International Energy Conservation Code
Envelope & Embodied Energy Subcommittee

Meeting Notes

February 16, 2023
11:00 AM to 2:00 PM EST (3 hour)

Committee Chair: *Tom Culp, Birch Point Consulting*
Committee Vice Chair: *Emily Lorenz, IIBEC*

1. **Call to order**. The meeting was called to order by Tom Culp at 11am ET
2. **Meeting Conduct** – Chair Culp reviewed the anti-trust, conflict of interest, representation of interests, and code of ethics policies.
3. **Roll Call/Establish Quorum** – Lorenz reported establishment of quorum

Name	Organization		Name	Organization	
*Culp, Tom (chair)	Glazing Industry Code Cmte; Aluminum Extruders Council	X	Guttman, Maureen	Energy Solutions	X
*Lorenz, Emily (vice chair)	Intl Inst of Building Enclosure Consultants	X	Humble, Jonathan	Amer Iron & Steel Institute	X
Altenhofen, David	RWDI		*Johnson, Greg	Natl Multifamily Housing Council	X
*Belcher, Matt	Enhanced Bldg Systems		*Kochkin, Vladimir	National Association of Homebuilders	X
Bradley, Jeff	American Wood Council	X	Melley, Michele	State of CT	
*Brooks, Scott	Disney		*Ross, Bob	Austin Ind. School District	X
*Burton, Richard	City of Lincoln, NE	X	Sanders, Helen	Façade Tectonics Inst.	X
Cinnamon, Tony	Wiss, Janney, Elstner		Spiriev, Bistra	GA Finance & Investment	
*Churchill Norbert, Zepherinus	CARICOM		*Tillou, Mike	PNNL	
*Clausing, Chris	Clausing Builders	X	VanGeem, Martha	Masonry Alliance for Codes and Standards	X
*Crandell, Jay	American Chemistry Council's Foam Sheathing Coalition	X	Weston, Teri	Air Barrier Assoc of Amer.	X
DeWein, Mike	North Branch Services		Zani, Andrea	Permasteelisa	X

*Member of main IECC Commercial Committee

4. **Assign Note Taker—Andrea Zani**
5. **Approval of Agenda**—Agenda approved
6. **Approval of Notes** – January 19, 2023 meeting notes accepted for file.
7. **Meeting conduct—**Culp reminded attendees of process. 20-minute check-in, 2 minutes per speaker, please raise hand to be recognized. Have turned on online mods in CDP access.
8. **ACTION items**

Unfinished Roofs / Ceilings / Attic items: (Tabled from 1/19/23)

CECD1-11-22– Possible subcommittee proposal on low sloped roof definition.

- **Modifications**: add the phrase "as applied to roofs" to end of definition and strike "roof" as such:
  - **LOW SLOPE~~LOW-SLOPED ROOF~~**. A ~~roof~~ ~~having a~~ slope less than 2 units vertical in 12 units horizontal (17-percent slope) as applied to roofs.

- **Motion**: VanGeem/Johnson motioned to **approve as modified**.
- **Motion passed** 12-0-2 (CNV)
- **Reason Statement**: The definition of slopes, with regard to roofing, is clarified.

CED1-145 – Remove redundant sentence for C503.2.1

Modifications:

Red Text: CED1-144, approved by sub 2/19/23
Blue Text: CED1-147 Modified, approved by sub 2/19/23
Green Text: CED1-146 Modified
Purple Text: CED1-145 Modified

C503.2.1 ~~Roof alterations, insulation entirely above deck~~ Roof, ceiling, and attic alterations. Insulation complying with Section C402.1 and
Section C402.2.1, or an approved design that minimizes deviation from the insulation requirements, shall be provided for the following ~~roof~~ alterations:

1. An *alteration* of roof-ceiling construction other than *reroofing* where existing~~there is no~~ insulation located below the roof deck or on an attic floor above conditioned space does not comply with Table C402.1.2.
2. *Roof replacement* or a ~~for~~ roof~~s~~ ~~with~~ *alteration* that includes removing and replacing the *roof covering*, where the *roof assembly* includes insulati~~it~~on entirely above the *roof deck*.

   Exceptions: Where compliance with Section C402.1 cannot be met due to limiting conditions on an existing roof, an approved design shall be submitted with the following:

   1. Construction documents that include a report by a registered design professional or an~~other~~ approved ~~source~~ third party documenting details of the limiting conditions affecting compliance with the insulation requirements.
   2. Construction documents that include a roof design by a registered design professional or an~~other~~ approved ~~source~~ third party that minimizes deviation from the insulation requirements.
3. Conversion of unconditioned attic space into conditioned space.
4. Replacement of ceiling finishes exposing cavities or surfaces of the roof-ceiling construction.

~~Insulation shall be installed in accordance with the requirements of Sections C402.2.1.2 through C402.2.1.5.~~

- **Motion:** Jay Crandell to **approve as modified** – Emily Lorenz second
- **Motion passed** 13-0-1 (CNV)
- **Reason statement**: As Modified (purple text) Removes redundant text and clarifies requirements for item 1

CED1-146 – Roof replacement

- **Motion:** Jay Crandell to **approve as modified** (see language under CED1-146 in green)– Theresa Weston
- **Motion passed** 13-0-1 (CNV)
- **Reason statement**: As Modified (green text) Clarifies requirements for roof replacements where insulation is located entirely above deck.

Item referred back from full committee on 1/25, to be returned to full committee on 2/22

CED1-127 – Orientation

- **Motion:** Greg Johnson for **disapprove** – Maureen Guttman
- **Motion passed** 12-0-2 (CNV)
- **Reason statement**: Proposal limits design flexibility and would be better suited to an optional compliance path

Opaque walls, floors, etc:

CED1-99 – equipment building thermal envelope exception

- **Motion:** Martha VanGeem for **approve as modified**– Greg Johnson
- **Modifications**:

C402.1.1.3 Equipment Building. Buildings that comply with the following shall be exempt from the *building thermal envelope* provisions of this code:

1. Are separate buildings with floor area not more than 1,200 square feet (110 m^2).
2. Are intended to house electric equipment with installed equipment power totaling not less than 7 watts per square foot (75 W/m^2) and not intended for human occupancy.
3. Have a heating system capacity not greater than ~~(17,000 Btu/hr) (5 kW)~~ (20,000 Btu/hr) (6kW) and a heating thermostat setpoint that is restricted to not more than 50°F (10°C).
4. Have an average wall and roof *U*-factor less than 0.200 in *Climate Zones* 1 through 5 and less than 0.120 in *Climate Zones* 6 through 8.
5. Comply with the roof solar reflectance and thermal emittance provisions for *Climate Zone* 1.
6. ~~Equipment buildings intended to house environmentally sensitive equipment, not intended for human occupancy, and not exceeding 1000 sq. ft. will be exempt from the building thermal envelope provisions of this code.~~

- **Motion results passed** 11-0-2
- **Reason statement**: This proposal as modified addresses the types of heating systems available for these types of buildings.

CED1-100 – mass walls and floors

- **Modifications**:

C402.1.3.6 Mass walls and mass floors. Compliance with required maximum U-factors for mass walls and mass floors in accordance with Table C402.1.2 and minimum R-values for insulation components applied to mass walls and mass floors in accordance with Table C402.1.3 shall be permitted for assemblies complying with the following:

1. **Where used as a component of the building thermal envelope, mass walls shall comply with one of the following:**

- **Motion:** Martha VanGeem for **approve as modified** – Jay Crandell
- **Motion results passed** 12-0-1 (CNV)
- **Reason Statement**: This clarifies the text and section numbers for mass walls and floors.

CED1-105 – relocate mass wall and floor criteria

- **Motion:** Jay Crandell for **disapprove** – Martha VanGeem
- **Motion results passed** 11-0-2 (CNV)
- **Reason statement**: Disapproved based on action taken on CED1-100

CED1-101 – metal framed wall U-factors

- **Motion:** Jonathan Humble for **disapprove** – Emily Lorenz
- **Motion results passed** 6-3-5 (CNV)
- **Reason statement:** The proposal contains an arbitrary assignment to the modification of U-values that were derived from a process that used an energy savings and cost-effectiveness analyses. This proposal also does not contain recommendations to also correlate the related R-values in Table C402.1.3 even though the proposal modifies the related U-factors to Table C402.1.2. Further, the IECC should not unfairly provide an advantage to competing materials.

CED1-143 – perf path baseline for framed walls

- **Motion:** Greg Johnson for approval as modified – Jeff Bradley
- **Motion Failed** 5-7-2
- **Motion:** Jonathan Humble for **disapprove** – Emily Lorenz
- **Motion Passed** 6-3-4 (CNV)
- **Reason statement**: It was determined that the existing language "same as proposal" was sufficient and that the proposal did not offer an improvement. In addition, the language was felt to be confusing as the use of two sentences offered greater confusion. The net result of this proposal also provided an advantage to a competing material because the list of wall types in the proposal only included three of the four listed in the U-factor and R-value tables and excluded "metal framed".

CED1-106 – thermal resistance of Mech Equip Penetrations (also look at overlap with CED1-107)

Modifications:

2024 International Energy Conservation Code [CE Project]

Revise as follows:

WALL, ABOVE-GRADE. A wall associated with the *building thermal envelope* that is more than 15 percent above grade and is on the exterior of the building or any wall that is associated with the *building thermal envelope* that is not on the exterior of the building. This includes, but is not limited to, between-floor spandrels, peripheral edges of floors, roof knee walls, dormer walls, gable end walls, walls enclosing a mansard roof, mechanical equipment petrations and skylight shafts.

Add new text as follows:

C402.1.2.1.5 Area-weighted Averaging of Above-Grade Wall U-factors. For *above-grade walls* which include more than one assembly component type, the area-weighted U-factor of the entire *above-grade wall* may be determined by accepted engineering practice.

Revise as follows:

C402.1.2.4 Thermal Resistance of mechanical equipment penetrations. Where the total area of through-wall penetrations of mechanical equipment is greater than 1 percent of the opaque above grade wall area, such area shall be calculated as a separate wall assembly, in accordance with either Section C402.1.2.1.5 or Section C402.1.4, ~~with~~ using a published and approved U-factor for that equipment or a default U-factor of 0.5.

- **Motion: J**ay Crandell for **approve as modified** – Martha VanGeem
- **Motion results passed** 11-0-1 (CNV)
- **Reason statement:** This proposal is editorial. Without this language it is unclear whether a building meeting the threshold required to account for mechanical equipment penetrations can use the prescriptive U-factor method for demonstrating above grade wall U-factor compliance.

CED1-109 – steel frame U-factor framing factor

- **Motion: J**ay Crandell for approval as submitted – Emily Lorenz
- **Motion failed** 4-4-6
- **Motion:** Jonathan Humble for **disapprove**– Martha VanGeem
- **Motion passed** 5-4-4
- **Reason statement:** The Draft #1 language that was approved in 2022 was preferred. In addition, the proposal did not contain further supplemental information that would support technical merits of the proposal's recommendations, nor how to verify the proposal was more accurate than the Draft #1 language as the proponent states. Further, the proposal does not address why the decisions by the IECC Commercial Consensus Committee and IECC Commercial Envelope Subcommittee for accepting CEP1-43-21 were not appropriate

CED1-111 – Table C402.1.3 footnote i

Modifications:

Portions of table not shown remain unchanged.

Walls, above grade[i]																
Mass[f]																
Metal building																
Metal framed [h,i]																
Wood framed and other [h,i]																

For SI: 1 inch = 25.4 mm, 1 pound per square foot =

4.88 kg/m^2, 1 pound per cubic foot = 16 kg/m^3. ci =

Continuous Insulation, NR = No Requirement, LS =

Liner System.

a. Assembly descriptions can be found in ANSI/ASHRAE/IESNA 90.1 Appendix A.

b. Where using *R*-value compliance method, a thermal spacer block shall be provided, otherwise use the *U*-factor compliance method in Table C402.1.2.

c. R-5.7ci is allowed to be substituted with concrete block walls complying with ASTM C90, ungrouted or partially grouted not less than 32 inches or less on center vertically and not less than 48 inches on center horizontally, with ungrouted cores filled with materials having a maximum thermal conductivity of 0.44 Btu-in/h-f^2 °F.

d. Where heated slabs are below grade, below-grade walls shall comply with the R-value requirements for above-grade mass walls .

e. "Mass floors" shall be in accordance with Section C402.2.3.

f. "Mass walls" shall be in accordance with Section C402.2.2.

g. The first value is for perimeter insulation and the second value is for full, under-slab insulation. Perimeter insulation and full-slab insulation components shall be installed in accordance with Section C402.2.4.1 .

h. The first value is *cavity insulation*; the second value is *continuous insulation*. Therefore, "R-0+R-12ci" means R-12 *continuous insulation* and no *cavity insulation*; "R-13+R-3.8ci" means R-13 *cavity insulation* and R-3.8 *continuous insulation*; "R-20" means R-20 *cavity insulation* and no *continuous insulation*. R-13, R-20, and R-27 *cavity insulation* as used in this table apply to a nominal 4-inch (101 mm), 6-inch (152 mm), and 8-inch (203 mm) deep wood or cold-formed steel stud cavities, respectively.

i. ~~For metal framed walls and wood framed walls w~~Where the required R-value in Table C402.1.3 is met by using continuous insulation such that cavity insulation is not required, the wall assembly framing is permitted to be spaced at any spacing ~~up to and including 24 inches on center~~.

- **Motion: J**ay Crandell for **approve as modified** – Jonathan Humble
- **Motion passed** 12-0-2 (CNV)
- **Reason statement:** addresses errata of footnote omitted but previously approved as part of CEPI-38; additional revisions were made for clarity of application.

CED1-112 – Group R wording

- **Motion**: Johnson/Lorenz motioned to **approve as submitted**.
- **Vote**: 12-0-1 (CNV)
- **Reason Statement**: Conflicting language is corrected. As written the code requires all buildings to comply with Group R requirements

CED1-113 – R-Table "other" wall and roof assemblies

- **Motion:** Martha VanGeem for **disapprove** – Emily Lorenz

- **Motion passed** 8-3-2 (CNV)
- **Reason statement:** This would complicate the code for the user by not allowing an R-value path for "other" categories and metal frame walls that aren't cold form steel

CED1-114 – stud cavity insulation

- **Motion:** Greg Johnson for **disapprove** – Emily Lorenz
- **Motion passed** 11-0-2 (CNV)
- **Reason statement:** Does not consider horizontal framing applications for layered insulation.

CED1-115 – deletion of section from CEPI-27

- **Motion:** Martha VanGeem for **approve as submitted** – Jay Crandell
- **Motion passed** 12-0-1 (CNV)
- **Reason statement**: These deletions were previously agreed on. In CEPI-27 (as modified/replaced) three subsections were deleted from the original proposal. However, in the public review draft, these sections were not shown as deleted. This proposal makes those deletions as a procedural "correction" to the draft.

CED1-116 – remove assembly construction section.

- **Motion:** Martha VanGeem for **disapprove**– Emily Lorenz
- **Motion results passed** 11-0-1 (CNV)
- **Reason statement**: Based on prior action on CED1-115.

9. **Upcoming meetings**—first and third Thursdays of every month

   a. Mar 2, 2023, 11:00 AM to 2:00 PM ET

      Tentative Action Items on Deck:

      Unfinished items from above.

      CED1-120 – move airspaces exception to main paragraph
      CED1-121 – cool wall SRI for climate zone 0
      CED1-149 – exterior wall envelope terminology
      CED1-150 – update AISI standard reference
      CED1-117 – envelope backstop
      CED1-142 – fenestration / envelope backstop
      CED1-196 – envelope backstop

   b. Mar 16, 2023, 11:00 AM to 2:00 PM ET

      Tentative remaining items:

      Unfinished items from above.

CED1-203 – secondary review, energy credits may review earlier, with mods
CED1-88 – exterior envelope definition
CED1-91 – glass block reference
CED1-151 – update ASTM standards
CED1-133 – air leakage testing exception. sent back for additional review of mod
Review editorial items previously approved but held to end.