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2025 Title 24 CASE Team comments on 15-Day Express Terms

Additional submitted attachment is included below.

Comments on Title 24, Part 6 15-Day Express Terms

Docket Number 24-BSTD-01

June 27, 2024

Introduction

The California Statewide Utility Codes and Standards Enhancement (CASE) Team and utility Compliance Improvement (CI) Team appreciate the opportunity to review the 2025 Building Energy Efficiency Standards, Title 24 Parts 1 and 6, Express Terms, 15-day Language (15-Day Express Terms). We commend the California Energy Commission (CEC) for encouraging public participation in the proceeding and value the opportunity to offer suggestions to refine the draft code language.

The CASE initiative presents recommendations in support of the CEC's efforts to update the Energy Code with new or updated requirements for various technologies. The three California Investor-Owned Utilities (IOUs) — Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison — and two Publicly Owned Utilities — Los Angeles Department of Water and Power and Sacramento Municipal Utility District— sponsored this effort. The program goal is to submit proposals that result in cost-effective enhancements to improve energy efficiency, energy performance, and GHG emissions reductions in California buildings.

CI Team subject matter experts work closely with the CASE proposal authors to address compliance and enforcement goals in Title 24, Part 6. The CI Team's goal is to reduce roadblocks for industry professionals in the compliance supply chain. Through the IOUs' sponsorship, the CI Team focuses on bridging the gaps between development and implementation of the energy code.

Comments on the 15-Day Express Terms

We have reviewed the 15-Day Express Terms (Part 1, Part 6, and the Reference Appendices) and appreciate that many of the code change proposals that we have worked with the CEC and other stakeholders to develop over the last few years are incorporated into the draft language. In our review we identified 42 suggested revisions that will improve the code language.

All recommended revisions are provided in *Table 1: Substantive Recommendations – 15-Day Express Terms* and *Table 2: Non-Substantive Recommendations – 15-Day Express Terms* along with a justification for each change.

For the marked-up language, revisions to the 2022 code language that appear in the 15-Day Express Terms are delineated with additions in black underlining and deletions in black ~~strikeouts~~. Our proposed revisions to the 15-Day Express Terms are delineated with additions in red underlining and deletions in red ~~strikeouts~~. In some instances, it was not feasible to provide marked-up code language within the body of the tables. Marked-up language for these sections is provided in the appendices as noted in the table.

For each suggested edit we have identified the member of the CASE Team or CI Team that developed the suggested edit. We welcome collaborative discussions between CEC staff and the individuals who recommended each revision so we can offer further descriptions and resolve outstanding issues. Small improvements that make language clearer and less complex, including addressing the issues identified in the tables below will allow the 2025 code to achieve high compliance, be enforceable, and will lead to sustained energy savings and GHG reductions.

Table 1: Substantive Recommendations – 15-Day Language Review

Remark #	Building Type(s)	CASE Report	CASE Measure	Section(s) of Code	Person Making Recommendation	CEC Staff Lead	Language Markup (deletions marked with red strikethroughs ; additions marked with red <u>underlining</u>)	Justification	Is the Change Needed for Both SF and MF?	Does the change affect energy saving, cost, or cost effectiveness?	Does the change affect HERS or ATT procedure?
1	MF	Residential HVAC Performance	Variable Capacity and Zonally Controlled Systems	Exception 1 to Section 160.3(b)5Liii	Alea German	Bach Tsan	Exception 1 to Section 160.3(b)5Liii: Multispeed or variable speed compressor systems, or single speed compressor systems that utilize the performance compliance approach, shall that incorporate controls that vary fan speed with respect to the number of zones calling as certified by the installer may demonstrate compliance with the airflow (cfm/ton) and fan efficacy (watt/cfm) requirements of Section 160.3(b)5Liii by operating the system at maximum compressor capacity and system fan speed with all zones calling for conditioning, rather than in every zonal control mode.	The language changes to Exception 1 to Section 150.0(m)13C were not incorporated into the multifamily language. This proposed update maintains consistency with single family.	No	No	No
2	SF	High Performance Envelope	Windows	150.1(c)3A	Simon Pallin	Payam Bozorgchami	Exception 23 to Section 150.1(c)3A: In Climate Zones 2, 4, and 6 through 15, for each dwelling unit up to 16 square feet of new skylight area per dwelling unit shall be allowed, with a maximum U-factor of 0.55, 0.40 and a maximum SHGC of 0.30 in and in Climate Zones 1, 3, 5, and 16 up to 16 square feet of skylight area per dwelling unit shall be allowed with a maximum U-factor of 0.40 and there is with no SHGC requirement.	As written the exception for 16ft2 of skylight area only applies to CZs 2,4,6-15. Proposed change clarifies the 16ft2 and max U-factor exception apply to all CZs. Without this change the skylight exception does not apply in CZs 1, 3, 5, & 16.	No	No	No
3	SF/MF	Residential HVAC Performance	Design (Sizing, Equipment Selection, and Ducts/Diffusers)	150.0(h)2C, 160.3(b)2C and 170.2(c)2C	Alea German	Bach Tsan	C. The outdoor design temperatures for heating shall be no lower than the 99.0 percent Heating Dry Bulb or the Heating Winter Median of Extremes values.	The CASE Team recommends reverting to the current 2022 code language and only referencing the Heating Winter Median of Extremes to not introduce confusion about which temperature represents the allowable minimum. Adding the 99.0% percentage level leads to confusion since JA2 Table 2-3 does not have 99.0% data and cannot be interpolated. See details from the CASE Team's docketed comments to the 45-Day Language on May 13th, 2024.	Yes	Yes	No
4	SF/MF	Residential HVAC Performance	Design (Sizing, Equipment Selection, and Ducts/Diffusers)	150.0(h)2C/D, 160.3(b)2C/D	Alea German	Bach Tsan	C. The outdoor design temperatures for heating shall be no lower than the 99.0 percent Heating Dry Bulb or the Heating Winter Median of Extremes values. D. The outdoor design temperatures for cooling shall be no greater than the 1.0 percent Cooling Dry Bulb and Mean Coincident Wet Bulb values.	The CASE Team recommends requiring that the design temperatures used be the referenced values rather than "no lower than" the referenced values. Allowing for heating design temperatures that are greater than the referenced values can lead to undersizing the compressor in conflict with 150.0(h)5.	Yes	Yes	No
5	SF/MF	Residential HVAC Performance	Design (Sizing, Equipment Selection, and Ducts/Diffusers)	150.0(h)2B, 160.3(b)2B and 170.2(c)2C	Alea German	Bach Tsan	Outdoor design conditions shall be selected from one of the following: i. Reference Joint Appendix JA2, which is based on data from the ASHRAE Climatic Data for Region X; or ii. The ASHRAE Handbook, Equipment Volume, Applications Volume and Fundamentals Volume; or iii. The SMACNA Residential Comfort System Installation Standards Manual; or iv. The ACCA Manual J.	The CASE Team recommends reverting to the current 2022 code language and requiring that design conditions be based on JA2. The added listed sources (with the exception of ASHRAE Fundamentals Handbook) do not have design conditions. The CASE Team has concerns with the use of ASHRAE 2021 Fundamentals Handbook data due to values that are substantially more mild than JA2 in certain locations. See details from the CASE Team's docketed comments to the 45-Day Language on May 13th, 2024.	Yes	Yes	No
6	SF/MF	Residential HVAC Performance	Design (Sizing, Equipment Selection, and Ducts/Diffusers)	150.2(b)1O (new section)	Alea German	Bach Tsan	Altered Space-Conditioning System Load Calculations and System Capacity: Altered space-conditioning systems shall comply with all applicable requirements specified in 150.2(a)1E.	The new limits on sizing proposed by the CASE Team and included in the 15-day language in Section 150.2(a)1E were intended to apply to both additions and alterations. As the 15-day language reads, these limits only apply to additions. The suggested language change extends it for alterations.	No	No	No
7	NR	Daylighting	Revise auto daylighting control exceptions	130.1(d)Ci	Yao-Jung Wen	Simon Lee	C. 3. The automatic daylighting/daylight responsive controls shall meet the following: i. A. For spaces required to install required to install where the installation of multilevel lighting controls is required under Section 130.1(b), adjust lighting via continuous dimming or the number of control steps provided by the multilevel controls adjust lighting via continuous dimming or the number of control steps provided by the multilevel controls allow the multilevel lighting controls to adjust the light level with continuous dimming.	The recommendation is to roll back to the 2022 language, which better captures the intent. In the 15-day language, the use of the word "allow" is not enforceable. Additionally, the 15-day language suggests that multilevel lighting controls would take over (i.e. override) daylight responsive controls to adjust the light level via continuous dimming. Section 130.1(b) specifies that multilevel lighting controls shall "provide" and "enable" continuous dimming from 100 percent to 10 percent or lower of lighting power. So "provide" and "enable" continuous dimming means that multilevel lighting controls do not have an inherent control logic for determining how the light level should be adjusted, and a manual dimmer can "provide" and "enable" continuous dimming. Therefore, it should be daylight responsive controls, not multilevel lighting controls, that adjust the light level via continuous dimming.	Yes - Section 160.5(b)4Dviii	Yes - Potentially if the current language is interpreted as continuous dimming is optional	No
8	NR	Envelope	Vestibule	141.0(a)	Maureen Guttman	Mikey Shewmaker Payam Bozorgchami	Exception 8 to Section 141.0(a): The requirements of Section 120.7(e) shall not apply to additions that do not include a public entrance door.	This clarification of scope for additions for a new mandatory provision was requested by the Compliance Improvement team and was included in the 45-Day comments, but is not included in the 15-Day language.	N/A	Yes	No

9	NR	Envelope	Vestibule	141.0(b)	Maureen Guttman	Mikey Shewmaker Payam Bozorgchami	<u>Exception 5 to Section 141.0(b): The requirements of Section 120.7(e) shall not apply to alterations.</u>	This clarification of scope for alterations for a new mandatory provision was requested by the Compliance Improvement team and was included in the 45-Day comments, but is not included in the 15-Day language.	N/A	Yes	No
10	SF	Envelope	Cathedral Ceilings	Table 150.1A	Simon Pallin	Payam Bozorgchami	Table 150.1A Option C, cathedral ceilings and radiant barrier requirements.	Table 150.1A Option C doesn't specify whether the requirement for radiant barrier differ between vented attics and cathedral ceilings. Radiant barriers will have no affect if the insulation in cathedral ceiling roofs are installed directly underneath the roof sheathing.	No	Yes	No
11	NR	Solar pool and spa heating	Solar pool and spa heating	Exception 5 to 110.4(c)	Sean Steffensen	Danny Tam	<u>Exception 5 to Section 110.4(c): Heating systems which are used exclusively for pools, or permanent spa applications where there is the available qualifying roof area is less than 65 percent of the combination of surface areas of the pool and spa. The qualifying roof area shall have no less than 70 percent annual solar access. Annual solar access is determined by dividing the total annual solar insolation, accounting for shading obstructions, by the total annual solar insolation if the same areas were unshaded by obstructions, inadequate Solar Access Roof Area (SARA) as specified in Section 150.1(c)14 for a solar pool heating system to be installed.</u>	Clarification that the exception is where there is insufficient roof area. The proposed language below excerpts the roof area requirements that CEC proposed in the 15-day language in a clearer format to improve compliance. Also expand scope of exception to pools as this seems to be the intended scope of the exception by CEC and was left out inadvertently.	yes	Yes	No

Table 2: Non-Substantive Recommendations – 15-Day Language Review

Remark #	Building Type(s)	CASE Report	CASE Measure	Section(s) of Code	Person Making Recommendation	CEC Staff Lead	Language Markup (deletions marked with red strikethroughs ; additions marked with red <u>underlining</u>)	Justification	Is the Change needed for both single family and multifamily?	Does the language change affect energy saving cost or cost effectiveness?	Does the change to language affect HERS or ATT procedure?
1	MF	Domestic Hot Water	Pipe Insulation Enhancement	160.4(e)	Amin Delagah	Danny Tam	SECTION 160.4(e)2B if the insulation conductivity falls outside the range provided in Table 160.4-A applicable fluid temperature range, the insulation shall meet a minimum R-value as indicated in Table 160.4-A. Or, it can have a <u>minimum</u> thickness determined using Equation 160.4-A- 1 .	These are corrections of grammar.	no	no	no
2	MF	Domestic Hot Water	HPWH Ventilation	110.3(c)7A	James Haile	Danny Tam	Backup Heat. Backup heat is required for systems when inlet air is unconditioned, unless the compressor cut-off <u>cutout</u> temperature is below the Heating Winter Median of Extremes for the closest location listed in Table 2-3 from Reference Joint Appendix JA2. Backup heat may be internal or external to the HPWH.	"Cutout" or "cut-out" is the correct term.	yes	no	no
3	MF	Domestic Hot Water	HPWH Ventilation	110.3(c)7B3ii	James Haile	Danny Tam	Permanent openings shall consist of a single layer of fixed flat slat louvers or grilles, with a total minimum Net Free Area (NFA) the larger of 125 square inches plus 25 square inches per kBtu per hour of compressor capacity, or the minimum provided by the manufacturer for this method. The permanent openings shall be fully louvered doors or two openings of equal area <u>NFA</u> , one in the upper half of the enclosure and one in the bottom half of the enclosure. The top of the upper opening must be 12 inches or less from the enclosure top and the bottom of the lower vent must be within 12 inches from the enclosure bottom; or	The "equal area" should refer to the NFA.	yes	no	no
4	NR	Nonresidential HVAC Controls	Guideline 36	140.4(r)	Hwakong Cheng	Bach Tsan	140.4(r) DDC Controller Logic Using ASHRAE Guideline 36. HVAC systems with DDC controllers shall use controller logic originating from a programming library based on sequences of operation from ASHRAE Guideline 36 in accordance with the following: 1.Requirement applies to all controllers that are capable of being programmed in the field; and 2.Requirement applies to the entirety or all applicable portions of equipment control for configurations included in the programming library; and 3.The programming library shall be certified to the Energy Commission as meeting the requirements of Reference Joint Appendix JA18. Exception to Section 140.4(r)3: Non-programmable (configurable-only) controllers for zone terminal units shall follow applicable ASHRAE Guideline 36 zone sequences referenced in JA18 Table 18.3-1 but are not subject to certification requirements. Exception 1 to Section 140.4(r): Logic from the certified programming library modified to suit application-specific operation that are not included in Guideline 36 sequences. Exception 2 to Section 140.4(r): Systems serving healthcare facilities. Exception 3 to Section 140.4(r): Non-programmable (configurable-only) controllers for zone terminal units shall follow applicable ASHRAE Guideline 36 zone sequences referenced in JA18 Table 18.3-1 but are not subject to programming library certification requirements in Section 140.4(r)3.	The 15-day language moved Exception 3 to Section 140.4(r) to be an exception to just 140.4(r)3. This exception for non-programmable zone controllers is intended to apply to the entire Section 140.4(r). In particular, it also applies to 140.4(r)1, which would otherwise exempt non-programmable controllers. This exception provides a special case to expand applicability to non-programmable (configurable-only) zone controllers so that they must follow Guideline 36 logic, even if that logic cannot come from a certified programming library. We recommend reverting this exception to apply to the entire Section 140.4(r) as it was arranged in the 45-day language.	no	no	no
5	SF	High Performance Envelope	Windows	150.2(a)1Aiii	Simon Pallin	Payam Bozorgchami	iii Exception 1 to Section 150.2(b)1Aii: Additions <u>iterations</u> that adds fenestration area of shall have a Maximum SHGC value of 0.23 in Climate Zone 15.	The revised language should reference additions and not alterations since this is in the additions subsection. Also adding the subsection iii to separate this from ii and iv.	No	Yes	N/A
6	SF	High Performance Envelope	Windows	150.2(b)1A	Simon Pallin	Payam Bozorgchami	Exception 1 to Section 150.2(b)1A: Alterations that add fenestration area of up to 75-square feet shall not be required to meet the total fenestration area and west-facing fenestration area requirements of Sections 150.1(e)3B and C; Alterations that add increases fenestration area of shall have a Maximum SHGC value of 0.23 in Climate Zone 15.	Revisions to correct minor grammatical typos changing "increases" to "increase" and adding "." after Exception title.	No	No	N/A
7	NR	Editorial MEMO	Editorial MEMO	Table 120.1-A	Hwakong Cheng	Ronald Balneg	See Appendix B of docketed comments for markup.	Updates to Table 120.1-A includes typographical mistakes that impact ventilation requirements to several space types. Affected space types include: general manufacturing, shipping/receiving, sorting, auditorium, places of religious worship	No	No	No
8	MF	MF HERS Verification	Incorrect Reference	RA3.6.3	Gina Rodda		"The ECC-rater shall inspect the heating plant and horizontal supply header and return piping in accordance with mandatory requirements in Title 24 Part 6 section 160.4-170.2(d)2E."	Incorrect section reference in RA3.6.3	No	No	No
9	MF	Multifamily Restructuring	Slab Perimeter Insulation	Section 160.1(g)	Taylor Taylor	Mikey Shewmaker Payam Bozorgchami	1. Insulation material alone without the facing shall have a water absorption rate no greater than 0.3 percent when tested in accordance with ASTM C272, Test Method A – 24-Hour-Immersion; and 2. Water vapor permeance no greater than 2.0 perm/inch when tested in accordance with ASTM C272 <u>ASTM E96</u> ; and	Item #2 incorrectly lists "ASTM C272" instead of "ASTM E96", which is the correct test for water vapor permeance.	No	No	No

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10	MF	Multifamily Indoor Air Quality	Compartmentalization	170.1(b)2F	Tharanga Jayarathne	Anushka Raut	HF-Dwelling unit enclosure air leakage. When performance compliance requires a building enclosure leakage rate that is lower than the standard design, the building enclosure shall be field verified in accordance with the procedures specified in Reference Residential Appendix RA3.8.	This allows energy savings credit in the performance path for lower dwelling unit enclosure leakage rate in multifamily buildings. The CASE team proposes to remove 170.1(b)2F. It's not possible to determine the fraction of leakage from the exterior vs interior, without complicated blower testing. And our energy modeling found little savings in most climate zones from compartmentalization that is tighter than the mandatory requirement.	No	No	Yes
11	MF/SF	Multifamily Indoor Air Quality	Compartmentalization	JA1	Tharanga Jayarathne	Anushka Raut	AIR LEAKAGE is a measure of how much <u>outside</u> air comes into a home or building through a manufactured fenestration or <u>exterior</u> door products	Update definition of "air leakage" in JA1 to strike through that air must come from exterior. Air leakage can also be from the neighboring spaces of the building in multifamily dwelling units.	Yes	No	No
12	MF	Multifamily Indoor Air Quality	Ventilation systems	150.0(o)1Gvi, 150.0(o)1I, 180.2(b)5Bib	Tharanga Jayarathne	Anushka Raut	150.0(o)1Gvi: Sound ratings for local mechanical exhaust. Local mechanical exhaust systems shall be rated for sound in accordance with Section <u>7.37.2</u> of ASHRAE 62.2 at no less than the minimum airflow rate required by Section 150.0(o)1G. 150.0(o)1I: Sound ratings for whole-dwelling unit ventilation systems. Whole-dwelling unit ventilation systems shall be rated for sound in accordance with Section <u>7.37.2</u> of ASHRAE 62.2 at no less than the minimum airflow rate required by Section 150.0(o)1C. 180.2(b)5Bib: Replacement ventilation fans. Whole-dwelling unit replacement ventilation fans shall be rated for airflow and sound in accordance with the requirements of ASHRAE 62.2 Sections 7.1 and <u>7.37.2</u> .	Sound Rating of fans in ASHRAE 62.2 - 2022 changed to section 7.3 from Section 7.2 in 62.2-2019 version. This reference needs to be updated. (it has been appropriately updated in other sections)	Yes	No	No
13	MF	Multifamily Indoor Air Quality	Ventilation systems	Table 170.2-K	Tharanga Jayarathne	Anushka Raut	See Appendix B of docketed comments for markup.	Table 170.2-K and footnotes need updates for consistency with other changes (balanced or supply ventilation, HRV/ERV FID). To correct a typo: moving footnote 2 from Table 170.2-K to 150.1-A. This footnote is about allowing supplemental heating that uses gas less than the specified thermal capacity.	No	No	No
14	MF	Multifamily Indoor Air Quality	Ventilation systems	160.2(b)2Biii, 160.3(b)5K	Tharanga Jayarathne	Anushka Raut	In 160.2(b)2Biii: At a minimum, systems with heat or energy recovery serving a single dwelling unit shall have a fan efficacy of ≤ 1.0 W/cfm as confirmed by HERS <u>ECC-Rater or ATT</u> field verification in accordance with Reference Appendix RA3.7.4.4 or NA2.2.4.1.5 as applicable. In 160.3(b)5K: Duct system sealing and leakage testing. When space-conditioning systems utilize forced air duct systems to supply conditioned air to an individual dwelling unit, the ducts shall be sealed, as confirmed through <u>ECC-Rater or ATT</u> field verification and diagnostic testing, in accordance with all applicable procedures specified in Reference Residential Appendix RA3.1	ECC-Rater or ATT terminology should be consistent with other field verification requirements instead of just saying field verification. "Field verification" may or may not include ECC-Rater or ATT field verification. The updated language is vague and difficult to enforce by requiring field verification but not identifying who is qualified to do this verification.	No	No	Yes
15	SF	Multifamily Indoor Air Quality	Ventilation systems	Table 150.1-A (continued on the third page)	Tharanga Jayarathne	Anushka Raut	Space Heating - If gas, AFUE <u>210</u>	Footnote 10 is not reference anywhere. It should be referenced in the row "Space Heating - If gas, AFUE". Current reference of footnote 2 should be removed.	No	No	No
16	MF	Multifamily Indoor Air Quality	Compartmentalization	160.2(b)2Aiv	Tharanga Jayarathne	Anushka Raut	iv. Whole-dwelling unit mechanical ventilation <u>and compartmentalization</u>	160.2(b)2Aiv Title omits the important requirement of compartmentalization under this subsection. CASE team proposes to change the title to "Whole-dwelling unit mechanical ventilation and compartmentalization"	No	No	No
17	MF	Multifamily Indoor Air Quality	Compartmentalization	NA 1.9.1	Tharanga Jayarathne	Anushka Raut	Systems verified under this procedure are not eligible for use of the sampling procedures described in NA1.6, <u>with the exception of NA2.3, Field Verification and Diagnostic Testing of Multifamily Dwelling Unit Enclosures, for which ATTs may use sampling.</u>	In 160.2(b)2Aivb2, CEC has added new language to allow Certified Acceptance Test Technician (ATT) to perform compartmentalization in multifamily buildings with four or more habitable stories. However, NA 1.9.1 states Certified Acceptance Test Technician (ATT) are not eligible to use sampling procedures for field verification and diagnostics. For buildings with large number of dwelling units, this restriction makes testing by ATTs impractical (time consuming and expensive), thus making the addition to section 160.2(b)2Aivb2 unusable. The CASE team proposes to allow ATTs to use sampling for compartmentalization testing similar to ECC-Raters.	No	No	Yes

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18	MF	Multifamily Indoor Air Quality	Compartmentalization	100.1 JA1,NA2.3.3, RA3.8.3	Tharanga Jayarathne	Anushka Raut	In 100.1 and JA1 COMPARTMENTALIZATION is when a dwelling unit enclosure <u>surface</u> area, including walls, ceilings, and floors shared with exterior spaces or adjacent spaces in the building including but limited to neighboring units, corridors, and elevator shafts, is constructed to prevent air leakage. NA2.3.3: If compliance requires the results of the test to be reported in cubic feet per minute per ft2 of dwelling unit enclosure surface area at 50 Pa (0.2 inch water) (CFM50/ft2 of enclosure), the dwelling unit enclosure <u>interior</u> -surface area in ft2 (compartmentalization-boundary-area) shall be recorded. RA3.8.3 If compliance requires the results of the test to be reported in cubic feet per minuter per ft2 of dwelling unit enclosure surface area at 50 Pa (0.2 inch water) (CFM50/ft2 of enclosure), the dwelling unit enclosure <u>interior</u> -surface area in ft2 (compartmentalization-boundary-area) shall be recorded.	CEC added a new definition for COMPARTMENTALIZATION to 100.1 and JA1 that includes description of dwelling unit enclosure area and removed the note defining compartmentalization boundary area in NA2.3.3 and RA3.8.3. CASE team recommends cleaning up language for consistency.	No	No	Yes
19	MF	Domestic Hot Water	Central DHW Electric-Ready	JA15.2.1(a), JA15.2.1(b), JA15.2.2(a), JA15.2.2(b), JA15.2.3(a), JA15.2.3(b), JA15.2.4(a), JA15.2.4(b), JA15.2.5(a), JA15.2.5(b), JA15.2.5(c), JA15.2.5(d)	Jose Garcia	Danny Tam	If the input capacity of the gas or propane water heating system is less than 200,000 Btu per hour ...	This change improves language clarity since the code language intends to apply to gas or propane water heating systems.	No	No	No
20	MF	Domestic Hot Water	Central DHW Electric-Ready	JA15.1	Jose Garcia	Danny Tam	Joint Appendix JA15 provides sizing requirements for electric ready infrastructure installed with gas or propane water heating systems to meet the requirement for electric readiness specified in Title 24, Part 6, Section 160.9(e).	The code section was updated to 160.9(f). This reference was not updated and no longer works	No	No	No
21	MF	Envelope	High Performance Window	170.2(a)3A Table 170.2-A	Avani Goyal	Mikey Shewmaker Payam Bozorgchami	See Appendix B for non-substantive markup.	The table should be cleaned up to consolidate rows delineating requirements based on number of stories of multifamily building. The footnotes should be rearranged to be in increasing sequential order.	No	No	No
22	SF	High Performance Envelope	Windows	150.2(a)1Bvii	Simon Pallin	Payam Bozorgchami	<u>vii Alterations that add fenestration area shall have a Maximum SHGC value of 0.23 in Climate Zone 15.</u>	The CASE Team proposes that the new allowance for additions 700 sqft and greater in 150.2(a)1Aiii should also apply to smaller additions.	No	Yes	N/A
23	NR	Nonresidential HVAC Controls	Guideline 36	140.4	Rupam Singla	Bach Tsan	A building complies with this section by being designed with and having constructed and installed a space-conditioning system that meets the applicable prescriptive requirements of Subsections (a) through (q) <u>(s)</u> .	References to newly added sections (r) and (s) should be included as applicable prescriptive sections.	N/A	No	No

Remark #	Building Type(s)	CASE Report	CASE Measure	Section(s) of Code	Person Making Recommendation	CEC Staff Lead	Language Markup (deletions marked with red strikethroughs ; additions marked with red <u>underlining</u>)	Justification	Is the Change needed for both single family and multifamily?	Does the language change affect energy saving cost or cost effectiveness?	Does the change to language affect HERS or ATT procedure?
24	NR	Nonresidential HVAC Controls	Guideline 36	Table JA.18.4-1	Rupam Singla	Bach Tsan	Table JA18.4-1 Required Guideline 36 Logic for Certified Programming Library row with Guideline 36 Logic Section "Section 5.16 Multiple-Zone VAV Air-Handling Unit ...": Update the Minimum Validation Requirements cell as follows: <u>Fan speed control and duct static pressure setpoint reset using trim and respond logic per 5.16.7</u> <u>Supply air temperature control, temperature setpoint reset based on outdoor air temperature and trim and respond logic, and air economizer high limits per 5.16.2</u> <u>System outdoor airflow requirements dynamically calculated for Zone Groups in Occupied Mode in accordance with Title 24 ventilation requirements, per 5.16.3.2</u> <u>Minimum outdoor air control for multiple supported equipment configurations per 5.16.4, 5.16.5, and 5.16.6, using Title 24 ventilation logic, Building relief per 5.16.8 and 5.16.9 Return fan control, per 5.16.10 and 5.16.11 Fan, filter, and pressure alarms per 5.16.13</u> <u>Building relief per 5.16.8 and 5.16.9</u> <u>Return fan control, per 5.16.10 and 5.16.11</u> <u>Fan, filter, and pressure alarms per 5.16.13</u> <u>Automatic FDD based on equipment operating state, including diagnostics based on fault conditions per 5.16.14</u> <u>Plant Requests per 5.16.16</u>	Put building relief, return fan control, and fan/filter/pressure alarms criteria on separate lines for clarity and for consistency with the rest of the table.	N/A	No	No
25	NR	Nonresidential HVAC Controls	Guideline 36	JA.18.5, third table	Rupam Singla	Bach Tsan	JA.18.5 Table Heading: <u>Manufacturer Company Responsible for Library Development</u> , (if different from Certifying Company)	Revise table heading to allow any company to certify library.	N/A	No	No
26	NR	Space Heating	Simultaneous Mechanical Heat Recovery	140.4(s)	Bryan Boyce	Ronald Balneg or Bach Tsan	<u>1. Simultaneous Mechanical Heat Recovery</u> <u>A. Simultaneous mechanical heat recovery is required for newly constructed buildings that meet either Ai or Bii.</u>	CEC changed the alphanumeric identifiers in its list from A and B to 'i' and 'ii' but neglected to revise the sentence prior to align. This markup addresses this inconsistency.	N/A	No	No
27	NR	CASE Editorial Markups		120.1(d)5A	Jeff Stein	Ronald Balneg	See Appendix A for mark-up.	Occupied Standby is a huge energy saver and highly cost effective but compliance is very poor because the code is very unclear where it is required. This is a clarification that does not change the requirement. These are all the spaces that meet this criteria. Including the list here will greatly improve compliance and enforcement because 120.1-A and 130.1(c) use different language and cross-referencing the two sections is tedious process. For the same reasons the IECC just added this same list to C403.7.8 Occupied Standby Controls and 90.1 is working on an addendum to also add a similar list. See the Appendix for more information.	Not in SF. The list should also be added to MF section 160.2(c)5E	yes. The real savings of improved compliance are huge. Perhaps bigger than all the rest of the 2025 measures.	no
28	NR, MF	Cooling Towers	Blowdown Controls	110.2(e)2I	Meg Waltner	Haile Bucaneg	"Langelier Saturation Index" should be rewritten as " <u>Cycles of concentration based on a Langelier Saturation Index of 2.5, calculated using the following equation:</u> "	The equation is the cycles of concentration based on an LSI of 2.5, not a calculation of LSI as currently indicated.	N/A	No	No
29	NR	Commercial Kitchens	All Electric Readiness Requirement	140.9(b)1B	DJ Joh	Haile Bucaneg	For kitchen/dining facilities having total Type I and Type II kitchen hood exhaust airflow rates greater than 5,000 cfm, each Type I hood shall have an exhaust rate that complies with Table 140.9-C. If a single hood or hood section is installed over appliances with different duty ratings, then the maximum allowable flow rate for the hood or hood section shall not exceed the Table <u>140.9-A-140.9-C</u> values for the highest appliance duty rating under the hood or hood section. Refer to ASHRAE Standard 154-2011 for definitions of hood type, appliance duty and next exhaust flow rate.	Reference correction, as there is no Table 140.9-A in the code language and the referenced table is 140.9-C.	N/A	No	No
30	NR	Laboratories	Exhaust Fan Control	140.4(c)1	DJ Joh	Haile Bucaneg	EXCEPTIONS to Section 140.4(c): <u>1. Fan system power caused solely by process loads. This exception does not apply to newly installed fan exhaust systems serving a laboratory.</u> <u>2. Laboratory exhaust fan systems compliant with the fan power consumption requirements of Section 140.9(c)3 items C or D.</u>	Without the exception, the fan power consumption section for labs is implicit rather than explicitly required. This exception clearly states that labs fan power consumption needs to meet either this 140.4(c) or 140.9.	N/A	No	No
31	NR	Refrigeration	Evaporator Specific Efficiency Proposal	120.6(a)3	DJ Joh	Haile Bucaneg	Table 120.6-A-2: All "2" in "CO2" should be subscript.	Consistency.	N/A	No	No

Appendix A: Additional Mark-up Language

The appendix provides code language mark-ups for longer edits that did not fit into the previous tables.

[Remark #7 \(Non-substantive\) | Editorial Memo](#)

Table 120.1-A Minimum Ventilation Rates

Occupancy Category – General manufacturing (excludes heavy industrial and process using chemicals) <u>Miscellaneous Spaces</u>	Minimum Occupant Load Density (persons/1000ft²) Total Outdoor Airflow Rate¹-R_t cfm/ft²	Area-based Minimum Ventilation R_a (cfm/ft²) Min Ventilation Air Rate for DCV	Air Class	Notes
<u>General manufacturing (excludes heavy industrial and process using chemicals)</u>	<u>5</u>	<u>0.15</u>	<u>3</u>	NA
Pharmacy (prep. Area)	0.15 <u>5</u>	<u>0.15</u>	2	NA
Photo studios	0.15 <u>5</u>	<u>0.15</u>	1	NA
Shipping/receiving	0.15 <u>5</u> <u>2</u>	<u>0.15</u>	2	B
Sorting, packing, light assembly	0.15 <u>5</u> <u>2</u>	<u>0.15</u>	2	NA
Occupancy Category – Public Assembly Spaces	Minimum Occupant Load Density (persons/1000ft²)	Area-based Minimum Ventilation R_a (cfm/ ft²) Min	Air Class	Notes

	Total Outdoor Airflow Rate¹-R_t cfm/ft²	Ventilation Air Rate for DCV		
Auditorium seating area	4.07 <u>71</u>	0.15	1	F
Places of religious worship	4.07 <u>71</u>	0.15	1	F

Remark #13 (Non-substantive) | Multifamily Indoor Air Quality

TABLE 170.2-K MECHANICAL COMPONENT PACKAGE – Multifamily Standard Building Design

Component	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Unitary ⁴² – Balanced Ventilation System ⁴ HRV/ERV Sensible Recovery Efficiency	0.67	0.67	NR	NR <u>0.67</u>	NR	NR	NR	NR	NR	NR	0.67	0.67	0.67	0.67	0.67 NR	0.67
Unitary ⁴² – Balanced Ventilation System ⁴ HRV/ERV Fan Efficacy (W/cfm)	0.6	0.6	1.0	1.0 <u>0.6</u>	1.0	1.0	1.0	1.0	1.0	1.0	0.6	0.6	0.6	0.6	0.6 <u>1.0</u>	0.6
Unitary ⁴² – Balanced Ventilation System ⁴ Non-HRV/ERV Fan Efficacy (W/cfm)	NR	NR	NR	0.4 NR	0.4	0.4	0.4	0.4	0.4	0.4	NR	NR	NR	NR	NR <u>0.4</u>	NR
Unitary ⁴² – Heat Pump, HSPF ² /HSPF ² ²¹	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
Unitary ⁴² – Dual-Fuel Heat Pump, AFUE	MIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	MIN
Unitary ⁴² – Refrigerant Charge Verification or Fault Indicator Display	NR	REQ	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR
Unitary ⁴² – SEER /SEER2	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
Unitary² – FIDs in HRV/ERV Systems	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>	<u>REQ</u>
Central ⁶³ - Balanced Ventilation Systems ⁴ Sensible Recovery Efficiency or Effectiveness	0.67	0.67	NR	NR <u>0.67</u>	NR	NR	NR	NR	NR	NR	0.67	0.67	0.67	0.67	0.67 NR	0.67

Central ⁵³ HRV/ERV Systems – Balanced Ventilation Systems ⁴ Bypass Function	REQ	REQ	NR	NR REQ	NR	NR	NR	NR	NR	NR	REQ	REQ	REQ	REQ	REQ NR	REQ
Central ⁵³ – Central Fan Integrated Ventilation System Fan Efficacy ⁴	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ
Duct Insulation in Unconditioned Space	R 8	R 8	R 6	R 8	R 6	R 6	R 6	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8	R 8
Water Heating - All Buildings System Shall meet Section 170.2(d)	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ

Footnotes to TABLE 170.2-K:

- 1. ~~Requirements only apply when using Balanced Ventilation to meet 160.2(b)2Aivb.~~
- 21. HSPF₂ means "heating seasonal performance factor."
- 3. ~~A supplemental heating unit may be installed in a space served directly or indirectly by a primary heating system, provided that the unit thermal capacity does not exceed 2 kilowatts or 7,000 Btu/hr and is controlled by a time-limiting device not exceeding 30 minutes.~~
- 42. Unitary system serving one dwelling unit
- 53. Central system serving multiple dwelling units
- 4. Requirements only apply when using Central fan integrated ventilation systems

Remark # 21 (Non-substantive) | Multifamily Envelope, High Performance Window

TABLE 170.2-A ENVELOPE COMPONENT PACKAGE – Multifamily Standard Building Design

Building Component - Roofs and Ceilings	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Option B ⁹¹ Below Roof Deck Insulation ^{4,2,3} (with air space)	NR	NR	NR	R19	NR	NR	NR	R19	R19	R13	R19	R19	R19	R19	R19	R13
Option B ⁹¹ Ceiling Insulation	R 38	R 38	R 30	R 38	R 30	R 30	R 30	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38	R 38
Option B ⁹¹ Radiant Barrier	NR	REQ	REQ	NR	REQ	REQ	REQ	NR	NR	NR	NR	NR	NR	NR	NR	NR
Option B ⁹¹ Low-Slope-Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.63	NR	0.63	NR

Option B ⁹¹ Low-Sloped-Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75	NR	0.75	NR
Option B ⁹¹ Low-Sloped-Solar Reflectance Index	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	75	NR	75	NR
Option B ⁹¹ Steep-Sloped-Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.20 0.25	0.20 0.25	0.20	0.20 0.25	0.20	0.20 0.25	NR
Option B ⁹¹ Steep-Sloped-Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75 0.80	0.75 0.80	0.75	0.75 0.80	0.75	0.75 0.80	NR
Option B ⁹¹ Steep-Sloped-Solar Reflectance Index	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	46 23	46 23	16	46 23	16	46 23	NR
Option C ⁴⁰⁴ Ceiling Insulation	R 38	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 30	R 38	R 38	R 38	R 38	R 38	R 38
Option C ⁴⁰⁴ Radiant Barrier	NR	REQ	RE Q	REQ	RE Q	RE Q	RE Q	RE Q	RE Q	RE Q	RE Q	RE Q	RE Q	RE Q	REQ	RE Q	NR
Option C ⁴⁰⁴ Low-Sloped-Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.63	NR	0.63	NR
Option C ⁴⁰⁴ Low-Sloped-Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75	NR	0.75	NR
Option C ⁴⁰⁴ Low-Sloped-Solar Reflectance Index	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	75	NR	75	NR
Option C ⁴⁰⁴ Steep-Sloped-Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.20	0.20	0.20	0.20	0.20	0.20	NR
Option C ⁴⁰⁴ Steep-Sloped-Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.75	0.75	0.75	0.75	0.75	0.75	NR
Option C ⁴⁰⁴ Steep-Sloped-Solar Reflectance Index	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	16	16	16	16	16	16	NR
Option D ¹⁴⁵ Metal Building U-factor	0.04 1	0.041	0.04 1	0.041	0.04 1	0.04 1	0.04 1	0.04 1	0.04 1	0.04 1	0.04 1	0.04 1	0.04 1	0.04 1	0.041	0. 04 1	0.04 1
Option D ¹⁴⁵ Wood Framed and Other U-factor	0.02 8	0.028	0.03 4	0.028	0.03 4	0.03 4	0.03 4	0.03 9	0.02 8	0.02 8	0.02 8	0.02 8	0.02 8	0.02 8	0.028	0. 02 8	0.02 8

Option D ⁴⁴⁵ Low-Sloped-Aged Solar Reflectance	NR	<u>NR0.63</u>	NR	<u>NR0.63</u>	NR	<u>NR0.63</u>	<u>NR0.63</u>	<u>NR0.63</u>	0.63	0.63	0.63	<u>NR0.63</u>	0.63	0.63	0.63	NR
Option D ⁴⁴⁵ Low-Sloped-Thermal Emittance	NR	<u>NR0.75</u>	NR	<u>NR0.75</u>	NR	<u>NR0.75</u>	<u>NR0.75</u>	<u>NR0.75</u>	0.75	0.75	0.75	<u>NR0.75</u>	0.75	0.75	0.75	NR
Option D ⁴⁴⁵ Low-Sloped-Solar Reflectance Index	NR	<u>NR75</u>	NR	<u>NR75</u>	NR	<u>NR75</u>	<u>NR75</u>	<u>NR75</u>	75	75	75	<u>NR75</u>	75	75	75	NR
Option D ⁴⁴⁵ Steep-Sloped-Aged Solar Reflectance	NR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	NR
Option D ⁴⁴⁵ Steep-Sloped-Thermal Emittance	NR	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	NR
Building Component - Roofs and Ceilings	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Option D Steep-Sloped-Solar Reflectance Index	NR	16	16	16	16	16	16	16	16	16	16	16	16	16	16	NR

TABLE 170.2-A ENVELOPE COMPONENT PACKAGE – Multifamily Standard Building Design (continued)

Building Component - Walls, Floors, Doors, and QII	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Walls - Metal Building - Any Fire Rating	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.057	0.057	0.057	0.057	0.057	0.057
Walls - Framed (wood, metal) and other - >1hr fire rating	0.059	0.059	0.059	0.059	0.059	0.065	0.065	0.059	0.059	0.059	0.051	0.059	0.059	0.051	0.051	0.051
Walls - Framed (wood, metal) and other - ≤1hr fire rating ³⁶	0.051	0.051	0.051	0.051	0.051	0.065	0.065	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051	0.051
Walls - Mass Light ^{4-5Z}	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.077 R 13	U 0.059 R 17
Walls - Mass Heavy	0.253	0.650	0.650	0.650	0.650	0.690	0.690	0.690	0.690	0.650	0.184	0.253	0.211	0.184	0.184	0.160

Floors/Soffits - Slab Perimeter ⁸ , Three Habitable Stories or less	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	U-F 0.58 R 7.0
Floors/Soffits - Wood Framed	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19	U 0.037 R 19
Floors/Soffits - Raised Mass	U 0.092 R 8.0	U 0.092 R 8.0	U 0.269 R 0	U 0.269 R 0	U- 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.269 R 0	U 0.092 R 8.0	U 0.138 R 4.0	U 0.092 R 8.0	U 0.092 R 8.0	U 0.138 R 4.0	U 0.092 R 8.0
Floors/Soffits - Other	0.048	0.039	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.039	0.071	0.071	0.039	0.039	0.039
Exterior Doors ⁶⁹ - Max U-Factor Dwelling Unit Entry	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Exterior Doors ⁶⁹ - Max U-Factor Common Use Area Entry NonSwinging	0.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	0.50
Exterior Doors ⁶⁹ - Max U-Factor Common Use Area Entry Swinging	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Quality Insulation Installation up to 3 habitable stories	Yes	Yes	Yes	Yes	Yes	Yes	NR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 170.2-A ENVELOPE COMPONENT PACKAGE – Multifamily Standard Building Design (continued)

Building Component - Fenestration	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Curtain Wall/ Storefront ^{7,10} - Maximum U-factor	0.38	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.38
Curtain Wall/ Storefront ^{7,10} - Maximum RSHGC ₇	NR	0.26	NR	0.26	NR	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.26	NR

Maximum Window to Wall Ratio	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%
Maximum Skylight Roof Ratio	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Footnote requirements to TABLE 170.2-A:

1. Option B meets §170.2(a)1Bii
~~Install the specified R-value with an air space present between the roofing and the roof deck. Such as standard installation of concrete or clay tile.~~
2. Install the specified R-value with an air space present between the roofing and the roof deck. Such as standard installation of concrete or clay tile
3. ~~2.~~ R-values shown for below roof deck insulation are for wood-frame construction with insulation installed between the framing members. Alternatives including insulation above rafters or above roof deck shall comply with the performance standards.
~~Assembly U-factors for exterior framed walls can be met with cavity insulation alone or with continuous insulation alone, or with both cavity and continuous insulation that results in an assembly U-factor equal to or less than the U-factor shown. Use Reference Joint Appendices JA4 Table 4.3.1, 4.3.1(a), or Table 4.3.4 to determine alternative insulation products to be less than or equal to the required maximum U-factor.~~
4. Option C meets §170.2(a)1Blili
5. Option D meets §170.2(a)1Biv
6. Assembly U-factors for exterior framed walls can be met with cavity insulation alone or with continuous insulation alone, or with both cavity and continuous insulation that results in an assembly U-factor equal to or less than the U-factor shown. Use Reference Joint Appendices JA4 Table 4.3.1, 4.3.1(a), or Table 4.3.4 to determine alternative insulation products to be less than or equal to the required maximum U-factor.
 4. ~~Mass wall has a heat capacity greater than or equal to 7.0 Btu/h-ft².~~
 5. ~~Product must be certified to meet the North American Fenestration Standard/Specification for an Architectural Window (AW).~~
 6. ~~Glazed doors must meet the fenestration requirements.~~
 7. ~~Requirements apply to doors included in the Curtainwall/Storefront construction assembly.~~
7. Mass wall has a heat capacity greater than or equal to 7.0 Btu/h-ft².
8. If using F-factor to comply, use Reference Joint Appendices JA4, Table 4.4.7 to determine alternate depth and R-value to be less than or equal to the required maximum Ffactor.
 9. ~~Option B meets §170.2(a)1Bii~~
 10. ~~Option C meets §170.2(a)1Blili~~
 11. ~~Option D meets §170.2(a)1Biv~~
9. Glazed doors must meet the fenestration requirements.
10. Requirements apply to doors included in the Curtainwall/Storefront construction assembly.
11. Product must be certified to meet the North American Fenestration Standard/Specification for an Architectural Window (AW).

Remark #27 (Non-substantive) | Alignment between NR and MF Occupied Standby Ventilation and Lighting Controls

We recommend that CEC consider reverting the language in the 15-day express terms in Section 120.1(d)5 to the language proposed in the 45-day express terms with these changes: remove “breakrooms” from the list of spaces that comply with both occupancy controls requirements in Section 130.1(c)5&6; and allow ventilation air to be reduced to zero per Table 120.1-A. Break rooms are currently not listed in Section 130.1(c)5&6. This change would not impact the stringency of the standard as proposed in the 15-Day express terms, but it would make the requirement easier to understand, comply with and enforce.

A precedent for this approach exists in the list of spaces added to the occupied standby requirements in the IECC 2024 and a similar list is proposed in the ASHRAE 90.1-2025 update. Where occupied standby applies, the savings are substantive, but will only be realized if the requirement is clearly understood. The proposed change is shown below in red underlined font.

5. Occupant sensor ventilation control devices. Occupied -Standby Zone Controls.

~~Occupant sensing or ventilation controls are required for space-conditioning zones that are both permitted to have their ventilation air reduced to zero while in occupied-standby mode per Table 120.1-A and required to install occupant sensors to comply with Section 130.1(c)5, 6 and 7. Occupant sensor ventilation control devices used to reduce the rate of outdoor air flow when occupants are not present shall comply with the following:~~

~~A. Space conditioning zones shall include occupied standby controls complying with Section 120.1(d)5B when all of the following are true:~~

- ~~i. All rooms served by the zone are permitted to have their ventilation air reduced to zero while in occupied-standby mode per Table 120.1-A; and~~
- ~~ii. Occupant sensors are required by Section 130.1(c)5 and 6; and~~
- ~~iii. The zone and ventilation system is not served by pneumatic controls.~~

~~Spaces meeting these criteria include, but not limited to:~~

~~Post-secondary classrooms and lecture halls~~

~~Conference, meeting, and training rooms~~

~~Multipurpose rooms < 1,000 ft²~~

~~Breakrooms~~

~~Enclosed offices and open plan office areas~~

~~Corridors and stairwells~~

Spaces meeting these criteria include:

Post-secondary classrooms and lecture halls

Conference, meeting, and training rooms

Multipurpose rooms < 1,000 ft²

Enclosed offices and open plan office areas

Corridors and stairwells