International Energy Conservation Code
Consensus Committee-Commercial

Meeting Agenda (Draft 4/12/23)

April 12, 2023
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.
   d. ICC Antitrust Compliance Guideline

3. Roll Call – Hoffman

4. Approval of Agenda

5. Approval of Minutes from April 5, 2023

6. Administrative issues.

7. Action Items.
   a. Public Comment Draft 1 Proposals

Tabled from 4/5 meeting

CED1-183-22(On-site renewable energy systems)	Electrical disapprove 10-4-1
CED1-52-22(On-site renewables modifications)	Electrical disapprove 10-3
CED1-85-22(Modify definitions in CC102)	Electrical disapprove 13-0
CED1-53-22(On-site renewable energy systems)	Electrical approve 6-5-3
CED1-51-22(Renewable energy in small buildings)	Electrical approve 9-4-1
CED1-208-22(Green retail tariffs in glide path)	Electrical disapprove 6-0-6
CED1-55-22(Green retail tariffs)	Electrical disapprove 6-1-7
CED1-56-22(Renewable energy investment fund)	Electrical as modified 7-1-3
CED1-170-22(Demand response water heater exception)	HVACR disapproved 5-1-4
CECD1-14-22(On-site renewables modification)	HVACR approve 10-0-1

New proposals

Copyright © 2021 International Code Council, Inc.

CED1-10-22(Additional documentation update) Admin disapprove 12-1-1/EPLR disapprove 12-0-1

CED1-11-22(On-site renewable energy system edit) Admin disapprove 12-1-1/EPLR disapprove 12-0-1

CECD1-20-22(Egress lighting stair exception) Electrical approve 11-1

CECD1-24-22(Casino lighting) Electrical approve 12-0

CECD1-21-22(Replacement for CED1-26-22) Electrical approve 12-0

CECD1-22-22(Timeswitch programming) Electrical approve 12-0

CECD1-23-22(Parking garage controls) Electrical as modified 13-0

CED1-9-22(Sleeping units) Electrical as modified 10-0-1

CED1-78-22(UPDS Efficiency resubmittal) Electrical as modified 10-0-1

CED1-75-22(Delete hotel lobby lighting power allowance) Electrical approve 9-0-2

CECD1-6-22(Efficiency option L04 daylight) Electrical approve

CED1-91-22(Glass block reference) Envelope approve 12-0-1

CED1-92-22(Building thermal envelope) Envelope approve 18-0-1

CED1-94-22(C402.1 clean-up) Envelope as modified 14-1-2

CED1-95-22(C402.1 fenestration clean-up) Envelope as modified 16-0-1

CED1-108-22(Relocate sections in C402.1.2 Envelope as modified 16-0-1

CED1-110-22(Various errata) Envelope approve 16-0

CED1-128-22(Air barrier editorial clean up) Envelope as modified 15-0-1

CED1-133-22(Whole building test method exception) Envelope disapprove 12-0-1

CED1-134-22(Dwelling unit testing unit) Envelope approve 16-0

CED1-149-22(Exterior wall envelope terminology) Envelope approve 12-1-1

CED1-88-22(Exterior envelope) Envelope disapprove 13-0-1

CED1-151-22(Update ASTM standards) Envelope approve 12-0-1

CED1-209-22(Solar reflectance alignment) Envelope as modified 13-0-1

CED1-184-22(Off-site contract duration) Modeling approve 13-0-1/EPLR approve 7-3-4

CECD1-18-22(Building energy credits) Modeling approve 3-1-6

~~CED1-203-22(Additional energy efficiency credits) Modeling as modified 11-0-1/EPLR approve 5-5-4 (moved to 4/19)~~

CED1-205-22(Appendix CC update) Modeling disapprove 10-0-1

CECD1-15-22(Appendix CD update) Modeling as modified 10-0-2

CED1-179-22(Deletion of Appendix CE) HVACR disapprove 6-5-1

CED1-178-22(Deletion of TSPR section) HVACR disapprove 8-1-1

CED1-176-22(G06 SHW demand response) HVACR as modified 11-0-2

CED1-161-22(HVAC demand response) HVACR as modified 9-3-2

~~CED1-156-22(Update efficiency table to match ASHRAE90.1)HVACR as modified 10-0(moved to 4/19)~~

CECD1-13-22(Healthcare) HVACR approve 11-0-1

CECD1-17-22(Fan power) HVACR approve 10-0-3

8. Subcommittee Reports

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.)

Copyright © 2021 International Code Council, Inc.

10. Next meeting Wednesday, April 19, 2023 at 2:00 pm Eastern

11. 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/

FOR ADDITIONAL INFORMATION, PLEASE CONTACT:

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

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-183-22 On-site renewable energy systems
CDP ID #	749
Code	IECC CE
Code Section(s)	C405.15.1
Location	base
Proponent	Steven Rosenstock srosenstock@eei.org
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	Reason statement: Proposal would reduce amount of cost-effective renewables required. ASHRAE 90.1 has a goals of zero energy buildings by 2031 so renewables in 90.1 are on a path of increasing and not staying static. Removing requirement to retire RECs would reduce the environmental benefits of on-site renewable energy.
Recommendation	DISAPPROVE
Vote	10 - 4 - 2
Recommendation Date	March 20, 2023
Next Step	To Subcommittee CE Elec, Light To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-052-22 On-site renewables modifications
CDP ID #	739
Code	IECC CE
Code Section(s)	C405.15.1
Location	base
Proponent	Alex Smith asmith@nahb.org
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason statement: Proposal would reduce amount of cost-effective on-site renewables required.
Recommendation	DISAPPROVE
Vote	10 - 3 - 1
Recommendation Date	March 20, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-085-22 Modify definitions in CC102
CDP ID #	774
Code	IECC CE
Code Section(s)	CC102
Location	appendix
Proponent	Alex Smith asmith@nahb.org
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason statement: The current definitions in the first draft correctly refer to electricity generation and not intended for other types or sources of energy generation.
Recommendation	DISAPPROVE
Vote	13 - 0 - 1
Recommendation Date	March 20, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-053-22 On-site renewable energy systems
CDP ID #	799
Code	IECC CE
Code Section(s)	C405.15.1
Location	base
Proponent	Bryan Holland bryan.holland@nema.org
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason statement: This code change proposal will permit all on-site renewable electricity generation with an output nameplate power rating not less .75 W/ft^2 and not just direct current generating systems.
Recommendation	AS SUBMITTED
Vote	6 - 5 - 3
Recommendation Date	March 20, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-051-22 Renewable energy in small buildings
CDP ID #	705
Code	IECC CE
Code Section(s)	C405.15.1
Location	base
Proponent	Charles Eley charles@eley.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason statement: Proposal would increase the scope of cost-effective on-site renewables requirements.
Recommendation	AS SUBMITTED
Vote	9 - 4 - 2
Recommendation Date	March 20, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-208-22 Green retail tariffs in glide path
CDP ID #	702
Code	IECC CE
Code Section(s)	CD101.4.1
Location	appendix
Proponent	Charles Eley charles@eley.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason Statement: Subcommittee was concerned about the uncertainty and durability of green retail tariff programs. Noted there were many abstentions in the vote. Some subcommittee members felt they did not have enough information.
Recommendation	DISAPPROVE
Vote	6 - 0 - 7
Recommendation Date	March 20, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-055-22 Green retail tariffs
CDP ID #	686
Code	IECC CE
Code Section(s)	C405.15.2.1
Location	base
Proponent	Charles Eley charles@eley.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason statement: Subcommittee was concerned about the uncertainty and durability of green retail tariff programs. Noted there were many abstentions in the vote.
Recommendation	DISAPPROVE
Vote	6 - 1 - 8
Recommendation Date	March 20, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-056-22 Renewable energy investment fund
CDP ID #	768
Code	IECC CE
Code Section(s)	C405.15.2.1
Location	base
Proponent	Charles Eley charles@eley.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason statement: When on-site renewables is not feasible as defined by the exceptions, this proposal would offer an additional path for purchasing off-site renewables from the jurisdiction. This would offer more flexibility and lower cost.
Recommendation	AS MODIFIED Michael Jouaneh emailed the modification to Kris Thu 3/23/2023 3:07 PM
Vote	7 - 1 - 5
Recommendation Date	March 25, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

CED1-56-22
(Modifications by PLR highlighted in yellow)

Proponents: Charles Eley, representing Architecture 2030 (charles@eley.com)

2024 International Energy Conservation Code [CE Project]

Revise as follows:

C405.15.2.1 Off-site procurement. The building owner as defined in the *International Building Code* shall procure and be credited for the total amount of off-site renewable electrical energy, not less than required in accordance with Equation 4-14, with one or more of the following:

1. ~~A~~ P*hysical renewable energy power purchase agreement*
2. ~~A~~*Financial renewable energy power purchase agreement*
3. ~~A~~ *Community renewable energy facility*
4. Off-site renewable energy system owned by the building property owner
5. *Renewable energy investment fund*

Add new definition as follows:

~~**RENEWABLE ENERGY INVESTMENT FUND.** A fund established by the local government or other entity to accept payment from building owners to construct or acquire qualifying renewable energy (along with RECs) on their behalf.~~

RENEWABLE ENERGY INVESTMENT FUND (REIF). A fund established by a jurisdiction to accept payment from *building project* owners to construct or acquire interests in qualifying renewable energy systems, together with their associated RECS, on the *building project* owners' behalf.

Reason: A renewable energy investment fund is recognized in Appendix CC and Appendix CD. For consistency, it should be included in C405.15.2.1.

Cost Impact: The code change proposal will decrease the cost of construction. Providing more options for acquiring off-site renewable energy will not increase the cost of compliance and could result in a reduction.

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-170-22 Provide Exception for R-2 Occupancies for DR Water Heater Controls
CDP ID #	665
Code	IECC CE
Code Section(s)	C404.10
Location	base
Proponent	Greg Johnson gjohnsonconsulting@gmail.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason Statement**: The IECC HVACR and Water Heating Subcommittee does not agree that R-2 occupancies are different enough from other occupancies to warrant an exception. Further, the proposed text would create a conflict with other requirements in C406.
Recommendation	**Disapprove as modified** **See the full proposal below.** The modifications were made by the proponent. The proposal has changed from the version considered at the March 9, 2023 meeting
Vote	**Disapprove as modified** 5-1-4
Recommendation Date	03/09/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

2024 International Energy Conservation Code [CE Project]

Revise as follows:

C404.10 Demand responsive water heating. Electric storage water heaters with a rated water storage volume of 40 gallons (150L) to 120 gallons (450L) and a nameplate input rating equal to or less than 12kW shall be provided with demand responsive controls in accordance with Table C404.10 or another equivalent approved standard.

Exceptions:

1. Water heaters that provide a hot water delivery temperature of 180°F (82°C) or greater.
2. Water heaters that comply with Section IV, Part HLW or Section X of the ASME Boiler and Pressure Vessel Code.
3. Water heaters that use 3-phase electric power.
4. Water heaters in R-2 occupancies.

TABLE C406.2(1) BASE ENERGY CREDITS FOR GROUP R-2, R-4, AND I-1 OCCUPANCIES[a]

ID	Energy Credit Measure	Section	Climate Zone																		
			0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
E01	Envelope Performance	C406.2.1.1	Determined in accordance with Section C406.2.1.1																		
E02	GA reduction (15E)	C406.2.1.2	8	13	7	11	6	8	9	6	1	24	8	9	30	15	5	32	28	31	36
E03	Envelope leak reduction	C406.2.1.3	15	10	12	8	6	16	13	5	1	7	7	9	65	16	1	73	43	52	26
E04	Add Roof Insulation	C406.2.1.4	1	1	1	1	1	1	4	3	1	5	3	4	6	5	1	7	7	6	8
E05	Add Wall Insulation	C406.2.1.5	10	10	6	8	5	6	8	4	1	8	3	4	11	7	1	14	12	13	13
E06	Improve Fenestration	C406.2.1.6	7	7	4	6	9	11	13	3	1	22	5	10	27	18	7	41	33	22	21
H01	HVAC Performance	C406.2.2.1	20	19	16	17	14	13	11	11	5	13	10	8	15	12	7	18	14	17	19
H02	Heating efficiency	C406.2.2.2	x	x	x	x	x	x	3	1	1	6	2	3	10	5	2	14	10	13	16
H03	Cooling efficiency	C406.2.2.3	7	6	4	4	3	3	1	1	1	1	1	1	1	1	x	x	x	x	x
H04	Residential HVAC control	C406.2.2.4	9	10	8	22	20	25	16	17	32	21	24	17	23	27	16	21	24	18	18
H05	D❮ASIfan control	C406.2.2.5	32	31	27	28	23	23	28	21	12	42	24	24	56	36	19	73	54	70	79
W01	SHW preheat recovery	C406.2.3.1 a	61	63	74	74	85	88	101	100	121	103	109	122	102	111	130	93	106	99	96
W02	Heat pump water heater	C406.2.3.1 b	50	52	62	61	72	74	86	85	104	88	94	106	88	96	112	81	92	87	84
W03	Efficient gas water heater	C406.2.3.1 c	38	39	46	46	53	55	63	62	76	64	68	76	64	69	81	58	66	62	60
W04	SHW pipe insulation	C406.2.3.2	7	7	8	7	8	8	8	9	10	8	9	9	7	8	9	6	7	6	6
W05	Point of use water heaters	C406.2.3.3 a	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Copyright © 2021 International Code Council, Inc.

ID	Energy Credit Measure	Section	Climate Zone																		
			0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
W06	Thermostatic bal. valves	C406.2.3.3 b	3	3	3	3	3	3	3	3	4	3	3	4	3	3	4	3	3	3	2
W07	SHW heat trace system	C406.2.3.3 c	12	12	13	13	14	15	15	15	18	14	15	16	13	14	16	11	13	11	10
W08	SHW submeters	C406.2.3.4	11	11	13	13	15	16	18	18	22	19	20	22	19	20	24	17	20	18	18
W09	SHW distribution sizing	C406.2.3.5	45	46	55	54	63	65	74	73	89	75	80	89	74	81	95	68	77	72	70
W10	Shower heat recovery	C406.2.3.6	15	16	19	19	22	23	26	26	32	27	29	32	27	29	34	25	28	27	26
P01	Energy monitoring	C406.2.4	3	3	2	3	2	2	2	2	2	2	2	2	2	2	2	3	2	2	3
X01	Demand Response Water Heater (R-2)	C406.2.X	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~	1 ~~TBD~~
L01	Lighting Performance	C406.2.5.1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
L02	Lighting dimming H tuning	C406.2.5.2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
L03	Increase occp. sensor	C406.2.5.3	3	3	4	4	4	4	3	4	3	2	3	2	1	1	2	1	1	1	1
L04	Increase daylight area	C406.2.5.4	5	5	5	5	5	5	4	4	4	4	4	3	3	4	3	2	3	3	2
L05	Residential light control	C406.2.5.5	8	8	9	9	9	9	8	8	10	6	8	7	4	6	8	3	5	4	3
L06	Light power reduction	C406.2.5.7	2	2	2	2	2	2	2	2	2	1	2	1	1	1	1	1	1	1	1
001	Efficient elevator	C406.2.7.1	4	4	4	4	5	5	5	5	5	4	5	5	4	4	5	4	4	4	3
002	Commercial kitchen equip.	C406.2.7.2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
003	Residential kitchen equip.	C406.2.7.3	15	15	17	16	17	18	17	18	20	16	17	18	15	16	18	13	15	13	12
004	Fault detection	C406.2.7.4	3	3	2	3	2	2	2	2	1	2	2	1	1	2	1	3	2	3	3

a. "x" indicates credit is not available for that measure.

Add new text as follows:

C406.2.X Demand Response Water Heating for R-2 Occupancies. For R-2 occupancies, electric storage water heaters with a rated water storage volume of 40 gallons (150L) to 120 gallons (450L) and a nameplate input rating equal to or less than 12kW shall be provided with demand responsive controls in accordance with Table C404.10 or an~~other~~ equivalent *approved* standard.

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-14-22 On-site renewables modifications
CDP ID #	
Code	IECC CE
Code Section(s)	
Location	base
Proponent	IECC CE HVACR subcommittee
Proposal Status	SC review
Subcommittee	CE HVACR & WH
Subcommittee Notes	
Recommendation	Approve
Vote	10-0-1
Recommendation Date	2/23/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-10, CED1-11, CED1-153, CED1-154, and CED1-171
CDP ID #	
Code	IECC CE
Code Section(s)	C407.3.2.(6), C409.6.1.9, C403.10, C403.11.6, C404.8.3
Location	
Proponent	Bruce Swiecicki, bswiecicki@npga.org
Proposal Status	SC review
Subcommittee	CE Admin
Subcommittee Notes	The SC would like the HVAC SC to reconsider CED1-153, 154, and 171. The SC would like the PLR SC to review all five public comments for technical merits.
Recommendation	Reason Statement: The proposed revisions to CED1-10 and 11 would add confusion and does not improve the requirement of the code. The proposed revisions to CED1-153, 154, and 171 are not reflect the intent or original cost-effectiveness rational that was provided when the exceptions were added to the code.
Vote	Disapprove: 12-0-1
Recommendation Date	1/17/2022
Next Step	To Subcommittee: HVAC SC (153, 154, 171) and PLR SC (All) To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-20-22 Exit stair LPD
CDP ID #	
Code	IECC CE
Code Section(s)	
Location	base
Proponent	Electrical power, lighting, renewables subcommittee
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	Reason: This addresses changes to Section 1008.2.1 of the IBC which requires higher illuminances exit access stairways, exit stairways and at their required landings.
Recommendation	AS SUBMITTED
Vote	11 - 1 - 2
Recommendation Date	March 24, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-24-22 Casino gaming exception
CDP ID #	
Code	IECC CE
Code Section(s)	
Location	base
Proponent	Electrical power, lighting, renewables subcommittee
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	Reason: This proposal removes an exception for a space category that has been added to the lighting power allowance table.
Recommendation	AS SUBMITTED
Vote	12 - 0 - 1
Recommendation Date	March 24, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-21-22 Replacement for CED1-26
CDP ID #	
Code	IECC CE
Code Section(s)	
Location	base
Proponent	Electrical power, lighting, renewables subcommittee
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	Reason: The proposals restructures the code for clarity of requirements for dwelling units and sleeping units.
Recommendation	AS SUBMITTED
Vote	12 - 0 - 1
Recommendation Date	March 24, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-22-22 Timeswitch programming
CDP ID #	
Code	IECC CE
Code Section(s)	
Location	base
Proponent	Electrical power, lighting, renewables subcommittee
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	Reason: This proposal will address the issue of programming time clock controls when a schedule is not known.
Recommendation	AS SUBMITTED
Vote	12 - 0 - 1
Recommendation Date	March 24, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-23-22 Parking garage controls
CDP ID #	
Code	IECC CE
Code Section(s)	
Location	base
Proponent	Electrical power, lighting, renewables subcommittee
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	Reason: This proposal would clarify what areas are covered by parking garage lighting versus exterior lighting for controls and lighting power requirements.
Recommendation	AS SUBMITTED
Vote	13 - 0 - 1
Recommendation Date	March 24, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-009-22 Sleeping units
CDP ID #	733
Code	IECC CE
Code Section(s)	C405
Location	base
Proponent	Michael Myer michael.myer@pnnl.gov
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: The proposal accommodates the specific lighting needs of patient rooms.
Recommendation	AS MODIFIED The proposal was modified so that the only change it makes to the code is to add one row to Table C405.3.2(2) **TABLE C405.3.2(2) INTERIOR LIGHTING POWER ALLOWANCES: SPACE-BY-SPACE METHOD** **BUILDING TYPE SPECIFIC SPACE TYPES[a]** / **LPD (watts/ft²)** Patient Room / 0.78
Vote	10 - 0 - 2
Recommendation Date	March 24, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	

Copyright © 2021 International Code Council, Inc.

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-078-22 UPS Efficiency resubmittal
CDP ID #	698
Code	IECC CE
Code Section(s)	C405.9
Location	base
Proponent	Nicholas O'Neil noneil@energy350.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	Reason: This code change proposal aligns the efficiency requirements for UPS installed in computer rooms with the efficiency requirements for this same equipment installed in data centers. This will reduce the energy consumption of UPS in computer rooms while improving the overall energy efficiency of the occupancy.
Recommendation	AS MODIFIED **C405.9 Data Centers and Computer Rooms**. Electrical equipment in data centers and computer rooms shall comply with this section.
Vote	10 - 0 - 2
Recommendation Date	March 24, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-075-22 Delete hotel lobby lighting power allowance
CDP ID #	734
Code	IECC CE
Code Section(s)	C405.3.2(2)
Location	base
Proponent	Glenn Heinmiller glenn@lampartners.com
Proposal Status	SC review
Subcommittee	CE Elec, Light
Subcommittee Notes	This will allow hotel lobbies to match the requirements of other lobbies, as the lighting requirements are similar.
Recommendation	APPROVED AS SUBMITTED
Vote	9 - 0 - 3
Recommendation Date	December 19, 2022
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-6-22 Efficiency option L04 daylight
CDP ID #	
Code	IECC CE
Code Section(s)	C406.2.5
Location	base
Proponent	CE Electrical power, lighting, renewables subcommittee
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	
Recommendation	
Vote	
Recommendation Date	
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-088-22 Exterior envelope
CDP ID #	849
Code	IECC CE
Code Section(s)	C202
Location	base
Proponent	Brian Trimble btrimble@imiweb.org
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** Based on prior action on CED1-149.
Recommendation	**Disapprove**
Vote	**Disapprove** 13-0-1 (CNV)
Recommendation Date	3/16/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-091-22 Glass block reference
CDP ID #	847
Code	IECC CE
Code Section(s)	C303.1.3(1)
Location	base
Proponent	Brian Trimble btrimble@imiweb.org
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** The correct terminology is glass block. Glazed block has a different meaning.
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 12-0-1 (CNV)
Recommendation Date	3/16/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-092-22 Building thermal envelope
CDP ID #	653
Code	IECC CE
Code Section(s)	C402
Location	base
Proponent	Aaron Phillips aphillips@asphaltroofing.org
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: Consistent use of "building thermal envelope" terminology
Recommendation	**Approve as modified** Modifications – (see meeting edits PDF) • as shown with "purple items" italicized. • C402.1 #1 change "building thermal envelope assemblies" to "the building envelope"
Vote	**Approve as modified** 18-0-1
Recommendation Date	12/1/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

BUILDING ENVELOPE
THERMAL ENVELOPE
ENVELOPE
ITALICIZE
MISSING

CED1-92-22

IECC: C105.2.2, SECTION 202, C401.3, SECTION C402, C402.1, C402.1.1.2, TABLE C402.1.1.2, TABLE C402.1.2, C402.1.2.2, TABLE C402.1.3, C402.1.4, TABLE C402.5, C402.6, C402.6.1.1, C402.6.2.3, C402.6.5, C403.4.1, C403.13.1, C403.14, C406.1.3, C406.2.1, C406.2.1.1, C406.3.8, TABLE C407.2(1), C409.6.1.4, C503.1, C503.2, C503.6, C504.2, C505.2, C505.2.1

Proponents: Aaron Phillips, representing Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Energy Conservation Code [CE Project]

Revise as follows:

C105.2.2 Building ~~Thermal~~ thermal envelope. Inspections shall verify the correct type of insulation, *R*-values, location of insulation, fenestration, *U*-factor, SHGC and VT, and that air leakage controls are properly installed, as required by the code, *approved* plans and specifications.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the *building thermal envelope*~~building envelope~~.

C401.3 Building ~~Thermal~~ thermal envelope certificate. A permanent *building thermal envelope*~~thermal envelope~~ certificate shall be completed by an *approved* party. Such certificate shall be posted on a wall in the space where the space conditioning equipment is located, a utility room or other *approved* location. If located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. A copy of the certificate shall also be included in the construction files for the project. The certificate shall include the following:

1. *R*-values of insulation installed in or on ceilings, roofs, walls, foundations and slabs, *basement walls*, crawl space walls and floors and ducts outside *conditioned spaces*.
2. *U*-factors and *solar heat gain coefficients* (SHGC) of fenestrations.
3. Results from any *building thermal envelope* ~~envelope~~ air leakage testing performed on the *building*.

Where there is more than one value for any component of the *building thermal envelope*~~building envelope~~, the certificate shall indicate the area-weighted average value where available. If the area-weighted average is not available, the certificate shall list each value that applies to 10 percent or more of the total component area.

SECTION C402
BUILDING THERMAL ENVELOPE REQUIREMENTS

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 C401.2.1 shall 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 U-, C- and F-factor based method of Section C402.1.2; the R-value based method of C402.1.3; or the component performance alternative of Section C402.1.4. Where the total area of the through-wall penetrations of mechanical equipment is greater than 1 percent of the opaque above-grade wall area, the building thermal envelope shall comply with Section C402.1.2.4.
2. Wall solar reflectance and thermal emittance shall comply with Section C402.3.
3. Roof solar reflectance and thermal emittance shall comply with Section C402.4.
4. Fenestration in *building thermal envelope*~~building envelope~~ ~~assemblies~~ shall comply with Section C402.5.
5. Air leakage of the building thermal envelope shall comply with Section C402.6.
6. Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section C403.12.
7. *Thermal bridges* in *above-grade walls* shall comply with Section C402.7.

Alternatively, where buildings have a vertical fenestration area or skylight area exceeding that allowed in Section C402.5, the building and *building thermal envelope* shall comply with Item 2 of Section C401.2.1 or Section C401.2.2.

C402.1.1.2 Greenhouses. Greenhouse structures or areas that are mechanically heated or cooled and that comply with all of the following shall be exempt from the *building thermal envelope*~~building envelope~~ requirements of this code:

1. Exterior opaque envelope assemblies comply with Sections C402.2 and C402.5.5.

Exception: Low energy greenhouses that comply with Section C402.1.1.

2. Interior partition *building thermal envelope* assemblies that separate the greenhouse from *conditioned space* comply with Sections C402.2, C402.5.3 and C402.5.5.
3. Fenestration assemblies that comply with the *building thermal envelope*~~thermal envelope~~ requirements in Table C402.1.1.2. The *U*-factor for a roof shall be for the roof assembly or a roof that includes the assembly and an *internal curtain system*.

Exception: Unconditioned greenhouses.

TABLE C402.1.1.2 FENESTRATION BUILDING THERMAL ENVELOPE MAXIMUM REQUIREMENTS

TABLE C402.1.2 OPAQUE BUILDING THERMAL ENVELOPE ASSEMBLY MAXIMUM REQUIREMENTS, U-FACTOR METHOD[a, b]

CLIMATE ZONE	0 AND 1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above roof deck	U-0.048	U-0.039	U-0.039	U-0.039	U-0.039	U-0.039	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.032	U-0.028	U-0.028	U-0.028	U-0.028
Metal buildings	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.035	U-0.031	U-0.029	U-0.029	U-0.029	U-0.026	U-0.026
Attic and other	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.021	U-0.017	U-0.017	U-0.017	U-0.017
Walls, above grade																
Mass[f]	U-0.151	U-0.151	U-0.151	U-0.123	U-0.123	U-0.104	U-0.104	U-0.090	U-0.090	U-0.080	U-0.080	U-0.071	U-0.071	U-0.071	U-0.037	U-0.037
Metal building	U-0.079	U-0.079	U-0.079	U-0.079	U-0.079	U-0.052	U-0.052	U-0.050	U-0.050	U-0.050	U-0.050	U-0.050	U-0.044	U-0.039	U-0.039	U-0.039
Metal framed	U-0.077	U-0.077	U-0.077	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.055	U-0.055	U-0.049	U-0.049	U-0.049	U-0.042	U-0.037	U-0.037
Wood framed and other[c]	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051	U-0.032	U-0.032
Walls, below grade																
Below-grade wall[c]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-1.140[e]	C-0.119	C-0.092	C-0.119	C-0.092	C-0.092	C-0.063	C-0.063	C-0.063	C-0.063	C-0.063
Floors																
Mass[d]	U-0.322[e]	U-0.322[e]	U-0.107	U-0.087	U-0.074	U-0.074	U-0.057	U-0.051	U-0.057	U-0.051	U-0.051	U-0.051	U-0.042	U-0.042	U-0.038	U-0.038
Joist/framing	U-0.066[e]	U-0.066[e]	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027
Slab-on-grade floors																
Unheated slabs	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.73[e]	F-0.54	F-0.52	F-0.52	F-0.52	F-0.51	F-0.51	F-0.434	F-0.51	F-0.434	F-0.434	F-0.424
Heated slabs	F-0.69	F-0.69	F-0.69	F-0.69	F-0.66	F-0.66	F-0.62	F-0.62	F-0.62	F-0.62	F-0.62	F-0.602	F-0.602	F-0.602	F-0.602	F-0.602
Opaque doors																
Nonswinging door	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31
Swinging door[g]	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37	U-0.37
Garage door < 14% glazing[h]	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31	U-0.31

For SI: 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. Where assembly *U*-factors, *C*-factors and *F*-factors are established in ANSI/ASHRAE/IESNA 90.1 Appendix A, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table, and provided that the construction, excluding the cladding system on walls, complies with the appropriate construction details from ANSI/ASHRAE/ISNEA 90.1 Appendix A.

b. Where *U*-factors have been established by testing in accordance with ASTM C1363, such opaque assemblies shall be a compliance alternative where those values meet the criteria of this table. The *R*-value of continuous insulation shall be permitted to be added to or subtracted from the original tested design.

c. Where heated slabs are below grade, below-grade walls shall comply with the *U*-factor requirements for above-grade mass walls.

d. “Mass floors” shall be in accordance with Section C402.2.3.

e. These *C*-, *F*- and *U*-factors are based on assemblies that are not required to contain insulation.

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

g. Swinging door *U*-factors shall be determined in accordance with NFRC-100.

h. Garage doors having a single row of fenestration shall have an assembly *U*-factor less than or equal to 0.44 in Climate Zones 0 through 6 and less than or equal to 0.36 in Climate Zones 7 and 8, provided that the fenestration area is not less than 14 percent and not more than 25 percent of the total door area.

C402.1.2.2 U-factor thermal resistance of cold-formed steel assemblies. *U*-factors for *building thermal envelopes* ~~building envelopes~~ containing cold-formed steel framed ceilings and walls shall be permitted to be determined in accordance with~~with~~ AISI S250 as modified herein.

1. Where the steel-framed wall contains no cavity insulation, and uses continuous insulation to satisfy the U-factor maximum, the steel-framed wall member spacing is permitted to be installed at any on-center spacing.
2. Where the steel-framed wall contains framing at 24 inches (610 mm) on center with a 23 percent framing factor or framing at 16 inches (400 mm) on-center with a 25 percent framing factor, the next lower framing member spacing input values shall be used when calculating using AISI S250.
3. Where the steel-framed wall contains less than 23 percent framing factors the AISI S250 shall be used without any modifications.
4. Where the steel-framed wall contains other than standard C-shape framing members the AISI S250 calculation option for other than standard C-shape framing is permitted to be used.

TABLE C402.1.3 OPAQUE BUILDING THERMAL ENVELOPE INSULATION COMPONENT MINIMUM REQUIREMENTS, R-VALUE ALTERNATIVES [a]

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.

C402.1.4 Component performance alternative. *Building thermal envelope*~~Building envelope~~ values and fenestration areas determined in accordance with Equation 4-1 shall be an alternative to compliance with the *U*-, *F*-, psi-, chi-, and *C*-factors in Tables C402.1.2, C402.1.5, and C402.5 and the maximum allowable fenestration areas in Section C402.5.1. *Fenestration* shall meet the applicable SHGC requirements of Section C402.5.3.

$$A_P + B_P + C_P + T_P \leq A_T + B_T + C_T + T_T - V_F - V_S \quad \textbf{(Equation 4-1)}$$

A_P = Sum of the (area x U-factor) for each proposed building thermal envelope assembly, other than slab-on-grade or below-grade wall assemblies
B_P = Sum of the (length x F-factor) for each proposed slab-on-grade edge condition
C_P = Sum of the (area x C-factor) for each proposed below-grade wall assembly
T_P = Sum of the (ψL_P) and (χN_p) values for each type of thermal bridge condition of the building thermal envelope as identified in Section C402.6 in the proposed building. For the purposes of this section, the (ψL_P) and (χN_P) values for thermal bridges caused by materials with a thermal conductivity less than or equal to 3.0 Btu-in/h-ft^2-F shall be assigned as zero. For buildings or structures located in Climate Zones 0 through 3, the value of T_P shall be assigned as zero.
ψL_P= psi-factor × length of the thermal bridge elements in the proposed building thermal envelope.
χN_P = chi-factor x number of the thermal bridge point elements other than fasteners, ties, or brackets in the proposed building thermal envelope.
A_T = Sum of the (area x U-factor permitted by Tables C402.1.2 and C402.5) for each proposed building thermal envelope assembly, other than slab-on-grade or below-grade wall assemblies
B_T = Sum of the (length x F-factor permitted by Table C402.1.2 for each proposed slab-on-grade edge condition
C_T = Sum of the (area x C-factor permitted by Table C402.1.2) for each proposed below-grade wall assembly
T_T = Sum of the (ψL_T) and (χN_T) values for each type of thermal bridge condition in the proposed building thermal envelope as identified in Section C402.6 with values specified as "compliant" in Table C402.1.4. For the purposes of this section, the (ψL_T) and (χNT) values for thermal bridges caused by materials with a thermal conductivity less than or equal to 3.0 Btu-in/h-ft^2-F shall be assigned as zero. For buildings or structures located in Climate Zones 0 through 3, the value of T_T shall be assigned as zero.
ψL_T= (psi-factor specified as "compliant" in Table C402.1.5) × length of the thermal bridge elements in the proposed building thermal envelope.
χN_T = (chi-factor specified as "compliant" in Table C402.1.5) x number of the thermal bridge point elements other than fasteners, ties, or brackets in the proposed building thermal envelope.
P_F = Maximum vertical fenestration area allowable by Section C402.5.1, C402.5.1.1, or C402.5.1.2
Q_F = Proposed vertical fenestration area
R_F = $Q_F - P_F$, but not less than zero (excess vertical fenestration area)
S_F = Area-weighted average U-factor permitted by Table C402.5 of all vertical fenestration assemblies
T_F = Area-weighted average U-factor permitted by Table C402.1.2 of all exterior opaque wall assemblies
U_F = $S_F - T_F$ (excess U-factor for excess vertical fenestration area)
V_F = R_F x U_F (excess UxA due to excess vertical fenestration area)
P_S = Maximum skylight area allowable by Section C402.1.2
Q_S = Actual skylight area

$R_S = Q_S – P_S$, but not less than zero (excess skylight area)
S_S = Area-weighted average U-factor permitted by Table C402.5 of all skylights
T_S = Area-weighted average U-factor permitted by Table C402.1.2 of all opaque roof assemblies
$U_S = S_S – T_S$ (excess U-factor for excess skylight area)
$V_S = R_S \times U_S$ (excess UxA due to excess skylight area)
A proposed psi- or chi-factor for each thermal bridge shall comply with one of the following as applicable:

1. Where the proposed mitigation of a thermal bridge is compliant with the requirements of Section C402.6, the “compliant” values in Table C402.1.4 shall be used for the proposed psi- or chi-factors.
2. Where a thermal bridge is not mitigated in a manner at least equivalent to Section C402.6, the “non-compliant” values in Table C402.1.4 shall be used for the proposed psi- or chi-factors.
3. Where the proposed mitigation of a thermal bridge provides a psi- or chi-factor less than the “compliant” values in Table C402.1.4, the proposed psi- or chi-factor shall be determined by thermal analysis, testing, or other approved sources.

Staff note existing items removed

TABLE C402.5 BUILDING THERMAL ENVELOPE FENESTRATION MAXIMUM U-FACTOR AND SHGC REQUIREMENTS

NR = No Requirement, PF = Projection Factor.

C402.6 Air leakage—building thermal envelope. The *building thermal envelope* shall comply with Sections C402.6.1 through C402.6.8.1.

C402.6.1.1 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* ~~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 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 thermal envelope*~~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,

    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.

C402.6.2.3 Building thermal envelope design and construction verification criteria. Where Section C402.6.2.1 and C402.6.2.2 are not appliable 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 C402.6.1.
2. Inspection of continuous air barrier components and assemblies shall be conducted during construction to verify compliance with the requirements ofC402.6.2.3.1 or C502.6.2.3.2. 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.

C402.6.5 Air intakes, exhaust openings, stairways and shafts. Stairway enclosures, elevator shaft vents and other outdoor air intakes and exhaust openings integral to the *building thermal envelope*~~building envelope~~ shall be provided with dampers in accordance with Section C403.7.7.

C403.4.1 Thermostatic controls. The supply of heating and cooling energy to each *zone* shall be controlled by individual thermostatic controls capable of responding to temperature within the *zone*. Where humidification or dehumidification or both is provided, not fewer than one humidity control device shall be provided for each humidity control system.

Exception: Independent perimeter systems that are designed to offset only *building thermal envelope*~~building envelope~~ heat losses, gains or both serving one or more perimeter *zones* also served by an interior system provided that both of the following conditions are met:

1. The perimeter system includes not fewer than one thermostatic control *zone* for each building exposure having exterior walls facing only one orientation (within ±45 degrees) (0.8 rad) for more than 50 contiguous feet (15 240 mm).
2. The perimeter system heating and cooling supply is controlled by thermostats located within the *zones* served by the system.

C403.13.1 Duct and plenum insulation and sealing. Supply and return air ducts and plenums shall be insulated with not less than R-6 insulation where located in unconditioned spaces and where located outside the building with not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8. Ducts located underground beneath buildings shall be insulated as required in this section or have an equivalent thermal distribution efficiency. Underground ducts utilizing the thermal distribution efficiency method shall be *listed* and *labeled* to indicate the *R*-value equivalency. Where located within a *building thermal envelope*~~building envelope~~ assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by not less than R-8 insulation in *Climate Zones* 0 through 4 and not less than R-12 insulation in *Climate Zones* 5 through 8.

Exceptions:

1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum is not greater than 15°F (8°C).

Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the International Mechanical Code.

C403.14 Mechanical systems located outside of the building thermal envelope. Mechanical systems providing heat outside of the *building thermal envelope*~~thermal envelope of a building~~ shall comply with Sections C403.14.1 through C403.14.4.

C406.1.3 Substantial Alterations to Existing Buildings. The *building thermal envelope*, *equipment*, and *systems* in *alterations* to *buildings* exceeding 5000 square feet (46.5 m^2) of *gross conditioned floor area* shall comply with the requirements of Section C406.1.1 and C406.1.2 where the alteration includes replacementof two or more of the following:

1. HVAC unitary systems or HVAC central heating or cooling equipment serving the alteration area, not including ductwork or *piping*.
2. 80% or more of the lighting fixtures in the *alteration* area.
3. *Building thermal envelope*~~Building envelope~~ components in the *alteration* area including new exterior cladding, fenestration, or insulation.

C406.2.1 More Efficient Building Thermal Envelope. A project shall achieve credits for improved envelope performance by complying with one of the following measures:

1. Section C406.2.1.1: E01
2. Section C406.2.1.2: E02
3. Section C406.2.1.3: E03
4. Both E02 and E03
5. Any combination of:

    5.1. Section C406.2.1.3: E03

    5.2. Section C406.2.1.4: E04

    5.3. Section C406.2.1.5: E05

    5.4. Section C406.2.1.6: E06

C406.2.1.1 EO1 Improved envelope performance 901 Appendix C. *Building thermal envelope*~~envelope~~ measures shall be installed to improve the energy performance ofthe project. The achieved energy credits shall be determined using Equation 4-15.

(Equation 4-15)

$$EC_{ENV} = 1000 \times (EPF_B - EPF_P)/EPF_B$$

EC_{ENV}= E01 measure energy credits
EPFB= base envelope performance factor calculated in accordance with ASHRAE 90.1-2019-Appendix C.
EPF_P= proposed envelope performance factor calculated in accordance with ASHRAE 90.1-2019-Appendix C.

C406.3.8 G07 Building Thermal Mass. The project shall have additional passive interior mass and a night flush control of the HVAC system. The credit is available to projects that have at least 80 percent of gross floor area unoccupied between midnight and 6:00 a.m. The project shall meet the following requirements:

1. Interior to the *building thermal envelope* insulation, provide 10 lb/ft(50 kg/m) of project conditioned floor area of passive thermal mass in the *building interior wall*, the inside of the *exterior wall*, or interior floor construction. Mass *construction* shall have mass surfaces directly contacting the air in *conditioned spaces* with directly attached gypsum panels allowed. Mass with carpet or furred gypsum panels or *exterior wall* mass that is on the exterior of the insulation layer (e.g., the portion of CMU block on the exterior of insulation filled cell cavities) shall not be included toward the *building* mass required.
2. HVAC units for 80 percent or more of the supply airflow in the project shall be equipped with outdoor air economizers and fans that have variable or low speed capable of operating at 66 percent or lower airflow and be included in the night flush *control* sequence.

3. Night flush controls shall be configured with the following sequence or another night flush strategy shall be permitted where demonstrated to be effective, avoids added morning heating, and is approved by the *authority having jurisdiction*.

   3.1. Summer mode shall be activated when outdoor air temperature exceeds 70ºF (21ºC) and shall continue uninterrupted until deactivated when outdoor air temperature falls below 45ºF (7ºC). During summer mode, the occupied cooling *set point* shall be set 1ºF (0.6ºC) higher than normal and the occupied heating *set point* shall be reset 2ºF (1.1ºC) lower than normal.

   3.2. When all the following conditions exist, night flush shall be activated:

      3.2.1. Summer mode is active in accordance with item 3.1.

      3.2.2. Outdoor air temperature is 5ºF (2.8ºC) or more below indoor average zone temperature.

      3.2.3. Indoor average zone temperature is greater than morning occupied heating *set point*.

      3.2.4. In climate zones 0A through 3A, outdoor dewpoint is below 50ºF (10ºC) or outdoor air enthalpy is less than indoor air enthalpy.

      3.2.5. Local time is between 10:00 pm and 6:00 am.

   3.3. When night flush is active,*automatic* night flush controls shall operate outdoor air *economizers* at low fan speed not exceeding 66 percent during the unoccupied period with *mechanical cooling* and heating locked out.

TABLE C407.2(1) REQUIREMENTS FOR TOTAL SIMULATED BUILDING PERFORMANCE

SECTION [a]	TITLE
Envelope	
C401.3	*Building thermal envelope* ~~Thermal envelope~~ certificate
C402.2.1.1	Joints staggered
C402.2.1.2	Skylight curbs
C402.2.6	Insulation of radiant heating system
C402.6	Air leakage—*building thermal envelope* ~~thermal envelope~~
Mechanical	
C403.1.1	Calculation of heating and cooling loads
C403.1.2	Data centers
C403.2	System design
C403.3	Heating and cooling equipment efficiencies
C403.4	Thermostatic controls
C403.4.2	Off-hour controls
C403.4.7	HVAC system controls for operable openings to the outdoors
C403.5.5	Economizer fault detection and diagnostics
C403.7, except C403.7.4.1	Ventilation and exhaust systems
C403.8, except C403.8.6	Fan and fan controls
C403.9	Large-diameter ceiling fans
C403.12, except C403.12.3	Refrigeration equipment performance
C403.13	Construction of HVAC system elements
C403.14	Mechanical systems located outside of the building thermal envelope
C404	Service water heating
C405, except C405.3	Electrical power and lighting systems
C406.1.2	Additional renewable and load management credit requirements
C408	Maintenance information and system commisioning

Thermal envelope should be struck here.

a. Reference to a code section includes all the relative subsections except as indicated in the table.

C409.6.1.4 Building Thermal Envelope Components. *Building thermal envelope* ~~Building envelope~~ components modeled in the standard reference design and the proposed design shall comply with the requirements of this Section.

C503.1 General. *Alterations* to any *building* or structure shall comply with the requirements of Section C503. *Alterations* shall be such that the existing *building* or structure is not less conforming to the provisions of this code than the existing *building* or structure was prior to the *alteration*. *Alterations* to an existing *building*, *building* system or portion thereof shall conform to the provisions of this code as those provisions relate to new construction without requiring the unaltered portions of the existing *building* or *building* system to comply with this code. *Alterations* shall not create an unsafe or hazardous condition or overload existing *building* systems.

Exception: The following *alterations* need not comply with the requirements for new construction, provided that the energy use of the building is not increased:

1. Storm windows installed over existing *fenestration*.
2. Surface-applied window film installed on existing single-pane *fenestration* assemblies reducing solar heat gain, provided that the code does not require the glazing or *fenestration* to be replaced.
3. *Roof recover*.
4. Roof replacement where roof assembly insulation is integral to or located below the structural roof deck.
5. *Air barriers* shall not be required for *roof recover* and roof replacement where the *alterations* or renovations to the building do not include *alterations*, renovations or *repairs* to the remainder of the *building thermal envelope* ~~building envelope~~.
6. An existing building undergoing alterations that complies with Section C407.

C503.2 Building thermal envelope. Alterations of existing *building thermal envelope* assemblies shall comply with this section. New *building thermal envelope*~~building envelope~~ assemblies that are part of the *alteration* shall comply with Section C402 . An area-weighted average *U*-factor for new and altered portions of the *building thermal envelope* shall be permitted to satisfy the *U*-factor requirements in Table C402.1.4. The existing *R*-value of insulation shall not be reduced or the *U*-factor of a *building thermal envelope* assembly be increased as part of a *building thermal envelope* alteration except where complying with Section C407.

Exception: Where the existing building exceeds the fenestration area limitations of Section C402.5.1 prior to alteration, the building is exempt from Section C402.5.1 provided that there is no increase in fenestration area.

C503.6 Additional energy efficiency credits. *Alterations* shall comply with measures from Sections C406.2 and C406.3 to achieve not less than 10 percent the number of required efficiency credits from Table C406.1.1 based on building occupancy group and *climate zone*. Where a project contains multiple occupancies, credits in Table C406.1.1 from each building occupancy shall be weighted by the gross floor area to determine the weighted average project energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of this section.

Exceptions:

1. *Alterations* that include replacement of no more than one of the following:

   1.1 HVAC unitary systems or HVAC central heating or cooling equipment serving the *work area* of the *alteration*.

   1.2 Water heating equipment serving the *work area* of the alteration.

   1.3 50 percent or more of the lighting fixtures in the *work area* of the alteration.

   1.4 50 percent or more of the area of interior surfaces of the *building thermal envelope*~~thermal envelope~~ in the *work area* of the alteration.

   1.5 50 percent or more of the building's *exterior wall envelope*, including fenestration.

2. *Alterations* to *buildings* in Utility and Miscellaneous Group U, Storage Group S, Factory Group F, High-Hazard Group H.
3. *Alterations* that do not contain conditioned space.
4. Portions of *buildings* devoted to manufacturing or industrial use.
5. *Buildings* in Climate Zone 0A.
6. *Alterations* that are permitted with an *addition* complying with Section C502.3.7.
7. *Alterations* that comply with Section C407.

C504.2 Application. For the purposes of this code, the following shall be considered to be repairs:

1. Glass-only replacements in an existing sash and frame.
2. *Roof repairs*.
3. Air barriers shall not be required for *roof repair* where the repairs to the building do not include *alterations*, renovations or *repairs* to the remainder of the *building thermal envelope*~~building envelope~~.
4. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided that an existing vestibule that separates a conditioned space from the exterior shall not be removed.
5. *Repairs* where only the bulb, the ballast or both within the existing luminaires in a space are replaced, provided that the replacement does not increase the installed interior lighting power.

C505.2 Energy use intensities. *Building thermal envelope*~~Building envelope~~, space heating, cooling, ventilation, lighting and service water heating shall comply with Sec-tions C505.2.1 through C505.2.4.

Exceptions:

1. Where it is demonstrated by analysis approved by the *code official* that the change will not increase energy use intensity.
2. Where the occupancy or use change is less than 5,000 square feet (464 m^2) in area.

C505.2.1 Building thermal envelope. Where a *change of occupancy* or use is made to a whole building that the results in fenestration area greater than the maximum fenestration area allowed by Section C402.4.1, the *building* shall comply with Section C402.1.5, with a proposed UA that shall not be greater than 110 percent of the target UA.

Exception: Where the *change of occupancy* or use is made to a portion of the *building*, the new occupancy is exempt from Section C402.4.1 provided that there is not an increase in fenestration area.

Reason: "Building thermal envelope" is a defined term in the IECC, but "building envelope" and "thermal envelope" are not defined. This proposal

attempts to standardize terminology throughout the commercial provisions by replacing all instances of "building envelope" and "thermal envelope" with the defined term "building thermal envelope." Within the commercial provisions of the First Public Comment Draft there are twenty-five uses of "building envelope" and twelve uses of "thermal envelope" that have been changed. If there are technically valid reasons to retain existing terminology in specific situations, please consider amending this proposal for those sections, as necessary.

Cost Impact: The code change proposal will neither increase nor decrease the cost of construction.
This proposal modifies terminology without intending to make technical changes. Therefore, there will be no impact on cost of construction.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-094-22 C402.1 clean-up
CDP ID #	720
Code	IECC CE
Code Section(s)	C402.1
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: Editorial clean-up of section references and titles for prescriptive U-factor, R-value, and component performance methods
Recommendation	**Approve as modified** Modification: Revise as follows: **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 C401.2.1 shall 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 U-, C- and F-factor based method of~~ Section C402.1.2; ~~the R-value based method of~~ Section C402.1.3; or ~~the component performance method alternative of~~ Section C402.1.4. Where the total area of the through-wall penetrations of mechanical equipment is greater than 1 percent of the opaque above-grade wall area, the building thermal envelope shall comply with Section C402.1.2.4. <ANY TEXT IN ORIGINAL PROPOSAL THAT IS NOT SHOWN REMAINS UNCHANGED>
Vote	**Approve as modified** 14-1-2
Recommendation Date	12/1/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	

Copyright © 2021 International Code Council, Inc.

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-095-22 C402.1 fenestration clean-up
CDP ID #	721
Code	IECC CE
Code Section(s)	C402.1
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: Clean-up and move requirements related to fenestration into one place (Item 4 of list) and add one missing section reference
Recommendation	**Approve as modified** Modification: 4. Fenestration in building envelope assemblies shall comply with Section C402.5. ~~Alternatively, where~~ buildings have a vertical fenestration area or skylight area ~~exceeding~~ greater than that allowed in Section C402.5, the building and *building thermal envelope* shall comply with Item 2 of Section C401.2.1 ~~or Section C401.2.2~~, or Section C402.1.4. (see meeting edits PDF)
Vote	**Approve as modified** 16-0-1
Recommendation Date	12/1/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-108-22 Relocate sections in C402.1.2
CDP ID #	724
Code	IECC CE
Code Section(s)	C402.1.2.2
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: move sections related to U-factor determination under section for U-factor determination and change title to remove reference to thermal resistance to be consistent focus on U-factors
Recommendation	**Approve as modified** Modification: Changed section numbers from: C402.1.2.1.5, C402.1.2.1.6, and C402.1.2.1.7 To: C402.1.2.1.4, C402.1.2.1.5, and C402.1.2.1.6
Vote	**Approve as modified** 16-0-1
Recommendation Date	12/1/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-110-22 various errata
CDP ID #	866
Code	IECC CE
Code Section(s)	C402.1.2.3 table
Location	
Proponent	Thomas Culp culp@birchpointconsulting.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement:** Corrects various errata per proponent's reasoning statement, including: • In footnote c of Table C402.1.2.3, remove "urethan or" so it is not material specific and parallels footnote b. Or at a minimum, correct the spelling of "urethane." • In item 3 of C402.7.4, "coved" should be "covered" • In C402.5.5 Doors, the reference to C402.4.3 should be changed to C402.5.3 due to section renumbering. • In C406.2.1.1, it should refer just to ASHRAE 90.1 Appendix C, not ASHRAE 90.1-2019 Appendix C. The proper year will be in Chapter 6 • Reference Standards, and will be 2022, not 2019. • In C505.2.1, the reference to sections C402.4.1 should be changed to C402.5.1 due to section renumbering in chapter 4. • Also, in the pdf version, the titles for C402.5.1.1 and C402.5.1.2 are repeated twice. Remove first one. But this is not showing up in cdpAccess, so maybe fixed already?.
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 16-0-1
Recommendation Date	11/17/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	

Copyright © 2021 International Code Council, Inc.

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-128-22 Air barrier editorial clean aup
CDP ID #	715
Code	IECC CE
Code Section(s)	C402.6
Location	base
Proponent	Emily Lorenz emilyblorenz@gmail.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: clean-up of some terminology related to the use of "air leakage" and general grammar
Recommendation	**Approve as modified** Modification: **C402.6.1 Air barriers.** A continuous *air barrier* shall be provided throughout the *building thermal envelope*. The *air barrier* is permitted to be located ~~any combination of~~ inside, outside, or within the *building thermal envelope*. The *air barrier* shall comply with Sections C402.6.1.2, and C402.6.1.3. The *air leakage* performance of the *air barrier* shall be verified in accordance with Section C402.6.2. <ANY TEXT IN ORIGINAL PROPOSAL THAT IS NOT SHOWN REMAINS UNCHANGED>
Vote	**Approve as modified** 15-0-1
Recommendation Date	12/1/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-133-22 Whole building test method exception
CDP ID #	869
Code	IECC CE
Code Section(s)	C402.6.2.1
Location	
Proponent	Anjana Agarwal anjana@theadhocgroup.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** Equivalent approved methods are already included in the primary paragraph and this proposal does not add clarity.
Recommendation	**Disapprove**
Vote	**Disapprove** 8-1-3 (CNV)
Recommendation Date	3/16/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-134-22 Dwelling unit testing unit
CDP ID #	892
Code	IECC CE
Code Section(s)	C402.6.2.2
Location	base
Proponent	Theresa Weston holtweston88@gmail.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason statement:** Per proponent's reasoning statement, This proposal updates to the text to use defined terms "testing unit enclosure area."
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 16-0-1
Recommendation Date	11/17/22
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-149-22 Exterior wall envelope terminology
CDP ID #	719
Code	IECC CE
Code Section(s)	C503.6
Location	base
Proponent	Jay Crandell jcrandell@aresconsulting.biz
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** cleans up wording using existing defined terms and removes an unneeded definition that is used only once in this one exception item and potentially conflicts with "exterior wall covering" defined term in the building code.
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 12-1-1 (CNV)
Recommendation Date	3/16/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-151-22 Update ASTM standards
CDP ID #	875
Code	IECC CE
Code Section(s)	Chapter 6
Location	base
Proponent	Theresa Weston holtweston88@gmail.com
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason:** it keeps the reference standards up to date with the most recent version.
Recommendation	**Approve as submitted**
Vote	**Approve as submitted** 12-0-1 (CNV)
Recommendation Date	3/16/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-209-22 Solar reflectance alignment
CDP ID #	613
Code	IECC CE
Code Section(s)	C409.6.1.4.1
Location	base
Proponent	Aaron Phillips aphillips@asphaltroofing.org
Proposal Status	SC review
Subcommittee	CE Envelope
Subcommittee Notes	**Reason**: The proposed change align the requirements in C409 with changes in C402.
Recommendation	**Approve as modified** **Modification:** **C409.6.1.4.1 Roofs**. Roofs will be modeled with insulation above a steel roof deck. The roof U-factor and area shall be modeled as in the proposed design. If different roof thermal properties are present in a single block, an area weighted U-factor shall be used. Roof solar reflectance ~~absorptance~~ shall be modeled at 0.25 ~~0.75~~ ~~0.70~~ and emittance at 0.90. **Exception:** For Climate Zones 0, 1, 2, and 3, solar reflectance ~~absorptance~~ and emittance shall be as specified in Section C402.4 and Table C402.4.
Vote	**Approve as modified** 13-0-1 (CNV)
Recommendation Date	3/16/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	

Copyright © 2021 International Code Council, Inc.

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-184-22 Off-site contract duration
CDP ID #	
Code	IECC CE
Code Section(s)	C405.15.2.2
Location	base
Proponent	Charles Eley
Proposal Status	SC review
Subcommittee	CE Electrical power, Lighting, Renewables
Subcommittee Notes	Reason statement: 15-year contract length is favorable for durability and for market stability.
Recommendation	APPROVE AS SUBMITTED
Vote	7 - 3 - 5
Recommendation Date	March 20, 2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-18-22 Additional Energy Credits for Non-Heat Pump Buildings
CDP ID #	
Code	IECC CE
Code Section(s)	C406.1.1.1, C406.1.1.2 and C502.3.7.1
Location	base
Proponent	Mike Waite mwaite@aceee.org
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal includes a 1.25 additional energy credit multiplier for non-heat pump new construction and addition projects.
Recommendation	Approve as modified (see attached)
Vote	Approve as modified – 3, Disapprove – 1, Abstain – 6
Recommendation Date	3/27/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-203-22 Additional energy efficiency credits
CDP ID #	933
Code	IECC CE
Code Section(s)	C503.6
Location	base
Proponent	Jack Bailey jbailey@oneluxstudio.com
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal clarifies the scope threshold where alteration projects are subject to obtaining C406 credits.
Recommendation	Approve as modified (See attached)
Vote	Approve as modified – 11, Disapprove – 0, Abstain - 1
Recommendation Date	3/27/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____x_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____

Copyright © 2021 International Code Council, Inc.

CED1-203-22

IECC: C406.1.3, C503.6, 503.6 (New)

2024 International Energy Conservation Code [CE Project]

Add new definition as follows:

SUBSTANTIAL IMPROVEMENT. Any *repair*, reconstruction, rehabilitation, *alteration*, *addition* or other improvement of a building or structure, the cost of which equals or ~~exceeds~~ is more than 50 percent of the market value of the structure before the improvement ~~or repair is started~~. ~~If~~ Where the structure has sustained *substantial damage*, as defined in the International Building Code, any repairs are considered substantial improvement regardless of the actual *repair* work performed. ~~The term~~ Substantial improvement does not~~, however,~~ include ~~either~~ the following:

1. ~~Any project for~~ ~~i~~ Improvement of a *building* required to correct ~~existing~~ health, sanitary or safety code violations ~~identified~~ ordered by the *building official*, or ~~and that are the minimum necessary to assure safe living conditions.~~
2. ~~Any a~~ *Alteration* of a ~~historic structure~~ *historic building* ~~provided that~~ where the *alteration* will not ~~preclude~~ affect the ~~structure's~~ building's ~~continued~~ designation as a ~~historic structure~~ *historic building*.

Revise as follows:

~~**C406.1.3 Substantial Alterations to Existing Buildings.** The *building envelope*, *equipment*, and *systems* in *alterations* to *buildings* exceeding~~

~~2~~

~~5000 square feet (46.5 m) of *gross conditioned floor area* shall comply with the requirements of Section C406.1.1 and C406.1.2 where the alteration includes replacement of two or more of the following:~~

~~1. HVAC unitary systems or HVAC central heating or cooling equipment serving the alteration area, not including ductwork or *piping*.~~

~~2. 80% or more of the lighting fixtures in the *alteration* area.~~

~~3. Building envelope components in the *alteration* area including new exterior cladding, fenestration, or insulation.~~

C503.6 Additional credit requirements for *Alterations*. ~~*Alterations* shall comply with measures from Sections C406.2 and C406.3 to achieve not less than 10 percent the number of required efficiency credits from Table C406.1.1 based on building occupancy group and *climate zone*. Where a project contains multiple occupancies, credits in Table C406.1.1 from each building occupancy shall be weighted by the gross floor area to determine the weighted average project~~

Copyright © 2021 International Code Council, Inc.

~~energy credits required. Accessory occupancies shall be included with the primary occupancy group for purposes of this section.~~ *Alterations* that are s*ubstantial improvements* shall comply with measures from Sections C406.2, Section C406.3, or both to earn the number of required credits specified in Table C406.1.1 based on *building* occupancy group and climate zone. Where a project contains multiple occupancies, credits specified in Table C406.1.1 for each *building* occupancy shall be weighted by the *gross conditioned floor area* to determine the weighted average credits required. Accessory occupancies, other than Groups F or H, shall be included with the primary occupancy group for the purposes of this section. ~~Credits shall be earned where all conditioned spaces in the *building* comply with the credit requirements.~~

Exceptions:

~~1. *Alterations* that include replacement of no more than one of the following:~~

~~1.1 HVAC unitary systems or HVAC central heating or cooling equipment serving the *work area* of the *alteration*.~~

~~1.2 Water heating equipment serving the *work area* of the alteration.~~

~~1.3 50 percent or more of the lighting fixtures in the *work area* of the alteration.~~

~~1.4 50 percent or more of the area of interior surfaces of the thermal envelope in the *work area* of the alteration.~~

~~1.5 50 percent or more of the building's *exterior wall envelope*, including fenestration.~~

1. Portions of *buildings* devoted to manufacturing or industrial use.
2. *Alterations* to *buildings* where the building after the *alteration* complies ~~that comply~~ with Section C407.
3. *Alterations* that do not contain conditioned space.
4. Portions of buildings devoted to manufacturing or industrial use.
5. *Alterations* that are permitted with an addition complying with Section C502.3.7.

Rationale:

This modification to the approach of CED1-203. A series of modifications to the original concept submitted for IECC-2024 have resulted in 3 consequences:

Copyright © 2021 International Code Council, Inc.

1. The alterations subject to the requirement have been narrowed substantially.
2. The requirements for the projects have become successively less stringent, requiring less efficiency improvements from the projects. The current requirements have been calibrated to ensure that enough credits from C406 will be available even for the least extensive alteration that met the threshold.
3. The language has become more complex to address technical issues.

This proposed modification pivots on the original concept to address these issues.

1. It is reasonable to assume that most of the projects that will be subject to these requirements will be projects that qualify as substantial improvements. Smaller projects can more easily be divided so that each major alteration to an energy system is on a separate permit. Therefore, it makes sense to simplify the trigger by making only alterations that qualify as substantial alterations subject to the requirements. Substantial Improvement is a defined term in the IBC and IEBC, so already is an established term and threshold in the I-Codes.
2. Substantial improvements have significant scope. It is therefore reasonable to require them to achieve more than the minimal number of credits required in the current draft. The requirement has been set at the credit requirement from Table C406.1.1, while still allowing credits from both C406.2 and C406.3. This means that projects will be required to achieve fewer credits than new buildings (since they are only subject to one of the credit tables), but will be able to achieve them in a more flexible way (since they will be able to choose from both the efficiency credits in C406.2 and the other credits in C406.3).
3. The result is a much simpler and straightforward requirement, with fewer opportunities for unintended consequences, that will also likely save more energy.

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-205-22 Appendix CC update
CDP ID #	928
Code	IECC CE
Code Section(s)	CC103.1 Table
Location	appendix
Proponent	Reid Hart reid.hart.pe@gmail.com
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal would replace the values in the Appendix CC prescriptive renewable energy requirement table based on PNNL's progress indicator analysis. However, the analysis has not been completed.
Recommendation	Disapprove
Vote	Approve – 0, Disapprove – 10, Abstain – 2
Recommendation Date	3/27/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____x_____
Consensus Committee	
Committee Response	

Copyright © 2021 International Code Council, Inc.

Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-15-22 Appendix CD Update
CDP ID #	
Code	IECC CE
Code Section(s)	CD101.1 and CD101.2
Location	Appendix
Proponent	Duane Jonlin Duane.Jonlin@Seattle.gov
Proposal Status	SC review
Subcommittee	CE Model, Metrics
Subcommittee Notes	This proposal updates "placeholder values" for the prescriptive pathway additional energy credit requirement and the performance path PAEC multiplier based on input from PNNL and others. It also incorporates two editorial changes.
Recommendation	Approve as modified (see attached)
Vote	Approve as modified – 10, Disapprove – 0, Abstain – 2
Recommendation Date	3/27/23
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

CECD1-15-22

IECC: CD101.1, CD101.2

Proponents: Greg Eades, representing **IECC Modeling, Whole Building Metrics, Zero Energy Subcommittee**

2024 International Energy Conservation Code [CE Project]

Revise as follows:

CD101.1 Prescriptive compliance. Where compliance is demonstrated using the prescriptive compliance option in Section C401.2.1, the additional efficiency credits required by Section C406.1 shall be ~~50 percent higher than~~ 1.4 times the number required by Section ~~Table~~ C406.1.1.

CD101.2 Total building performance compliance. Where compliance is demonstrated using the total building performance option in Section C401.2.1, the percentage of annual energy cost (PAEC), applied to standard reference design referenced in Equation 4-32~~23~~, shall be multiplied by ~~0.98~~ 0.97.

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-179-22 Remove Appendix CE
CDP ID #	908
Code	IECC CE
Code Section(s)	Appendix CE
Location	Appendix
Proponent	Ted Williams <NGDLLC@outlook.com>
Proposal Status	SC review
Subcommittee	CE HVACR and Water Heating Subcommittee
Subcommittee Notes	**Reason Statement**: Providing more guidance for the jurisdictions wishing to adopt the stretch code is appropriate.
Recommendation	**Disapprove**
Vote	**Disapprove** 6-5-1
Recommendation Date	02/23/2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-178-22 Remove Total System Performance Compliance Path
CDP ID #	902
Code	IECC CE
Code Section(s)	409
Location	base
Proponent	Ted Williams <NGDLLC@outlook.com>
Proposal Status	SC review
Subcommittee	CE HVACR and Water Heating Subcommittee
Subcommittee Notes	**Reason Statement**: TSPR is an optional path to comply, and not necessarily more efficient than federal minimums
Recommendation	**Disapprove**
Vote	**Disapprove** 8-1-1
Recommendation Date	01/12/2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-176-22 Reduce Service Water Heating DR Credit When Required in Section 404
CDP ID #	699
Code	IECC CE
Code Section(s)	C406.3.7 G06
Location	base
Proponent	Reid Hart, (reid.hart.pe@gmail.com)
Proposal Status	SC review
Subcommittee	CE HVACR and Water Heating Subcommittee
Subcommittee Notes	**Reason Statement**: Ensures that double credit is not given where baseline DR requirements exist. The modified proposal is clearer than the original.
Recommendation	**Approve as modified** **See modified language below**
Vote	**Approve as modified** 11-0-2
Recommendation Date	03/23/2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

CED1-176-22 As Modified

Proponents: Reid Hart, representing Pacific Northwest National Laboratory (**reid.hart.pe@gmail.com**)

2024 International Energy Conservation Code [CE Project]

Revise as follows:

C406.3.7 G06 SWH Energy Storage. Where SHW is heated by electricity, automatic load management controls that comply with ANSI/CTA-2045-B shall preheat stored SHW before the peak period and suspend electric water heating during the peak period. Storage capacity shall be provided by either:

1. Preheating water above 140°F (60°C) delivery temperature with at least 1.34 kWh of energy storage per kW of water-heating capacity. Tempering valves shall be provided at the water heater delivery location.
2. Providing additional heated water tank storage capacity above peak SHW demand with equivalent peak storage capacity to item 1. ~~Where heat pump water heating is used, the credits achieved shall be 1/3 of the credits in Tables C406.3(1) through C406.3(9).~~

Credits achieved for measure G06 shall be calculated using Equation 4-32 ~~as follows~~:

~~1. Where a controlling entity does not make a *demand response signal* available to the *building* or where water heaters are not required to have *demand responsive controls* by Section C404.10, credits shall be the full value listed in Tables C406.3(1) through C406.3(9).~~

~~2. Where a controlling entity does make a demand response signal available to the building and where water heaters are not required to have demand responsive controls by Section C404.10, credits shall be 50 percent of the value listed in Tables C406.3(1) through C406.3(9).~~

~~3. Where heat pump water heating is used, the credits achieved shall be 33 percent of the credits calculated in item 1 or 2.~~

$EC_{G06\_ach} = EC_{G06\_base} * EC_{G06\_adj}$ (Equation 4-32)

EC_{G06_ach} = SWH Energy Storage credit achieved for Project
EC_{G06_base} = G06 Base energy credit from Section 406.3
EC_{G06_adj} = energy credit adjustment factor from Table C406.3.7

Table C406.3.7
Energy Credit Adjustment Based on Use of Heat Pump Water Heater or Demand Response

Demand Response Ready per C404.10	*Demand Response Signal* Available[a]	Has HPWH	EC_{G06_Adj}[b]
No	-NA-	No	100%
No	-NA-	Yes	33%
Yes	No	No	50%
Yes	No	Yes	17%
Yes	Yes	-NA-	0%

a. "*Demand Response Signal* Available" is "Yes" where a controlling entity currently makes a *demand response signal* available to the building.

b. The lower values of $ECG_{06\ adj}$ in this column apply when no less than 67 percent of the whole-building design

Copyright © 2021 International Code Council, Inc.

end use service water heating requirements are met using only heat pump heating at the conditions described in C406.2.3.1.2.

Reason: The credit adjustments added here account for the difference between a capability being required in the base code and full implementation though the credit measure. Full credit is given here when either the base code requirement does not apply or there is not a demand response program available. Half credit is given when there is a demand response program and the base code requires compatible demand response controls.

A review of the logic changes the adjustment to a reduction whenever controls are required in C404.10. It also reorganizes adjustment factors into a table rather than including them in text based on feedback of the HVAC/SHW subcommittee.

Cost Impact: The code change proposal will neither increase nor decrease the cost of construction.
The changes here are in response to base code changes and allow for partial credit when there is a capability requirement in the base code that is fully implemented here.

Workgroup Recommendation

Proposal # 699

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CED1-161-22 Reduce DR Energy Credits for HVAC when required in C403
CDP ID #	661
Code	IECC CE
Code Section(s)	C403.4.6 & C406.3.3 G02
Location	Base
Proponent	Reid Hart reid.hart.pe@gmail.com)
Proposal Status	SC review
Subcommittee	CE HVACR and Water Heating Subcommittee
Subcommittee Notes	**Reason Statement**: Standing on the reason statement with the proposal but with clearer language.
Recommendation	**Approve as modified** **See updated proposal below**
Vote	**Approve as modified** 8-3-2
Recommendation Date	02/15/2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

CED1-161-22

Proponents: Reid Hart, rep**.** Pacific Northwest National Laboratory (reid.hart.pe@gmail.com); Michael Tillou, representing Pacific Northwest National Laboratory (michael.tillou@pnnl.gov); Ellen Franconi, representing Pacific Northwest National Laboratory (ellen.franconi@pnnl.gov)

2024 International Energy Conservation Code [CE Project]

Revise as follows:

C403.4.6 Demand responsive controls. Buildings shall be provided with *demand responsive controls* capable of executing the following actions in response to a demand response signal:

1. Automatically increasing the zone operating cooling set point by the following values: 1°F (0.5°C), 2°F (1°C), 3°F (1.5°C), and 4°F (2°C).
2. Automatically decreasing the zone operating heating set point by the following values: 1°F (0.5°C), 2°F (1°C), 3°F (1.5°C), and 4°F (2°C).

Where a *demand response signal* is not available the heating and cooling system controls shall be capable of performing all other functions. Where thermostats are controlled by direct digital control including, but not limited to, an energy management system, the system shall be capable of *demand responsive control* and capable of adjusting all thermal set-points to comply. The demand responsive controls shall comply with either Section C403.4.6.1 or Section C403.4.6.2

Exceptions:

1. Group I occupancies
2. Group H occupancies
3. Controls serving data center systems
4. Occupancies or applications requiring precision in indoor temperature control as approved by the code official
5. Controls that serve only fossil fuel equipment
6. Buildings that comply with Load Management measure G02 in Section C406.3.3

C406.3.3 G02 HVAC Load Management. Automatic load management controls shall be configured as follows:

1. **Cooling Temperature Shift:** Where electric cooling is in use ~~to~~ controls shall gradually increase the cooling setpoint by at least 3°F (1.7°C) over a minimum of three hours or reduce effective cooling capacity to 60% of installed capacity during the peak period or adjust cooling temperature setpoint as described in C403.6.1.
2. **Heating Temperature Shift:** Where electric heating is in use ~~to~~ controls shall gradually decrease the heating setpoint by at least 3°F (1.7°C) over a minimum of three hours or reduce effective heating capacity to 60% of installed capacity during the peak period or adjust heating temperature setpoint as described in C403.6.1.
3. **Ventilation Shift:** Where HVAC systems ~~are serving~~ serve multiple zones and have less than 70 percent outdoor air required, include controls that provide excess outdoor air preceding the peak period and reduce outdoor air by at least 30 percent during the peak period, in accordance with ASHRAE Standard 62.1 Section 6.2.5.2 Short Term Conditions or provisions for *approved* engineering analysis in the International Mechanical Code Section 403.3.1.1, Outdoor Airflow Rate.

Copyright © 2021 International Code Council, Inc.

~~**Exception:** Single zone air conditioners and heat pumps that comply with the requirements of C403.4.6.1 shall be deemed to meet the control requirements of this section.~~

Credits achieved for measure G02 shall be calculated as follows:

1. ~~Where a *demand response signal* is not available for the *building* from a controlling entity or *demand responsive controls* are not required by Section C403.4.6, the full value of the G02 credits in Tables C406.3(1) through C406.3(9) shall be achieved.~~
2. ~~Where a *demand response signal* is available for the *building* from a controlling entity and *demand responsive controls* are required by Section C403.4.6, 50 percent of the G02 credits in Tables C406.3(1) through C406.3(9) shall be achieved.~~

$EC_{G02\_ach} = EC_{G02\_base} * EC_{G02\_adj}$ (Equation 4-30)

EC_{G02_ach} = SWH Energy Storage credit achieved for Project
EC_{G02_base} = G02 Base energy credit from Section 406.3
EC_{G02_adj} = energy credit adjustment factor from Table C406.3.3

Table C406.3.3
Energy Credit Adjustment Based on Use of Ventilation Shift or Demand Response

***Demand Response Signal* Available[a]**	**Demand Response Required by C403.4.6.1[b]**	**Includes Ventilation Shift[c]**	**EC_{G02_Adj}**
No	**No**	**Yes**	**100%**
No	**Yes**	**Yes**	**80%**
Yes	**No**	**Yes**	**80%**
Yes	**Yes**	**Yes**	**40%**
No	**No**	**No**	**70%**
No	**Yes**	**No**	**50%**
Yes	**No**	**No**	**50%**
Yes	**Yes**	**No**	**0%**

c. "*Demand Response Signal* Available" is "Yes" where a controlling entity makes a *demand response signal* available to the building.
d. If the exception is invoked in Section C403.4.6.1 for Buildings that comply with Load Management measure G02, then "Demand Response Required" is "Yes".
e. Ventilation shift controls as described in Section C406.3.3, item 3.

Reason: Providing an exception to HVAC demand response in Section C403.4.6 is appropriate

Copyright © 2021 International Code Council, Inc.

where buildings comply with energy credit G02 in Section C406.3.3. G02 provides a generally superior method of control including gradually ramping temperature setpoints, ventilation deferment, and options for capacity reduction rather than temperature control. Further, G02 is not restricted to only open ADR methods, but can work with local building demand monitoring or a scheduled peak approach in smaller buildings. Including an exception for C403.4.6 also avoids the perception that a building must comply with both (possibly conflicting) requirements, as measures in C406 are chosen by the building designer to meet a required credit level. To coordinate with C403.4.6 requirements, where an openADR demand response signal is available from the serving utility or where required by C403.4.6, the credits are reduced by half.

Cost Impact: The code change proposal will neither increase nor decrease the cost of construction. In some cases the cost of construction is reduced, as the exception allows clear compliance with either requirement and not both.

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-13-22 Clarify Hydronic Heat Recovery Hospital Cooling Systems
CDP ID #	1520
Code	IECC CE
Code Section(s)	C403.11.6
Location	Base
Proponent	John Bade (johnbade@2050partners.com)
Proposal Status	SC review
Subcommittee	CE HVACR and Water Heating Subcommittee
Subcommittee Notes	**Reason Statement**: It harmonizes with ASHARE 90.1-22.
Recommendation	**Approve**
Vote	**Approve 11-0-1**
Recommendation Date	03/09/2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

CECD1-13-22

Proponents: 13Bade (johnbade@2050partners.com

Revise as follows:

C403.11.6 Heat recovery for space conditioning in healthcare facilities.
Where heating water is used for space heating, a ~~condenser~~ heat pump chiller meeting the requirements of Table C403.3.2(15) for heat recovery ~~system~~ and uses the cooling *system* return water as the heat source shall be installed where ~~provided that all of~~ the following are true:

1. The building is a Group I-2, Condition 2 occupancy.
2. The total design chilled water capacity for the Group I-2, Condition 2 occupancy, either air cooled or water cooled, required at cooling design conditions exceeds 3,600,000 Btu/h (1100 kw) of cooling.
3. Simultaneous heating, including *reheat*, and cooling occurs above 60°F (16°C) outdoor air temperature.

The ~~required~~ heat recovery system shall have a cooling capacity ~~that is~~ of not less than 7 percent of the total design chilled water capacity of the Group I-2, Condition 2 occupancy at peak design conditions.

Exceptions:
1. Buildings that provide 60 percent or more of their reheat energy from on-site renewable energy or other site-recovered energy. *On-site renewable energy* used to meet Sections C405.15.1 or C406.3.1 shall not be used to meet this exception.
2. Buildings in Climate Zones 5C, 6B, 7, and 8.

Reason Statement:

Section C403.11.6, “Heat Recovery for Space Conditioning in Healthcare Facilities,” requires heat recovery in most acute inpatient hospitals. The existing language refers to “condenser heat recovery.” The heat source was intended to be the chilled water return, and the economic justification was built on that. The diagram shows a parallel and in-series system. Both are acceptable ways to meet the requirement.

Copyright © 2021 International Code Council, Inc.

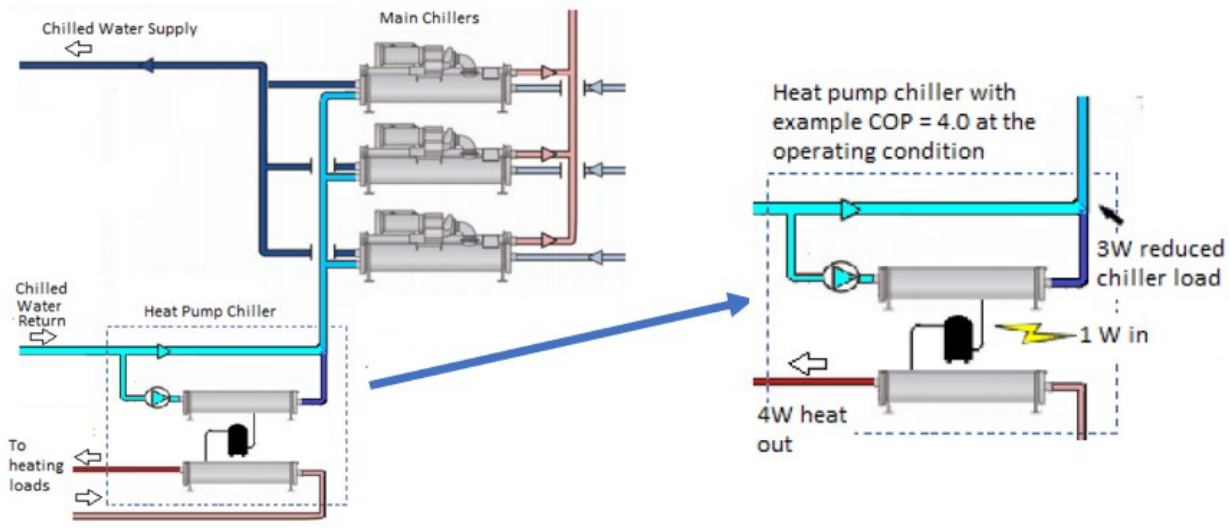

Figure 1. Heat pump chiller piped in series

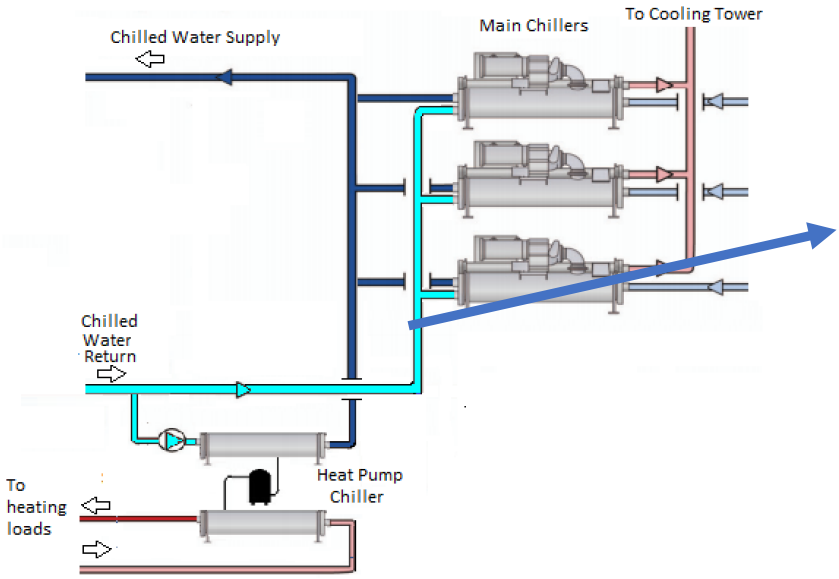

Figure 2. Heat pump chiller piped in parallel

The term “condenser heat recovery” has led some users to believe that the heat source can be water leaving the main chiller condenser. While this method does recover heat, it does not reduce the load on the chillers. Using the chilled return water as the heat source saves much more energy.

Reviewers should know that the misunderstanding extends to the ASHRAE 90.1-2019 User’s Manual. The intent of the language is not correctly described. This discrepancy will be addressed.

ASHRAE SSPC 90.1 passed addendum cu, which is nearly identical to this proposal. It was included in the 2022 version of the standard. The addendum can be found at this link:

Copyright © 2021 International Code Council, Inc.

https://www.ashrae.org/file%20library/technical%20resources/standards%20and%20guidelines/standards%20addenda/90_1_2019_cu_20220630.pdf

Economic justification:

This addendum clarifies existing requirements. The economic justification was completed when Section 6.5.6.3 was created for the 2019 version of ASHRAE 90.1, and the same rationale was used for IECC 2021. The justification was based on recovering heat from the chilled water return.

Cost of construction:

This proposal neither increases nor decreases the cost of construction. The exception for site recovered energy was removed because there is no first cost increase to use the chilled water return system as the heat source rather than the chiller condenser water. The exception for on-site renewable energy was removed because there are now separate requirements for on-site renewable energy elsewhere in the standard.

Copyright © 2021 International Code Council, Inc.

International Energy Conservation Code
Code Change Proposal Tracking Sheet

Proposal #	CECD1-17-22 Delete Fan Power Limits
CDP ID #	1522
Code	IECC CE
Code Section(s)	IECC: C403.8.1, TABLE C403.8.1(1), TABLE C403.8.1(2), TABLE C403.8.1(3), TABLE C403.8.1(4), C403.8.1.1, C403.8.1.2, C403.8.2, C403.8.3, C403.8.4, C403.8.5, TABLE C403.8.5, C403.8.6, C403.8.6.1, TABLE C403.8.6.1
Location	base
Proponent	Laura Petrillo-Groh <LPetrillo-Groh@ahrinet.org>
Proposal Status	SC review
Subcommittee	CE HVACR and Water Heating Subcommittee
Subcommittee Notes	**Reason Statement**: The same language was approved by ASHRAE SSPC 90.1, but not in time for the 2022 version. To keep the codes in alignment, IECC 2024 should keep the language that is in IECC 2021.
Recommendation	**Approve as Modified**
Vote	**Approve as Modified** 10-0-3
Recommendation Date	03/09/2023
Next Step	To Subcommittee To Advisory Group_____ To Consensus Committee_____X_____
Consensus Committee	
Committee Response	
Vote	Affirmative_____ Negative_____ Table_____ To Subcommittee_____
Date	

Copyright © 2021 International Code Council, Inc.

CECD1-XX-22 Fan Power

IECC: C403.8.1, TABLE C403.8.1(1), TABLE C403.8.1(2), TABLE C403.8.1(3), TABLE C403.8.1(4), C403.8.1.1, C403.8.1.2, C403.8.2, C403.8.3, C403.8.4, C403.8.5, TABLE C403.8.5, C403.8.6, C403.8.6.1, TABLE C403.8.6.1

Proponents: Laura Petrillo-Groh, representing AHRI (lpetrillo-groh@ahrinet.org)

2024 International Energy Conservation Code [CE Project]

Revise as follows:

C403.8.1 Allowable Fan horsepower. ~~For each fan system serving an occupied space or other enclosed space that includes one or more fans or fan arrays with fan electrical input power greater than 1 kW, fan system electrical input power determined per Section C403.8.1.2 at the fan system design airflow shall not be greater than the limit is calculated in accordance with Section C403.8.1.1. This section does not apply to fans service heat rejection equipment.~~ Each HVAC system having a total fan system motor nameplate horsepower greater than 5 hp (3.7 kW) at fan system design conditions shall not be greater than the allowable fan system motor nameplate hp (Option 1) or fan system bhp (Option 2) shown in Table C403.8.1(1). This includes supply fans, exhaust fans, return/relief fans, and fan-powered terminal units associated with systems providing heating or cooling capability. Single-zone variable air volume systems shall comply with the constant volume fan power limitation.

Exceptions:

1. Hospital, vivarium and laboratory systems that utilize flow control devices on exhaust or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.

2. Individual exhaust fans with motor nameplate horsepower of 1 hp (0.746 kW) or less are exempt from the allowable fan horsepower requirement.

Add new text as follows:

~~**C403.8.2Motor nameplate horsepower.**~~

~~For each fan, the fan brake horsepower (bhp) shall be indicated on the construction documents and the selected motor shall be not larger than the first available motor size greater than the following: 1. For fans less than 6 bhp (4476 W), 1.5 times the fan brake horsepower.~~

TABLE C403.8.1(1)
FAN POWER LIMITATION

	LIMIT	CONSTANT VOLUME	VARIABLE VOLUME
Option 1: Fan system motor name plate hp	Allowable nameplate motor hp	hp ≤ CFMs × 0.0011	hp ≤ CFMs × 0.0015
Option 2: Fan system bhp	Allowable fan system bhp	bhp ≤ CFMs × 0.00094 + *A*	bhp ≤ CFMs × 0.0013 + *A*

For SI: 1 bhp = 735.5 W, 1 hp = 745.5 W, 1 cfm = 0.4719 L/s.
where:
CFMs =The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.
hp = The maximum combined motor nameplate horsepower.
bhp = The maximum combined fan brake horsepower.
A = Sum of [*PD* × CFM$_D$ / 4131].
where:
PD = Each applicable pressure drop adjustment from Table C403.8.1(2) in. w.c.
CFM$_D$ = The design airflow through each applicable device from Table C403.8.1(2) in cubic feet per minute.

TABLE C403.8.1(2)
FAN POWER LIMITATION PRESSURE DROP ADJUSTMENT

DEVICE	ADJUSTMENT
Credits	
Return air or exhaust systems required by code or accreditation standards to be fully ducted, or systems required to maintain air pressure differentials between adjacent rooms	0.5 inch w.c. (2.15 inches w.c. for laboratory and vivarium systems)

Return and exhaust airflow control devices	0.5 inch w.c.
Exhaust filters, scrubbers or other exhaust treatment	The pressure drop of device calculated at fan system design condition
Particulate filtration credit: MERV 9 thru 12	0.5 inch w.c.
Particulate filtration credit: MERV 13 thru 15	0.9 inch w.c.
Particulate filtration credit: MERV 16 and greater and electronically enhanced filters	Pressure drop calculated at 2 times the clean filter pressure drop at fan system design condition.
Carbon and other gas-phase air cleaners	Clean filter pressure drop at fan system design condition.
Biosafety cabinet	Pressure drop of device at fan system design condition.
Energy recovery device, other than coil runaround loop	For each airstream, (2.2 × energy recovery effectiveness - 0.5) inch w.c.
Coil runaround loop	0.6 inch w.c. for each airstream.
Evaporative humidifier/cooler in series with another cooling coil	Pressure drop of device at fan system design conditions.
Sound attenuation section (fans serving spaces with design background noise goals below NC35)	0.15 inch w.c.
Exhaust system serving fume hoods	0.35 inch w.c.
Laboratory and vivarium exhaust systems in high-rise buildings	0.25 inch w.c./100 feet of vertical duct exceeding 75 feet.
Deductions	
Systems without central cooling device	- 0.6 inch w.c.
Systems without central heating device	- 0.3 inch w.c.
Systems with central electric resistance heat	- 0.2 inch w.c

For SI: 1 inch w.c. = 249 Pa, 1 inch = 25.4 mm, 1 foot = 304.8 mm.

w.c. = Water Column, NC = Noise Criterion

TABLE C403.8.1(1) SUPPLY FAN POWER ALLOWANCES (W/CFM)

Multi-Zone VAV Fan System Airflow (cfm)[a]	All Other Fan Systems Airflow (cfm)					
Air system Component	<5,000	5,000 to <10,000	≥10,000	<5,000	5,000 to <10,000	≥10,000
W/cfm						
Supply System Base Allowance for each fan system	0.413	0.472	0.480	0.243	0.267	0.248
Particle filtration (select all that apply)						
Filter not higher than MERV 12	0.094	0.079	0.073	0.097	0.084	0.075
MERV 13 to MERV 16 filter	0.210	0.177	0.165	0.217	0.185	0.168
HEPA filter	0.347	0.292	0.277	0.357	0.304	0.278
Heating (select all that apply)						
Hydronic heating coil (central)	0.047	0.050	0.055	0.049	0.053	0.057
Electric heat	0.047	0.050	0.055	0.049	0.042	0.038
Gas or oil furnace <90% Et or <90% AFUE	0.071	0.060	0.073	0.061	0.063	0.075
Gas or oil furnace ≥ 90% Et or ≥90% AFUE	0.117	0.099	0.092	0.122	0.104	0.094
Cooling and dehumidification (select all that apply)						
Hydronic/DX cooling coil, or heat pump coil (wet) [Healthcare facilities can select twice]	0.141	0.118	0.110	0.146	0.125	0.112
Fluid economizer coil	0.141	0.118	0.110	0.146	0.125	0.112
Desiccant system-solid or liquid	0.164	0.138	0.128	0.170	0.145	0.131
Hot gas reheat coil	0.047	0.040	0.037	0.049	0.042	0.038
Series energy recovery	0.141	0.118	0.110	0.146	0.125	0.112
Evaporative humidifier/cooler in series with a cooling coil. Value shown is allowed W/cfm per 1.0 in. wg. Determine pressure loss (in. wg.) at the lesser of 400 fpm or maximum velocity allowed by the manufacturer. [Calculation required[b]]	0.233	0.196	0.184	0.241	0.205	0.186
Energy recovery						
Enthalpy Recovery Ratio ≥0.50 and <0.55	0.141	0.118	0.110	0.146	0.125	0.112
Enthalpy Recovery Ratio ≥0.55 and <0.60	0.166	0.140	0.130	0.172	0.147	0.133
Enthalpy Recovery Ratio ≥0.60 and <0.65	0.191	0.161	0.151	0.198	0.169	0.153
Enthalpy Recovery Ratio ≥0.65 and <0.70	0.217	0.182	0.171	0.224	0.191	0.173
Enthalpy Recovery Ratio ≥0.70 and <0.75	0.242	0.204	0.191	0.250	0.213	0.193
Enthalpy Recovery Ratio ≥0.75 and <0.80	0.267	0.225	0.212	0.276	0.235	0.213
Enthalpy Recovery Ratio ≥0.80	0.292	0.246	0.232	0.301	0.257	0.234
Run-around liquid or refrigerant coils	0.141	0.118	0.110	0.146	0.125	0.112
Gas-phase filtration						
Gas-phase filtration	0.233	0.196	0.184	0.241	0.205	0.186
Other						
Economizer return damper	0.049	0.042	0.038	0.049	0.043	0.039
100% Outdoor air system[c]	0.000	0.000	0.000	0.073	0.104	0.112
Low-turndown single-zone VAV fan systems[d]	0.000	0.000	0.000	0.073	0.104	0.094
Air blender	0.047	0.040	0.037	0.049	0.042	0.038
Sound attenuation section [fans serving spaces with design background noise goals below NC35]	0.035	0.030	0.027	0.036	0.032	0.029
Deducation for systems that feed a terminal unit or fan coil with a fan with electrical input power <1kW	-0.500	-0.500	-0.500	-0.100	-0.100	-0.100

a. See section C408.3.1.1 for requirements for a Multi-Zone VAV system.

b. Power allowances require further calculation. Multiply the actual pressure drop of the device or component by the fan power allowance in Table C403.8.1(2).

c. The 100 percent outdoor air system must serve 3 or more HVAC zones.

d. A low-turndown single-zone VAV fan system must be capable of and configured to reduce airflow to 50 percent of design airflow and use no more than 30 percent of the design wattage at that airflow. No more than 10 percent of the design load served by the equipment shall have fixed loads.

e. The deduction of 0.500 W/cfm is a default value for multizone VAV fan systems. If the terminal unit or fan coil manufacturer can demonstrate that the share of the unit's fan power required to move the fan system's air is less than 0.500 W/cfm, that value may be used. The W/cfm shall be calculated by dividing the power required to operate the terminal unit's fan at fan system design conditions by the airflow of the terminal unit at those conditions.

TABLE C403.8.1(2) EXHAUST, RETURN, RELIEF, TRANSFER FAN SYSTEM POWER ALLOWANCES (W/CFM)

Mult-Zone VAV Fan System airflow[a] (cfm)			All Other Fan Systems Airflow (cfm)			
Air System Component	<5,000	5,000 TO <10,000	≥10,000	<5,000	5,000 to <10,000	≥10,000
W/cfm						
Exhaust, Return, Relief, and Transfer System Base Allowance for each *fan system*	0.231	0.256	0.248	0.194	0.192	0.200
Particle filtration						
Filter (any MERV value)[b]	0.049	0.042	0.038	0.049	0.043	0.039
Energy recovery						
Enthalpy Recovery Ratio ≥ 0.50 and <0.55	0.146	0.125	0.112	0.146	0.128	0.114
Enthalpy Recovery Ratio ≥0.55 and <0.60	0.173	0.148	0.133	0.173	0.150	0.135
Enthalpy Recovery Ratio≥0.60 and <0.65	0.199	0.170	0.153	0.199	0.173	0.155
Enthalpy Recovery Ratio ≥0.65 and <0.70	0.225	0.192	0.173	0.226	0.196	0.176
Enthalpy Recovery Ratio ≥0.70 and <0.75	0.250	0.214	0.193	0.252	0.218	0.196
Enthalpy Recovery Ratio ≥0.75 and <0.80	0.276	0.236	0.213	0.277	0.240	0.216
Enthalpy Recovery Ratio ≥0.8	0.302	0.258	0.234	0.303	0.263	0.236
Run-around liquid or refrigerant coils	0.146	0.125	0.112	0.146	0.128	0.114
Special exhaust and return system requirements (select all that apply)						
Return or exhaust systems required to be fully ducted by code or accreditation standards	0.122	0.105	0.094	0.122	0.107	0.096
Return and/or exhaust airflow control devices required by code or accreditation standards to maintain pressure relationships between spaces	0.122	0.105	0.094	0.122	0.107	0.096
Laboratory and vivarium exhaust systems in high-rise buildings for vertical duct exceeding 75 feet. Value shown is allowed W/cfm per 0.25 inch wg for each 100 feet exceeding 75 feet. [Calculation required[c]]	0.061	0.053	0.047	0.061	0.054	0.048
Exhaust system serving fume hoods	0.085	0.074	0.066	0.085	0.075	0.067
Biosafety cabinet. Value shown is allowed W/cfm per 1.0 inch wg air pressure drop [Calculation required[c]]	0.241	0.206	0.186	0.242	0.210	0.188
Exhaust filters, scrubbers, or other exhaust treatment required by code or standard. Value shown is allowed W/cfm per 1.0 inch wg air pressure drop. [Calculation required[c]]	0.241	0.206	0.186	0.242	0.210	0.188
Other						
Sound attenuation section (fans serving spaces with design background noise goals below NC35)	0.036	0.032	0.029	0.036	0.032	0.029

a. See Section C408.3.1.1 for requirements for a Multi-Zone VAV System.

b. Particle filter pressure loss can only be counted once per fan system.

c. Power allowances require further calculation. Multiply the actual pressure drop of the device or component by the fan power allowance in Table C403.8.1(2).

~~**TABLE C403.8.1(3) FAN POWER LIMIT ALTITUDE CORRECTION FACTOR**~~

~~**Altitude (ft)**~~	~~**Correction factor**~~
~~**<3,000**~~	~~**1.000**~~
~~**≥3,000 and <4,000**~~	~~**0.896**~~
~~**≥4,000 and <5,000**~~	~~**0.864**~~
~~**≥5,000 and <6,000**~~	~~**0.832**~~
~~**≥6,000**~~	~~**0.801**~~

TABLE C403.8.1(4) DEFAULT VALUES FOR FAN ELECTRICAL INPUT POWER BASED ON MOTOR NAMEPLATE HP[a,b]

Motor Nameplate Horsepower	Variable-Speed Drive (kW)	Without Variable-Speed Drive (kW)
<1	0.96	0.89
≥1 and <1.5	1.38	1.29
≥1.5 and <2	1.84	1.72
≥2 and <3	2.73	2.57
≥3 and <5	4.38	4.17
≥5 and <7.5	6.43	6.15
≥7.5 and <10	8.46	8.13
≥10 and <15	12.47	12.03
≥15 and <20	16.55	16.04
≥20 and <25	20.58	19.92
≥25 and <30	24.59	23.77
≥30 and <40	32.74	31.70
≥40 and <50	40.71	39.46
≥50 and <60	48.50	47.10
≥60 and <75	60.45	58.87
≥75 and <100	80.40	78.17

a. This table cannot be used for Motor Nameplate Horsepower values greater than 100.

b. This table is to be used only with motors with a service factor ≤1.15. If the service factor is not provided, this table may not be used.

C403.8.1.1 Determining Fan Power Limit. The maximum allowed fan system electrical input power, shall be determined in accordance with the following steps 1 through 5:

1. The fan system's classification shall be determined. A fan system is considered to be multizone VAV where it meets the following requirements; fan systems that do not meet the following requirements shall be classified as other fans:

   1.1 The fan system shall serve three or more HVAC zones and airflow to each shall be individually controlled based on heating, cooling and/or ventilation requirements.

   1.2 The sum of the minimum airflows for each HVAC zone shall be not greater than 40 percent of the fan system design conditions.

   Exception: Hospital, vivarium, and laboratory systems that use flow control devices on exhaust or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall use the multizone VAV fan power allowances.

2. Determine the fan system airflow and choose the applicable table(s) for fan power allowance.

   2.1 For single-cabinet fan systems, use the fan system airflow and the power allowances in both Table C403.8.1(1) and Table C403.8.1(2).

   2.2 For supply-only fan systems, use the fan system airflow and power allowances in Table C403.8.1(1).

   2.3 For relief fan systems, use the design relief airflow and the power allowances in Table C403.8.1(2).

   2.4 For exhaust, return and transfer fan systems, use the fan system airflow and the power allowances in Table C403.8.1(2).

   2.5 For complex fan systems and DOAS with energy recovery fan systems, separately calculate the fan power allowance for the supply and return/exhaust systems and sum them. For the supply airflow at the fan system design conditions, and the power allowances in Table C403.8.1(1). For the return/exhaust airflow, use return or exhaust airflow at the fan system design conditions, and the power allowances in Table C403.8.1(2).

3. ~~For each fan system determine the components included in the fan system and sum the fan power allowances of those components. All fan systems shall include the System Base Allowance. If, for a given component, only a portion of the fan system airflow passes through the component, calculate the fan power allowance for the com-ponent per equation 4-7:~~

~~(Equation 4-7)~~

$$FPA_{adj} = (Q_{comp} / Q_{sys}) * FPA_{comp}$$

~~FPA_{adj} = The corrected fan power allowance for the component in w/cfm~~
~~Q_{comp} = The airflow through component in cfm~~
~~Qsys = The fan system airflow in cfm~~
~~FPA_{comp} = The fan power allowance of the component from Table C403.8.1(1) or Table C403.8.1(2)~~

4. ~~Multiply the fan system airflow by the sum of the fan power allowances for the fan system, then divide by 1000 to convert to KW.~~

~~(Equation 4-8)~~

$$FPL = (Q_{sys} * FPA_{sum})/1000$$

~~FPL = The fan power limit in KW~~
~~Q_{sys} = The fan system airflow in cflm (L/s)~~
~~FPA_{sum} = The sum of the fan power allowance for the system in W/cfm~~
~~1000 = The conversion from W to kW~~

5. ~~For building sites at elevations greater than 3,000 feet (900 m), multiply the fan power limit by the correction factor from Table C408.3.1(3).~~

~~(Equation 4-9)~~

$$FPL_{alt} = FPL * C_{alt}$$

~~FPL_{alt} = The adjusted fan power limit in KW.~~
~~FPL = The fan power limit in KW calculated in step 4.~~
~~C_{alt} = The altitude correction factor from Table C408.3.1(3)~~

~~**C403.8.1.2 Determining Fan System Electrical Input Power. The fan system electrical input power is the sum of the fan electrical input power of each fan or fan array included in the fan system other than fans with fan electrical input power ≤ 1 kW. If variable speed drives are used their efficiency losses shall be included. Fan system input power shall be calculated with mid-life filter pressure drop, which is the mean of the clean filter pressure drop and design final filter pressure drop. The fan electrical input power for each fan or fan array shall be determined using one of the following methods. There is no requirement to use the same method for all fans in a fan system:**~~

1. ~~**Use the default fan electrical input power in Table C408.3.1(4) for one or more of the fans. This method cannot be used for complex fan systems.**~~
2. ~~**Use the fan electrical input power at fan system design conditions provided by the manufacturer of the fan, fan array, or equipment that includes the fan or fan array, calculated per a test procedure included in 10 CFR Part 430, 10 CFR Part 431, ANSI/AMCA Standard 210, ASHRAE 51 AHRI Standard 430, AHRI Standard 440, or ISO 5801.**~~
3. ~~**Use the fan electrical input power provided by the manufacturer, calculated at fan system design conditions per one of the methods listed in section 5.3 of ANSI/AMCA 208.**~~
4. ~~**Use the fan nameplate electrical input power.**~~

C403.8.2Motor nameplate horsepower.
For each fan, the fan brake horsepower (bhp) shall be indicated on the construction documents and the selected motor shall be not larger than the first available motor size greater than the following:

1. For fans less than 6 bhp (4476 W), 1.5 times the fan brake horsepower.
2. For fans 6 bhp (4476 W) and larger, 1.3 times the fan brake horsepower.

Exceptions:

1. Fans equipped with electronic speed control devices to vary the fan airflow as a function of load.
2. Fans with a fan nameplate electrical input power of less than 0.89 kW.
3. Systems complying with Section C403.8.1 fan system motor nameplate hp (Option 1).
4. Fans with motor nameplate horsepower less than 1 hp (746 W).

Reason: This harmonizes the code with ASHRAE 90.1-2022.

Cost Impact: The code change proposal will decrease the cost of construction.
Changes to Section C403.8.1 as included in the Public Draft 1 would increase the cost of construction. Reverting to the language in the 2021 IECC would reduce the cost, by comparison.