

International Energy Conservation Code Consensus Committee-Residential

Draft Meeting Agenda (4/21 posting)

Webex Meeting Link

April 28, 2022 2:00 PM EST to 5 PM EST (3 hours)

Committee Chair: JC Hudgison, CBO, Assoc. AIA

Committee Vice Chair: Bridget Herring & Robin Yochum, LEED Green Associate

- 1. Call to order.
- 2. Meeting Conduct.
 - a. Identification of Representation/Conflict of Interest
 - b. ICC Council Policy 7 Committees: Section 5.1.10 Representation of Interests
 - c. ICC <u>Code of Ethics</u>: ICC advocates commitment to a standard of professional behavior that exemplifies the highest ideals and principles of ethical conduct which include integrity, honesty, and fairness. As part of this commitment it is expected that participants shall act with courtesy, competence and respect for others.
- 3. Roll Call.
- 4. Approve Agenda
- 5. Approval of Minutes
- 6. Administrative issues-staff
- 7. Action Items
 - a. Code Change Proposals

REPI-150-21 (Alterations Building Envelope)(Existing Buildings as modified 8-0)

RECPI-2-21 (Townhome footnote) (Admin approve 4-0-1)
CEPI-11-21 Part II (Attic Definition) (Admin disapprove 4-0-1)
REPI-77-21 (Duct Insulation) (HVACR disapprove 11-0-1)

REPI-79-21 (Ducts in Conditioned Space) (HVACR approve 12-0)

REPI-82-21 (Ducts Buried in Ceiling Insulation) (HVACR as modified 12-0)

REPI-83-21 (Duct Deeply Buried) (HVACR approve 12-0)

REPI-97-21 (Ventilation Sampling Multi-family) (HVACR disapprove 6-5-1)

REPI-99-21 (Electric Resistance Zone Heat) (HVACR disapprove 7-4-1)

IRCEPI-2-21 (Bath Intermittent Exhaust Cntl)(HVACR disapprove unanimously)

Copyright © 2021 International Code Council, Inc.

```
CEPI-16-21 Part II (Fenestration definition) (Envelope disapprove 12-1-3)
                                          (Envelope as modified 16-2)
REPI-26-21 (Slab Insulation)
REPI-34-21 (U Factor Table Slab F Factor) (Envelope disapprove 18-0)
REPI-36-21 (R Value Table Heated Slab)
                                          (Envelope disapprove 19-0)
REPI-35-21 (R Value Table Floor Options)
                                          (Envelope approve 15-4)
REPI-39-21 (Attic knee wall)
                                          (Envelope approve 10-8)
REPI-125-21 (Slab Edge Insulation)
                                          (Envelope disapprove 17-0-1)
REPI-165-21 (Alt Thermal Envel R Value Opt) (Envelope approve 18-1)
REPI-158-21 (Renewable Energy Document)(Electrical as modified 10-1-1)
                                          (Modeling disapprove 13-1-2)
REPI-135-21 (ERI)
```

- 8. Subcommittee Reports
- 9. Other business.
- 10. Upcoming meetings. May 5 at 2 PM EST
- 11. Adjourn.

FOR FURTHER IECC Residential INFORMATION BE SURE TO VISIT THE ICC WEBSITE: IECC Residential Website

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

Kristopher Stenger, AIA, CBO Director of Energy Programs International Code Council kstenger@iccsafe.org



Proposal #	REPI-150-21 Alterations building envelope
CDP ID #	442
Code	IECC RE
Code Section(s)	R503.1.1, R503.1.1.1, R503.1.1.2 (New), 503.1.1.3 (New), R503.1.1.4 (New),
. ,	R503.1.1.5 (New), R503.1.1.6 (New) New Section y
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC rev
Subcommittee	RE Existing Bldg
Subcommittee Notes	
Recommendation	Stephen Dent: Motion to approve as modified Paul Demers: Second
Vote	8-0 for, motion to approve carries
Recommendation Date	3/22/2022
Next Step	To Subcommittee
Νεχί σιερ	To Advisory Group To Consensus CommitteeX
Consensus Committee	To Advisory Group To Consensus CommitteeX
·	
Consensus Committee	

MODIFICATION REVIEWED BY SUBCOMMITTEE

Proponents: Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jorandell@aresconsulting.biz)

2021 International Energy Conservation Code

Add new definitions as follows:

APPROVED SOURCE. An independent person, firm or corporation, approved by the building official, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.

CONSTRUCTION DOCUMENTS. Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

Revise existing definition as follows:

ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering. An alteration that includes the removal of all existing layers of roof assembly materials down to the roof deck and installing replacement materials above the existing roof deck.

Revise text as follows:

R503.1.1 (N1111.1.1) Building thermal envelope. Alterations of existing building thermal envelope assemblies shall comply with this section. New & building thermal envelope assemblies that are part of the alteration shall comply with Section R402 R402.1.2 or R402.1.4, Sections R402.2.1 through R402.2.12, R402.3.1, R402.3.2, R402.4.3 and R402.4.5. In no case shall the R-value of insulation be reduced or the U-factor of a building thermal envelope assembly be increased as part of a building thermal envelope alteration.

Exception: The following alterations shall not be required to comply with the requirements for new construction provided that the energy use of the building is not increased:

- Storm windows installed over existing fenestration.
- Existing earling, wall or floor eavities exposed during construction provided that these eavities are filled with insulation.
- Construction where the existing roof, wall or floor cavity is not exposed.
- 2.4. Roof recover.
- 5. Roofs without insulation in the eavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
- 3.6. Surface-applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided that the code does not require the glazing or fenestration assembly to be replaced.
- An existing building undergoing alterations that is demonstrated to be in compliance with Section R405 or Section R406.

R503.1.1.1 (N1111.1.1.1) Replacement f Fenestration alterations. Where new fenestration area is added to an existing building, the new fenestration shall comply with Section R402.3. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U*-factor and SHGC as specified in Table R402.1.3. Where more than one replacement fenestration unit is to be installed, an area-weighted average of the *U*-factor, SHGC or both of all replacement fenestration units shall be an alternative that can be used to show compliance.

Add new text as follows:

R503.1.1.2 (N1111.1.1.2) Roof alterations. Roof insulation complying with Section R402.1 or an approved design shall be provided for the following roof alteration conditions as applicable:

- An alteration to roof-ceiling construction where there is no insulation above conditioned space.
- 2. Roof replacement for roofs with insulation entirely above deck,

Exception: Where compliance with Section R402.1 cannot be met due to limiting conditions on an existing roof, the following shall be permitted to demonstrate compliance with the insulation requirements:

- Construction documents that include a report by a registered design professional or other approved source documenting details of the limiting conditions affecting compliance with the insulation requirements.
- Construction documents that include a roof design by a registered design professional or other approved source
 that minimizes deviation from the insulation requirements.
- 3. Conversion of an unconditioned attic space into conditioned space, and
- Replacement of ceiling finishes exposing cavities or surfaces of the roof-ceiling construction to which insulation can be applied.

R503.1.1.3 (N1111.1.1.3) Above-grade wall alterations. *Above-grade wall* alterations shall comply with the following requirements as applicable:

- Where interior finishes are removed exposing wall cavities, the existing cavity shall be filled with existing or new insulation complying with Section R303.1.4;
- Where exterior wall coverings and fenestration are removed and replaced for the full extent of any exterior wall
 assembly, continuous insulation shall be provided where required in accordance with Section R402.1 or an
 approved design;
- Where Items 1 and 2 apply, the entire wall assembly shall be insulated in accordance with Section R402.1; and
- 4. Where new interior finishes or exterior wall coverings are applied to the full extent of any exterior wall assembly of mass construction, insulation shall be provided where required in accordance with Section R402.1 or an approved design.

Where any of the above requirements are applicable, the above-grade wall alteration shall comply with the insulation and water vapor retarder requirements of Section R702.7 of the International Residential Code. Where the exterior wall coverings are removed and replaced, the above-grade wall alteration shall comply with the water and wind resistance requirements of Section R703.1.1 of the International Residential Code.

R503.1.1.4 (N1111.1.1.4) Floor alterations. Where an alteration to a floor or floor overhang exposes cavities or surfaces to which insulation can be applied and the floor or floor overhang is part of the building thermal envelope, the floor or floor overhang shall be brought into compliance with Section R402.1 or an approved design. This requirement shall apply to floor alterations where the floor cavities or surfaces are exposed and accessible prior to construction.

R503.1.1.5 (N1111.1.1.5) Below-grade wall alterations. Where a blow-grade space is changed to conditioned space, the below-grade walls shall be insulated where required in accordance with Section R402.1. Where the below-grade space is conditioned space and a below-grade wall is altered by removing or adding interior finishes, it shall be insulated where required in accordance with Section R402.1.

R503.1.1.6 (N1111.1.1.6) Air barrier. <u>Building thermal envelope</u> assemblies altered in accordance with Section R503.1.1 shall be provided with an <u>air barrier</u> in accordance with Section R402.4. The <u>air barrier</u> shall not be required to be made continuous with unaltered portions of the <u>building thermal envelope</u>. Testing requirements of Section R402.4.1.2 shall not be required.

Add a new footnote to Tables R402.1.2 and Table R402.1.3 as follows (portions of tables not shown are unchanged):

TABLE R402.1.2

MAXIMUM ASSEMBLY U-FACTORS* AND FENESTRATION REQUIREMENTS

	mistimom riodember o rivorono rino i encorron ricajontemento									
	CLIMATE	FENESTRATION	SKYLIGHT U-	GLAZED	CEILING U-	WOOD	MASS WALL	FLOOR U-	BASEMENT	CRAWL
	ZONE	U-FACTOR!	FACTOR	FENESTRATION SHGC4*	FACTOR #	FRAME WALL U-	U-FACTOR ^b	FACTOR	WALL U- FACTOR	SPACE WALL U-
- 1						FACTOR				FACTOR

g. Roofs with insulation entirely above deck shall comply with Section C402.2.1 and the "Group R" U-factors of Table C402.1.4.

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

CLIMATE ZONE	FENESTRATION U-FACTORN	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION 8HGC ^{b,e}	R-VALUE	WOOD FRAME WALL	MASS WALL R- VALUE ^b	FLOOR R-VALUE	BASEMENT ⁴⁴ WALL R-VALUE	8LAB ^d R-VALUE & DEPTH	SPACE4# WALL
			555		R-VALUE®					R-VALUE

... Roofs with insulation entirely above deck shall comply with Section C402.2.1 and the "Group R" R-values of Table C402.1.3.

Reason (Revisions): This revised REPI-150 proposal coordinates with action taken by the Commercial Building Envelope Subcommittee on proposals CEPI-225 and CEPI-17. Included are new and revised definitions in coordination with a new exception added in Section R503.1.1.2, Item 2 to provide flexibility in addressing roof replacements with insulation entirely above deck. A related revision provides appropriate reference to R-value and U-factor requirements for these types of roof systems which currently are not addressed in the residential energy provisions, yet are commonly used for 3-story or lower multi-family buildings which have roof types no different than used on 4-story or taller multi-family buildings covered under the commercial energy provisions. Finally, some clarifying wording was added to Section R503.1.1.3 at the request of the IECC Residential Existing Buildings Committee resulting in a 5-0 (non-quorum) vote in support of REPI-150 as modified.

Cost Impact (Revisions): The revisions to REPI 150 will decrease the cost of construction.

The revisions provide flexibility and help avoid impractical requirements being applied to existing building alterations, particularly for roof replacements and above-grade wall alterations. Thus, depending on the existing building conditions and the particular alterations being performed, the overall revised REPI-150 proposal may actually lower cost.

Reason (Original Proposal): Existing building alterations are perhaps one of the primary opportunities to reduce national energy consumption, yet Chapter 5 does little to address this need. There are many opportunities to cost-effectively improve energy efficiency of the existing building stock by use of reasonable criteria to trigger (or avoid) requirements with flexibility in the manner or extent of compliance where needed. This proposal attempts to strike that balance in a practical and cost-effective manner for building envelope assemblies of existing buildings that are undergoing specific types of alterations. Consequently, this proposal will help to address the 40% of national energy use that is attributed to the existing building stock and will only apply where alterations are proposed that provide opportunity to improve the performance of the existing building stock. A similar coordinated proposal was also submitted for the IECC-C committee.

Key changes made in this proposal are summarized as follows:

- The revisions to charging language in Section R503.1.1 are made to be consistent with commercial building provisions in C503.2.
- A clause is added to Section R503.1.1 to prevent reduction in existing building thermal envelope insulation levels as is included in the IECC provisions.
- Exceptions 2 and 3 of Section R503.1.1 are deleted as they are now addressed and preserved within requirements in new subsections for above-grade walls, floors, and roofs.
- Existing exception 5 of Section R503.1.1 is deleted because it is a requirement (not an exception) that is now moved to new Section R503.1.1.2 for roof alterations.
- New exception 4 is added to Section R503.1.1 to provide the flexibility of a "whole" existing building compliance path using the
 existing total building performance and ERI paths in Sections R405 and R406. This would be most applicable to extensive or multiple
 alterations as may occur in a building renovation.
- Section 503.1.1.1 for fenestration replacements is modified to address fenestration alterations including both added fenestration and fenestration replacements as both are also addressed in the IECC-C provisions for existing buildings and are relevant to existing residential building alterations.
- A new Section R503.1.1.2 is provided to address multiple types of roof alterations to identify conditions where it is appropriate
 to provide insulation (if not already present).
- 8. A new Section R503.1.1.3 is provided for above-grade wall alterations which identifies conditions where it is appropriate and practical to provide insulation (if not already present). Language is also provided to ensure coordination with building code moisture control requirements which require integration with and can influence the method of complying with the insulation requirements.

- A new Section R503.1.1.4 is provided for floor alterations and takes an approach similar to that done for above-grade walls (although with fewer conditional requirements).
- A new Section R503.1.1.5 is provided for below-grade wall alterations. This captures the cases where a below-grade space (e.g., basement) is being converted to conditioned space and where basement walls are altered and the basement is already conditioned.
- 11. Finally, new Section R503.1.1.6 is provided to address air barrier installations in altered building thermal envelope assemblies. However, it is made clear that continuity of the air barrier is not required with unaltered portions of the building thermal envelope as that would cause the alteration to extend beyond its intended scope. It also is made clear that whole building air leakage testing is not required.

Cost Impact: The code change proposal will increase the cost of construction.

Where requirements are triggered and where upgrades in energy efficiency were not already planned for an alteration, this proposal will increase cost for a limited set of envelope alteration activities for existing buildings. Some existing requirements such as roof replacements and filling of exposed stud cavities remain unchanged. For those existing buildings with deficient insulation levels (or no insulation) and where planned alterations allow that deficiency to be addressed efficiently, the cost-benefits are expected to closely align with that for new buildings. However, it is not possible to conduct a simple cost-benefit analysis for existing buildings because of the multitude of variables involved and the flexibility provided in this proposal that make it nearly impossible to quantify with any reasonable level of certainty. Thus, we consider these proposed provisions to be cost- effective by judgment as these types of existing building thermal envelope upgrades are currently being used in the existing building/remodeling/renovation market, although not consistently or in an enforceable manner. In addition, the current charging language in Section R503.1.1 requires compliance with insulation requirements for new buildings for all alterations, barring only those few excepted. Now, this proposal provides requirements that also provide flexibility in means of compliance for the many alterations that are currently not included in exceptions to Section 503.1.1. For these cases, this proposal could be considered to reduce cost.



Proposal #	RECPI-2-21 change to townhome in footnote h
CDP ID #	590
Code	IECC RE
Code Section(s)	R405.4.2(1) table CCC New Section n
Location	base
Proponent	Jeff Shapiro jeff.shapiro@intlcodeconsultants.com
Proposal Status	SC rev
Subcommittee	RE Admin
Subcommittee Notes	
Recommendation	Approval
Vote	4-0-1
Recommendation Date	4/5/22
Next Step	To Subcommittee To Advisory Group To Consensus CommitteeX
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	



Proposal #	CEPI-011-21 Part II Attic definition
CDP ID #	338
Code	IECC RE
Code Section(s)	R202 New Section n
Location	base
Proponent	Darren Meyers dmeyers@ieccode.com
Proposal Status	SC rev
Subcommittee	RE Admin
Subcommittee Notes	
Recommendation	Disapproval
Vote	4-0-1
Recommendation Date	4/5/22
Next Step	To Subcommittee To Advisory Group To Consensus CommitteeX
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	



Proposal #	REPI-077-21 Duct Insulation
CDP ID #	464
Code	IECC RE
Code Section(s)	R403.3, TABLE R403.6.2, R403.3.2, R403.3.3, TABLE R402.1.2, R403.3.3.1, TABLE R405.4.2(1) New Section y
Location	base
Proponent	David Springer iecc-ducts2@2050partners.com
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Presented David Bixby HVACR WG to reject the Original proposal
Recommendation	David Bixby presented WG- Proponent Mark Lyles – Shilpa Surana agreeing to reject this Proposal- Subcommittee vote is to reject this "Original proposal with a count of 11 to reject – Reason statement- This Proposal should be revisited with the next code cycle
Vote	11 for with 1 abstain
Recommendation Date	4/4/2022
Next Step	To Subcommittee To Advisory Group To Consensus Committeex
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	



Proposal #	REPI-079-21 Ducts in Conditioned Space				
CDP ID #	551				
Code	IECC RE				
Code Section(s)	R403.3.2 New Section n				
Location	Base				
Proponent	Craig Conner <u>craig.conner@mac.com</u>				
Proposal Status	SC rev				
Subcommittee	RE HVACR & WH				
Subcommittee Notes	Presented HVACR WG Chair David Bixby- accept as written to approve				
Recommendation	David Bixby presented the proposal from the WG as Chair/ second Sonny Richardson – vote 12 yes/ zero NO/ no abstentions – approved as written				
Vote	subcommittee vote to approve "as written" 12 yes/ zero NO/ no abstention				
Recommendation Date	4/4/2022				
Next Step	To Subcommittee To Advisory Group To Consensus Committeeyes				
Consensus Committee					
Committee Response					
Vote	Affirmative Negative Table To Subcommittee				
Date					

Copyright © 2021 International Code Council, Inc.



Proposal #	REPI-082-21 Ducts buried within ceiling insulation
CDP ID #	556
Code	IECC RE
Code Section(s)	R403.3.3, N1103.3.3 New Section n
Location	base
Proponent	Craig Conner craig.conner@mac.com
Proposal Status	SC rev
Subcommittee	RE HVACR & WH
Subcommittee Notes	David Bixby WG Chair presented the "as modified proposal" vote 12 unanimous
Recommendation	David Bixby presented this Proposal "As modified" for the subcommittee to approve – Modified Restore 3A in item 3 and add item 4 Motion David Bixby/ second Dean Potter - subcommittee sends to IECC committee to approve this Proposal 1. In Climate Zones 0A, 1A, 2 and 3A, the supply ducts shall be completely
Vote	12 voting members motion – Proposal passed unanimously
Recommendation Date	4/4/2022
Next Step	To Subcommittee To Advisory Group To Consensus Committeeyes
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee

Date	

R403.3.3 (N1103.3.3) Ducts buried within ceiling insulation. Where supply and return air ducts are partially or completely buried in ceiling insulation, such ducts shall comply with all of the following:

- 1. The supply and return ducts shall have an insulation R-value not less than R-8.
- 2. At all points along each duct, the sum of the ceiling insulation *R*-value against and above the top of the duct, and against and below the bottom of the duct, shall be not less than R-19, excluding the *R*-value of the duct insulation.
- 3. In Climate Zones 0A, 1A, 2A and 3A, the supply ducts shall be completely buried within ceiling insulation, insulated to an *R*-value of not less than R-13 and in compliance with the vapor retarder requirements of Section 604.11 of the International Mechanical Code or Section M1601.4.6 of the International Residential Code, as applicable.

Exception: Sections of the supply duct that are less than 3 feet (914 mm) from the supply outlet shall not be required to comply with these requirements.

4. In Climate Zones 0A, 1A, 2A and 3A when installed in a sealed attic with vapor diffusion port, the supply ducts shall be completely buried within ceiling insulation, insulated to an R-value of not less than R8 and in compliance with the vapor retarder requirements of Section 604.11 of the International Mechanical Code or Section M1601.4.6 of the International Residential Code, as applicable.

Exception: Sections of the supply duct that are less than 3 feet (914 mm) from the supply outlet shall not be required to comply with these requirements.

4.1. Air permeable insulation installed in sealed attics shall be in compliance with the requirements of Section R806.5.2 of the International Residential Code.



Proposal #	REPI-083-21 Ducts deeply buried
CDP ID #	553
Code	IECC RE
Code Section(s)	R403.3.3.1, N1103.3.3.1 New Section n
Location	base
Proponent	Craig Conner craig.conner@mac.com
Proposal Status	SC rev
Subcommittee	RE HVACR & WH
Subcommittee Notes	David Bixby presented this Proposal from the HVACR WG- Craig Connor Proponent supported the motion to approve
Recommendation	David Bixby Presented and made the motion to accept this Original Proposal- second Sonny Richardson- Vote to approve 12 unanimous motions carried
Vote	12 members voting unanimous/ zero NO votes/ no abstentions
Recommendation Date	4/4/2022
Next Step	To Subcommittee To Advisory Group To Consensus Committeeyes
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	

Copyright © 2021 International Code Council, Inc.



Proposal #	REPI-097-21 Ventilation Sampling for multifamily
CDP ID #	522
Code	IECC RE
Code Section(s)	R403.6.3, R403.6.4 (New) New Section y
Location	base
Proponent	Aaron Gary aaron.gary@texenergy.org
Proposal Status	SC rev
Subcommittee	RE HVACR & WH
Subcommittee Notes	Aaron Gary presented the "As Modified Proposal to approve, with a lot of discussion a motion was made from a subcommittee voting member to disapprove – from that point on the committee appeared to lean against the Proposal – Aaron Gary reminded the subcommittee that previously the subcommittee approved Proposal REPI-085 which is similar to this Proposal-
Recommendation	Subcommittee vote is to disapprove this "As modified" Proposal and send the vote count and recommendation to the IECC Consensus committee for a vote
Vote	Vote to disapprove 6 yes, 5 no and 1 abstention
Recommendation Date	4/4/2022
Next Step	To Subcommittee To Advisory Group To Consensus Committeeyes
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	

MODIFICATION REVIEWED BY THE SUBCOMMITTEE

REPI-97-21 MOD1

IECC®: R403.6.3, R403.6.4 (New)

Proponents:

Aaron Gary, representing Self (<u>aaron.gary@texenergy.org</u>)

2021 International Energy Conservation Code

R403.6.3 Testing.

Each Mmechanical ventilation systems shall be tested and verified to provide the minimum ventilation flow rates required by Section R403.6. Testing shall be performed according to the ventilation equipment manufacturer's instructions, or by using a flow hood or box, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals or grilles, outlet terminals or grilles, or in the connected ventilation ducts. Where required by the code official, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.

Exceptions: The following systems are exempt:

- 1. Kitchen range hoods that are ducted to the outside with 6-inch (152 mm) or larger duct and not more than one 90-degree (1.57 rad) elbow or equivalent in the duct run.
- 2. Where tested in accordance with R403.6.4, testing of each mechanical ventilation system is not required.

R403.6.4 Dwelling Unit Sampling for R2 multifamily dwelling units.

For buildings with eight or more *dwelling units* testing units complying with R403.6.3, the mechanical ventilation systems in the greater of seven units or 20 percent of the *dwelling units* testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and the *dwelling unit* a unit with the largest testing unit conditioned floor area. For each tested unit Where buildings have fewer than eight *dwelling units* testing units, each *dwelling unit* testing unit shall be tested. Where the ventilation flow rate of a mechanical ventilation system is less than the that does not meet the minimum permitted ventilation flow rate, corrective actions shall be made to the system and the system retested unit it passes. For each *dwelling unit* that has less ventilation airflow rate than the minimum permitted airflow rate, an additional three units, including the corrected unit shall be tested, including a mixture—of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

Where buildings qualify under the scope of Section R101.2 of the International Residential Code, each mechanical ventilation system in each dwelling unit shall be tested.



Proposal #	REPI-099-21 Electric resistance zone heat unit
CDP ID #	330
Code	IECC RE
Code Section(s)	R403.7.1 New Section y
Location	base
Proponent	David Baylon david@davidbaylon.com
Proposal Status	SC rev
Subcommittee	RE HVACR & WH
Subcommittee Notes	Proponent David Baylon and Kevin Rose presented this proposal. Motion subcommittee member to disapprove this Proposal
Recommendation	Proposal presented subcommittee made a motion and second to disapprove this "AS modified" proposal. The overall argument to disapprove found the "As modified" Proposal to be incomplete, over reaching across climate zone. The proposal is not ready and may need more work.
Vote	Vote 7 to disapprove, 4 NO to disapproval with 1 abstention
Recommendation Date	4/4/2022
Next Step	To Subcommittee To Advisory Group To Consensus Committeeyes
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	



Proposal #	IRCPI-002-21 Bathroom Intermittent Exhaust Control		
CDP ID #	311		
Code	IRC		
Code Section(s)	N1103.6.4 New Section y		
Location	base		
Proponent	Glory O'Brien glory.obrien@westernmechanicalsolutions.com		
Proposal Status	SC rev		
Subcommittee	RE HVACR & WH		
Subcommittee Notes	Subcommittee heard the proposal on 4/18/2022 Glory O'Brien Presenting committee voted to reject the Proposal unanimously rejected		
Recommendation	Notes from the subcommittee- The Proposal is incomplete and therefore rejected		
Vote	Reject Unanimously vote count		
Recommendation Date	4/18/2022		
Next Step	To Subcommittee To Advisory Group To Consensus Committeex		
Consensus Committee			
Committee Response			
Vote	Affirmative Negative Table To Subcommittee		
Date			



Proposal #	CEPI-016-21 Part II Fenestration definition	
CDP ID #	392	
Code	IECC RE	
Code Section(s)	R402.1.2 table, R402.3, R402.5 New Section n	
Location	base	
Proponent	SEHPCAC sehpcac@iccsafe.org	
Proposal Status	SC rev	
Subcommittee	RE Envelope	
Subcommittee Notes	Concerns with conflicts with long-standing definition of fenestration and the effects of treating half-glazed doors and opaque doors in the same manner. Unnecessary change. In this case, it does not make sense to align with ASHRAE 90.1	
Recommendation	Disapprove as submitted: REASON: Not needed. Fenestration is already well-defined term.	
Vote	12 Yes / 1 No / 3 Abstain	
Recommendation Date	04/20/2022	
Next Step	To Subcommittee To Advisory Group To Consensus Committee	
Consensus Committee		
Committee Response		



Proposal #	REPI-026-21 Slab insulation	
CDP ID #	124	
Code	IECC RE	
Code Section(s)	R402.1.2 table, R402.2.9 New Section n	
Location	base	
Proponent	Jeremy Williams jeremy.williams@ee.doe.gov	
Proposal Status	SC rev	
Subcommittee	RE Envelope	
Subcommittee Notes	Editorial concerns. Discussion about different values for heated and unheated slabs. Concerns about learning curve for code users.	
Recommendation	Approved As Modified: REASON: Provides more flexible methods of compliance.	
Vote	16 YES / 2 NO	
Recommendation Date	04/20/2022	
Next Step	To Subcommittee To Advisory Group To Consensus Committee	
Consensus Committee		
Committee Response		
Vote	Affirmative Negative Table To Subcommittee	
Date		

REPI-26-21 (MODIFICATION)

(Delete and replace entire proposal to reconcile REPI-26, 34, and 36)

IECC®: SECTION 202 (New), TABLE R402.1.2, R402.2.9, R402.1.2, R402.1.3, R402.1.5

Proponents:

Jeremy Williams, U.S. Department of Energy, representing U.S. Department of Energy (jeremy.williams@ee.doe.gov)
Jay Crandell, P.E., ABTG/ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2021 International Energy Conservation Code

Add new definition as follows:

R202 (N1101.6) DEFINITIONS

F-Factor (Thermal Transmittance). The perimeter heat loss factor for slab-on-grade floors (Btu/h·ft·°F) [W/(m·K)].

Revise as follows:

R402.1.2 (N1102.1.2) 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.

Revise as follows:

TABLE R402.1.2 (TABLE N1102.1.2) MAXIMUM ASSEMBLY U-FACTORS^a AND FENESTRATION REQUIREMENTS

Portions of table not shown remain unchanged.

CLIMATE ZONE	SLAB F-FACTOR ^g	
	<u>UNHEATED</u>	<u>HEATED</u>
0	<u>0.73</u>	0.74
1	<u>0.73</u>	<u>0.74</u>
2	<u>0.73</u>	<u>0.74</u>
3	<u>0.54</u>	<u>0.66</u>
4 except Marine	<u>0.51</u>	0.66
5 and Marine 4	0.51	0.66
6	0.48	0.66
7 and 8	<u>0.48</u>	<u>0.66</u>

For SI: 1 foot = 304.8 mm.

a. Nonfenestration \emph{U} -factors \underline{and} F-factors shall be obtained from measurement, calculation or an approved source.

• • •

g. F-factors for slabs correspond to the R-values of Table R402.1.3 and the installation conditions of Section R402.2.9.1.

Revise as follows:

R402.1.3 (N1102.1.3) 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 or F-factor in Table R402.1.2

Revise as follows:

TABLE R402.1.3 (TABLE N1102.1.3)

INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT^a

Portions of table not shown remain unchanged.

	SLAB ^d		
CLIMATE ZONE	R-VALUE & DEPTH		
	<u>Unheated</u>	<u>Heated</u>	
0	0	R-5ci edge and R-	
U	U	<u>5 full slab</u>	
1	0	R-5ci edge and R-	
1	U	<u>5 full slab</u>	
2	0	R-5ci edge and R-	
		<u>5 full slab</u>	
3	10ci, 2 ft	R10ci, 2 ft and R-	
3		<u>5 full slab</u>	
A ovcont Marino	10ci, <u>3</u> 4-ft	R10ci, 3 ft and R-	
4 except Marine		<u>5 full slab</u>	
5 and Marine 4	10ci, <u>3</u> 4-ft	R10ci, 3 ft and R-	
5 and Marine 4		5 full slab	
6	10ci, 4 ft	R10ci, 4 ft and R-	
Ь		<u>5 full slab</u>	
7 and 8	10ci 4 ff	R10ci, 4 ft and R-	
/ 4110 8		5 full slab	

For SI: 1 foot = 304.8 mm. NR

Revise as follows:

R402.1.5 (N1102.1.5) Tetal UA Component performance alternative. Where the proposed total building thermal envelope thermal conductance UA, the sum of U factor times assembly area, is less than or equal to the required total building thermal envelope conductance using UA resulting from multiplying the U factors in Table R402.1.2 by the same assembly area as in the proposed building, the building shall be considered to be in compliance with Table R402.1.2. The UA calculation total thermal conductance shall be performed determined in accordance with Equation 4-1. Proposed U-factors and slab-on-grade F-factors shall be taken from ANSI/ASHRAE/IES Standard 90.1 Appendix A or determined using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. In addition to UA total thermal conductance compliance, the SHGC requirements of Table R402.1.2 and the maximum fenestration U-factors of Section R402.5 shall be met.

$$(U_pA + F_pP) \le (U_rA + F_rP)$$
 (Equation 4-1)

where:

 $\underline{U}_{\varrho}A$ = the sum of proposed U-factors times the assembly areas of the proposed building.

 $\underline{F}_{p}P$ = the sum of proposed F-factors times the slab-on-grade perimeter lengths of the proposed building.

 $\underline{U_f}A$ = the sum of U-factors in Table R402.1.2 times the same assembly areas of the proposed building.

F_rP = the sum of F-factors in Table R402.1.2 times the same slab-on-grade perimeter lengths of the proposed building.

⁼ NotRequired.

ci = continuous insulation.

d. Slab insulation shall be installed in accordance with Section R402.2.9.1. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R value for slabs, a sindicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.

Exception: For Climate Zones 0, 1, and 2, the value of F_rP shall equal the value of F_pP

Revise as follows:

R402.2.9 (N1102.2.9) Slab-on-grade floors. Slab-on-grade floors with afloorsurface within 24 less than 12 inches (600 305 mm) above or below grade shall be insulated in accordance with Table R402.1.3.

Exception: Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation.

Revise as follows:

R402.2.9.1 (N1102.2.9.1) Slab-on-grade floor insulation installation. Whereinstalled, the <u>slab edge continuous</u> insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the <u>vertical</u> distance provided in Table R402.1.3, <u>but need not exceed the footing depth in accordance with Section R403.1.4 of the International Residential Code. the distance of the Alternatively, a proposed design for slab insulation R-value and installation shall comply with Table R402.1.2, Section R402.1.5, or Section R405. ,as applicable, by any combination of vertical insulation, insulation extending under the slab or insulation extending outfrom the building. Where a proposed design includes it insulation extending away from the building, it shall be protected by pavement or by not less than 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Where installed, full slab insulation shall be continuous under the entire area of the slab-on-grade floor, except at structural column locations and service penetrations. Slab edge insulation required at the heated slab perimeters hall not be required to extend below the bottom of the heated slab and shall be continuous with the full slab insulation.</u>

Revise as follows:

TABLE R405.4.2(1) (TABLE N1105.4.2(1)) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Portions of table not shown remain unchanged.

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
	Type: same as proposed.	As proposed
	Foundation wall or slab extension area above and below grade: 1ft (30 cm) Foundation wall or slab extension below grade: same as proposed	
	Foundation wall or slab perimeter length: same as proposed	As proposed
	and s Soil characteristics: same as proposed.	
	Foundation wall <i>U</i> -factor or slab <i>F</i> -factor: as specified in Table R402.1.2	

REASON STATEMENT (REVISED CONSENSUS PROPOSAL):

This revised consensus proposal combines the original REPI-26-21, REPI-34-21 and REPI-36-21 proposals based on the residential envelope subcommittee's direction to have proponents of REPI 26, 34, and 36 work on a proposal to reconcile differences in the three proposals. This proposal incorporates and coordinates the various changes in the three proposals for insulation of slab foundations. While most changes are formatting and editorial in nature, technical changes were made to unify the proposals with regard to the required F-factors (Table R402.1.2), the associated slab R-values (Table R402.1.3), and insulation installation requirements (Section R402.2.9.1). This was necessary because the location and placement of insulation on foundations affect the F-factors (thermal performance), not just the R-value and length or width of installation.

Finally, an exception was added to the Component Performance Alternative (Section R402.1.5) which restricts the use of slab insulation to make trade-offs for two reasons (note that currently the ability to use slab insulation to make trade-offs is not enabled in the code for any climate zone). First, slab insulation is not required for slab edges or perimeters in Climate Zones 0-2 and adding insulation to make a trade-off may overstate the actual trade-off value of the added slab insulation relative to the case with no insulation (e.g., ground and concrete thermal mass effects which are significant in warmer climates were not factored into the original development of F-factors) and their application in the performance (modeling) path is similarly affected. This may change with future research to better characterize heat transfer through slab on grade foundations. Second, Climate Zones 0-2 intersect with the "very heavy termite infestation" region and local rules often require an inspect strip (which alters the true F-factor) or, in some cases, prohibit the use of exterior insulation on the exposed edges of slabs.

Cost Impact: The code change proposal will decrease the cost of construction

The proposal better aligns R-values and insulation depths in Table R402.1.3 with typical footing depths for frost protect in the climate zones where perimeter edge insulation is required. For example, the insulation depth in CZ 4 and 5 are reduced from 4-feet to 3-feet. In addition, this proposal adds the ability to make trade-offs with slab insulation (F-factors) in the Component Performance Alternative (Section R402.1.5) – formerly the Total UA alternative – and in the performance (modeling) path of Section R405 (see changes to Table R405.4.2(1)).



Proposal #	REPI-034-21 Ufactor Table Slab F Factor		
CDP ID #	353		
Code	IECC RE		
Code Section(s)	R402.1.2, TABLE R402.1.2, TABLE R405.4.2(1) New Section n		
Location	base		
Proponent	Jay Crandell jcrandell@aresconsulting.biz		
Proposal Status	SC rev		
Subcommittee	RE Envelope		
Subcommittee Notes	Reason: Proponent recommended disapproval based on action on REPI-26		
Recommendation	Disapprove as submitted		
Vote	18 Yes / 0 No		
Recommendation Date	04/20/2022		
Next Step	To Subcommittee To Advisory Group To Consensus Committee		
Consensus Committee			
Committee Response			
Vote	Affirmative Negative Table To Subcommittee		
Date			

Copyright © 2021 International Code Council, Inc.



Proposal #	REPI-036-21 R Value Table heated slab
CDP ID #	352
Code	IECC RE
Code Section(s)	R402.1.3 table, R402.2.9.1 New Section n
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Reason: Proponent recommended disapproval based on action on REPI-26
Recommendation	Disapprove as submitted
Vote	19 Yea / 0 No
Recommendation Date	04.20.2022
Next Step	To Subcommittee To Advisory Group To Consensus Committee
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	



Proposal #	REPI-035-21 R Value Table Floor options	
CDP ID #	451	
Code	IECC RE	
Code Section(s)	R402.1.3 table, R402.2.7 New Section n	
Location	base	
Proponent	Jay Crandell jcrandell@aresconsulting.biz	
Proposal Status	SC rev	
Subcommittee	RE Envelope	
Subcommittee Notes	Consistent with how wall assemblies are handled in the code. Provides flexibility with a prescriptive option when a hybrid option is desired to decrease thermal bridging or moisture is desired. Makes the code easier to use. Concerns with constructability, the way heat moves through assemblies, availability of materials, cost of CI. Some pointed out that constructability is not a concern. Argument on both sides of whether proposal is needed or not.	
Recommendation	Disapprove as submitted: REASON: constructability issues. Shouldn't encourage the construction methods this would require. Motion Fails 4 Yes / 15 No Approve as Submitted. Reason: consistent w how assemblies are handled in the code. provides flexibility where so desired. Motion Passes	
Vote	15 Yes / 4 No	
Recommendation Date	04/20/2022	
Next Step	To Subcommittee To Advisory Group To Consensus Committee	
Consensus Committee		
Committee Response		



Proposal #	REPI-039-21 Attic knee or pony wall	
CDP ID #	375	
Code	IECC RE	
Code Section(s)	R402.2.3 (New), Table R402.4.1.1 (New), TABLE R405.2, TABLE R406.2 New Section y	
Location	base	
Proponent	Robby Schwarz robby@btankinc.com	
Proposal Status	SC rev	
Subcommittee	RE Envelope	
Subcommittee Notes	provides more details on how to insulate knee walls, adds additional clarity for these spaces	
Recommendation	Motion to approve Rob Buchanan, Chris Mathis seconded Reason: assembly often overlooked and with low compliance rates. Language has issues but it's necessary.	
Vote	10-8-0	
Recommendation Date	3/16/22	
Next Step	To Subcommittee To Advisory Group To Consensus CommitteeX	
Consensus Committee		
Committee Response		

Vote	Affirmative Negative Table	
	To Subcommittee	
Date		

REPI-39 Knee Wall and New Rim Joist section – Edited based on recommendations of the Subcommittee and the SEHPCAC editing workgroup

Definition

Knee wall – An *above-grade wall* assembly, or wall defined by vertical truss members, of any height that separate conditioned space from unconditioned buffer spaces, such as ventilated attics, entry porch roofs, etc., rather than ambient outdoors.

R402.2.3 (N1102.2.3) Attic knee or pony wall.

R402.2.3 Attic knee or pony wall.

Attic knee or pony wall assemblies that separate conditioned space from unconditioned attic spaces shall meet the same insulation requirements as above-grade walls. be constructed to be insulated to the R-value of the above grade wall. described in Table R402.1.3. Such Knee or pony walls shall have a sealed air barrier between conditioned and to the unconditioned space and shall have an air barrier on the attic or unconditioned side of the assembly.

Air permeable insulation installed in knee or pony wall cavities shall be enclosed on six sides of the cavity. Insulation installed in knee or pony wall cavities shall be installed in substantial contact with the air barrier.

R402.2.3.1 Where vertical Knee or pony wall cavities defined by roof truss framing members are used to separate conditioned space and unconditioned space, they shall meet the same insulation requirements as the above-grade walls. be insulated to the same R-value as the above grade wall.

level as other exterior above grade walls. Vertical or diagonal surfaces that are greater than 1 foot (305 mm) in height into a ventilated attic shall be considered a knee or pony wall. Vertical

Copyright © 2021 International Code Council, Inc.

or diagonal surfaces that are 1 foot (305 mm) or less in height into a ventilated attic shall be buried with insulation to maintain the ceilings required Rvalue.

Table R402.4.1.1

AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION a

COMPONENT AIR RARRIED AIR CEALING CRITERIA INCLUMATION INCTALLATION			
COMPONENT	AIR BARRIER, AIR SEALING CRITERIA	INSULATION INSTALLATION	
		CRITERIA	
Knee or pony walls	Knee or pony walls shall have a sealed air barrier between conditioned and unconditioned space. and shall be sheathed on the attic or unconditioned side of the assembly. be constructed to have a sealed air barrier on six sides of the wall assembly including to the unconditioned side of the assembly.	Insulation installed in a knee or pony wall assembly shall be meet the same insulation requirements as above-grade walls. installed in accordance with Section R402.2.3	
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, <i>R</i> -value, of not less than R-3 per inch. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.	



Proposal #	REPI-125-21 Slab edge insulation
CDP ID #	94
Code	IECC RE
Code Section(s)	R405.4.2(1) table New Section n
Location	base
Proponent	Maston Stafford maston.stafford@texenergy.org
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Unnecessary and conflicting with action in REPI-26. The proposal mixes the requirements for insulation and termite protection.
Recommendation	Disapprove as submitted: REASON: does not provide the intended clarification and confuses the requirements for standard reference design.
Vote	17 Yes / 0 No / 1 Abstain
Recommendation Date	04/20/2022
Next Step	To Subcommittee To Advisory Group To Consensus Committee
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	

Copyright © 2021 International Code Council, Inc.



Proposal #	REPI-165-21 Alt Thermal Envelope R-Value Options
CDP ID #	448
Code	IECC RE
Code Section(s)	X New Section y
Location	appendix
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Gives flexibility and a consistent methodology and calculation approach. Tech content aligns with ASHRAE. Supports the desire seen on the field for easy to follow tabular values. Concerns with the lengthy footnotes.
Recommendation	Approve as Submitted : REASON: Improves and adds flexibility in the code
Vote	18 Yes / 1 No
Recommendation Date	04/20/2022
Next Step	To Subcommittee To Advisory Group To Consensus Committee
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee



Proposal #	REPI-158-21 Renewable Energy Documentation
CDP ID #	242
Code	IECC RE
Code Section(s)	RC102, SECTION R404, R404.5, R406.7.3, RC102.3 New Section n
Location	base
Proponent	Diana Burk diana@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	The subcommittee discussed the process of retaining or retiring the RECs. The intent of the code change is to prevent double-dipping of energy credits. There were concerns about enforcement, timing at the local level, and removing a potential revenue stream from utilities.
Recommendation	
Vote	As modified 10-1-1
Recommendation Date	4/11/22
Next Step	To Subcommittee To Advisory Group To Consensus Committee
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	



Proposal #	REPI-135-21 ERI
CDP ID #	333
Code	IECC RE
Code Section(s)	R406.5 Table New Section n
Location	base
Proponent	Seth Wiley seth@sethisreal.com
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	
Recommendation	
Vote	Disapprove 13-1-2
Recommendation Date	4/13/22
Next Step	To Subcommittee To Advisory Group To Consensus Committee
Consensus Committee	
Committee Response	
Vote	Affirmative Negative Table To Subcommittee
Date	