriptive compliance. To restrict the use of the allowance, edits are made to Section 12 and Appendix C to clarify that the footnote is not used in the baseline building. A similar edit is not required in Appendix G, as that uses an independent baseline envelope.

In addition to the updated prescriptive criteria, corrections have also been made to the nonswinging opaque door U-factor for semiheated spaces in zones 0-2 that is physically impossible, and an error in the SI values for fixed and operable fenestration U-factors for semiheated spaces in zone 0 that do not match the IP values.

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and ~~striking through~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum am to 90.1-2022

Modify Tables 5.5-0 through 5.5-8 as shown (IP):

Table 5.5-0 Building Envelope Requirements for Climate Zone 0 (A,B)*

Opaque Elements	Nonresidential		Residential		Semiheated				
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value			
<i>Opaque Doors</i>									
<i>Swinging</i>	U-0.370		U-0.370		U-0.700				
<i>Nonswinging</i>	U-0.310		U-0.310		U-1.450 1.20				
Fenestration	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	<u>0.50</u> 0.48	<u>0.22</u> 0.21	1.10 (for all types)	<u>0.50</u> 0.48	<u>0.22</u> 0.21	1.10 (for all types)	1.20	NR (for all types)	NR (for all types)
<i>Operable</i>	0.62	<u>0.20</u> 0.19		0.62	<u>0.20</u> 0.19		1.20		
<i>Entrance door</i>	0.83	<u>0.20</u> 0.19		0.83	<u>0.20</u> 0.19		1.10		
<i>Skylight, 0% to 3% of Roof</i>									
All types	<u>0.70</u> 0.68	0.30	NR	<u>0.70</u> 0.68	0.30	NR	1.80	NR	NR

Table 5.5-1 Building Envelope Requirements for Climate Zone 1 (A,B)*

Opaque Elements	Nonresidential		Residential		Semiheated				
	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value			
<i>Opaque Doors</i>									
<i>Swinging</i>	U-0.370		U-0.370		U-0.700				
<i>Nonswinging</i>	U-0.310		U-0.310		U-1.450 1.20				
Fenestration	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	0.50 <u>0.48</u>	0.23	1.10 (for all types)	0.50 <u>0.48</u>	0.23	1.10 (for all types)	1.20	NR (for all types)	NR (for all types)
<i>Operable</i>	0.62	0.21		0.62	0.21		1.20		
<i>Entrance door</i>	0.83	0.21		0.83	0.21		1.10		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.70 <u>0.68</u>	0.30	NR	0.70 <u>0.68</u>	0.30	NR	1.80	NR	NR

Table 5.5-2 Building Envelope Requirements for Climate Zone 2 (A,B)*

Opaque Elements	Nonresidential			Residential			Semiheated		
	Assembly Maximum	Insulation Min. R-Value	Assembly Min. VT/SHGC	Assembly Maximum	Insulation Min. R-Value	Assembly Min. VT/SHGC	Assembly Maximum	Insulation Min. R-Value	Assembly Min. VT/SHGC
<i>Opaque Doors</i>									
Swinging	U-0.370			U-0.370			U-0.700		
Nonswinging	U-0.310			U-0.310			U-1.450 1.20		
Fenestration	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	0.45	0.250.23	1.10 (for all types)	0.45	0.250.23	1.10 (for all types)	0.500.48	NR (for all types)	NR (for all types)
Operable	0.60	0.230.21		0.60	0.230.21		0.650.62		
Entrance door	0.77	0.230.21		0.77	0.230.21		0.77		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.65	0.30	NR	0.65	0.30	NR	0.90 0.75	NR	NR

Table 5.5-3 Building Envelope Requirements for Climate Zone 3 (A,B,C)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	0.42	0.25	1.10 (for all types)	0.42	0.25	1.10 (for all types)	0.500.48	NR (for all types)	NR (for all types)
Operable	0.54	0.23		0.54	0.23		0.650.62		
Entrance door	0.68	0.23		0.68	0.23		0.77		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.55	0.30	NR	0.55	0.30	NR	0.900.75	NR	NR

Table 5.5-4 Building Envelope Requirements for Climate Zone 4 (A,B,C)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	0.360.35	0.360.34	1.10 (for all types)	0.360.35	0.360.34	1.10 (for all types)	0.500.45	NR (for all types)	NR (for all types)
Operable	0.450.43	0.330.31		0.450.43	0.330.31		0.650.60		
Entrance door	0.63	0.330.31		0.63	0.330.31		0.77		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.500.49	0.40	NR	0.500.49	0.40	NR	0.750.65	NR	NR

Table 5.5-5 Building Envelope Requirements for Climate Zone 5 (A,B,C)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	0.36 <u>0.32</u>	0.38	1.10 (for all types)	0.36 <u>0.32</u>	0.38	1.10 (for all types)	0.50 <u>0.42</u>	NR (for all types)	NR (for all types)
Operable	0.45 <u>0.39</u>	0.33		0.45 <u>0.39</u>	0.33		0.65 <u>0.54</u>		
Entrance door	0.63	0.33		0.63	0.33		0.77		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.50 <u>0.46</u>	0.40	NR	0.50 <u>0.46</u>	0.40	NR	0.75 <u>0.55</u>	NR	NR

c. At sites located 4,000 feet or more above sea level, the assembly maximum *U-factor* is permitted to be increased by 0.02 BTU/hr x ft² x °F.

Table 5.5-6 Building Envelope Requirements for Climate Zone 6 (A,B)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	0.34 <u>0.31</u>	0.38	1.10 (for all types)	0.34 <u>0.31</u>	0.38	1.10 (for all types)	0.39 <u>0.35</u>	NR (for all types)	NR (for all types)
Operable	0.42 <u>0.38</u>	0.34		0.42 <u>0.38</u>	0.34		0.48 <u>0.43</u>		
Entrance door	0.63	0.34		0.63	0.34		0.68		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.47 <u>0.45</u>	0.40	NR	0.50 <u>0.45</u>	0.40	NR	0.75 <u>0.55</u>	NR	NR

c. At sites located 4,000 feet or more above sea level, the assembly maximum *U-factor* is permitted to be increased by 0.02 BTU/hr x ft² x °F.

Table 5.5-7 Building Envelope Requirements for Climate Zone 7*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U ^b	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U ^b	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	0.29 <u>0.28</u>	0.40	1.10 (for all types)	0.29 <u>0.28</u>	0.40	1.10 (for all types)	0.36 <u>0.32</u>	NR (for all types)	NR (for all types)
Operable	0.36 <u>0.35</u>	0.36		0.36 <u>0.35</u>	0.36		0.44 <u>0.39</u>		
Entrance door	0.63	0.36		0.63	0.36		0.63		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.44	NR	NR	0.44	NR	NR	0.75 <u>0.55</u>	NR	NR

b. At sites located 4,000 feet or more above sea level, the assembly maximum *U-factor* is permitted to be increased by 0.02 BTU/hr x ft² x °F.

Table 5.5-8 Building Envelope Requirements for Climate Zone 8*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	0.26 <u>0.25</u>	0.40	1.10 (for all types)	0.26 <u>0.25</u>	0.40	1.10 (for all types)	0.36 <u>0.31</u>	NR (for all types)	NR (for all types)
<i>Operable</i>	0.32 <u>0.31</u>	0.36		0.32 <u>0.31</u>	0.36		0.44 <u>0.38</u>		
<i>Entrance door</i>	0.63	0.36		0.63	0.36		0.63		
<i>Skylight, 0% to 3% of Roof</i>									
All types	0.41 <u>0.40</u>	NR	NR	0.41 <u>0.40</u>	NR	NR	0.75 <u>0.55</u>	NR	NR

Modify Tables 5.5-0 through 5.5-8 as shown (SI):

Table 5.5-0 Building Envelope Requirements for Climate Zone 0 (A,B)*

Opaque Elements	Nonresidential			Residential			Semiheated		
	Assembly Maximum	Insulation Min. R-Value	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Insulation Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Insulation Min. R-Value
<i>Opaque Doors</i>									
<i>Swinging</i>	U-2.101			U-2.101			U-3.975		
<i>Nonswinging</i>	U-1.760			U-1.760			U-8.233 <u>6.81</u>		
Fenestration	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	2.84 <u>2.72</u>	0.22 <u>0.21</u>	1.10 (for all types)	2.84 <u>2.72</u>	0.22 <u>0.21</u>	1.10 (for all types)	2.84 <u>6.81</u>	NR (for all types)	NR (for all types)
<i>Operable</i>	3.52	0.20 <u>0.19</u>		3.52	0.20 <u>0.19</u>		3.69 <u>6.81</u>		
<i>Entrance door</i>	4.71	0.20 <u>0.19</u>		4.71	0.20 <u>0.19</u>		6.25		
<i>Skylight, 0% to 3% of Roof</i>									
All types	3.97 <u>3.86</u>	0.30	NR	3.97 <u>3.86</u>	0.30	NR	10.22	NR	NR

Table 5.5-1 Building Envelope Requirements for Climate Zone 1 (A,B)*

Opaque Elements	Nonresidential			Residential			Semiheated		
	Assembly Maximum	Insulation Min. R-Value	Assembly Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Min. R-Value
<i>Opaque Doors</i>									
Swinging	U-2.101			U-2.101			U-3.975		
Nonswinging	U-1.760			U-1.760			U-8.233 6.81		
Fenestration	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	2.842.72	0.23	1.10 (for all types)	2.842.72	0.23	1.10 (for all types)	6.81	NR (for all types)	NR (for all types)
Operable	3.52	0.21		3.52	0.21		6.81		
Entrance door	4.71	0.21		4.71	0.21		6.25		
<i>Skylight, 0% to 3% of Roof</i>									
All types	3.973.86	0.30	NR	3.973.86	0.30	NR	10.22	NR	NR

Table 5.5-2 Building Envelope Requirements for Climate Zone 2 (A,B)*

Opaque Elements	Nonresidential			Residential			Semiheated		
	Assembly Maximum	Insulation Min. R-Value	Assembly Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Min. R-Value	Assembly Maximum	Insulation Min. R-Value	Assembly Min. R-Value
<i>Opaque Doors</i>									
Swinging	U-2.101			U-2.101			U-3.975		
Nonswinging	U-1.760			U-1.760			U-8.233 6.81		
Fenestration	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
Fixed	2.56	0.250.23	1.10 (for all types)	2.56	0.250.23	1.10 (for all types)	2.842.72	NR (for all types)	NR (for all types)
Operable	3.41	0.230.21		3.41	0.230.21		3.693.52		
Entrance door	4.37	0.230.21		4.37	0.230.21		4.37		
<i>Skylight, 0% to 3% of Roof</i>									
All types	3.69	0.30	NR	3.69	0.30	NR	5.11 4.26	NR	NR

Table 5.5-3 Building Envelope Requirements for Climate Zone 3 (A,B,C)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	2.38	0.25	1.10 (for all types)	2.38	0.25	1.10 (for all types)	2.842.72	NR	NR
<i>Operable</i>	3.07	0.23		3.07	0.23		3.693.52	(for all types)	(for all types)
<i>Entrance door</i>	3.86	0.23		3.86	0.23		0.77		
<i>Skylight, 0% to 3% of Roof</i>									
All types	3.12	0.30	NR	3.12	0.30	NR	5.11 <u>4.26</u>	NR	NR

Table 5.5-4 Building Envelope Requirements for Climate Zone 4 (A,B,C)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	2.041.99	0.360.34	1.10 (for all types)	2.041.99	0.360.34	1.10 (for all types)	2.842.55	NR	NR
<i>Operable</i>	2.562.44	0.330.31		2.562.44	0.330.31		3.693.41	(for all types)	(for all types)
<i>Entrance door</i>	3.58	0.330.31		3.58	0.330.31		4.37		
<i>Skylight, 0% to 3% of Roof</i>									
All types	2.842.78	0.40	NR	2.842.78	0.40	NR	4.263.69	NR	NR

Table 5.5-5 Building Envelope Requirements for Climate Zone 5 (A,B,C)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	2.041.82	0.38	1.10 (for all types)	2.041.82	0.38	1.10 (for all types)	2.842.38	NR	NR
<i>Operable</i>	2.562.21	0.33		2.562.21	0.33		3.693.06	(for all types)	(for all types)
<i>Entrance door</i>	3.58	0.33		3.58	0.33		4.37		
<i>Skylight, 0% to 3% of Roof</i>									
All types	2.842.61	0.40	NR	2.842.61	0.40	NR	4.263.12	NR	NR

c. At sites located 1,200 m or more above sea level, the assembly maximum *U-factor* is permitted to be increased by 0.11 W/m²K.

Table 5.5-6 Building Envelope Requirements for Climate Zone 6 (A,B)*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U ^c	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	1.93 <u>1.76</u>	0.38	1.10 (for all types)	1.93 <u>1.76</u>	0.38	1.10 (for all types)	2.21 <u>1.99</u>	NR (for all types)	NR (for all types)
<i>Operable</i>	2.38 <u>2.16</u>	0.34		2.38 <u>2.16</u>	0.34		2.73 <u>2.44</u>		
<i>Entrance door</i>	3.58	0.34		0.63	0.34		3.86		
<i>Skylight, 0% to 3% of Roof</i>									
All types	2.67 <u>2.55</u>	0.40	NR	2.84 <u>2.55</u>	0.40	NR	4.26 <u>3.12</u>	NR	NR

c. At sites located 1,200 m or more above sea level, the assembly maximum *U-factor* is permitted to be increased by 0.11 W/m²K.

Table 5.5-7 Building Envelope Requirements for Climate Zone 7*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U ^b	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U ^b	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	1.65 <u>1.59</u>	0.40	1.10 (for all types)	1.65 <u>1.59</u>	0.40	1.10 (for all types)	2.04 <u>1.82</u>	NR (for all types)	NR (for all types)
<i>Operable</i>	2.04 <u>1.99</u>	0.36		2.04 <u>1.99</u>	0.36		2.50 <u>2.21</u>		
<i>Entrance door</i>	3.58	0.36		3.58	0.36		3.58		
<i>Skylight, 0% to 3% of Roof</i>									
All types	2.50	NR	NR	2.50	NR	NR	4.26 <u>3.12</u>	NR	NR

b. At sites located 1,200 m or more above sea level, the assembly maximum *U-factor* is permitted to be increased by 0.11 W/m²K.

Table 5.5-8 Building Envelope Requirements for Climate Zone 8*

Fenestration	Nonresidential			Residential			Semiheated		
	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC	Assembly Max. U	Assembly Max. SHGC	Assembly Min. VT/SHGC
<i>Vertical Fenestration, 0% to 40% of Wall</i>									
<i>Fixed</i>	1.48 <u>1.42</u>	0.40	1.10 (for all types)	1.48 <u>1.42</u>	0.40	1.10 (for all types)	2.04 <u>1.76</u>	NR (for all types)	NR (for all types)
<i>Operable</i>	1.82 <u>1.76</u>	0.36		1.82 <u>1.76</u>	0.36		2.50 <u>2.16</u>		
<i>Entrance door</i>	3.58	0.36		3.58	0.36		3.58		
<i>Skylight, 0% to 3% of Roof</i>									
All types	2.33 <u>2.27</u>	NR	NR	2.33 <u>2.27</u>	NR	NR	4.26 <u>3.12</u>	NR	NR

Modify Section 12 as follows:

Table 12.5.1 Modeling Requirements for Calculating Design Energy Cost and Energy Cost Budget

Proposed Design (Column A) Design Energy Cost (DEC)	Budget Building Design (Column B) Energy Cost Budget (ECB)
5. Building Envelope	
<i>(unchanged)</i>	<p>d. No shading projections are to be modeled; <i>fenestration</i> shall be assumed to be flush with the <i>wall</i> or <i>roof</i>. If the <i>fenestration area</i> for new <i>buildings</i> or additions exceeds the maximum allowed by Section 5.5.4.2, the area shall be reduced proportionally along each exposure until the limit set in Section 5.5.4.2 is met. If the <i>vertical fenestration area</i> facing west or east of the <i>proposed design</i> exceeds the area limit set in Section 5.5.4.5 then the <i>energy cost budget</i> shall be generated by simulating the <i>budget building design</i> with its actual <i>orientation</i> and again after rotating the entire <i>budget building design</i> 90, 180, and 270 degrees and then averaging the results. <i>Fenestration U-factor</i> shall be equal to the criteria from Tables 5.5-0 through 5.5-8 for the appropriate climate <u>without use of <i>fenestration</i> footnotes</u>, and the <i>SHGC</i> shall be equal to the criteria from Tables 5.5-0 through 5.5-8 for the appropriate climate. For portions of those tables where there are no <i>SHGC</i> requirements, the <i>SHGC</i> shall be equal to that determined in accordance with Section C3.6(d). The <i>VT</i> shall be equal to that determined in accordance with Section C3.6(d). The <i>fenestration</i> model for <i>building envelope alterations</i> shall reflect the limitations on area, <i>U-factor</i>, and <i>SHGC</i> as described in Section 5.1.4.</p>

(rest of table unchanged)

Modify Appendix C as follows:

C3.6 Calculation of Base Envelope Performance Factor. The simulation model for calculating the *base envelope performance factor* shall modify the simulation model for calculating the *proposed envelope performance factor* as follows:

...

- d. *Fenestration* shall be assumed to be flush with the *wall* or *roof*. *Fenestration U-factor* and *SHGC* shall be the maximum allowed for the appropriate *class of construction*, *space conditioning category*, and climate zone in accordance with Section 5.5.4 without use of *fenestration* footnotes in Tables 5.5-5 through 5.5-7. Where there is no *SHGC* requirement, the *SHGC* shall be equal to 0.40 for all *vertical fenestration* and 0.55 for *skylights*. The *VT* for *fenestration* in the base envelope design shall be equal to 1.10 times the *SHGC*.

...

(rest of section unchanged)