

Code Review

2018 Changes to International Codes

IECC - RESIDENTIAL - ENERGY TAC

W A R N I N G

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W A R N I N G



**FLORIDA
BUILDING
COMMISSION**
"Stronger Codes Through Science and Consensus"

Florida
dbpr
Department of Business and Professional Regulation



Building Codes and Standards

Energy Conservation Code (IECC)- (Residential)

Energy Technical Advisory Committee (TAC)

2018 International Energy Conservation Code – Residential

Energy TAC

IECC-R Code Change No.	IECC-R Section	Change Summary b/t 2015 IECC-R and 2018 IECC-R	Change Summary b/t 2017 FEC-R and 2018 IECC-R	Staff comments										
CE3-16, Part II	R202 (IRC N1101.6)	<p>Modifies text of definition “Air Barrier”. Deletes definition “CONTINUOUS AIR BARRIER”. This proposal removes a redundant definition.</p> <p>Cost Impact: Will not increase the cost of construction. This proposal does not change code requirements, only updates definitions and reduces redundancy.</p>	<p>This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to these definitions</p>	<p>Overlapping provision to be considered during step 2 of the code change process</p>										
<table border="1"> <thead> <tr> <th>RCCIWG – Comment</th> <th>TAC Action</th> <th>Commission Action</th> <th>TAC</th> <th>Commission</th> </tr> </thead> <tbody> <tr> <td>Impactful (Explain) <input type="checkbox"/></td> <td> Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/> </td> <td> Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/> </td> <td> <input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions </td> <td> <input type="checkbox"/> <input type="checkbox"/> </td> </tr> </tbody> </table>					RCCIWG – Comment	TAC Action	Commission Action	TAC	Commission	Impactful (Explain) <input type="checkbox"/>	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	<input type="checkbox"/> <input type="checkbox"/>
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CE4-16, Part II	R202 (IRC N1101.6)	<p>Modifies text of definition Section R202 (N1101.6) “BUILDING THERMAL ENVELOPE”. The Thermal envelope completely surrounds the house and the ceiling portion of the envelope was excluded from the previous definition. Also changes element to element assemblies.</p> <p>Cost Impact: Will not increase the cost of construction. The changes are editorial to add clarity and understanding to the definition. No new requirements are added and thus, costs are not impacted.</p>	<p>Same as change between 2015 IECC-R and 2018 IECC-R</p>											

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

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CE11-16, Part II	R202 (IRC N1101.6), R202	Replaces definitions “Skylights”, “Vertical fenestration”. The definition of entrance doors needs grammatical improvements per proposal. Also change to format the Fenestration, Skylights and Vertical Fenestration definitions found in R202 in the same manner as found in C202. Cost Impact: Will not increase the cost of construction. These revisions are intended for editorial clarity . There should be no impact on the cost of construction.	This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to these definitions			Overlapping provision to be considered during step 2 of the code change process
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CE26-16, Part II	C303.1.1	Modifies text of Section R303.1.1 (N1101.10.1) “Building thermal envelope insulation”. The purpose of this change is to clarify how R-values for above deck roof insulation products are identified. Cost Impact: Will not increase the cost of construction. The proposed change is a clarification and does not change the stringency of existing code requirements so the cost of construction will be unchanged.	Same as change between 2015 FEC-C and 2018 IECC			

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CE30-16, Part II	C303.1.3/ R303.1.2.3	Modifies text of TABLE R303.1.3(2) [N1103.10.3(2)] DEFAULT OPAQUE DOOR U-FACTORS, Table R303.1.3R303.1.3(1) (1) “DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT U-FACTORS”. The default U-factor tables should distinguish opaque doors from glazed windows, doors and skylights. The headings in the Tables should be revised accordingly. Cost Impact: Will not increase the cost of construction. The proposal involves clarifying default values and editorially changing Table headings, and thus does not affect construction costs.		Same as change between 2015 IECC-R and 2018 IECC-R		
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CE65-16, Part II	R402.2.6 (IRC N1102.2.6)	Modifies text of Section R402.2.6 (N1102.2.6) “Steel-frame ceilings, walls and floors”. Changes use of word “meet” for “comply”. The use of the word “comply” interjects code language more often found throughout the codes and clarifies the intent in a slightly stronger tone. Cost Impact: Will not increase the cost of construction. The proposal only clarifies the intent of the code section and does not cause any increases in materials or labor for constructing the building.		Same as change between 2015 IECC-R and 2018 IECC-R		

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CE84-16, Part II	C402.1.3, C402.1.4, R402.2.5	<p>Modifies text of Section R402.2.5 (N1102.1.4) “Mass walls”. Modifies Table R402.1.2 (N1102.1.2) “INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT” and Table R402.1.4 (N1102.1.4) “EQUIVALENT U-FACTORS”. Modifies Table C402.1.3 “Opaque thermal envelope insulation component minimum requirements, r-value method” and table c402.1.4 “Opaque thermal envelope assembly maximum requirements, u-factor method”. The IECC as a result of changes approved for the 2015 addressed mass walls and mass floors differently. This proposal covers both Commercial and Residential portions and would treat the information on mass walls and mass floors as technical requirements and not as definitions. Therefore the proposal removes the technical requirements from the footnotes; and places each in the proper envelope section on floors or walls.</p> <p>Cost Impact: Will not increase the cost of construction. These revisions are strictly editorial in nature. They place the technical requirements for both mass walls and mass floors in the appropriate code sections.</p>	Same as change between 2015 IECC-R and 2018 IECC-R			
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CE157-16, Part II	R101.4.1, R101.5	<p>Modifies text of Section R101.4.1 “Mixed Residential and Commercial buildings” and R101.5 “Compliance”. This proposal seeks to remove confusion concerning the terms Group R and Residential. By defining 'Group R' as those having one of the IBC Group R occupancies that can occur in a</p>	Same as change between 2015 IECC-R and 2018 IECC-R			

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		Commercial building and then it either removes or replaces the word 'residential' in various provisions. Group R is already used in various places in the code, most notably the building envelope (insulation) assembly tables Cost Impact: Will not increase the cost of construction. The intent of the proposal is editorial in nature . To the extent that people had previously interpreted 'residential' to apply to hospital patient room and nursing home sleeping units, there may be some increase in cost for envelope insulation or HVAC systems.		
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CE174-16, Part II	R403.5.2 (IRC N1103.5.2)	Modifies text of Section R403.5.2 (N1103.5.2) “Demand recirculation water systems”. Modifies text of definition “DEMAND RECIRCULATION WATER SYSTEM”. Removes language from C404.7, R403.5.2 and N1103.5.2. Changes the requirement from the pump having to have controls to the system having to have the controls. Modifies Item 2 currently limits the water temperature of water entering the cold water piping to 'exactly' 104 degrees. Cost Impact: Will not increase the cost of construction. The proposal is editorial in nature . It will have no impact on the cost of construction.	Same as change between 2015 IECC-R and 2018 IECC-R	
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CE176-16, Part II	C404.9.3, R403.10.3	<p>Modifies text of Section R403.10.3 (N1103.10.3) "Covers". Proposal eliminates terminology and clarifies that the intent if a pool or permanent spa utilizes a heat pump or solar energy source for more than 70% of the energy used in heating the pool or permanent spa, then one is exempt from the vapor retardant cover requirement.</p> <p>Cost Impact: Will not increase the cost of construction. This is only a clarification of the original intent of this section. This change does not require additional materials or labor for construction.</p>	Same as change between 2015 IECC-R and 2018 IECC-R	
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CE177-16, Part II	R403.10.3 (IRC N1103.10.3)	<p>Modifies text of Section R403.10.3 (N1103.10.3) "Covers". Proposal revises the exception from 70% to 75%. Add in parameters for "operating season". Allow the use of other on-site renewable energy systems.</p> <p>Cost Impact: Will increase the cost of construction. For this exception, since the requirement has been increased from 70% to 75%, the estimated increase in cost for this option would be approximately 7 percent.</p>	Same as change between 2015 IECC-R and 2018 IECC-R	
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CE248-16, Part II	R406.3 (N1106.3)	<p>Modifies text of Section R406.3 (N1106.3) Energy Rating Index. Proposal provides an exception for energy used to recharge or refuel a vehicle that is used for on-road (and off-site) transportation purposes. This exception is limited to vehicles that are only used for off-site purposes that are obtaining their energy through the building energy infrastructure.</p> <p>Cost Impact: Will not increase the cost of construction. This does not change the requirements for total building performance, but clarifies what is to be excluded from scope of this section. Therefore, it will not increase the cost of construction.</p>	Same as change between 2015 IECC-R and 2018 IECC-R				
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CE274-16, Part II	R501.4 (IRC N1107.4)	<p>Modifies text of Section R501.4 to require compliance of Alterations, repairs etc., with the IECC and the Existing Building Code.</p> <p>Cost Impact: Will not increase the cost of construction. These were missing codes to the list.</p>	Same as change between 2015 IECC-R and 2018 IECC-R				
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RE3-16	R202	<p>Adds new definition “AIR-IMPERMEABLE INSULATION”. Adds new Standard “ASTM E2178-13 Standard Test Method for Air Permeance of Building Materials”. The term air permeable insulation is utilized in the IECC specifically in Table R404.1.1.</p>	Same as change between 2015 IECC-R and 2018 IECC-R				

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		<p>Carrying this definition over to from the IRC to the IECC helps clarify what can and cannot be used in specific installation according to the code. The proposal was further modified by the Committee to clarify that the modification was needed to correct the proposed definition to align with what is in the ASTM standards. The as-modified proposal was approved because it is difficult to explain what is intended without a definition.</p> <p>Cost Impact: Will not increase the cost of construction. There would be no cost impact associated with this proposed definition as it is being added to create better consistency between the code families and clarity for the intent of the current code.</p>		
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						<input type="checkbox"/> Overlapping provisions		<input type="checkbox"/>	

RE5-16	R202 (IRC N1101.6)	<p>Modifies text of Section R202 “(N1101.6) HIGH-EFFICACY LAMPS”. This proposal clarifies the definition to include LED lamps and other lamp technologies that may be used</p> <p>Cost Impact: Will not increase the cost of construction. This proposal only clarifies the definition and does not change any code requirements.</p>	Same as change between 2015 IECC-R and 2018 IECC-R	
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RCCIWG – Comment		TAC Action		Commission Action		TAC		Commission	
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>		<input type="checkbox"/> No Action Needed		<input type="checkbox"/>	
						<input type="checkbox"/> Overlapping provisions		<input type="checkbox"/>	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

RE8-16	R202 (New) [IRC N1101.6 (New)]	<p>Adds new definition R202 (IRC N1101.6) “OPAQUE DOOR”. Proposal to define the term Opaque Door.</p> <p>Cost Impact: Will not increase the cost of construction. The proposal clarifies the code by adding a definition for a term already used in the residential provisions. The action is essentially editorial and should have no cost implications.</p>	Same as change between 2015 IECC-R and 2018 IECC-R				
RCCIWG – Comment Impactful (Explain) <input type="checkbox"/>		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	TAC <input type="checkbox"/> <input type="checkbox"/>	Commission <input type="checkbox"/> <input type="checkbox"/>	
RB21-16	R301.2	<p>Modifies text of TABLE R301.2 (1) “CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA”. The change adds manual j criteria to the table, so that the jurisdictions are getting manual js that are designed to the correct variables. The requirement for a manual j or an engineered equivalent has been in the code for several cycles, but we do not assist the jurisdiction nor the applicant in determining their criteria. A jurisdiction is given the option of using table 1a or 1b from ACCA Manual J or for the jurisdiction to determine their own criteria due to their unique circumstances.</p> <p>Cost Impact: Will not increase the cost of construction. This proposal will not increase the cost. This is to provide information on design parameters for the home. The information can be obtained from ACCA Manual J's table 1a or 1b, or some jurisdictions have parameters established.</p>	Same as change between 2015 IRC-B and 2018 IRC-B				

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						<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE14-16	R401.3 (IRC N1101.14)	Modifies text of Section R401.3 (N1101.14) “Certificate (Mandatory)”. Expands party’s that can complete certificate of R401.3. Cost Impact: Will not increase the cost of construction. This proposal will not increase cost and in fact is likely to lower cost as design professionals would now most likely not be tasked with completing this requirement of code.		This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to this section		Overlapping provision to be considered during step 2 of the code change process		
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):		<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE17-16	R402.1 (IRC N1102.1)	Modifies text of Section R402.1 (N1102.1) “General (Prescriptive)”. This amendment refers design of log homes to ICC400 Standard on the Design and Construction of Log Structures (ICC400) as it is the only consensus standard for log building. Cost Impact: Will not increase the cost of construction. Log wall construction is an alternate method of construction from the wood frame, steel frame, and concrete masonry options addressed in the energy conservation codes. The intent is to evaluate solid wood walls rather than apply prescriptive requirements that may impact the esthetic and/or durability of the wall system. Without this change, readers may believe that they have only three options: 1.) Build with very large logs, 2.) Add insulation to the outside, or 3.) Add insulation to the inside		Same as change between 2015 IECC-R and 2018 IECC-R				

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		<p>Option 1: Prescriptive mass wall R-values set minimum log widths that are not commonly available, require greater cost to build, and cannot be milled by equipment used today. These factors will constrict the industry to the high-end custom home market. It will cause the existing log home inventory significant undue stress as owners of otherwise energy efficient log homes will be pressed to insulate their nominal 6" log walls (average width of 5"-5.5"). A survey of the industry indicates that a 10" round/8x nominal or smaller covers 80% of the log home products built and in production in climate zones 5-8, which is over 55% of the log home market. The 10" round/8x nominal log size equates to an average log width of about 7"-7.5".</p> <p>Option 2: This would be consistent with the details for cross-laminated timber (CLT).</p> <p>Option 3: It should be noted that adding insulation to the inside of a log wall is not recommended as it restricts the benefits of mass wall effects while eliminating the opportunity for inspection that may otherwise identify a need for maintenance. All three options are extremely costly as opposed to trade-offs in the building thermal envelope, which is why most log home companies use REScheck for compliance. This can help keep the log width to a size that is economical for production, builder and home owner. Therefore the cost of construction can actually be reduced by evaluating log walls by measures other than prescriptive wall R-value (R/inch of wood).</p> <p>Effect of the proposed amendment on the cost of design: ___ Increase ___ Reduce XXX No Effect</p> <p>Effect of the proposed amendment on the cost of construction: ___ ___ Increase XXX Reduce ___ No Effect</p> <p>Is the amendment proposal more or less restrictive than the I-Codes? ___ More ___ Less XXX Same</p>		
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				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE22-16	Table R402.1.2 (IRC Table N1102.1.2)	Modifies text of Section (N1102.1.2) “INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT”. This proposal improves the effectiveness of heated (radiant) slab insulation. Cost Impact: Will increase the cost of construction. That this proposal may increase cost is debatable. In many cases, radiant slabs are insulated with sub-slab insulation as a matter of good practice and this is obvious to many who use them. In fact, at least some states already require the use of sub-slab insulation with heated radiant slabs. This proposal will also decrease long-term costs of operating a heated slab in comparison to use of an unheated slab with perimeter insulation only. There are also practical and cost-saving advantages of not increasing perimeter insulation thickness, particularly when placed in its most effective location on the exterior side of the slab edge.	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE31-16	Table R402.1.2 (IRC Table N1101.1.2), R402.1.4 (IRC Table N1101.1.4)	Modifies text of Table R402.1.2 (N1102.1.2) “INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT”. This code change proposal considers improving maximum allowable fenestration U-factors to match older ENERGY STAR specifications where data indicate there is substantial market penetration.	Same as change between 2015 IECC-R and 2018 IECC-R	This change has no impact on Florida. This change is limited to Zones 3 through 8.		

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		<p>Cost Impact: Will not increase the cost of construction. Cost Impact: Data collected by DOE indicates an incremental cost of \$0.18/ft² for a window with a U-factor of 0.30 compared to a window with a U-factor of 0.35.[3] The present analysis conservatively assumes the same incremental cost of \$0.18/ft² for windows with a U-factor of 0.32 compared to windows with a U-factor of 0.35.</p> <p>Cost-effectiveness: Assuming windows have a useful life of 30 years, an evaluation of the life-cycle cost savings of these improved levels over the 2015 IECC requirements using DOE's cost-effectiveness methodology shows positive life-cycle cost savings in climate zones 3 to 8. Life-cycle savings range from about \$16 in zone 3 to \$388 in zone 8.</p>											
RCCIWG – Comment Impactful (Explain) <input type="checkbox"/>		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	<table border="1"> <thead> <tr> <th></th> <th>TAC</th> <th>Commission</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> No Action Needed</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Overlapping provisions</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		TAC	Commission	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
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RE40-16	R402.2.2 (IRC N1102.2.2)	<p>Modifies text of Section R402.2.2 (N1102.2.2) “Ceilings without attic spaces”. The proposal editorial in that it does not change the insulation requirements, but reorganizes the text in R402.2.2 to match the format and style used on R402.2.1. Provides clear direction on where the thicker insulation requirement is needed. The code change was further modified by the Committee. The modification was made to eliminate further correlation problems should the greater insulation levels change.</p> <p>Cost Impact: Will not increase the cost of construction. The proposal is an editorial reorganization for clarification of current requirements. Thus, the cost of construction is not changed.</p>	Same as change between 2015 IECC-R and 2018 IECC-R										

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				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE53-16	Table R402.2.6 (IRC Table N1102.2.6)	Modifies text of Table R402.2.6 (N1102.2.6) “STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)”. This proposal corrects an inconsistency in the code by eliminating two conflicting entries in the code for R21 insulation on a steel wall when using the table that establishes equivalency with a wood stud wall with R-13+0 insulation. Cost Impact: Will increase the cost of construction. An additional R-1 of continuous insulation will be required under this proposal if a designer selects R-19 cavity insulation. The extra cost could be offset by a lower continuous insulation value for R-21 cavity insulation for these assemblies. Unfortunately, this is necessary to address an error in the public comment that was approved with EC66-09/10.	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE64-16	Table R402.4.1.1 (IRC Table N1102.4.1.1)	Modifies text of Table R402.4.1.1 (N1102.4.1.1) “AIR BARRIER AND INSULATION INSTALLATION”. Per committee reasoning, Sealing of the ductwork to the membrane (wall, floor and ceiling) is an issue that does need to be addressed. Cost Impact: Will not increase the cost of construction. This proposal only clarifies the intent of the code . There is no additional materials or labor costs associated as this work is what the current code intends.	Same as change between 2015 IECC-R and 2018 IECC-R			

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				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE65-16	Table R402.4.1.1 (IRC Table N1102.4.1.1)	Modifies text of Table R402.4.1.1 (N1102.4.1.1) “AIR BARRIER AND INSULATION INSTALLATION”. Per reasoning, the intent of the code is that whatever the finish surface, penetrations must be sealed to it. Per committee, not all finishes are drywall so this is an appropriate change. Cost Impact: Will not increase the cost of construction. This proposal only clarifies the code provision for sealing. As this is only a clarification, there is no additional cost associated with this proposed change	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE71-16	Table R402.4.1.1 (IRC Table N1102.4.1.1)	Modifies text of table R402.4.1.1 (N1102.4.1.1) “AIR BARRIER AND INSULATION INSTALLATION”. Proposal changes HVAC register boots section, such that forced air passes through a supply boot a portion of that air is directed into building cavities the boot penetrates. Cost Impact: Will increase the cost of construction. There is a minimal cost impact associated with this proposal. The duct system is already being sealed with mastic to meet the duct leakage requirements of the code and the additional mastic installation needed to seal a supply boot to the subfloor is small.	Same as change between 2015 IECC-R and 2018 IECC-R			

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				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE83-16	R402.4.1.2 (IRC N1102.4.1.2)	<p>Modifies text of Section R402.4.1.2 (N1102.4.1.2) “Testing”. Adds new standard “BRS/RESNET/ICC 380-2016 Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems and Airflow of Mechanical Ventilation Systems”. Adds BSR/RESNET/ICC 380-2016 to provide for needed guidance for performing envelope air leakage, duct leakage and air flow testing. Building off of existing standards (e.g. ASTM E779-10) the standard allows for multiple test procedures to provide flexibility for the testing industry. The proposal further modified by the Committee to reference ASTM E779 or ASTM E1827 and retain details that RESNET 380 might not have in it.</p> <p>Cost Impact: Will not increase the cost of construction. RESNET Standard 380 allows for single point testing to demonstrate compliance with the air leakage requirements verses multipoint testing now required by E 779. The results of the two tests, as described in the reason statement, are comparable so that a house constructed to meet the E 779 standard will cost no different than a house constructed to meet Standard 380. The code change may lead to a reduction in the costs to conduct the tests as the envelope testing industry may charge more for a multi-point test than a single-point test given the time needed for the multi-point test.</p>	<p>This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to this section</p>			Overlapping provision to be considered during step 2 of the code change process
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

RE84-16	R402.4.1.2 (IRC N1102.4.1.2)	<p>Modifies text of Section R402.4.1.2 (N1102.4.1.2) "Testing". Replaces the reference to "doors" with a reference to "terminations". Permits interior or exterior terminations to be sealed. Removes the reference to "heat recovery ventilators". Removes the requirement to "close" the termination.</p> <p>Cost Impact: Will not increase the cost of construction. This change increases flexibility for conducting the blower door test and can potentially reduce associated costs.</p>	Same as change between 2015 IECC-R and 2018 IECC-R				
RCCIWG – Comment Impactful (Explain) <input type="checkbox"/>		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	TAC <input type="checkbox"/> <input type="checkbox"/>	Commission <input type="checkbox"/> <input type="checkbox"/>	
RE90-16	R402.4.2 (IRC N1102.4.2)	<p>Modifies text of Section R402.4.2 (N1102.4.2) "Fireplaces". UL 907 is not a useful standard for the purpose of this code requirement, proposal to remove this requirement.</p> <p>Cost Impact: Will not increase the cost of construction. This proposal will lower costs down by not having a requirement for a product to meet a non-usable, non-useful standard.</p>	Same as change between 2015 IECC-R and 2018 IECC-R				
RCCIWG – Comment Impactful (Explain) <input type="checkbox"/>		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	TAC <input type="checkbox"/> <input type="checkbox"/>	Commission <input type="checkbox"/> <input type="checkbox"/>	
RE99-16	R403.3 (IRC N1103.3), R403.3.6 (New) [IRC N1103.3.6 (New)]	<p>Modifies text of Section R403.3 "Ducts". Adds new Section 403.3.6 "Ducts buried within ceiling insulation". There have been concerns about burying duct work in a hot humid climate (climate zones 1A, 2A, 3A) where there is an increase in the chances of condensation on the vapor retarder around the duct insulation. In order to prevent condensation in the</p>	Same as change between 2015 IECC-R and 2018 IECC-R				

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		<p>humid climate zones, R-18 duct insulation is required rather than R-8 insulated duct. Condensation on the exterior of the duct insulation can be prevented by an R-18 fiberglass duct with an exterior vapor retarder or a duct with less (or no) insulation that is encapsulated in a vapor retardant foam that meets the duct requirements of the IRC mechanical section or the IMC.</p> <p>Cost Impact: Will not increase the cost of construction. This proposal provides a new option that will increase the energy efficiency of a house with ducts in an attic without additional cost in most situations.</p>														
RCCIWG – Comment <input type="checkbox"/> Impactful (Explain)		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	<table border="1"> <thead> <tr> <th></th> <th>TAC</th> <th>Commission</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> No Action Needed</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Overlapping provisions</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>		TAC	Commission	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>			
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RE100-16	R403.3 (IRC N1103.3), R403.3.6 (New) [IRC N1103.3.6 (New)], R403.3.7 (New) [(IRC N1103.3.7 (New)]	<p>Modifies text of Section R403.3 (N1102.3) “Ducts”. Adds new Section R403.3.6 (N1103.3.6) “Ducts buried within ceiling insulation” and “R403.3.7 (N1103.3.7) Ducts located in conditioned space”. In addition to allowing ducts to be buried within attic insulation, this proposal sets alternate requirements for ducts to be considered within conditioned space. Under R403.3.7 provides for the traditional code definition of being within conditioned space. However, item "2" in the proposal provides the DOE comparable performance alternative for extremely tight ducts with a full complement of insulation, and with provision for condensation avoidance for humid climates.</p> <p>Cost Impact: Will not increase the cost of construction. This proposal provides a new option that will likely reduce the cost of construction and increase the energy efficiency of a house with ducts in an attic. Burying ducts in insulation and tightly sealing the ducts is a less expensive and more energy efficient solution than creating a conditioned attic. Additionally, it is often</p>	Same as change between 2015 IECC-R and 2018 IECC-R													

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		a more practical and homeowner friendly solution than installing bulkheads in the ceiling to keep ducts in conditioned space.		
RCCIWG – Comment	TAC Action	Commission Action	TAC	Commission
Impactful (Explain) <input type="checkbox"/>	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>
			<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>
RE102-16	R403.3.2 (IRC N1103.3.2)	Modifies text of Section R403.3.2 (N1103.3.2) “Sealing (Mandatory)”. Removes exception from R403.3.2. Per reasoning, the most appropriate location to address the sealing exceptions for ductwork is within the mechanical section of the code, where the whole criteria and exceptions are called out. Cost Impact: Will not increase the cost of construction. The code change proposal will not change the cost of construction. Code requirements are not proposed to be changed, rather clarified as to the intent of the current code.	This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process
RCCIWG – Comment	TAC Action	Commission Action	TAC	Commission
Impactful (Explain) <input type="checkbox"/>	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>
			<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>
RE105-16	R403.3.3 (IRC N1103.3.3)	Modifies text of Section R403.3.3 (N1103.3.3) “Duct testing (Mandatory)”. This section contains requirements for testing dwelling units' primary heating or cooling system ducts. This proposed change clarifies that H/ERV systems that are ducted separately from ducts serving heating or cooling systems are not required to have their ducts tested. Cost Impact: Will not increase the cost of construction. This change is a clarification only and will not increase the cost of construction.	This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

RCCIWG – Comment		TAC Action	Commission Action		TAC	Commission
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE110-16	R403.3 (IRC N1103.3), R403.3.6 (New) [IRC N1103.3.6 (New)], R403.3.7 (New) [(IRC N1103.3.7 (New))]	Modifies text of Section R403.3 (N1103.3) “Ducts”. Adds new section R403.3.6.1 (N1103.6.1) “Deeply buried duct effective R-value”. The proposal, in addition to allowing ducts to be installed within ceiling insulation, also provides additional effective insulation credit for ducts deeply buried (more than 3 1/2” under insulation) to claim an effective R-value of R-25. Proposal modified by committee because of previously heard proposal. Cost Impact: Will not increase the cost of construction. This new section creates an option to installing ducts . It is generally less expensive to bury a duct than suspend a duct system installed in an attic. In addition, there is an energy efficiency credit available for ducts that are buried providing further reduction in installed cost of other efficiency measures that may no longer be necessary.	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE121-16	R403.6.1 (IRC N1103.6.1), Table R403.6.1 (IRC Table N1103.6.1)	Modifies text of Section R403.6.1 (N1103.6.1) “Whole-house mechanical ventilation system fan efficacy”. R403.6.1 (N1103.6.1) “WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY”. This proposal introduces a minimum fan efficacy for H/ERVs. Cost Impact: Will not increase the cost of construction. At the levels proposed, fan efficacy is not a major driver of price. Low-cost H/ERVs are available at the efficacy level proposed.	Same as change between 2015 IECC-R and 2018 IECC-R			

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RCCIWG – Comment		TAC Action	Commission Action		TAC	Commission
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				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE126-16	R404.1 (IRC N1104.1)	Modifies text of Section R404.1 “Lighting equipment (Mandatory)”. Proposal to remove exception as it is obsolete. Cost Impact: Will not increase the cost of construction. There is no correlation between the voltage of a lighting fixture (“low-voltage” or otherwise) and the cost of a lighting fixture. Therefore, the removal of the exemption will have no impact of the cost of construction. The removal of the exemption will not require the purchase of light fixtures that are more expensive than would be purchased with the exemption in place.	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE127-16	R404.1 (IRC N1104.1)	Modifies text of Section R404.1 (N1104.1) “Lighting equipment (Mandatory)”. Raises the minimum lighting efficacy from 75% to 90%. The price of high-efficacy lighting is now competitive with other lighting as more and more products such as CFLs and LEDs saturate the market. The life-cycle costs of LEDs are significantly lower than any conventional lamp or light fixture. Cost Impact: Will not increase the cost of construction. The price of high-efficacy lighting is now competitive with other lighting as more and more products such as CFLs and LEDs saturate the market. The life-cycle costs of LEDs are significantly lower than any conventional lamp or light fixture.	Same as change between 2015 IECC-R and 2018 IECC-R			

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RCCIWG – Comment		TAC Action	Commission Action		TAC	Commission
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
RE132-16	R405.1 (IRC N1101.5)	Modifies text of Section R405.1 (N1105.1) “Scope”. This proposed change corrects a contradiction in the current code. Section R405.1 states that energy analysis for the Simulated Performance Alternative compliance path is to include only heating, cooling, and water heating energy (i.e., mechanical ventilation is not included). However, Table R405.5.2(1) clearly includes specifications for mechanical ventilation. Cost Impact: Will not increase the cost of construction. This change has no cost impact because it does not change requirements, but rather clarifies the intent of the current code.	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
RE140-16	R405.3 (IRC N1105.3)	Modifies text of Section R405.3 (N1105.3) “Performance-based compliance”. This proposal updates the reference to the DOE Energy Information Administration’s current publications of state energy pricing data. Cost Impact: Will not increase the cost of construction. This is merely an update to an information source that can be used as part of a performance-based compliance path, does not change any requirements in the code, and does not affect the cost of construction.	This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process		

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RCCIWG – Comment		TAC Action	Commission Action		TAC	Commission
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				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE142-16	R405.4.2	Modifies text of Section table R405.4.2 (N1105.4.2) “Compliance report”. Per reasoning: Sampling is a process of testing/evaluating one unit in a batch of 7 multiple like units to determine if all seven of the units would pass the intent of Code. The reality is that single family and attached housing, town houses and duplexes, are not like units even when they have the same model number and have been built off of the same plan. Our construction processes are not true assembly line processes so for the purpose of code compliance batch sampling should continue not to be allowed for these types of housing. Multifamily stacked housing, on the other hand, is basically one large building that has been subdivided into multiple smaller units. Batch sampling is ideal for this type of construction. Cost Impact: Will not increase the cost of construction. Sampling of stacked multifamily units is more cost effective than testing each unit while at the same time ensuring that the inspection process for code compliance is valid as intended.	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE143-16	Table R405.5.2(1) [IRC Table N1105.5.2(1)]	Modifies text of Table R405.5.2(1) [(N1105.5.2(1)] “SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS”. The purpose of this proposal is to remove an inconsistency in the code concerning language listed for Air Exchange rate.	This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific	Overlapping provision to be considered during step 2 of the code change process		

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		<p>Cost Impact: Will not increase the cost of construction. Since the code requirements are not proposed to be changed, this proposal will not affect the cost of construction.</p>	changes to this item of the Table										
RCCIWG – Comment Impactful (Explain) <input type="checkbox"/>		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	<table border="1"> <thead> <tr> <th></th> <th>TAC</th> <th>Commission</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> No Action Needed</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Overlapping provisions</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		TAC	Commission	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
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<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>											
<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>											
RE149-16	Table R405.5.2 [IRC Table N1105.5.2(1)]	<p>Modifies text of Table R405.5.2(1) [N1105.5.2(1)] “SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS”. This change simply corrects the equation for the energy calculation of the mechanical ventilation system. There is no effect on system cost.</p> <p>Cost Impact: Will not increase the cost of construction. This change simply corrects the equation for the energy calculation of the mechanical ventilation system. There is no effect on system cost.</p>	Same as change between 2015 IECC-R and 2018 IECC-R										
RCCIWG – Comment Impactful (Explain) <input type="checkbox"/>		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): 	<table border="1"> <thead> <tr> <th></th> <th>TAC</th> <th>Commission</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> No Action Needed</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Overlapping provisions</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		TAC	Commission	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
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RE152-16	Table R405.5.2(1) [IRC Table N1105.5.2(1)]	<p>Modifies text of table R405.5.2 (1) [N1105.5.2(1)] “SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS”. In the Thermal distribution systems row of the table, adds an exception for “non-ducted heating and cooling systems not having a fan”.</p> <p>Cost Impact: Will not increase the cost of construction. This proposal does not require the purchase of any additional</p>	This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to this item of the Table	Overlapping provision to be considered during step 2 of the code change process									

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		materials and or the expenditure of any additional labor, accordingly, it will have no impact on the cost of construction.			
RCCIWG – Comment		TAC Action	Commission Action	TAC	Commission
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>
RE166-16	R406.3 (IRC N1106.3), R406.3.1 (IRC N1106.3.1), R406.6.1 (IRC N1106.6.1), R406.7 (IRC N1106.7), R406.7.1 (IRC N1106.7.1), R406.7.2 (IRC N1106.7.2), R406.7.3 (IRC N1106.7.3)	<p>Modifies text of Section R406.3 (N1106.3) “Energy Rating Index”, R406.6.1 (N1106.6.1) “Compliance software tools”, R406.6.4 (N1106.6.4) “Specific approval”, R406.6.5 (N1106.6.5) “Input values”. Deletes R406.3.1 (N1106.3.1) “ERI reference design”. R406.7 (N1106.7) “Calculation software tools”. R406.7.1 (N1106.7.1) “Minimum capabilities”. Adds new standard “ANSI/RESNET/ICC 301-2014 Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index First Published March 7, 2014 Republished January 2016”.</p> <p>Modification made per Public comment: As written the ERI ventilation rate specification is in conflict with the ventilation rate specified by the IRC. The current language references ANSI/RESNET/ICC Standard 301 which references the ASHRAE 62.2-2013. The ventilation rate in the ASHRAE Standard 62.2 is significantly higher than the ventilation rate in the IRC. The IRC rate was reaffirmed in Group A changes this code cycle. Without this ventilation rate correction, the higher ventilation rate would use more energy unnecessarily and thereby increase ERI scores for no good reason. interestingly the ASHRAE 62.2-2010 used the same rate as is in the current IRC.</p> <p>Cost Impact: Will not increase the cost of construction. This proposal references RESNET/ICC – 301 RESNET/ICC – 301 and strikes all language in C406 that is duplicated in the Standard or that is no longer needed in the code because the concept is covered in the Standard. Per reasoning: The</p>	This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to some of these sections	Overlapping provision to be considered during step 2 of the code change process	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		<p>collaborative team based the existing ERI code language on the yet to be approved standard ANSI/RESNET/ICC-301, now completed this proposal adds in that standard and language. As stated in the Reason Statement, the ERI approach submitted during the 2015 IECC code development cycle (RE188-13) was based on the yet to be approved Standard 301. The ERI values that populate Table R406.4 were calculated and based on the protocol described in Standard 301 so referencing this standard will not lead to an increase in the stringency of the ERI values and will not result in an increase in first cost for the construction of the house. This proposal DOES NOT propose to change the Section R406.2 requirements for Mandatory Requirements or the 2009 IECC as minimum requirement which would increase first cost. The Energy Rating Index described in Section R406.3 is consistent with Standard 301. The requirements for Calculation Software Tools in Section R406.7 will not increase the cost to develop software as the requirements are consistent with the requirements in Standard 301. Standard 301 does not place additional requirements into C406 but provides a standardized method for generating ERI scores and demonstrating compliance with the R406.</p>		
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RCCIWG – Comment		TAC Action		Commission Action			TAC	Commission	
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):		<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>	
						<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>	

RE173-16	Table R406.4 (IRC Table N1106.4)	<p>Modifies text of Table R406.4 (N1106.4) “MAXIMUM ENERGY RATING INDEX”. Per reasoning: Proposal is intended to produce substantial additional energy savings compared to the current or proposed levels of prescriptive requirements in the 2015 IECC, while allowing considerably greater flexibility to builders using a method with which a large segment of the market is already familiar. This flexibility is likely to result in lower construction costs for any given level of energy efficiency. The revised ERI values in the proposal were based on an</p>	<p>This change is not similar to that of the FEC-R. The FEC-R provides for Florida specific changes to some of these sections for consistency with Florida</p>	<p>Overlapping provision to be considered during step 2 of the code change process</p>
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Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		<p>additional 10 percent savings beyond 2012 with 2014 NAECA HVAC and water heating equipment efficiencies. The values can also be achieved using heating, cooling, and water heating equipment efficiency levels higher than NAECA minimum levels in the Northern and Southern parts of the country. The resulting ERI values are considered cost effective in all climate zones and will result in increased efficiency for residential construction over the 2012 IECC.</p> <p>Modification by public comment specifies eligible and mandatory requirements for compliance under the ERI.</p> <p>Cost Impact: Will not increase the cost of construction. Because this proposal provides more flexibility, it is likely to result in lower construction costs for any given level of energy efficiency</p>	Statutes.													
RCCIWG – Comment Impactful (Explain) <input type="checkbox"/>		TAC Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	Commission Action Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	<table border="1"> <thead> <tr> <th></th> <th>TAC</th> <th>Commission</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> No Action Needed</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> Overlapping provisions</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>		TAC	Commission	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>			
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RE183-16	R502.1.1.2 (IRC N1108.1.1.2), R503.1.2 (IRC N1109.1.2)	<p>Modifies text of Section R502.1.1.2 (N1108.1.1.2) “Heating and cooling systems”, R503.1.2 (N1109.1.2) “Heating and cooling systems”. Changing reference to Sections subsections of R403 to the entire section.</p> <p>Cost Impact: Will increase the cost of construction. There would likely be a cost for having a load calculation done or for piping insulation to be done or whatever requirement would have normally applied had the building been new but no longer applies because the building isn't new, even though the equipment is.</p>	Same as change between 2015 IECC-R and 2018 IECC-R													

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

RCCIWG – Comment		TAC Action	Commission Action		TAC	Commission
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE184-16	R503.1.1.1 (IRC N1109.1.1.1)	Modifies text of Section R503.1.1.1 (N1109.1.1.1) “Replacement fenestration”. The purpose of this code proposal is to clarify that the weighted average performance of replacement window units can be used for compliance purposes. Cost Impact: Will not increase the cost of construction. Since the code requirements are not proposed to be changed, this proposal will not affect the cost of construction.	Same as change between 2015 IECC-R and 2018 IECC-R			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain):	<input type="checkbox"/> No Action Needed	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RE187-16	Appendix RA (IRC Appendix T)	Deletes Appendix RA “(APPENDIX T) RECOMMENDED PROCEDURE FOR WORST-CASE TESTING OF ATMOSPHERIC VENTING SYSTEMS UNDER R402.4 OR R405 CONDITIONS ≤ 5ACH”. This informational appendix is more appropriate in a standard and is not written to be part of a code that becomes law. Cost Impact: Will not increase the cost of construction. The code change proposal only serves to remove an optional appendix that appears to be misplaced in the IECC. As this Appendix is not a requirement, there is not a change in the cost of construction.	Same as change between 2015 IECC-R and 2018 IECC-R			

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

RCCIWG – Comment		TAC Action	Commission Action		TAC	Commission
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>
RM48-15	M2103.2, M2103.2.1, M2103.2.2	Modifies Section M2103.2 “Thermal barrier required.” Deletes sections M2103.2.1 and M2103.2.2. Insulation R-values should be located in Chapter 11. Proposal to address this. The code change was further modified by the Committee. The modification keeps the text within the IRC for user convenience. Cost Impact: Will not increase the cost of construction. This proposal will not increase the cost of construction as it is the first step in re-locating an existing insulation requirement from the IRC mechanical section to the IECC/Chapter 11 IRC. There is no increase in the R-value of the insulation or the installation labor.	Same as change between 2015 IRC and 2018 IRC			
Impactful (Explain) <input type="checkbox"/>		Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	Accommodate Florida Specific Need: YES (Select Criteria) <input type="checkbox"/> NO: <input type="checkbox"/> a. <input type="checkbox"/> b. <input type="checkbox"/> c. <input type="checkbox"/> d. <input type="checkbox"/> e. <input type="checkbox"/> f. <input type="checkbox"/> Others (Explain): <input type="text"/>	<input type="checkbox"/> No Action Needed <input type="checkbox"/> Overlapping provisions	<input type="checkbox"/>	<input type="checkbox"/>

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following:

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Code Change No: CE3-16 Part II

Original Proposal

Section: R202 (IRC N1101.6)

Proponent: Theresa Weston, representing DuPont Building Innovations
(theresa.a.weston@dupont.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2015 International Energy Conservation Code

Revise as follows:

R202 (N1101.6) GENERAL DEFINITIONS

AIR BARRIER. ~~Material(s)~~ Materials assembled and joined together to ~~provide a barrier to restrict or prevent the passage of air leakage through the building thermal envelope.~~ An air barrier ~~may~~ can be a single material or a combination of materials.

Delete without substitution:

~~**CONTINUOUS AIR BARRIER.** A combination of materials and assemblies that restrict or prevent the passage of air through the building thermal envelope.~~

Reason: This proposal removes a redundant definition. Air Barriers are already defined as "Materials assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials". Additionally, the definition for Air Barrier is updated.

Cost Impact: Will not increase the cost of construction
This proposal does not change code requirements, only updates definitions and reduces redundancy.

Report of Committee Action Hearings

Committee Action:

Approved as Modified

Modify as follows:

AIR BARRIER. ~~Materials assembled and~~ One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the building thermal envelope and its assemblies. ~~An air barrier can be a single material or a combination of materials.~~

Committee Reason: The modification brings clarity to the definition by eliminating an extraneous sentence. The as-modified proposal was approved because the committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

CE3-16 Part II

AM

CE3-16 Part II

AIR BARRIER. ~~Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials.~~ Relating to air distribution systems, a material object(s) which impedes or restricts the free movement of air under specified conditions. For fibrous glass duct, the air barrier is its foil cladding; for flexible non-metal duct, the air barrier is the non-porous core; and for sheet metal duct and air handling units, the air barrier is the metal in contact with the air stream. For mechanical closets, the air barrier may be a uniform panelized material such as gypsum wall board which meets ASTM C 36, or it may be a membrane which alone acts as an air barrier which is attached to a panel, such as the foil cladding of fibrous glass duct board.

Relating to the building envelope, air barriers comprise the planes of primary resistance to air flow between the interior spaces of a building and the outdoors and the planes of primary air flow resistance between adjacent air zones of a building, including planes between adjacent conditioned and unconditioned air spaces of a building. To be classed as an air barrier, a building plane must be substantially leak free; that is, it shall have an air leakage rate not greater than 0.5 cfm/ft² when subjected to an air pressure gradient of 25 pascal. In general, air barriers are made of durable, non-porous materials and are sealed to adjoining wall, ceiling or floor surfaces with a suitable long-life mastic. House wraps and taped and sealed drywall may constitute an air barrier but dropped acoustical tile ceilings (T-bar ceilings) may not. Batt insulation facings and asphalt-impregnated fiberboard and felt paper are not considered air barriers.

Code Change No: CE4-16 Part II

Original Proposal

Section: R202 (IRC N1101.6)

Proponent: Robert Schwarz, representing EnergyLogic, Inc. (robby@nrglogic.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

2015 International Energy Conservation Code

Revise as follows:

R202 (N1101.6) BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, ~~floor floors, roof ceilings, roofs~~ and any other building ~~elements-element assemblies~~ that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.

2015 International Residential Code

Revise as follows:

[RE] BUILDING THERMAL ENVELOPE. The ~~basement walls~~ basement walls, ~~exterior walls~~ exterior walls, ~~floor floors, roof ceilings, roofs~~ and any other building element assemblies that enclose ~~conditioned spaces~~ conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.

Reason: The Thermal envelope completely surrounds the house and the ceiling portion of the envelope was excluded from the previous definition. In addition, the envelope is not one element of the building but rather an **assembly** of materials that create it in each location that is described in the definition. We feel it is important to ensure a common understanding that the entirety of the assembly in each location must be understood in order to create the thermal envelope that functions as intended by the code.

Cost Impact: Will not increase the cost of construction
The changes are editorial to add clarity and understanding to the definition. No new requirements are added and thus, costs are not impacted.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: This definition needs to be consistent throughout the I-codes.

Assembly Action

None

Final Action Results

CE4-16 Part II

AS

Code Change No: CE11-16 Part II

Original Proposal

Section(s): R202 (IRC N1101.6), R202

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: David Collins, representing Sustainability, Energy, High Performance Code Action Committee; Joseph Hetzel (Jhetzel@thomasamc.com)

Revise as follows:

FENESTRATION. Products classified as either *skylights* or *vertical fenestration*.

Skylights. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal.

Vertical fenestration. Windows (fixed or operable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of at least 60 degrees (1.05 rad) from horizontal.

Delete without substitution:

~~**SKYLIGHT.** Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal.~~

~~**VERTICAL FENESTRATION.** Windows (fixed or moveable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of a least 60 degrees (1.05 rad) from horizontal.~~

Reason: The definition of entrance doors needs grammatical improvements as shown in the proposal. The key change is adding the word 'occupant' before the purposes of the door. This is to distinguish entrance doors from doors which are used trucks or other cargo or material movement. Changes in the last cycles as well as companion proposals to this proposal in this cycle provide better standards specific to garage doors. As such they need to be distinguished from doors used by people 'not on vehicles' to enter or exit a building. The edit to the definition of Fenestration in the Commercial portion of the code is for consistency with Table C402.4 as well as some editorial clarity.

The final action proposed in this change is to format the Fenestration, Skylights and Vertical Fenestration definitions found in R202 in the same manner as found in C202. In C202 - Skylights and Vertical Fenestration are shown as subdefinitions to Fenestration. With the relocation there is also minor wording changes for consistency with the C202 provisions.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC).. In 2015, the SEHPCAC has held three two- or three-day open meetings and 25 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction
These revisions are intended for editorial clarity. There should be no impact on the cost of construction.

Analysis: In Part II, because IRC Section N1101.6 (definitions) does not include a standalone definition for vertical fenestration, the deletion indicated for that definition in Part II is not applicable for Section N1101.6.

**Report of Committee Action
Hearings**

Committee Action:

As Submitted

Committee Reason: There always seems to be an issue about whether the window is vertical fenestration or a skylight. This change makes it clear and makes the definitions consistent with the commercial side of the codes.

Assembly Action:

None

Public Comments

Public Comment 1:

Hugo Aguilar, representing American Supply Association (haguilar@asa.net) requests Approve as Modified by this Public Comment.

Modify as follows:

FENESTRATION. Products classified as either *skylights* or *vertical fenestration*.

Skylights. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal.

Vertical fenestration. Windows (~~that are~~ fixed or operable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of ~~at least~~ not less than 60 degrees (1.05 rad) from horizontal.

Commenter's Reason: The original proposal intended to correlate the skylights and vertical fenestration definitions between Section C202 and Section R202. However, the definition for "vertical fenestration" in Section R202 does not correlate completely with the definition in Section C202 for "vertical fenestration" as the language "at least" in Section R202 was changed to "not less than." Furthermore, the language "that are" was not added to R202 either. This is required for correlation.

Final Action Results

CE11-16 Part II

AMPC1

CE11-16, Part II

SKYLIGHT. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.

Vertical fenestration. No change

Code Change No: CE26-16 Part II

Original Proposal

Section: C303.1.1

Proponent: Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

R303.1.1 (N1101.10.1) Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be *listed* on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be *listed* on the certification. For insulated siding, the *R*-value shall be labeled on the product's package and shall be listed on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

Exception: For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.2 of the *International Building Code* or Table R906.2 of the *International Residential Code*, as applicable.

Reason: The purpose of this change is to clarify how *R*-values for above deck roof insulation products are identified. For insulation installed above a roof deck, *R*-value identification markings on individual insulation pieces are not practical because products installed above roof decks are covered by other roof system components almost immediately after installation due to the need to quickly achieve a weathertight condition. Because of this, material standards for above deck roof insulation do not require marking individual pieces of insulation; rather *R*-value information is included on product packaging. This change references IBC Table 1508.2, "Material Standards for Roof Insulation" and will require that above deck roof insulation products have *R*-value identification markings in accordance with the material standards already referenced in IBC. For those buildings covered by the IRC, the residential part of the change also refers to Table R906.2 of the IRC.

Cost Impact: Will not increase the cost of construction
The proposed change is a clarification and does not change the stringency of existing code requirements so the cost of construction will be unchanged.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: There are other ways to certify roof deck insulation and this added exception will allow those other ways.

Assembly Action

None

Final Action Results

CE26-16 Part II

AS

Code Change No: CE30-16 Part II

Original Proposal

Section: C303.1.3

Proponent: David Collins, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org); Joseph Hetzel (Jhetzel@thomasamc.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

**TABLE R303.1.3(2) [N1103.10.3(2)]
DEFAULT OPAQUE DOOR U-FACTORS**

DOOR TYPE	OPAQUE U-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

**TABLE R303.1.3(1) (1)
DEFAULT GLAZED FENESTRATION WINDOW, GLASS DOOR AND SKYLIGHT U-FACTORS**

FRAME TYPE	WINDOW OR GLASS DOOR		SKYLIGHT	
	Single pane	Double Pane	Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

Reason: The default U-factor tables should distinguish opaque doors from glazed windows, doors and skylights. The headings in the Tables should be revised accordingly. The proposed insulated metal value is approximately 25% higher than the DASMA research tested value of 0.82.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). In 2015, the SEHPCAC has held three two- or three-day open meetings and 25 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction
The proposal involves clarifying default values and editorially changing Table headings, and thus does not affect construction costs.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: The word OPAQUE is very helpful for finding the correct table in the code.

Assembly Action

None

Final Action Results

CE30-16 Part II

AS

Code Change No: **CE65-16 Part II**

Original Proposal

Section: R402.2.6 (IRC N1102.2.6)

Proponent: Michael Gieszler, City of Hillsboro, Oregon Building Dept., representing Oregon Building Officials Association (mike.gieszler@hillsboro-oregon.gov)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

R402.2.6 (N1102.2.6) Steel-frame ceilings, walls and floors. Steel-frame ceilings, walls, and floors shall ~~meet~~ comply with the insulation requirements of Table R402.2.6 or ~~shall meet~~ the U-factor requirements of Table R402.1.4. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

Reason: The use of the word "comply" interjects code language more often found throughout the codes and clarifies the intent in a slightly stronger tone. The term "comply" infers something that has to be done or obeyed. The word "meet" establishes an expectation.

There is no additional cost

Cost Impact: Will not increase the cost of construction

The proposal only clarifies the intent of the code section and does not cause any increases in materials or labor for constructing the building.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

CE65-16 Part II

AS

Code Change No: CE84-16 Part II

Original Proposal

Section: C402.1.3, C402.1.4

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: David Collins, representing Sustainability, Energy, High Performance Code Action Committee

Revise as follows:

R402.2.5 (N1102.1.4) Mass walls. Mass walls ~~for where used as a component of the purposes thermal envelope of this chapter a building shall be considered above-grade one of the following:~~

1. Above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), ~~earth (adobe, compressed earth block, rammed earth) and, solid timber/ or solid logs, or any other walls.~~
2. Any wall having a heat capacity greater than or equal to 6 Btu/ft² × °F (123 kJ/m² × K).

TABLE R402.1.2 (N1102.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT U-FACTOR ^b	GLAZED FENESTRATION SHGC ^{b,e}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT WALL R-VALUE ^c	SLAB R-VALU E & DEPTH ^d	CRAWL SPACE WALL R-VALUE ^c
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5 ^h	8/13	19	5/13 ^f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5 ^h	8/13	19	10 /13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5 ^h	13/17	30 ^g	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10 ^h	15/20	30 ^g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10 ^h	19/21	38 ^g	15/19	10, 4 ft	15/19

For SI: 1 foot = 304.8 mm.

a. R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in climate zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

c. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2

feet, whichever is less in Climate Zones 1 through 3 for heated slabs.

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation.

i. ~~Mass walls shall be in accordance with Section R402.2.5.~~ The second R -value applies when more than half the insulation is on the interior of the mass wall.

**TABLE R402.1.4 (N1102.1.4)
EQUIVALENT U-FACTORS^a**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR ^b	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35	0.55	0.030	0.060	0.098	0.047	0.091 ^c	0.136
4 except Marine	0.35	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32	0.55	0.026	0.045	0.057	0.028	0.050	0.055

a. Nonfenestration U- factors shall be obtained from measurement, calculation or an approved source.

b. ~~Mass walls shall be in accordance with Section R402.2.5.~~ When more than half the insulation is on the interior, the mass wall U- factors shall be a maximum of 0.17 in Climate Zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.057 in Climate Zones 6 through 8.

c. Basement wall U- factor of 0.360 in warm-humid locations as defined by Figure R301.1 and Table R301.1.

Reason: The IECC as a result of changes approved for the 2015 addressed mass walls and mass floors differently. For one the details were found in a footnote to a table, for the other the details were found in the section text. One could read what was in either location as a definition of the terms. This proposal covers both Commercial and Residential portions and would treat the information on mass walls and mass floors as technical requirements and not as definitions. Therefore the proposal removes the technical requirements from the footnotes; and places each in the proper envelope section on floors or walls. The footnotes in the tables are reduced to being pointers to the regulating text. Finally while the existing text may appear to be a definition of the terms, mass floors and mass walls can be a variety of weights and densities, but the IECC requires specific weights when the mass wall or mass floor is going to be an element of the building's thermal envelope.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). In 2015, the SEHPCAC has held three two- or three-day open meetings and 25 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

These revisions are strictly editorial in nature. They place the technical requirements for both mass walls and mass floors in the appropriate code sections.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

CE84-16 Part II

AS

Code Change No: **CE157-16 Part II**

Original Proposal

Section: R101.4.1, R101.5

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: David Collins (dcollins@preview-group.com); Dan Buuck (dbuuck@nahb.org); Steven Orłowski (sorłowski@boma.org)

Revise as follows:

R101.4.1 Mixed ~~occupancy~~ Residential and Commercial buildings. Where a building includes both *residential building* and *commercial building* ~~occupancies portions~~, each ~~occupancy portion~~ shall be separately considered and meet the applicable provisions of the IECC—Commercial Provisions or IECC—Residential Provisions.

R101.5 Compliance. *Residential buildings* shall meet the provisions of IECC—Residential Provisions. *Commercial buildings* shall meet the provisions of IECC—Commercial Provisions.

Reason: The code is split in Commercial and Residential halves. The definitions of commercial buildings and residential buildings rely on the occupancy categories found in the IBC. While used in the Commercial provisions the terms 'Group R' and 'residential' are not defined. Group R occupancies can occur in a building defined as a Commercial Building. Non-residential occupancies can not, by definition, occur in a Residential Building. People with an IBC background – when using the IECC-C and encountering the word 'residential' are likely to consider one of the Group R occupancies. People with an ASHRAE background, on the other hand, will also include such things as nursing home rooms and hospital patient rooms as 'residential'. The result is inconsistent application.

This proposal would end the issue by defining 'Group R' as those having one of the IBC Group R occupancies that can occur in a Commercial building and then it either removes or replaces the word 'residential' in various provisions. Group R is already used in various places in the code, most notably the building envelope (insulation) assembly tables.

Specific amendments:

1. The definitions of entrance door and storefront (a type of door) both have the word 'nonresidential' removed. The truth is these types of doors are often found on Group R buildings such as hotels and larger apartment buildings. Removal of the term 'non-residential' will not change how the fenestration industry considers these doors.
2. Section C101.4.1 and R101.4.1 are both now titled Mixed occupancy - but the discussion is not about mixed occupancy as someone used to the IBC would consider a mixed occupancy, but is addressing when a building might meet the definitions of Residential Building and Commercial Building. This controls which half of the code is used - not provisions within each half of the code.
3. Section C406.7: The text is removed because it is redundant. Group R-2 buildings are residential occupancy buildings.
4. C407.5.2.3 In this case the term Multifamily residential building appeared to be applying to Group R-2 apartments and not other types of residential occupancy. If the committee believes this applies to hotels, motels and Group R-4 care facilities - then the term Group R should be used instead of Group R-2.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). In 2015, the SEHPCAC has held three two- or three-day open meetings and 25 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

The intent of the proposal is editorial in nature. To the extent that people had previously interpreted 'residential' to apply to hospital patient room and nursing home sleeping units, there may be some increase in cost for envelope insulation or HVAC systems.

Analysis: This proposal does not impact Chapter 11 of the IRC.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: This clarity is needed for portions of buildings that are different types (residential versus commercial).

Assembly Action

None

Final Action Results

CE157-16 Part II

AS

Code Change No: **CE174-16 Part II**

Original Proposal

Section: R403.5.2 (IRC N1103.5.2)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: David Collins, representing Sustainability, Energy, High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

R403.5.2 (N1103.5.2) Demand recirculation water systems. ~~A Demand recirculation water distribution system having one or more recirculation pumps that pump water from a heated water supply pipe back to the heated water source through a cold water supply pipe shall be a demand recirculation water system. Pumps systems shall have controls that comply with both of the following:~~

1. ~~The control controls shall start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture or sensing the flow of hot or tempered water to a fixture fitting or appliance.~~
2. ~~The control controls shall limit the temperature of the water entering the cold water piping to 404not greater than104°F (40°C).~~

DEMAND RECIRCULATION WATER SYSTEM. ~~A water distribution system where pump(s) prime having one or more recirculation pumps that pump water from a heated-water supply pipe back to the service hot water piping with heated water upon demand for hot water heated-water source through a cold-water supply pipe.~~

Reason: The proposal suggests three actions:

1. It removes language from C404.7, R403.5.2 and N1103.5.2 which is definitional in nature and creates a definition of Demand Recirculation Water System in Sections C202, R202 and N1101.6.
2. It changes the requirement from the pump having to have controls to the system having to have the controls. If one reads the second control requirement – it would seem this is a system requirement – not a requirement that applies to the pumps in the system.
3. Item 2 currently limits the water temperature of water entering the cold water piping to 'exactly' 104 degrees. We believe the intent is for that limit to be a maximum temperature.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). In 2015, the SEHPCAC has held three two- or three-day open meetings and 25 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction

The proposal is editorial in nature. It will have no impact on the cost of construction.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: The proposal changes the code language to be more technically correct. Approval is based on the proponent's published reason statements.

Assembly Action

None

Final Action Results

CE174-16 Part II

AS

Code Change No: CE176-16 Part II

Original Proposal

Section: C404.9.3

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Jennifer Hatfield, J. Hatfield & Associates, PL, representing Association of Pool & Spa Professionals (jhatfield@apsp.org)

Revise as follows:

R403.10.3 (N1103.10.3) Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means.

Exception: Where more than 70 percent of the energy for heating, computed over an operation season, is from ~~site-recovered energy, such as from a~~ heat pump or a solar energy source, covers or other vapor-retardant means shall not be required.

Reason: The original intent of this exception was that when an air-source swimming pool heat pump was installed on a pool or spa, it would not require a vapor retardant cover. Because an air-source swimming pool heat pump transfers heat from the air to the pool, it is a more energy efficient way to heat a pool over other types of heaters. The language included the term "site recovered energy" without the knowledge that this term is defined in ASHRAE 90.1 and as defined would not include air-source swimming pool heat pumps. If this exception were to be interpreted to require a heat pump that uses site-recovered energy, as defined in ASHRAE 90.1, then one would find that such a product does not exist in the swimming pool industry.

Therefore, this proposal eliminates that terminology to clarify that the intent here is if a pool or permanent spa utilizes a heat pump or solar energy source for more than 70% of the energy used in heating the pool or permanent spa, than one is exempt from the vapor retardant cover requirement. This change also ensures consistency with the change made to the 2018 International Swimming Pool & Spa Code (proposal SP 7) in the Group A hearings and is also what is being proposed for the corresponding commercial section of the IECC (See Part I of this proposal number)..

Cost Impact: Will not increase the cost of construction
This is only a clarification of the original intent of this section. This change does not require additional materials or labor for construction.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: Changing the language allows for more sources of energy to be available so that covers don't have to be used.

Assembly Action

None

Final Action Results

CE176-16 Part II

AS

Code Change No: **CE177-16 Part I**

Original Proposal

Section: C404.9.3

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

C404.9.3 Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other approved vapor-retardant means.

Exception: Where more than ~~70~~**75** percent of the energy for heating, computed over an operating season of at least 3 calendar months, is from site-recovered energy such as from a heat pump or solar on-site renewable energy source system, covers or other vapor-retardant means shall not be required.

Reason: This proposal makes the following changes:

Revise the exception from 70% to 75%. This revision is based on information provided by the US Department of Energy, which can be found at the following web sites:

<http://energy.gov/energysaver/swimming-pool-covers>

<http://energy.gov/energysaver/heat-pump-swimming-pool-heaters> (see Table 1. Costs by Location of Heating Outdoor Pools with a Heat Pump)

<http://energy.gov/energysaver/gas-swimming-pool-heaters> (see Table 2. Costs of Outdoor Pool Gas Heating by Location)

Based on the tables shown, for many cities and pool water temperatures, the energy savings from using covers is on the order of 75-90%. By increasing the requirement to 75%, the exception will help to create more of an energy savings balance between not using the cover and on-site energy systems.

Add in parameters for "operating season". As shown on the DOE web site, the estimated operating season can be anywhere from 3 months to 12 months, depending on the location of the pool. Adding in the words "of at least 3 months" ensures that the on-site systems can provide the required amount of energy while the pool is being operated.

Allow the use of other on-site renewable energy systems. The phrase "such as" provides examples of site-recovered energy systems. By using the term "*on-site renewable energy*", which is a defined term in Section C202, it provides more technical options that can qualify. Since this is a list, the new language provides more information and clarification.

Cost Impact: Will increase the cost of construction

For this exception, since the requirement has been increased from 70% to 75%, the estimated increase in cost for this option would be approximately 7 percent.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: Approval is based on the proponent's published reason statements.

Assembly Action

None

Final Action Results

CE177-16 Part I

AS

Code Change No: **CE177-16 Part II**

Original Proposal

Section: R403.10.3 (IRC N1103.10.3)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

R403.10.3 (N1103.10.3) Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means.

Exception: Where more than ~~70~~75 percent of the energy for heating, computed over an operation season of at least 3 calendar months, is from site-recovered energy, such as from a heat pump or ~~solar energy source~~ on-site renewable energy system, covers or other vapor-retardant means shall not be required.

Reason: This proposal makes the following changes:

Revise the exception from 70% to 75%. This revision is based on information provided by the US Department of Energy, which can be found at the following web sites:

<http://energy.gov/energysaver/swimming-pool-covers>

<http://energy.gov/energysaver/heat-pump-swimming-pool-heaters> (see Table 1. Costs by Location of Heating Outdoor Pools with a Heat Pump)

<http://energy.gov/energysaver/gas-swimming-pool-heaters> (see Table 2. Costs of Outdoor Pool Gas Heating by Location)

Based on the tables shown, for many cities and pool water temperatures, the energy savings from using covers is on the order of 75-90%. By increasing the requirement to 75%, the exception will help to create more of an energy savings balance between not using the cover and on-site energy systems.

Add in parameters for "operating season". As shown on the DOE web site, the estimated operating season can be anywhere from 3 months to 12 months, depending on the location of the pool. Adding in the words "of at least 3 months" ensures that the on-site systems can provide the required amount of energy while the pool is being operated.

Allow the use of other on-site renewable energy systems. The phrase "such as" provides examples of site-recovered energy systems. By using the term "*on-site renewable energy*", which is a defined term in Section C202, it provides more technical options that can qualify. Since this is a list, the new language provides more information and clarification.

Cost Impact: Will increase the cost of construction

For this exception, since the requirement has been increased from 70% to 75%, the estimated increase in cost for this option would be approximately 7 percent.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

CE177-16 Part II

AS

Code Change No: CE248-16 Part II

Original Proposal

Section: R406.3 (N1106.3)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

R406.3 (N1106.3) Energy Rating Index. The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a *residential building* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the total energy use of the rated design relative to the total energy use of the *ERI reference design*. The ERI shall consider all energy used in the *residential building*. Energy used to recharge or refuel a vehicle for on-road (and off-site) transportation purposes shall not be included in the *ERI reference design* or the *rated design*.

Reason: More commercial buildings are offering amenities for alternatively fueled vehicles. Items such as refueling stations and charging stations are offered to employees, customers, and visitors to provide more options to owners of vehicles that are more energy efficient and provide environmental benefits. The energy for these vehicles will most likely be delivered through a building energy meter. Even though the energy is not being used by the building, or being used by building equipment, or being used by building occupants, it may be considered to be a "process load" under the current scope.

For smaller buildings with several refueling or recharging stations, the amount of energy provided for off-site transportation purposes could be a significant portion of the overall energy use if it is counted as a "process" load.

This proposal provides an exception for this energy used to recharge or refuel a vehicle that is used for on-road (and off-site) transportation purposes. This exception is limited to vehicles that are only used for off-site purposes that are obtaining their energy through the building energy infrastructure. Please note that vehicles that are used on or at the building site for process or other purposes (e.g., forklifts, campus delivery vehicles, lawn service equipment, etc.) are to be accounted for like other "receptacle" or "process" loads in the total building performance approach.

Cost Impact: Will not increase the cost of construction

This does not change the requirements for total building performance, but clarifies what is to be excluded from scope of this section. Therefore, it will not increase the cost of construction.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: It is appropriate to not include the energy used to recharge these types of vehicles from the energy calculations. There are already incentives for fuel efficient/electric vehicles. We don't know how much those vehicles will be used so we can't depend on that use to lower the cost of the power to the building.

Assembly Action

None

Final Action Results

CE248-16 Part II

AS

Code Change No: CE274-16 Part II

Original Proposal

Section: R501.4 (IRC N1107.4)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-RESIDENTIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Hope Medina, representing Colorado Chapter of ICC (hmedina@coloradocode.net)

Revise as follows:

R501.4 (N1107.4) Compliance. *Alterations, repairs, additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations, repairs, additions* and changes of occupancy or relocation, respectively, in this code and the International Residential Code, International Building Code, International Existing Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code and NFPA 70.

Reason: It doesn't make sense for alterations, repairs, additions, change of occupancies, and relocated buildings to not need to comply with the IECC and the Existing Building Code. Especially since this section deals with existing buildings in one form or the other. We feel this was just an oversight in the creation of the new Chapter, and would like to correct the over sight.
Our Theme: A Code for the End User

Is the code section completely understandable to the end user?
Is the code section or requirement easy to find?
Is the code requirement even doable in the real world?
Will the code requirement really save energy or only on paper?

Cost Impact: Will not increase the cost of construction
These were missing codes to the list,

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: This proposal properly coordinates the codes.

Assembly Action

None

Final Action Results

CE274-16 Part II

AS

Code Change No: **RE3-16**

Original Proposal

Section: R202

Proponent: Robert Schwarz, representing EnergyLogic, Inc. (robby@nrglogic.com)

Add new definition as follows:

AIR-IMPERMEABLE INSULATION. An insulation having an air permability of equal to or less than 0.02 L/s-m2 at 75 Pa pressure differential when tested in accordance with ASTM E2178 or E283.

Reference standards type: This is an update to reference standard(s) already in the ICC Code Books
Add new standard(s) as follows:

ASTM E2178-13 Standard Test Method for Air Permeance of Building Materials

Reason: Definition carried over from the IRC

The term air permeable insulation is utilized in the IECC specifically in Table R404.1.1. Carrying this definition over to from the IRC to the IECC helps clarify what can and cannot be used in specific installation according to the code.

Cost Impact: Will not increase the cost of construction

There would be no cost impact associated with this proposed definition as it is being added to create better consistency between the code families and clarity for the intent of the current code.

Analysis: The term is defined in IRC Chapter 2.

The standard proposed for inclusion in this code, ASTM E2178-13, is referenced in the *International Energy Conservation Code-Commercial Provisions*.

Report of Committee Action Hearings

Committee Action:

Approved as Modified

Modify as follows:

AIR-IMPERMEABLE INSULATION. An insulation having ~~which also functions as~~ an air permeability of equal to or less than 0.02 L/s-m2 at 75 Pa pressure differential when tested in accordance with ASTM E2178 or E283 ~~barrier material~~.

Committee Reason: The modification was needed to correct the proposed definition to align with what is in the ASTM standards. The as-modified proposal was approved because it is difficult to explain what is intended without a definition.

Assembly Action

None

Final Action Results

RE3-16

AM

Code Change No: RE5-16

Original Proposal

Section: R202 (IRC N1101.6)

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

R202 (N1101.6) HIGH-EFFICACY LAMPS. Compact fluorescent lamps, light emitting diode (LED) lamps, T-8 or smaller diameter linear fluorescent lamps, or other lamps with a minimum efficacy of:

1. Sixty lumens per watt for lamps over 40 watts;
2. Fifty lumens per watt for lamps over 15 watts to 40 watts; and
3. Forty lumens per watt for lamps 15 watts or less.

Reason: This proposal clarifies the definition to include LED lamps and other lamp technologies that may be used (such as induction lighting or other lighting technology).

Cost Impact: Will not increase the cost of construction
This proposal only clarifies the definition and does not change any code requirements.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement. A light emitting diode lamp option creates competition to drive down costs for all lamps.

Assembly Action

None

Final Action Results

RE5-16

AS

Code Change No: RE8-16

Original Proposal

Section: R202 (New) [IRC N1101.6 (New)]

Proponent: David Collins, representing Sustainability, Energy, High Performance Code Action Committee; Joseph Hetzel (Jhetzel@thomasamc.com)

Add new definition as follows:

R202 (IRC N1101.6) OPAQUE DOOR. A door that is not less than 50 percent opaque in surface area.

Reason: The term opaque door is used in the residential provisions of the code. A definition is needed to clarify application. The definition proposed is identical to the IECC Commercial Provisions in Section C202.

The IECC defines a door that is more than 50% glass in area as a glass door. Adding this exception to the IECC clarifies that any door that is not as least 50% glazing is considered, for the purposes of the residential provisions of the IECC, an opaque door. This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). In 2015, the SEHPCAC has held three two- or three-day open meetings and 25 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction
The proposal clarifies the code by adding a definition for a term already used in the residential provisions. The action is essentially editorial and should have no cost implications.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: A needed definition for what is and is not an opaque door. The term is used in several places in the code so the definition is necessary.

Assembly Action

None

Final Action Results

RE8-16

AS

Code Change No: RE14-16

Original Proposal

Section: R401.3 (IRC N1101.14)

Proponent: Robert Schwarz, representing EnergyLogic, Inc. (robby@nrglogic.com)

Revise as follows:

R401.3 (N1101.14) Certificate (Mandatory). A permanent certificate shall be completed by the builder or ~~registered design professional~~ other approved party and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and floor) and ducts outside conditioned spaces; U-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

Reason: This could be in the wheelhouse of the design professional, but more often it would be the responsibility of the Insulator and or Energy Rater so limiting who can generate the certificate for the Builder does not make sense. As this very important requirement rarely gets executed broadening who can create it is well worth while.

Cost Impact: Will not increase the cost of construction
This proposal will not increase cost and in fact is likely to lower cost as design professionals would now most likely not be tasked with completing this requirement of code.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

RE14-16

AS

RE14-16

R401.3 Energy performance level (EPL) display card (Mandatory). The building official shall require that an energy performance level (EPL) display card be completed and certified by the builder to be accurate and correct before final approval of the building for occupancy. Florida law (Section 553.9085, *Florida Statutes*) requires the EPL display card to be included as an addendum to each sales contract for both presold and nonpresold residential buildings. The EPL display card contains information indicating the energy performance level and efficiencies of components installed in a dwelling unit. The building official shall verify that the EPL display card completed and signed by the builder accurately reflects the plans and specifications submitted to demonstrate code compliance for the building. A copy of the EPL Display Card can be found in Appendix C.

~~R401.3 Certificate (Mandatory).~~ A permanent certificate shall be completed by the builder or registered design professional and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall list the predominant R -values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and floor) and ducts outside conditioned spaces; U -factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace or baseboard electric heater is installed in the residence, the certificate shall list “gas-fired unvented room heater,” “electric furnace” or “baseboard electric heater,” as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.~~

Code Change No: **RE17-16**

Original Proposal

Section: R402.1 (IRC N1102.1)

Proponent: Robert Pickett, RobPickett & Associates, LLC representing the Log & Timber Homes Council, representing Log & Timber Homes Council (robpickett@vermontel.net); Craig Drumheller, National Association of Home Builders, representing National Association of Home Builders (CDrumheller@nahb.org)

Revise as follows:

R402.1 (N1102.1) General (Prescriptive). The *building thermal envelope* shall meet the requirements of Sections R402.1.1 through R402.1.5.

Exception-Exceptions:

1. The following low-energy buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this section shall be exempt from the *building thermal envelope* provisions of Section R402.
 - 1.1 Those with a peak design rate of energy usage less than 3.4 Btu/h • ft² (10.7 W/m²) or 1.0 watt/ft² of floor area for space-conditioning purposes.
 - 1.2 Those that do not contain *conditioned space*.
2. Log homes designed in accordance with ICC-400.

Reason: This amendment refers design of log homes to ICC400 *Standard on the Design and Construction of Log Structures* (ICC400) as it is the only consensus standard for log building. This amendment would benefit future state and local adoption as it is consistent with existing State amendments or legislation. At least four states have passed legislation referring to ICC400, while several other states have amended their energy conservation code to add log home specific paths. In 2015, the City and County of Denver adopted language similar to the proposed, and Vermont amended the 2015 IECC to add Table 402.1.5, *Log Home Insulation, Fenestration and Heating Requirements by Component*. Idaho added Table R402.a *Log Home Prescriptive Thermal Envelope Requirements by Component* to their 2014 code. Minnesota added Footnote H to Table 1102.1(1) to their 2012 IECC.

The design, construction and performance of log walls are quite different than the convention construction methods detailed in the IRC (and residential requirements of the IECC). ICC400 responds to the thermal envelope requirements of the IRC Chapter 11 and IECC Chapter 4. The standard offers prescriptive, calculated/engineered and performance/testing paths for substantiating the performance of log walls, and trade-off packages for each Climate Zone. Therefore, the thermal envelope of log homes would be evaluated as follows:

- **THERMAL:** ICC400-2012 **Section 305 Thermal Envelope** presents requirements for weather protection and determination of thermal properties, offering prescriptive, calculation, and performance options. **TABLE 305.3.1.2 Insulation and Fenestration Requirements by Component** provides one such prescriptive option.
- **AIR INFILTRATION:** Guidance is provided in ICC400 in **Section 306 Infiltration**. Section 306, along with 305.1 Weather protection and 304 Provisions for Settling in Log Structures all work in unison to address the issue. The same blower door requirement of the 2015 code shall apply to log walls as for any other method of construction.
- **VAPOR RETARDERS:** As noted in Exception 3 of IRC Section R702.7 Vapor retarders, "Construction where moisture or its freezing will not damage the materials." There is no cavity to protect in a log wall, and all joinery is covered by ICC400-2012.
- **EXTERIOR COVERING:** The Exception in IRC Section R703.1 General refers to "Log walls designed and constructed in accordance with the provisions of ICC400." The standard covers all discussion of weather resistance, drainage planes, etc.

The members of the Log & Timber Homes Council have encouraged certifying log homes through Energy Star® for many years. With the attention to design and construction details in accordance with ICC400, log homes with a nominal 6" wide log profile have been certified as 5-Star Plus with ratings in the 50's and lower. Blower door testing has demonstrated that log homes meet the 3ACH50 requirements of Climate Zones 4-8. These tests have demonstrated that perhaps it is the tightness as well as mass of a log home that provide the satisfaction and comfort of the occupants.

It is important to note that ICC400 pertains to building solid wood walls and structural framing with logs. It defaults to the I-Codes for design conditions, foundations, roofing, mechanical, electrical, plumbing, etc. In Section 305 Thermal Envelope, ICC400 calls for compliance with the requirements of the IECC with an exception for log walls. The thermal properties of log walls can be taken from prescriptive tables, tested or calculated per the stipulated equations. Application of thermal mass is described to establish conformance with the IECC.

Bibliography: ICC Standard on the Design and Construction of Log Structures (ICC 400)

Please note: ICC copyrighted documents can only be distributed through their publications department. Electronic and print copies can be obtained from the ICC store at <http://shop.iccsafe.org/catalogsearch/result/?order=relevance&dir=desc&q=ICC+400>. Energy Performance of Log Homes, Log & Timber Homes Council, NAHB, 2015, 42 pgs. http://loghomes.org/wp-content/uploads/2013/06/EnergyPerformanceWP_2010.pdf Preservation & Maintenance of Log Structures, Log & Timber Homes Council, NAHB, 2003, 16 pgs. <http://loghomes.org/wp-content/uploads/2013/06/Preservation-Maintenance-of-Log-Structures-10-15-03.pdf>

Cost Impact: Will not increase the cost of construction

Log wall construction is an alternate method of construction from the wood frame, steel frame, and concrete masonry options addressed in the energy conservation codes. The intent is to evaluate solid wood walls rather than apply prescriptive requirements that may impact the esthetic and/or durability of the wall system.

Without this change, readers may believe that they have only three options: 1.) Build with very large logs, 2.) Add insulation to the outside, or 3.) Add insulation to the inside.

Option 1: Prescriptive mass wall R-values set minimum log widths that are not commonly available, require greater cost to build, and cannot be milled by equipment used today. These factors will constrict the industry to the high-end custom home market. It will cause the existing log home inventory significant undue stress as owners of otherwise energy efficient log homes will be pressed to insulate their nominal 6" log walls (average width of 5"-5.5"). A survey of the industry indicates that a 10" round/8x nominal or smaller covers 80% of the log home products built and in production in climate zones 5-8, which is over 55% of the log home market. The 10" round/8x nominal log size equates to an average log width of about 7"-7.5".

Option 2: This would be consistent with the details for cross-laminated timber (CLT).

Option 3: It should be noted that adding insulation to the inside of a log wall is not recommended as it restricts the benefits of mass wall effects while eliminating the opportunity for inspection that may otherwise identify a need for maintenance. All three options are extremely costly as opposed to trade-offs in the building thermal envelope, which is why most log home companies use REScheck for compliance. This can help keep the log width to a size that is economical for production, builder and home owner. Therefore the cost of construction can actually be reduced by evaluating log walls by measures other than prescriptive wall R-value (R/inch of wood).

Effect of the proposed amendment on the cost of design: ___ Increase ___ Reduce XXX No Effect
 Effect of the proposed amendment on the cost of construction: ___ Increase XXX Reduce ___ No Effect
 Is the amendment proposal more or less restrictive than the I-Codes? ___ More ___ Less XXX Same

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: Log homes are unique structures that are hard to fit into the prescriptive structure of the energy code. Many people, other than log home manufacturers, are involved with ICC 400 to make that standard what it needs to be for that product. Therefore, this is a good proposal that should be included in the code.

Assembly Action

None

Final Action Results

RE17-16

AS

Code Change No: RE22-16

Original Proposal

Section(s): Table R402.1.2 (IRC Table N1102.1.2)

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council

Revise as follows:

**TABLE R402.1.2 (N1102.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a**

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^{b, e}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^c WALL R-VALUE
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35	0.55	0.25	38	20 or 13+5 ^h	8/13	19	5/13 ^f	0	5/13
4 except Marine	0.35	0.55	0.40	49	20 or 13+5 ^h	8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.55	NR	49	20 or 13+5 ^h	13/17	30 ^g	15/19	10, 2 ft	15/19
6	0.32	0.55	NR	49	20+5 or 13+10 ^h	15/20	30 ^g	15/19	10, 4 ft	15/19
7 and 8	0.32	0.55	NR	49	20+5 or 13+10 ^h	19/21	38 ^g	15/19	10, 4 ft	15/19

For SI: 1 foot = 304.8 mm.

a. R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in climate zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

c. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

d. ~~R-5 shall be added provided under the full slab area of a heated slab in addition to the required slab edge R-values for heated/unheated slabs. Insulation depth shall be as indicated in the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slab/able.~~

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.

- g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
- h. The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
- i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

Reason: This proposal improves the effectiveness of heated (radiant) slab insulation. The current practice of simply adding an additional R-5 insulation to the perimeter of a heated slab results in substantially greater heat loss from a heated slab than unheated slab which creates an avoidable and inappropriate energy cost penalty to consumers that use heated (radiant) slabs instead of unheated slabs. For example, ASHRAE 90.1 Appendix A (Table A6.3.1) shows that R-15 slab edge insulation only on a heated slab results in an F-factor of 1.25 whereas R-10 slab edge insulation only on an unheated slab results in an F-factor of 0.54. Thus, there is a more than two-fold increase in heat loss from the heated slab than there is from the unheated slab, even though the heated slab has an additional R-5 perimeter insulation as currently required by code. This is a very inefficient and non-equivalent way to insulate a heated slab. Instead, placing the additional R-5 insulation underneath a heated slab brings the performance of a heated slab more closely in line with the performance of an unheated slab such that consumers do not pay for a heated slab and then also doubly pay for higher energy costs over the life of the building. This practice will also provide the benefit of improved temperature control and comfort and is considered a common and good practice for heated (radiant) slabs.

Cost Impact: Will increase the cost of construction
 That this proposal may increase cost is debatable. In many cases, radiant slabs are insulated with sub-slab insulation as a matter of good practice and this is obvious to many who use them. In fact, at least some states already require the use of sub-slab insulation with heated radiant slabs. This proposal will also decrease long-term costs of operating a heated slab in comparison to use of an unheated slab with perimeter insulation only. There are also practical and cost-saving advantages of not increasing perimeter insulation thickness, particularly when placed in its most effective location on the exterior side of the slab edge.

**Report of Committee Action
Hearings**

Committee Action: **As Submitted**

Committee Reason: The proposed changes give a short payback period for minimal required effort.

Assembly Action: **None**

Public Comments

Public Comment 1:

Martha VanGeem, representing Masonry Alliance for Codes and Standards (martha.vangeem@gmail.com) requests Approve as Modified by this Public Comment.

Modify as follows:

**TABLE R402.1.2 (N1102.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a**

- For SI: 1 foot = 304.8 mm.
- a. R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.
 - b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in climate zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.
 - c. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
 - d. R-5 shall be provided under the full slab area of a heated slab in addition to the required slab edge R-values for unheated slabs as indicated in the table. The slab edge insulation for heated slabs is not required to extend below the slab.
 - e. There are no SHGC requirements in the Marine Zone.
 - f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.
 - g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
 - h. The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5

continuous insulation.

i. The second R -value applies when more than half the insulation is on the interior of the mass wall.

Commenter's Reason: This modification clarifies the proposal. The word "unheated" is deleted because there is no criteria for "unheated" slabs. The sentence in the proposal is confusing as to whether the insulation under the slab is required for all slabs or just heated slabs. The reason in the original proposal indicates that the intent is that the insulation under the slab is for heated slabs. In addition, the second sentence is added because the edge insulation should not be required to extend below the slab when insulation under the slab is provided.

Final Action Results

RE22-16

AMPC1

Code Change No: RE31-16

Original Proposal

Section: Table R402.1.2 (IRC Table N1101.1.2), R402.1.4 (IRC Table N1101.1.4)

Proponent: Donald Surrena (dsurrena@nahb.org)

Revise as follows:

TABLE R402.1.2 (N1102.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT U-FACTOR ^b	GLAZED FENESTRATION SHGC ^{b,e}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE ⁱ	FLOOR R-VALUE	BASEMENT WALL R-VALUE ^c	SLAB R-VALUE & DEPTH ^d	CRAWL SPACE WALL R-VALUE ^c
1	NR	0.75	0.25	30	13	3/4	13	0	0	0
2	0.40	0.65	0.25	38	13	4/6	13	0	0	0
3	0.35 <u>0.32</u>	0.55	0.25	38	20 or 13+5 ^h	8/13	19	5/13 ^f	0	5/13
4 except Marine	0.35 <u>0.32</u>	0.55	0.40	49	20 or 13+5 ^h	8/13	19	10 /13	10, 2 ft	10/13
5 and Marine 4	0.32 <u>0.30</u>	0.55	NR	49	20 or 13+5 ^h	13/17	30 ^g	15/19	10, 2 ft	15/19
6	0.32 <u>0.30</u>	0.55	NR	49	20+5 or 13+10 ^h	15/20	30 ^g	15/19	10, 4 ft	15/19
7 and 8	0.32 <u>0.30</u>	0.55	NR	49	20+5 or 13+10 ^h	19/21	38 ^g	15/19	10, 4 ft	15/19

For SI: 1 foot = 304.8 mm.

a. R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. Exception: Skylights may be excluded from glazed fenestration SHGC requirements in climate zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

c. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slabs.

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation.

i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

**TABLE R402.1.4 (N1102.1.4)
EQUIVALENT U-FACTORS^a**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR ^b	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	0.50	0.75	0.035	0.084	0.197	0.064	0.360	0.477
2	0.40	0.65	0.030	0.084	0.165	0.064	0.360	0.477
3	0.35 <u>0.32</u>	0.55	0.030	0.060	0.098	0.047	0.091 ^c	0.136
4 except Marine	0.35 <u>0.32</u>	0.55	0.026	0.060	0.098	0.047	0.059	0.065
5 and Marine 4	0.32 <u>0.30</u>	0.55	0.026	0.060	0.082	0.033	0.050	0.055
6	0.32 <u>0.30</u>	0.55	0.026	0.045	0.060	0.033	0.050	0.055
7 and 8	0.32 <u>0.30</u>	0.55	0.026	0.045	0.057	0.028	0.050	0.055

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.

b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Climate Zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.087 in Climate Zone 4 except Marine, 0.065 in Climate Zone 5 and Marine 4, and 0.057 in Climate Zones 6 through 8.

c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure R301.1 and Table R301.1.

Reason: Window efficiency has been aggressively targeted by programs such as ENERGY STAR because, compared to opaque walls, windows result in a much higher heat loss. Many Building America projects after 2010 incorporate window U-factors as low as 0.27, especially in cold climates, indicating that low-U glazing is finding widespread use in the marketplace.^[1] Given these developments, this code change proposal considers improving maximum allowable fenestration U-factors to match older ENERGY STAR specifications where data indicate there is substantial market penetration. According to the 2013 ENERGY STAR market assessment conducted by Ducker Worldwide, the overall ENERGY STAR penetration for residential windows in the year 2013 was estimated to be 80%.^[2] For new construction alone, ENERGY STAR residential window market penetration ranges from 70% to 88% based on climatic region, except for Florida which has a lower penetration rate of 36%. This proposed change only affects climate zones 3 through 8, for which data indicate excellent market penetration. It can thus be concluded that the current residential building market is sufficiently primed for lowering window U-factors in these climate zones.

Energy Savings: DOE's analysis of the energy impact of this proposed change found energy savings in climate zones 3 through 8. Savings ranged from about 0.6% to 1.1% of IECC-regulated end uses (heating, cooling, water heating, and lighting).

The U.S. Department of Energy (DOE) develops its proposals through a public process to ensure transparency, objectivity and consistency in DOE-proposed code changes. Energy savings and cost impacts are assessed based on established methods and reported for each proposal, as applicable. More information on the process utilized to develop the DOE proposals for the 2018 IECC can be found at: <https://www.energycodes.gov/development/2018IECC>.

Cost Impact: Data collected by DOE indicates an incremental cost of \$0.18/ft² for a window with a U-factor of 0.30 compared to a window with a U-factor of 0.35.^[3] The present analysis conservatively assumes the same incremental cost of \$0.18/ft² for windows with a U-factor of 0.32 compared to windows with a U-factor of 0.35.

[1] See Case Studies in the "cold/very cold" regions in the Building America Solution Center at <https://basc.pnnl.gov/optimized-climate-solutions/coldvery-cold>

[2] Available from ENERGY STAR by request

[3] Residential Energy Efficiency Measures – Prototype Estimate and Cost Data available at http://bc3.pnnl.gov/sites/default/files/Residential_Report.pdf

Cost Impact: Will not increase the cost of construction

Cost Impact: Data collected by DOE indicates an incremental cost of \$0.18/ft² for a window with a U-factor of 0.30 compared to a window with a U-factor of 0.35.^[3] The present analysis conservatively assumes the same incremental cost of \$0.18/ft² for windows with a U-factor of 0.32 compared to windows with a U-factor of 0.35.

Cost-effectiveness: Assuming windows have a useful life of 30 years, an evaluation of the life-cycle cost savings of these improved levels over the 2015 IECC requirements using DOE's cost-effectiveness methodology shows positive life-cycle cost savings in climate zones 3 to 8. Life-cycle savings range from about \$16 in zone 3 to \$388 in zone 8.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: Windows with these U-factors are now readily available in the market place. The extra cost has a short payback period.

Assembly Action

None

Final Action Results

RE31-16

AS

Code Change No: **RE40-16**

Original Proposal

Section(s): R402.2.2 (IRC N1102.2.2)

Proponent: Mike Fischer, Kellen Company, representing Center for the Polyurethanes Industry of the American Chemistry Council (mfischer@kellencompany.com)

Revise as follows:

R402.2.2 (N1102.2.2) Ceilings without attic spaces. Where Section R402.1.2 would require R-38 or R-49 insulation levels above R-30 in the ceiling and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. The full height of uncompressed R-30 insulation shall extend over the top of the wall plate at the eaves. This reduction of insulation from the requirements of Section R402.1.2 shall be limited to 500 square feet (46 m²) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

Reason: The proposed language relates to the current provision in the IECC-R that allows for some limited lower R-Values where the roof/ceiling design provides limited space. This might typically apply where a room addition or a sun room with a single slope roof constructed with simple dimensional lumber framing instead of trusses. The proposal is largely editorial in that it does not change the insulation requirements, but reorganizes the text in R402.2.2 to match the format and style used on R402.2.1. The proposal makes one clarification that in order to use this option the insulation must extend over the wall top plate to avoid a thermal short circuit.

Cost Impact: Will not increase the cost of construction
The proposal is an editorial reorganization for clarification of current requirements. Thus, the cost of construction is not changed.

Report of Committee Action Hearings

Committee Action:

As Modified

Modify as follows:

402.2.2 (N1102.2.2) Ceilings without attic spaces. Where Section R402.1.2 would require R-38 or R-49 insulation levels above R-30 in the ceiling and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. The full height of uncompressed R-30 insulation shall extend over the top of the wall plate at the eaves. This reduction of insulation from the requirements of Section R402.1.2 shall be limited to 500 square feet (46 m²) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the *U*-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

Committee Reason: The modification was made to eliminate further correlation problems should the greater insulation levels change.

The as modified proposal was approved because it provides clear direction on where the thicker insulation requirement is needed.

Assembly Action:

None

Public Comments

Public Comment 1:

Martha VanGeem, representing Masonry Alliance for Codes and Standards (martha.vangeem@gmail.com) requests Approve as Modified by this Public Comment.

Modify as follows:

R402.2.2 (N1102.2.2) Ceilings without attic spaces. Where Section R402.1.2 would require insulation levels ~~above~~ greater than R-30 in the ceiling and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. ~~The full height of uncompressed R-30 insulation~~ Insulation shall extend over the top of the wall plate ~~at to the eaves outer edge of such plate and shall not be compressed.~~ This reduction of insulation from the requirements of Section R402.1.2 shall be limited to 500 square feet (46 m²) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section R402.1.4 and the total UA alternative in Section R402.1.5.

Commenter's Reason: The SEHPCAC reviewed approved changes to analyze if in the CAC's opinion whether the newly approved text was clear, understandable and enforceable. This proposal as approved by the committee is not clear. First the phrase 'above R-30' could be read as physically above (higher) or providing a 'higher' level of insulation. We feel 'greater the R30' reflects the intent of the proponent.

Secondly, the new sentence added in the middle of the paragraph seems to be adding new requirements without clearly stating them as a requirement. For example the 'full height of uncompressed insulation'. Is that intended as a prohibition of compressing the insulation in certain locations? If so, it is not clear. Further the 'extension' over the wall plate at the eaves ' is, at best, imprecise. We acknowledge the struggles of the proponent to craft clear language. We took a number of runs at it to develop this proposed revision. We feel it better expresses the intent of the proponent. Without this or similar improve to the text, the proposal should be disapproved because it would introduce unenforceable code text.

This public comment was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). In 2015-16, the SEHPCAC has held five two- or three-day open meetings and 40 workgroup calls, to discuss and debate proposed changes and public comments. Attendees at the meetings and calls included members of the SEHPCAC as well as any interested parties. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Final Action Results

RE40-16

AMPC1

Code Change No: **RE53-16**

Original Proposal

Section: Table R402.2.6 (IRC Table N1102.2.6)

Proponent: Mark Nowak, representing Steel Framing Alliance (mark@mnowak.net)

Revise as follows:

TABLE R402.2.6 (N1102.2.6)
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE ^a
Steel Truss Ceilings^b	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings^b	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel-Framed Wall, 16" on center	
R-13	R-13 + 4.2 or R-19 + 2.4 or R-21 + 2.8 or R-0 + 9.3 or R-15 + 3.8 or R-21 + 3.1
R-13 + 3	R-0 + 11.2 or R-13 + 6.1 or R-15 + 5.7 or R-19 + 5.0 or R-21 + 4.7
R-20	R-0 + 14.0 or R-13 + 8.9 or R-15 + 8.5 or R-19 + 7.8 or R-19 + 6.2 or R-21 + 7.5
R-20 + 5	R-13 + 12.7 or R-15 + 12.3 or R-19 + 11.6 or R-21 + 11.3 or R-25 + 10.9
R-21	R-0 + 14.6 or R-13 + 9.5 or R-15 + 9.1 or R-19 + 8.4 or R-21 + 8.1 or R-25 + 7.7
Steel Framed Wall, 24" on center	
R-13	R-0 + 9.3 or R-13 + 3.0 or R-15 + 2.4
R-13 + 3	R-0 + 11.2 or R-13 + 4.9 or R-15 + 4.3 or R-19 + 3.5 or R-21 + 3.1
R-20	R-0 + 14.0 or R-13 + 7.7 or R-15 + 7.1 or R-19 + 6.3 or R-21 + 5.9
R-20 + 5	R-13 + 11.5 or R-15 + 10.9 or R-19 + 10.1 or R-21 + 9.7 or R-25 + 9.1
R-21	R-0 + 14.6 or R-13 + 8.3 or R-15 + 7.7 or R-19 + 6.9 or R-21 + 6.5 or R-25 + 5.9
Steel Joist Floor	
R-13	R-19 in 2 x 6, or R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6, or R-19 + 12 in 2 x 8 or 2 x 10

a Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.

b. Insulation exceeding the height of the framing shall cover the framing.

Reason: This proposal corrects an inconsistency in the code by eliminating two conflicting entries in the code for R21 insulation on a steel wall when using the table that establishes equivalency with a wood stud wall with R-13+0 insulation. Public comment number 1 to E66-09/10 was mistakenly submitted with this error and subsequently approved.

Cost Impact: Will increase the cost of construction

An additional R-1 of continuous insulation will be required under this proposal if a designer selects R-19 cavity insulation. The extra cost could be offset by a lower continuous insulation value for R-21 cavity insulation for these assemblies. Unfortunately, this is necessary to address an error in the public comment that was approved with EC66-09/10.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

RE53-16

AS

Code Change No: RE64-16

Original Proposal

Section: Table R402.4.1.1 (IRC Table N1102.4.1.1)

Proponent: Michael Gieszler, representing Oregon Building Officials Association
(mike.gieszler@hillsboro-oregon.gov)

Revise as follows:

**TABLE R402.4.1.1 (N1102.4.1.1)
AIR BARRIER AND INSULATION INSTALLATION**

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
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 of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.

Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate the building thermal envelope shall be sealed to the subfloor, wall covering or drywall ceiling .	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

Reason: HVAC register boots are installed in ceilings as well as walls and floors and should be sealed regardless of which part of the thermal envelope they pass through.

Cost Impact: Will not increase the cost of construction

This proposal only clarifies the intent of the code. There is no additional materials or labor costs associated as this work is what the current code intends.

Report of Committee Action Hearings
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Committee Action:

Approved as Submitted

Committee Reason: Sealing of the ductwork to the membrane (wall, floor and ceiling) is an issue that does need addressed.

Assembly Action

None

Final Action Results

RE64-16

AS

Code Change No: RE65-16

Original Proposal

Section: Table R402.4.1.1 (IRC Table N1102.4.1.1)

Proponent: Michael Gieszler, representing Oregon Building Officials Association
(mike.gieszler@hillsboro-oregon.gov)

Revise as follows:

**TABLE R402.4.1.1 (N1102.4.1.1)
AIR BARRIER AND INSULATION INSTALLATION**

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
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 of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage	Air sealing shall be provided between the	

separation	garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall finished surface.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

Reason: The intent of the code is that whatever the finish surface, penetrations must be sealed to it.

Cost Impact: Will not increase the cost of construction

This proposal only clarifies the code provision for sealing. As this is only a clarification, there is no additional cost associated with this proposed change.

Report of Committee Action Hearings
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Committee Action:

Approved as Submitted

Committee Reason: Not all finishes are drywall so this is an appropriate change.

Assembly Action

None

Final Action Results

RE65-16

AS

Code Change No: **RE71-16**

Original Proposal

Section: Table R402.4.1.1 (IRC Table N1102.4.1.1)

Proponent: Robert Schwarz, representing EnergyLogic, Inc. (robby@nrglogic.com)

Revise as follows:

TABLE R402.4.1.1 (N1102.4.1.1)
AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier shall be sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
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 of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	

Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC <u>supply and return</u> register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall <u>penetrated by the boot</u> .	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

a. In addition, inspection of log walls shall be in accordance with the provisions of ICC-400.

Reason: For minimal additional effort, this proposal ensures that the durability, comfort, health safety, and efficiency intent of the code is carried out. When forced air passes through a supply boot a portion of that air is directed into building cavities the boot penetrates. In the same fashion a portion of the air that is returned to the HVAC system is pulled from the cavity rather than from the room when the boot is not sealed to the surface they penetrate through. Air transports moisture, energy, and pollutants. Gaining greater control of the air that is moving through and around the building ensures better efficiency and compliance with the intent of the code.

Cost Impact: Will increase the cost of construction

There is a minimal cost impact associated with this proposal. The duct system is already being sealed with mastic to meet the duct leakage requirements of the code and the additional mastic installation needed to seal a supply boot to the subfloor is small.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides information that is easily understood by field personnel.

Assembly Action

None

Final Action Results

RE71-16

AS

Code Change No: **RE83-16**

Original Proposal

Section: R402.4.1.2 (IRC N1102.4.1.2)

Proponent: Eric Makela, Cadmus Group, representing RESNET

Revise as follows:

R402.4.1.2 (N1102.4.1.2) Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ~~ASTM E 779 or ASTM E 1827~~ BRS/RESNET/ICC 380 and reported at a pressure of 0.2 inch w.g. (50 Pascals). 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*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

- ~~1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.~~
- ~~2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.~~
- ~~3. Interior doors, if installed at the time of the test, shall be open.~~
- ~~4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.~~
- ~~5. Heating and cooling systems, if installed at the time of the test, shall be turned off.~~
- ~~6. Supply and return registers, if installed at the time of the test, shall be fully open.~~

Reference standards type: This reference standard is new to the ICC Code Books

Add new standard(s) as follows:

BRS/RESNET/ICC 380-2016 Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems.
Republished January 2016. Addendum A-2015 and Addendum B-2015.

Reason: BRS/RESNET/ICC 380-2016 provides needed guidance for performing envelope air leakage, duct leakage and air flow testing. Building off of existing standards (e.g. ASTM E779-10) the standard allows for multiple test procedures to provide flexibility for the testing industry. Standard 380 also covers testing for single-family and 3-story and less multi-family projects and will be referenced as the protocol for testing for the rating industry. The E 779 standard requires multi-point testing under both pressurized and depressurized conditions. BRS/RESNET/ICC 380-2016 allows E 779 tests but expands the test methodology to allow single point tests under only one pressurization/depressurization condition and includes correction factors to account for test bias and uncertainty. Thus, 380 can be a substantially less expensive protocol than E 779.

The standard provides a consistent, uniform methodology for evaluating the airtightness of building envelopes and heating and cooling air ducts. The test procedures can be used as building diagnostics, in quality assurance and control, for determining compliance with codes and standards and to determine input to energy simulations and ratings. The standard provides a step-by-step approach to testing for building envelop leakage with the goal of standardizing how testing should be performed in the field. Standard 380 provides guidelines for calculating common air leakage testing metrics e.g. CFM50, ACH50, NLA, SLA and ELA. Referencing a standard with this type of flexibility allows the testing metric to change in the code without the need to change the reference standard (e.g. changing from ACH50 to SLA).

Why Use BRS/RESNET/ICC 380-2016 in Place of ASTM Standard E779-10. ASTM Standard E779-10 requires multi-point testing at a range of 10 to 60 Pa in 5 to 10 Pa increments using both pressurization AND depressurization of the building and the reporting requirements include: fan pressurization measurements (inside-outside zero flow building pressure differences), inside and outside temperatures (at start and end of test), the product of the absolute value of the indoor/outdoor air temperature difference multiplied by the building height, tabular list of all air leakage measurements and calculations (time, building pressure difference, air

density, nominal airflow, fan airflow rate, air leakage rate, deviations from standard procedure, wind speed and direction and whether it is estimated or measured on site (if measured on site, the height above ground at which the wind speed was measured), and the calculation details (leakage coefficient, pressure exponent, effective leakage area for pressurization and depressurization and combined results, whether a reference pressure other than 4 Pa was used, and an estimate of confidence limits). This is a test method more suitable for research testing than code enforcement, so we adopted BSR/RESNET/ICC 380-2016 with references to specific calculation procedures found in ASTM Standard E779-10.

BSR/RESNET/ICC 380-2016 has been developed to provide a consensus national standard for consistent measurement of several air-flow related residential building metrics. It builds off of existing American National Standards to provide standard procedures essential to the evaluation of the energy performance of residential buildings energy.

Cost Impact: Will not increase the cost of construction

RESNET Standard 380 allows for single point testing to demonstrate compliance with the air leakage requirements verses multi-point testing now required by E 779. The results of the two tests, as described in the reason statement, are comparable so that a house constructed to meet the E 779 standard will cost no different than a house constructed to meet Standard 380. The code change may lead to a reduction in the costs to conduct the tests as the envelope testing industry may charge more for a multi-point test than a single-point test given the time needed for the multi-point test.

Analysis: A review of the standard proposed for inclusion in the code, BRS/RESNET/ICC 380-2016, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2016)

Report of Committee Action Hearings

Committee Action:

Approved as Modified

Modify as follows:

R402.4.1.2 (N1102.4.1.2) Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with BRS/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). 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*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, if installed at the time of the test, shall be open.
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.
5. Heating and cooling systems, if installed at the time of the test, shall be turned off.
6. Supply and return registers, if installed at the time of the test, shall be fully open.

Committee Reason: The modification was made to reinstate details that RESNET 380 might not have in it. The proposal was approved as modified because the committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

RE83-16

AM

RE83-16**R402.4.1.2 Testing.**

The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding ~~five~~ seven air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ~~ASTM E 779~~ or ASTM E 1827/ANSI/RESNET/ICC 380-2016 and reported at a pressure of 0.2 inch w.g. (50 Pascals). ~~Where required by the code official,~~ Testing shall be conducted by either individuals as defined in Section 553.993(5) or (7), Florida Statutes or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or 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*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

[no change to remaining text in section]

R402.4 Air leakage (Mandatory). The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Section R402.4.1 through R402.4.4.

Exception: Dwelling units of R-2 Occupancies and multiple attached single family dwellings shall be permitted to comply with FBC-EC Section C405.5.3.4.

Code Change No: **RE84-16**

Original Proposal

Section: R402.4.1.2 (IRC N1102.4.1.2)

Proponent: Mike Moore, Newport, representing Broan-NuTone (mmoore@newportventures.net)

Revise as follows:

R402.4.1.2 (N1102.4.1.2) Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding five air changes per hour in Climate Zones 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). 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*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, if installed at the time of the test, shall be open.
- ~~4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.~~
4. Exterior or interior terminations for continuous ventilation systems shall be sealed.
5. Heating and cooling systems, if installed at the time of the test, shall be turned off.
6. Supply and return registers, if installed at the time of the test, shall be fully open.

Reason: This change provides clarification and flexibility to the current requirement as follows, without reducing stringency:

1. Replace the reference to "doors" with a reference to "terminations". Residential ventilation systems do not have doors.
2. Permit interior or exterior terminations to be sealed. This increases flexibility and can promote safety while reducing time and costs.
3. Remove the reference to "heat recovery ventilators". HRVs are a type of ventilation system, so the reference here is redundant.
4. Remove the requirement to "close" the termination. This is not necessary if the termination is sealed.

Cost Impact: Will not increase the cost of construction

This change increases flexibility for conducting the blower door test and can potentially reduce associated costs.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: Provides good clarity to make sure there is not leakage at these points.

Assembly Action

None

Final Action Results

RE84-16

AS

Code Change No: RE90-16

Original Proposal

Section: R402.4.2 (IRC N1102.4.2)

Proponent: Tom Stroud, Hearth, Patio & Barbecue Association, representing Hearth, Patio & Barbecue Association (stroud@hpba.org)

Revise as follows:

R402.4.2 (N1102.4.2) Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces listed and labeled in accordance with UL 127, the doors shall be tested and listed for the fireplace. ~~Where using tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907.~~

Reason: UL 907 is not a useful standard for the purpose of this code requirement. There are no fireplace doors certified to that standard and, according to testing laboratories, there is no way to test to that standard. The biggest difficulty is that the masonry fireplace must be brought up to equilibrium, which is not achievable.

The intent of this code is ensure a better seal on the appliances, thereby decreasing air infiltration and exfiltration. While seeking to require the use of tight-fitting doors on masonry fireplaces would seem to help accomplish that goal, having a test standard that is unachievable will actually limit, or possibly eliminate, the installation of doors.

Cost Impact: Will not increase the cost of construction
This proposal will lower costs down by not having a requirement for a product to meet a non-usable, non-useful standard.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

RE90-16

AS

Code Change No: RE99-16

Original Proposal

Section: R403.3 (IRC N1103.3), R403.3.6 (New) [IRC N1103.3.6 (New)]

Proponent: Craig Drumheller (CDrumheller@nahb.org)

Revise as follows:

R403.3 Ducts. Ducts and air handlers shall be installed in accordance with Sections R403.3.1 through ~~R403.3.5~~ R403.3.6.

Add new text as follows:

R403.3.6 Ducts buried within ceiling insulation Supply and return ducts shall be permitted to be installed partially, or fully buried within ceiling insulation provided the the ducts comply with all of the following:

1. Supply and return ducts shall be insulated with an R-value of not less than R-8.
2. At all points along the duct, the sum of the ceiling insulation R-values above the top of the duct and below the bottom of the duct shall be not less than R-18 excluding the duct R-valu.
3. In *Climate Zones 1A, 2A, 3A*, where supply ducts are completely covered with ceiling insulation, the supply ducts shall be insulated to an R-value of not less than R-18 and the ducts shall be in accordance with the vapor retarder requirements in Section 604.11 of the *International Mechanical Code* or Section M1601.4.6 of the *International Residential Code* as applicable.

Exception: Sections of supply ducts less than 3 feet from the supply outlet.

Reason: A significant amount of research has been performed on ducts buried in attic insulation over the past decade, yet the energy code is silent on whether or not it is an acceptable practice. There are concerns about displaced insulation and condensation potential. Both of these issues are addressed in this proposal.

Work sponsored by the Department of Energy and their Building America program definitively shows that their is energy savings associated with burying ducts (partly or fully) within attic insulation. A recent Home Innovation study measured the summertime delivered air temperature 7 degrees F colder with R-8 buried ducts than insulated ducts exposed in an attic in a hot humid climate where no evidence of condensation was measured (Mallay). Research by Steven Winters and Associates also shows that a buried duct more than compensates for the displaced attic insulation and there is a net energy savings by burying the ducts partly or fully into the attic insulation (Shapiro).

There have been concerns about burying duct work in a hot humid climate (climate zones 1A, 2A, 3A) where there is an increase in the chances of condensation on the vapor retarder around the duct insulation. In order to prevent condensation in the humid climate zones, R-18 duct insulation is required rather than R-8 insulated duct. Condensation on the exterior of the duct insulation can be prevented by an R-18 fiberglass duct with an exterior vapor retarder or a duct with less (or no) insulation that is encapsulated in a vapor retardant foam that meets the duct requirements of the IRC mechanical section or the IMC.

Bibliography: Compact Buried Ducts in a Hot Humid Climate, Mallay, D. 2016 (page 33)
http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/compact-buried-ducts-hot-humid.pdf
 Measure Guideline: Buried and/or Encapsulated Ducts, Shapiro, C, et. al., 2013 (pages 52-56)
http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/measure_guide_buried_encap_ducts.pdf
 Buried and Encapsulated Ducts, US Department of Energy, 2013 (page 1)
https://www1.eere.energy.gov/buildings/residential/pdfs/ba_in_1.1.3_highperformanceducts_100213.pdf

Cost Impact: Will not increase the cost of construction
 This proposal provides a new option that will increase the energy efficiency of a house with ducts in an attic without additional cost in most situations.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Modified

Modify as follows:

R403.3.6 Ducts buried within ceiling insulation Supply and return ducts shall be permitted to be installed partially, or fully buried within ceiling insulation provided the ducts comply with all of the following:

1. Supply and return ducts shall be insulated with an R-value of not less than R-8.
2. At all points along the duct, the sum of the ceiling insulation R-values above the top of the duct and below the bottom of the duct shall be not less than ~~R-18~~R-19 excluding the duct R-value.
3. In *Climate Zones* 1A, 2A, 3A, where supply ducts are completely covered with ceiling insulation, the supply ducts shall be insulated to an R-value of not less than ~~R-18~~R-13 and the ducts shall be in accordance with the vapor retarder requirements in Section 604.11 of the *International Mechanical Code* or Section M1601.4.6 of the *International Residential Code* as applicable.

Exception: Sections of supply ducts less than 3 feet from the supply outlet.

Committee Reason: The modification was made to correct insulation values to align with the research performed. The as-modified proposal was approved because this is a good, common sense solution that utilizes insulation already being installed in the attic.

Assembly Action

None

Final Action Results

RE99-16

AM

Code Change No: **RE100-16**

Original Proposal

Section: R403.3 (IRC N1103.3), R403.3.6 (New) [IRC N1103.3.6 (New)], R403.3.7 (New) [(IRC N1103.3.7 (New))]

Proponent: Craig Drumheller, National Association of Home Builders (CDrumheller@nahb.org)

Revise as follows:

R403.3 (N1102.3) Ducts. Ducts and air handlers shall be installed in accordance with Sections R403.3.1 through ~~R403.3.5~~ R403.3.7.

R403.3.6 (N1103.3.6) 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 have insulation of an R-value not less than of R-8.
2. At all points along each duct, the sum of the ceiling insulation R-values against and above the top of the duct, and against and below the bottom of the duct is not less than R-19, excluding the R-value of the duct insulation.
3. In climate zones 1A, 2A and 3A, the supply ducts are completely buried within ceiling insulation, are insulated to an R-value of not less than R-18 and are in compliance with the vapor retarder requirements of Section 604.11 of the *International Mechanical Code* or Section M1601.4.6 or the *International Residential Code*, as applicable.

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

R403.3.7 (N1103.3.7) Ducts located in conditioned space For ducts to be considered as inside a conditioned space, the ducts shall comply with either of the following:

1. The duct system is located completely within the continuous air barrier and within the building thermal envelope.
2. The ducts are buried within ceiling insulation in accordance with Section R403.3.6 and all of the following conditions exist:
 - 2.1. The air handler is located completely within the continuous air barrier and within the building thermal envelope.
 - 2.2. The duct leakage, as measured either by a rough-in test of the ducts or a post-construction total system leakage test to outside the building thermal envelope in accordance with Section R403.3.4, is less than or equal to 1.5 cubic feet per minute (42.5 L/min) per 100 square feet (9.29 m²) of conditioned floor area served by the duct system.
 - 2.3. The ceiling insulation R-value installed against and above the insulated duct is greater than or equal to the proposed ceiling insulation R-value, less the R-value of the insulation on the duct.

Reason: In addition to allowing ducts to be buried within attic insulation, this proposal sets alternate requirements for ducts to be considered within conditioned space. The DOE Zero Energy Ready Home defines ducts inside conditioned space as, "Duct distribution systems located within the home's thermal and air barrier boundary or optimized to achieve comparable performance." Item "1)" under R403.3.7 provides for the traditional code definition of being within conditioned space. However, item "2)" in the proposal provides the DOE comparable performance alternative for extremely tight ducts with a full complement of insulation, and with provision for condensation avoidance for humid climates.

Research has shown that virtually all of the benefit of locating ducts inside conditioned space can be achieved by locating the air handler in conditioned space and tested, very low leakage insulated ducts in a vented attic buried under ceiling insulation.

R403.7 provides for these conditions in that: The air handler must be located completely within the continuous air barrier and the building thermal envelope; and the ducts must be tested to an extremely low but still measurable level of leakage. The sum of the duct R-value and the ceiling insulation immediately above the duct is unchanged from the amount of prescriptive or proposed ceiling insulation that would have otherwise been installed.

Bibliography: DOE Zero Energy Ready Home National Program Requirements (Rev. 04). May 11, 2015.

http://energy.gov/sites/prod/files/2015/05/f22/DOE%20Zero%20Energy%20Ready%20Home%20National%20Program%20Requirements%20Rev05%20-%20Final_0.pdf

Cost Impact: Will not increase the cost of construction

This proposal provides a new option that will likely reduce the cost of construction and increase the energy efficiency of a house with ducts in an attic. Burying ducts in insulation and tightly sealing the ducts is a less expensive and more energy efficient solution than creating a conditioned attic. Additionally, it is often a more practical and homeowner friendly solution than installing bulkheads in the ceiling to keep ducts in conditioned space.

Report of Committee Action Hearings
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Committee Action:

Approved as Modified

Modify as follows:

R403.3.6 (N1103.3.6) 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 have insulation of an R-value not less than of R-8.
2. At all points along each duct, the sum of the ceiling insulation R-values against and above the top of the duct, and against and below the bottom of the duct is not less than R-19, excluding the R-value of the duct insulation.
3. In climate zones 1A, 2A and 3A, the supply ducts are completely buried within ceiling insulation, are insulated to an R-value of not less than ~~R-18~~ R-13 and are in compliance with the vapor retarder requirements of Section 604.11 of the *International Mechanical Code* or Section M1601.4.6 or the *International Residential Code*, as applicable.

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

Committee Reason: The modification was made to be in alignment with the Committee's prior modification action on RE99-16. The proposal as modified was approved because this adds to the language that RE99-16 added so that testing can consider the ductwork being inside of the thermal envelope.

Assembly Action

None

Final Action Results

RE100-16

AM

Code Change No: RE102-16

Original Proposal

Section: R403.3.2 (IRC N1103.3.2)

Proponent: Donald Surrena (dsurrena@nahb.org)

Revise as follows:

R403.3.2 (N1103.3.2) Sealing (Mandatory). Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the *International Mechanical Code* or *International Residential Code*, as applicable.

Exceptions:

- ~~1. Air impermeable spray foam products shall be permitted to be applied without additional joint seals.~~
- ~~2. For ducts having a static pressure classification of less than 2 inches of water column (500 Pa), additional closure systems shall not be required for continuously welded joints and seams, and locking type joints and seams of other than the snap lock and button lock types.~~

Reason: These exceptions already exist in the mechanical section of the IRC (1601.4.1) and IMC (603.9). Section R403.3.2 is a pointer and as such should not have criteria in it. Why should exceptions to a criteria that is located in another code be placed in the energy code? The most appropriate location to address the sealing exceptions for ductwork is within the mechanical section of the code, where the whole criteria and exceptions are called out.

Cost Impact: Will not increase the cost of construction

The code change proposal will not change the cost of construction. Code requirements are not proposed to be changed, rather clarified as to the intent of the current code.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The requirements for sealing needs to be completely controlled by the IMC/IRC-M. This will delete a redundancy.

Assembly Action

None

Final Action Results

RE102-16

AS

RE102-16

R403.3.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes and building cavities that form the primary air containment passageways for air distribution systems shall be considered ducts or plenum chambers, shall be constructed and sealed in accordance with Section C403.2.7.2 of the Commercial Provisions of this code and shall be shown to meet duct tightness criteria below. Joints and seams shall comply with either the *International Mechanical Code* or *International Residential Code*, as applicable.

Exceptions:

1. ~~Air impermeable spray foam products shall be permitted to be applied without additional joint seals.~~
2. ~~For ducts having a static pressure classification of less than 2 inches of water column (500 Pa), additional closure systems shall not be required for continuously welded joints and seams, and locking type joints and seams of other than the snap lock and button lock types.~~

Duct tightness shall be verified by testing to Section 803 of the RESNET Standards in accordance with ANSI/RESNET/ICC 380-20165 by either an energy rater certified in accordance with individuals as defined in Section 553.9903(5) or (7), *Florida Statutes*, or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i), *Florida Statutes*, Section 553.99, *Florida Statutes*, or as authorized by *Florida Statutes*, to be "substantially leak free" in accordance with Section R403.3.3.

Code Change No: **RE105-16**

Original Proposal

Section: R403.3.3 (IRC N1103.3.3)

Proponent: Mike Moore, Newport representing Broan-NuTone (mmoore@newportventures.net)

Revise as follows:

R403.3.3 (N1103.3.3) Duct testing (Mandatory). Ducts shall be pressure tested to determine air leakage by one of the following methods:

1. Rough-in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. All registers shall be taped or otherwise sealed during the test.
2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.

Exception-Exceptions:

1. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.
2. A duct air leakage test is not required for ducts serving heat or energy recovery ventilators that are not integrated with ducts serving heating or cooling systems.

A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*.

Reason: This section contains requirements for testing dwelling units' primary heating or cooling system ducts. This proposed change clarifies that H/ERV systems that are ducted separately from ducts serving heating or cooling systems are not required to have their ducts tested.

Cost Impact: Will not increase the cost of construction
This change is a clarification only and will not increase the cost of construction.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: There is no concern about duct leakage for ducts for HRV units. Air is purposely moved across the air barrier by these systems.

Assembly Action

None

Final Action Results

RE105-16

AS

RE105-16

Section R403.3.3 Duct testing (Mandatory). [No change to text]

Exceptions:

1. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.
2. Duct testing is not mandatory for buildings complying by Section 405 of this code.

Code Change No: **RE110-16**

Original Proposal

Section: R403.3 (IRC N1103.3), R403.3.6 (New) [IRC N1103.3.6 (New)], R403.3.7 (New) [(IRC N1103.3.7 (New))]

Proponent: Craig Drumheller, National Association of Home Builders (CDrumheller@nahb.org)

Revise as follows:

R403.3 (N1103.3) Ducts. Ducts and air handlers shall be installed in accordance with Sections R403.3.1 through ~~R403.3.5~~ R403.3.6.

R403.3.6 (N1103.3.6) Ducts buried within ceiling insulation Supply and return ducts shall be permitted to be installed partially, or fully buried within ceiling insulation provided they meet the following requirements:

1. Supply and return ducts shall be insulated to a minimum of R-8;
2. At all points along the duct, the sum of the ceiling insulation above the top of the duct and below the bottom of the duct shall be a minimum of R-19 excluding the duct R-value;
3. In *climate zones* 1A, 2A, 3A, where supply ducts are fully buried within ceiling insulation, the supply ducts shall be insulated to minimum R-18 and in accordance with the vapor retarder requirements in Chapter 16 (M1601.4.6) of the *International Residential Code* or Chapter 6 (604.11) of the *International Mechanical Code*

Exception: Sections of supply ducts less than 3 feet from the supply outlet.

Add new text as follows:

R403.3.6.1(N1103.6.1) Deeply buried duct effective R-value. Sections of ducts installed in accordance with Section R403.3.6 and directly on or within 5.5 inches of the ceiling board and surrounded with blown attic insulation of R-30 or greater and the top of the duct is buried a minimum of 3.5 inches below the insulation shall be permitted to claim an effective duct insulation of R-25 for the deeply buried section of the duct when using a simulated energy performance analysis.

Reason: The proposal, in addition to allowing ducts to be installed within ceiling insulation, also provides additional effective insulation credit for ducts deeply buried (more than 3 1/2" under insulation) to claim an effective R-value of R-25. This value is based on peer reviewed research conducted by Steven Winters and Associates (Griffiths) and similar language has been incorporated into California's Title 24 residential energy code (CEC).

This will be a valuable, energy equivalent, alternative for many builders that have difficulty designing ducts within the building.

Bibliography: Insulation Buried Attic Ducts: Analysis and Field Evaluation Findings, Griffiths, D et. al., 2008, (page 1-123) http://www.eceee.org/library/conference_proceedings/ACEEE_buildings/2004/Panel_1/p1_11/paper
2013 Residential Compliance Manual, California Energy Commission, 2013 (page 4-44)
http://www.energy.ca.gov/2013publications/CEC-400-2013-001/chapters/04_Building_HVAC_Requirements.pdf

Cost Impact: Will not increase the cost of construction

This new section creates an option to installing ducts. It is generally less expensive to bury a duct than suspend a duct system installed in an attic. In addition, there is an energy efficiency credit available for ducts that are buried providing further reduction in installed cost of other efficiency measures that may no longer be necessary.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Modified

Modify as follows:

R403.3.6 Ducts buried within ceiling insulation Supply and return ducts shall be permitted to be installed partially, or fully buried within ceiling insulation provided they meet the following requirements:

1. Supply and return ducts shall be insulated to a minimum of R-8;
2. At all points along the duct, the sum of the ceiling insulation above the top of the duct and below the bottom of the duct shall be a minimum of R-19 excluding the duct R-value;
3. In climate zones 1A, 2A, 3A, where supply ducts are fully buried within ceiling insulation, the supply ducts shall be insulated to minimum R-18 and in accordance with the vapor retarder requirements in Chapter 16 (M1601.4.6) of the International Residential Code or Chapter 6 (604.11) of the International Mechanical Code.

Exception: Sections of supply ducts less than 3 feet from the supply outlet.

Committee Reason: The modification was made because that section was already addressed by a previously heard proposal. The proposal as-modified was approved because the committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

RE110-16

AM

Code Change No: RE121-16

Original Proposal

Section: R403.6.1 (IRC N1103.6.1), Table R403.6.1 (IRC Table N1103.6.1)

Proponent: Mike Moore, Newport (mmoore@newportventures.net)

Revise as follows:

R403.6.1 (N1103.6.1) Whole-house mechanical ventilation system fan efficacy. When installed to function as a whole house mechanical ventilation system fans shall meet the efficacy requirements of Table R403.6.1.

~~**Exception:** Where whole-house mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor. Where an air handler that is integral to tested and listed HVAC equipment is used to provide whole-house mechanical ventilation, the air handler shall be powered by an electronically commutated motor.~~

**TABLE R403.6.1 (N1103.6.1)
WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY-**

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY ^a (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
HRV or ERV	Any	1.2 cfm/watt	Any
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any
Bathroom, utility room	10	1.4 cfm/watt	< 90
Bathroom, utility room	90	2.8 cfm/watt	Any

For SI: 1 cfm = 28.3 L/min.

a. When tested in accordance with HVI Standard 916

Reason: This proposal introduces a minimum fan efficacy for H/ERVs. The efficacy proposed is the minimum required by the ENERGY STAR H/ERV specification used in Canada. This will save homeowners ~\$92/year in fan energy costs versus specifying the worst performing H/ERVs currently available on the market (i.e., assuming 0.5 cfm/W fan gets replaced by 1.2 cfm/W fan, 75 cfm, 8760 hours/year of operation, \$0.12/kWh). Increasing the efficacy from 0.5 cfm/W to 1.1 cfm/W is feasible without a significant change in motor technology or product cost.

Cost Impact: Will not increase the cost of construction

At the levels proposed, fan efficacy is not a major driver of price. Low-cost H/ERVs are available at the efficacy level proposed.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides appropriate energy limitations for ERV and HRV fan motors.

Assembly Action

None

Final Action Results

RE121-16

AS

Code Change No: **RE126-16**

Original Proposal

Section: R404.1 (IRC N1104.1)

Proponent: Glenn Heinmiller, Lam Partners, representing International Association of Lighting Designers (glenn@lampartners.com)

Revise as follows:

R404.1 Lighting equipment (Mandatory). Not less than 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps or not less than 75 percent of the permanently installed lighting fixtures shall contain only high-efficacy lamps.

~~Exception: Low-voltage lighting-~~

Reason: The rationale for this exception has always been unclear, and even more so today with the changes in lighting technology. This exception is obsolete and not relevant to the type of lighting technology currently used. Many of the types of LED fixtures used in residential construction that have a transformer could be considered "low-voltage". The exception could also be interpreted to exempt all 12-volt halogen fixtures, which are very inefficient. This exception is not needed and provides a possible big loophole for someone who wanted to "game" the code.

Cost Impact: Will not increase the cost of construction

There is no correlation between the voltage of a lighting fixture ("low-voltage" or otherwise) and the cost of a lighting fixture. Therefore, the removal of the exemption will have no impact of the cost of construction. The removal of the exemption will not require the purchase of light fixtures that are more expensive than would be purchased with the exemption in place.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: Having a blanket exception does not mean that there isn't high efficacy lamps for low voltage.

Assembly Action

None

Final Action Results

RE126-16

AS

Code Change No: **RE127-16**

Original Proposal

Section: R404.1 (IRC N1104.1)

Proponent: David Collins, representing Sustainability, Energy, High Performance Code Action Committee

Revise as follows:

R404.1 (N1104.1) Lighting equipment (Mandatory). ~~Not less than 75 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps or not less than 75~~90 percent of the permanently installed lighting fixtures shall contain only high-efficacy lamps.

Exception: Low-voltage lighting.

Reason: The lighting market is rapidly moving towards high-efficacy lighting. Raising the minimum lighting efficacy from 75% to 90% will align with market trends for high-efficacy performance and greater energy savings. Switching to an LED light bulb, for example, can reduce electricity consumption by more than 80 percent. This code change would allow 10% of fixtures to be non-compliant, thereby accommodating incandescent decorative lighting fixtures. The existing exception already exempts low-voltage lighting.

This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). In 2015, the SEHPCAC has held three two- or three-day open meetings and 25 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: <http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx>

Cost Impact: Will not increase the cost of construction
The price of high-efficacy lighting is now competitive with other lighting as more and more products such as CFLs and LEDs saturate the market. The life-cycle costs of LEDs are significantly lower than any conventional lamp or light fixture.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: There are available cost-effective products that are an easy way to lower energy use.

Assembly Action

None

Final Action Results

RE127-16

AS

Code Change No: RE132-16

Original Proposal

Section: R405.1 (IRC N1101.5)

Proponent: Jeremiah Williams (jeremiah.williams@ee.doe.gov)

Revise as follows:

R405.1 (N1105.1) Scope. This section establishes criteria for compliance using simulated energy performance analysis. Such analysis shall include heating, cooling, mechanical ventilation, and service water heating energy only.

Reason: This proposed change corrects a contradiction in the current code. Section R405.1 states that energy analysis for the Simulated Performance Alternative compliance path is to include only heating, cooling, and water heating energy (i.e., mechanical ventilation is not included). However, Table R405.5.2(1) clearly includes specifications for mechanical ventilation that may differ between the proposed design and the standard reference design. This proposal modifies the Scope section to match the clear direction given in the table.

Energy Savings: The proposal is not expected to produce energy cost savings.

The U.S. Department of Energy (DOE) develops its proposals through a public process to ensure transparency, objectivity and consistency in DOE-proposed code changes. Energy savings and cost impacts are assessed based on established methods and reported for each proposal, as applicable. More information on the process utilized to develop the DOE proposals for the 2018 IECC can be found at: <https://www.energycodes.gov/development/2018IECC>.

Cost Impact: Will not increase the cost of construction
This change has no cost impact because it does not change requirements, but rather clarifies the intent of the current code.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

RE132-16

AS

Code Change No: **RE140-16**

Original Proposal

Section: R405.3 (IRC N1105.3)

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)

Revise as follows:

R405.3 (N1105.3) Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved by the code official*, such as the Department of Energy, Energy Information Administration's *State Energy Data System Prices and Expenditures reports* ~~*State Energy Price and Expenditure Report*~~. *Code officials* shall be permitted to require time-of-use pricing in energy cost calculations.

Exception: The energy use based on source energy expressed in Btu or Btu per square foot of *conditioned floor area* shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

Reason: This proposal updates the reference to the DOE Energy Information Administration's current publications of state energy pricing data. On its State Energy Data System (SEDS) web site, EIA publishes reports on recent year energy prices by state, as well as time series reports on energy prices (e.g., 1970 to 2013).

Modifying this reference will allow code officials to use a recent year of data for energy prices or a time series of prices (e.g., 3 recent years) to get a longer average energy price.

Bibliography: EIA State Energy Data System, "State Energy Price and Expenditure Estimates 1970 Through 2013"

<http://www.eia.gov/state/seds/archive/seper2013.pdf>

Web site links:

<http://www.eia.gov/state/seds/>

<http://www.eia.gov/state/seds/archive/#2013>

Cost Impact: Will not increase the cost of construction

This is merely an update to an information source that can be used as part of a performance-based compliance path, does not change any requirements in the code, and does not affect the cost of construction.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: This correction provides clarity about the report reference.

Assembly Action

None

Final Action Results

RE140-16

AS

RE140-16

R405.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual ~~energy cost~~ total normalized Modified Loads that ~~is~~ are less than or equal to the annual ~~energy cost~~ total loads of the *standard reference design* as calculated in accordance with Appendix B RCof this standard. ~~Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time of use pricing in energy cost calculations.~~

Exception: ~~The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.~~

Code Change No: RE142-16

Original Proposal

Section: R405.4.2

Proponent: Robert Schwarz, representing EnergyLogic, Inc. (robby@nrglogic.com)

Revise as follows:

R405.4.2 (N1105.4.2) Compliance report. Compliance software tools shall generate a report that documents that the *proposed design* complies with Section R405.3. A compliance report on the *proposed design* shall be submitted with the application for the building permit. Upon completion of the building, a compliance report based on the as-built condition of the building shall be submitted to the *code official* before a certificate of occupancy is issued. Batch sampling of buildings to determine energy code compliance ~~for all buildings in the batch shall only be prohibited~~ allowed for stacked multifamily units.

Compliance reports shall include information in accordance with Sections R405.4.2.1 and R405.4.2.2. Where the *proposed design* of a building could be built on different sites where the cardinal orientation of the building on each site is different, compliance of the *proposed design* for the purposes of the application for the building permit shall be based on the worst-case orientation, worst-case configuration, worst-case building air leakage and worst- case duct leakage. Such worst-case parameters shall be used as inputs to the compliance software for energy analysis.

Reason: Sampling is a process of testing/evaluating one unit in a batch of 7 multiple like units to determine if all seven of the units would pass the intent of Code. The reality is that single family and attached housing, town houses and duplexes, are not like units even when they have the same model number and have been built off of the same plan. Our construction processes are not true assembly line processes so for the purpose of code compliance batch sampling should continue not to be allowed for these types of housing.

Multifamily stacked housing, on the other hand, is basically one large building that has been subdivided into multiple smaller units. Batch sampling is ideal for this type of construction as each unit is a continuation of the unit adjacent to it, thus create the total building. When inspecting at rough you can cost affectively evaluate multiple units so in reality the sampling truly only comes into play for the final diagnostics (blower door testing) and reporting.

Cost Impact: Will not increase the cost of construction
Sampling of stacked multifamily units is more cost effective than testing each unit while at the same time ensuring that the inspection process for code compliance is valid as intended.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This is a good method for testing stacked multi-family buildings. It has been used with good success in several areas of the country.

Assembly Action **None**

Final Action Results

RE142-16 **AS**

Code Change No: RE143-16

Original Proposal

Section: Table R405.5.2(1) [IRC Table N1105.5.2(1)]

Proponent: William Fay, representing Energy Efficient Codes Coalition; Charlie Haack, ICF International, representing Energy Efficient Codes Coalition; Maureen Guttman, Building Codes Assistance Project, representing Building Codes Assistance Project (mguttman@bcapcodes.org); Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE), representing Energy Efficient Codes Coalition; Jeffrey Harris, representing Alliance to Save Energy; William Prindle, ICF International, representing Energy Efficient Codes Coalition

Revise as follows:

**TABLE R405.5.2(1) [(N1105.5.2(1))]
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS**

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	Air leakage rater of 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8 at a pressure of 0.2 inches w.g. (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ where: CFA = conditioned floor area N_{br} = number of bedrooms Energy Recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same air leakage rate as the standard reference design. For tested residences, the measured air exchange rate ^a . The mechanical ventilation rate ^b shall be in addition to the air leakage rate and shall be as proposed.
Mechanical ventilation	None, except where mechanical ventilation is specified by the proposed design, in which case: Annual vent fan energy use: $kWh/yr = 0.03942 \times CFA + 29.565 \times (N_{br} + 1)$ where: CFA = conditioned floor area N_{br} = number of bedrooms	As proposed
Internal gains	$IGain = 17,900 + 23.8 \times CFA + 4104 \times N_{br}$ (Btu/day per dwelling unit)	Same as standard reference design.
Internal mass	An internal mass for furniture and contents of 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element ^c but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs, 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
Structural mass	For masonry basement walls, as proposed, but with insulation required by Table R402.1.4 located on the interior side of the walls	As proposed
Structural mass	For other walls, for ceilings, floors, and interior walls, wood frame construction	As proposed
Heating systems ^{d, e}	As proposed for other than electric heating without a heat pump, 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 IECC-Commercial Provisions. Capacity: sized in accordance with Section R403.7	As proposed
Cooling systems ^{d, f}	As proposed Capacity: sized in accordance with Section R403.7.	As proposed

Service water heating, ^{e, f, g}	As proposed Use: same as proposed design	As proposed gal/day = 30 + (10 × N _{br})
Thermal distribution systems	Duct insulation: From Section R403.2.1A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft ² (9.29 m ²) of <i>conditioned floor area</i> at a pressure of differential of 0.1 inches w.g. (25 Pa).	As tested or as specified in Table R405.5.2(2) if not tested. Duct insulation shall be as proposed.
Thermostat	Type: Manual, cooling temperature setpoint = 75°F; Heating temperature setpoint = 72°F	Same as standard reference

For SI: 1 square foot = 0.93 m², 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m², 1 gallon (US) = 3.785 L, 1°C = (1°F-32)/1.8, 1 degree = 0.79 rad.

- Where required by the *code official*, testing shall be conducted by an *approved party*. Hourly calculations as specified in the *ASHRAE Handbook of Fundamentals*, or the equivalent shall be used to determine the energy loads resulting from infiltration.
- The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 *ASHRAE Handbook of Fundamentals*, page 26.24 and the "Whole-house Ventilation" provisions of 2001 *ASHRAE Handbook of Fundamentals*, page 26.19 for intermittent mechanical ventilation.
- Thermal storage element shall mean a component not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element must be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or must be connected to such a room with pipes or ducts that allow the element to be actively charged.
- For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.
- For a proposed design without a proposed heating system, a heating system with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.
- For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.
- For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater with the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For the case of a proposed design without a proposed water heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.
- For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine glazing area:

$$AF = A_s \times FA \times F$$
 where:
 AF = Total glazing area.
 A_s = Standard reference design total glazing area.
 FA = (Above-grade thermal boundary gross wall area)/above-grade boundary wall area + .05 x below-grade boundary wall area).
 F = (Above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.
 and where:
 Thermal Boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.
 Below-grade boundary wall is any thermal boundary wall in soil contact.
 Common wall area is the area of walls shared with an adjoining dwelling unit.
 L and CFA are in the same units.

Reason: The purpose of this proposal is to remove an inconsistency in the code. Under section R402.4.1.2, testing is mandatory in all buildings. As a result, the language in this table as to residences not tested is inconsistent and confusing. Moreover, the language implies that homes not tested will automatically comply with the air exchange rate requirements, since the assumption for the proposed design would be the same as that of the standard reference design. That is clearly not the intent of the IECC, and this proposal removes the conflicting language.

Cost Impact: Will not increase the cost of construction
 Since the code requirements are not proposed to be changed, this proposal will not affect the cost of construction.

**Report of Committee Action
Hearings**

Committee Action:	Approved as Submitted
Committee Reason: This is a simple cleanup as testing is always required.	
Assembly Action	None

Final Action Results

RE143-16

AS

RE143-16

**TABLE R405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS**

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems ^{d, e}	<p><u>Efficiency: In accordance with prevailing Federal minimum standards</u></p> <p>As proposed for other than electric heating without a heat pump. 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 IECC— Commercial Provisions. Capacity: sized in accordance with Section R403.7</p> <p><u>Fuel type: same as proposed</u></p>	<p><u>As proposed</u></p> <p>As proposed</p> <p><u>As proposed</u></p>
Cooling systems ^{d, f}	<p>As proposed</p> <p><u>Fuel Type: Electric</u></p> <p>Capacity: sized in accordance with Section R403.7.</p> <p><u>Efficiency: In accordance with prevailing Federal minimum standards</u></p>	<p>As proposed</p> <p><u>As proposed</u></p> <p><u>As proposed</u></p>
Service water Heating ^{d, e, f, g}	<p>As proposed <u>Fuel Type: As proposed</u></p> <p>Use: same as proposed design</p> <p><u>Efficiency: In accordance with prevailing Federal minimum standards</u></p>	<p>As proposed</p> <p>Gal/day = 30 + (10 × N_{br})</p> <p><u>As proposed</u></p>

[All other parts of the table to remain unchanged.]

**TABLE R405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS**

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Thermal distribution systems	Distribution System Efficiency: 0.88	Thermal distribution system efficiency shall be as tested in accordance with

	<p>Duct location: entirely within the building thermal envelope</p> <p>Air Handler location: entirely within the building thermal envelope</p> <p>Duct insulation: R-6</p>	<p><u>Section 803 of RESNET Standards ANSI/RESNET/ICC 380-20165 or if not tested shall be modeled as a Qn to outside of 0.080 for ducted systems. Hydronic and ductless systems shall be as specified in Table R405.5.2(2) if not tested.</u></p> <p>As proposed</p> <p>As proposed... ..</p> <p>As proposed</p>
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[No other changes to table.]

Revise Table R405.5.2 (1) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS as follows:

Building Component	Standard Reference Design	Proposed Design
	<p>Total <u>Vertical fenestration area</u>^b =</p> <p>(a) The proposed glazing <u>vertical fenestration area</u>, where the proposed glazing fenestration <u>area</u> is less than 15 percent of the conditioned floor area, or</p> <p>(b) 15 percent of the conditioned floor area,</p> <p><u>The adjusted vertical fenestration area</u>, where the proposed glazing <u>fenestration area</u> is 15 percent or more of</p>	<p>As proposed</p>

Vertical Fenestration other than opaque doors	<p>the conditioned floor area, <u>The adjusted vertical fenestration area shall be calculated as follows:</u></p> $AVF_{adj} = AVF \times 0.15 \times CFA / AF,$ <p><u>Where</u></p> <p><u>AVF_{adj} = Adjusted Vertical Fenestration</u></p> <p><u>AVF = Proposed Vertical Fenestration Area</u></p> <p><u>CFA = Conditioned Floor Area</u></p> <p><u>AF = Proposed Total Fenestration area</u></p>	
	Orientation: equally distributed to four cardinal compass orientations (N, E, S & W)	As proposed
	U-factor: as specified in Table R402.1.4	As proposed
	SHGC: as specified in Table R402.1.2 except that for climates with no requirement (NR) SHGC=0.40 shall be used.	As proposed
	Interior shade fraction: 0.92-(0.21xSHGC for the standard reference design)	0.92-(0.21xSHGC as proposed)
	External shading: none	As proposed
	<p>None-Skylight area=</p> <p>(a) <u>The proposed skylight area, where the proposed fenestration area is less than 15 percent of the conditioned floor area, or;</u></p> <p>(b) <u>The adjusted skylight area, where the proposed fenestration area is 15 percent or greater of the conditioned floor area. The adjusted skylight area shall be calculated as follows:</u></p> $ASKY_{adj} = ASKY \times 0.15 \times CFA / AF$ <p><u>Where</u></p> <p><u>ASKY_{adj} = Adjusted skylight area</u></p> <p><u>ASKY = Proposed skylight area</u></p>	As proposed

Skylights	<u>CFA = Conditioned Floor Area</u>	
	<u>AF= Proposed total fenestration area</u>	
	<u>Orientation: as proposed</u>	<u>As proposed</u>
	<u>U-factor: as specified in Table R402.1.4</u>	<u>As proposed</u>
	<u>SHGC: as specified in Table R402.1.2 including footnote (b) of that table, except that for climates with no requirement (NR) SHGC=0.40 shall be used.</u>	<u>As proposed</u>
	<u>Interior shade fraction for the area of proposed skylights with SHGC ratings that include a pre-installed interior shade: 0.92-(0.21xSHGC for the standard reference design)</u>	<u>As proposed, with shades assumed closed 50% of the time</u>
	<u>External shading: none</u>	<u>As proposed</u>

Code Change No: RE149-16

Original Proposal

Section: Table R405.5.2 [IRC Table N1105.5.2(1)]

Proponent: Mike Moore, Newport - Representing Broan-NuTone, representing Broan-NuTone (mmoore@newportventures.net)

Revise as follows:

**TABLE R405.5.2(1) [N1105.5.2(1)]
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS**

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Mechanical ventilation	None, except where mechanical ventilation is specified by the proposed design, in which case: Annual vent fan energy use: kWh/yr $= 0.03942 \times CFA + 29.565 \times (N_{br} + 1)$ $(1/e_f) \times (0.0876 \times CFA + 65.7 \times (N_{br} + 1))$ where: CFA = conditioned floor area, N_{br} = number of bedrooms, and e_f = the minimum exhaust fan efficacy from Table R403.6.1 corresponding to a flow rate of $0.01 \times CFA + 7.5 \times (N_{br} + 1)$	As proposed
Internal gains	$IGain = 17,900 + 23.8 \times CFA + 4104 \times N_{br}$ (Btu/day per dwelling unit)	Same as standard reference design.
Internal mass	An internal mass for furniture and contents of 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element ^c but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs, 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
	For masonry basement walls, as proposed, but with insulation required by Table R402.1.4 located on the interior side of the walls	As proposed
	For other walls, for ceilings, floors, and interior walls, wood frame construction	As proposed
Heating systems ^{d, e}	As proposed for other than electric heating without a heat pump, 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 IECC-Commercial Provisions. Capacity: sized in accordance with Section R403.7	As proposed
Cooling systems ^{d, f}	As proposed Capacity: sized in accordance with Section R403.7.	As proposed
Service water heating ^{d, e, f, g}	As proposed Use: same as proposed design	As proposed $gal/day = 30 + (10 \times N_{br})$
Thermal distribution systems	Duct insulation: From Section R403.2.1A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft ² (9.29 m ²) of conditioned floor area at a pressure of differential of 0.1 inches w.g. (25 Pa).	As tested or as specified in Table R405.5.2(2) if not tested. Duct insulation shall be as proposed.
Thermostat	Type: Manual, cooling temperature setpoint = 75°F; Heating	Same as standard reference

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
	temperature setpoint = 72°F	

For SI: 1 square foot = 0.93 m², 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m², 1 gallon (US) = 3.785 L, Δ°C = (Δ°F-32)/1.8, 1 degree = 0.79 rad.

- a. Where required by the *code official*, testing shall be conducted by an *approved* party. Hourly calculations as specified in the ASHRAE *Handbook of Fundamentals*, or the equivalent shall be used to determine the energy loads resulting from infiltration.
- b. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE *Handbook of Fundamentals*, page 26.24 and the "Whole-house Ventilation" provisions of 2001 ASHRAE *Handbook of Fundamentals*, page 26.19 for intermittent mechanical ventilation.
- c. Thermal storage element shall mean a component not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element must be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or must be connected to such a room with pipes or ducts that allow the element to be actively charged.
- d. For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.
- e. For a proposed design without a proposed heating system, a heating system with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.
- f. For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.
- g. For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater with the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For the case of a proposed design without a proposed water heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.
- h. For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine glazing area:

$$AF = A_s \times FA \times F$$

where:

AF = Total glazing area.

A_s = Standard reference design total glazing area.

FA = (Above-grade thermal boundary gross wall area)/above-grade boundary wall area + .05 x below-grade boundary wall area).

F = (Above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.

and where:

Thermal Boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

L and CFA are in the same units.

Reason: Currently, the equation used for the reference home in Table R405.5.2(1) assumes continuous operation of the whole house mechanical ventilation system (i.e., 8760 hours/year) and a fixed fan efficacy of 2.2 cfm/W, which is not supported by the fan efficacy requirements in Table R403.6.1. This change will keep the table current by allowing the fan efficacy of the reference home to track with any future changes to the whole house mechanical ventilation fan efficacy requirements in Table R403.6.1.

Example:

The proposed equation is equivalent to the current equation if we use 2.2 cfm/W for the fan efficacy:

$$\text{Proposed equation} = (1/e_f) \times (0.0876 \times CFA + 65.7 \times (N_{br}+1))$$

$$\text{Substituting } e_f = 2.2 \text{ yields: } (1/2.2) \times (0.0876 \times CFA + 65.7 \times (N_{br}+1)) = 0.03942 \times CFA + 29.565 \times (N_{br}+1) = \text{the current equation}$$

Cost Impact: Will not increase the cost of construction

This change simply corrects the equation for the energy calculation of the mechanical ventilation system. There is no effect on system cost.

Report of Committee Action Hearings
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Committee Action:

Approved as Submitted

Committee Reason: The proposal properly corrects an equation used for ventilation for performance path compliance.

Assembly Action

None

Final Action Results

RE149-16

AS

Code Change No: RE152-16

Original Proposal

Section: Table R405.5.2(1) [IRC Table N1105.5.2(1)]

Proponent: Marilyn Williams, NEMA, representing National Electrical Manufacturers Association (mar_williams@nema.org)

Revise as follows:

**TABLE R405.5.2 (1) [N1105.5.2(1)]
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS**

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass wall if proposed wall is mass; otherwise wood frame.	As proposed
	Gross area: same as proposed	As proposed
	<i>U</i> -factor: as specified in Table N1102.1.4	As proposed
	Solar absorptance = 0.75	As proposed
	Emittance = 0.90	As proposed
Basement and crawl space walls	Type: same as proposed	As proposed
	Gross area: same as proposed	As proposed
	<i>U</i> -factor: from Table N1102.1.4, with insulation layer on interior side of walls	As proposed
Above-grade floors	Type: wood frame	As proposed
	Gross area: same as proposed	As proposed
	<i>U</i> -factor: as specified in Table N1102.1.4	As proposed
Ceilings	Type: wood frame	As proposed
	Gross area: same as proposed	As proposed
	<i>U</i> -factor: as specified in Table N1102.1.4	As proposed
Roofs	Type: composition shingle on wood sheathing	As proposed
	Gross area: same as proposed	As proposed
	Solar absorptance = 0.75	As proposed
	Emittance = 0.90	As proposed
Attics	Type: vented with aperture = 1 ft ² per 300 ft ² ceiling area	As proposed
Foundations	Type: same as proposed	As proposed
	Foundation wall area above and below grade and soil characteristics: same as proposed	As proposed
Opaque doors	Area: 40 ft ²	As proposed
	Orientation: North	As proposed
	<i>U</i> -factor: same as fenestration from Table N1102.1.4	As proposed
Vertical fenestration other than opaque doors	Total area ^b =	As proposed
	(a)The proposed glazing area, where the proposed glazing area is less than 15 percent of the conditioned floor area (b)15 percent of the conditioned floor area, where the proposed glazing area is 15 percent or more of the conditioned floor area	

RE152-16

**TABLE R405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED
DESIGNS**

<p>Air exchange rate</p>	<p>Air leakage rate of 5 7.00 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8 at a pressure of 0.2 inches w.g (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$</p> <p>where: <i>CFA</i> = conditioned floor area <i>Nbr</i> = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.</p>	<p>For residences that are not tested, the same air leakage rate as the standard reference design.</p> <p>For tested residences, the measured air exchange rate shall be in addition to the air leakage rate and shall be as proposed.</p> <p>The measured air exchange rate shall be in addition to the air leakage rate and shall be as proposed.</p>
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Revise Table R405.5.2 (1) as follows:

Step 1. Restore 2012 IECC footnote (b), in coordination with errata currently in process at ICC:

(Note: final footnote letter "#" is not yet available from ICC - must match

superscript reference in Table row dealing with Vertical Fenestration)

#. For residences with conditioned basements, R-2 and R-4 residences and townhouses,

the following formula shall be used to determine glazing area:

$AF = As \times FA \times F$

where:

AF = Total glazing area.

As = Standard reference design total glazing area.

$FA = (Above\text{-}grade\text{ thermal boundary gross wall area}) / (above\text{-}grade\text{ boundary wall area}$

$+ 0.5 \times below\text{-}grade\text{ boundary wall area})$.

$F = \frac{\text{(Above-grade thermal boundary wall area)}}{\text{(above-grade thermal boundary wall area + common wall area)}}$ or 0.80 0-56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

Step 2. Modify the above restored footnote to coordinate with the rest of the code change that resulted in the removal of footnotes (a) and (b) for the 2015 IECC.

#. For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine glazing fenestration area:

$$AF = A_s \times FA \times F$$

where:

AF = Total glazing fenestration area.

A_s = Standard reference design total glazing fenestration area.

$FA = \frac{\text{(Above-grade thermal boundary gross wall area)}}{\text{(above-grade boundary wall area + 0.5 \times below-grade boundary wall area)}}$.

$F = \frac{\text{(Above-grade thermal boundary wall area)}}{\text{(above-grade thermal boundary wall area + common wall area)}}$ or 0.80 0-56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
	Orientation: equally distributed to four cardinal compass orientations (N, E, S & W).	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
	SHGC: as specified in Table N1102.1.2 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed
	Interior shade fraction: 0.92-(0.21 × SHGC for the standard reference design)	0.92-(0.21 × SHGC as proposed)
	External shading: none	As proposed
Skylights	None	As proposed
Thermally isolated sunrooms	None	As proposed
Air exchange rate	Air leakage rate of 5 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8 at a pressure of 0.2 inches w.g (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ where: CFA = conditioned floor area N_{br} = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same air leakage rate as the standard reference design. For tested residences, the measured air exchange rate ^a . The mechanical ventilation rate ^b shall be in addition to the air leakage rate and shall be as proposed.
Mechanical ventilation	None, except where mechanical ventilation is specified by the proposed design, in which case: Annual vent fan energy use: kWh/yr = $0.03942 \times CFA + 29.565 \times (N_{br} + 1)$ where: CFA = conditioned floor area N_{br} = number of bedrooms	As proposed
Internal gains	IGain = $17,900 + 23.8 \times CFA + 4104 \times N_{br}$ (Btu/day per dwelling unit)	Same as standard reference design.
Internal mass	An internal mass for furniture and contents of 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element ^c but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs, 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
	For masonry basement walls, as proposed, but with insulation required by Table R402.1.4 located on the interior side of the walls	As proposed
	For other walls, for ceilings, floors, and interior walls, wood frame construction	As proposed
Heating systems ^{d, e}	As proposed for other than electric heating without a heat pump, 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 IECC-Commercial Provisions. Capacity: sized in accordance with Section R403.7	As proposed
Cooling systems ^{d, f}	As proposed Capacity: sized in accordance with Section R403.7.	As proposed
Service water heating ^{d, e, f, g}	As proposed Use: same as proposed design	As proposed gal/day = $30 + (10 \times N_{br})$

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Thermal distribution systems	<p>Duct insulation: From Section R403.2.1, a thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems.</p> <p>Exception: For non-ducted heating and cooling systems not having a fan, the standard reference design distribution system efficiency (DSE) shall be 1.</p> <p>For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft² (9.29 m²) of conditioned floor area at a pressure of differential of 0.1 inches w.g. (25 Pa).</p>	As tested or as specified in Table R405.5.2(2) if not tested. Duct insulation shall be as proposed.
Thermostat	Type: Manual, cooling temperature setpoint = 75°F; Heating temperature setpoint = 72°F	Same as standard reference

For SI: 1 square foot = 0.93 m², 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m², 1 gallon (US) = 3.785 L, Å°C = (Å°F-32)/1.8, 1 degree = 0.79 rad.

a. Where required by the code official, testing shall be conducted by an approved party. Hourly calculations as specified in the ASHRAE Handbook of Fundamentals, or the equivalent shall be used to determine the energy loads resulting from infiltration.

b. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE Handbook of Fundamentals, page 26.24 and the "Whole-house Ventilation" provisions of 2001 ASHRAE Handbook of Fundamentals, page 26.19 for intermittent mechanical ventilation.

c. Thermal storage element shall mean a component not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element must be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or must be connected to such a room with pipes or ducts that allow the element to be actively charged.

d. For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.

e. For a proposed design without a proposed heating system, a heating system with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.

f. For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.

g. For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater with the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For the case of a proposed design without a proposed water heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.

h. For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine glazing area:

$$AF = A_{s_} \times FA \times F$$

where:

AF = Total glazing area.

A_{s_} = Standard reference design total glazing area.

FA = (Above-grade thermal boundary gross wall area)/above-grade boundary wall area + .05 x below-grade boundary wall area).

F = (Above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.

and where:

Thermal Boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

L_{and_CFA} are in the same units.

Reason: Space heating systems that operate without consuming fan energy and that do not have ductwork (no duct losses) do not have distribution system losses and this proposal would simply change the code to factually recognize that reality.

Cost Impact: Will not increase the cost of construction

This proposal does not require the purchase of any additional materials and or the expenditure of any additional labor, accordingly, it will have no impact on the cost of construction.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the published reason statement.

Assembly Action

None

Final Action Results

RE152-16

AS

Code Change No: **RE166-16**

Original Proposal

Section(s): R406.3 (IRC N1106.3), R406.3.1 (IRC N1106.3.1), R406.6.1 (IRC N1106.6.1), R406.7 (IRC N1106.7), R406.7.1 (IRC N1106.7.1), R406.7.2 (IRC N1106.7.2), R406.7.3 (IRC N1106.7.3)

Proponent: Eric Makela, Cadmus Group, representing RESNET

Revise as follows:

R406.3 (N1106.3) Energy Rating Index. The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the ERI reference design has an Index value of 100 and a residential building that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1 percent change determined in the total energy use of the rated design relative to the total energy use of the ERI reference design accordance with ANSI/RESNET/ICC 301. ~~The ERI shall consider all energy used in the residential building.~~

Delete without substitution:

R406.3.1 (N1106.3.1) ERI reference design. ~~The ERI reference design shall be configured such that it meets the minimum requirements of the 2006 International Energy Conservation Code prescriptive requirements.~~

~~The proposed residential building shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design.~~

Revise as follows:

R406.6.1 (N1106.6.1) Compliance software tools. ~~Documentation verifying that Software tools used for determining the methods and accuracy of the compliance software tools conform to the provisions of this section~~ ERI shall be provided to the code official Approved Software Rating Tools in accordance with ANSI/RESNET/ICC 301.

R406.7.2 R406.6.4 (N1106.6.4) Specific approval. Performance analysis tools meeting the applicable sections of Section R406 shall be *approved*. ~~Tools are permitted~~ Documentation demonstrating the approval of performance analysis tools in accordance with Section R406.6.1 shall be provided to be approved based on meeting a specified threshold for a jurisdiction the code official. ~~The code official shall approve tools for a specified application or limited scope.~~

R406.7.3 R406.6.5 (N1106.6.5) Input values. When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from ~~an approved source~~ ANSI/RESNET/ICC 301.

Delete without substitution:

R406.7 (N1106.7) Calculation software tools. ~~Calculation software, where used, shall be in accordance with Sections R406.7.1 through R406.7.3.~~

R406.7.1 (N1106.7.1) Minimum capabilities. ~~Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section R406.3, and shall include the following capabilities:~~

1. ~~Computer procedure shall not allow the user to directly modify the building component characteristics of the ERI reference design.~~
2. ~~Calculation of whole building, as a single zone, sizing for the heating and cooling equipment in the ERI reference design residence in accordance with Section R403.7.~~
3. ~~Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.~~
4. ~~Printed code official inspection checklist listing each of the rated design component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.~~

Reference standards type: This reference standard is new to the ICC Code Books
Add new standard(s) as follows:

ANSI/RESNET/ICC 301-2014 Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index First Published March 7, 2014 Republished January 2016.

Reason: During the 2015 code development cycle, a collaborative code change proposal (RE188-13) to include the ERI approach in the code was submitted by the Institute for Market Transformation, Natural Resources Defense Council and Britt/Makela Group. The ERI approach was adopted in the code as Section R406 and is currently being adopted by states and local jurisdictions.

The collaborative team based the ERI code language on the yet to be approved standard ANSI/RESNET/ICC-301. This required the team to include language from the standard concerning the development of the Energy Rating Index (see Section R406.3), compliance software tool approval (R406.6.1) and the minimum capabilities of the software used to determine an ERI for a project (R406.7.1). Overall the language that was included in the proposal provides the basic concepts for developing a program to meet the ERI approach but referencing the RESNET/ICC-301 would ensure that the ERI approach is deployed using a standardized process from a consensus document.

This proposal references RESNET/ICC – 301 RESNET/ICC – 301 and strikes all language in C406 that is duplicated in the Standard or that is no longer needed in the code because the concept is covered in the Standard.

RESNET/ICC - 301 Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using an Energy Rating Index provides a consistent, uniform methodology for evaluating and labeling the energy performance of residences. The methodology compares the energy performance of an actual home with the energy performance of a reference home of the same geometry, resulting in a relative energy rating called the Energy Rating Index. Where the energy performance of the actual home and the reference home are equal, the Energy Rating Index is 100 and where the actual home requires no net purchased energy annually, the Energy Rating Index is 0 (zero). Per the provisions of R406, the Energy Rating Reference Home used for this comparative analysis has the energy attributes of the 2006 International Energy Conservation Code (IECC) Standard Reference Design. Thus, the Energy Rating Index is relative to the minimum building energy efficiency requirements of the 2006 IECC.

Cost Impact: Will not increase the cost of construction

As stated in the Reason Statement, the ERI approach submitted during the 2015 IECC code development cycle (RE188-13) was based on the yet to be approved Standard 301. The ERI values that populate Table R406.4 were calculated and based on the protocol described in Standard 301 so referencing this standard will not lead to an increase in the stringency of the ERI values and will not result in an increase in first cost for the construction of the house. This proposal DOES NOT propose to change the Section R406.2 requirements for Mandatory Requirements or the 2009 IECC as minimum requirement which would increase first cost. The Energy Rating Index described in Section R406.3 is consistent with Standard 301. The requirements for Calculation Software Tools in Section R406.7 will not increase the cost to develop software as the requirements are consistent with the requirements in Standard 301. Standard 301 does not place additional requirements into C406 but provides a standardized method for generating ERI scores and demonstrating compliance with the R406.

Analysis: A review of the standard proposed for inclusion in the code, BRS/RESNET/ICC 301-2016, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2016)

Report of Committee Action Hearings
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Committee Action:

As Submitted

Committee Reason: The ERI path needs to be standardized and the RESNET standard does that. The difference in ventilation rate might need to be resolved but the experts can solve that through public comments.

Assembly Action:

None

Public Comments

Public Comment 1:

Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing self (joe@buildingscience.com) requests Approve as Modified by this Public Comment.

Modify as follows:

R406.3 (N1106.3) Energy Rating Index. The Energy Rating Index (ERI) shall be determined in accordance with ANSI/RESNET/ICC 301-except for buildings constructed in accordance with the ~~International Residential Code~~ International Residential Code, the *ERI reference design* ventilation rate shall be in accordance with the following:

Ventilation rate in cubic feet per minute = $(0.01 \times \text{total square foot area of house}) + [7.5 \times (\text{number of bedrooms} + 1)]$ _____ **(Equation 4-1)**

Commenter's Reason: As written the ERI ventilation rate specification is in conflict with the ventilation rate specified by the IRC. The current language references ANSI/RESNET/ICC Standard 301 which references the ASHRAE 62.2-2013. The ventilation rate in the ASHRAE Standard 62.2 is significantly higher than the ventilation rate in the IRC. The IRC rate was reaffirmed in Group A changes this code cycle. Without this ventilation rate correction, the higher ventilation rate would use more energy unnecessarily and thereby increase ERI scores for no good reason. Interestingly the ASHRAE 62.2-2010 used the same rate as is in the current IRC.

Third party organizations should not set ventilation rates for the IRC and the IECC. Ventilation rates in the IRC and IECC should be set by the ICC code development process.

This proposal brings the IECC/IRC ERI calculation into compliance with the IRC ventilation rate by using the same ventilation equation as will be in Section 1507.3.3 of the 2018 IRC.

The published committee reason expected this update, stating: *"The difference in ventilation rate might need to be resolved but the experts can solve that through public comments."* This is the public comment they were referring to.

Final Action Results

RE166-16

AMPC1

RE166-16**Section R406.3 Energy Rating Index. Revise to read as follows:****R406.3 Energy Rating Index.**

The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a *residential building* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1-percent change in the ~~total energy use~~ annual total normalized modified loads of the ~~rated design~~ *rated design* relative to the annual total energy use loads of the *ERI reference design*. The ERI shall consider all energy used in the *residential building*.

R406.3.1 ERI reference design.

The *ERI reference design* shall be configured such that it meets the minimum requirements of the 2006 *International Energy Conservation Code* prescriptive requirements.

~~The proposed residential building shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the ERI reference design.~~

Section R406.4 ERI-based compliance. Revise to read as follows:**R406.4 ERI-based compliance.**

~~The ERI for the rated design shall be determined in accordance with ANSI/RESNET/ICC 301-2014, including Addendum A-2015, and Compliance based on an ERI analysis requires that the rated design be shown to have an ERI less than or equal to the appropriate value listed in Table R406.4 when compared to the ERI reference design.~~

Section R406.5 Verification by approved agency. Revise to read as follows:

R406.5 Verification by approved agency. Verification of compliance with Section R406 shall be completed by an *approved* third party, in accordance with Florida Statutes 553.990 (Building Energy Efficiency Rating System).

R406.6.1 Compliance software tools.

~~Computer software utilized for demonstration of code compliance shall have been approved by the Florida Building Commission in accordance with requirements of this code. Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.~~

Code Change No: **RE173-16**

Original Proposal

Section(s): Table R406.4 (IRC Table N1106.4)

Proponent: Amanda Hickman, InterCode Incorporated, representing Leading Builders of America (amanda@intercodeinc.com)

Revise as follows:

**TABLE R406.4 (N1106.4)
MAXIMUM ENERGY RATING INDEX**

CLIMATE ZONE	ENERGY RATING INDEX
1	52-57
2	52-57
3	54-57
4	54-62
5	55-61
6	54-61
7	53-58
8	53-58

Reason: Some estimates have put the ERI scores for homes built to the 2015 prescriptive code as high as 79. This proposal is intended to produce substantial additional energy savings compared to the current or proposed levels of prescriptive requirements in the 2015 IECC, while allowing considerably greater flexibility to builders using a method with which a large segment of the market is already familiar. This flexibility is likely to result in lower construction costs for any given level of energy efficiency. Builders who do not make use of this proposed method are still able to comply with the code using any of the existing compliance pathways.

The revised ERI values in the proposal were based on an additional 10 percent savings beyond 2012 with 2014 NAECA HVAC and water heating equipment efficiencies. The values can also be achieved using heating, cooling, and water heating equipment efficiency levels higher than NAECA minimum levels in the Northern and Southern parts of the country. The resulting ERI values are considered cost effective in all climate zones and will result in increased efficiency for residential construction over the 2012 IECC.

While the ERI values will provide flexibility, the 2009 IECC residential envelope requirements have been set as a backstop in the ERI path for the least efficient level of efficiency for insulation R-values, glazing U-factor and SHGC. This proposal also requires complying with the applicable mandatory requirements to be consistent with the Above Code section in the IECC. And because energy losses in the domestic hot water distribution system fall outside the scope of the energy rating index as it can be calculated with 2012 methodology, current code provisions relating to hot water pipe insulation are mandatory as well.

Since the final action hearings and publication of the 2015 IECC, the "Standard for the Calculation and Labeling of the Energy Performance of Low-Rise Residential Buildings using the Energy Rating Index" (ANSI/RESNET/ICC 301-2014) was published. This standard development change required software vendors to make changes to their software to comply with the requirements of the new standard.

These changes have caused the ERI scores to increase by an estimated 2 to 3 points due to infiltration and ventilation changes, and decrease by an estimated 1 to 2 points due to changes related to efficient domestic water heating. This results in a net change of 1 to 2 points in ERI Scores.

The proposed ERI numbers take all of the aforementioned adjustments into account.

Sources:

1. RE188-13 Public Comment #2 Reason statement: Eric Makela, Britt/Makela Group, representing self, Ron Burton, representing Leading Builders of America, David Goldstein, representing National Resource Defense Council, and Meg Waltner, representing National Resource Defense Council
2. "Upcoming Changes to the HERS Index and Potential Impact on HERS Index Scores"

Cost Impact: Will not increase the cost of construction

Because this proposal provides more flexibility, it is likely to result in lower construction costs for any given level of energy efficiency.

**Report of Committee Action
Hearings**

Committee Action:

As Submitted

Committee Reason: The revised index numbers are realistic and are still difficult to achieve. There have been changes in the RESNET standards because of water heating equipment so the revised index numbers cannot be compared to the current index numbers. The revised index numbers are a compromise that can advocate for the adoption of the IECC without having the ERI method being amended out at adoption. In one state where the IECC is adopted and the ERI method is left intact, no one uses the ERI method because the index numbers are far too difficult to achieve. The revised index numbers might encourage use of the ERI method to achieve higher performing buildings.

Assembly Action:

None

Public Comments

Public Comment 1:

Mike Fischer, Kellen, representing The Center for the Polyurethanes Industry of the American Chemistry Council and the Polyisocyanurate Insulation Manufacturers Association (mfischer@kellencompany.com) requests Approve as Modified by this Public Comment.

Modify as follows:

**TABLE R406.4 (N1106.4)
MAXIMUM ENERGY RATING INDEX**

CLIMATE ZONE	ENERGY RATING INDEX ^a
1	57
2	57
3	57
4	62
5	61
6	61
7	58
8	58

a. ~~Where~~ When on-site renewable energy is included for compliance using the ERI analysis ~~of~~ per Section R406.4, the building shall meet the mandatory requirements ~~of~~ with Section R406.2 and the building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table R402.1.2 or Table R402.1.4 of the 2015 *International Energy Conservation Code*.

Commenter's Reason: RE 173-16 was submitted by the Leading Builders of America (LBA) to adjust the ERI as quantified by the Energy Rating Index (ERI) values in Table R406.4. (N1106.4) in order to correlate changes with the published version of ANSI/RESNET/ICC 301-2014 (RESNET 301). While RESNET 301 was not ready for adoption into the 2015 IECC, it was generally understood that it would be proposed for inclusion into the 2018 IECC as an option for compliance via the ERI path. In fact, RESNET 301 was proposed for inclusion into the 2018 IECC via RE166-16, which was recommended for Approval as Submitted by the IECC-R Committee. This modification specifies eligible and mandatory requirements for compliance under the ERI. The 2015 IECC ERI path does not address the inclusion of onsite renewable power generation for code compliance using ERI calculation tools, including RESNET 301. The application of the ERI path and use of software compliance tools require a full consideration of several pieces of the code, including climate zone, mandatory provisions including backstops, and approved software tools; none of these code provisions stand alone. A review of the bibliography included with the reason statement for RE173 provides additional background on the inclusion of RESNET 301 into the IECC; and the HERS Index paper (Dillon) includes a reference to the inclusion of onsite power production. The Center for the Polyurethanes Industry (CPI) of the American Chemistry Council (ACC) recommends an approach that provides for the use of onsite renewable power production for ERI path compliance while maintaining rigorous energy conservation standards.

ACC recommends approval of RE 173-16 as modified by this public comment, which will:

- Permit onsite power production to be used to offset energy use and included in the ERI calculation under Section R406.
- Establish a more stringent backstop for the ERI path when on-site renewable energy is included in the ERI analysis by setting the baseline for mandatory minimum envelope efficiency with the 2015 IECC prescriptive path.
- Retain the current 2009 IECC prescriptive path backstops for ERI calculation of buildings that do not incorporate on-site power production.

As the use of distributed generation in homes becomes more prevalent, it is important to address its role in the building energy code. This public comment establishes an easily enforceable path that safeguards current efficiency levels and allows for the responsible use of onsite power that does not cannibalize current efficiency levels.

Final Action Results

RE173-16

AMPC1

RE173-16**TABLE R406.4 MAXIMUM ENERGY RATING INDEX**

CLIMATE ZONE	ENERGY RATING INDEX
1	<u>52 58</u>
2	<u>52 58</u>
3	51
4	54
5	55
6	54
7	53
8	53

Code Change No: **RE183-16**

Original Proposal

Section: R502.1.1.2 (IRC N1108.1.1.2), R503.1.2 (IRC N1109.1.2)

Proponent: Shaunna Mozingo, Colorado Code Consulting - City of Cherry Hills Village, representing Colorado Chapter of ICC Energy Code Development Committee (smozingo@coloradocode.net)

Revise as follows:

R502.1.1.2 (N1108.1.1.2) Heating and cooling systems. New heating, cooling and duct systems that are part of the addition shall comply with Section R403 ~~Sections R403.1, R403.2, R403.3, R403.5 and R403.6.~~

Exception: Where ducts from an existing heating and cooling system are extended to an addition, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section R403.3.3.

R503.1.2 (N1109.1.2) Heating and cooling systems. New heating, cooling and duct systems that are part of the alteration shall comply with ~~Sections R403.1, R403.2, R403.3 and R403.6~~ Section R403.

Exception: Where ducts from an existing heating and cooling system are extended, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section R403.3.3.

Reason: The charging statement for both of these sections let us know that these requirements only apply if you have "new heating, cooling and duct systems that are part of the addition or alteration". It's not talking about the house, it's talking about installing new systems. Why would we not want them to comply with all of the provisions of the code for systems in R403? If I put in a new system at any phase of construction I had better make sure it is sized for the building I'm putting it into. Don't tell me you can't do adequate sizing on an existing building. You can get it the absolute best that you can but you at least have to put some thought into it.

Maybe you don't require a Manual J or some type of load calculation if you are doing an addition or alteration and dealing with an existing system, although you should always look to see if your mechanical equipment can handle the new load you're placing on it but it doesn't say that anywhere in the code, but this isn't talking about existing systems. We always have to do load calcs for new construction but never have to look at the system again to see if it is sized correctly for any future work that may be done to the home, even if we add a 10,000 sq ft addition? Well if we put in a new piece of equipment, it should go through load calcs and sizing just like if it were being put in a new building.

These sections didn't just leave out load calcs/sizing for new equipment, it left out mechanical system piping insulation. Why? It left out new snow and ice melt systems. Why? It left out pool and spa requirements. Again, why? If any of them are new, they need to meet all of the code requirements.

These sections should have read that heating and cooling and ducts systems that are part of the addition or alteration... and left out the word "new" if that was their intent. But the way it is worded, they are talking about new systems and they should have to comply.

Cost Impact: Will increase the cost of construction

There would likely be a cost for having a load calculation done or for piping insulation to be done or whatever requirement would have normally applied had the building been new but no longer applies because the building isn't new, even though the equipment is.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: The revised language makes it clear that new systems must comply with all requirements of the code.

Assembly Action

None

Final Action Results

RE183-16

AS

Code Change No: RE184-16

Original Proposal

Section: R503.1.1.1 (IRC N1109.1.1.1)

Proponent: William Fay, representing Energy Efficient Codes Coalition; Charlie Haack, ICF International, representing Energy Efficient Codes Coalition; Maureen Guttman, Building Codes Assistance Project, representing Building Codes Assistance Project (mguttman@bcapcodes.org); Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE), representing Energy Efficient Codes Coalition; Jeffrey Harris, Alliance to Save Energy, representing Alliance to Save Energy; William Prindle, ICF International, representing Energy Efficient Codes Coalition

Revise as follows:

R503.1.1.1 (N1109.1.1.1) Replacement fenestration. 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 provided in Table R402.1.2. Where more than one replacement *fenestration* unit is being installed, an area-weighted average of the *U*-factor and/or SHGC of all replacement *fenestration* units shall be permitted to be used to demonstrate compliance.

Reason: This purpose of this code proposal is to clarify that the weighted average performance of replacement window units can be used for compliance purposes. Use of a weighted average for compliance is consistent with the requirements both for fenestration in new homes and in residential additions under this code and is also consistent with the requirements for replacement windows in the IECC – Commercial Provisions.

Cost Impact: Will not increase the cost of construction
 Since the code requirements are not proposed to be changed, this proposal will not affect the cost of construction.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: This is much needed for residential. It is already allowed for commercial so it makes sense that residential code would benefit.

Assembly Action

None

Final Action Results

RE184-16

AS

Code Change No: RE187-16

Original Proposal

Section: Appendix RA (IRC Appendix T)

Proponent: Donald Surrena (dsurrena@nahb.org)

Delete without substitution:

~~**APPENDIX RA (APPENDIX T)
RECOMMENDED PROCEDURE FOR WORST CASE TESTING OF ATMOSPHERIC VENTING SYSTEMS UNDER
R402.4 OR R405 CONDITIONS ≤ 5ACH₆₀**~~

Reason: This Appendix RA, "Recommended Procedure for Worst Case Testing of Atmospheric Venting Systems Under R402.4 or R405 Conditions, is not appropriate as an appendix in the IECC. It is noted as "informative and is not part of the code." Appendices are typically included in code books to offer optional or supplement criteria to the provisions in the main chapters of the code that are written in mandatory language for adoption if chosen by the jurisdiction. Appendices provide additional information for administration of the Department of Building Safety as well as standards not typically administered by all building departments. Appendices have the same force and effect as the primary chapters of the code when explicitly adopted by the jurisdiction. This Appendix RA is intended only as a recommended procedure to test venting and it is more appropriate in a training manual or technical guide for those parties that are involved in testing. This informational appendix is more appropriate in a standard and is not written to be part of a code that becomes law.

Cost Impact: Will not increase the cost of construction
The code change proposal only serves to remove an optional appendix that appears to be misplaced in the IECC. As this Appendix is not a requirement, there is not a change in the cost of construction.

**Report of Committee Action
Hearings**

Committee Action:

Approved as Submitted

Committee Reason: This is information that needs to be only in the IFGC and not in the IECC.

Assembly Motion:

Disapprove

Online Vote Results:

Failed

Support: 36.45% (74) Oppose: 63.55% (129)

Assembly Action

None

Final Action Results

RE187-16

AS

Code Change No: RB21-16

Original Proposal

Section: R301.2

Proponent: Hope Medina, representing self (hmedina@coloradocode.net)

Revise as follows:

**TABLE R301.2 (1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA**

GROUND SNOW LOAD	WIND DESIGN				SEISMIC DESIGN CATEGORY ^f	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP ^e	ICE BARRIER UNDERLAYMENT REQUIRED ^h	FLOOD HAZARD ^g	AIR FREEZING INDEX ⁱ	MEAN ANNUAL TEMP ^j
	Speed ^d (mph)	Topographic effects ^k	Special wind region ^l	Wind-borne debris zone ^m		Weathering ^a	Frost line depth ^b	Termite ^c					

MANUAL J DESIGN CRITERIAⁿ							
<u>Elevation</u>	<u>Latitude</u>	<u>Winter Heating</u>	<u>Summer Cooling</u>	<u>Altitude Correction Factor</u>	<u>Indoor Design Temperature</u>	<u>Design Temperature Cooling</u>	<u>Heating Temperature Difference</u>
-	-	-	-	-	-	-	-
<u>Cooling Temperature Difference</u>	<u>Wind Velocity Heating</u>	<u>Wind Velocity Cooling</u>	<u>Coincident Wet Bulb</u>	<u>Daily Range</u>	<u>Winter Humidity</u>	<u>Summer Humidity</u>	-

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

- a. Weathering may require a higher strength concrete or *grade* of masonry than necessary to satisfy the structural requirements of this code. The weathering column shall be filled in with the weathering index, "negligible," "moderate" or "severe" for concrete as determined from Figure R301.2(3). The *grade* of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.
- b. The frost line depth may require deeper footings than indicated in Figure R403.1(1). The *jurisdiction* shall fill in the frost line depth column with the minimum depth of footing below finish *grade*.
- c. The *jurisdiction* shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.
- d. The *jurisdiction* shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(4)A]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.
- e. The outdoor design dry-bulb temperature shall be selected from the columns of 97 ¹/₂ -percent values for winter from Appendix D of the *International Plumbing Code*. Deviations from the Appendix D temperatures shall be permitted to reflect local climates or local weather experience as determined by the *building official*.
- f. The *jurisdiction* shall fill in this part of the table with the seismic design category determined from Section R301.2.2.1.
- g. The *jurisdiction* shall fill in this part of the table with (a) the date of the *jurisdiction's* entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of the currently effective FIRMs and FBFMs or other flood hazard map adopted by the authority having *jurisdiction*, as amended.
- h. In accordance with Sections R905.1.2, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1 and R905.8.3.1, where there has been a history of local damage from the effects of ice damming, the *jurisdiction* shall fill in this part of the table with "YES." Otherwise, the *jurisdiction* shall fill in this part of the table with "NO."
- i. The *jurisdiction* shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99 percent) value on the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)."
- j. The *jurisdiction* shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)."
- k. In accordance with Section R301.2.1.5, where there is local historical data documenting structural damage to buildings due to topographic wind speed-up effects, the *jurisdiction* shall fill in this part of the table with "YES." Otherwise, the *jurisdiction* shall indicate "NO" in this part of the table.
- l. In accordance with Figure R301.2(4)A, where there is local historical data documenting unusual wind conditions, the *jurisdiction* shall fill in this part of the table with "YES" and identify any specific requirements. Otherwise, the *jurisdiction* shall indicate "NO" in this part of the table.
- m. In accordance with Section R301.2.1.2.1, the *jurisdiction* shall indicate the wind-borne debris wind zone(s). Otherwise, the *jurisdiction* shall indicate "NO" in this part of the table.
- n. The jurisdiction shall fill in these sections of the table to establish the design criteria using Table 1a or 1b from ACCA Manual J or established criteria determined by the jurisdiction having authority.

Reason: The requirement for a manual j or an engineered equivalent has been in the code for several cycles, but we do not assist the jurisdiction nor the applicant in determining their criteria. Often when a manual J is being put together for a project the responsible party will reach out to the jurisdiction who quite often have not determined what their design criteria is. What happens is different criteria will be used for different projects within the same jurisdiction. To assist the responsible party who is attempting to meet this requirement a jurisdiction should determine these variables. A jurisdiction is given the option of using table 1a or 1b from ACCA Manual J or for the jurisdiction to determine their own criteria due to their unique circumstances.

In Table 301.2(1) jurisdictions must establish other design criteria that is specific to that jurisdiction. It makes sense to add manual j criteria to the table, so that the jurisdictions are getting manual js that are designed to the correct variables. It's not uncommon for jurisdictions to not enforce the requirement for a manual j due to the complexity of reviewing and verifying the information. I believe by removing the inconsistent variable more manual js will be more consistently performed. This will allow for more jurisdictions to review manual j, and in turn will have more mechanical equipment installed that has been sized correctly.

Cost Impact: Will not increase the cost of construction

This proposal will not increase the cost. This is to provide information on design parameters for the home. The information can be obtained from ACCA Manual J's table 1a or 1b, or some jurisdictions have parameters established.

Report of Committee Action Hearings

Committee Action:

Approved as Submitted

Committee Reason: Manual J is mandatory in accordance with R403.7 and this promotes the "one book" concept.

Assembly Action:

None

Final Action Results

RB21-16

AS

Code Change No: **RM48-15**

Original Proposal

Section: M2103.2, M2103.2.1, M2103.2.2

Proponent: Brent Ursenbach, Salt Lake County, representing Utah Chapter ICC (bursenbach@slco.org)

Revise as follows:

M2103.2 Thermal barrier required. Radiant floor heating systems shall have a thermal barrier in accordance with Sections M2103.2.1 through M2103.2.4. Insulation R-values for slab-on-grade and suspended floor installations shall be in accordance with Chapter 11.

Exception: Insulation shall not be required in engineered systems where it can be demonstrated that the insulation will decrease the efficiency or have a negative effect on the installation.

Delete without substitution:

~~**M2103.2.1 Slab on grade installation.** Radiant piping used in slab on grade applications shall have insulating materials having a minimum R-value of 5 installed beneath the piping.~~

~~**M2103.2.2 Suspended floor installation.** In suspended floor applications, insulation shall be installed in the joist bay cavity serving the heating space above and shall consist of materials having a minimum R-value of 11.~~

Reason: Insulation R-values should be located in the IECC/Chapter 11, not Chapter 21- Hydronic Piping. Design professionals, code officials, contractors, developers, virtually all involved in the building process look to the IECC/Chapter 11 for specific thermal performance values. Locating these two sub-sections in the IMC has created considerable confusion. A similar proposal will be submitted in Group B, to add these sub-sections into the IECC where they belong.

Cost Impact: Will not increase the cost of construction

This proposal will not increase the cost of construction as it is the first step in re-locating an existing insulation requirement from the IRC mechanical section to the IECC/Chapter 11 IRC. There is no increase in the R-value of the insulation or the installation labor.

Report of Committee Action Hearings

Committee Action:

Approved as Modified

Modify proposal as follows:

M2103.2 Thermal barrier required. Radiant floor heating systems shall have a thermal barrier in accordance with Sections M2103.2.1 through M2103.2.4. Insulation R-values for slab-on-grade and suspended floor installations shall be in accordance with the International Energy Conservation Code Chapter 11.

Exception: Insulation shall not be required in engineered systems where it can be demonstrated that the insulation will decrease the efficiency or have a negative effect on the installation.

Committee Reason: Approval was based on the proponent's published reason statements. The modification keeps the text within the IRC for user convenience.

Assembly Action:

None

Final Action Results

RM48-15

AM