International Energy Conservation Code
Consensus Committee-Residential

Draft Meeting Agenda (5/16 posting)

Webex Meeting Link

May 19, 2022
2:00 PM EST to 5 PM EST (3 hours)

Committee Chair: JC Hudgison, CBO, Assoc. AIA
Committee Vice Chair: Bridget Herring & Robin Yochum, LEED Green Associate

1. Call to order.

2. Meeting Conduct.
   a. Identification of Representation/Conflict of Interest
   b. ICC Council Policy 7 Committees: Section 5.1.10 Representation of Interests
   c. ICC Code of Ethics: ICC advocates commitment to a standard of professional behavior that exemplifies the highest ideals and principles of ethical conduct which include integrity, honesty, and fairness. As part of this commitment it is expected that participants shall act with courtesy, competence and respect for others.
   d. ICC Antitrust Compliance Guideline

3. Roll Call.

4. Approve Agenda

5. Approval of Minutes

6. Administrative issues-staff

7. Subcommittee Reports

8. Action Items
   a. Code Change Proposals

REPI-39-21 (Attic knee wall)	(Envelope as modified 17-1)
REPI-40-21 (Steel ceilings and walls)	(Envelope as modified 15-0-2)
IRCPI-001-21 (Steel Ceilings and Walls)	(Envelope as modified 15-0-2)
REPI-56-21 (Insulation installation)	(Envelope disapprove 12-4-1)
REPI-68-21 (Cool Roofs)	(Envelope approve 10-7-1)
REPI-78-21 (Distribution System Efficiency)	(HVACR as modified 12-0)
REPI-88-21 (Water Heater installation)	(HVACR disapprove 6-4)

REPI-145-21 (Alterations duct leakage testing) (Existing Bldg a modified 6-0)
REPI-158-21 (Renewable Energy Documentation)(Electrical as modified 14-0-1)
REPI-111-21 (Electrification) (Electrical as modified 10-3-1)
RECPI-8-21 (CO2 Index proposal) (Modeling approve 11-2-2)
REPI-163-21 (Zero Energy Appendix) (Modeling approve 13-2-2)
REPI-162-21 (Net zero climate zone 0 value) (Modeling disapprove 17-0-0)

9. Other business.

10. Upcoming meetings. May 26 at 2 PM EST

11. Adjourn.

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

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

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

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-039-21 Attic knee or pony wall
CDP ID #	375
Code	IECC RE
Code Section(s)	R402.2.3 (New), Table R402.4.1.1 (New), TABLE R405.2, TABLE R406.2 New Section y
Location	base
Proponent	Robby Schwarz robby@btankinc.com
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	provides more details on how to insulate knee walls, adds additional clarity for these spaces
Recommendation	Motion to approve Rob Buchanan, Chris Mathis seconded Reason: assembly often overlooked and with low compliance rates. Language has issues but it's necessary. modifications presented as further modified. Reason: modified to remove pony wall and simplified six-side wall assembly provision
Vote	10-8-0; 17-1-0
Recommendation Date	3/16/22; 5/4/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee __X_____
Consensus Committee	
Committee Response	

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

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

Definition

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

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

~~R402.2.3 Attic knee or pony wall.~~

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

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

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

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

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

Table R402.4.1.1

AIR BARRIER, AIR SEALING AND INSULATION INSTALLATION [a]

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

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-040-21 steel ceilings and walls
CDP ID #	106
Code	IECC RE
Code Section(s)	R402.2.6, Table R402.2.6 New Section n
Location	base
Proponent	Jonathan Humble Jhumble@steel.org
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Sent to working group led by Alison Lindberg
Recommendation	Working group summary from Alison Lindberg with modified language. Motion to approve as modified A. Lindberg/A. Hickman Reason: provides clear and accurate way of determining wall and ceiling assemblies for closed form steel
Vote	As modified 15-0-2
Recommendation Date	
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Revise as follows:

R402.2.6 (N1102.2.6) Steel-frame ceilings, walls and floors.

Steel-frame ceilings walls and floors shall comply with the ~~insulation requirements of Table R402.2.6 or the~~ *U*-factor requirements of Table R402.1.2. The calculation of the *U*-factor for ~~a~~ steel-framed ceilings and walls in an envelope assembly shall ~~use a series-parallel path calculation method~~ be determined in accordance with AISI S250 as modified herein.

a. Where the steel-framed wall contains no cavity insulation, and uses continuous insulation to satisfy the U-factor maximum, the *steel-framed wall* member spacing is permitted to be installed at any on-center spacing.

a. Where the steel-framed wall contains framing at 24 inch (600 mm) on center with a 23% framing factor or framing at 16 inch (400 mm) on-center with a 25% framing factor, the next lower framing member spacing input values shall be used when calculating using AISI S250.

a. Where the steel-framed wall contains less than 23% framing factors the AISI S250 shall be used without any modifications.

a. Where the steel-framed wall contains other than standard C-shape framing members the AISI S250 calculation option for other than standard C-shape framing is permitted to be used.

Delete without substitution:

~~TABLE R402.2.6 STEEL-FRAME CEILING, WALL AND FLOOR INSULATION R-VALUES~~

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL-FRAME 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-frame Wall, 16 inches on center	
R-13+5	R-0 + 15 or R-13 + 9 or R-15 + 8.5 or R-19 + 8 or R-21 + 7
R-13+10	R-0+20 or R-13 + 15 or R-15 + 14 or R-19 + 13 or R-21 + 13
R-20	R-0 + 14.0 or R-13 + 8.9 or R-15 + 8.5 or R-19 + 7.8 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-frame Wall, 24 inches on center	
R-13+5	R-0 + 15 or R-13 + 7.5 or R-15 + 7 or R-19 + 6 or R-21 + 6
R-13+10	R-0 + 20 or R-13 + 13 or R-15 + 12 or R-19 + 11 or R-21 + 11
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~~

~~The first value is cavity insulation *A* value; the second value is continuous insulation *A* value. Therefore, for example,~~

a. ~~"R-30 + 3" means R-30 cavity insulation plus R-3 continuous insulation.~~

a. ~~Insulation exceeding the height of the framing shall cover the framing.~~

Add new standard(s) as follows:

AISI

AISI American Iron and Steel Institute
25 Massachusetts Avenue, NW, Suite 800
Washington DC 20001.

AISI - S250 - 21 North American Standard for Thermal Transmittance of Building Envelopes with Cold-Formed Steel Framing

Attached Files

AISI_CFSD-Report-RP20-2-Final.pdf
http://localhost/proposal/106/879/files/download/23/ **AISI S250-21&S250-21-C_s.pdf**
http://localhost/proposal/106/879/files/download/22/

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	IRCPI-001-21 steel ceilings and walls
CDP ID #	157
Code	IRC
Code Section(s)	N1102.2.6, TABLE N1102.2.6 New Section n
Location	base
Proponent	Jonathan Humble Jhumble@steel.org
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Alison Lindberg also presented version in IRC language. Reason same as previous.
Recommendation	Motion to Approve as modified A. Lindberg/A. Hickman Reason: provides clear and accurate way of determining wall and ceiling assemblies for closed form steel and previous decision from SC.
Vote	15-0-2
Recommendation Date	5/2/2022
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

(N1102.2.6) Steel-frame ceilings, walls and floors.

Steel-frame ceilings walls and floors shall comply with the ~~insulation requirements of Table R402.2.6 or the~~ *U*-factor requirements of Table R402.1.2. The calculation of the *U*-factor for ~~a~~ steel-framed ceilings and walls in an envelope assembly shall ~~use a series-parallel path calculation method~~ be determined in accordance with AISI S250 as modified herein.

b. Where the steel-framed wall contains no cavity insulation, and uses continuous insulation to satisfy the U-factor maximum, the *steel-framed wall* member spacing is permitted to be installed at any on-center spacing.

b. Where the steel-framed wall contains framing at 24 inch (600 mm) on center with a 23% framing factor or framing at 16 inch (400 mm) on-center with a 25% framing factor, the next lower framing member spacing input values shall be used when calculating using AISI S250.

b. Where the steel-framed wall contains less than 23% framing factors the AISI S250 shall be used without any modifications.

b. Where the steel-framed wall contains other than standard C-shape framing members the AISI S250 calculation option for other than standard C-shape framing is permitted to be used.

Delete without substitution:

~~TABLE R402.2.6 STEEL-FRAME CEILING, WALL AND FLOOR INSULATION R-VALUES~~

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL-FRAME 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-frame Wall, 16 inches on center	
R-13+5	R-0 + 15 or R-13 + 9 or R-15 + 8.5 or R-19 + 8 or R-21 + 7
R-13+10	R-0+20 or R-13 + 15 or R-15 + 14 or R-19 + 13 or R-21 + 13
R-20	R-0 + 14.0 or R-13 + 8.9 or R-15 + 8.5 or R-19 + 7.8 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-frame Wall, 24 inches on center	
R-13+5	R-0 + 15 or R-13 + 7.5 or R-15 + 7 or R-19 + 6 or R-21 + 6

~~R-13+10~~	~~R-0 + 20 or R-13 + 13 or R-15 + 12 or R-19 + 11 or R-21 + 11~~
~~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~~

~~The first value is cavity insulation *A* value; the second value is continuous insulation *A* value. Therefore, for example,~~

b. ~~"R-30 + 3" means R-30 cavity insulation plus R-3 continuous insulation.~~

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

Add new standard(s) as follows:

AISI
AISI American Iron and Steel Institute
25 Massachusetts Avenue, NW, Suite 800
Washington DC 20001.
AISI - S250 - 21 North American Standard for Thermal Transmittance of Building Envelopes with Cold-Formed Steel Framing

Attached Files

AISI_CFSD-Report-RP20-2-Final.pdf
http://localhost/proposal/106/879/files/download/23/ **AISI S250-21&S250-21-C_s.pdf**
http://localhost/proposal/106/879/files/download/22/

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-056-21 insulation installation
CDP ID #	471
Code	IECC RE
Code Section(s)	R402.4.1.1, TABLE R402.4.1.1, R402.4.1.2 New Section n
Location	base
Proponent	Mark Lyles markl@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Proponent: modified, closer to grade 1 level of performance, pull language form Title 24
Recommendation	Bobby Parks motion to disapprove, Greg Johnson seconded. Reason: Good info but mostly installation instructions rather than code language. Some of the language used such as “without voids” is problematic.
Vote	12-4-1
Recommendation Date	3/16/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-068-21 Cool Roofs
CDP ID #	425
Code	IECC RE
Code Section(s)	R402.6 (New), R402.6.1 (New), TABLE R405.4.2(1), R503.1.1, R407.2 New Section y
Location	base
Proponent	Elizabeth McCollum iecc-cool-roof@2050partners.com
Proposal Status	SC rev
Subcommittee	RE Envelope
Subcommittee Notes	Support for reducing heat island effect. Complimented the proponent on analysis provided. Reasonable and technically sound; in place in CA for over a decade. Concern with cost-effectiveness of including Climate Zone 3 given that portions are not in urban areas. Some building owners won't see a benefit. Reheard 5/4: Proposal: Cool roof proposal in Climate Zones 0-3, Akin to commercial. Continuing proposal from last meeting.
Recommendation	Out of time/ Tabled until next meeting - no objections Motion to Approve A. Lindberg/L. Fithian Reason: it will increase efficiency and reduce heat island effect in climate zones: 0-3
Vote	10-7
Recommendation Date	5/4/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_X_____
Consensus Committee	

Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code

Code Change Proposal Tracking Sheet

Proposal #	REPI-078-21 Distribution System Efficiency
CDP ID #	461
Code	IECC RE
Code Section(s)	R403.3.1, TABLE R405.4.2(1) New Section n
Location	base
Proponent	David Springer iecc-ducts2@2050partners.com
Proposal Status	SC rev
Subcommittee	RE HVACR & WH
Subcommittee Notes	Presented WG Chair David Bixby motion to accept presented to the subcommittee for voting. This Proposal was heard in two different versions **"as modified"** on 4/4/2022 and again revised 5/2/2022 subcommittee voted to approve
Recommendation	4/4/2022 subcommittee WG Chair David Bixby made a motion to the subcommittee to accept and approve this Proposal (as written original proposal Mark Lyles second- Vote of the subcommittee to approve the Proposal as written - Vote on 4/4/2022 subcommittee 12 vote yes unanimous. This Proposal then was listed on the Agenda for the IECC committee to vote. Prior to the meeting starting David Bixby and Gary Klein asked me to pull the Proposal as new information had come to light. The Proposal was pulled from the IECC agenda. On 5/2/2022 This Proposal was heard with a new **Modification V2.** The subcommittee agreed to approve the Proposal as Modified. Gary Klein has offered to present this Proposal to the IECC committee and answer questions.
Vote	Motion to approve 9 voting members unanimously approved
Recommendation Date	5/2/2022 meeting of HVACR subcommittee
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee____x_____
Consensus Committee	
Committee Response	

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI-78-21

IECC®: SECTION 202, R403.3.1, TABLE R405.4.2(1)

Proponents:
David Springer, representing on behalf of the California Statewide Utility Codes and Standards Team (ieccducts2@2050partners.com); Mark Lyles, representing New Buildings Institute (markl@newbuildings.org)

Revise as follows:
IECC2021P1E_RE_Ch02_SecR202_DefTHERMAL_DISTRIBUTION_EFFICIENCY_TDE_ ~~THERMAL~~ DISTRIBUTION SYSTEM EFFICIENCY (~~TDE~~ DSE). ~~The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct.~~ The ratio of the thermal energy transferred to or from the conditioned space to the thermal energy transferred at the equipment distribution system heat exchanger. Energy delivered to or from the conditioned space includes distribution system losses to the conditioned space.

R403.3.1 Ducts located outside conditioned space.
Supply and return ducts located outside conditioned space shall be insulated to an R-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Ducts buried beneath a building shall be insulated as required per this section or have an equivalent ~~*thermal*~~ *distribution system efficiency*. Underground ducts utilizing the ~~*thermal*~~ *distribution system efficiency* method shall be listed and labeled to indicate the R-value equivalency.

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

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Thermal distribution systems	Duct insulation: in accordance with Section R403.3.1. 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. Duct location: same as proposed design. **Exception:** For nonducted heating and cooling systems that do not have a fan, the standard reference design ~~thermal~~ distribution system efficiency (DSE) shall be 1. 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 floorarea* at a pressure of differential of 0.1 inch w.g. (25 Pa).	Duct location: as proposed. Duct insulation: as proposed. As tested or, where not tested, as specified in Table R405.4.2(2).

Reason Statement: Thermal Distribution System Efficiency (TDSE) defined in Section R202 is inconsistent with the term (DSE) used in Table R405.4.2(1). The change to Distribution System Efficiency (DSE) is to provide consistency. This definition is from the ASHRAE Standard 152, a consensus standard titled “Method of Test for Determining the Design and Seasonal Efficiencies of Residential Thermal Distribution Systems.”

Bibliography: ANSI/ASHRAE Standard 152-2014: Method Of Test For Determining The Design And Seasonal Efficiencies Of Residential Thermal Distribution Systems, ASHRAE, https://webstore.ansi.org/standards/ashrae/ansiashraestandard1522014.
Cost Impact: This proposal does not increase the cost of construction.

Working Group Recommendation: **Accept as modified by WG.**

THERMAL DISTRIBUTION EFFICIENCY (TDE). The resistance to changes in air heat as air is conveyed through a distance of air duct. TDE is a heat loss calculation evaluating the difference in the heat of the air between the air duct inlet and outlet caused by differences in temperatures between the air in the duct and the duct material. TDE is expressed as a percent difference between the inlet and outlet heat in the duct. This is back to the definition that is in the 2021 IECC.

DISTRIBUTION SYSTEM EFFICIENCY (DSE). The ~~ratio of the thermal energy transferred to or from the conditioned space to the thermal energy transferred at the equipment distribution system heat exchanger. Energy delivered to or from the conditioned space includes distribution system losses to the conditioned space.~~
A system efficiency factor that adjusts for the energy losses associated with delivery of energy from the equipment to the source of the load.

N1103.3.1 (R403.3.1) Ducts located outside conditioned space.

Supply and return ducts located outside conditioned space shall be insulated to an R-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Ducts buried beneath a building shall be insulated as required by this section or have an equivalent thermal distribution efficiency. Underground ducts utilizing the *thermal distribution ~~system~~ efficiency* method shall be listed and labeled to indicate the R-value equivalency. This returns the wording back to what is in the 2021 IECC.

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

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Thermal distribution systems	Duct insulation: in accordance with Section R403.3.1. 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. Duct location: same as proposed design. **Exception**: For nonducted heating and cooling systems that do not have a fan, the standard reference design thermal distribution system efficiency (DSE) shall be 1. For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft (9.29 m) of conditioned floor area at a pressure of differential of 0.1inch w.g. (25 Pa).	Duct location: as proposed. Duct insulation: as proposed. As tested or, where not tested, as specified in Table R405.4.2(2).

This returns the wording back to what is in the 2021 IECC. The wording of this table is being proposed for clarification in REPI 86.

Working Group Remarks: The original proponents of having TDE in the IECC reached out to the WG to explain the reason why the term was added to the code. Underground ducts are tested in accordance with NSF P374. The term, *thermal distribution efficiency (TDE)*, comes from this testing protocol. Underground ducts are listed in accordance with ICC ES LC1014, which also refers to NSF P374. While neither of these are ANSI standards, they are the only methods currently available for testing, listing and labeling underground ducts. There are several manufacturers of underground ducts that certify to these methods. To be consistent and to facilitate enforcement, *thermal distribution efficiency (TDE)* needs to remain in the IECC.

Separately, the WG learned that ANSI/RESNET/IECC Standard 301 has a different, but similar definition for DSE. Since Standard 301 is already referenced in the IECC, it makes sense to use this definition. DSE is used in Table R405.4.2(1).

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-088-21 Water Heater installation
CDP ID #	113
Code	IECC RE
Code Section(s)	R403.5, R403.5.4 New Section y
Location	base
Proponent	Nicholas O'Neil noneil@energy350.com
Proposal Status	SC rev
Subcommittee	RE HVACR & WH
Subcommittee Notes	Proposal Presented to the HVACR subcommittee on 5/2/2022. Motion to disapprove submitted and second.
Recommendation	Proponent Nick O'Neil presented the Proposal for (tanked only) water heaters. The discussion surrounding the cost savings being too low. With detailed discussion a subcommittee member made a motion to Disapprove. Receiving a second vote was taken.
Vote	Vote to disapprove this original Proposal 6/4/0
Recommendation Date	5/2/2022
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee___x_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-145-21 Alterations duct leakage testing
CDP ID #	287
Code	IECC RE
Code Section(s)	R502.3.2, R502.3.2.1, R503.1.2, R503.1 New Section y
Location	base
Proponent	Sean Denniston sean@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Existing Bldg
Subcommittee Notes	While the committee did agree that duct leakage in existing homes is an issue the current proposal only requires the ducts to be tested and report given to the owner and the code official. There were no requirements as to what would happen if the duct leakage was more than the current code allowed or if at certain duct leakage any repairs would have been needed. **With Modification – Heard on 5/10/2022** - REASON STATEMENT this helps clarify when duct testing is needed and not needed in existing homes and duct installation remains important no matter when it was installed.
Recommendation	Jim Z motion to disapprove Paul D second **With Modification – heard on 5/10/2022** Robby approve as modified, including modification made during sub-committee meeting – Paul seconds
Vote	6-1 motion carries **With Modification – heard on 5/10/2022** 6-1 motion carries to approve as modified
Recommendation Date	1/25/2022 **With Modification – 5/10/2022**
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee __X
Consensus Committee	

Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI 145-21

Modify the section as follows:

R502.3.2 Heating and cooling systems. HVAC ducts newly installed as part of an addition shall comply with Section R403.

> **Exception:** Where ducts from an existing heating and cooling system are extended ~~to~~ into an addition, Sections R403.3.5 and R403.3.6 shall not be required.

Modify the section as follows:

R503.1.2 Heating and cooling systems. New heating, cooling and duct systems ~~HVAC ducts~~ ~~newly~~ installed as part of an alteration shall comply with Section R403. Alterations to heating, cooling and duct systems shall comply with this section.

> **Exception:** Where ducts from an existing heating and cooling system are extended to an addition.

R503.1.2.1 Duct Leakage. Where an *alteration* includes any of the following, ducts shall be tested in accordance with Section R403.3.5 and shall have a total leakage less than or equal to 12.0 cubic feet per minute (339.9 L/min) per 100 square feet (9.29 m2) of conditioned floor area:

1. Where 25% or more of the registers that are part of the duct system are relocated.
2. Where 25% or more of the total length of all ducts in the system are relocated.
3. Where the total length of all ducts in the system is increased by 25% or more.

> **Exception:** Duct systems located entirely inside a *conditioned space* in accordance with R403.3.2.

Reason

This revision addresses issues brought up by the sub-committee.

Additions: The duct testing requirement is completely removed from C502 for additions. Instead, the language closes a loophole that allows ducts extended into the addition to avoid requirements for duct construction. It limits the exception to the requirements for duct testing and leakage.

Alterations: The sub-committee cited the lack of a leakage rate requirement as a major part of the reason for disapproval since the original, proposal would incur cost without ensuring energy savings. This revision introduces a leakage rate requirement of 12 CFM/sf, a very high level of allowable leakage that is three times the requirement for new construction. Additionally, the revision changes the code trigger threshold. Rather than being triggered by the installation of new heating and cooling equipment, it is triggered by extensive alterations to the duct system. This both places the requirement within scope for the IECC since only clearly altered duct systems will be subject and the requirement only needs to be met when that alteration is significant. An exception is included for ducts entirely within the conditioned space. The result is that only major alterations to terrible duct systems would trigger any kind of leakage requirement. Merely bad ductwork and terrible ductwork within conditioned space would be exempt.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-158-21 Renewable Energy Documentation
CDP ID #	242
Code	IECC RE
Code Section(s)	RC102, SECTION R404, R404.5, R406.7.3, RC102.3 New Section n
Location	base
Proponent	Diana Burk diana@newbuildings.org
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	
Recommendation	Motion to approve as modified addresses committee concerns regarding the potential use of off site renewables and indicates that only the portion or RECs required for compliance shall be counted.
Vote	Approve as modified 14-0-1
Recommendation Date	5/9/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

REPI-158 Revision

Revise definition as follows:

RENEWABLE ENERGY CERTIFICATE (REC): A~~n~~ market-based instrument that represents and conveys the environmental, ~~social, and other non-power~~ attributes of one megawatt hour of renewable electricity generation and could be sold separately from the underlying physical electricity associated with renewable energy resources ~~energy~~; also known as an energy attribute and energy attribute certificate (EAC).

Revise as follows:

SECTION R404 ELECTRICAL POWER, ~~AND~~LIGHTING, AND RENEWABLE ENERGY SYSTEMS

Add new section as follows:

R404.5 Renewable energy certificate (REC) documentation. Where ~~on-site~~ renewable energy generation is used to comply with ~~required by~~ this code, documentation shall be provided to the *code official* by the property owner or owner's authorized agent ~~shall~~ which demonstrates that ~~any~~ where RECs or EACs are associated with ~~on-site~~ the portion of renewable energy used to comply with this code, the RECS or EACS shall be ~~are~~ retained~~,~~ or retired, on behalf of the property owner.

Revise text as follows:

R406.7.3 Renewable energy certificate (REC) documentation. Where ~~onsite~~ renewable energy power production is included in the calculation of an ERI, documentation shall comply with Section R404.5. ~~one of the following forms of documentation shall be provided to the *code official*:~~

1. ~~Substantiation that the *RECs* associated with the onsite renewable energy are owned by, or retired on behalf of, the homeowner.~~

2. ~~A contract that conveys to the homeowner the *RECs* associated with the onsite renewable energy, or conveys to the homeowner an equivalent quantity of *RECs* associated with other renewable energy.~~

Revise text as follows:

RC102.3 Renewable energy certificate (REC) documentation. ~~Documentation shall comply with Section R404.5.~~ Where *RECs* are associated with *renewable energy* power production included in the calculation of ERI zero energy score, documentation shall comply with Section R404.5.

(Staff Note: RECs or EACs associated with renewable energy not used to comply with this code are not required to be retired or retained on behalf of the property owner.)

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	REPI-111-21 Electrification
CDP ID #	125
Code	IECC RE
Code Section(s)	R404.4 New Section y
Location	base
Proponent	Jeremy Williams jeremy.williams@ee.doe.gov
Proposal Status	SC rev
Subcommittee	RE Elec, Light
Subcommittee Notes	Straw poll to include as a voluntary appendix failed 3-10-1
Recommendation	Motion to approve as modified by the subcommittee which addressed options for outlets and the space provided for equipment.
Vote	Approve as modified 10-3-1
Recommendation Date	5/9/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Residential Electrification

Modify the 2021 International Energy Conservation Code as follows:

Add new text as follows:

R404.4 Electric readiness.
Systems using fossil fuel: water heaters, household clothes dryers, conventional cooking tops or conventional ovens shall comply with the requirements of Sections R404.4.1 through R404.4.4. All water heating systems shall comply with the space requirements of Section R404.4.5.

R404.4.1 Cooking Products.
An individual branch circuit outlet with a rating not less than 250-volts, 40-amperes shall be installed, and terminate within three feet of conventional cooking tops, conventional ovens or cooking products combining both.

Exception: Cooking products not installed in an individual dwelling unit.

R404.4.2 Household Clothes Dryers.
An individual branch circuit outlet with a rating not less than 240-volts, 30-amperes shall be installed, and terminate within three feet of each household clothes dryer.

Exception: Clothes dryers that serve more than one dwelling unit and are located outside of a dwelling unit.

R404.4.3 Water Heaters.
An individual branch circuit outlet with a rating not less than either 240-volts, 30-amperes or 120V, 20-amperes shall be installed, and terminate within three feet of each fossil fuel water heater.

Exception: Water heaters in a centralized water heating system serving multiple dwelling units in a R-2 occupancy.

R404.4.4 Electrification-ready circuits.
The unused conductors required by Sections R404.4.1 through R404.4.3 shall be labeled with the word "spare." Space shall be reserved in the electrical panel in which the branch circuit originates for the installation of an overcurrent device. Capacity for the circuits required by Sections R404.4.1 through R404.4.3 shall be included in the load calculations of the original installation.

R404.4.5 Water heater space.
An indoor space that is at least 3 feet by 3 feet wide by 7 feet high shall be available surrounding or within 3 feet of the installed water heater.

Exceptions:

1. Installed heat pump, electric tankless, or fossil fuel tankless water heaters.
2. Water heaters in a centralized water heating system serving multiple dwelling units in a R-2 occupancy.

International Energy Conservation Code

Code Change Proposal Tracking Sheet

Proposal #	RECPI-8-21 CO2e Index
CDP ID #	
Code	IECC RE
Code Section(s)	R401.3 & R406.7.2.2
Location	Base
Proponent	Gayathri Vijayakumar
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	RECPI-8-21 was submitted by Econ subcommittee member Gayathri Vijayakumar introducing the CO2e Index as a component of R401 & R406
Recommendation	**Approve As Submitted** Motion: Gayathri Vijayakumar, 2nd Robert Salcido Reason Statement: The subcommittee determined there was benefit in adding a metric to the Certificate (R401.3) that demonstrates GHG emissions. There was modest opposition due to adding an unenforceable metric with uncertain value. After healthy discussion the Econ SC voted largely in favor of including a CO2e index when utilizing the R406 ERI Compliance Alternative
Vote	Approve 11-2 (2 Abstain, 5 Not Present)
Recommendation Date	5-11-22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

IECC®: R401.3, R406.7.2.2
Proponents: Gayathri Vijayakumar, Steven Winter Associates, Inc.
2021 International Energy Conservation Code
Revise as follows:
SECTION R401 GENERAL
R401.3 Certificate. A permanent certificate shall be completed by the builder or 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 indicate the following:
1. The predominant R-values of insulation installed in or on ceilings, roofs, walls, foundation components such as slabs, basement walls, crawl space walls and floors and ducts outside conditioned spaces.
2. U-factors of fenestration and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for any component of the building envelope, the certificate shall indicate both the value covering the largest area and the area weighted average value if available.
3. The results from any required duct system and building envelope air leakage testing performed on the building.
4. The types, sizes 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 indicate "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be indicated for gas-fired unvented room heaters, electric furnaces and electric baseboard heaters.
5. Where on-site photovoltaic panel systems have been installed, the array capacity, inverter efficiency, panel tilt and orientation shall be noted on the certificate.
6. For buildings where an Energy Rating Index score is determined in accordance with Section R406, the Energy Rating Index score and CO_2e Index, both with and without any on-site generation, shall be listed on the certificate.
7. The code edition under which the structure was permitted and the compliance path used.
SECTION R406 ENERGY RATING INDEX COMPLIANCE ALTERNATIVE
Revise as follows:
R406.7.2.2 Confirmed compliance report for a certificate of occupancy. A confirmed compliance report submitted for obtaining the certificate of occupancy shall be made site and address specific and include the following:
1. Building street address or other building site identification.
2. Declaration of ERI and CO_2e Index on title page and on building plans.
3. The name of the individual performing the analysis and generating the report.
4. The name and version of the compliance software tool.

5. Documentation of all inputs entered into the software used to produce the results for the reference design and/or the rated home.
6. A final confirmed certificate indicating that the confirmed rated design of the built home complies with Sections R406.2 and R406.4. The certificate shall report the energy features that were confirmed to be in the home, including: component-level insulation R-values or U-factors; results from any required duct system and building envelope air leakage testing; and the type and rated efficiencies of the heating, cooling, mechanical ventilation, and service water-heating equipment installed. Where on-site renewable energy systems have
been installed on or in the home, the certificate shall report the type and production size of the installed system.

Revise as follows:

CHAPTER 6 [RE] REFERENCED STANDARDS

ICC International Code Council, Inc.
500 New Jersey Avenue NW6th Floor
Washington, DC 20001

ANSI/APSP/ICC 14—2019: American National Standard for Portable Electric Spa Energy Efficiency
R403.11

ANSI/APSP/ICC 15a—2020: American National Standard for Residential Swimming Pool and Spa Energy Efficiency
R403.12

ANSI/RESNET/ICC 301—2019 2022: Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index
R406.4

Reason:

As stated in the Executive Summary of the "Path Forward on Energy and Sustainability to Confront a Changing Climate," reduction of greenhouse gas emissions is part of our mission on this Committee. This proposal is a simple step toward that goal, by simply reporting an index, similar to ERI, that helps a builder/homeowner understand the performance of their home with respect to GHG. The software that calculates an ERI in 2024 IECC R406 path will be done so in accordance with ANSI 301-2022. That Standard requires software to list this CO2e Index on labels & certificates. It is intended to be published in time for reference within the 2024 IECC to include an update to GHG emission factors (Addendum B). This proposal doesn't mandate a maximum CO2e Index although it paves the way for a future proposal to do so.

It would also be possible to report GHG emissions, as calculated in accordance with the same standard, if the concept of the CO2e Index is too new to receive enough support.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction since the reporting of this value is already part of compliance with the referenced Standard.

Attached Files:
Until ANSI 301-2022 is published, this approved Addendum D to ANSI 301-2019 is being shared, to provide context for the CO2e Index, which will be modified by Addendum B above.
https://www.resnet.us/wp-content/uploads/FS_301-2019AdndmD_webpost.docx

International Energy Conservation Code

Code Change Proposal Tracking Sheet

Proposal #	REPI-163-21 Appendix RC
CDP ID #	186
Code	IECC RE
Code Section(s)	RC102.2 table
Location	Base
Proponent	Kim Cheslak, NBI; Lauren Urbanek, NRDC
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	Diana Burk presented on behalf of Kim Cheslak and Lauren Urbanek who were unable to attend the SC meeting. Proposal is to modify the ERI scores in Table RC102.2 to reflect PHIUS certified projects
Recommendation	**Approve As Modified** Motion: Diana Burk, 2nd Amy Boyce Reason Statement: After discussion it was determined the PHIUS values submitted by Climate Zone were overly stringent. The subcommittee felt a more realistic value was warranted where a friendly modification by Gayathri Vijayakumar, to set the ERI values across all Climate Zones at 42, was accepted by both Diana Burk and Amy Boyce. The subcommittee agreed voting in favor of the modification.
Vote	Approve As Modified 13-2 (2 Abstain, 3 Not Present)
Recommendation Date	5-11-22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code

Code Change Proposal Tracking Sheet

Proposal #	REPI-162-21 Appendix RC
CDP ID #	309
Code	IECC RE
Code Section(s)	RC102.2 table
Location	Base
Proponent	SEHPCAC
Proposal Status	SC rev
Subcommittee	RE Econ, Model, Metric
Subcommittee Notes	Kris Stenger presented on behalf of SEHPCAC; REPI-162-21 introduces ERI value for Climate Zone 0 in Table RC102.2
Recommendation	**Disapprove** Motion: Gayathri Vijayakumar, 2nd Thomas Marston Reason Statement: Motion to disapprove based on Econ SC prior action on REPI-163-21 that includes Climate Zone 0 with a more stringent ERI of 42 without Onsite Power Production (OPP). The Econ SC unanimously supported disapproval.
Vote	Disapprove 17-0 (3 Not Present)
Recommendation Date	5-11-22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	