International Energy Conservation Code
Consensus Committee-Commercial

Meeting Agenda (Draft 4/6)

April 13, 2022
2:00 PM Eastern to 5:00 PM Eastern (3 hours)
Webex Link

Committee Chair: Duane Jonlin
Committee Vice Chair: Emily Hoffman

1. Call to order.

2. Meeting Conduct. Staff
   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.

3. Roll Call – Hoffman

4. Approval of Agenda

5. Approval of Minutes

6. Administrative issues.
   a. Progress indicators

7. Action Items.
   a. Code Change Proposals

CEPI-209-21 (Mand. Performance Table)	(Modeling approve 15-2-1)
CEPI-212-21 (Performance Stand Ref Table)	(Modeling approve 19-0-0)
CECPI-2-21 (Comm Min. Renewables Cap.)	(Elect. Power approve 10-3-4)
CEPI-150-21 (Scope of Exterior Lighting)	(Elect. Power approve 10-4-2)
CEPI-153-21 (Occupant Sensor)	(Elect. Power disapprove 11-3)
CEPI-71-21 (Air Leakage Test Level)	(Envelope as modified 18-0-2)
CEPI-61-21 (Climate Zone & Building Size Exc)	(Envelope as modified 20-0-2)
CECPI-3-21 (Consensus Air Leakage Restructuring)	(Envelope as modified 18-0-1)
CEPI-55-21 (Air Barriers)	(Envelope disapprove 17-0-2)
CEPI-56-21 (Air Leakage)	(Envelope disapprove 17-0-2)
CEPI-57-21 (Air Leakage)	(Envelope disapprove 17-0-2)

CEPI-70-21 (Air Leakage Dwelling Unit Testing)	(Envelope disapprove 17-0-2)
CEPI-58-21 (Air Barrier Testing)	(Envelope as modified 18-0-4)
CEPI-1-21 (Process Energy)	(Envelope disapprove 16-0-3 and EPLR disapprove 11-2-1)
CEPI-13-21 Part I (Conditioned Space definition)	(Envelope disapprove 19-0-1)
CEPI-21-21 (Insulation Product Rating)	(Envelope disapprove 17-0-1)
CEPI-28-21 (U-Factor basis for R-Value)	(Envelope as modified 15-0-1)
CEPI-207-21 (Source Energy)	(Modeling as modified 17-0-1)
CEPI-229-21 (Alterations acceptance test)	(Modeling as modified 18-0-1)
CEPI-25-21 (Data Centers)	(Elect. Power disapprove 7-5-3)
CEPI-134-21 (Data Centers)	(Elect. Power approve 15-0-1)
CEPI-135-21 (Sleeping unit lighting power)	(Elect. Power as modified 15-0-1)
CEPI-136-21 (Lighting for dwelling units)	(Elect. Power deny 8-7-1)
CEPI-137-21 (Lighting dwelling units)	(Elect. Power as modified 7-5-1)
CEPI-176-21 (Lighting demand responsive controls)	(Elect. Power as modified 8-6)
CEPI-181-21 (Lighting unfinished spaces)	(Elect. Power as modified 14-0-1)
CEPI-188-21 (Exterior Lighting Res. Provisions)	(Elect. Power as modified 13-0-1)

8. Subcommittee & Temporary Work Group reports
    a. Envelope and Embodied Energy- Culp
    b. Electrical Power, Lighting, and Renewables-Jouaneh
    c. HVACR & Water Heating-Shelide
    d. Modeling, Whole-Building Metrics, Zero Energy-Eades
    e. Construction Cost & LCC Update- Tillou

9. Other business.
    a. Public comment on any matters discussed at the meeting (Please limit comments to 2 minutes. Further comments can be directed to the Secretariat following the meeting to be considered at a future meeting.)

10. “3 Minutes of Fame.” Speakers TBD

11. Upcoming meetings. April 20

12. Adjourn.

FOR FURTHER INFORMATION BE SURE TO VISIT THE ICC WEBSITE:
IECC Commercial Consensus Committee Webpage
https://www.iccsafe.org/products-and-services/i-codes/code-development/cs/iecc-commercial-consensus-committee/
ICC Energy webpage
https://www.iccsafe.org/products-and-services/codes-standards/energy/
Code Change Proposal Submittals
https://energy.cdpaccess.com/login/
Energy Complete Monograph
Monograph

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

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

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-209-21 Mandatory Performance Table Envelope items
CDP ID #	167
Code	IECC CE
Code Section(s)	C407.2 table New Section n
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC rev
Subcommittee	CE Model, Metrics
Subcommittee Notes	The SC supports this CCP, although there were some commenters were not comfortable with the reference to C402.2.4.1 Insulation Installation. The concern is that C402.2.4.1 which is "tradable" is included in Table C407.2 which is "non-tradable".
Recommendation	Accept
Vote	Accept-15, Reject-2, Revise-1
Recommendation Date	3/7/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____✓_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-212-21 Performance Standard Ref Table Roof
CDP ID #	335
Code	IECC CE
Code Section(s)	C407.4.1(1) table New Section n
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC rev
Subcommittee	CE Model, Metrics
Subcommittee Notes	The SC unanimously accepted this proposal to correct the solar absorptance and emittance factors contained in Table C407.4.1(1)
Recommendation	Accept the CCP as modified.
Vote	Accept-19, Reject-0, Revise-0
Recommendation Date	3/7/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____✓_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECPI-2-21 Comm. Minimum Renewable Capacity Consensus Proposal
CDP ID #	592
Code	IECC CE
Code Section(s)	New Sections
Location	base
Proponent	Electrical Power, Lighting, and Renewable Subcommittee
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	
Recommendation	As proposed
Vote	10-3-3
Recommendation Date	3/14/22
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 #	CEPI-150-21 Scope of Exterior Lighting
CDP ID #	383
Code	IECC CE
Code Section(s)	C405.2 New Section n
Location	base
Proponent	Jack Bailey jbailey@oneluxstudio.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: This change clarifies when lighting controls are required and is consistent with other provisions with the IECC
Recommendation	AS SUBMITTED
Vote	10 - 4 - 2
Recommendation Date	March 15, 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 #	CEPI-153-21 Occupant sensor
CDP ID #	77
Code	IECC CE
Code Section(s)	C405.2.1.1 New Section n
Location	base
Proponent	Glenn Heinmiller glenn@lampartners.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: this proposal reduces flexibility of code without significant energy savings.
Recommendation	DISAPPROVE
Vote	11 - 3 - 1
Recommendation Date	March 15, 2022
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

CECPI-3-21 Merged C402.5 Structure Proposal – V6

(Includes comments on V4 made before and during the IECC-C Subcommittee. It also reflects sub-committee action on CEPI-71, CEPI-61 and CEPI-62)

Note: There are explanatory tables and the color coding is explained at the end of the proposal

Modify as shown below. Also renumber sections in C402.1 as appropriate due to the movement of C402.5.5 to C402.1.3:

C402.5 Air leakage—building thermal envelope. The *building thermal envelope* shall comply with Sections C402.5.1 through Section ~~C402.5.11.1~~ C402.5.8.1~~., or the building *thermal envelope* shall be tested in accordance with Section C402.5.2 or C402.5.3. Where compliance is based on such testing, the building shall also comply with Sections C402.5.7, C402.5.8 and C402.5.9.~~

C402.5.1 Air barriers. A continuous ~~air barrier~~ *air barrier* shall be provided throughout the *building thermal envelope*. The *air barrier* is permitted to be any combination of inside, outside, or within the *building thermal envelope* The ~~air barrier~~ *air barrier* shall comply with Sections C402.5.1.1, and C402.5.1.2. The *air leakage* performance of the *air barrier* shall be verified in accordance with Section C402.5.2.

Exception: ~~Air barriers~~ *Air barriers* are not required in buildings ~~located~~ in *Climate Zone* 2B.

C402.5.1.1 Air barrier design and documentation requirements. Design of the continuous *air barrier* shall be documented in the following manner :

1. Components comprising the continuous *air barrier* and their position within each *building thermal envelope* assembly shall be identified.
2. Joints, interconnections, and penetrations of the continuous *air barrier* components shall be detailed.
3. The continuity of the *air barrier* at building element assemblies that enclose conditioned space or provide a boundary between conditioned space and unconditioned space shall be identified.
4. Documentation of the continuous air barrier shall detail methods of sealing the air barrier such as wrapping, caulking, gasketing, taping or other *approved* methods at the following locations:
   - 4.1. Joints around fenestration and door frames.
   - 4.2. Joints between walls and floors, between walls at building corners, between walls and roofs including parapets and copings, where above-grade walls meet foundations and similar intersections.
   - 4.3. Penetrations or attachments through the continuous *air barrier* in building envelope roofs, walls, and floors.
   - 4.4. Building assemblies used as ducts or plenums.
   - 4.5. Changes in continuous *air barrier* materials and assemblies.
5. Identify where testing will or will not be performed in accordance with Section C402.5.2. Where testing will not be performed, a plan for field inspections required by C402.5.2.3 shall be provided that includes the following:
   - 5.1 Schedule for periodic inspection(s),
   - 5.2 Continuous air barrier scope of work,
   - 5.3 List of critical inspection items,
   - 5.4 Inspection documentation requirements, and

5.5 Provisions for corrective actions where needed.

~~**C402.5.1.1**~~ **C402.5.1.2 Air barrier construction.** The *continuous air barrier* shall be constructed to comply with the following:

1. The ~~air barrier~~ *air barrier* shall be continuous for all assemblies that ~~are~~ comprise the ~~thermal envelope of the building~~ *building thermal envelope* and across the joints and assemblies.
2. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure differentials such as those from design wind load, stack effect and mechanical ventilation.
3. Penetrations of the ~~air barrier~~ *air barrier* shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. ~~Joints and seams associated with penetrations shall be sealed in the same manner or taped.~~ Sealing materials shall be securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure ~~from wind, stack effect and mechanical ventilation~~. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the fire sprinkler manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.
4. Recessed lighting fixtures shall comply with Section ~~C402.5.10~~ C402.5.1.2.1. Where similar objects are installed that penetrate the ~~air barrier~~ *air barrier*, provisions shall be made to maintain the integrity of the ~~air barrier~~ *air barrier*.
5. ~~5.~~ Electrical and communication boxes shall comply with ~~C402.5.11~~ C402.5.1.2.2 ~~to maintain the integrity of the air barrier.~~

~~**C402.5.1.2 Air barrier compliance.** A continuous air barrier for the opaque building envelope shall comply with the following:~~

~~1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2.~~

~~**Exception:** Buildings in Climate Zones 2B, 3C and 5C.~~

~~2. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.3.~~

~~**Exceptions:**~~

~~1. Buildings in Climate Zones 2B, 3B, 3C and 5C.~~

~~2. Buildings larger than 5,000 square feet (464.5 m2) floor area in Climate Zones 0B, 1, 2A, 4B and 4C.~~

~~3. Buildings between 5,000 square feet (464.5 m2) and 50,000 square feet (4645 m2) floor area in Climate Zones 0A, 3A and 5B.~~

~~3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.~~

C402.5.2 Air leakage compliance. *Air leakage* of the *building thermal envelope* shall be tested by an *approved* third party in accordance with C402.5.2.1. The measured *air leakage* shall not be greater than

0.35 cfm/ft^2 (1.8 L/s × m^2) of the *building thermal envelope* area at a pressure differential of 0.3 inch water gauge (75 Pa) with the calculated *building thermal envelope* surface area being the sum of the above- and below-grade *building thermal envelope*.

Exceptions:

1. Where the measured *air leakage* rate is greater than 0.35 cfm/ft^2 (1.8 L/s × m^2) but is not greater than 0.45 cfm/ft^2 (2.3 L/s × m^2), the *approved* third party shall perform a diagnostic evaluation using smoke tracer or infrared imaging. The evaluation shall be conducted while the building is pressurized along with a visual inspection of the *air barrier* in accordance with ASTM E1186. All identified leaks shall be sealed where such sealing can be made without damaging existing building components. A report specifying the corrective actions taken to seal leaks shall be deemed to establish compliance with the requirements of this section where submitted to the code official and the building owner. Where the measured *air leakage rate* is greater than 0.45 cfm/ft2 (2.3 L/s × m2), corrective actions must be made to the building and an additional test completed for which the results are 0.45 cfm/ft^2 (2.3 L/s × m^2), or less.
2. Buildings in Climate Zones 2B.
3. Buildings larger than 25,000 square feet (2300 m^2) floor area in Climate Zones 0 through 4, other than Group R and I occupancies, that comply with Section C402.5.2.3.
4. As an alternative, buildings or portions of buildings, containing Group R and I occupancies, shall be permitted to be tested by an *approved* third party in accordance with C402.5.2.2. The reported *air leakage* of the *building thermal envelope* shall not be greater than 0.27 cfm/ft^2 (1.4 L/s x m^2) of the *testing unit enclosure area* at a pressure differential of 0.2 inch water gauge (50 Pa).

C402.5.2.1 Whole building test method and reporting. The *building thermal envelope* shall be tested for *air leakage* in accordance with ASTM E3158 or an equivalent *approved* method. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

Exceptions:

1. For buildings less than 10,000 ft^2 (1000 m^2) the entire *building thermal envelope* shall be permitted to be tested in accordance with ASTM E779, ASTM E3158 or ASTM E1827 or an equivalent *approved* method.
2. For buildings greater than 50,000 ft^2 (4645 m^2), portions of the building shall be permitted to be tested and the measured *air leakage* shall be area-weighted by the surface areas of the *building thermal envelope* in each portion. The weighted average tested *air leakage* shall not be greater than the whole building leakage limit. The following portions of the building shall be tested:
    1. The entire *building thermal envelope* area of stories that have any conditioned spaces directly under a roof.
    2. The entire *building thermal envelope* area of stories that have a building entrance, a floor over unconditioned space, a loading dock, or that are below grade.
    3. Representative above-grade portions of the building totaling not less than 25 percent of the wall area enclosing the remaining conditioned space.

C402.5.2.2 Dwelling and sleeping unit enclosure test method and reporting. The *building thermal envelope* shall be tested for *air leakage* in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM

E1827, or an equivalent *approved* method. Where multiple *dwelling units* or *sleeping units* or other occupiable conditioned spaces are contained within one *building thermal envelope*, each unit shall be considered an individual testing unit, and the building *air leakage* shall be the weighted average of all testing unit results, weighted by each *testing unit enclosure area*. Units shall be tested without simultaneously pressurizing adjacent units and shall be separately tested ~~test~~ as follows:

1. Where buildings have less than eight testing units, each testing unit shall be tested.
2. Where buildings have eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a middle floor unit, a ground floor unit and a unit with the largest *testing unit enclosure area*. For each tested unit that exceeds the maximum *air leakage* rate, an additional three units shall be tested, including a mixture of testing unit types and locations.

C402.5.2.3 Building envelope design and construction verification criteria. Where Sections C402.5.2.1 and C402.5.2.2 are not applicable, the installation of the continuous *air barrier* shall be verified by the *code official*, *a registered design professional* or *approved agency* in accordance with the following:

1. A review of the construction documents and other supporting data shall be conducted to assess compliance with the requirements in Section C402.5.1**.**
2. Inspection of continuous *air barrier* components and assemblies shall be conducted during construction to verify compliance with the requirements of Sections C402.5.2.3.1 or C402.5.2.3.2. The *air barrier* shall remain accessible for inspection and repair.
3. A final inspection report shall be provided for inspections completed by the *registered design professional* or *approved agency*. The inspection report shall be provided to the building owner or owner's authorized agent and the *code official*. The report shall identify deficiencies found during inspection and details of corrective measures taken.

~~**C402.5.1.3**~~ **C402.5.2.3.1 Materials.** Materials with an air permeability not greater than 0.004 cfm/ft^2 (0.02 L/s × m^2) under a pressure differential of 0.3 inch water gauge (75 Pa) ~~when~~ where tested in accordance with ASTM E2178 shall comply with this section. Materials in Items 1 through 16 below shall be deemed to comply with this section, provided that joints are sealed and materials are installed as air barriers in accordance with the manufacturer's instructions.

1. Plywood with a thickness of not less than 3/8 inch (10 mm).
2. Oriented strand board having a thickness of not less than 3/8 inch (10 mm).
3. Extruded polystyrene insulation board having a thickness of not less than 1/2 inch (12.7 mm).
4. Foil-back polyisocyanurate insulation board having a thickness of not less than 1/2 inch (12.7 mm).
5. Closed-cell spray foam having a ~~minimum~~ density of not less than 1.5 pcf (2.4 kg/m3) and having a thickness of not less than 11/2 inches (38 mm).
6. Open-cell spray foam with a density ~~between~~ greater than 0.4 and less than 1.5 pcf (0.6 and 2.4 kg/m3) and having a thickness of not less than 4.5 inches (113 mm).
7. Exterior or interior gypsum board having a thickness of not less than 1/2 inch (12.7 mm).
8. Cement board having a thickness of not less than 1/2 inch (12.7 mm).
9. Built-up roofing membrane.
10. Modified bituminous roof membrane.

11. Single-ply roof membrane.
12. A Portland cement/sand parge, or gypsum plaster having a thickness of not less than 5/8 inch (15.9 mm).
13. Cast-in-place and precast concrete.
14. Fully grouted concrete block masonry.
15. Sheet steel or aluminum.
16. Solid or hollow masonry constructed of clay or shale masonry units.

~~**C402.5.1.4**~~ **C402.5.2.3.2 Assemblies**. Assemblies of materials and components with an average air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s × m^2) under a pressure differential of 0.3 inch of water gauge ~~(w.g.)~~(75 Pa) ~~when~~ where tested in accordance with ASTM E2357, ASTM E1677, ASTM D8052 or ASTM E283 shall comply with this section. Assemblies listed in Items 1 through 3 below shall be deemed to comply, provided that joints are sealed and the requirements of Section C402.5.1.1 are met.

1. Concrete masonry walls coated with either one application of block filler or two applications of a paint or sealer coating.
2. Masonry walls constructed of clay or shale masonry units with a nominal width greater than or equal to ~~of~~ 4 inches (102 mm) ~~or more~~.
3. A Portland cement~~/~~sand parge, stucco or plaster not less than 1/2 inch (12.7 mm) in thickness.

~~**C402.5.1.5 Building envelope performance verification.** The installation of the continuous air barrier shall be verified by the code official, a registered design professional or approved agency in accordance with the following:~~

~~1. A review of the construction documents and other supporting data shall be conducted to assess compliance with the requirements in Section C402.5.1.~~
~~2. Inspection of continuous air barrier components and assemblies shall be conducted during construction while the air barrier is still accessible for inspection and repair to verify compliance with the requirements of Sections C402.5.1.3 and C402.5.1.4.~~
~~3. A final commissioning report shall be provided for inspections completed by the registered design professional or approved agency. The commissioning report shall be provided to the building owner or owner's authorized agent and the code official. The report shall identify deficiencies found during the review of the construction documents and inspection and details of corrective measures taken.~~

~~**C402.5.2 Dwelling and sleeping unit enclosure testing.** The building thermal envelope shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the code official. The measured air leakage shall not exceed 0.30 cfm/ft2 (1.5 L/s m2) of the testing unit enclosure area at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple dwelling units or sleeping units or other occupiable conditioned spaces are contained within one building thermal envelope, each unit shall be considered an individual testing unit, and the building air leakage shall be the weighted average of all testing unit results, weighted by each testing unit's enclosure area. Units shall be tested separately with an unguarded blower door test as follows:~~

~~1. Where buildings have fewer than eight testing units, each testing unit shall be tested.~~
~~2. For buildings with eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit and a~~

~~unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional two units shall be tested, including a mixture of testing unit types and locations.~~

~~**C402.5.3 Building thermal envelope testing.** The building thermal envelope shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E3158 or ASTM E1827 or an equivalent method approved by the code official. The measured air leakage shall not exceed 0.40 cfm/ft2 (2.0 L/s × m2) of the building thermal envelope area at a pressure differential of 0.3 inch water gauge (75 Pa). Alternatively, portions of the building shall be tested and the measured air leakages shall be area weighted by the surface areas of the building envelope in each portion. The weighted average test results shall not exceed the whole building leakage limit. In the alternative approach, the following portions of the building shall be tested:~~

1. ~~The entire envelope area of all stories that have any spaces directly under a roof.~~
2. ~~The entire envelope area of all stories that have a building entrance, exposed floor, or loading dock, or are below grade.~~
3. ~~Representative above-grade sections of the building totaling at least 25 percent of the wall area enclosing the remaining conditioned space.~~

~~**Exception:** Where the measured air leakage rate exceeds 0.40 cfm/ft2 (2.0 L/s × m2) but does not exceed 0.60 cfm/ft2 (3.0 L/s × m2), a diagnostic evaluation using smoke tracer or infrared imaging shall be conducted while the building is pressurized along with a visual inspection of the air barrier. Any leaks noted shall be sealed where such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to comply with the requirements of this section.~~

~~**C402.5.4**~~ **C402.5.3 Air leakage of fenestration.** The *air leakage* of fenestration assemblies shall ~~meet~~ comply with ~~the provisions of~~ Table ~~C402.5.4~~ C402.5.3. Testing shall be conducted by an accredited, independent testing laboratory in accordance with the applicable reference test standard in Table ~~C402.5.4~~ C402.5.3 ~~by an accredited, independent testing laboratory~~ and *labeled* by the manufacturer.

Exceptions:

1. Field-fabricated fenestration assemblies that are sealed in accordance with Section ~~C402.5.1~~ C402.5.1.2.
2. Fenestration in buildings that ~~comply with the testing alternative~~ are tested for *air leakage* of in accordance with Section ~~C402.5~~ C402.5.2 are not required to meet the air leakage requirements in Table ~~C402.5.4~~ C402.5.3.

TABLE ~~C402.5.4~~ C402.5.3

MAXIMUM AIR LEAKAGE RATE FOR FENESTRATION ASSEMBLIES

No changes in table

~~**C402.5.5**~~ **C402.1.3 Rooms containing fuel-burning appliances.** In *Climate Zones* 3 through 8, where combustion air is supplied through openings in an exterior wall to a room or space containing a space-conditioning fuel-burning appliance, one of the following shall apply:

1. The room or space containing the appliance shall be located outside of the *building thermal envelope.*
2. The room or space containing the appliance shall be enclosed and isolated from conditioned spaces inside the *building thermal envelope*. Such rooms shall comply with all of the following:
   - 2.1 The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be insulated to be not less than equivalent to the insulation requirement of below-grade walls as specified in Table C402.1.3 or Table C402.1.4.
   - 2.2 The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be sealed in accordance with Section ~~C402.5.1.1~~ C402.5.1.2.
   - 2.3 The doors into the enclosed room or space shall be fully gasketed.
   - 2.4 Piping serving as part of a heating or cooling system ~~Water lines~~ and ducts in the enclosed room or space shall be insulated in accordance with Section C403. Service water piping shall be insulated in accordance with Section C404.
   - 2.5 Where an air duct supplying combustion air to the enclosed room or space passes through *conditioned space*, the duct shall be insulated to an R-value of not less than R-8.

Exception: Fireplaces and stoves complying with Sections 901 through 905 of the *International Mechanical Code*, and Section 2111.14 of the *International Building Code*.

~~**C402.5.6**~~ **C402.5.4 Doors and access openings to shafts, chutes, stairways and elevator lobbies.** Doors and *access* openings from conditioned space to shafts, chutes stairways and elevator lobbies not within the scope of the fenestration assemblies covered by Section ~~C402.5.4~~ C402.5.3 shall be gasketed, weather-stripped or sealed.

Exceptions:

1. Door openings required to comply with Section 716 of the *International Building Code*.

2. Doors and door openings required by the *International Building Code* to comply with UL 1784 ~~by the *International Building Code*~~.

~~**C402.5.7**~~ **C402.5.5 Air intakes, exhaust openings, stairways and shafts.** Stairway enclosures, elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be provided with dampers in accordance with Section C403.7.7.

~~**C402.5.8**~~ **C402.5.7 Loading dock weather seals.** Cargo door openings and loading door openings shall be equipped with weather seals that restrict ~~infiltration~~ *air leakage* and provide direct contact along the top and sides of vehicles that are parked in the doorway.

~~**C402.5.9**~~ **C402.5.6 Vestibules.** Building entrances shall be protected with an enclosed vestibule. ~~, with all doors~~ Doors opening into and out of the vestibule shall be equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the *building entrance* shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors.

Exceptions: Vestibules are not required for the following:

1. Buildings in *Climate Zones* 0 through 2.

2. Doors not intended to be used by the public, such as doors to mechanical or electrical equipment rooms, or intended solely for employee use.

3. Doors opening directly from a *sleeping unit* or dwelling unit.

4. Doors that open directly from a space less than 3,000 square feet (298 m2) in area.

5. Revolving doors.

6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

7. Doors that have an air curtain with a velocity of not less than 6.56 feet per second (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.

~~**C402.5.10**~~ **C402.5.1.2.1 Recessed lighting.** Recessed luminaires installed in the *building thermal envelope* shall be all of the following:

1. IC-rated.

2. Labeled as having an air leakage rate of not ~~more~~ greater than 2.0 cfm (0.944 L/s) ~~when~~ where tested in accordance with ASTM E283 at a 1.57 psf (75 Pa) pressure differential.

3. Sealed with a gasket or caulk between the housing and interior wall or ceiling covering.

~~**C402.5.11**~~ **C402.5.1.2.2 Electrical and communication boxes.** Electrical and communication boxes that penetrate the air barrier of the building thermal envelope, and that do not comply with ~~C402.5.11.1~~ C402.5.1.2.2.1, shall be caulked, taped, gasketed, or otherwise sealed to the air barrier element being penetrated. All openings on the concealed portion of the box shall be sealed. Where present, insulation shall rest against all concealed portions of the box.

~~**C402.5.11.1**~~ **C402.5.1.2.2.1 Air-sealed boxes.** Where air-sealed boxes are installed, they shall be marked in accordance with NEMA OS 4. Air-sealed boxes shall be installed in accordance with the manufacturer's instructions.

~~**C402.5.11**~~ **C402.5.8 Operable openings interlocking.** Where occupancies ~~utilize~~ have operable openings to the outdoors that are larger than 40 square feet (3.7 m2) in area, such openings shall be interlocked

with the heating and cooling system ~~so as~~ to raise the cooling setpoint to 90°F (32°C) and lower the heating setpoint to 55°F (13°C) whenever the operable opening is open. The change in heating and cooling setpoints shall occur ~~within 10 minutes of opening~~ when the operable opening has been open for a period not to exceed 10 minutes.

Exceptions:

1. Operable openings into separately ~~Separately~~ zoned areas associated with the preparation of food that contain appliances that contribute to the HVAC loads of a restaurant or similar type of occupancy.

2. ~~Warehouses~~ Storage occupancies that utilize overhead doors for the function of the occupancy, where *approved* ~~approved by the code official~~.

3. ~~The first entrance doors where~~ Doors located in the exterior wall ~~and~~ that are part of a vestibule system.

~~**C402.5.11.1**~~ **C402.5.8.1 Operable controls.** Controls shall comply with Section C403.13.

…….

C406.9 Reduced air ~~infiltration~~ leakage. ~~Air infiltration~~ *Air leakage* of the ~~shall be verified by whole-building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827~~ *building thermal envelope* shall be tested ~~testing conducted~~ by an *approved* third party in accordance with Section C402.5.2.1 ~~by an independent third party~~. The measured *air leakage* ~~rate of the building envelope~~ shall not exceed ~~0.25~~ 0.22 cfm/ft^2 (~~2.0~~ 1.1 L/s × m^2) of the *building thermal envelope* at ~~under~~ a pressure differential of 0.3 inch~~es~~ water gauge ~~column~~ (75 Pa), with the calculated surface area being the sum of the above- and below-grade *building thermal envelope* ~~building envelope~~. ~~A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.~~

~~**Exceptions**:~~

~~1. For buildings having over 250,000 square feet (25 000 m2) of conditioned floor area, air leakage testing need not be conducted on the whole building where testing is conducted on representative above-grade sections of the building. Tested areas shall total not less than 25 percent of the conditioned floor area and shall be tested in accordance with this section.~~

****

Reason: This proposal is a merged proposal based on parts or all of proposals CEPI-55, CEPI-56, CEPI-57, CEPI-58, CEPI-63 Pt1, and CEPI-70 aimed primarily at reorganizing the structure of Section C402.5 to reduce redundancy and improve the clarity of the section. Section C402.5 is currently one of the most intricate and potentially confusing sections of the code, and this proposal seeks to simplify it by improving the flow of the text. Reorganization focused on the re-structure of the existing testing requirements to have clear performance requirements, testing criteria requirements and whole building testing exceptions. Specifically:

- The restructuring separates sections specifying the air leakage maximum values from sections specifying the methods by which these values are tested and verified. This allows for the enhanced air leakage option in Section C406 to be tested by the same by the same test method as the basic requirements in Section C402.5. This will enable consistency between the two sections and reduce divergence as the code is developed in future code cycles. Furthermore, this section separation will allow an easier revision of the code as new technology are deployed in the industry.
- Adding a clarification that the Group R & I sleeping and dwelling unit testing is optional. Group R & I buildings are permitted to use whole building testing.
- Removes overlapping exceptions, and repeated testing references.

Some additional requirements contained in CEPI-57 and CEPI-58 are included.

Summary of changes in merged, re-structure proposal:

The restructure is shown in the table below.

- Referenced Section and Table numbers is shown in the proposal text in green to aid in review.
- Clauses/requirements/exceptions dealing with the performance level stringency and climate zone and building size test exceptions that were recommended by the SC action on overlay proposals (CEPI-71, CEPI-61 & CEPI-62) are highlighted in red. Changes in stringency from CEPI-71 are shown below.

	IECC-2021	**Based on CEPI-71**
Whole Building leakage limit	0.40 cfm/ft^2 (2.0 L/s × m^2) @0.3 inch water gauge (75 Pa)	0.35 cfm/ft^2 (1.8 L/s × m2) @ 0.3 inch water gauge (75 Pa)
Oops clause upper limit	0.60 cfm/ft^2 (2.3 L/s × m^2) @0.3 inch water gauge (75 Pa)	0.45 cfm/ft^2 (2.3 L/s × m^2) @0.3 inch water gauge (75 Pa)
Dwelling unit leakage limit	0.30 cfm/ft^2 (1.5 L/s x m^2) @ 0.2 inch water gauge (50 Pa).	0.27 cfm/ft^2 (1.4 L/s x m^2) @ 0.2 inch water gauge (50 Pa).
C406.9 Energy credit (whole building)	0.25 cfm/ft^2 (2.0 L/s × m^2) @ 0.3 inches water column (75 Pa)	0.22 cfm/ft^2 (1.1 L/s × m^2) @ 0.3 inches water column (75 Pa)

- CEPI-57 and CEPI-58 contained additions of text and some revisions that were not included in other proposals. Those provisions which were included in the merged proposal are included as underlined text in blue.
- Changes from previously approved proposals were included and are shown in purple (CEPI-32, CEPI-60, CEPI-68 and CEPI-69) are included and shown in purple.

Structure (Merged) Proposal Section	IECC-C 2021 Section	Revisions
C402.1.3 Rooms containing fuel-burning appliances.	C402.5.5	Moved section to a more appropriate place in the code
C402.5 Air leakage – building thermal envelope.	C402.5	
C402.5.1 Air Barriers.	C402.5.1	Clarifies separation of verification requirements from the air barrier construction requirements.
C402.5.1.1 Air barrier design and documentation	n/a	Added from CEPI-57
C402.5.1.2 Air barrier construction.	C402.5.1.1	
C402.5.1.2.1 Recessed lighting.	C402.5.10	Moved section
C402.5.1.2.2 Electrical and communication boxes	n/a	Added from CEPI -60 (moved in restructure)
C402.5.1.2.2.1 Air-sealed boxes	n/a	Added from CEPI -60 (moved in restructure)
C402.5.2 Air leakage compliance.	C402.5.3 & C402.5.1.2	Moved and split section to separate air leakage minimum from testing criteria. Climate Zone and building size testing criteria are included in
C402.5.2.1 Whole building test method and reporting	C402.5.3	Separated out whole building testing section
C402.5.2.2 Dwelling and sleeping unit enclosure test method and reporting.	C402.5.2	Separated dwelling unit test procedure
C402..5.2.3 Building envelope design and construction verification criteria.	C402.5.1.5	
C402.5.2.3.1 Materials	C402.5.1.3	
C402.5.2.3.2 Assemblies.	C402.5.1.4	
C402.5.3 Air leakage of fenestration.	C402.5.4	
C402.5.4 Doors and access openings to shafts, chutes, stairways	C402.5.6	
C402.5.5 Air intakes, exhaust openings, stairways and shafts.	C402.5.7	
C402.5.6 Vestibules.	C402.5.9	
C402.5.7 Loading dock weather seals.	C402.5.8	
C402.5.8 Operable openings interlocking.	C402.5.11	
C402.5.8.1 Operable controls.	C402.5.11.1	

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction as written, because it is just rearranging the current requirements for better clarity and usability. This reorganization also includes changes from other approved proposals (CEPI-32, CEPI-60, CEPI-68 and

CEPI-69), whose cost impact statements also indicate that they will neither increase nor decrease the cost of construction.

Merged C402.5 Structure Proposal V6: Clean Version w/ color coding)

Moved Section (originally C402.5.5), renumber subsequent sections:

C402.1.3 Rooms containing fuel-burning appliances. In *Climate Zones* 3 through 8, where combustion air is supplied through openings in an exterior wall to a room or space containing a space-conditioning fuel-burning appliance, one of the following shall apply:

3. The room or space containing the appliance shall be located outside of the *building thermal envelope.*
4. The room or space containing the appliance shall be enclosed and isolated from conditioned spaces inside the *building thermal envelope*. Such rooms shall comply with all of the following:
   - 4.1 The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be insulated to be not less than equivalent to the insulation requirement of below-grade walls as specified in Table C402.1.3 or Table C402.1.4.
   - 4.2 The walls, floors and ceilings that separate the enclosed room or space from conditioned spaces shall be sealed in accordance with Section ~~C402.5.1.1~~ C402.5.1.2.
   - 4.3 The doors into the enclosed room or space shall be fully gasketed.
   - 4.4 Piping serving as part of a heating or cooling system and ducts in the enclosed room or space shall be insulated in accordance with Section C403. Service water piping shall be insulated in accordance with Section C404.
   - 4.5 Where an air duct supplying combustion air to the enclosed room or space passes through *conditioned space*, the duct shall be insulated to an R-value of not less than R-8.

Exception: Fireplaces and stoves complying with Sections 901 through 905 of the *International Mechanical Code*, and Section 2111.14 of the *International Building Code*.

…….

C402.5 Air leakage—building thermal envelope. The *building thermal envelope* shall comply with Sections C402.5.1 through Section C402.5.8.1.

C402.5.1 Air barriers. A continuous *air barrier* shall be provided throughout the *building thermal envelope*. The *air barrier* is permitted to be any combination of inside, outside, or within the *building thermal envelope* The *air barrier* shall comply with Sections C402.5.1.1, and C402.5.1.2. The *air leakage* performance of the *air barrier* shall be verified in accordance with Section C402.5.2.

Exception: *Air barriers* are not required in buildings in *Climate Zone* 2B.

C402.5.1.1 Air barrier design and documentation requirements. Design of the continuous *air barrier* shall be documented in the following manner :

6. Components comprising the continuous *air barrier* and their position within each *building thermal envelope* assembly shall be identified.
7. Joints, interconnections, and penetrations of the continuous *air barrier* components shall be detailed.
8. The continuity of the *air barrier* building element assemblies that enclose conditioned space or provide a boundary between conditioned space and unconditioned space shall be identified.
9. Documentation of the continuous air barrier shall detail methods of sealing the air barrier such as wrapping, caulking, gasketing, taping or other *approved* methods at the following locations:
   9.1. Joints around fenestration and door frames.
   9.2. Joints between walls and floors, between walls at building corners, between walls and roofs including parapets and copings, where above-grade walls meet foundations, and similar intersections.
   9.3. Penetrations or attachments through the continuous *air barrier* in building envelope roofs, walls, and floors.
   9.4. Building assemblies used as ducts or plenums.
   9.5. Changes in continuous *air barrier* materials and assemblies.
10. Identify where testing will or will not be performed in accordance with Section C402.5.2. Where testing will not be performed, a plan for field inspections required by C402.5.2.3 shall be provided that includes the following:
    5.6 Schedule for periodic inspection,
    5.7 Continuous air barrier scope of work,
    5.8 List of critical inspection items,
    5.9 Inspection documentation requirements, and
    5.10 Provisions for corrective actions where needed.

C402.5.1.2 Air barrier construction. The *continuous air barrier* shall be constructed to comply with the following:

6. The *air barrier* shall be continuous for all assemblies that comprise the *building thermal envelope* and across the joints and assemblies.
7. Air barrier joints and seams shall be sealed, including sealing transitions in places and changes in materials. The joints and seals shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to resist positive and negative pressure differentials such as those from design wind loads, stack effect and mechanical ventilation.
8. Penetrations of the *air barrier* shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location. Sealing shall allow for expansion, contraction and mechanical vibration. Sealing materials shall be securely installed around the penetration so as not to dislodge, loosen or otherwise impair the penetrations' ability to resist positive and negative pressure. Sealing of concealed fire sprinklers, where required, shall be in a manner that is recommended by the fire sprinkler manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.
9. Recessed lighting fixtures shall comply with Section C402.5.1.2.1. Where similar objects are installed that penetrate the *air barrier*, provisions shall be made to maintain the integrity of the *air barrier*.
10. Electrical and communication boxes shall comply with C402.5.1.2.2.

C402.5.1.2.1 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be all of the following:

1. IC-rated.

2. Labeled as having an air leakage rate of not ~~more~~ greater than 2.0 cfm (0.944 L/s) ~~when~~ where tested in accordance with ASTM E283 at a 1.57 psf (75 Pa) pressure differential.

3. Sealed with a gasket or caulk between the housing and interior wall or ceiling covering.

C402.5.1.2.2 Electrical and communication boxes. Electrical and communication boxes that penetrate the air barrier of the building thermal envelope, and that do not comply with C402.5.1.2.2.1, shall be caulked, taped, gasketed, or otherwise sealed to the air barrier element being penetrated. All openings on the concealed portion of the box shall be sealed. Where present, insulation shall rest against all concealed portions of the box.

C402.5.1.2.2.1 Air-sealed boxes. Where air-sealed boxes are installed, they shall be marked in accordance with NEMA OS 4. Air-sealed boxes shall be installed in accordance with the manufacturer's instructions.

C402.5.2 Air leakage compliance. *Air leakage* of the *building thermal envelope* shall be tested by an *approved* third party in accordance with C402.5.2.1. The measured *air leakage* shall not be greater than 0.35 cfm/ft^2 (1.8 L/s × m^2) of the *building thermal envelope* area at a pressure differential of 0.3 inch water gauge (75 Pa) with the calculated *building thermal envelope* surface area being the sum of the above- and below-grade *building thermal envelope*.

Exceptions:

5. Where the measured *air leakage* rate is greater than 0.35 cfm/ft^2 (1.8 L/s × m^2) but is not greater than 0.45 cfm/ft^2 (2.3 L/s × m^2), the *approved* third party shall perform a diagnostic evaluation using smoke tracer or infrared imaging. The evaluation shall be conducted while the building is pressurized along with a visual inspection of the *air barrier* in accordance with ASTM E1186. All identified leaks shall be sealed where such sealing can be made without damaging existing building components. A report specifying the corrective actions taken to seal leaks shall be deemed to establish compliance with the requirements of this section where submitted to the code official and the building owner. Where the measured *air leakage rate* is greater than 0.45 cfm/ft2 (2.3 L/s × m2), corrective actions must be made to the building and an additional test completed for which the results are 0.45 cfm/ft^2 (2.3 L/s × m^2), or less.
6. Buildings in Climate Zones 2B.
7. Buildings larger than 25,000 square feet (2300 m^2) floor area in Climate Zones 0 through 4, other than Group R and I occupancies, that comply with C402.5.2.3.
8. As an alternative, buildings or portions of buildings, containing Group R and I occupancies, shall be permitted to be tested by an *approved* third party in accordance with C402.5.2.2. The reported *air leakage* of the *building thermal envelope* shall not be greater than 0.27 cfm/ft^2 (1.4 L/s x m^2) of the *testing unit enclosure area* at a pressure differential of 0.2 inch water gauge (50 Pa).

C402.5.2.1 Whole building test method and reporting. The *building thermal envelope* shall be tested for *air leakage* in accordance with ASTM E3158 or an equivalent *approved* method. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

Exceptions:

3. For buildings less than 10,000 ft^2 (1000 m^2) the entire *building thermal envelope* shall be permitted to be tested in accordance with ASTM E779, ASTM E3158 or ASTM E1827 or an equivalent *approved* method.
4. For buildings greater than 50,000 ft^2 (4645 m^2), portions of the building shall be permitted to be tested and the measured *air leakage* shall be area-weighted by the surface areas of the *building thermal envelope* in each portion. The weighted average tested *air leakage* shall not be greater than the whole building leakage limit. The following portions of the building shall be tested:
    4. The entire *building thermal envelope* area of stories that have any conditioned spaces directly under a roof.
    5. The entire *building thermal envelope* area of stories that have a building entrance, a floor over unconditioned space, a loading dock, or that are below grade.
    6. Representative above-grade portions of the building totaling not less than 25 percent of the wall area enclosing the remaining conditioned space.

C402.5.2.2 Dwelling and sleeping unit enclosure test method and reporting. The *building thermal envelope* shall be tested for *air leakage* in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827, or an equivalent *approved* method. Where multiple *dwelling units* or *sleeping units* or other occupiable conditioned spaces are contained within one *building thermal envelope*, each unit shall be considered an individual testing unit, and the building *air leakage* shall be the weighted average of all testing unit results, weighted by each *testing unit enclosure area*. Units shall be tested without simultaneously pressurizing adjacent units and shall be separately tested ~~test~~ as follows:

3. Where buildings have less than eight testing units, each testing unit shall be tested.
4. Where buildings have eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a middle floor unit, a ground floor unit and a unit with the largest *testing unit enclosure area*. For each tested unit that exceeds the maximum *air leakage* rate, an additional three units shall be tested, including a mixture of testing unit types and locations.

C402.5.2.3 Building envelope design and construction verification criteria. Where Sections C402.5.2.1 and C402.5.2.2 are not applicable, the installation of the continuous *air barrier* shall be verified by the *code official*, *a registered design professional* or *approved agency* in accordance with the following:

4. A review of the construction documents and other supporting data shall be conducted to assess compliance with the requirements in Section C402.5.1**.**
5. Inspection of continuous *air barrier* components and assemblies shall be conducted during construction to verify compliance with the requirements of Sections C402.5.2.3.1 or C402.5.2.3.2. The *air barrier* shall remain accessible for inspection and repair.
6. A final inspection report shall be provided for inspections completed by the *registered design professional* or *approved agency*. The inspection report shall be provided to the building owner or owner's authorized agent and the *code official*. The report shall identify deficiencies found during inspection and details of corrective measures taken.

C402.5.2.3.1 Materials. Materials with an air permeability not greater than 0.004 cfm/ft^2 (0.02 L/s × m^2) under a pressure differential of 0.3 inch water gauge (75 Pa) where tested in accordance with ASTM E2178 shall comply with this section. Materials in Items 1 through 16 below shall be deemed to comply with this section, provided that joints are sealed and materials are installed as air barriers in accordance with the manufacturer's instructions.

17. Plywood with a thickness of not less than 3/8 inch (10 mm).

18. Oriented strand board having a thickness of not less than 3/8 inch (10 mm).
19. Extruded polystyrene insulation board having a thickness of not less than 1/2 inch (12.7 mm).
20. Foil-back polyisocyanurate insulation board having a thickness of not less than 1/2 inch (12.7 mm).
21. Closed-cell spray foam having a density of not less than 1.5 pcf (2.4 kg/m3) and having a thickness of not less than 11/2 inches (38 mm).
22. Open-cell spray foam with a density greater than 0.4 and less than 1.5 pcf (0.6 and 2.4 kg/m3) and having a thickness of not less than 4.5 inches (113 mm).
23. Exterior or interior gypsum board having a thickness of not less than 1/2 inch (12.7 mm).
24. Cement board having a thickness of not less than 1/2 inch (12.7 mm).
25. Built-up roofing membrane.
26. Modified bituminous roof membrane.
27. Single-ply roof membrane.
28. A Portland cement/sand parge, or gypsum plaster having a thickness of not less than 5/8 inch (15.9 mm).
29. Cast-in-place and precast concrete.
30. Fully grouted concrete block masonry.
31. Sheet steel or aluminum.
32. Solid or hollow masonry constructed of clay or shale masonry units.

C402.5.2.3.2 Assemblies. Assemblies of materials and components with an average air leakage not greater than 0.04 cfm/ft^2 (0.2 L/s × m^2) under a pressure differential of 0.3 inch of water gauge (75 Pa) where tested in accordance with ASTM E2357, ASTM E1677, ASTM D8052 or ASTM E283 shall comply with this section. Assemblies listed in Items 1 through 3 below shall be deemed to comply, provided that joints are sealed and the requirements of Section C402.5.1.1 are met.

4. Concrete masonry walls coated with either one application of block filler or two applications of a paint or sealer coating.
5. Masonry walls constructed of clay or shale masonry units with a nominal width greater than or equal to 4 inches (102 mm).
6. A Portland cement~~/~~sand parge, stucco or plaster not less than 1/2 inch (12.7 mm) in thickness.

C402.5.3 Air leakage of fenestration. The *air leakage* of fenestration assemblies shall ~~meet~~ comply with Table C402.5.3. Testing shall be conducted by an accredited, independent testing laboratory in accordance with the applicable reference test standard in Table C402.5.3 and *labeled* by the manufacturer.

Exceptions:

3. Field-fabricated fenestration assemblies that are sealed in accordance with Section C402.5.1.2.
4. Fenestration in buildings that are tested for *air leakage* of in accordance with Section C402.5.2 are not required to meet the air leakage requirements in Table C402.5.3.

TABLE C402.5.3

MAXIMUM AIR LEAKAGE RATE FOR FENESTRATION ASSEMBLIES

No changes in table

C402.5.4 Doors and access openings to shafts, chutes, stairways and elevator lobbies. Doors and *access* openings from conditioned space to shafts, chutes stairways and elevator lobbies not within the scope of the fenestration assemblies covered by Section C402.5.3 shall be gasketed, weather-stripped or sealed.

Exceptions:

1. Door openings required to comply with Section 716 of the *International Building Code*.

2. Doors and door openings required by the *International Building Code* to comply with UL 1784.

C402.5.5 Air intakes, exhaust openings, stairways and shafts. Stairway enclosures, elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be provided with dampers in accordance with Section C403.7.7.

C402.5.6 Vestibules. Building entrances shall be protected with an enclosed vestibule. Doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the *building entrance* shall not eliminate the requirement that a vestibule be provided on any doors adjacent to revolving doors.

Exceptions: Vestibules are not required for the following:

1. Buildings in *Climate Zones* 0 through 2.

2. Doors not intended to be used by the public, such as doors to mechanical or electrical equipment rooms, or intended solely for employee use.

3. Doors opening directly from a *sleeping unit* or dwelling unit.

4. Doors that open directly from a space less than 3,000 square feet (298 m2) in area.

5. Revolving doors.

6. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

7. Doors that have an air curtain with a velocity of not less than 6.56 feet per second (2 m/s) at the floor that have been tested in accordance with ANSI/AMCA 220 and installed in accordance with the manufacturer's instructions. Manual or automatic controls shall be provided that will operate the air curtain with the opening and closing of the door. Air curtains and their controls shall comply with Section C408.2.3.

C402.5.7 Loading dock weather seals. Cargo door openings and loading door openings shall be equipped with weather seals that restrict *air leakage* and provide direct contact along the top and sides of vehicles that are parked in the doorway.

C402.5.8 Operable openings interlocking. Where occupancies have operable openings to the outdoors that are larger than 40 square feet (3.7 m2) in area, such openings shall be interlocked with the heating and cooling system ~~so as~~ to raise the cooling setpoint to 90°F (32°C) and lower the heating setpoint to

55°F (13°C) whenever the operable opening is open. The change in heating and cooling setpoints shall occur when the operable opening has been open for a period not to exceed 10 minutes.

Exceptions:

1. Operable openings into separately zoned areas associated with the preparation of food that contain appliances that contribute to the HVAC loads of a restaurant or similar type of occupancy.

2. Storage occupancies that utilize overhead doors for the function of the occupancy, where *approved*.

3. Doors located in the exterior wall that are part of a vestibule system.

C402.5.8.1 Operable controls. Controls shall comply with Section C403.13.

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C406.9 Reduced air leakage. *Air leakage* of the *building thermal envelope* shall be tested by an *approved* third party in accordance with Section C402.5.2.1. The measured *air leakage* shall not exceed 0.22 cfm/ft^2 (1.1 L/s × m^2) of the *building thermal envelope* at a pressure differential of 0.3 inch water gauge (75 Pa), with the calculated surface area being the sum of the above- and below-grade *building thermal envelope*.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-071-21 Air Leakage reduction
CDP ID #	73
Code	IECC CE
Code Section(s)	C402.5.2, C402.5.3,C406.9 New Section n
Location	base
Proponent	Theresa Weston holtweston88@gmail.com
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement**: Increases stringency, reflects supported 0.35 value per subcommittee straw poll, and is consistent with ASHRAE value
Recommendation	**Approve as modified**. Modification: **C402.5.2 Dwelling and sleeping unit enclosure testing.** The building thermal envelope shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the code official. The measured air leakage shall not exceed 0.27 ~~0.23~~ ~~0.30~~ cfm/ft^2 (1.4 ~~1.1~~ ~~1.5~~ L/s m^2) of the testing unit enclosure area at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple dwelling units or sleeping units or other occupiable conditioned spaces are contained within one building thermal envelope, each unit shall be considered an individual testing unit, and the building air leakage shall be the weighted average of all testing unit results, weighted by each testing unit's enclosure area. Units shall be tested separately with an unguarded blower door test as follows: 1. Where buildings have fewer than eight testing units, each testing unit shall be tested. 2. For buildings with eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional two units shall be tested, including a mixture of testing unit types and locations. **C402.5.3 Building thermal envelope testing.** The building thermal envelope shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM

E3158 or ASTM E1827 or an equivalent method approved by the code official. The measured air leakage shall not exceed 0.35 ~~0.30~~ ~~0.40~~ cfm/ft^2 (1.8 ~~1.5~~ ~~2.0~~ L/s × m^2) of the building thermal envelope area at a pressure differential of 0.3 inch water gauge (75 Pa). Alternatively, portions of the building shall be tested and the measured air leakages shall be area weighted by the surface areas of the building envelope in each portion. The weighted average test results shall not exceed the whole building leakage limit. In the alternative approach, the following portions of the building shall be tested:

1. The entire envelope area of all stories that have any spaces directly under a roof.

2. The entire envelope area of all stories that have a building entrance, exposed floor, or loading dock, or are below grade.

3. Representative above-grade sections of the building totaling at least 25 percent of the wall area enclosing the remaining conditioned space.

Exception: Where the measured air leakage rate exceeds 0.35 ~~0.30~~ ~~0.40~~ cfm/ft^2 (1.8 ~~1.5~~ ~~2.0~~ L/s × m^2) but does not exceed ~~0.60~~ 0.45 cfm/ft^2 (~~3.0~~ 2.3 L/s × m^2), a diagnostic evaluation using smoke tracer or infrared imaging shall be conducted while the building is pressurized along with a visual inspection of the air barrier. Any leaks noted shall be sealed where such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to comply with the requirements of this section.

C406.9 Reduced air infiltration. Air infiltration shall be verified by whole-building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air-leakage rate of the building envelope shall not exceed ~~0.25~~ ~~0.20~~ 0.22 cfm/ft^2 (~~2.0~~ ~~1.0~~ 1.1 L/s × m^2) under a pressure differential of 0.3 inches water column (75 Pa), with the calculated surface area being the sum of the above- and below-grade building envelope. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

Exception: For buildings having over 250,000 square feet (25 000 m^2) of conditioned floor area, air leakage testing need not be conducted on the whole building where testing is conducted on representative above-grade sections of the building. Tested areas shall total not less than 25 percent of

	the conditioned floor area and shall be tested in accordance with this section.
Vote	Approve as modified 18-0-2
Recommendation Date	3/3/2022
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 #	CEPI-061-21 Air Leakage applicability
CDP ID #	359
Code	IECC CE
Code Section(s)	C402.5.1.2 New Section n
Location	base
Proponent	Helen Sanders helen.sanders@Technoform.com
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement**: To provide for more consistency with prior actions regarding inspection versus testing options in acknowledgement of the costs of testing on smaller buildings
Recommendation	**Approve as modified**. Modification: **Revise as follows:** C402.5.1.2. A continuous air barrier for the opaque building envelope shall comply with the following: 1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2. ~~**Exception**: Buildings in Climate Zones 2B, 3C and 5C.~~ 2. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.3. **Exceptions**: ~~1~~. Buildings in Climate Zones 2B~~, 3B, 3C and 5C.~~ ~~2. Buildings larger than 5,000 square feet (464.5 m^2) floor area in Climate Zones 0B, 1, 2A, 4B and 4C.~~ 3. Buildings ~~between 5,000~~ larger than 25,000 square feet (2500 ~~464.5~~ m^2) ~~and 50,000 square feet (4645 m^2)~~ floor area in Climate Zones 0 through 4 ~~0A, 3A and 5B~~.

	3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.
Vote	Approve as modified 20-0-2
Recommendation Date	3/3/2022
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 #	CECPI-03-21 Air Barrier Section Reorganization
CDP ID #	
Code	IECC CE
Code Section(s)	C402.5
Location	base
Proponent	Envelope and Embodied Carbon Subcommittee
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement**: The restructuring aspect of this code change proposal will neither increase nor decrease the cost of construction as written, because it is just rearranging the current requirements for better clarity and usability. This reorganization also includes changes from other approved proposals (CEPI-32, CEPI-60, CEPI-68 and CEPI-69), whose cost impact statements also indicate that they will neither increase nor decrease the cost of construction. As part of the restructuring and cleanup, this code proposal does include the results of other air leakage proposals previously approved by the envelope subcommittee, some of which do impact the cost of construction. Please see the associated cost statements for CEPI-32, 60, 61, 68, 69, and CEPI-71. .
Recommendation	**Approve as modified.** Modification: See word file “Merged Proposal Air Barrier restructural_v6.docx”
Vote	**Approve as modified**: 18 – 0 – 1 (CNV)
Recommendation Date	3/17/22
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 #	CEPI-055-21 Air Barriers
CDP ID #	71
Code	IECC CE
Code Section(s)	C402.5 New Section n
Location	base
Proponent	Theresa Weston holtweston88@gmail.com
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reasoning statement**: Based on previous action on CECPI-3-21
Recommendation	**Disapprove**
Vote	**Disapprove**: 17 – 0 – 2 (CNV)
Recommendation Date	3/17/22
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 #	CEPI-056-21 Air Leakage
CDP ID #	292
Code	IECC CE
Code Section(s)	C402.5 New Section n
Location	base
Proponent	SEHPCAC sehpcac@iccsafe.org
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reasoning statement**: Based on previous action on CECPI-3-21
Recommendation	**Disapprove**
Vote	**Disapprove**: 17 – 0 – 2 (CNV)
Recommendation Date	3/17/22
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 #	CEPI-057-21 Air Leakage
CDP ID #	401
Code	IECC CE
Code Section(s)	C402.5, C402.5.1.2, C402.5.2, C402.5.3, C402.5.3.1, C402.5.3.2, C402.5.3, C406.1, TABLE C406.1(1), TABLE C406.1(2), TABLE C406.1(3), TABLE C406.1(4), TABLE C406.1(5), C406.9 New Section y
Location	base
Proponent	Emily Toto etoto@ashrae.org
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reasoning statement**: Based on previous action on CECPI-3-21
Recommendation	**Disapprove**
Vote	**Disapprove**: 17 – 0 – 2 (CNV)
Recommendation Date	3/17/22
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 #	CEPI-070-21 air leakage dwelling unit testing
CDP ID #	69
Code	IECC CE
Code Section(s)	C402.5.2, C402.5.3,C406.9 New Section n
Location	base
Proponent	Theresa Weston holtweston88@gmail.com
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reasoning statement**: Based on previous action on CECPI-3-21
Recommendation	**Disapprove**
Vote	**Disapprove**: 17 – 0 – 2 (CNV)
Recommendation Date	3/17/22
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 #	CEPI-058-21 Air Barrier Testing
CDP ID #	322
Code	IECC CE
Code Section(s)	C402.5, C402.5.1.2, C402.5.2, C402.5.3, C406.9 New Section n
Location	base
Proponent	Mark Lyles markl@newbuildings.org
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement**: CEPI-58 was modified by the proponents to remove overlapping changes with other proposals that also addressed re-structuring, test exemptions, and test stringency. The remaining modifications were supported by the SC because they: • clarify terminology, • clarify which spaces outside of dwelling or sleeping units must be tested, • limit the scope of this test method to Group R-2 and I-1, and • introduce an equivalent test metric for the points associated with Reduced Air Infiltration when testing dwelling/sleeping units.
Recommendation	**Approve as modified.** Modification: See word file "2022-03-17_CEPI-58-21_MOD1_REVISED_03_15_2022_Mtg edits.docx"
Vote	**Approve as modified**: 18 – 0 – 4 (CNV)
Recommendation Date	3/17/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	

Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

CEPI-58-21 (modification replaces version in the monograph)

IECC®: C402.5.2, C406.9

Proponents:

Mark Lyles, representing New Buildings Institute (markl@newbuildings.org); Gayathri Vijayakumar, representing Steven Winter Associates, Inc. (gvijayakumar@swinter.com); Diana Burk, representing New Buildings Institute (diana@newbuildings.org)

2021 International Energy Conservation Code

Revise as follows:

CHAPTER 2 [CE] DEFINITIONS

TESTING UNIT ENCLOSURE AREA. The area sum of all the boundary surfaces that define the dwelling unit, sleeping unit or ~~occupiable~~ conditioned *enclosed space* including top/ceiling, bottom/floor and all side walls. This does not include interior partition walls within the dwelling unit, sleeping unit, or ~~occupiable~~ conditioned *enclosed space*. Wall height shall be measured from the finished floor of the conditioned space to the finished floor or roof/ceiling air barrier above.

C402.5 Air leakage—thermal envelope.

C402.5.1.2 Air barrier compliance. A continuous air barrier for the opaque building envelope shall comply with the following:

1. Buildings or portions of buildings, including Group R-2 and I-1 occupancies, shall meet the provisions of Section C402.5.2.

Exception: Buildings in Climate Zones 2B, 3C and 5C.

2. Buildings or portions of buildings other than Group R-2 and I-1 occupancies shall meet the provisions of Section C402.5.3.

Exceptions:

1. Buildings in Climate Zones 2B, 3B, 3C and 5C.

2. Buildings larger than 5,000 square feet (464.5 m2) floor area in Climate Zones 0B, 1, 2A, 4B and 4C.

3. Buildings between 5,000 square feet (464.5 m2) and 50,000 square feet (4645 m2) floor area in Climate Zones 0A, 3A and 5B.

3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.

C402.5.2 Dwelling and sleeping unit enclosure testing.

The *building thermal envelope* shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the *code official*. The measured air leakage shall not exceed 0.30 cfm/ft2 (1.5 L/s x m2) of the *testing unit enclosure area* at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple *dwelling units* or *sleeping units* or other *enclosed spaces* are contained within one *building thermal envelope*, each shall be considered an individual testing unit, and the building air leakage shall be the weighted average of all tested unit results, weighted by the enclosure area of each tested unit. Units shall be tested without simultaneously testing adjacent units and shall be separately tested as follows:

1. Where buildings have fewer than eight total dwelling or sleeping units, each unit shall be tested.

2. For buildings with eight or more dwelling or sleeping units, the greater of seven units or 20 percent of the units in the building shall be tested, including a top floor unit, a ground floor unit and a unit with the largest *testing unit enclosure area*. For each tested unit that exceeds the maximum air leakage rate, an additional two units shall be tested, including a mixture of unit types and locations.

3. *Enclosed spaces* with not less than one *exterior wall* in the *building thermal envelope* shall be tested in accordance with C402.5.3.

Exception: Corridors, stairwells, and *enclosed spaces* having a *conditioned floor area* not greater than 1,500 ft^2 shall be permitted to comply with Section C402.5.1.5 and either Section C402.5.1.3 or C402.5.1.4.

C402.5.3 Building thermal envelope testing. The *building thermal envelope* shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E3158 or ASTM E1827 or an equivalent method approved by the *code official*. The measured air leakage shall not exceed 0.40 cfm/ft2 (2.0 L/s × m2) of the *building thermal envelope* area at a pressure differential of 0.3 inch water gauge (75 Pa). Alternatively, portions of the building shall be tested and the measured air leakages shall be area weighted by the surface areas of the building envelope in each portion. The weighted average test results shall not exceed the whole building leakage limit. In the alternative approach, the following portions of the building shall be tested:

1. The entire envelope area of all stories that have any spaces directly under a roof.
2. The entire envelope area of all stories that have a building entrance, exposed floor, or loading dock, or are below grade.
3. Representative above-grade sections of the building totaling at least 25 percent of the wall area enclosing the remaining conditioned space.

C406.9 Reduced air infiltration. Air infiltration shall be verified by whole-building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air-leakage rate of the building envelope shall not exceed 0.25 cfm/ft2 (2.0 L/s × m2) under a pressure differential of 0.3 inches water column (75 Pa), with the calculated surface area being the sum of the above- and below-grade building envelope. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

> **Exception:** Buildings tested in accordance with C402.5.2 where the weighted average of all tested unit results is not greater than 0.20 cfm/ft2 (1.0 L/s x m2) at a pressure differential of 0.2 inch water gauge (50 Pa).

Updated Reason Statement: (Justification for 0.20 cfm50/ft2 in C406.9)

The following text is extracted from the rationale submitted to ASHRAE 62.2 in support of an Addendum to require 0.20 cfm50/ft2 as their dwelling unit air leakage threshold. That Addendum e to 62.2-2019 was approved on April 30, 2021.

How does this 0.20 compare to ACH50 and residential code requirements?
While a simple conversion to ACH50 is not possible, for most apartments, from 500 ft^2 to 2500 ft^2 in floor area, this 0.20 cfm50/ft2 corresponds to ~ 4 ACH50 to 5 ACH50, depending on the floorplan and ceiling height, which is similar to values that have already been required by the IECC-R for low-rise multifamily since the 2012 IECC. It has therefore already been established through the Residential code that these values are cost-effective. CEPI-58 simply is trying to ensure that multifamily under the commercial code have equal access to the points associated with Reduced Air Infiltration.

Supporting data from tested units
Since 2011, the ENERGY STAR Multifamily High Rise program has required dwelling units to achieve compartmentalization rates of 0.3 cfm50/sf or less. Based on 2,181 units that were tested since 2013 to demonstrate compliance with that threshold, 725 (33%) were able to achieve 0.20 cfm50/sf or lower, while initially only targeting the 0.3. The mean was 0.23 cfm50/sf and the median was 0.22 cfm50/sf. This demonstrates that 0.2 is an achievable threshold, with sometimes no additional cost over achieving the code requirement (0.30 cfm50/ft2).

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-1-21 Process Energy
CDP ID #	514
Code	IECC CE
Code Section(s)	C101.2, CHAPTER 2 [CE], SECTION C202, (New), C401.1
Location	base
Proponent	Darren Meyers dmeyers@ieccode.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: Exempting process spaces from lighting controls or lighting power limitations does not save any energy.
Recommendation	Disapprove
Vote	11-2-1
Recommendation Date	March 28, 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 #	CEPI-013-21 Part I Conditioned space
CDP ID #	305
Code	IECC CE
Code Section(s)	C202 New Section n
Location	base
Proponent	Robert DeVries rdevries@nuwool.com
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement**: Did not increase clarity of the code.
Recommendation	**Disapprove**
Vote	**Disapprove**: 19 – 0 – 1 (CNV)
Recommendation Date	3/17/22
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 #	CEPI-021-21 Insulation product rating
CDP ID #	341
Code	IECC CE
Code Section(s)	C303.1.4 New Section n
Location	base
Proponent	Darren Meyers dmeyers@ieccode.com
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reasoning statement**: All the information that is needed is in the FTC R-value rule and we don't need to repeat that information in the IECC
Recommendation	**Disapprove**
Vote	**Disapprove**: 17 – 0 – 1 (CNV)
Recommendation Date	3/17/22
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 #	CEPI-028-21 U-factor as basis for R-values
CDP ID #	337
Code	IECC CE
Code Section(s)	C402, C402.1, C402.1.3, C402.1.4, TABLE C402.1.3, TABLE C402.1.4 New Section n
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC rev
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement**: To align with IBC with IRC and assign U-factors as the primary basis; modifications were added for increased clarity
Recommendation	**Approve as modified.** Modification: See word file "2022-03-17 CEPI-28_Mtg edits.docx"
Vote	**Approve as modified**: 15 – 0 – 1 (CNV)
Recommendation Date	3/17/22
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

CEPI-28 Make U, C, F-factor table primary

- **Motion / Second** by Crandell / Weston
- **Motion**: Approved as modified
- **Modification**:

C402.1 General.

Building thermal envelope assemblies for buildings that are intended to comply with the code on a prescriptive basis in accordance with the compliance path described in Item 1 of Section C401.2.1shall comply with the following:

1. The opaque portions of the *building thermal envelope* shall comply with the specific insulation requirements of Section C402.2 and the thermal requirements of either the ~~R-value-based method of~~ U-, C- and F-factor-based method of Section C402.1.3; the ~~U-, C- and F-factor-based method of~~ R-value-based method of Section C402.1.4; or ~~the component performance alternative of~~ the component performance alternative of Section C402.1.5.
(note: for last C402.1.5 item, just retaining the language, unlike in the original proposal. Showing the restoration in this modification, but cancels out, so don't have to show as a change in the 2nd public review draft)
2. Roof solar reflectance and thermal emittance shall comply with Section C402.3.
3. Fenestration in building envelope assemblies shall comply with Section C402.4.
4. Air leakage of building envelope assemblies shall comply with Section C402.5.

Alternatively, where buildings have a vertical fenestration area or skylight area exceeding that allowed in Section C402.4, the building and *building thermal envelope* shall comply with Item 2 of Section C401.2.1 or Section C401.2.2.

Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section C403.11.

C402.1.4 ~~C402.1.3~~ Insulation component R-value alternatives ~~-based method~~.
Building thermal envelope opaque assemblies shall comply with the requirements of Sections C402.2 and C402.4 based on the *climate zone* specified in Chapter 3. For opaque portions of the *building thermal envelope* ~~using this section as an alternative to Section C402.1.3 intended to comply on an insulation component R-value basis,~~ the R-values for cavity insulation and continuous insulation shall be not less than that specified in Table C402.1.4 ~~C402.1.3~~.

- **Passes/Fails**: 15 – 0 – 1 (CNV)
- **Reason**: To align with IBC with IRC and assign U-factors as the primary basis; modifications were added for increased clarity.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-207-21 Source Energy
CDP ID #	492
Code	IECC CE
Code Section(s)	C407.2 New Section n
Location	base
Proponent	James Ranfone jranfone@aga.org
Proposal Status	SC rev
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal revises the building performance exception to include a source energy comparison based on ASHRAE Standard 189.1-2020 conversion factors. This revised exception provides the only means of assessing energy performance on fuel cycle energy consumption and ultimately carbon footprints since site energy metrics alone cannot account for these upstream energy system losses.
Recommendation	Accept the attached revised proposal
Vote	Accept-17, Reject-0, Abstain-1
Recommendation Date	
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____✓_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

2021 International Energy Conservation Code

Revise as follows:
C407.2 Mandatory requirements.

Compliance based on total building performance requires that a proposed design meet all of the following:

1. The requirements of the sections indicated within Table C407.2.

An annual energy cost that is less than or equal to 80 percent of 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. *Code officials* shall be permitted to require time-of-use

2. pricing in energy cost calculations. The reduction in energy cost of the proposed design associated with *on-site renewable energy*
shall be not more than 5 percent of the total energy cost. The amount of renewable energy purchased from off-site sources shall be the same in the *standard reference design* and the *proposed design*.

Exceptions:
1. Jurisdictions that require site energy (1 kWh = 3413 Btu) rather than energy cost as the metric of comparison.
2. Where energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area is substituted for the energy cost, the energy use shall be calculated using source energy factors from Table C407.2.1. For electricity, U.S. locations shall use values for eGRID subregions. Locations outside the U.S. shall use the value for "All other electricity" or locally derived values.

Table C407.2.1
Source Energy Conversion Factors for Electricity

Fossil Fuels Delivered to Buildings	
Natural gas	1.092
LPG or propane	1.151
Fuel oil (residual)	1.191
Fuel oil (distillate)	1.158
Coal	1.048
Gasoline	1.187
Other fuels not specified in this table	1.048
Electricity	
AKGD - ASCC Alaska Grid	2.47
AKMS - ASCC Miscellaneous	1.35
AZNM - WECC Southwest	2.57
CAMX - WECC California	1.66
ERCT - ERCOT All	2.32
FRCC - FRCC All	2.78
HIMS - HICC Miscellaneous	3.15
HIOA - HICC Oahu	3.87
MROE - MRO East	2.92
MROW - MRO West	2.21
NEWE - NPCC New England	2.66
NWPP - WECC Northwest	1.48
NYCW - NPCC NYC/Westchester	2.89
NYLI - NPCC Long Island	2.84
NYUP - NPCC Upstate NY	1.81
PRMS - Puerto Rico Miscellaneous	3.27
RFCE - RFC East	2.90
RFCM - RFC Michigan	2.93
RFCW - RFC West	2.97
RMPA - WECC Rockies	2.16
SPNO - SPP North	2.21
SPSO - SPP South	2.05
SRMV - SERC Mississippi Valley	2.84
SRMW - SERC Midwest	3.09
SRSO - SERC South	2.89
SRTV - SERC Tennessee Valley	2.82
SRVC - SERC Virginia/Carolina	2.91
All other electricity	2.51
Thermal Energy	
Chilled water	0.60
Steam	1.84
Hot Water	1.73

Reason Statement:

The proposed change brings C407.2 into greater consistency with source energy metric usage in Federal energy programs including Energy Star for Commercial Buildings and Home Energy Score. This revised exception provides the only means of assessing energy performance on fuel cycle energy consumption and ultimately carbon footprints since site energy metrics alone cannot account for these upstream energy system losses. In addition, the proposed exception language addresses a persistent criticism of national average multipliers, which may not reflect regional or local mixes of renewable energy in meeting building demands, and encourages authorities having jurisdiction to use locally relevant multipliers as provided in Tables 407.2.1 that is based on recently developed and adopted conversion factors as per Addendum m to Standard 189.1-2020 publicly reviewed in

January 2022. These conversion factors will also be part of IgCC 2024. Also, greater usefulness of the exception is critical since the basic requirements of C407.2 focusing on energy cost is not consistent with the intent of the IECC as stated in C101.3, which addresses energy use and conservation, not energy cost.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

Cost Impact: The code change proposal will not increase or decrease the cost of construction The proposal would not increase the cost of construction since the proposal is for changes to an exception. If the use of source energy metrics allows more alternatives for achieving energy performance improvements, it may decrease construction costs ultimately.Cost Impact: The code change proposal will not increase or decrease the cost of construction The proposal would not increase the cost of construction since the proposal is for changes to an exception. If the use of source energy metrics allows more alternatives for achieving energy performance improvements, it may decrease construction costs ultimately.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-229-21 Alterations acceptance testing
CDP ID #	281
Code	IECC CE
Code Section(s)	C503.4.2, C503.5.1 , C503.6.1 New Section y
Location	base
Proponent	Sean Denniston sean@newbuildings.org
Proposal Status	SC rev
Subcommittee	CE Model, Metrics
Subcommittee Notes	This CCP ensures that the unaltered portions of mechanical, hot water and lighting systems in existing buildings, where a portion of the system is altered, are subject to C408 acceptance testing requirements. The CCP was revised to align with CEPI-215 and to remove C503 references to C408 for clarity.
Recommendation	Accept revised CCP (attached)
Vote	Accept-18, Reject-0, Revise-0, Abstain-1
Recommendation Date	
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____✓_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

CEPI-229-21 – Revised by Committee

Modify the section as follows:

C503.3 Heating and cooling systems. New heating, cooling and duct systems that are part of the alteration shall comply with Sections C403 ~~and C408~~.

Add the following section:

C503.4.2 Mechanical system acceptance testing. Where an *alteration* requires compliance with Section C403 or any of its subsections, mechanical systems that serve the *alteration* shall comply with Sections C408.2.2, C408.2.3 and C408.2.5.

Exceptions:

1. ~~Mechanical systems and service water heater systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h (140.7 kW) cooling capacity and 600,000 Btu/h (175.8 kW) combined service water heating and space heating capacity.~~ *Buildings* with less than 10,000 square feet (929 m2) and a combined heating, cooling, and service water-heating capacity of less than 960,000 Btu/h (280 kW).
2. Systems included in Section C403.5 that serve individual *dwelling units* and *sleeping units*.

Modify the section as follows:

C503.4 Service hot water systems. New service hot water systems that are part of the alteration shall comply with Sections C404 and C408 ~~and C408~~.

Add the following section:

C503.5.1 Service hot water system acceptance testing. Where an *alteration* requires compliance with Section C404 or any of its subsections, service hot water systems that serve the *alteration* shall comply with Sections C408.2.3 and C408.2.5.

Exceptions:

1. ~~Service water heater systems in buildings where the total mechanical equipment capacity is less than 600,000 Btu/h (175.8 kW) combined service water heating and space heating capacity.~~ *Buildings* with less than 10,000 square feet (929 m2) and a combined heating, cooling, and service water-heating capacity of less than 960,000 Btu/h (280 kW).

2. Systems included in Section C403.5 that serve individual dwelling units and sleeping units.

Modify the section as follows:

C503.5 Lighting systems. New lighting systems that are part of the alteration shall comply with Sections C405 ~~and C408~~.

Add the following section:

C503.6.1 Lighting acceptance testing. Where an *alteration* requires compliance with Section C405 or any of its subsections, lighting systems that serve the *alteration* shall comply with Section C408.3.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-025-21 Data Centers
CDP ID #	455
Code	IECC CE
Code Section(s)	C401.3, C202 New Section y
Location	base
Proponent	Steven Rosenstock srosenstock@eei.org
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: Currently the IECC already allows users to utilize ASHRAE 90.4. But the definition listed in this proposal differs what is in the IECC. The definition in the IECC is understandable by those that utilize this code including designers, engineers, code officials, and architects.
Recommendation	Disapprove
Vote	7-5-3
Recommendation Date	March 28, 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 #	CEPI-134-21 Data Centers
CDP ID #	220
Code	IECC CE
Code Section(s)	C405.1, C405.9 New Section y
Location	base
Proponent	Jack Bailey jbailey@oneluxstudio.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: It makes sense to remove from current location under general, to a new section. This will also make it easier for searching in digital codes.
Recommendation	Approved As Submitted
Vote	15-0-1
Recommendation Date	March 28, 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 #	CEPI-135-21 Sleeping unit lighting power
CDP ID #	57
Code	IECC CE
Code Section(s)	C405.1, table C405.3.2 New Section n
Location	base
Proponent	Glenn Heinmiller glenn@lampartners.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: Improves code language to more accurately depict dwelling and sleeping unit use.
Recommendation	As Modified C405.2.5 Specific application controls. ~~3. Permanently installed luminaires within dwelling units shall be provided with controls complying with Section C405.2.1.1 or C405.2.3.1.~~
Vote	15-0-1
Recommendation Date	March 28, 2022
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-136-21 Lighting for dwelling units
CDP ID #	308
Code	IECC CE
Code Section(s)	C405.1.1 New Section n
Location	base
Proponent	Steven Rosenstock srosenstock@eei.org
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: Subcommittee has concerns with increased values for luminaire efficacy. Also, the exception language and main charging language is out of step with R404 (equivalent residential section).
Recommendation	Disapproved
Vote	8-7-1
Recommendation Date	March 28, 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 #	CEPI-137-21 Lighting dwelling units
CDP ID #	391
Code	IECC CE
Code Section(s)	C405.1.1, C405.3.1 New Section n
Location	base
Proponent	Mike Moore mmoore@statorllc.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: This proposal clarifies exceptions to high-efficacy lighting requirements.
Recommendation	As Modified: C405.1.1 Lighting for dwelling units. No less than 90 percent of the permanently installed lighting serving dwelling units, ~~excluding lighting equipment and applications that are excluded by Section C405.3.1,~~ shall be provided by lamps with an efficacy of not less than 65 lm/W or luminaires with an efficacy of not less than 45 lm/W, or shall comply with Sections C405.2.4 and C405.3. <u>Exceptions:</u> 1. <u>Kitchen appliance lighting.</u> 2. <u>Antimicrobial lighting used for the sole purpose of disinfecting.</u> SECTION C405.3.1 IS NOT REVISED BY THIS PROPOSAL.
Vote	7-5-1
Recommendation Date	March 28, 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 #	CEPI-176-21 Lighting demand responsive control
CDP ID #	500
Code	IECC CE
Code Section(s)	C405.2.9, C406.1 New Section y
Location	base
Proponent	Michael Jouaneh mjouaneh@lutron.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: Provides a means to effectively reduce lighting during demand response requests or other signals and improve the effective use of energy.
Recommendation	As modified. **C405.2.9 Demand responsive lighting controls.** ~~Spaces required to comply with Section C405.2.3 light-reduction controls~~ New buildings shall install controls that are capable of automatically reducing general lighting power by at least 15% in response to a demand response signal. Exceptions: 1. Buildings with less than 4,000 watts of combined installed general lighting power in spaces that have more than 0.5 W/ft^2 of general lighting power. ~~are required to comply with C405.2.3~~. 2. Buildings in jurisdictions where the utilities don't offer demand response programs.
Vote	8-6-1
Recommendation Date	March 28, 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 #	CEPI-181-21 Lighing unfinished spaces
CDP ID #	527
Code	IECC CE
Code Section(s)	C405.3.2.2 New Section n
Location	base
Proponent	Lisa Rosenow lrosenow@evergreen-tech.net
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: Prevents the trading of lighting power between finished and unfinished areas of the building.
Recommendation	As Modified C405.3.2.2 Space-by-Space Method. Where a building has <u>unfinished spaces</u>, ~~spaces designated as unfinished, the area and lighting power within the unfinished spaces shall not be included in the Space-by-Space Method calculation for finished spaces.~~ the lighting power allowance for the unfinished spaces shall be the total connected lighting power for those spaces, or <u>0.1</u> ~~0.2~~ watts per square foot (<u>1.08</u> ~~10.76~~ w/m^2), whichever is less. For the Space-by-Space Method, the interior lighting power allowance is calculated as follows:
Vote	14-0-1
Recommendation Date	March 28, 2022
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CEPI-188-21 Exterior Lighting Residential Provisions
CDP ID #	386
Code	IECC CE
Code Section(s)	C405.5.1, C405.3.1, C405.2 New Section n
Location	base
Proponent	Jack Bailey jbailey@oneluxstudio.com
Proposal Status	SC rev
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: For consistency with previously approved proposal CEPI-135.
Recommendation	As Modified C405.5.1 Total connected exterior building exterior lighting power. 14.Lighting controlled from within sleeping units and dwelling units.
Vote	13-0-1
Recommendation Date	March 28, 2022
Next Step	To Subcommittee_____ To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	