

AGENDA

UNIFORM BUILDING CODE COMMISSION
MECHANICAL ADVISORY COMMITTEE
MEETING

March 8, 2022 3:00

Anchor Location

Heber M Wells Building Rm 474
160 E 300 S
Salt Lake City UT 84114

Join with Google Meet

meet.google.com/jsn-gggy-xec

Join by phone

(US) +1 617-675-4444 PIN: 666 532 571 6152#

This agenda is subject to change up to 24 hours prior to the meeting.

1. Roll call
2. Approve minutes from the February 8, 2022 meeting
3. Start the review of the energy portion of the 2021 IRC and current & proposed Amendments
 - Table R405.4.2(1)
 - Table R1102.1.2 (R402.1.2) / Table N1102.1.3 (R402.1.3)
 - Chapter 11
 - N1101.13 (R401.2)/ N1101.13.5 (R401.2.5)/N1108(R408)
 - N1101.14 (R401.3)#7
 - N1102.2.1(R402.2.1)/N1102.3.2 (R402.3.3)/N1102.3.4 (R402.3.4)
 - N1102.2.9.1 (R402.2.9.1)
 - Table N1102.4.1.1 (R402.4.1.1)/N1102.4.6 (R402.4.6)
 - N1102.4.1.3 (R402.4.1.3)



In compliance with the Americans with Disabilities Act, individuals needing special accommodations (including auxiliary communicative aids and services) during this meeting should notify Dave Taylor, ADA Coordinator, at least three working days prior to the meeting. Division of Occupational and Professional Licensing, 160 East 300 South, Salt Lake City UT 84115, Phone 530-6628 or toll-free in Utah only 866-275-3675.

N1103.3.1 (R403.3.1)
N1103.5.1.1 (R403.5.1.1)
N1103.6.3 (R403.6.3)
N1104.2 (R404.2 / N1104.3 (R404.3))
N1105.2 (R405.2)
N1106.3 (R406.3) / N1106.3.1 (406.3.1) / N1106.3.2 (R406.3.2) / N1106.4 (R406.4)

Next Scheduled Meeting: April 12, 2022

If you do not plan on attending this meeting, please call Sharon at 530-6163 or email at ssmalley@utah.gov



In compliance with the Americans with Disabilities Act, individuals needing special accommodations (including auxiliary communicative aids and services) during this meeting should notify Dave Taylor, ADA Coordinator, at least three working days prior to the meeting. Division of Occupational and Professional Licensing, 160 East 300 South, Salt Lake City UT 84115, Phone 530-6628 or toll-free in Utah only 866-275-3675.

MINUTES

UNIFORM BUILDING CODE COMMISSION
MECHANICAL ADVISORY COMMITTEE

Meeting

February 8, 2022 3:00 pm

Convened 3:04 PM

Adjourned 4:48

STAFF:

Steve Duncombe, Bureau Manager
Sharon Smalley, Board Secretary

MECHANICAL ADVISORY COMMITTEE:

| | |
|-----------------|--------------------------------|
| David Halverson | David Wilson |
| Clay Monroe | Chris Jensen |
| Terry Palmer | Alyssa Wahlin |
| Martin Carillo | Trent Hunt, Commission Liaison |

VISITORS:

| | |
|------------------|------------------|
| Brent Ursenbach | Macario Garcia |
| Nicholas Schou | Max Marchand |
| Donald Jarvis | Mitch Richardson |
| Eric Lacey | Peter Nelson |
| Jim Meyers | Shawn Teigen |
| Kevin Emerson | Teddy Charlton |
| Shellie Barrus | Tom Mills |
| Thomas Kessinger | Steve Thob |
| Tyler Poulson | Mike Orton |
| 1-347-***-**19 | Soren Simonsen |
| 1-801-***-**29 | |

INTRODUCE NEW MEMBER

Alyssa Wahlin is a new member for this committee. She introduced herself and gave her background.

MINUTES

A motion was made by Dave Wilson to approve the minutes from the January 18, 2022 meeting as written. The motion was seconded by Chris Jensen and passed unanimously.

REVIEW PROPOSED AMENDMENT TO 2021 IECC, SECTIONS R103, R105, R202, R401, R402, R403, R404, R405, AND R406 WITH ADDITIONAL CORRECTIONS

Thomas Kessinger spoke to those present in connection with the proposed amendment for Electric Ready Homes for the 2021 IRC. He worked with Chris Jensen to identify the corrections that needed to be made for the electrical terminology. Following the discussion by all present, a motion was made by Dave Wilson to approve the proposal as modified. The motion was seconded by Martin Carillo and passed with a vote of six in favor and Alyssa Wahlin voting in opposition.

REVIEW PROPOSED AMENDMENT FOR 2015 IRC SECTION M1401.3 AND N1103.7

It was pointed out that this proposal has already be included as part of House Bill 39 and is being reviewed during this legislative session. Follow the discussion by all present, a motion was made by Martin Carillo that a statement be issued asking for a further study and evaluation of the effects, complaints and remedies necessary to fix the issues and to study the ramifications of this amendment before a decision can be made. The motion was seconded by Dave Wilson and passed unanimously. A second motion was made by Terry Palmer to make a recommendation to the Commission and the legislature to accept the offer from Rocky Mountain Gas Association to complete the site specific study of homes already having a problem with the mechanical system to determine what the exact problem is before the amendment is approved. The motion was seconded by Dave Wilson and passed unanimously.

START THE REVIEW OF THE ENERGY PORTION OF THE 2021 IRC AND CURRENT AMENDMENTS

The committee decided to start this review at the March meeting.

The meeting adjourned at 4:48.

Note: These minutes are not intended to be a verbatim transcript but are intended to record the significant features of the business conducted in this meeting. Discussed items are not necessarily shown in the chronological order they occurred.

UTAH DEPARTMENT OF COMMERCE
DIVISION OF OCCUPATIONAL AND PROFESSIONAL LICENSING
160 East 300 South Salt Lake City UT 84111
PO Box 146741 Salt Lake City UT 84114-6741
E-mail: b8@utah.gov
Web: www.dopl.utah.gov

REQUEST FOR CODE AMENDMENT

| | |
|---|---------------------|
| Requesting Agency/Person: Utah State HBA | Date: 1/24/2021 |
| Street Address: 38 West 13775 South | |
| City, State, Zip Draper, UT 84020 | |
| Contact Person: Ross Ford | Phone: 801-352-8266 |
| Code to be Amended: 2021 IRC / IECC 2021 (Include edition) | |
| Section: TABLE R405.4.2(1) N 1105.4.2(1) | |
| Section Title: SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS | |

AMENDMENT: Corrections to Standard Reference Designs

Type proposed amendment in rule change form. (Using strikeout on portions being removed and underline on all new wording.)

1. Include the entire section you wish to amend.
2. Attach additional sheets if necessary.

See attached changes.

Purpose of or Reason for the amendment:

These amendments bring the table into compliance with other changes effective in other parts of the building code as amended, including the Utah version of RESCheck already in use.

Cost or Savings Impact of Amendment:

No change

Compliance Costs for Affected Persons (APerson@ means any individual, partnership, corporation, association, governmental entity, or public or private organization of any character other than an agency.) (You must break out the impact cost to State Budget, Local Government and you must state aggregate cost to other persons {cost per person times number of persons affected}):

None

Signature:

Date:

For Division Use:

Date Received:

Committee Action:

- Approved Denied
 Approved with revisions
 Referred to:
 Tabled

UBC Commission Decision for Hearing:

- Approved for hearing Denied
 Approved with revisions
 Referred to:
 Tabled

Date Filed:

Public Hearing Date:

UBC Commission Decision for Adoption:

- Approved Denied
 Approved with revisions
 Referred to:
 Tabled

Effective Date:

TABLE R405.4.2(1)—continued
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

| BUILDING COMPONENT | STANDARD REFERENCE DESIGN | PROPOSED DESIGN | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|--|--|--|------|---------|-------------------|--|-------|-------|---|-------------|-------------|------|-------------|--------------|------|-------|--------|------|
| Air exchange rate | The air leakage rate at a pressure of 0.2 inch w.g. (50 Pa) shall be Climate Zones 0 through 2; 5.0 air changes per hour. NAHB Climate Zones 3 through 8 : 3.0 5.0 air changes per hour. | The measured air exchange rate. ^a | | | | | | | | | | | | | | | | | | |
| | The mechanical ventilation rate shall be in addition to the air leakage rate and shall be the same as in the proposed design, but no greater than $0.01 \times \text{CFA} + 7.5 \times (\text{N}_{br} + 1)$ where: CFA = conditioned floor area N _{br} = number of bedrooms The mechanical ventilation system type shall be the same as in the proposed design. Energy recovery shall not be assumed for mechanical ventilation. | The mechanical ventilation rate ^b shall be in addition to the air leakage rate and shall be as proposed | | | | | | | | | | | | | | | | | | |
| Heating systems ^{d,e} | NAHB For other than electric heating without a heat pump, as proposed. Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section C403 of the International Energy Conservation Code—Commercial Provisions. Fuel Type: same as proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum standards Nonelectric furnace: natural gas furnace with prevailing federal minimum standards Nonelectric boilers: natural gas boiler with prevailing federal minimum standards Capacity: sized in accordance with Section N11403.7 | As proposed As proposed As proposed As proposed As proposed | | | | | | | | | | | | | | | | | | |
| | Cooling systems ^{d,f} | As proposed Fuel Type: Electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section N11403.7. | As proposed As proposed As proposed As proposed | | | | | | | | | | | | | | | | | |
| Service water Heating ^{d,g} | As proposed Fuel Type: same as proposed design Efficiency: in accordance with prevailing federal minimum standards Use in units of gal/day = $30 + (10 \times \text{N}_{br})$ where: N _{br} = number of bedrooms Tank temperature: 120 °F | As proposed As proposed Same as standard reference Same as standard reference Same as standard reference Use, in units of gal/day = $25.5 \times (8.5 \times \text{N}_{br}) \times (1 - \text{HWDS})$ where: N _{br} = number of bedrooms HWDS = factor for the compactness of the hot water distribution system: <table border="1" data-bbox="1040 1709 1406 1883"> <thead> <tr> <th colspan="2">Compactness ratio factor</th> <th>HWDS</th> </tr> <tr> <th>1-story</th> <th>2-or-more stories</th> <th></th> </tr> </thead> <tbody> <tr> <td>> 60%</td> <td>> 30%</td> <td>0</td> </tr> <tr> <td>> 30% ≤ 60%</td> <td>> 15% ≤ 30%</td> <td>0.05</td> </tr> <tr> <td>> 15% ≤ 30%</td> <td>> 7.5% ≤ 15%</td> <td>0.10</td> </tr> <tr> <td>< 15%</td> <td>< 7.5%</td> <td>0.15</td> </tr> </tbody> </table> | Compactness ratio factor | | HWDS | 1-story | 2-or-more stories | | > 60% | > 30% | 0 | > 30% ≤ 60% | > 15% ≤ 30% | 0.05 | > 15% ≤ 30% | > 7.5% ≤ 15% | 0.10 | < 15% | < 7.5% | 0.15 |
| Compactness ratio factor | | HWDS | | | | | | | | | | | | | | | | | | |
| 1-story | 2-or-more stories | | | | | | | | | | | | | | | | | | | |
| > 60% | > 30% | 0 | | | | | | | | | | | | | | | | | | |
| > 30% ≤ 60% | > 15% ≤ 30% | 0.05 | | | | | | | | | | | | | | | | | | |
| > 15% ≤ 30% | > 7.5% ≤ 15% | 0.10 | | | | | | | | | | | | | | | | | | |
| < 15% | < 7.5% | 0.15 | | | | | | | | | | | | | | | | | | |

UTAH DEPARTMENT OF COMMERCE
DIVISION OF OCCUPATIONAL AND PROFESSIONAL LICENSING
160 East 300 South Salt Lake City UT 84111
PO Box 146741 Salt Lake City UT 84114-6741
E-mail: b8@utah.gov
Web: www.dopl.utah.gov

REQUEST FOR CODE AMENDMENT

| | |
|---|----------------------------|
| Requesting Agency/Person: Utah State HBA | Date: 1/24/2021 |
| Street Address: 38 West 13775 South | |
| City, State, Zip Draper, UT 84020 | |
| Contact Person: Ross Ford | Phone: 801-352-8266 |
| Code to be Amended: 2021 IRC / IECC 2021 (Include edition) | |
| Section: TABLE R1102.1.2 (R402.1.2) / TABLE N1102.1.3 (R402.1.3) | |
| Section Title: <small>MAXIMUM ASSEMBLY U-FACTORS a AND FENESTRATION REQUIREMENTS / INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT</small> | |

| |
|---|
| AMENDMENT: R-Value / U Factor Corrections |
| Type proposed amendment in rule change form. (Using strikeout on portions being removed and underline on all new wording.) 1. Include the entire section you wish to amend. 2. Attach additional sheets if necessary. See attached sheet with modifications to tables for Climate Zones 3, 5 and 6. |

Purpose of or Reason for the amendment:

See attached Explanation Sheets referenced in proposed changes (i.e. NAHB E4) for detailed reasons and explanations, along with cost and payback data. However, in short, payback periods of 24 - 122 years are not reasonable investments to force on Utah families when purchasing a home.

Cost or Savings Impact of Amendment:

| Ref # | Brief Description | Cost | Payback if Implemented |
|-------|------------------------|---------|------------------------|
| E3 | Ceiling Insulation CZ3 | \$1,366 | 122 years |
| E4 | Ceiling Insulation CZ5 | \$1,366 | 118 years |
| E4 | Ceiling Insulation CZ6 | \$1,366 | 105 years |
| E19 | Wall Insulation CZ3 | \$1,199 | 24 years |
| E1 | Wall Insulation CZ5 | \$4,970 | 78 years |
| E20 | Wall Insulation CZ6 | \$1,819 | 55 years |
| E18 | Basement Wall CZ5 | \$590 | 84 years |
| E2 | Slab Insulation CZ3 | \$1,988 | 23 years |
| E2 | Slab Insulation CZ5 | \$993 | 28 years |

See attached sheets labelled with Ref # at Left for detailed cost and back data for each proposed change.

Compliance Costs for Affected Persons (APerson@ means any individual, partnership, corporation, association, governmental entity, or public or private organization of any character other than an agency.) (You must break out the impact cost to State Budget, Local Government and you must state aggregate cost to other persons {cost per person times number of persons affected}):

None

Signature:

Date:

For Division Use:

Date Received:

Committee Action:

- Approved Denied
 Approved with revisions
 Referred to:
 Tabled

UBC Commission Decision for Hearing:

- Approved for hearing Denied
 Approved with revisions
 Referred to:
 Tabled

Date Filed:

Public Hearing Date:

UBC Commission Decision for Adoption:

- Approved Denied
 Approved with revisions
 Referred to:
 Tabled

Effective Date:

**TABLE R1102.1.2 (R402.1.2)
MAXIMUM ASSEMBLY U-FACTORS ^a AND FENESTRATION REQUIREMENTS**

| CLIMATE ZONE | FENESTRATION U-FACTOR ^f | SKYLIGHT U-FACTOR | GLAZED FENESTRATION SHGC ^{d,e} | CEILING U-FACTOR | WOOD FRAME WALL U-FACTOR | MASS WALL U-FACTOR ^b | FLOOR U-FACTOR | BASEMENT WALL U-FACTOR | CRAWL SPACE WALL U-FACTOR |
|----------------|------------------------------------|-------------------|---|--|--------------------------------------|---------------------------------|----------------|--------------------------------------|---------------------------|
| 3 | 0.30 | 0.55 | 0.25 | NAHBE3 0.030 0.026 | NAHBE19 0.060 0.084 | 0.098 | 0.047 | 0.091 ^e | 0.136 |
| 5 and Marine 4 | 0.30 | 0.55 | NR | NAHBE4 0.026 0.024 | NAHBE1 0.045 0.060 | 0.082 | 0.033 | NAHBE18 0.050 0.059 | 0.055 |
| 6 | 0.30 | 0.55 | NR | NAHBE4 0.026 0.024 | NAHBE20 0.045 0.060 | 0.060 | 0.033 | 0.050 | 0.055 |

**TABLE N1102.1.3 (R402.1.3)
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT ^a**

| CLIMATE ZONE | FENESTRATION U-FACTOR ^{b,i} | SKYLIGHT U-FACTOR | GLAZED FENESTRATION SHGC ^{b,e} | CEILING R-VALUE | WOOD FRAME WALL R-VALUE ^g | MASS WALL R-VALUE ^h | FLOOR R-VALUE | BASEMENT WALL R-VALUE ^{c,g} | SLAB ^d R-VALUE & DEPTH | CRAWL SPACE ^{c,g} WALL R-VALUE |
|--------------|--------------------------------------|-------------------|---|-------------------------------|---|--------------------------------|---------------|--|---|---|
| 3 | 0.30 | 0.55 | 0.25 | NAHBE3 49 38 | NAHBE19 20 + 5 or 13 + 5 10ci 0 + 15 | 8/13 | 19 | 5 ci or 13 ^f | NAHBE2 10ci, 2 ft 0 | 5 ci or 13 ^f |
| 5 & Marine 4 | 0.30 ⁱ | 0.55 | 0.40 | NAHBE4 60 49 | NAHBE1 20 + 5 or 13 + 5 10ci 0 + 15 | 13/17 | 30 | NAHBE18 10 ci or 13 15ci or 19 or 13 + 5ci | NAHBE2 10ci, 4 ft 10ci, 2 ft | 15ci or 19 or 13 + 5ci |
| 6 | 0.30 ⁱ | 0.55 | NR | NAHBE4 60 49 | NAHBE20 20 + 5 or 13 + 5 10ci or 0 + 15 20 | 15/20 | 30 | 15ci or 19 or 13 + 5ci | 10ci, 4 ft | 15ci or 19 or 13 + 5ci |

Summary of Costs and Payback. See attached Explanation sheets with corresponding Ref # for full details.

| Ref # | Brief Description | Cost | Payback if Implemented |
|-------|------------------------|----------|------------------------|
| E3 | Ceiling Insulation CZ3 | \$ 1,366 | 122 years |
| E4 | Ceiling Insulation CZ5 | \$ 1,366 | 118 years |
| E4 | Ceiling Insulation CZ6 | \$ 1,366 | 105 years |
| E19 | Wall Insulation CZ3 | \$ 1,199 | 24 years |
| E1 | Wall Insulation CZ5 | \$ 4,970 | 78 years |
| E20 | Wall Insulation CZ6 | \$ 1,819 | 55 years |
| E18 | Basement Wall CZ5 | \$ 590 | 84 years |
| E2 | Slab Insulation CZ3 | \$ 1,988 | 23 years |
| E2 | Slab Insulation CZ5 | \$ 993 | 28 years |

E1. Wall R-Value/U-Factor Corrections (Climate Zones 4 & 5)

This amendment modifies the prescriptive wall insulation levels for above-grade framed walls from R-20+5 to R-20 and R-13+10 to R-13+5. It restores prescriptive options for walls with cavity-only insulation.

Revise as follows:

R402.1.2 Insulation and fenestration criteria. The building thermal envelope shall meet the requirements of Table R402.1.2, based on the climate zone specified in Chapter 3. Assemblies shall have a U-factor equal to or less than that specified in Table R402.1.2. Fenestration shall have a U-Factor and glazed fenestration SHGC equal to or less than that specified in Table R402.1.2.

R402.1.3 R-value alternative. Assemblies with R-value of insulation materials equal to or greater than that specified in Table R402.1.3 shall be an alternative to the U-factor in Table R402.1.2.

TABLE R402.1.2
MAXIMUM ASSEMBLY U-FACTORS^a AND FENESTRATION REQUIREMENTS

| CLIMATE ZONE | FENESTRATION U-FACTOR ⁱ | SKYLIGHT U-FACTOR | GLAZED FENESTRATION SHGC ^{d,*} | CEILING U-FACTOR | WOOD FRAME WALL U-FACTOR | MASS WALL U-FACTOR ^b | FLOOR U-FACTOR | BASEMENT WALL U-FACTOR | CRAWL SPACE WALL U-FACTOR |
|-----------------|------------------------------------|-------------------|---|------------------|---------------------------|---------------------------------|----------------|------------------------|---------------------------|
| 0 | 0.50 | 0.75 | 0.25 | 0.035 | 0.084 | 0.197 | 0.064 | 0.360 | 0.477 |
| 1 | 0.50 | 0.75 | 0.25 | 0.035 | 0.084 | 0.197 | 0.064 | 0.360 | 0.477 |
| 2 | 0.40 | 0.65 | 0.25 | 0.026 | 0.084 | 0.165 | 0.064 | 0.360 | 0.477 |
| 3 | 0.30 | 0.55 | 0.25 | 0.026 | 0.060 | 0.098 | 0.047 | 0.091 ^e | 0.136 |
| 4 except Marine | 0.30 | 0.55 | 0.40 | 0.024 | 0.060 0.045 | 0.098 | 0.047 | 0.059 | 0.065 |
| 5 and Marine 4 | 0.30 | 0.55 | 0.40 | 0.024 | 0.060 0.045 | 0.082 | 0.033 | 0.050 | 0.055 |
| 6 | 0.30 | 0.55 | NR | 0.024 | 0.045 | 0.060 | 0.033 | 0.050 | 0.055 |
| 7 and 8 | 0.30 | 0.55 | NR | 0.024 | 0.045 | 0.057 | 0.028 | 0.050 | 0.055 |

Footnotes remain unchanged

TABLE R402.1.3
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT^a

| CLIMATE ZONE | FENESTRATION U-FACTOR ^{b,i} | SKYLIGHT ^b U-FACTOR | GLAZED FENESTRATION SHGC ^{b,*} | CEILING R-VALUE | WOOD FRAME WALL R-VALUE ^e | MASS WALL R-VALUE ^h | FLOOR R-VALUE | BASEMENT ^{c,g} WALL R-VALUE | SLAB ^d R-VALUE & DEPTH | CRAWL SPACE ^{c,g} WALL R-VALUE |
|--------------|--------------------------------------|--------------------------------|---|-----------------|--|--------------------------------|---------------|--------------------------------------|-----------------------------------|---|
| 0 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 1 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 2 | 0.40 | 0.65 | 0.25 | 49 | 13 or 0&10ci | 4/6 | 13 | 0 | 0 | 0 |
| 3 | .30 | 0.55 | 0.25 | 49 | 20 or 13&5ci ^h or 0 & 15ci ^h | 8/13 | 19 | 5ci or 13 ^f | 10ci, 2 ft | 5ci or 13 ^f |

| | | | | | | | | | | |
|-----------------|-------------------|------|------|----|--|-------|----|------------------------|------------|------------------------|
| 4 except Marine | .30 | 0.55 | 0.40 | 60 | 30 or 20&5ci ^h or 13&5ci ^h or 0 & 20ci ^h | 8/13 | 19 | 10ci or 13 | 10ci, 4 ft | 10ci or 13 |
| 5 and Marine 4 | 0.30 ⁱ | 0.55 | 0.40 | 60 | 30 or 20&5ci ^h or 13&5ci ^h or 0 & 20ci ^h | 13/17 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |
| 6 | 0.30 ⁱ | 0.55 | NR | 60 | 30 or 20&5ci ^h or 13&10ci ^h or 0 & 20ci ^h | 15/20 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |
| 7 and 8 | 0.30 ⁱ | 0.55 | NR | 60 | 30 or 20&5ci ^h or 13&10ci ^h or 0 & 20ci ^h | 19/21 | 38 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |

Footnotes remain unchanged

Reason:

This amendment restores wall insulation values to the 2018 IECC. The requirement for added levels of continuous insulation is onerous and unjustified for the following reasons:

- It has a small impact on the energy use. Removing this requirement from the code will change energy use only by **\$4.0** per month on average in **CZ 4** and **\$5.3** per month on average in **CZ 5** for a 2,600 square foot single-family house.
- The added cost to consumer of constructing wall assemblies with exterior insulation is \$4,970.
- Simple payback for the added level of insulation relative to the 2018 code is **103 years in CZ 4 and 78 years in CZ 5**.
- It leads to onerous installation requirements for cladding and fenestration over thick foam sheathing that are not commensurate with the small energy savings.
- Installing vinyl cladding directly over a thick layer of foam leads to challenges with ensuring that the nails are embedded into the framing and can impact resilience of the building during high wind events.
- The use of 20+5 assemblies limits interior vapor retarder options. Approved design is required for walls that use a Class I vapor retarder (e.g. sheet polyethylene).
- The net present value of the added continuous insulation over a 40-year useful life is negative – it costs much more than it saves over a 40-year period.
- The added continuous insulation results in a negative cash flow for the consumer throughout a 30-year mortgage – the consumer's total payment for the mortgage and energy bill is higher every month.

[Return to Summary Table](#)

E2. Slab Edge R-Value Correction (Climate Zones 3, 4 & 5)

This amendment restores the requirement for slab edge insulation in Climate Zones 3, 4, and 5.

Revise as follows:

R402.1.3 R-value alternative. Assemblies with R-value of insulation materials equal to or greater than that specified in Table R402.1.3 shall be an alternative to the U-factor in Table R402.1.2.

TABLE R402.1.3
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT^a

| CLIMATE ZONE | FENESTRATION U-FACTOR ^{b,1} | SKYLIGHT ^b U-FACTOR | GLAZED FENESTRATION SHGC ^{b,*} | CEILING R-VALUE | WOOD FRAME WALL R-VALUE ^o | MASS WALL R-VALUE ^h | FLOOR R-VALUE | BASEMENT ^{c,g} WALL R-VALUE | SLAB ^d R-VALUE & DEPTH | CRAWL SPACE ^{c,g} WALL R-VALUE |
|-----------------|--------------------------------------|--------------------------------|---|-----------------|--|--------------------------------|---------------|--------------------------------------|-------------------------------------|---|
| 0 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 1 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 2 | 0.40 | 0.65 | 0.25 | 49 | 13 or 0&10ci | 4/6 | 13 | 0 | 0 | 0 |
| 3 | .30 | 0.55 | 0.25 | 49 | 20 or 13&5ci ^h or 0 & 15ci ^h | 8/13 | 19 | 5ci or 13 ^f | 10ci, 2 ft 0 | 5ci or 13 ^f |
| 4 except Marine | .30 | 0.55 | 0.40 | 60 | 30 or 20&5ci ^h or 13&10ci ^h or 0&20ci ^h | 8/13 | 19 | 10ci or 13 | 10ci, 4 ft 10ci, 2 ft | 10ci or 13 |
| 5 and Marine 4 | 0.30 ⁱ | 0.55 | 0.40 | 60 | 30 or 20&5ci ^h or 13&10ci ^h or 0&20ci ^h | 13/17 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft 10ci, 2 ft | 15ci or 19 or 13 & 5ci |
| 6 | 0.30 ⁱ | 0.55 | NR | 60 | 30 or 20&5ci ^h or 13&10ci ^h or 0&20ci ^h | 15/20 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |
| 7 and 8 | 0.30 ⁱ | 0.55 | NR | 60 | 30 or 20&5ci ^h or 13&10ci ^h or 0&20ci ^h | 19/21 | 38 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |

Footnotes remain unchanged

Reason:

This amendment restores wall insulation values to the 2018 IECC. The requirement for added levels of slab insulation is onerous and unjustified for the following reasons:

- It has a small impact on the energy use: **\$7.3 per month on average in CZ 3** and **\$3.0 in CZ 4 & 5** for a 2,600 square foot single-family house.
- The added costs to consumer of installing slab insulation is \$1,988 in CZ3 and \$993 in CZ 4 & 5.
- This corresponds to a simple payback of **23 years in CZ 3** and **28 years in CZ 4 & 5**.
- Large parts of CZ 3 overlap with the area with very heavy termite infestation probability in the states of South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas (refer to Figure R318.4 in 2021 IRC). The decision to add slab insulation in CZ 3 should be made by the building designer based on several factors and should not be a requirement. The remainder of CZ 3, all of CZ 4, and part of CZ 5 are designated as moderate to heavy probability of termite infestation.

- The net present value of the added continuous insulation over a 40-year useful life is negative – it costs much more than it saves over a 40-year period.
- The added continuous insulation results in a negative cash flow for the consumer throughout 30-year mortgage – the consumer's total payment for the mortgage and energy bill is higher every month.

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E3. Attic R-Value/U-Factor Corrections (Climate Zones 2 & 3)

This amendment restores the prescriptive attic insulation levels from R-49 to R-38.

Revise as follows:

R402.1.2 Insulation and fenestration criteria. The building thermal envelope shall meet the requirements of Table R402.1.2, based on the climate zone specified in Chapter 3. Assemblies shall have a U-factor equal to or less than that specified in Table R402.1.2. Fenestration shall have a U-Factor and glazed fenestration SHGC equal to or less than that specified in Table R402.1.2.

R402.1.3 R-value alternative. Assemblies with R-value of insulation materials equal to or greater than that specified in Table R402.1.3 shall be an alternative to the U-factor in Table R402.1.2.

**TABLE R402.1.2
MAXIMUM ASSEMBLY U-FACTORS^a AND FENESTRATION REQUIREMENTS**

| CLIMATE ZONE | FENESTRATION U-FACTOR ^f | SKYLIGHT U-FACTOR | GLAZED FENESTRATION SHGC ^{g,*} | CEILING U-FACTOR | WOOD FRAME WALL U-FACTOR | MASS WALL U-FACTOR ^b | FLOOR U-FACTOR | BASEMENT WALL U-FACTOR | CRAWL SPACE WALL U-FACTOR |
|-----------------|------------------------------------|-------------------|---|--------------------------------------|--------------------------|---------------------------------|----------------|------------------------|---------------------------|
| 0 | 0.50 | 0.75 | 0.25 | 0.035 | 0.084 | 0.197 | 0.064 | 0.360 | 0.477 |
| 1 | 0.50 | 0.75 | 0.25 | 0.035 | 0.084 | 0.197 | 0.064 | 0.360 | 0.477 |
| 2 | 0.40 | 0.65 | 0.25 | 0.030 0.026 | 0.084 | 0.165 | 0.064 | 0.360 | 0.477 |
| 3 | 0.30 | 0.55 | 0.25 | 0.030 0.026 | 0.060 | 0.098 | 0.047 | 0.091 ^c | 0.136 |
| 4 except Marine | 0.30 | 0.55 | 0.40 | 0.024 | 0.045 | 0.098 | 0.047 | 0.059 | 0.065 |
| 5 and Marine 4 | 0.30 | 0.55 | 0.40 | 0.024 | 0.045 | 0.082 | 0.033 | 0.050 | 0.055 |
| 6 | 0.30 | 0.55 | NR | 0.024 | 0.045 | 0.060 | 0.033 | 0.050 | 0.055 |
| 7 and 8 | 0.30 | 0.55 | NR | 0.024 | 0.045 | 0.057 | 0.028 | 0.050 | 0.055 |

Footnotes remain unchanged

**TABLE R402.1.3
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT^a**

| CLIMATE ZONE | FENESTRATION U-FACTOR ^{b,i} | SKYLIGHT ^b U-FACTOR | GLAZED FENESTRATION SHGC ^{b,*} | CEILING R-VALUE | WOOD FRAME WALL R-VALUE ^g | MASS WALL R-VALUE ^h | FLOOR R-VALUE | BASEMENT ^{c,g} WALL R-VALUE | SLAB ^d R-VALUE & DEPTH | CRAWL SPACE ^{e,g} WALL R-VALUE |
|--------------|--------------------------------------|--------------------------------|---|--------------------------------|--|--------------------------------|---------------|--------------------------------------|-----------------------------------|---|
| 0 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 1 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 2 | 0.40 | 0.65 | 0.25 | 38 49 | 13 or 0&10ci | 4/6 | 13 | 0 | 0 | 0 |
| 3 | .30 | 0.55 | 0.25 | 38 49 | 20 or 13&5ci ^h or 0 & 15ci ^h | 8/13 | 19 | 5ci or 13 ^f | 10ci, 2 ft | 5ci or 13 ^f |

| | | | | | | | | | | |
|-----------------|-------------------|------|------|----|---|-------|----|------------------------|------------|------------------------|
| 4 except Marine | .30 | 0.55 | 0.40 | 60 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 8/13 | 19 | 10ci or 13 | 10ci, 4 ft | 10ci or 13 |
| 5 and Marine 4 | 0.30 ⁱ | 0.55 | 0.40 | 60 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 13/17 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |
| 6 | 0.30 ⁱ | 0.55 | NR | 60 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 15/20 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |
| 7 and 8 | 0.30 ⁱ | 0.55 | NR | 60 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 19/21 | 38 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |

Footnotes remain unchanged

Reason:

This amendment restores attic insulation values to the 2018 IECC. The requirement for R49 is onerous and unjustified for the following reasons:

- It has a negligible impact on the energy use: **\$0.67 per month on average in CZ 2** and **\$0.92 per month on average in CZ 3** for a 2,600 square foot single-family house.
- The added costs to consumer of installing ceiling insulation is \$1,366.
- This corresponds to a simple payback of **177 years in CZ 2** and **122 years in CZ 3**.
- Vaulted or cathedralized ceiling are very problematic when trying to achieve R- 49, which is about 16 inches thick. This would require a rafter at least 17" tall (which does not exist) or a prefabricated insulated panel (which represents a very small portion of the market). Developing an engineered solution for vaulted or cathedral ceilings would add substantial costs and that would make paybacks even longer.
- The net present value of the added continuous insulation over a 40-year useful life is negative – it costs much more than it saves over a 40-year period.
- The added continuous insulation results in a negative cash flow for the consumer throughout the 30-year mortgage – the consumer’s total payment for the mortgage and energy bill is higher every month.

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E4. Attic R-Value/U-Factor Corrections (Climate Zones 4-8)

This amendment restores the prescriptive attic insulation levels from R-60 to R-49.

Revise as follows:

R402.1.2 Insulation and fenestration criteria. The building thermal envelope shall meet the requirements of Table R402.1.2, based on the climate zone specified in Chapter 3. Assemblies shall have a U-factor equal to or less than that specified in Table R402.1.2. Fenestration shall have a U-Factor and glazed fenestration SHGC equal to or less than that specified in Table R402.1.2.

R402.1.3 R-value alternative. Assemblies with R-value of insulation materials equal to or greater than that specified in Table R402.1.3 shall be an alternative to the U-factor in Table R402.1.2.

TABLE R402.1.2
MAXIMUM ASSEMBLY U-FACTORS^a AND FENESTRATION REQUIREMENTS

| CLIMATE ZONE | FENESTRATION U-FACTOR ^f | SKYLIGHT U-FACTOR | GLAZED FENESTRATION SHGC ^{d, e} | CEILING U-FACTOR | WOOD FRAME WALL U-FACTOR | MASS WALL U-FACTOR ^b | FLOOR U-FACTOR | BASEMENT WALL U-FACTOR | CRAWL SPACE WALL U-FACTOR |
|-----------------|------------------------------------|-------------------|--|-----------------------|--------------------------|---------------------------------|----------------|------------------------|---------------------------|
| 0 | 0.50 | 0.75 | 0.25 | 0.035 | 0.084 | 0.197 | 0.064 | 0.360 | 0.477 |
| 1 | 0.50 | 0.75 | 0.25 | 0.035 | 0.084 | 0.197 | 0.064 | 0.360 | 0.477 |
| 2 | 0.40 | 0.65 | 0.25 | 0.026 | 0.084 | 0.165 | 0.064 | 0.360 | 0.477 |
| 3 | 0.30 | 0.55 | 0.25 | 0.026 | 0.060 | 0.098 | 0.047 | 0.091 ^c | 0.136 |
| 4 except Marine | 0.30 | 0.55 | 0.40 | <u>0.026</u> 0.024 | 0.045 | 0.098 | 0.047 | 0.059 | 0.065 |
| 5 and Marine 4 | 0.30 | 0.55 | 0.40 | <u>0.026</u> 0.024 | 0.045 | 0.082 | 0.033 | 0.050 | 0.055 |
| 6 | 0.30 | 0.55 | NR | <u>0.026</u> 0.024 | 0.045 | 0.060 | 0.033 | 0.050 | 0.055 |
| 7 and 8 | 0.30 | 0.55 | NR | <u>0.026</u> 0.024 | 0.045 | 0.057 | 0.028 | 0.050 | 0.055 |

Footnotes remain unchanged

TABLE R402.1.3
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT^a

| CLIMATE ZONE | FENESTRATION U-FACTOR ^{b, i} | SKYLIGHT ^b U-FACTOR | GLAZED FENESTRATION SHGC ^{b, e} | CEILING R-VALUE | WOOD FRAME WALL R-VALUE ^g | MASS WALL R-VALUE ^h | FLOOR R-VALUE | BASEMENT ^{c, g} WALL R-VALUE | SLAB ^d R-VALUE & DEPTH | CRAWL SPACE ^{c, g} WALL R-VALUE |
|--------------|---------------------------------------|--------------------------------|--|-----------------|--|--------------------------------|---------------|---------------------------------------|-----------------------------------|--|
| 0 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 1 | NR | 0.75 | 0.25 | 30 | 13 or 0&10ci | 3/4 | 13 | 0 | 0 | 0 |
| 2 | 0.40 | 0.65 | 0.25 | 49 | 13 or 0&10ci | 4/6 | 13 | 0 | 0 | 0 |
| 3 | .30 | 0.55 | 0.25 | 49 | 20 or 13&5ci ^h or 0 & 15ci ^h | 8/13 | 19 | 5ci or 13 ^f | 10ci, 2 ft | 5ci or 13 ^f |

| | | | | | | | | | | |
|-----------------|-------------------|------|------|---------------------|---|-------|----|------------------------|------------|------------------------|
| 4 except Marine | .30 | 0.55 | 0.40 | 60 49 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 8/13 | 19 | 10ci or 13 | 10ci, 4 ft | 10ci or 13 |
| 5 and Marine 4 | 0.30 ⁱ | 0.55 | 0.40 | 60 49 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 13/17 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |
| 6 | 0.30 ⁱ | 0.55 | NR | 60 49 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 15/20 | 30 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |
| 7 and 8 | 0.30 ⁱ | 0.55 | NR | 60 49 | 30 or 20& 5ci ^h or 13& 10ci ^h or 0& 20ci ^h | 19/21 | 38 | 15ci or 19 or 13 & 5ci | 10ci, 4 ft | 15ci or 19 or 13 & 5ci |

Footnotes remain unchanged

Reason:

This amendment restores attic insulation values to the 2018 IECC. The requirement for R60 is onerous and unjustified for the following reasons:

- It has a negligible impact on the annual energy use and unreasonable paybacks:

| Climate Zone (CZ) | Average Monthly Savings | Simple Payback |
|-------------------|-------------------------|----------------|
| CZ 4 | \$0.75 per month | 152 years |
| CZ 5 | \$1.0 per month | 118 years |
| CZ 6 | \$1.0 per month | 105 years |
| CZ 7 | \$1.25 per month | 90 years |

- The added costs to consumer of installing ceiling insulation is \$1,366.
- Higher levels of insulation are more challenging to implement in practice because the rafters or top chords limit the amount of insulation that can be placed around the perimeter, reducing the overall effectiveness of the requirement. This is particularly an issue in homes with smaller footprints or more complex roof configurations (hip roofs, dormers, etc.) where the perimeter attic insulation is a larger portion of the overall attic insulation.
- Vaulted or cathedral ceilings are very problematic when trying to achieve R-60, which is about 20 inches thick. This would require a rafter at least 21" tall (which does not exist) or a prefabricated insulated panel (which represents a very small portion of the market). Developing an engineered solution for vaulted or cathedral ceilings would add substantial costs and that would make paybacks even longer.
- The net present value of the added continuous insulation over a 40-year useful life is negative – it costs much more than it saves over a 40-year period.
- The added continuous insulation results in a negative cash flow for the consumer throughout the 30-year mortgage – the consumer’s total payment for the mortgage and energy bill is higher every month.

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