BSR/ASHRAE/IES Addendum d
to ANSI/ASHRAE/IES Standard 90.2-2024

Public Review Draft

Proposed Addendum d to Standard 90.2-2024, High-Performance Energy Design of Residential Buildings

First Public Review (December 2025)
(Draft Shows Proposed Changes to Current Standard)

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FOREWORD

This proposal makes changes to the envelope backstop tables to align with current minimum national model code requirements by removing Table 6.3 and makes associated updates to cross references throughout. These changes include:

- *Updates to U-value tables to align with IECC-2024 and address the perception from potentially adopting jurisdictions that it is not as stringent as the current IECC-Residential code.*
- *Updates to associated footnotes*
- *Update to definition of warm-humid*
- *Removal of separate solar U-value table*
- *Removal of references to solar U-value table*
- *Update to normative reference for IECC-R from 2021 to 2024*

[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by <u>underlining</u> (for additions) and ~~strikethrough~~ (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 d to 90.2-2024

Modify Section 5.1.1 as follows

5.1.1 Prescriptive Compliance. *Additions* shall comply with Section 5.1.1(a) through (d):

a. Envelope assemblies: All new envelope *assemblies* comprising the *addition* shall meet or exceed the envelope *assembly* characteristics of Table <u>7-1</u> ~~6-3~~ and Table 7-2.
b. Heating and cooling systems: New heating, cooling, and duct systems that are part of the *addition* shall comply with Section 7.2 and either Table 5-1 or Table 5-2.
c. *Service water heating* systems: New *service water heating* systems that are part of the *addition* shall comply with Section 7.4 and Table 5-3.
d. Lighting: New lighting systems that are part of the *addition* shall comply with Section 7.5.

Modify Section 5.2.1 as follows

5.2.1 Envelope Assemblies. All new envelope *assemblies* comprising the *alteration* shall meet or exceed the envelope *assembly* characteristics of Table ~~6-3~~ 7-1 and Table 7-2.

Remove and Reserve Section 6.2.3 as follows

6.2.3 Reserved. ~~Building Thermal Envelope.~~ ~~Where renewable energy systems are used, the building *envelope components* shall have solar heat gain coefficient (SHGC) values and U-factors no greater than the values shown in Table 6-3.~~

Remove Table 6.3 as follows

~~Table 6-3 Maximum SHGC and U-Factors when Renewable Energy Systems are Used (I-P Units)~~

	~~Maximum SHGC~~			~~Maximum U-Factors~~						
~~Climate Zone~~	~~Glazed Fenestration~~	~~Skylights~~	~~Fenestration~~	~~Skylights~~	~~Ceilings~~	~~Frame Walls~~	~~Mass Walls~~	~~Floors~~	~~Basement Walls~~	~~Crawlspace Walls~~
~~0~~	~~0.25~~	~~0.30~~	~~0.50~~	~~0.75~~	~~0.035~~	~~0.084~~	~~0.197~~	~~0.064~~	~~0.360~~	~~0.477~~
~~1~~	~~0.25~~	~~0.30~~	~~0.50~~	~~0.75~~	~~0.035~~	~~0.084~~	~~0.197~~	~~0.064~~	~~0.360~~	~~0.477~~
~~2~~	~~0.25~~	~~0.30~~	~~0.40~~	~~0.65~~	~~0.030~~	~~0.084~~	~~0.165~~	~~0.064~~	~~0.360~~	~~0.477~~
~~3~~	~~0.25~~	~~0.30~~	~~0.35~~	~~0.55~~	~~0.030~~	~~0.060~~	~~0.098~~	~~0.047~~	~~0.091[a]~~	~~0.136~~
~~4 except Marine~~	~~0.40~~	~~0.40~~	~~0.35~~	~~0.55~~	~~0.026~~	~~0.060~~	~~0.098~~	~~0.047~~	~~0.059~~	~~0.065~~
~~Marine 4 and 5~~	~~NR~~	~~NR~~	~~0.32~~	~~0.55~~	~~0.026~~	~~0.060~~	~~0.082~~	~~0.033~~	~~0.050~~	~~0.055~~
~~6~~	~~NR~~	~~NR~~	~~0.32~~	~~0.55~~	~~0.026~~	~~0.045~~	~~0.060~~	~~0.033~~	~~0.050~~	~~0.055~~
~~7~~	~~NR~~	~~NR~~	~~0.32~~	~~0.55~~	~~0.026~~	~~0.045~~	~~0.057~~	~~0.028~~	~~0.050~~	~~0.055~~
~~8~~	~~NR~~	~~NR~~	~~0.32~~	~~0.55~~	~~0.026~~	~~0.045~~	~~0.057~~	~~0.028~~	~~0.050~~	~~0.055~~

~~a. The required U-factor is 0.360 for warm-humid locations as defined by Figure R301.1 and Table 301.1 in the IECC.[3]~~

Table 6-3 Maximum SHGC and U-Factors when Renewable Energy Systems are Used (SI Units)

	Maximum SHGC		Maximum U-factors							
Climate Zone	Glazed Fenestration	Skylights	Fenestration	Skylights	Ceilings	Frame Walls	Mass Walls	Floors	Basement Walls	Crawlspace Walls
0	0.25	0.30	2.84	4.26	0.20	0.48	1.12	0.36	2.04	2.71
1	0.25	0.30	2.84	4.26	0.20	0.48	1.12	0.36	2.04	2.71
2	0.25	0.30	2.27	3.69	0.17	0.48	0.94	0.36	2.04	2.71
3	0.25	0.30	1.99	3.12	0.17	0.34	0.56	0.27	0.52[a]	0.77
4 except Marine	0.40	0.40	1.99	3.12	0.15	0.34	0.56	0.27	0.34	0.37
Marine 4 and 5	NR	NR	1.82	3.12	0.15	0.34	0.47	0.19	0.28	0.31
6	NR	NR	1.82	3.12	0.15	0.26	0.34	0.19	0.28	0.31
7	NR	NR	1.82	3.12	0.15	0.26	0.32	0.16	0.28	0.31
8	NR	NR	1.82	3.12	0.15	0.26	0.32	0.16	0.28	0.31

Modify Section 7.1 as follows (align w/ 2024 IECC)

Table 7-1 Envelope Component Maximum SHGC and U-Factors (I-P)

	Maximum SHGC	Maximum U-factors							
Climate Zone	Glazed Fenestration	Fenestration	Skylights	Ceilings	Frame Walls	Mass Walls	Floors	Basement Walls	Crawlspace Walls
0	~~0.30~~0.28	~~1.2~~ 0.50	~~0.75~~0.60	0.035	0.082	0.197 [a]	0.064	0.360	0.477
1	~~0.30~~0.28	~~1.2~~0.50	~~0.75~~0.60	0.035	0.082	0.197 [a]	0.064	0.360	0.477
2	~~0.30~~0.28	~~0.65~~0.40	~~0.75~~0.60	~~0.035~~0.030	0.082	0.165 [a]	0.064	0.360	0.477
3	~~0.30~~0.28	~~0.50~~0.30	~~0.65~~0.53	~~0.035~~0.026	~~0.082~~0.060	~~0.141~~ 0.098[a]	0.047	0.091 [b]	0.136
4 except Marine	~~NR~~ 0.40	~~0.35~~0.30	~~0.60~~0.53	~~0.030~~0.026	~~0.082~~0.045	~~0.141~~ [a] 0.098[a]	0.047	0.059	0.065
Marine 4 and 5	NR	~~0.35~~0.28	~~0.60~~0.50	~~0.030~~0.026	~~0.057~~0.045	0.082	0.033	0.050~~9~~	~~0.065~~0.055
6	NR	~~0.35~~0.28	~~0.60~~0.50	0.026	~~0.057~~0.045	0.060	0.033	0.050	~~0.065~~0.055
7	NR	~~0.35~~0.27	~~0.60~~0.50	0.026	~~0.057~~0.045	0.057	0.033	0.050	~~0.065~~0.055
8	NR	~~0.35~~0.27	~~0.60~~0.50	0.026	~~0.057~~0.045	0.057	~~0.033~~0.028	0.050	~~0.065~~0.055

a. Where greater than half of a *mass wall*'s insulation is on the interior, the maximum U-factor shall be as follows: 0.170 in Climate Zones 0 and 1, 0.140 in Climate Zone 2, ~~0.120~~ 0.080 in Climate Zone 3~~,~~ and ~~0.100 in~~ Climate Zone 4 except Marine~~.~~, and 0.048 for Climate Zones Marine 4, 5, 6, 7, and 8.
b. The required U-factor is 0.360 for warm-humid locations as defined by R301.3 ~~Figure R301.1 and Table 301.1 in~~ of the IECC.[3]

Table 7-1 Envelope Component Maximum SHGC and U-factors (SI)

	Maximum SHGC	Maximum U-factors							
Climate Zone	Glazed Fenestration	Fenestration	Skylights	Ceilings	Frame Walls	Mass Walls	Floors	Basement Walls	Crawlspace Walls
0	~~0.30~~0.28	~~6.82~~2.84	~~4.26~~3.41	0.20	0.47	1.12 [a]	0.36	2.04	2.71
1	~~0.30~~0.28	~~6.82~~2.84	~~4.26~~3.41	0.20	0.47	1.12 [a]	0.36	2.04	2.71
2	~~0.30~~0.28	~~3.69~~2.27	~~4.26~~3.41	~~0.20~~0.17	0.47	0.94 [a]	0.36	2.04	2.71
3	~~0.30~~0.28	~~2.84~~1.70	~~3.69~~3.00	~~0.20~~0.15	~~0.47~~0.34	~~0.80~~0.56 [a]	0.27	0.52 [b]	0.77
4 except Marine	~~NR~~ 0.40	~~1.99~~1.70	~~3.41~~3.00	~~0.17~~0.15	~~0.47~~0.26	~~0.80~~0.56 [a]	0.27	0.34	0.37
Marine 4 and 5	NR	~~1.99~~1.59	~~3.41~~2.84	~~0.17~~0.15	~~0.32~~0.26	0.47	0.19	0.34	~~0.37~~0.31
6	NR	~~1.99~~1.59	~~3.41~~2.84	0.15	~~0.32~~0.26	0.34	0.19	0.28	~~0.37~~0.31
7	NR	~~1.99~~1.53	~~3.41~~2.84	0.15	~~0.32~~0.26	0.32	0.19	0.28	~~0.37~~0.31
8	NR	~~1.99~~1.53	~~3.41~~2.84	0.15	~~0.32~~0.26	0.32	~~0.19~~0.16	0.28	~~0.37~~0.31

a. Where greater than half of a *mass wall*'s insulation is on the interior, the maximum U-factor shall be as follows: 0.170 in Climate Zones 0 and 1, 0.140 in Climate Zone 2, ~~0.120~~ 0.45 in Climate Zone 3~~,~~ and ~~0.100 in~~ Climate Zone 4 except Marine~~.~~, and 0.27 for Climate Zones Marine 4, 5, 6, 7, and 8.
b. The required U-factor is 0.360 for warm-humid locations as defined by R301.3 ~~Figure R301.1 and Table 301.1 in~~ of the IECC.[3]

Modify D1.2 as follows

D1.2 Installed insulation ~~materials, thickness amounts, and locations~~ shall comply with *the proposed design*. ~~In no case shall installed insulation thickness amounts be less than those required to deliver the maximum U-factors defined in Table 6-3 or Table 7-1, as applicable.~~

Modify Table H-1 as follows

Table H-1 Sample Plan Review Inspection Checklist

Project address or location		[Home Address]	
Builder's name and phone number			
Builder's e-mail address			
Climate zone		House Size, ft^2	Orientation
Building Thermal Envelope Compliance			Notes
Conditioned floor area defined		☐ Yes ☐ No	
U-Factor values listed for all *fenestration*		☐ Yes ☐ No	
SHGC values listed for all *fenestration*		☐ Yes ☐ No	
Insulation materials listed with R-values		☐ Yes ☐ No	
Mechanical Compliance			Notes
HVAC equipment listed (List equipment types, sizes and efficiencies in the notes.)		☐ Yes ☐ No	
Manual J included and project address/location verified		☐ Yes ☐ No	
Duct design defined, including duct layout that identifies duct sizes, duct lengths, fittings, transitions, locations, insulation materials, R-value sealing requirements, and design values for cfm, external static pressure, and utilized friction rate		☐ Yes ☐ No	
Service water heating equipment listed (List equipment size, type, and efficiency in the notes.)		☐ Yes ☐ No	
Pipe design defined, including locations, insulation materials and R-values		☐ Yes ☐ No	
Lighting Compliance			Notes
Lighting fixture schedule, lumens, and wattage listed		☐ Yes ☐ No	
Modeling Compliance			Notes
Name and version of the simulation program employed listed		☐ Yes ☐ No	
The *proposed design* adheres to the modeling rule set defined in Section 6.1 (unless *on-site power production* or *off-site power production* is being utilized).		☐ Yes ☐ No	
The *proposed design* meets the *ERI* appropriate for its climate zone, per Table 6-1.		☐ Yes ☐ No	
Renewable Energy System			Notes
On-site power production system or *off-site power production* system defined, including *renewable energy* source and projected kW output		☐ Yes ☐ No	
Complies with *the building thermal envelope* elements in Table <u>7-1</u> ~~6-3~~		☐ Yes ☐ No	

Sign below to confirm that the above information is listed on the constructed documents submitted.

Jurisdiction having authority:		
Inspectors name (printed):		
Inspectors signature:		Date:

Modify Section 10 as follows

10. NORMATIVE REFERENCES

...

3. ICC. ~~2021~~ 2024. International Energy Conservation Code. Country Club Hills, IL: International Code Council.