Multifamily Buildings

What's Changed in 2022?

What Does this Fact Sheet Cover?

This fact sheet describes changes made to the 2019 Title 24, Part 6 Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) and incorporated in the 2022 Energy Code for multifamily buildings.

In a change to 2019, the 2022 Energy Code reorganized building types and now classifies these buildings as multifamily buildings:

- Occupancy Group R-2 (excluding hotel/motel buildings and timeshare properties with over six guests)
- Occupancy Group R-3 that are non-transient congregate residences (excluding boarding houses with over six guests and alcohol or drug abuse recovery homes)
- Occupancy Group R-4

The 2022 Energy Code reorganizes low-rise (three or fewer stories) and high-rise (four or more stories) multifamily buildings into one building type and moves requirements for multifamily buildings to their own subchapters (Subchapters 10-12).

When & How to Use this Fact Sheet

Use this fact sheet if you need to examine the language of the Energy Code for multifamily building types.

- Energy Code changes are organized by building feature.
- Each building feature section includes explanatory notes on all applicable sections.
- When language has been added or substantially revised, the intent of the language of the 2022 Energy Code is included.
- Notes are provided as needed.
- *Multifamily Buildings: What's New in 2022* Fact Sheet.
- To review Energy Code updates for other occupancy types, refer to these fact sheets: *Single-family Buildings: What's Changed in 2022* and *Nonresidential Buildings: What's Changed in 2022*.

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Why Did the Energy Code Change?

The 2022 Energy Code is an important part of California's work to reduce carbon emissions and fight climate change. The Energy Code is updated every three years with the mandate to increase building energy efficiency while staying cost-effective for building owners over the lifespan of a building.

Increases in energy efficiency and on-site generation:

- ✦ Reduce utility bills
- ✦ Improve indoor comfort and air quality
- ✦ Increase market value
- ✦ Reduce greenhouse gas emissions (GHG)

The California Energy Commission (CEC) estimates that over 30 years the 2022 Energy Code will provide $1.5 billion in consumer benefits and reduce 10 million metric tons of GHG – equivalent to taking nearly 2.2 million gas cars off the road for a year.

For multifamily buildings alone, the CEC estimates that the 2022 Energy Code will reduce net CO_2 emissions by close to 10,000 metric tons per year compared to the 2019 Energy Code, the equivalent of taking 2,240 gas cars off the road each year. This is the result of encouraging electric heat pump space heating instead of gas furnaces, new photovoltaic and battery storage measures and other improvements to building envelope and HVAC component efficiency.

BENEFITS OF THE 2022 ENERGY CODE ACROSS ALL BUILDING TYPES

- ✦ Increases on-site renewable energy generation from solar
- ✦ Increases electric load flexibility to support grid reliability
- ✦ Reduces emissions from newly constructed buildings
- ✦ Reduces air pollution for improved public health
- ✦ Encourages adoption of environmentally beneficial efficient electric technologies

Decarbonization Goals

California is aiming to reduce its greenhouse gas emissions (GHG) while creating an energy system that is resilient to climate risks, spurring innovation and a low-carbon transition nationally and internationally. Per the CEC Energy Assessment, California has some of the most ambitious climate and energy goals in the world.

GHG Emission Reduction Goals

Assembly Bill 32:

1990 levels by 2020

Senate Bill 32:

40% below 1990 levels by 2030

Executive Order S-3-05:

80% below 1990 levels by 2050

This can be achieved through a variety of measures, such as incremental steps toward "carbon neutral" buildings, and timely balancing of onsite energy production and consumption in support of a healthy, stable grid. The Energy Code supports reaching these goals.

Learn more from the CEC Building Decarbonization Assessment at bit.ly/CEC-building-decarbonization

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Mechanical Systems: Multifamily Buildings

Building Application		Mandatory: All Occupancy Subchapters 1-2, 7 (§§100.0-110.12, 150.0)	Mandatory: Multifamily Subchapter 10 (§§160.0-160.6)	Prescriptive Subchapter 11 (§§170.0-170.2)	Performance Subchapter 11 (§170.1)	Additions Alterations Subchapter 12 (§§180.1-2)	Reference Appendices
General		§§100.0, 100.1-2, 110.0-2, 110.5	§160.0	§170.2	§170.1	(§§180.1-2)	JA1 Definitions, JA2 Weather/Climate, JA3 TDV
Ventilation and Indoor Air Quality (IAQ)	Dwelling Unit	§§110.2, 110.5	§160.2(a)(b)	N/A			**≥ 4 Habitable Stories** NA7 Installation/Acceptance High Rise **≤ 3 Habitable Stories** RA2 HERS Procedures RA3 HERS Test Protocols
	Common Use Area		§160.2(a)(c)				NA1 NR HERS NA2 NR HERS Test Procedures NA7 Installation/Acceptance NR
	Parking Garage		§160.2(d)				NA7 Installation/Acceptance Covered Process
Heating, Ventilation and Air Conditioning (HVAC)	Dwelling Unit		§§160.3(a)1, 160.3(b)	§170.2(c)3			JA5 OCST Thermostats, JA6 FID, JA9 Low-Leakage AHU RA4.3 HVAC Special Measures **≤ 3 Habitable Stories** RA1 HERS Refrigerant Charge RA2 HERS Procedures RA3 HERS Test Protocols
	Common Use Area		§§160.3(a)2, 160.3(c)	§§170.2(c)1,2,4			JA5 OCST Thermostats, JA6 FID NA1 NR HERS NA2 NR HERS Test Procedures NA3 Fan Motor Efficiencies NA7 Installation/Acceptance NR
Water Heating	Dwelling Unit	§110.3	§160.4	§170.2(d)			RA4.4 Water Heating Special Measures JA13 HPWH Demand Management JA14 Central HPWH
	Common Use Area		§160.4	N/A			NA7 Installation/Acceptance NR
Pool and Spa Systems		§§110.4, 150.0(p)	§160.7(b)	N/A			N/A
Covered Process: Elevators		§§100.1, 100.2	§120.6(f)				NA7 Installation/Acceptance Covered Process

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES — GENERAL PROVISIONS				
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION				
New		100.1(b)		**AHAM** is the Association of Home Appliance Manufacturers. **AHAM HRH-2** is the Association of Home Appliance Manufacturers document titled "Residential Kitchen Range Hood Performance Test Procedures," 2020 (AHAM HRH-2). **AHAM RKRH-CPPG** is the Association of Home Appliance Manufacturers document titled "Residential Kitchen Range Hood Certification Program Procedural Guide" 2020 (version 3).
Revised				**Air, Makeup** has an added mechanical feature "compensating outdoor air" that is considered makeup air per this definition.
New				**Boiler System** is one or more boilers and their piping and controls that work together to supply steam or hot water to heat output devices remote from the boiler.
New				**Combined Energy Efficiency Ratio (CEER)** is the ratio of net cooling capacity (in Btu/hr) to total rate of electrical energy input (in watts) of a cooling system under designated operating conditions, including standby mode, as determined using the applicable test method in the Appliance Efficiency Regulations.
New			*New DOAS definitions in support of the new requirements of* §§140.4(p)-(q).	**Dedicated Outdoor Air System (DOAS)** is a ventilation system which delivers 100% outdoor air and delivers ventilation supply air to each space, either directly or in conjunction with local or central space-conditioning systems serving those same spaces such as a DX-DOAS, HRV, ERV, or custom ventilation only unit.
New				**DX-Dedicated Outdoor Air System Units (DX-DOAS)** a type of air-cooled, water-cooled, or water-source DOAS unit that dehumidifies 100 percent outdoor air and includes reheat that is capable of controlling the supply dry-bulb temperature of the dehumidified air to the designed supply air temperature. This conditioned outdoor air is then delivered directly or indirectly to the conditioned spaces. It may precondition outdoor air by containing an enthalpy wheel, sensible wheel, desiccant wheel, plate heat exchanger, heat pipes, or other heat or mass transfer apparatus.
New				**Integrated Seasonal Coefficient of Performance (ISCOP)** A seasonal efficiency number that is a combined value based on the formula listed in AHRI Standard 920 of the two COP values for the heating season of a DX-DOAS unit water or air source heat pump, expressed in W/W.
New				**Drain Water Heat Recovery (DWHR)** is a system that recovers heat from effluent in waste piping and uses it to preheat water in a domestic or service water heating system in order to reduce water heating energy usage.
New				**Dual-fuel Heat Pump** is an electric heat pump with gas furnace supplemental heat that alternates between the two fuel sources.
New				**Duct Wall Penetrations** are openings to the duct wall made by pipes, holes, conduit, tie rods, or wires.
New				**Dwelling Unit, Attached** is a dwelling unit that shares a common wall or common floor/ceiling with another dwelling unit.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION *(continued)*				
New	100.1(b)			**Economizer, Pumped Refrigerant** is a system by which the supply air of a cooling system is cooled directly by refrigerant pumped between indoor and outdoor units during cooler ambient temperatures in order to reduce or eliminate the need for mechanical cooling.
New				**Energy Efficiency Ratio 2 (EER2)** is the EER metric for residential central air conditioners effective January 1, 2023, as created by the U.S. Department of Energy "ISSUANCE 2016-11-30 Energy Conservation Program: Test Procedures for Central Air Conditioners and Heat Pumps, Final Rule."
New				**Enthalpy Recovery Ratio (ERR)** is a ratio of the change in enthalpy of the outdoor air supply to the difference in enthalpy between the entering supply airflow and the entering exhaust airflow, with no adjustment to account for that portion of the psychometric change in the leaving supply airflow that is the result of leakage of entering exhaust airflow rather than exchange of heat or moisture between the airstreams.
New			*New definitions support the new heat pump water heater requirements.*	**Heat Pump Water Heater (HPWH)** is a water heater that transfers thermal energy from one temperature level to a higher temperature level for the purpose of heating water, including all ancillary equipment such as fans, storage tanks, pumps or controls necessary for the device to perform its function. **Single-pass Heat Pump Water Heater** is an HPWH in which the cold water passes through the heat pump(s) once and is heated to the intended storage temperature. **Multi-pass Heat Pump Water Heater** is an HPWH in which the cold water passes through the heat pump(s) multiple times, each time gaining a temperature increase, until the tank reaches the intended storage temperature.
New				**Heating Seasonal Performance Factor 2 (HSPF2)** is the HSPF metric for residential central heat pumps effective January 1, 2023, as created by the U.S. Department of Energy "ISSUANCE 2016-11-30 Energy Conservation Program: Test Procedures for Central Air Conditioners and Heat Pumps, Final Rule."
Revised Revised			*Revised and new definitions in support of the new HRV/ERV requirements of §140.4.*	**Mechanical Cooling** is lowering the temperature within a space using refrigerant compressors or absorbers, desiccant dehumidifiers, or other systems that require energy to directly condition the space. Systems that are solely energy recovery ventilation (ERV) or heat recovery ventilation (HRV) are not considered mechanical cooling. In nonresidential, multifamily buildings, and hotel/motel buildings, cooling of a space by direct or indirect evaporation of water alone is not considered mechanical cooling. **Mechanical Heating** is raising the temperature within a space using electric resistance heaters, fossil fuel burners, heat pumps, or other systems that require energy to directly condition the space. Systems that only use solar energy or heat recovery as the heat source are not mechanical heating systems.
New				**Multifamily Building** is any of the following: a building of Occupancy Group R-2, other than a hotel/motel building or timeshare property; a building of Occupancy Group R-3 that is a non-transient congregate residence other than boarding houses of more than 6 guests and alcohol or drug abuse recovery homes of more than 6 guests; or a building of Occupancy Group R-4.
New				**Net Sensible Coefficient of Performance (COP)** is defined by AHRI 1360 and includes all indoor unit power and air-cooled condenser/condensing unit power for air cooled units and includes all indoor unit power and the power allowance for pump and heat rejection as described in the Heat Rejection/Cooling Fluid Standard Rating Conditions table of AHRI 1360 for water, glycol, and chilled water units.
New				**Seasonal Energy Efficiency Ratio 2 (SEER2)** is the SEER metric for residential central air conditioners and heat pumps effective January 1, 2023, as created by the U.S. Department of Energy "ISSUANCE 2016-11-30 Energy Conservation Program: Test Procedures for Central Air Conditioners and Heat Pumps, Final Rule."
New				**Sensible Energy Recovery Ratio** is a ratio of the change in the dry-bulb temperature of the outdoor air supply to the difference in dry-bulb temperature between the outdoor air and entering exhaust airflow, with no adjustment to account for that portion of the dry-bulb temperature change in the leaving supply airflow that is the result of leakage of entering exhaust airflow rather than heat exchange between the airstreams.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION *(continued)*				
Revised	100.1(b)			**Single Zone System** is an air distribution system that supplies air to one thermal zone controlled by a single thermostat.
Revised				**Space-conditioning System** is a system that provides mechanical heating, or mechanical cooling within or associated with conditioned spaces in a building, and may incorporate use of components such as chillers/compressors, fluid distribution systems (e.g., air ducts, water piping, refrigerant piping), pumps, air handlers, cooling and heating coils, air or water cooled condensers, economizers, terminal units, and associated controls.
New				**Uniform Energy Factor (UEF)** of a water heater is a measure of overall water heater efficiency, as determined using the applicable test method in the Appliance Efficiency Regulations.
Revised				**Ventilation System, Central Fan Integrated (CFI)** is a ventilation system configuration in which the ventilation ductwork is connected to the duct system of a dwelling unit space conditioning system to enable distribution of ventilation air to the dwelling unit while the space conditioning system air handling unit is operating.
New				**Zonal** describes characterized by or relating to a zone or zones.
Section 100.2 – CALCULATION OF TIME DEPENDENT VALUATION (TDV) ENERGY: No change				
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS				
Section 110.0 – SYSTEMS AND EQUIPMENT – GENERAL: No change				
Section 110.1 – MANDATORY REQUIREMENTS FOR APPLIANCES: No change				
Section 110.2 – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING EQUIPMENT				
Minor	110.2(a)		**Revised Efficiency Tables**	Updated efficiencies on tables include: ✦ 110.2-A Air Conditioners and Condensing Units ✦ 110.2-B Heat Pumps ✦ 110.2-E Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps ✦ 110.2-F (formerly 110.2-G) Heat Rejection Equipment ✦ 110.2-H (formerly 110.2-I) Electrically Operated Variable Refrigerant Flow Air-to-Air and Applied Heat Pumps ✦ 110.2-I (formerly 110.2-J) Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units ✦ 110.2-J (formerly 110.2-K) Gas and Oil-Fired Boilers
New			**New Efficiency Tables**	✦ 110.2-K DX-DOAS Units, Single Package and Remote Condenser ✦ 110.2-N Heat Pump and Heat Recovery Chillers
No Change	110.2(b)-(d)			No change
Minor	110.2(e)		**Open and Closed Circuit Cooling Towers**	Exception has been clarified in which "open and closed circuit cooling" towers with rated capacity < 150 tons are exempt from these cycle of concentration requirements.
No Change	110.2(f)		**Low Leakage Air-handling Units**	No change

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Section 110.3 – MANDATORY REQUIREMENTS FOR SERVICE WATER-HEATING SYSTEMS AND EQUIPMENT: No change				
Section 110.4 – MANDATORY REQUIREMENTS FOR POOL AND SPA SYSTEMS AND EQUIPMENT: No change				
Section 110.5 – NATURAL GAS CENTRAL FURNACES, COOKING EQUIPMENT, POOL AND SPA HEATERS, AND FIREPLACES: PILOT LIGHTS PROHIBITED: No change				
Title 24, Part 6 Subchapter 10 MULTIFAMILY BUILDINGS – MANDATORY REQUIREMENTS				
Section 160.0 – GENERAL				
No Change	**120.0**	160.0 *Matches.*	**General**	No change
Section 160.2 – MANDATORY REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY (IAQ)				
No Change	**120.1(a)**	160.2(a) *Matches.*	**General Requirements**	No change
Section 160.2(b) – MANDATORY REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY (IAQ): ATTACHED DWELLING UNIT				
Minor	~~**120.1(b)**~~ Removed	160.2(b)1	**Attached Dwelling Unit Air Filtration**	Minor changes
Revised		160.2(b)2	**Attached Dwelling Unit Ventilation and Indoor Air Quality (IAQ)** *ASHRAE 62.2 requirements and tables are included in the Energy Code (not just referenced) which adds new code sections and tables to support compliance to these requirements.* *New airflow ventilation and verification requirements for kitchen hoods depend upon range utility type (electric or natural gas).*	A. **Amendments to ASHRAE 62.2 requirements.** **i. Window Operation:** No change **ii. Central Fan Integrated (CFI) Ventilation Systems:** These systems must not be continuous when used for whole-building ventilation. In addition, they must use a motorized outdoor air damper, meet damper control requirements and meet available ventilation demands independently from comfort conditioning. **iii. Air Filtration:** No change **iv. Whole-dwelling Unit Mechanical Ventilation:** When balanced ventilation system serving a single dwelling unit is used with heat recovery/energy recovery, then the fan efficacy must be ≤ 1.0 W/CFM. Otherwise, no changes. **v. Multifamily Building Central Ventilation System Airflow Rate Tolerance:** New requirements are added in which the design ventilation airflow rate for each dwelling unit must be stated on the building design plans approved by the enforcement agency. Verified airflow to each dwelling unit shall be no more than 20% greater of the designed airflow rate, and the ventilation systems must use mechanical or software airflow control means to ensure that each of the dwelling-unit airflows can be maintained at the design ventilation airflow within this tolerance at all times. System airflow control-means may include, but are not limited to, constant air regulation devices, orifice plates and variable speed central fans. **vi. Local Mechanical Exhaust:** ASHRAE requirements are now spelled out and includes new requirements for kitchen hoods. These new requirements apply to when a vented kitchen range hood is used to meet the kitchen local exhaust requirements of Table 160.2-E, then the system(s) must meet or exceed the requirements of either airflow or capture efficiency of Table 160.2-G (which are dictated by range utility type and size of dwelling unit) with HVI or AHAM certified equipment per Residential Appendix RA 3.7.4.3. If capture efficiency rating is used, then the airflow listed in the HVI/AHAM directory corresponding to the compliant capture efficiency rating shall be met by installed system. Additionally, the installer will verify the installed airflow by use of either below: a. The system installer shall measure the airflow in accordance with the procedures in Residential Appendix RA3.7 to confirm airflow rate of Table 160.2-G is met; OR b. By installing an exhaust fan meeting Table 160.2-G (based on static pressure values dependent upon if airflow or capture efficiency rating used), and an eligible duct system that conforms to the specifications of Table 160.2-H (Prescriptive Ventilation System Duct Sizing). An eligible system has a total duct length ≤ 25 ft, with three or fewer elbows, and an exterior termination fitting hydraulic diameter that is greater than the duct diameter but not less than the hydraulic diameter of the fan outlet. When using capture efficiency rating, use the airflow listed in HVI/AHAM that corresponds to the compliance capture efficiency of Table 160.2-G for sizing ducting per Table 160.2-H. ***(continued)***

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Section 160.2(b) – MANDATORY REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY (IAQ) : ATTACHED DWELLING UNIT *(continued)*				
Revised		160.2(b)2	*New minimum efficacy and verification requirements apply to energy recovery ventilation and heat recovery ventilation fan systems.* *There are new central ventilation system duct sealing requirements.*	***(continued)*** **vii. Airflow Measurement of Whole-dwelling Unit Ventilation:** This airflow must be tested per Residential Appendix RA3.7 or Nonresidential Appendix NA2.2. Balanced ventilation airflow must be the average of the supply and exhaust fan flows. **viii. Sound Ratings for Whole-dwelling Unit Ventilation Systems:** These are set per ASHRAE 62.2 §7.2 per airflow required by §§160.2(b)2Aiv or 160.2(b)2Av above. **ix. Label for Whole-dwelling Unit Ventilation System ON-OFF Control:** Manual ON/OFF control associated with whole-building ventilation must be labeled with this message or the equivalent: "This switch controls the indoor air quality ventilation for the home. Leave switch in the ON position at all times unless the outdoor air quality is very poor." **x. Combustion Air and Compensating Outdoor Air or Makeup Air:** California Mechanical Code Chapter 7 must be used along with ASHRAE 62.2 §6.4. B. **Dwelling Unit HERS Field Verification and Diagnostic Testing:** Minor changes to clean up include new vented kitchen hood requirements and new language in which heat recovery ventilation (HRV) and energy recovery ventilation (ERV) are required to have a fan efficacy of ≤ 1.0 W/CFM which must be verified by a HERS Rater per Residential Appendix RA3.7.4.4 or Nonresidential Appendix NA2.2.4.1.5 C. **Multifamily Building Central Ventilation System Field Verification:** Central ventilation ducts that conform to subsections a and b below must meet the duct sealing requirements in the California Mechanical Code §603.10 and have leakage that is ≤ 6% of the rooftop fan or central fan design airflow rate as confirmed by field verification in accordance with the procedures in Nonresidential Appendix NA7.18.3. The leakage test must be conducted using a test pressure of 25 Pa (0.1 inches) for ducts serving ≤ 6 dwelling units and 50 Pa (0.2 inches) for ducts serving > 6 dwelling units and must measure the leakage of all ductwork between the central fan and the connection point to the in-unit grille or fan. i. The ventilation ducts serve multiple dwelling units. ii. The ventilation ducts provide continuous airflows or airflows to provide balanced ventilation to meet the requirements specified in §§160.2(b)2Aiv or 160.2(b)2Av as applicable.
Section 160.2(c) – MANDATORY REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY (IAQ): COMMON USE AREA				
Revised	**120.1(c)**	160.2(c)1-4 *Does not match the new requirements of §120.1(c) and matches the 2019 requirements.*	***Common Use Area***	1. **Air Filtration** A. **Mechanical Systems:** Revisions clarify when air filtration is required for recirculated and outdoor air to occupied spaces before passing through any thermal-conditioning component for mechanical space-conditioning, supply-only ventilation and supply side of balanced ventilation systems. There is a new exception for HRV/ERV in which the filters may be located downstream if ancillary filtration is located upstream of the thermal-conditioning system. B. **Air Filter Efficiency:** No change C. **Air Filters:** Minor change supports the new location of Equation 160.2-A. D. **Filter Racks:** New requirements specify that filter racks or grilles must be gasketed or sealed to eliminate any gaps around the filter to prevent air from bypassing the filter. 2. **Natural Ventilation:** No change 3. **Mechanical Ventilation:** Occupiable spaces must be ventilated with a mechanical ventilation system capable of providing an outdoor airflow rate (Vz) to the zone no less than the larger of Equation 160.2-G or 160.2-H. 4. **Exhaust Ventilation:** No change

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Section 160.2(c) – MANDATORY REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY (IAQ): COMMON USE AREA *(continued)*				
Revised	**120.1(d)**	160.2(c)5 *Matches.*	***Common Use Area*** **Operation and Control Requirements for Minimum Quantities of Outdoor Air**	A-D. No change E. **Occupant Sensor Ventilation Control Devices:** Clarity is provided for when and how ventilation must be controlled, when allowed per Table 160.2-B and when lighting occupancy sensors are required for the space per §160.5(b)4Cv, vi and vii (Mandatory Indoor Lighting Controls). Occupancy sensor control requirements depend on the vacancy of the space(s) and the zone(s) subject to the space-conditioning system design parameters. When occupancy sensors indicate that all the spaces within the zone are "unoccupied" when the zone is scheduled to be "occupied," within 20 minutes the zone will be placed in occupied standby mode. Within 5 minutes of entering occupied standby mode, the ventilation is to be shut off and, if a space-conditioning system used for ventilation also, space-conditioning zone setpoints must be reset per §160.3(a)2Diii (Occupancy Sensing Zone Controls) until the space is "occupied," or when ventilation is needed to provide space-conditioning. All other requirements remain the same.
No Change	**120.1(e)**	160.2(c)6	***Common Use Area*** **Ducting for Zonal Heating and Cooling Units**	No change
Revised	**120.1(f)**	160.2(c)7 *Matches.*	***Common Use Area*** **Design and Control Requirements for Quantities of Outdoor Air**	A. Designed minimum outdoor air must operate at no less than the larger of the minimum per §160.2(c)3 (Mechanical Ventilation) or at the rate required for an exempt or covered process make-up exhaust system(s). B. Variable air volume (VAV) systems must be capable of maintaining measured outside air rates within 10% of the designed minimum. C. All mechanical ventilation and space-conditioning systems (not just constant volume as was the requirement in 2019) must be tested to confirm that they operate within 10% of the designed minimum outside air rate.
Minor	**120.1(g)**	160.2(c)8 *Matches.*	***Common Use Area*** **Air Classification and Recirculation Limitations**	Air class definitions per ASHRAE 62.1 are provided to support the understanding of each class type.
Section 160.2(d) – MANDATORY REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY (IAQ): PARKING GARAGES				
New	**N/A**	160.2(d)	**Parking Garages**	Mechanical ventilation systems of enclosed parking garages must meet the requirements of §120.6(c).
New	**120.1(h)**	**N/A** *Does not match new §120.1(h) requirements.*	~~**Ventilation Only Mechanical Systems**~~	
Section 160.3(a)1 – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS IN MULTIFAMILY BUILDINGS: DWELLING UNIT CONTROLS				
	120.2 and **150.0**	160.3(a)1	***Dwelling Unit*** **Controls**	
No Change	**120.2(c)** and **150.0(i)**	160.3(a)1 *Matches.*	***Dwelling Unit*** **Thermostats**	No change

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Section 160.3(a)2 – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS IN MULTIFAMILY BUILDINGS: COMMON USE AREA CONTROLS				
No Change	**120.2(a)-(b)** and **(d)**	160.3(a)2A-C *Matches.*	***Common Use Area*** **Controls**	No change
Revised	**120.2(e)**	160.3(a)2D *Matches.*	***Common Use Area*** **Shut-off and Reset Controls for Space-conditioning Systems**	i. No change ii. No change iii. **Occupancy-sensing Zone Controls:** Edits are made similar to those in §160.2(c)5 (Operation and Control Requirements for Minimum Quantities of Outdoor Air) to clarify requirements.
No Change	**120.2(f)-(h)**	160.3(a)2E-G		No change
Revised	**120.2(i)**	160.3(a)2H *Matches.*	***Common Use Area*** **Economizer Fault Detection and Diagnostics**	Newly installed air handlers with mechanical cooling capacity over 33,000 Btuh and an air economizer must meet the fault detection and diagnostics (FDD) requirements of this section (changed from the 2019 Energy Code trigger of 60,000 Btuh).
Minor	**120.2(j)**	160.3(a)2I *Matches.*	***Common Use Area*** **Direct Digital Controls**	Additional references are made to §110.12 (Mandatory Requirements for Demand Management) to support how direct digital controls (DDC) must interact with demand-responsive controllability.
No Change	**120.2(k)**	160.3(a)2J	***Common Use Area*** **Optimum Start/Stop Controls**	No change
Section 160.3(b) – MANDATORY REQUIREMENTS FOR SPACE CONDITIONING SYSTEMS IN MULTIFAMILY BUILDINGS: DWELLING UNIT SPACE-CONDITIONING EQUIPMENT				
No Change	**150.0(h)1-4**	160.3(b)1-4 *Matches.*	***Dwelling Unit*** **Space-conditioning and Air Distribution Systems**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.3(b) – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS IN MULTIFAMILY BUILDINGS: DWELLING UNIT SPACE CONDITIONING EQUIPMENT *(continued)*				
Revised	**150.0(m) 1-13**	160.3(b)5 *Does not match 2022 requirements for single-family buildings in §150.0(m); it matches the 2019 Energy Code.*	***Dwelling Unit*** **Air-Distribution and Ventilation System Ducts, Plenums and Fans**	A. **California Mechanical Code Compliance:** i. All air distribution system ducts and plenums, including but not limited to mechanical closets and air handler boxes, must meet the requirements of the California Mechanical Code §§601.0, 602.0, 603.0, 604.0 and 605.0 and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition, incorporated herein by reference. ii. Portions of supply-air and return-air ducts and plenums of a space-heating or cooling system must either: a. Be insulated to minimum installed level of R-6.0; OR b. Have no insulation when the duct system is located entirely in conditioned space as confirmed through field verification and diagnostic testing in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.8. EXCEPTIONS: 1. Portions of the duct system located in conditioned space below the ceiling separating the occupiable space from the attic are not required to be insulated if all of the following conditions are met: a. The cavity, duct or plenum is located entirely inside the building's thermal envelope as confirmed by visual inspection; AND b. At all locations where portions of non-insulated cavities, ducts or plenums make a transition into unconditioned space, the transition is air-sealed to prevent air infiltration into the cavity and insulated to a minimum of R-6 as confirmed by visual inspection. iii. Connections of metal ducts and the inner core of flexible ducts must be mechanically fastened. iv. Openings must be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A or UL 181B or with an aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape must be used. v. Building cavities, support platforms for air handlers and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct must not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms must not be compressed to cause reductions in the cross-sectional area of the ducts. EXCEPTION: There is an exception for ducts and fans integral to a wood heater or fireplace. B- J. No change
New			*Testing by HERS Rater or contractor is based on number of habitable floors.*	K. **Duct System Sealing and Leakage Testing:** Currently, air leakage is based on air handler airflow and is no longer based on nominal system air handler airflow. EXCEPTIONS: 1. The HERS Rater field verification and HERS Provider data registry requirements of Residential Appendices RA2 and RA3 are not required for multifamily dwelling units in buildings with four or more habitable stories. The installer must certify that diagnostic testing was performed in accordance with the applicable procedures. 2. Multifamily dwelling units in buildings with four or more habitable stories in Climate Zones 1, 3, 5 and 7 are excepted. L. **System Airflow Rate and Fan Efficacy:** Small duct high-velocity forced air system fan efficacy is now ≤ 0.62 W/CFM. Otherwise, only the exceptions have changed. EXCEPTIONS: 1. The HERS Rater field verification and HERS Provider - is data registry requirements of Residential Appendices RA2 and RA3 are not required for multifamily dwelling units in buildings with four or more habitable stories. The installer must certify that diagnostic testing was performed in accordance with the applicable procedures. 2. Multifamily dwelling units in buildings with four or more habitable stories in Climate Zone 1 are excepted.
	150.0(j)2B	160.3(b)6 *Matches.*	***Dwelling Unit*** **Pipe Insulation**	Piping for space-conditioning systems, piping for a solar water-heating system collector loop and distribution piping for steam and hydronic heating system must meet the requirements of §160.3(c)1.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.3(c) – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS IN MULTIFAMILY BUILDINGS: COMMON USE AREA SPACE-CONDITIONING SYSTEMS				
No Change	**120.3**	160.3(c)1 *Matches.*	***Common Use Area*** **Pipe Insulation**	No change
No Change	**120.4(a)**	160.3(c)2A-B *Matches.*	***Common Use Area*** **CMC Compliance and Duct Insulation**	No change
Revised	**120.4(b)1-2**	160.3(c)2C *Matches.*	***Common Use Area*** **Duct and Plenum Materials**	**Factory-fabricated and Field-fabricated Duct Systems:** New requirements are added that all ductwork and plenums with pressure class ratings meet Seal Class A as specified in ASHRAE 90.1, with an exception for exposed ductwork in occupied space.
No Change	**120.4(c)-(f)**	160.3(c)2D-G *Matches.*	***Common Use Area*** **Ducting**	No change
New	**120.4(g)**	160.3(c)2H *Matches.*	***Common Use Area*** **Duct Sealing**	New duct systems have new testing requirements in which ducts must either: i. Be tested by a HERS Rater per Nonresidential Appendices NA1 and NA2 to verify that no more than 6% leakage of the nominal air handler airflow rates of a constant volume, single zone system that serves < 5,000 ft² AND has more than 25% of the duct surface outside the conditioned space AND is not serving a healthcare facility; OR ii. Meet the California Mechanical Code requirements of §603.9.2 if they cannot meet the requirements above.
Section 160.3(d) – MANDATORY REQUIREMENTS FOR SPACE-CONDITIONING SYSTEMS IN MULTIFAMILY BUILDINGS: DWELLING UNITS IN BUILDINGS ≥ 4 HABITABLE STORIES				
Revised	**120.5(a)**	160.3(d)	***Mechanical Acceptance Testing*** *Dwelling unit requirements are revised.*	1. ***Common Use Area*** **Acceptance Testing:** It is clarified that these requirements apply only to common use areas. Otherwise, there are no changes. 2. ***Dwelling Units*** **of Multifamily Buildings ≥ 4 habitable stories:** Before an occupancy permit is granted, the following systems and equipment serving multifamily dwelling units must be certified as meeting the Acceptance Requirements for Code Compliance, as specified by the Nonresidential Appendix NA7. These systems and equipment must also comply with the appliable requirements of §160.3(d)3. A certificate of acceptance must be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements: A. **Dwelling unit ventilation systems** must be tested in accordance with Nonresidential Appendix NA7.18.1. B. **Dwelling unit enclosure leakage** must be tested in accordance with Nonresidential Appendix NA7.18.2 when exhaust or supply ventilation systems are used for compliance with whole-dwelling unit ventilation requirements as specified in §160.2(b)2Aivb2. C. **Central ventilation ducts** must be leak-tested in accordance with Nonresidential Appendix NA7.18.3. D. **Central ventilation system heat recovery or energy recovery systems** in multifamily buildings must be tested in accordance with Nonresidential Appendix NA7.18.4
No Change	**120.5(b)**	160.3(d)3 *Matches.*	**Title 24, Part 1 10-103.2**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.4(a)-(d) – MANDATORY REQUIREMENTS FOR WATER-HEATING SYSTEMS: DWELLING UNIT INDIVIDUAL WATER HEATERS				
Revised	**150.0(n)**	**160.4(a)-(d)** *Does not match the new 2022 requirements for single-family buildings in §150.0(n) but matches 2019 requirements.*	***Dwelling Unit:*** **Water-heating Systems**	a. Systems using gas or propane water heaters to serve individual dwelling units must include the following components: 1. A dedicated, 125-volt, 20-amp electrical receptacle that is connected to the electric panel with a 120/240-volt 3 conductor, 10 AWG copper branch circuit, within 3 ft from the water heater and accessible to the water heater with no obstructions. In addition, all of the following are required: A. Labeling both ends of the unused conductor with the word "spare" and electrically isolating them AND B. A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit in A above that is labeled with the words "Future 240V Use" AND 2. A Category III or IV vent, or a Type B vent with straight pipe between the outside termination and the space where the water heater is installed AND 3. A condensate drain that is no more than 2 inches higher than the base of the installed water heater and that allows natural draining without pump assistance AND 4. A gas supply line with a capacity of at least 200,000 Btuh b. Water-heating recirculation loops serving multiple dwelling units must meet the requirements of §110.3(c)4. c. Solar water-heating systems and collectors must be certified and rated by the Solar Rating and Certification Corporation (SRCC), the International Association of Plumbing and Mechanical Officials, Research and Testing (IAPMO R&T), or by a listing agency that is approved by the CEC Executive Director. d. Instantaneous water heaters with an input rating greater than 6.8 kBtuh (2kW) must meet the requirements of §110.3(c)6.
Section 160.4(e) – MANDATORY REQUIREMENTS FOR WATER-HEATING SYSTEMS: DWELLING UNIT OR COMMON USE AREA WATER-HEATING SYSTEMS				
Revised	**120.9**	**160.4(e)** *Matches.*	**Commercial Boilers**	1-2. No change 3. There is an exception for newly installed boilers ≥ 5 MMBtuh stack gas oxygen concentration limits and combustion air requirements apply to boilers with steady full-load thermal efficiency of ≥ 90%. This was changed from 85% in the 2019 Energy Code.
Section 160.4(f) – MANDATORY REQUIREMENTS FOR WATER-HEATING SYSTEMS: PIPING				
	150.0(j)2 **120.3(c)**	**160.4(f)1** *Does not match changes in §150.0(j)2 2022 single-family building requirements.*	**Piping** *Table 160.4-4 Pipe Insulation Thickness does NOT match Table 120.3-A Pipe Insulation Thickness.*	Piping for multifamily domestic hot water systems must be insulated to meet the requirements of Table 160.4-A. EXCEPTIONS: 1. Factory-installed piping within space-conditioning equipment certified under §§110.1 or 110.2 is not required to meet insulation requirements of Table 160.4-A. 2. Piping that penetrates framing members is not required to have pipe insulation for the distance of the framing penetration. Piping that penetrates metal framing must use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation must abut securely against all framing members. 3. Piping installed in interior or exterior walls is not required to have pipe insulation if all of the requirements are met for compliance with Quality Insulation Installation (QII) as specified in the Residential Appendix RA3.5. 4. Piping surrounded with a minimum of 1 inch of wall insulation, 2 inches of crawlspace insulation or 4 inches of attic insulation is not required to have pipe insulation.
No Change	**120.3(b)**	**160.4(f)2** *Matches.*	**Insulation Protection**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.4 – MANDATORY REQUIREMENTS FOR WATER-HEATING SYSTEMS				
New	**120.10(a)**	**N/A** *Does not match new §120.10(a) requirements.*	~~**Fan Energy Index**~~	This requirement does not apply to multifamily occupancies, dwelling unit or common use areas, but it does apply to mixed-use nonresidential occupancy.

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Performance Change Summaries
Title 24, Part 6 Subchapter 11 MULTIFAMILY BUILDINGS – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES				
Section 170.0 – GENERAL				
Minor	**140.0**	**170.0**	**General**	Minor changes
Section 170.1 – PERFORMANCE APPROACH				
Revised	**140.1(a)-(c)**	**170.1(a)-(c)** *Does not match single-family building requirements in which energy design rating (EDR) will not be used to document multifamily buildings when using the Performance Method.*	**Performance Approach: Energy Budget** Source energy compliance is required and must comply independently from building time-dependent valuation.	a. **Energy Budget for the Standard Design Building.** The energy budget for the Standard Design Building is expressed in terms of source energy and time-dependent valuation (TDV) energy, and they are determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The source energy budget and the TDV energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, photovoltaic (PV) and battery storage systems, service water heating and covered process loads. b. **Energy Budget for the Proposed Design Building.** The energy budget for a Proposed Design Building is expressed in terms of source energy and TDV energy, and they are determined by calculating the source energy and TDV energy for the Proposed Design Building. The source energy budget are the TDV energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, PV and battery storage systems, and service water heating and covered process loads. The Proposed Building must separately comply with the source energy budget and the TDV energy budget. EXCEPTION: Community solar or battery per Title 24, Part 1 §10-115. c. **Calculation of Energy Budget:** The Standard Design energy budget and Proposed Design energy use shall be calculated using compliance software approved by the California Energy Commission.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Performance Change Summaries
Section 170.1 – PERFORMANCE APPROACH *(continued)*				
	140.1(d)	**170.1(d)** *Matches. §150.1(b) changes in single-family building requirements.*	**Compliance Demonstration Requirements for Performance Standards**	1. Source energy, in addition to TDV energy, has standard design requirements which the Proposed Building must meet or exceed. 2. New verification and installation requirements for all multifamily building types include: A. **EER/EER2/SEER/SEER2/CEER/HSPF/HSPF2 Rating(s):** when field verified following applicable requirements of Residential Appendix RA3.4.1 B. **Variable Capacity Heat Pump (VCHP) Compliance Option:** when field verified following applicable requirements of Residential Appendix RA3.4.4.3 C. **Low Leakage Air Handler:** when field verified following applicable requirements of Residential Appendix RA3.1.4.3.9 D. RESERVED E. **Heat Pump - Rated Heating Capacity:** when performance compliance requires installation of a heat pump system, the heating capacity values field verified at 47˚F and 17˚F following applicable requirements of Residential Appendix RA3.4.4.2 F. **Whole-house Fan:** when field verified following applicable requirements of Residential Appendix RA3.9 G. **Central Fan Ventilation Cooling System:** when field verified following applicable requirements of Residential Appendix RA3.3.4 H. **Dwelling Unit Enclosure Air Leakage:** when field verified following applicable requirements of Residential Appendix RA3.8 I. **QII:** when performance compliance requires field verification of QII following applicable requirements of Residential Appendix RA3.5 J. **Pre-Cooling:** when performance compliance requires field verification of the installation and programming of a Pre-Cooling Thermostat following applicable requirements of Residential Appendix RA3.4.5

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 11 MULTIFAMILY BUILDINGS – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES				
Section 170.2(c)1-2 – PRESCRIPTIVE APPROACH: COMMON USE AREA SPACE-CONDITIONING SYSTEMS				
No Change	**140.4(a)**	**170.2(c)1-2** *Matches.*	***Common Use Area* Sizing and Equipment Selection**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(c)3 – PRESCRIPTIVE APPROACH: DWELLING UNIT SPACE-CONDITIONING SYSTEMS				
Revised	**≤ 3 Habitable Stories: 150.1(c)6** **≥ 4 Habitable Stories: 140.4(a)**	170.2(c)3A *Does not match changes in §150.1(c)6 2022 single-family building requirements.* *Does not match changes in §140.4(a) 2022 non-residential building requirements.*	***Dwelling Unit*** **Heating System Type**	Heating System Type: Space-conditioning systems serving dwelling units must meet i or ii. Use the Performance Method for all system types not meeting i or ii. i. **Multifamily Buildings ≤ 3 Habitable Stories:** • For Climate Zones 1-15: The space-conditioning system must be a heat pump. • For Climate Zone 16: The space-conditioning system must be an air conditioner with a furnace. • Balanced ventilation systems must meet applicable requirements of §170.2(c)3Bivc (Dwelling Unit Balanced Ventilation Systems). ii. **Multifamily Buildings ≥ 4 Habitable Stories:** • For Climate Zones 2-15: The space-conditioning system must be a heat pump. • For Climate Zones 1 and 16: The space-conditioning system must be a dual-fuel heat pump. EXCEPTION: 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 kW or 7,000 Btuh and is controlled by a time-limiting device not exceeding 30 minutes.
	150.1(c)7A	170.2(c)3Bi *Matches aside from a new exception.*	***Dwelling Unit*** **Refrigerant Charge**	There is a new exception; otherwise, there are no changes. EXCEPTION: **Multifamily Buildings ≥ 4 Habitable Stories:** The HERS Rater field verification and HERS Provider data registry requirements of Residential Appendices RA2 and RA3 are not required. The installer must certify that diagnostic testing was performed in accordance with the applicable procedures.
	150.1(c)9	170.2(c)3Bii *Matches aside from a new exception.*	***Dwelling Unit*** **Space-conditioning Distribution Systems**	There is a new exception; otherwise, there are no changes. EXCEPTION: **Multifamily Buildings ≥ 4 Habitable Stories:** The HERS Rater field verification and HERS Provider data registry requirements of Residential Appendices RA2 and RA3 are not required. The installer must certify that diagnostic testing was performed in accordance with the applicable procedures.
	150.1(c)10	170.2(c)3Biii *Does not match 2022 changes in §150.1(c)10 single-family building requirements; matches 2019 Energy Code.*	***Dwelling Unit*** **Central Fan Integrated Ventilation Systems**	Central forced air system fans used to provide outside air, must have an air-handling unit fan efficacy less than or equal to the maximum W/CFM specified in a or b below: a. 0.45 W/CFM for gas furnace air-handling units OR b. 0.58 W/CFM for air-handling units that are not gas furnaces The airflow rate and fan efficacy requirements in this section must be confirmed through field verification and diagnostic testing in accordance with all applicable procedures specified in Residential Appendix RA3.3. Central Fan Integrated Ventilation Systems must be certified to the CEC as Intermittent Ventilation Systems as specified in Residential Appendix RA3.7.4.2. EXCEPTION: **Multifamily Buildings ≥ 4 Habitable Stories:** The HERS Rater field verification and HERS Provider data registry requirements of Residential Appendices RA2 and RA3 are not required. The installer must certify that diagnostic testing was performed in accordance with the applicable procedures.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(c)3 – PRESCRIPTIVE APPROACH: DWELLING UNIT SPACE-CONDITIONING SYSTEMS *(continued)*				
New		170.2(c)3Biv *When ≤ 3 habitable stories: Does not match single family because these requirements apply only to multifamily occupancies.*	***Dwelling Unit* Balanced Ventilation Systems** *When ≥ 4 habitable stories, the fan efficacy requirements of §170.2(c)4A (Common Use Area) apply.*	When balanced ventilation is used to meet ventilation requirements of §160.2(b)2Aivb, one of the following requirements applies: a. In Climate Zones 1-2, 11-16, for any size multifamily building using ERV/HRV serving each dwelling unit: • Sensible recovery efficiency ≥ 67% rated at 32 F° AND • Fan efficacy ≤ 0.6 W/CFM AND • Multifamily buildings ≤ 3 habitable stories: HERS verification per Residential Appendix RA3.7.4.4 OR • Multifamily buildings ≥ 4 habitable stories: Field verification per Nonresidential Appendix NA2.2.4.1.5 b. In Climate Zones 1-2, 11-16 for multifamily buildings ≥ 4 habitable stories using ERV/HRV serving multiple dwelling units: • Sensible recovery efficiency ≥ 67% rated at 32°F AND • Fan efficacy per §170.2(c)4A (Common Use Area Fan Systems) AND • Recovery bypass or control to directly economize with ventilation air based on outdoor air temperature limits per Table 170.2-G AND • Field verification per Nonresidential Appendix NA7.18.4 c. In Climate Zones 4-10 for multifamily buildings ≤ 3 habitable stories when a heat pump space-conditioning system is installed to meet the requirements of §170.2(c)3Ai (Dwelling Unit Heating System Type), balanced ventilation systems without an ERV or HRV must have a fan efficacy less than or equal to 0.4 W/CFM. EXCEPTION: **Multifamily Buildings ≥ 4 Habitable Stories:** The HERS Rater field verification and HERS Provider data registry requirements of Residential Appendices RA2 and RA3 are not required. The installer must certify that diagnostic testing was performed in accordance with the applicable procedures.
No Change	**150.1(c)13**	170.2(c)3C *Matches.*	***Dwelling Unit* HVAC System Bypass Ducts**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(c)4 – PRESCRIPTIVE APPROACH: COMMON USE AREA SPACE-CONDITIONING SYSTEMS				
Revised	**140.4(c)**	**170.2(c)4Ai-iii** *Matches.*	***Common Use Area* Fan Systems** *New fan power requirements are triggered for fan systems with input power ≥ 1 kW. New tables and equations are provided.* **EXCEPTIONS to §170.2(c)4A:** 1. Fan system power caused solely by process loads: No changes	i. **Fan Power Budget:** For each fan system that is moving air into, out of, or between conditioned or circulating air for the purpose of conditioning air within a space and includes at least one fan or fan array with fan electrical input power ≥ 1 kW, the fan system electrical input power must not exceed kW budgets at the fan system design airflow. a. **Calculating Fan Power Budget:** ***Fan system airflow x sum of the fan power allowances / 1000 = Fan Power kW Budget**** ** For building sites at elevations > 3,000 ft, multiply Fan Power kW Budget by correction factor in Table 170.2-D.* *Each fan system airflow determines the fan power allowance(s) using the appropriate allowance table. For a given component, if only a portion of the fan system airflow passes through the component, use the equation to calculate the Fan Power Allowance for that component.* **Fan System Type** / **Fan System Power Allowance Tables** Single-Cabinet: Table 170.2-B and Table 170.2-C Supply-Only: Table 170.2-B Relief: Table 170.2-C Exhaust, Return, Transfer: Table 170.2-C Complex Supply, Return/Exhaust: • **Fan power** allowances use Table 170.2-B and then use sum of all. • **Airflow** allowance: – **Supply:** Use Table 170.2-B for each fan using design conditions. – **Return/exhaust:** Use Table 170.2-C for each fan at design conditions. b. **Determining Designed Fan Power:** Fan input power must be calculated with two times the clean filter pressure drop, which is the mean of the clean filter pressure drop and design final filter pressure drop. If variable speed drives are used, their efficiency losses must be included. Each fan or fan array designed fan power must be determined using one of the following methods. There is no requirement to use the same method for all fans in a fan system to determine the total Designed Fan Power. I. Fan power per Table 170.2-E (cannot be used for complex fans). II. Fan power provided by the manufacturer of the fan, fan array or equipment that includes the fan or fan array calculated per USDOE 10 CFR Part 430, USDOE 10 CFR Part 431, ANSI/AMCA Standard 208-2018, ANSI/AMCA Standard 210-2016, AHRI Standard 430-2020, AHRI Standard 440-2019 or ISO 5801-2017 III. Fan power provided by the manufacturer calculated at fan system design conditions per ANSI/AMCA 208-2018 §5.3 OR IV. Fan power using the maximum electrical input power provided on the motor nameplate ii. **Variable Air Volume (VAV) Systems:** No change iii. **Fractional HVAC Motors for Fans:** No change
	140.4(d) *Altered.*	**170.2(c)4B** *Matches.*	***Common Use Area* Space-conditioning Zone Controls**	i. No change ii. VAV systems change (otherwise no changes): a. Zones with direct digital controls (DDC) volume of primary air in the deadband must not exceed design zone outdoor airflow as specified by §160.2(c)3. 20% of peak primary airflow is no longer an option.

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Section 170.2(c)4 – PRESCRIPTIVE APPROACH: COMMON USE AREA SPACE-CONDITIONING SYSTEMS *(continued)*				
	140.4(e) *Altered.*	170.2(c)4C *Matches except that §140.4 exception #6 is removed, and a new exception #7 for CEH is not applicable.*	***Common Use Area*** **Economizers**	i. Each cooling air handler with a design total mechanical cooling capacity over 33,000 Btuh (no longer 54,000 Btuh) is Prescriptively required to provide an air or water economizer. Some clarifications are made to Table 170.2-F (Economizer Trade-Off Table for Cooling Systems). All other requirements remain the same. EXCEPTIONS: 1-5. No change 6. Removed
No Change	**140.4(f)**	170.2(c)4D *Matches.*	***Common Use Area*** **Supply Air Temperature Reset Controls**	No change
No Change	**140.4(g)**	170.2(c)4E *Matches.*	***Common Use Area*** **Electric Resistance Heating**	No change
No Change	**140.4(h)**	170.2(c)4F *Matches.*	***Common Use Area*** **Heat Rejection Systems**	No change
No Change	**140.4(i)**	170.2(c)4G *Matches.*	***Common Use Area*** **Minimum Chiller Efficiency**	No change
No Change	**140.4(j)**	170.2(c)4H *Matches.*	***Common Use Area*** **Limitation of Air-Cooled Chillers**	No change
	140.4(k) *Altered.*	170.2(c)4I *Does not match non-residential §140.4(k) 2022 changes; matches 2019 Energy Code.*	***Common Use Area*** **Hydronic System Measures**	1-7. No change
Revised	**140.4(l)**	170.2(c)4K *Matches.*	***Common Use Area*** **Air Distribution System Duct Leakage Sealing**	REMOVED. This is now a Mandatory requirement per §160.3(c)2H (Duct Sealing).
No Change	**140.4(m)**	170.2(c)4K *Matches.*	***Common Use Area*** **Fan Control**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(c)4 – PRESCRIPTIVE APPROACH: COMMON USE AREA SPACE-CONDITIONING SYSTEMS *(continued)*				
No Change	**140.4(n)**	170.2(c)4L *Matches.*	***Common Use Area*** **Mechanical System Shut-off**	No change
No Change	**140.4(o)**	170.2(c)4M *Matches.*	***Common Use Area*** **Exhaust System Transfer Air**	No change
New	**140.4(p)**	170.2(c)4N *Does not match non-residential §140.4(p) 2022 changes.*	***Common Use Area*** **Dedicated Outdoor Air Systems**	When HVAC systems use a Dedicated Outdoor Air System (DOAS) system to condition, temper or filter 100% outdoor air separate from space-conditioning systems serving the same space(s), the following is required: i. Each space must be served by either: a. A DOAS unit and an independent space-conditioning system with economizer per §170.2(c)4Ci (Economizers) AND the exhaust heat recovery requirements of §170.2(c)4O (Exhaust Air Heat Recovery) OR b. A DOAS unit and an independent cooling system, in which the DOAS unit, at a minimum, provides the minimum ventilation airflow rate per §120.1(c)3 (Air Filtration) and ≥ 0.3 CFM/ft² during economizer operation AND ventilation sensible energy recovery ratio of ≥ 60% or enthalpy recovery ratio of ≥ 50% at full flow cooling and heating design conditions AND energy recovery bypass, or control to directly economize with ventilation air based on outdoor air temperatures limits specified in Table 170.2-G. c. DOAS units with airflow rate > 1,000 CMF must meet demand ventilation control requirements in accordance with §160.2(c)5C, D and E. EXCEPTION to i: There is an exception for systems installed for the sole purpose of providing makeup air for exhausting toxic fumes, flammable materials, paint, corrosive fumes or dust; dryer exhaust; or commercial kitchen hoods used for collecting and removing grease vapors and smoke. ii. Ventilation fan systems must be capable of modulating fan speed control. iii. Heating and cooling equipment fans, heating and cooling circulation pumps and terminal unit fans must cycle off and terminal unit primary cooling air must be shut off when there is no call for heating or cooling in the zone. EXCEPTION to iii: Fans used for heating and cooling using < 0.12 W/CFM may operate when space temperatures are within the thermostat deadband to provide destratification and air mixing in the space. iv. The DOAS supply air must be delivered directly to the occupied space or downstream of the terminal heating or cooling coils. EXCEPTIONS to iv: 1. Active chilled beam systems 2. Sensible only cooling terminal units with pressure-independent variable-airflow regulating devices limiting the DOAS supply air to the greater of latent load or minimum ventilation requirements 3. Terminal heating and/or cooling units that comply with the low fan power allowance requirements in Exception to §170.2(c)4Oiii v. DOAS with mechanical cooling providing ventilation to multiple zones and operating in conjunction with zone heating and cooling systems must not use heating or heat recovery to warm supply air above 60°F when representative building loads or outdoor air temperature indicate that the majority of zones require cooling. vi. DOAS with a total fan system input power < 1 kW must not exceed a total combined fan power of 1.0 W/CFM. DOAS with fan power ≥ 1 kW must meet the requirements §170.2(c)4A (Fan Systems).

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(c)4 – PRESCRIPTIVE APPROACH: COMMON USE AREA SPACE-CONDITIONING SYSTEMS *(continued)*				
New	**140.4(q)**	**170.2(c)4O** *Does not match non-residential §140.4(p) 2022 changes.*	***Common Use Area*** **Exhaust Air Heat Recovery**	Fan systems designed to operate to the criteria listed in either Table 170.2-I or Table 170.2-J must include an exhaust air heat recovery system which meets the following: i. The system has a sensible energy recovery ratio of ≥ 60% or enthalpy recovery ratio of ≥ 50% at cooling or heating design conditions; AND ii. There is an energy recovery bypass, or control to directly economize with ventilation air based on outdoor air temperatures limits specified in Table 170.2-G. For energy recovery systems where the transfer of energy cannot be stopped, bypass must prevent the total airflow rate of either outdoor air or exhaust air through the energy recovery exchanger from exceeding 10% of the full design airflow rate. EXCEPTION: There is an exception for DOAS units with the capability to shut off when a separate independent space-conditioning system meets the economizer requirements specified by §170.2(c)4Ci is economizing. iii. For a DOAS unit and a separate independent space-conditioning system meeting the requirements of §170.2(c)4Nia, the design supply fan airflow rate must be the total airflow of only the DOAS unit. EXCEPTIONS: 1. Systems meeting §140.9(c) (Prescriptive Requirements for Laboratory and Factory Exhaust Systems) 2. Systems serving spaces that are not cooled and that are heated < 60°F 3. Climate Zone 16 when > 60% of the outdoor air heating energy is provided from site-recovered energy 4. Climate Zone 15 sensible recovery ratio requirements at heating design conditions 5. Climate Zone 1 sensible recovery ratio requirements at cooling design conditions 6. Where the sum of the airflow rates exhausted and relieved within 20 ft of each other is < 75% of the design outdoor airflow rate, excluding exhaust air that is either used for another energy recovery system, when not allowed by California Mechanical Code (Title 24, Part 4) for use in energy recovery systems with leakage potential, or Class 4 as specified in §160.2(c)8 (Air Classification and Recirculation Limitations) 7. Systems expected to operate < 20 hours per week

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(d) – WATER HEATING SYSTEMS: DWELLING UNITS				
Revised	**150.1(c)8**	**170.2(d)** *Does not match single family changes in §150.1(c)8 in which gas or propane gas water heaters are allowed.*	**Domestic Water-heating Systems**	**Recirculation:** ✦ **Within Individual Dwelling Unit:** Demand Recirculation Systems with manual ON/OFF control as specified in the Reference Appendix RA4.4.9 must be used. ✦ **Serving Multiple Dwelling Units:** The domestic water-heating system must meet the requirements of §§110.3(c)2 and 110.3(c)5, and must be capable of automatically controlling the recirculation pump operation based on measurement of hot water demand and hot water return temperature. 2019 dual loop recirculation requirements no longer apply. **Water Heater(s):** **One System per Individual Dwelling Unit:** 1. The system must be one of the following, or pursue the Performance Method: A. In all Climate Zones: One 240-volt heat pump water heater AND i. In Climate Zones 1 and 16 only: Use compact hot water distribution meeting Residential Appendix RA4.4.6; AND ii. In Climate Zone 16 only: Use drain water heat recovery system verified per Residential Appendix RA3.6.9. B. In all Climate Zones: One 240-volt, NEEA Tier 3 or greater heat pump water heater, AND only in Climate Zone 16 use a drain water heat recovery system verified per Residential Appendix RA3.6.9 C. A gas or propane instantaneous water heater with an input of 200,000 Btuh or less and no storage **Serving Multiple Dwelling Units:** 2. **Heat pump water heaters** must include all of the following: A. The hot water return from the recirculation loop must connect to a recirculation loop tank and must not directly connect to the primary heat pump water heater inlet or the primary thermal storage tanks. B. The fuel source for the recirculation loop tank must be electricity if auxiliary heating is needed. The recirculation loop heater must be capable of multi-pass water heating operation. C. For systems with single-pass primary heat pump water heater, the primary thermal storage tanks must be piped in series if multiple tanks are used. For systems with multi-pass primary heat pump water heater, the primary thermal storage tanks must be piped in parallel if multiple tanks are used. D. The primary storage tank temperature setpoint must be at least 135°F. E. The recirculation loop tank temperature setpoint must be at least 10°F lower than the primary thermal storage tank temperature setpoint such that hot water from the recirculation loop tank is used for the temperature maintenance load before engaging the recirculation loop tank heater. F. The minimum heat pump water heater compressor cut-off temperature must be equal to or lower than 40°F ambient air temperature. G. A recirculation system must be provided. EXCEPTION to G: There is an exception for recirculation systems for buildings with ≤ 8 dwelling units. H. Design documentation must be provided in accordance with Joint Appendix JA14.4. ***(continued)***

2022 ENERGY CODE: ***NEW*** ***MAJOR REVISION*** ***ITALICS in Change Summaries indicate substantial text changes in the Energy Code***

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(d) – WATER HEATING SYSTEMS: DWELLING UNITS *(continued)*				
Revised	**150.1(c)8**	**170.2(d)**	**Domestic Water-heating Systems**	***(continued)*** 3. **Gas or propane central systems** must include all of the following: A. In Climate Zones 1-9: Gas service water-heating systems with a total installed gas water-heating input capacity of ≥ 1 MMBtuh must have gas service water-heating equipment with a minimum thermal efficiency of 90%. Multiple units are allowed to meet this requirement with an input capacity-weighted average of at least 90%. EXCEPTIONS to A: 1. Individual gas water heaters with input capacity at or below 100,000 Btuh must not be included in the calculations of the total system input or total system efficiency. 2. There is an exception if 25% of the annual water-heating requirement is provided by site-solar energy or site-recovered energy. B. A recirculation system must be provided. EXCEPTION to B: There is an exception for buildings with ≤ 8 dwelling units. C. The solar water-heating system meets the installation criteria specified in Residential Appendix RA4 and with a minimum solar savings fraction of either i or ii below: i. In Climate Zones 1-9: Solar savings fraction of ≥ 0.20 In Climate Zones 10-16: Solar savings fraction of ≥ 0.35 OR ii. In Climate Zones 1-9: Solar savings fraction of ≥ 0.15 In Climate Zones 10-16: Solar savings fraction of ≥ 0.30 AND drain water heat recovery system verified per Residential Appendix RA3.6.9 4. A water-heating system serving multiple dwelling units is determined by the CEC Executive Director to use no more than any of the options above.
New	**140.5(c)**	**N/A** *Does not match §140.5(c).*	**~~High-capacity Service Water-heating Systems~~**	The requirements do not apply to multifamily common use area spaces, but they do apply to mixed-use nonresidential occupancy.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 12 MULTIFAMILY BUILDINGS - ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING MULTIFAMILY BUILDINGS						
Section 180.0 – GENERAL						
No Change	**141.0/150.2**	180.0	**General**	No change		
Section 180.1 – ADDITIONS: Requirements and exceptions apply to dwelling unit and common use areas.						
➤ Revised	**150.2(a)**	180.1 *Matches §150.2(a).*	**Additions**	EXCEPTIONS: 1. REMOVED 2-4. No changes 5. **When any length of ducting** is added to distribution system, HERS duct testing requirements for altered distribution systems per §180.1(b)2Ai and ii required (previously required when adding > 40 ft of new ducting). 6. **Photovoltaic and battery storage systems**, as specified in §170.2(f)-(h), are not required for Additions. 7. **Dwelling Unit Space-Heating System** that is a new or replacement space-heating system serving an Addition may be a heat pump or gas heating system.		
No Change	**150.2(a)1** **141.0(a)1**	180.1(a) *Matches.*	**Prescriptive Approach**	No change		
➤ Revised	**150.2(a)1C**	180.1(a)2 *Matches.*	**Mechanical Ventilation for Indoor Air Quality**	✦ A new exception is added to whole-building ventilation of §§160.2(b)2Aiv-v for Additions that are detached junior accessory dwelling units (JADUs). ✦ It is clarified that applicable local exhaust fan requirements of §§160.2(b)2Avi and 160.2(b)2B apply to Additions.		
No Change	**150.2(a)1D**	180.1(a)3 *Matches.*	**Water Heater**	No change		
No Change	**150.2(a)2 A-B** **111.0(a)2 A-B**	180.1(b)1-2 *Matches.*	**Performance Approach**	No change		
➤ Revised	**150.2(a)2C**	180.1(b)3 *Matches.*	**Mechanical Ventilation for Indoor Air Quality**	✦ A new exception is added to whole-building ventilation of §§160.2(b)2Aiv-v for Additions that are detached JADUs. ✦ It is clarified that applicable local exhaust fan requirements of §§160.2(b)2Avi and 160.2(b)2B apply to Additions.		

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 180.2 – ALTERATIONS: DWELLING UNIT SPACE-CONDITIONING SYSTEMS						
No Change	**150.2(b)** **141.0(b)**	180.2 *Does not match §141.0(b) in terms of exception location, but exceptions allowances are not changed.*	**Alterations**	Exceptions at end of §141.0(b) are moved to the beginning of this section in the multifamily subchapter. There are no changes to the exceptions aside from their location: EXCEPTIONS: 1-2. When existing heating, cooling or service water heating for an Alteration are provided by expanding existing systems, or by moving the existing equipment, the existing systems and equipment need not comply with §§110.0-110.10, 160.0-160.7, and 170.2(c) or (d). 3. Where an existing system with electric reheat is expanded when adding variable air volume (VAV) boxes to serve an Alteration, total electric reheat capacity may be expanded ≤ 20% of the existing installed electric capacity in any one permit, and the system need not comply with §170.2(c)4E [Energy Code reference updated from §170.2(b)4E] (Electric Resistance Heating). Additional electric reheat capacity > 20% may be added subject to the requirements of the §170.2(c)4E [Energy Code reference updated from §170.2(b)4E]. 4. The requirements of §160.3(a)2H (Economizer FDD) do not apply to Alterations of space-conditioning systems or components.		
Revised	**141.0(b)1**	180.2(a) *Does not match §141.0(b)1 changes.*	**Mandatory**	~~D. Fan Energy Index: New fan systems serving an existing building must meet the requirements of §120.10 (Mandatory Requirements for Fans)~~		
Section 180.2(b)2A – ALTERATIONS: DWELLING UNIT SPACE-CONDITIONING SYSTEMS						
Revised	**150.2(b)1C**	180.2(b)2Ai *Matches.*	**Entirely New/Complete Replacement Space-conditioning Systems**	i. When replacing all aspects of the HVAC system (indoor unit, outdoor unit, packaged unit, ducting and distribution), all of the requirements that apply to New Construction apply to the new complete replacement HVAC scope of work per §160.2(a)1 (Ventilation and IAQ), §160.3(a)1 (Thermostats), §§160.3(b)1-3 (Loads, Design Conditions and Outdoor Condensing Units), §160.3(b)5 (Air-Distribution and Ventilation System Ducts, Plenums, and Fans), §160.3(b)6 (Pipe Insulation), §160.3(c)1 (Common Use Area Pipe Insulation), §170.2(c)3B (Space Conditioning and Ventilation Systems); §180.2(b)2Av (Altered Space-Heating System) and Table 180.2-C (Duct Insulation R-Value).		
Revised	**150.2(b)1D**	180.2(b)2Aii *Matches except for §150.2(b)1D 2022 changes regarding ceiling insulation.*	**Altered Duct Systems: Duct Sealing** *There are new ceiling insulation requirements when altering ducts if the air handler or ducts are in a vented attic.*	a. When > 25 ft of new length of ducting is added to distribution system, HERS duct testing requirements for altered distribution systems now apply. Formerly, HERS duct testing was required when adding > 40 ft of new ducting. Otherwise, there are no changes. Change to Table 180.2-C (Duct Insulation R-Value): Climate Zones 3 and 5-7 require R-6; Climate Zones 1, 2, 4 and 8-16 require R-8. **New EXCEPTION for Multifamily Buildings ≥ 4 Habitable Stories:** The HERS Rater field verification and HERS Provider data registry requirements of Residential Appendices RA2 and RA3 are not required. The installer must certify that diagnostic testing was performed in accordance with the applicable procedures.		
No Change	**150.2(b)1E** *Applies to single-family buildings.*	180.2(b)2Aiii *No changes from 2019 requirements for multifamily buildings.*	**Altered Space-conditioning System: Duct Sealing**	Altered HVAC systems with ducting require a duct testing leakage rate of ≤ 15% for air-handler airflow and ≤ 10% for measured duct leakage to outside. Otherwise, there are no changes. **New EXCEPTION for Multifamily Buildings ≥ 4 Habitable Stories:** The HERS Rater field verification and HERS Provider data registry requirements of Residential Appendices RA2 and RA3 are not required. *The installer must certify that diagnostic testing was performed in accordance with the applicable procedures.*		
No Change	**150.2(b)1F**	180.2(b)2Aiv *Matches.*	**Altered Space-conditioning System: Mechanical Cooling**	No change		

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 180.2(b)2A – ALTERATIONS: DWELLING UNIT SPACE-CONDITIONING SYSTEMS *(continued)*						
Revised	**150.2(b)1G**	180.2(b)2Av *Matches aside from exception #3 applicable Climate Zones in §150.2(b)1G.*	**Altered Space-heating System**	Altered or replacement heating systems must not use electric resistance as the primary heat source. EXCEPTIONS: 1. Non-ducted electric resistance is allowed if the existing system is electric resistance. 2. Ducted electric resistance space-heating systems are allowed if the existing space heating system is electric resistance and a ducted space-cooling system is not being replaced or installed. 3. In Climate Zones 6, 7, 8 and 15 only: When replacing any type of electric resistance space-heating system, electric resistance is allowed.		
	150.2(b)1L	**N/A** *Does not match the new §150.2(b)1L added in 2022 single-family buildings.*	~~**Mechanical Ventilation for Indoor Air Quality - Entirely New or Complete Replacement Ventilation Systems**~~			
	150.2(b)1M	**N/A** *Does not match the new §150.2(b)1M added in 2022 single-family buildings.*	~~**Mechanical Ventilation for Indoor Air Quality - Altered Ventilation Systems**~~			

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 180.2(b)2B – ALTERATIONS: COMMON USE AREA SPACE-CONDITIONING SYSTEMS						
Revised	**141.0(b)2C**	180.2(b)2Bi *Matches aside from exceptions of §141.0(b)2 that are added for 2022.*	***Common Use Area*** **New or Replacement Space-conditioning Systems or Components**	**New or replacement space-conditioning systems or components** other than new or replacement space-conditioning system ducts must meet the requirements of §170.2(c)1,2 and 4 that apply to the systems or components being altered. Additional Fan Power Allowances are available when determining the Fan Power Budget as specified in Table 180.2-D. These values may be added to the Fan Power Allowance values in Table 170.2-B and Table 170.2-C. EXCEPTIONS: 1. No changes: This requirement does not apply to replacement of electric reheat of equivalent or lower capacity electric resistance space heaters when natural gas is not available. 2. §170.2(c)4L (Prescriptive Mechanical System Shut-off) does not apply to new or replacement space-conditioning systems or components. 3. §170.2(c)4C (Economizers) does not apply to single package air-cooled commercial unitary air conditioners and heat pumps with cooling capacity < 54,000 Btuh. A new or replacement gas hot water boiler system with a total system input of at least 1 MMBtu/h but no more than 10 MMBtu/h need not comply with the requirements of §140.4(k)8 (High-Capacity Space Heating Gas Boiler Systems).		
	141.0(b)2D	180.2(b)2Bii *Matches except for §141.0(b)2Diii that is added for 2022.*	**Common Use Area Altered Duct Systems**	New or replacement space-conditioning system ducts installed to serve an existing building must meet the requirements of §160.3(c)2 AND b or c below. a. RESERVED b. Entirely new or complete replacement duct systems installed as part of an Alteration must be leakage tested in accordance with §160.3(c)2H [Energy Code reference updated from §160.2(c)2H]. Entirely new or complete replacement duct systems installed as part of an Alteration must be constructed of at least 75% new duct material. Up to 25% of the total duct material may consist of reused parts from the building's existing duct system (including registers, grilles, boots, air handlers, coils, plenums and ducts) if the reused parts are accessible and can be sealed to prevent leakage. c. If the new ducts are an extension of an existing duct system and the combined new and existing duct system meets the criteria in Subsections 1, 2 and 3 below, the duct system must be sealed to a leakage rate ≤ 15% of the nominal air-handler airflow rate as confirmed through HERS field verification and diagnostic testing, in accordance with the applicable procedures in Nonresidential Appendices NA1 and NA2. 1. The duct system provides conditioned air to an occupiable space for a constant volume, single zone space-conditioning system. 2. The space-conditioning system serves < 5,000 ft² of conditioned floor area. 3. The combined surface area of the ducts located outdoors or in unconditioned space is > 25% of the total surface area of the entire duct system. EXCEPTIONS: 1. When it is not possible to achieve the duct leakage criterion in §180.2(b)2Biib, then all accessible leaks must be sealed and verified through a visual inspection and a smoke test performed by a certified HERS Rater utilizing the methods specified in Nonresidential Appendix NA2.1.3.2.2. 2. Existing duct systems that are extended, which are constructed, insulated or sealed with asbestos are exempt from the requirements §180.2(b)2Biib.		

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 180.2(b)2B – ALTERATIONS: COMMON USE AREA SPACE-CONDITIONING SYSTEMS *(continued)*						
	141.0(b)2E *Altered.*	180.2(b)2Biii *Matches.*	**Common Use Area Altered Space-conditioning Systems**	a. No change b. The duct system that is connected to the new or replaced space-conditioning system equipment must be sealed in accordance with §180.2(b)2Bii. EXCEPTIONS: 1. Buildings are altered so that the duct system no longer meets the criteria of §170.2(c)4Ji. 2. Duct systems are documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Nonresidential Appendix NA2. 3. No change: Duct Sealing. Existing duct systems that are constructed, insulated or sealed with asbestos are exempt from the requirements of §180.2(b)2Biiib.		
Section 180.2(b)3 – ALTERATIONS: DWELLING UNIT WATER HEATING						
Revised	**150.2(b)1H**	180.2(b)3 *Matches.*	**Hot Water Systems: Individual Water Heating Systems**	A. **Pipe Insulation:** No change B. **Distribution System:** No change C. **Water Heating System:** Replacement water heater has been changed to be one of the following. Otherwise, there are no changes. i. Natural gas or propane water heater ii. One heat pump water heater with storage tank in the garage or conditioned space on a rigid surface ≥ R-10 AND with communication interface; or port (See §110.12(a) for more information.) iii. One NEEA Tier 3 or greater heat pump water heater iv. Electric resistance water heater, if replacing an electric resistance water heater v. A water-heating system determined by the CEC Executive Director to use no more energy than the one specified in §180.2(b)3Ci through iii above; OR, if no natural gas is connected to the existing water heater location, a water-heating system determined by the CEC Executive Director to use no more energy than the one specified in §180.2(b)3Civ above.		

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 180.2(b)5 – ALTERATIONS: DWELLING UNIT MECHANICAL VENTILATION AND IAQ						
New	**N/A**	180.2(b)5	**Mechanical Ventilation and Indoor Air Quality**	Alterations to existing buildings must comply with subsections A and B below as applicable. When HERS field verification and diagnostic testing is required by §180.2(b)5, buildings with ≤ 3 habitable stories must use the applicable procedures in the Residential Appendices, and buildings with ≥ 4 habitable stories must use the applicable procedures in Nonresidential Appendices NA1 and NA2. A. **Entirely New or Complete Replacement Ventilation Systems:** Entirely new or complete replacement ventilation systems must comply with all applicable requirements in §160.2(b)2. B. **Altered Ventilation Systems:** Altered ventilation system components or newly installed ventilation equipment serving the Alteration must comply with §160.2(b)2 as applicable subject to the requirements specified in subsections i and ii below. i. **Whole-dwelling Unit Mechanical Ventilation** a. **Whole-dwelling Unit Airflow:** If the whole-dwelling ventilation fan is altered or replaced, one of the following subsections 1 or 2 must be used for compliance as applicable: 1. **Dwellings that were required by a previous building permit** to comply with the current whole-dwelling unit airflow requirements must meet or exceed the whole-dwelling unit mechanical ventilation airflow requirements of current code as confirmed through HERS field verification and diagnostic testing. 2. **Dwellings that were not required by a previous building permit** to have a whole-dwelling unit ventilation system to comply with current whole-dwelling unit ventilation requirements are not required to do so. b. **Replacement Ventilation Fans:** Whole-dwelling unit replacement ventilation fans must be rated for airflow and sound in accordance with the requirements of ASHRAE 62.2 §§7.1 and 7.2 and meet current airflow requirements. c. **Air Filters:** If the air filtration device for a whole-dwelling unit ventilation system is altered or replaced, one of the following subsections 1 or 2 must be used for compliance: 1. **Dwellings that were required by a previous building permit** to comply with the ventilation system air filtration requirements of the current code must comply with the air filtration requirements of the current code. 2. **Dwellings that were not required by a previous building permit** to comply with the ventilation system air filtration requirements of the current code are not required to comply with the air filtration requirements of the current code. ii. **Local Mechanical Exhaust** a. **Bathroom Local Mechanical Exhaust:** Altered bathroom local mechanical exhaust systems must comply with current requirements. b. **Kitchen Local Mechanical Exhaust:** If the kitchen local ventilation fan is altered or replaced, one of the following subsections 1, 2 or 3 must be used for compliance: 1. **Dwellings that were required by a previous building permit to comply** with the kitchen local exhaust requirements of the current code must meet or exceed the applicable airflow or capture efficiency requirements in the current code. 2. **Dwellings that were required by a previous building permit** to install a vented kitchen range hood or other kitchen exhaust fan must install a replacement fan that meets or exceeds the airflow required by the previous building permit, or 100 CFM, whichever is greater. 3. **Dwellings that were not required to have a kitchen local ventilation exhaust system** according to the conditions in either subsection 1 or 2 above are not required to comply with the requirements of §160.2(b)2Avi [Energy Code reference updated from §160.0(b)2Avi]. c. **Replacement Ventilation Fans:** New or replacement local mechanical exhaust fans must be rated for airflow and sound in accordance with the requirements of ASHRAE 62.2 §7.1 and Title 24, Part 6 §160.2(b)2Avif [Energy Code reference updated from §160.0(b)2Avif]. Additionally, when compliance with a specified exhaust airflow rate is required, the replacement fan must be rated at no less than the airflow rate required for compliance.		

Section 180.2(c) – ALTERATIONS: DWELLING UNITS AND COMMON USE AREAS PERFORMANCE APPROACH				
	150.2(b)1H	**180.2(c)**	**Dwelling Unit and Common Use Area**	Performance Approach
Revised	**150.2(b)2**	**180.2(c)1** *Matches.*	**Altered Components**	When using the Performance Method, entirely new or replacement ventilation systems are subject to §180.2(b)5A, and altered ventilation systems are subject to §180.2(b)5B. Otherwise, there are no changes.

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Envelope: Multifamily Buildings

Building Application	Mandatory		Prescriptive	Performance	Additions Alterations	Reference Appendices
	All Occupancy Subchapters 1-2, 7 (§§100.0-110.12, 150.0)	Multifamily Subchapter 10 (§§160.0-160.6)	Subchapter 11 (§§170.0-170.2)	Subchapter 11 (§170.1)	Subchapter 12 (§§180.0-180.2)	
General	§§100.0, 100.1-2, 110.0-2, 110.5	§160.0	§§170.0, 170.2	§170.1	§§180.0 -180.2	JA1 Definitions, JA2 Weather/Climate, JA3 TDV
Envelope (conditioned)	§110.6-8	§§160.1(a)-(f)	§§170.2(a)-(b)			JA4 U-factor/C-Factor/Thermal Mass NA6 Alternate Fenestration Method (COG) NA7 Installation/Acceptance NR **≤ 3 Habitable Stories** RA2 HERS Procedures RA3 HERS Test Protocols RA4.2 Envelope Special Measures

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES — GENERAL PROVISIONS				
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION				
Revised	100.1(b)			**Curtain Wall/Storefront** is an external, non-bearing wall intended to separate the exterior non-conditioned and interior conditioned spaces. It also consists of any combination of framing materials, fixed glazing, opaque glazing, operable windows or other in-fill materials. Note: Window wall is also included as part of the curtain wall/storefront fenestration category.
New				**Multifamily Building** is any of the following: a building of Occupancy Group R-2, other than a hotel/motel building or timeshare property; a building of Occupancy Group R-3 that is a non-transient congregate residence other than boarding houses of more than 6 guests and alcohol or drug abuse recovery homes of more than 6 guests; or a building of Occupancy Group R-4.
New			*These definitions support new requirements for roof Alterations.*	**Roof Recover** is the process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.
				Roof Replacement is the process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.
Section 100.2 – CALCULATION OF TIME DEPENDENT VALUATION (TDV) ENERGY: No change				

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS				
Section 110.6 – MANDATORY REQUIREMENTS FOR FENESTRATION PRODUCTS AND EXTERIOR DOORS				
➤ Revised	110.6(a)		**Certification of Fenestration Products and Exterior Doors Other than Field-fabricated**	1. **Air Leakage:** No change 2. **U-factor:** The Nonresidential Appendix NA6 formula can ONLY be used for skylights < 200 ft² and is not allowed for any vertical fenestration except for dwelling unit unrated site-built fenestration meeting the maximum area restrictions per §170.2(a)3Aii Exception 3. 3. **Solar Heat Gain Coefficient (SHGC):** The Nonresidential Appendix NA6 formula can ONLY be used for skylights < 200 ft² and is not allowed for any vertical fenestration except for dwelling unit unrated site-built fenestration meeting the maximum area restrictions per §170.2(a)3Aii Exception 3. 4. **Visible Transmittance (VT):** The Nonresidential Appendix NA6 formula can ONLY be used for skylights < 200 ft² and is not allowed for any vertical fenestration. 5. **Labeling:** No change 6. **Fenestration Acceptance Requirements:** No changes for nonresidential or hotel/motel occupancies
No Change	110.6(b)		**Installation of Field-fabricated Fenestration and Exterior Doors**	No change
Section 110.7 – MANDATORY REQUIREMENTS TO LIMIT AIR LEAKAGE: No change				
Section 110.8 – MANDATORY REQUIREMENTS FOR INSULATION, ROOFING PRODUCTS AND RADIANT BARRIERS: Minor changes				
Title 24, Part 6 Subchapter 10 – MULTIFAMILY BUILDINGS – MANDATORY REQUIREMENTS All envelope requirements apply to both dwelling unit and common use areas.				
Section 160.0 – GENERAL				
No Change	**150.0(a)-(g) & 120.0**	160.0 *Matches.*	**General**	No change
Section 160.1 – MANDATORY REQUIREMENTS FOR BUILDING ENVELOPES: All the envelope requirements apply to both dwelling unit and common use areas.				
➤ Revised	**150.0(a)1-2**	160.1(a)1 *Matches except for new attic roof U-factor in §150.0(a)1.*	**Ceiling and Roof Insulation: Attic Roofs**	The new mandatory roof deck requirements in Climate Zones 4, 8 and 4-16 do not apply to altered attics, only to New Construction.
No Change	**120.7(a)**	160.1(a)2 *Matches.*	**Ceiling and Roof Insulation: Non Attic Roofs**	No change
No Change	**150.0(a)3**	160.1(a)3 *Matches.*	**Insulation Placement**	No change
No Change	**120.7(b)**	160.1(b) *Matches.*	**Wall Insulation**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.1 – MANDATORY REQUIREMENTS FOR BUILDING ENVELOPES: All the envelope requirements apply to both dwelling unit and common use areas. *(continued)*				
No Change	**120.7(c)** **150.0(d)**	160.1(c) *Matches.*	**Floor and Soffit Insulation**	No change
No Change	**150.0(g)**	160.1(d) *Matches.*	**Vapor Retarder**	No change
Revised	**150.0(q)**	160.1(e) *Does not match 2022 §150.0(q) U-factor changes; matches 2019 Energy Code.*	**Fenestration Products** *Mandatory U-factor requirements apply to all multifamily projects. (This was required for only ≤ 3 habitable story dwelling units in the 2019 Energy Code.)*	Fenestration separating conditioned space from unconditioned space or outdoors must meet the requirements of either Item 1 or 2 below: 1. Fenestration, including skylight products, must have a maximum U-factor of 0.58. EXCEPTIONS: 1. ≤ 0.5% of the conditioned floor area 2. Dual-glazed greenhouse or garden windows, ≤ 30 square feet of fenestration area per dwelling unit 2. All fenestration, including skylight products, should meet the 0.58 U-factor OR have an area-weighted average U-factor of ≤ 0.58.
No Change	**150.0(e)**	160.1(f) *Matches.*	**Installation of Fireplaces, Decorative Gas Appliances and Gas Logs**	No change

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Performance Change Summaries
Title 24, Part 6 Subchapter 11 – MULTIFAMILY BUILDINGS – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES				
Section 170.0 – GENERAL				
Minor	**140.0**	170.0 *Matches.*	**Performance and Prescriptive Compliance Approaches**	Minor changes

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Performance Change Summaries
Section 170.1 – PERFORMANCE APPROACH				
Revised	**140.1(a)-(c)**	170.1(a)-(c) *Does not match single-family requirements in which energy design rating (EDR) will not be used to document multifamily buildings when using the Performance Method.*	**Performance Approach: Energy Budgets** *Source energy compliance is required and must comply independently from building time-dependent valuation.*	a. **Energy Budget for the Standard Design Building:** The energy budget for the Standard Design Building is expressed in terms of source energy and time-dependent valuation (TDV) energy, and they are determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The source energy budget and the TDV energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, photovoltaic (PV) and battery storage system, service water heating, and covered process loads. b. **Energy Budget for the Proposed Design Building:** The energy budget for a Proposed Design Building is expressed in terms of source energy and TDV energy, and they are determined by calculating the source energy and TDV energy for the Proposed Design Building. The source energy budget and the TDV energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, PV and battery storage system, and service water heating and covered process loads. The Proposed Building must separately comply with the source energy budget and the TDV energy budget. EXCEPTION: There is an exception for community solar or battery per Title 24, Part 1 §10-115. c. **Calculation of Energy Budget:** The Standard Design energy budget and Proposed Design energy use shall be calculated using compliance software approved by the California Energy Commission.
	140.1(d)	170.1(d) *Matches §150.1 single-family building requirements.*	**Compliance Demonstration Requirements for Performance Standards**	Source energy, in addition to TDV energy, has standard design requirements, which the proposed building must meet or exceed. There are new verification and installation requirements for all multifamily building types: I. **Quality Insulation Installation (QII):** When performance compliance requires field verification of QII, field verified via applicable requirements of Residential Appendix RA3.5, verification of buildings ≤ 3 habitable stories must be done by a HERS Rater.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 11 – MULTIFAMILY BUILDINGS - PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES				
Section 170.2 – PRESCRIPTIVE APPROACH				
No Change	**150.1(a) / 140.2**	170.2	**Prescriptive Approach**	No change
Section 170.2(a) – PRESCRIPTIVE APPROACH: BUILDING ENVELOPES: All envelope requirements apply to both dwelling unit and common use areas.				
➤ Revised	**140.3(a)1A**	170.2(a)1A *Does not match 2022 §140.3(a)1A roofing product changes.*	**Exterior Roofs and Ceilings** *New roofing product requirements apply to multifamily buildings based on roof type and Climate Zone per Table 170.2-A.*	**A. Roofing Products** *Table 170.2-A* ***Envelope Component Package – Roofing***
No Change	**150.1(c)11**	*Matches single-family attic options (B and C).*		

Roof/Ceiling Type	Roof Slope	Climate Zone	Aged Solar Reflectance	Thermal Emittance	SRI
Option B and C (Attic)	Low	1-12, 14, 16	N/A		
		13 and 15	≥ 0.63	≥ 0.75	≥ 75
	Steep	1-9, 16	N/A		
		10-15	≥ 0.20	≥ 0.75	≥ 16
Option D (Rafter)	Low	1-8, 12, 16	N/A		
		9-11, 13-15	≥ 0.63	≥ 0.75	≥ 75
	Steep	1 and 16	N/A		
		2-15	≥ 0.20	≥ 0.75	≥ 16

SRI = solar reflective index.

No Change	**140.3(a)1B**	170.2(a)1B *Does not match 2022 §140.3(a)1B, which had no changes to roof insulation.*	**Exterior Roofs and Ceilings**	**B. Roof Insulation** *Table 170.2-A* ***Envelope Component Package – Roof Insulation***
No Change	**150.1(c)1A**			

Roof/Ceiling Type	Insulation	Climate Zone	Insulation R-value/U-factor
Option B (Attic with ducts)	Below Roof	1-3, 5-7	N/A
		4, 8-9, 11-15	R-19
		10 and 16	R-13
	Ceiling	1-2, 4, 8-16	R-38
		3, 5-7	R-30
Option C (Attic without ducts)	Ceiling	1, 11-16	R-38
		2-10	R-30
Option D (Rafter)	Metal Building	1-16	0.041
	All Other	1-2, 4, 8-16	0.028
		3, 5-6	0.034
		7	0.039

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<table>
<tr><th>Level of Change</th><th>2019 Section</th><th>2022 Section</th><th>Subtitle & Notes</th><th>Prescriptive Change Summaries</th></tr>
<tr><td colspan="5">Section 170.2(a) – PRESCRIPTIVE APPROACH: BUILDING ENVELOPES: All envelope requirements apply to both dwelling unit and common use areas. (continued)</td></tr>
<tr><td>Revised</td><td>140.3(a)2</td><td><u>170.2(a)2</u>
Does not match §140.3(a)2, which only had changes for metal framed walls.</td><td>Wall Insulation
Wall requirements are more stringent for most Climate Zones, and there are new requirements for fire-rated walls.</td><td>A. Wall Insulation
<u>Table 170.2-A</u> Envelope Component Package – Wall Insulation
<table>
<tr><th>Wall Type</th><th>Climate Zone</th><th>Insulation U-factor</th></tr>
<tr><td rowspan="2">Metal Building – Any Fire Rating</td><td>1-10</td><td>0.061</td></tr>
<tr><td>11-16</td><td>0.057</td></tr>
<tr><td rowspan="3">Framed (all types)
> 1 hour fire rating</td><td>1-5, 8-10, 12-13</td><td>0.059</td></tr>
<tr><td>6-7</td><td>0.065</td></tr>
<tr><td>11, 14-16</td><td>0.051</td></tr>
<tr><td rowspan="2">Framed (all types)
≤ 1 hour fire rating</td><td>1-5, 8-16</td><td>0.051</td></tr>
<tr><td>6-7</td><td>0.065</td></tr>
<tr><td rowspan="2">Mass Light</td><td>1-15</td><td>0.077 (R-13)</td></tr>
<tr><td>16</td><td>0.059 (R-17)</td></tr>
<tr><td rowspan="6">Mass Heavy</td><td>1, 12</td><td>0.253</td></tr>
<tr><td>2- 5, 10</td><td>0.650</td></tr>
<tr><td>6-9</td><td>0.690</td></tr>
<tr><td>11, 14-15</td><td>0.184</td></tr>
<tr><td>13</td><td>0.211</td></tr>
<tr><td>16</td><td>0.160</td></tr>
</table>
B. Demising Walls</td></tr>
<tr><td>No Change</td><td>150.1(c)1B</td><td>Does not match §150.1(c)1B, which had no changes.</td><td></td><td></td></tr>
<tr><td>No Change</td><td>140.3(a)3</td><td></td><td></td><td></td></tr>
</table>

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(a) – PRESCRIPTIVE APPROACH: BUILDING ENVELOPES: All envelope requirements apply to both dwelling unit and common use areas. *(continued)*				
Revised	**140.3(a)5**	170.2(a)3A *Matches §140.3(a)5 relative solar heat gain coefficient (RSHGC) changes. Otherwise, §140.3(a)5 had no changes for this building type.*	**Fenestration** *There is a new formula to determine relative solar heat gain coefficient via the Prescriptive Method. (This change applies to nonresidential buildings also.) Otherwise, all other fenestration requirements of §140.3(a)5 apply with no changes.*	*Table 170.2-A* ***Envelope Component Package – Fenestration***
No Change	**150.1(c)3**	*Does not match §150.1(c)3, which had no changes.*	*There is a new classification for products meeting North American Fenestration Standard/Specification (NAFS) for Architectural Window (AW) Ratings, which is typically determined by the structural engineer.*	
			The Nonresidential Appendix NA6 formula can be used for any amount of unrated vertical site-built fenestration as long as area restrictions are met, which is not the same for common use spaces or nonresidential occupancies.	
			Be aware that the window-to-wall ratio AND the window-to-floor ratio limitation applies to all areas within multifamily occupancy projects.	

Fenestration Type	Efficiency Type	Climate Zone	Efficiency
Curtain Wall / Storefront	U-factor All Buildings	1 and 16	0.38
		2-15	0.41
	RSHGC ≤ 3 Habitable Stories	1, 3, 5, 16	N/A
		2, 4, 6-13, 15	0.26
		14	0.25
	RSHGC ≥ 4 Habitable Stories	1	0.35
		2-13, 15	0.26
		14 and 16	0.25
	VT ≤ 3 Habitable Stories	1-16	N/A
	VT ≥ 4 Habitable Stories	1-16	0.46
NAFS 2017 Performance Class AW Rating	U-factor All Buildings	1 and 16	0.38
		2-15	0.40
	RSHGC ≤ 3 Habitable Stories	1, 3, 5, 16	N/A
		2, 4, 6-15	0.24
	RSHGC ≥ 4 Habitable Stories	1	0.35
		2-16	0.24
	VT ≤ 3 Habitable Stories	1-16	N/A
	VT ≥ 4 Habitable Stories	1-16	0.37
All Other	U-factor All Buildings	1-6, 9-16	0.30
		7-8	0.34
	RSHGC ≤ 3 Habitable Stories	1, 3, 5, 16	N/A
		2, 4, 6-15	0.23
	RSHGC ≥ 4 Habitable. Stories	1	0.35
		2-16	0.23
	VT	1-16	N/A
Max. Window-to-Floor Ratio		1-16	20%
Max. Window-to-Wall Ratio		1-16	40%

RSHGC = relative solar heat gain coefficient; VT = visible transmittance.

EXCEPTIONS:

1. For each dwelling unit, ≤ 3 ft² of new glazing area installed in doors is not required to meet the U-factor and RSHGC requirements of Table 170.2-A.
2. Chromogenic type glazing exceptions apply with no changes.
3. For dwelling units containing unrated site-built fenestration that meets the maximum area restriction, the U-factor and solar heat gain coefficient (SHGC) can be determined in accordance with the Nonresidential Appendix NA6 or use default values in Table 110.6-A and Table 110.6-B.

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<table>
<tr><th>Level of Change</th><th>2019 Section</th><th>2022 Section</th><th>Subtitle & Notes</th><th>Prescriptive Change Summaries</th></tr>
<tr><td colspan="5">Section 170.2(a) – PRESCRIPTIVE APPROACH: BUILDING ENVELOPES: All envelope requirements apply to both dwelling unit and common use areas. (continued)</td></tr>
<tr><td>No Change

No Change</td><td>140.3(a)6

150.1(c)3</td><td>170.2(a)3B
Does not match §140.3(a)5.

Does not match § 150.1(c)3.</td><td>Skylights

Skylight efficiency requirements are combined with “All Other.” All other skylight requirements and exceptions remain the same.</td><td>Table 170.2-A Envelope Component Package – Skylights
<table>
<tr><th>Fenestration Type</th><th>Efficiency Type</th><th>Climate Zone</th><th>Efficiency</th></tr>
<tr><td rowspan="7">Skylights</td><td rowspan="2">U-factor
All Buildings</td><td>1-6, 9-16</td><td>0.30</td></tr>
<tr><td>7-8</td><td>0.34</td></tr>
<tr><td rowspan="2">RSHGC ≤ 3 Habitable Stories</td><td>1, 3, 5, 16</td><td>N/A</td></tr>
<tr><td>2, 4, 6-15</td><td>0.23</td></tr>
<tr><td rowspan="2">RSHGC ≥ 4 Habitable Stories</td><td>1</td><td>0.35</td></tr>
<tr><td>2-16</td><td>0.23</td></tr>
<tr><td>VT</td><td>1-16</td><td>N/A</td></tr>
<tr><td>Haze</td><td>1-16</td><td>90%</td></tr>
<tr><td colspan="2">Max. Skylight-to-Roof Ratio</td><td>1-16</td><td>5%</td></tr>
<tr><td colspan="4">RSHGC = relative solar heat gain coefficient; VT = visible transmittance.</td></tr>
</table>
EXCEPTIONS: No change</td></tr>
<tr><td>Minor</td><td>140.3(a)7 and 150.1(c)5</td><td>170.2(a)4
Matches.</td><td>Exterior Doors</td><td>If an opaque door has ≥ 25% of its surface area as glazing, the entire rough opening is considered a glazed door. Glazed doors must meet the fenestration requirements.</td></tr>
<tr><td>No Change

No Change</td><td>140.3(a)4

150.1(c)1C and D</td><td>170.2(a)5

“Other” matches Table 140.3-B, and all other floor types match single family requirements in §150.1(c)1C and D.</td><td>Floors</td><td>A. Raised Floors
B. Slab on Grade

Table 170.2-A Envelope Component Package – Floors
<table>
<tr><th>Floor Type</th><th>Climate Zone</th><th>Insulation R-Value/U-factor</th></tr>
<tr><td>≤ 3 Habitable Floors
Slab Perimeter</td><td>1-15
16</td><td>N/A
0.58 (R-7)</td></tr>
<tr><td>≥ 4 Habitable Floors
Slab Perimeter</td><td>1-16</td><td>N/A</td></tr>
<tr><td>Wood Framed</td><td>1-16</td><td>0.037 (R-19 in wood framing)</td></tr>
<tr><td>Raised Mass</td><td>1-2, 11, 13-14, 16
3-10
12 and 15</td><td>0.092 (R-8)
0.269 (R-0)
0.138 (R-4)</td></tr>
<tr><td>Other</td><td>1
2, 11, 14-16
3-10, 12-13</td><td>0.048
0.039
0.071</td></tr>
</table></td></tr>
</table>

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(a) – PRESCRIPTIVE APPROACH: BUILDING ENVELOPES: All envelope requirements apply to both dwelling unit and common use areas. *(continued)*				
No Change	**150.1(c)1E**	170.2(a)6 *Matches.*	**Quality Insulation Installation**	This QII requirement applies to buildings ≤ 3 habitable stories in all Climate Zones except in Climate Zone 7; when a building has ≥ 4 habitable stories, the QII requirement does not apply.
No Change	**140.3(c)**	170.2(b) *Matches.*	**Minimum Daylighting Requirement for Large Enclosed Spaces**	No change
	140.3(a)9	*Does not match §140.3(a)9 new air barrier requirements.*	**~~Air Barrier~~** *There are no Prescriptive air barrier requirements for multifamily occupancies.*	

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 12 – MULTIFAMILY BUILDINGS — ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING MULTIFAMILY BUILDINGS ***All envelope requirements apply to both dwelling unit and common use areas.***						
Section 180.0 – GENERAL						
No Change	**141.0(a)**	180.0	**General**		No change	
Section 180.1 – ADDITIONS						
No Change	**150.2(a)**	180.1 *Matches.*	**Additions**		No change	
Revised	**150.2(a)1**	180.1(a)1 *Matches.*	**Envelope** *Envelope requirements for Additions match single-family and not nonresidential Addition requirements. Remember that these requirements apply to dwelling unit and common use area Additions.*		**A. Additions > 700 ft²:** No change **B. Additions ≤ 700 ft²**: Be aware that the applicable Climate Zone trigger has changed. Roof and ceiling insulation requirements for vented attics are as follows: a) In Climate Zones 1, 2, 4 and 8-16: Overall assembly U-factor ≤ 0.025 (wood-framed assemblies using insulation with R-value of ≥ R-38) b) In Climate Zones 3 and 5-7: Overall assembly U-factor ≤ 0.031 (wood-framed assemblies using insulation with R-value of ≥ R-30) All other requirements remain the same.	
Section 180.2 – ALTERATIONS						
No Change	**141.0(b)1**	180.2(a) *Matches.*	**Mandatory Requirements**		No change	

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 180.2 – ALTERATIONS *(continued)*						
Revised	**150.2(b)1I**	180.2(b)1A *Matches.*	**Prescriptive Approach: Roof Alterations**	If > 50% of a roof's area or > 2,000 ft² (whichever is less) of roof is replaced, recovered or recoated, the following roofing product requirements apply: i. **Low-sloped Roofs:** In Climate Zones 2, 4, 6-15 aged solar reflectance ≥ 0.63 AND thermal emittance ≥ 0.75 OR solar reflective index (SRI) ≥ 75. Aged solar reflectance is specified in Table 180.2-A in which the roof U-factor requirements of have changed for all Climate Zones to qualify for trade off. ii. **Steep-sloped Roofs:** In Climate Zones 4, 8-15, aged solar reflectance ≥ 0.20 AND thermal emittance ≥ 0.75 OR SRI ≥ 16. EXCEPTIONS: 1. A building's ceiling assemblies have a U-factor ≤ 0.025 or are insulated with ≥ R-38 ceiling insulation in an attic. 2. A building has a radiant barrier in the attic, where the radiant barrier is not installed directly above spaced sheathing, meeting the requirements of §170.2(a)1C. 3. In Climate Zone 2, 4, 9, 10, 12 or 14, a building has no ducts in the attic. 4. A building has ≥R-2 continuous insulation above or below the roof deck. EXCEPTIONS for i and ii 1. The integrated PV or solar thermal panels exception has not changed. 2. The exception for ≥ 25 lb/ft² roof construction has not changed. iii. **Low-sloped Roof Recover/Replacement:** In Climate Zones 1, 2, 4 8-16, ≥ R-14 continuous OR U-factor ≤ 0.039 OR maximum thickness allowed by manufacturer's roofing instructions of required for height of roof membrane surface to top of base flashing. EXCEPTIONS: 1. Roof recover adds ≥ R-10 insulation above roof deck. 2. If existing mechanical equipment is not being disconnected or lifted, either ≥ R-10 or the insulation thickness compliant with the manufacturer's instructions for minimum base flashing height, whichever is greater, must be installed. 3. Drains: Tapered insulation to drains or any other low point is allowed as long as overall weighted R-14 achieved. 4. Roof recoat does not need to meet insulation requirements.		
			Steep-sloped roof exceptions have changed and match those for single-family buildings.			
Revised	**141.0(b)2 Bii**	*Does not match §141.0(b)2Bii.*	*Non-attic roofs have requirements similar to nonresidential roofs with revised Climate Zones and R-values*			
New	**150.2(b)1J**	180.2(b)1B *Matches.*	**Roof/Ceiling Insulation**	i. **Attic Roof:** a. In Climate Zones 1-4 and 8-16: An overall weighted U-factor ≤ 0.020 (R-49 at ceiling) is required. There is an exception for Climate Zones 1, 3, 4 and 9 with existing R-19. b. In Climate Zones 2 and 11-16: Air sealing of the ceiling plane between attic and conditioned space is required per §110.7. There are exceptions for dwelling units when ≥ R-19 ceiling insulation exists or when atmospherically vented space-heating or water-heating combustion appliances are located inside the pressure boundary of the dwelling unit. c. In Climate Zones 1-4 and 8-16: Recessed can lights must be covered with same depth of insulation as the rest of ceiling, and, if they are not insulation contact (IC) rated, they are to be replaced with IC-rated cans or retrofitted with fire-proof covers allowing for insulation coverage. There is an exception for dwelling units in Climate Zones 1-4 and 8-10 with existing R-19. d. Attic ventilation is required per the California Building Code. EXCEPTIONS: 1. ≥ R-38 insulation exists at the ceiling in dwelling units. 2. The alteration would directly disturb asbestos in dwelling units unless that disturbance is in conjunction with asbestos abatement. 3. Knob and tube wiring exists in dwelling unit vented attic space. 4. There is not enough accessible space in attic to accommodate the required R-value, in which entire accessible space will be utilized while not violating the California Residential Code §806.3. 5. When a dwelling unit attic space is shared with other dwelling units, only the attic space above the altered dwelling unit is required to meet these requirements.		
			Attic roof requirements match those for single-family buildings.			

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Section 180.2 – ALTERATIONS *(continued)*						
	~~150.2(b)1A and B~~ **141.0(b)2 Aiii**	**180.2(b)1C** *Does not match §141.0(b)2Aiii but is based on those requirements.*	**Fenestration** *Fenestration alteration U-factor and solar heat gain coefficient requirements in Table 180.2-B are new just for multifamily occupancies.*	**NOTE:** When glass is replaced in an existing sash and frame or sashes are replaced in an existing frame, these changes are considered to be Repairs. In these cases, §180.2(b) requires that the replacement be at least equivalent to the original in performance. i. Fenestration products installed to replace existing fenestration products of the same total area must meet either the maximum U-factor, RSHGC and VT of Table 180.2-B or the area weighted U-factor and RSHGC of Table 170.2-A. EXCEPTION: In an Alteration, where ≤ 150 ft² of the entire building's vertical fenestration is replaced, RSHGC and VT requirements of Table 180.2 B do not apply. ii. Alterations that add fenestration and skylight area must meet the total fenestration area requirements of §170.2(a) and the U-factor, RSHGC and VT requirements of Table 180.2-B. EXCEPTIONS: 1. Projects adding ≤ 50 ft² of vertical fenestration do not have to meet area limitations of §170.2(a) or the U-factor, RSHGC or VT requirements of Table 180.2-B. 2. Projects adding ≤ 16 ft² of skylights per dwelling unit with a U-factor ≤ 0.55, RSHGC ≤ 0.30 and meeting VT requirements of Table 180.2-B are not required to meet the total fenestration area requirements of §170.2(a)3.		
		180.2(b)1C	**Fenestration: Performance Approach**	PERFORMANCE EXCEPTION: 1. Any dual-glazed greenhouse or garden window installed as part of an Alteration complies with the U-factor requirements in §170.2.		
New	**141.0(b)2R** **150.2(b)1N**	**180.2(b)1D** *Matches.*	**Exterior Doors**	New exterior opaque door area must meet the U-factor requirements of §170.2(a)4.		
No Change	**141.0(c)**	**180.3** *Matches.*	**Repairs**	No change		
No Change	**150.2(c)**	**180.4** *Matches.*	**Whole Building**	No change		

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Electrical Systems: Multifamily Buildings

Building Application		Mandatory: All Occupancy Subchapters 1-2, 7 (§§100.0-110.12, 150.0)	Mandatory: Multifamily Subchapter 10 (§§160.0-160.6)	Prescriptive Subchapter 11 (§§170.0-170.2)	Performance Subchapter 11 (§170.1)	Additions Alterations Subchapter 12 (§§180.0-180.2)	Reference Appendices
General		§§100.0, 100.1-2, 110.0	§160.0	§170.2	§170.1	§§180.0-180.2	JA1 Definitions, JA3 TDV
Indoor Lighting (conditioned)	Dwelling Unit	§110.9	§§160.5(a)1-2	N/A	N/A		JA8 Res. High Efficacy JA10 Res. Flicker NA7 Installation/Acceptance NR NA8 Default Luminaire Power
	Common Use Area		§160.5(b)	§170.2(e)1-5	§170.1		
Indoor Lighting (unconditioned)	Common Use Area		§160.5(b)	§170.2(e)1-5	N/A		
Outdoor Lighting	Dwelling Unit (controlled from within)		§§160.5(a)1, 160.5(a)3	N/A			
	Common Use Area		§160.5(c)	§170.2(e)6			
Sign Lighting			§160.5(d)	§170.2(e)7			NA7 Installation/Acceptance NR
Electrical Power Distribution	Common Use Area	§110.11	§160.6	N/A			N/A
Demand Management		§110.12	N/A				JA13 HPWH Demand Management NA7 Installation/Acceptance NR

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 1 – ARTICLE 1 – ENERGY BUILDING REGULATIONS				
Section 10-103 – PERMIT, CERTIFICATE, INFORMATIONAL, AND ENFORCEMENT REQUIREMENTS FOR DESIGNERS, INSTALLERS, BUILDERS, MANUFACTURERS, AND SUPPLIERS				
Minor	10-103(a)4B		**Certificate of Acceptance**	Certificate of Acceptance forms are to be recorded by an Acceptance Test Technician Certification Provider (ATTCP) and not through any data registry that may be approved by the California Energy Commission (CEC).
Section 10-103.1 – NONRESIDENTIAL LIGHTING CONTROLS ACCEPTANCE TEST TRAINING AND CERTIFICATION				
New	10-103.1(c)3H		**Electronic Database System**	The ATTCP must maintain, or by suitable contractual requirements cause to be maintained, an electronic database system approved by the CEC that meets minimum requirements dictated within this code section.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 10-114 – DETERMINATION OF OUTDOOR LIGHTING ZONES AND ADMINISTRATIVE RULES FOR USE				
Revised	10-114		**Lighting Zones** *New changes affect how lighting zones apply.*	Changes to Table 10-114-A include a new scope of how lighting zones apply to projects. **LZ0 (Very Low):** No change **LZ1 (Low):** Statewide default location description: *Rural areas, as defined by the 2010 U.S. Census. These areas include: single or dual family residential areas, parks and agricultural zone districts,* developed portion of government designated parks, recreation areas and wildlife preserves. Those that are wholly contained within a higher lighting zone may be considered by the local government as part of that lighting zone. *Retail stores, located in a residential neighborhood and rural town centers, as defined by the 2010 U.S. Census, can be designated as LZ2 if the business operates during hours of darkness.* **LZ2 (Moderate):** Urban clusters, as defined by the 2010 U.S. Census: *The following building types may occur here: multifamily housing, mixed use residential neighborhoods, religious facilities, schools and light commercial business districts or industrial zoning districts.* **LZ3 (Moderately High):** Urban areas, as defined by the 2010 U.S. Census: *The following building types may occur here: high intensity commercial corridors, entertainment centers and heavy industrial or manufacturing zone districts.* **LZ4 (High):** No change
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES – GENERAL PROVISIONS				
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION				
Revised	100.1(b)			**Accent Lighting** is directional lighting to emphasize a particular object or surface feature, or to draw attention to a part of the field of view. It can be recessed, surface mounted, or mounted to a pendant, stem, or track, and can be display lighting. *It shall not provide general lighting.*
Revised				**Inseparable Solid State Lighting (SSL) Luminaire** is a luminaire featuring solid state lighting components such as LEDs, light engines and/or driver components which cannot be easily removed or replaced by the end user, thus requiring replacement of the entire luminaire. Removal of solid state lighting components may require the cutting of wires, use of a soldering iron or damage to or destruction of the luminaire. *If solid state lighting components are not removable without destruction to the luminaire, the luminaire is deemed inseparable.*
Revised				**Lighting** definition has had an overhaul for cleanup and to rearrange alphabetically versus in subcategories. Additionally, some existing definitions have been revised to provide clarity.
New			*This definition supports the new specific lighting allowance.*	**Security Cameras** are any operational camera used to enhance the safety and security within a general hardscape area.
New				**Multifamily Building** is any of the following: a building of Occupancy Group R-2, other than a hotel/motel building or timeshare property; a building of Occupancy Group R-3 that is a non-transient congregate residence other than boarding houses of more than 6 guests and alcohol or drug abuse recovery homes of more than 6 guests; or a building of Occupancy Group R-4.
New				**Tunable Lighting** consists of light sources with the ability to alter their luminous flux and/or spectral power distribution. Tunable lighting includes the following types: **Dim-to-warm** (also known as warm dim) light source is capable of simultaneously decreasing its correlated color temperature as its light output decreases, typically resembling the change in color temperature of an incandescent lamp as it dims. **Tunable white** light source is capable of adjusting its correlated color temperature while maintaining its relative light output and capable of adjusting its light output while maintaining its correlated color temperature. **Color tunable light** source is capable of emitting highly saturated light of varying hues, as well as white light, for example by varying the relative intensity of individual emitters within the light source.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Revised	100.1(b)			**Nonresidential Function Areas:** **Barber, Beauty Salon, Spa Area** is a room or area in which the primary activity is manicures, pedicures, facials or the cutting or styling of hair. **Manufacturing, Commercial and Industrial Work Area** is a room or area in which an art, craft, assembly or manufacturing operation is performed.
Section 100.2 – CALCULATION OF TIME DEPENDENT VALUATION (TDV) ENERGY: No change				
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS				
Section 110.0 – SYSTEMS AND EQUIPMENT – GENERAL: No change				
Section 110.1 – MANDATORY REQUIREMENTS FOR APPLIANCES: No change				
Section 110.9 – MANDATORY REQUIREMENTS FOR LIGHTING CONTROLS				
No Change	110.9(a)		**Lighting Control Devices and Systems**	No change
Revised	110.9(b)		**All Lighting Controls**	1. **Time-switch Lighting Controls:** Minor changes 2. **Daylighting Controls:** No change 3. **Dimmers:** No change 4. **Occupant-sensing Controls:** No change 5. ~~**Part-Night Outdoor Lighting Controls:**~~ REMOVED 6. **Sensors Used to Detect Occupants:** No change 7. **Indicator Lights:** No change
No Change	110.9(c)		**Track Lighting Integral Current Limiter**	No change
No Change	110.9(d)		**Track Lighting Supplementary Over-current Protection Panel**	No change
Section 110.11 – MANDATORY REQUIREMENTS FOR ELECTRICAL POWER DISTRIBUTION SYSTEM: No change				

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 110.12 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT				
Revised	110.12(a) Revised		**Demand-responsive Controls**	When demand-responsive controls are installed (required or voluntary), the demand-responsive controls must be capable of communicating with *the virtual end node (VEN) using a wired or wireless bi-directional communication pathway.* All other changes were limited to removing previous communication protocols that are no longer required.
No Change	110.12(b)		**Demand-responsive Zonal HVAC Controls**	No change
Revised	110.12(c) Revised		**Demand-responsive Lighting Controls** *There is a new trigger based on lighting wattage not ft².*	When general lighting that is subject to the multilevel requirements of §130.1(b) for a project is ≥ 4,000 watts, that general lighting must be capable of automatically reducing the lighting power in response to a demand-response signal in a manner consistent with uniform level of illumination requirements of Table 130.1-A. Compliance testing, per Nonresidential Appendix NA7.6.3, must demonstrate ≥ 15% reduction of total installed lighting power. An exception for general lighting wattage associated with health or life safety statute, ordinance or regulation still applies.
No Change	110.12(d)		**Demand-responsive Electronic Message Center Control**	No change
New	110.12(e)		**Demand-responsive Controlled Receptacles** *The trigger is tied to demand-responsive lighting controls of §110.12(c).*	Controlled receptacles in buildings must be capable of automatically turning off all loads connected to the receptacle in response to a demand response signal. EXCEPTIONS: 1. Buildings that are not required to have demand-responsive lighting controls 2. Spaces where a health or life safety statute, ordinance or regulation does not permit the receptacles to be automatically controlled

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<table>
<tr><th>Level of Change</th><th>2019 Section</th><th>2022 Section</th><th>Subtitle & Notes</th><th>Mandatory Change Summaries</th></tr>
<tr><td colspan="5">Title 24, Part 6 Subchapter 10 – MULTIFAMILY BUILDINGS – MANDATORY REQUIREMENTS</td></tr>
<tr><td colspan="5">Section 160.5(a) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: DWELLING UNIT LIGHTING</td></tr>
<tr><td>Revised</td><td>150.0(k)1A</td><td>160.5(a)1
Matches.</td><td>Luminaire Requirements

There are new exceptions to the high-efficacy requirements of Table 150.0-A.

Requirements are reordered; otherwise, the changes are minimal.</td><td>A. Luminaire Efficacy: All installed luminaires must meet the requirements in Table 160.5-A.
Table 160.5-A Classification of High Luminous Efficacy Light Sources
<table>
<tr><th>Automatically considered high luminous efficacy (does NOT need to be JA8 certified)</th><th>Must be JA8 certified/marked</th></tr>
<tr><td>1. LED light sources installed outdoors</td><td rowspan="2">7. All non-screw-base light sources installed in ceiling-recessed downlight luminaires other than those specified in items 3, 4 or 5 (on the left side of this table)</td></tr>
<tr><td rowspan="2">2. Inseparable Solid State Lighting (SSL) luminaires and colored light sources that are installed to provide decorative, accent, display, utility, under cabinet or special effect lighting</td></tr>
<tr><td>8. Anything not listed in this table</td></tr>
<tr><td>3. Pin-based linear fluorescent or compact fluorescents with electronic ballasts.</td><td></td></tr>
<tr><td>4. High-intensity discharge (HID) light sources including pulse-start metal halide and high-pressure sodium light sources</td><td></td></tr>
<tr><td>5. Luminaires with hardwired high frequency generator and induction lamp</td><td></td></tr>
<tr><td>6. Title 20-compliant ceiling fan light kits</td><td></td></tr>
</table>
EXCEPTIONS:
1. Integrated Device Lighting: Lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, garage door openers and non-removable lighting attached to ceiling fans
2. Navigation Lighting: Lighting such as night lights, step lights and path lights less than 5 watts
3. Cabinet Lighting: Lighting internal to drawers, cabinetry and linen closets with an efficacy of 45 lumens per watt or greater
B. Screw-based Luminaires: Screw-based luminaires must contain lamps that comply with Joint Appendix JA8.
C. Recessed Downlight Luminaires in Ceilings: There is a new exception to the airtight labeling and installation requirements when recessed luminaires are marked for use in fire-rated installations and recessed luminaires installed in non-insulated ceilings.
D. Light Sources in Enclosed or Recessed Luminaires: No changes were made although this section has been reorganized.
E. Blank Electrical Boxes: Added language specifies how the blank electrical boxes must be served: dimmer, vacancy sensor control, low voltage wiring or fan speed control.</td></tr>
</table>

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.5(a) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: DWELLING UNIT LIGHTING *(continued)*				
Revised	**150.0(k)1**	160.5(a)2 *Matches.*	**Indoor Lighting Controls** *Occupancy sensors no longer need to be programed like vacancy sensors.*	A-D. Minor changes to support clean up E. **Automatic-OFF Controls:** Walk-in closets have been added in addition to bathrooms, garages, laundry rooms and utility rooms as spaces requiring an occupancy/vacancy sensor providing automatic-OFF functionality. It was clarified that lighting in opaque-fronted drawers and cabinetry must be controlled with an automatic-off when a drawer or door is closed. Occupancy sensors no longer need to be programed like vacancy sensors. F. **Dimming Controls:** Lighting in habitable spaces (e.g., living rooms, dining rooms, kitchens and bedrooms) must be provided with readily accessible dimming controls. Forward phase-cut dimmers controlling LED light sources in these spaces must comply with NEMA SSL 7A. EXCEPTIONS: 1. Ceiling fans with integrated lighting can use remote control. 2. Lighting is controlled by occupancy/vacancy sensor with automatic-off functionality. 3. Navigation lighting (e.g., night lights, step lights and path lights) that is < 5 watts, and lighting that is internal to opaque fronted drawers and cabinetry or that uses automatic-OFF controls. G. **Independent Controls:** The following must be controlled independently: ◊ Integrated lighting of exhaust fans from the fan function ◊ Under cabinet lighting ◊ Under shelf lighting ◊ Interior lighting of display cabinets ◊ Switched outlets
Revised	**150.0(k)3** No change	160.5(a)3	**Outdoor Lighting Controls**	It is clarified that residential outdoor lighting control requirements apply to luminaires controlled from within dwelling unit.
Section 160.5(b) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: COMMON USE AREA LIGHTING				
	130.0(c)	160.5(b)	***Common Use Area*** **Lighting**.	Lighting systems in common use areas providing shared provisions for living, eating, cooking or sanitation to dwelling units that would otherwise lack these provisions (for example, dormitories including a shared kitchen and living room with a group of bedrooms) may instead comply with §160.5(a)
Revised	**130.0(c)**	160.5(b)1 *Matches.*	**Luminaire Classification and Power**	A. Luminaire wattage must be labeled: No change B. For luminaires with line voltage lamp holders not served by drivers, ballasts or transformers: The wattage of such luminaires must be determined as the maximum rated wattage as labeled in accordance with §160.5(b)1A. (50 watt per socket/JA8 wattage no longer utilized.) C-G. Minor changes
No Change	**130.0(d)**	160.5(b)2 *Matches.*	**Lighting Controls**	No change
No Change	**130.0(e)**	160.5(b)3 *Matches.*	**Energy Management Control System (EMCS)**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.5(b) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: COMMON USE AREA LIGHTING *(continued)*				
➤ Revised	**130.1(a)**	**160.5(b)4A** *Does not match §130.1(a) changes.*	**Manual Area Controls** *There are new exceptions, and the egress lighting exception is reduced from 0.20 w/ft² to 0.10 w/ft².*	i. **Be readily accessible:** An expanded exception includes areas of the building intended for access, or use by the public, in addition to restrooms with ≥ 2 stalls, parking areas and stairwells. ii. **Be located in the same enclosed area with the lighting it controls:** An exception is allowed for areas where placement of a manual area control poses a health and safety hazard. The manual area control may instead be located so that a person using the control can see the lights or area controlled by that control, or visually signal or display showing the current state of the controlled lighting. iii. **Provide separate control** of general, floor display, wall display, window display, case display, ornamental and special effects lighting, such that each type of lighting can be turned on or off without turning on or off other types of lighting. Scene controllers may comply with this requirement provided that at least one scene turns on general lighting only, and the control provides a means to manually turn off all lighting. The exception for egress lighting per the California Building Code §1008 is reduced to 0.10 watts per ft². Formerly, it was 0.20 w/ft².
➤ Revised	**130.1(b)**	**160.5(b)4B** *Matches.*	**Multilevel Lighting Controls**	EXCEPTIONS: There are exceptions for an area enclosed by ceiling height partitions that has only one luminaire with no more than two lamps or has only one inseparable SSL luminaire and bathrooms. Otherwise, things are moved around but remain the same. Table 160.5-B includes revised luminaire types and uniform level of luminance options.
➤ Revised	**130.1(c)**	**160.5(b)4C** *Matches.*	**Automatic Shut-Off Controls** *New partial-OFF occupancy sensor requirements are added for offices > 250 ft².*	All installed indoor lighting must be equipped with controls able to automatically reduce lighting power when the space is typically unoccupied. i. **In addition to §§160.5(b)4A-B** the following are required: a. Control by an occupant-sensing control, automatic time-switch control or other control capable of automatically shutting off all of the lighting when the space is typically unoccupied b. Separate controls for the lighting on each floor, other than lighting in stairwells c. Separate controls for a space enclosed by ceiling height partitions ≤ 5,000 ft² d. ~~Separate controls for general, display, ornamental, and display case lighting.~~ REMOVED e. ~~Automatic time switch controls – May include a manual-on mode~~ REMOVED EXCEPTIONS: 1 - 5: It is clarified that lighting providing means of egress illumination, as the term is used in the California Building Code, must be configured to provide no less than the amount of light required by California Building Code §1008 while in the partial-OFF mode. Otherwise, there are no changes. ii. **Countdown Timers:** No change iii-iv. **If Using Automatic Time-switch Controls:** No change v. **Occupant-sensing Controls Are Required:** It is clarified that in ≤ 20 minutes after the control zone is unoccupied, the general lighting must be reduced by: a. 100% using occupancy sensors for offices ≤ 250 ft², multipurpose rooms < 1,000 ft², conference rooms or restrooms of any size when multilevel control is NOT required per §160.5(b)4B (Multilevel Controls) b. 50-70% using vacancy or partial-ON occupancy sensors when multilevel control IS required per § 160.5(b)4B (Multilevel Controls) vi. **Full or Partial-OFF Occupant-sensing Controls:** a. In corridors and stairwells in which general lighting must be automatically reduced by ≥ 50% when the space is unoccupied. b. Offices > 250 ft² must have separately controlled zones ≤ 600 ft² that reduce full power by ≥ 80% in ≤ 20 minutes after the control zone is unoccupied. When using embedded sensors on luminaires, each luminaire is considered to be a zone if capable of being controlled independently from others. Additionally, all lighting power must be off in ≤ 20 minutes after the entire office space is unoccupied. ≤ 100% lighting power is allowed when a control zone is occupied, but all unoccupied lighting control zones are limited to ≤ 20% lighting power. EXCEPTION: There is an exception for under-shelf or furniture-mounted task lighting that is controlled by a local switch and either a time switch or an occupancy sensor. vii. **Partial-OFF Occupant-sensing Controls:** For lighting in parking garages (parking areas, loading and unloading areas): Minor changes

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.5(b) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: COMMON USE AREA LIGHTING *(continued)*				
Revised	**130.1(d)**	160.5(b)4D *Matches.*	**Automatic Daylighting Controls** *Secondary daylighting controls are now mandatory, and lighting in daylit zones must be able to reduce by ≥ 90% in non-parking lot areas and 100% in parking lot areas.*	General lighting in primary and secondary daylit zones is now subject to the Mandatory requirements for daylighting controls and be able to reduce by ≥ 90% in non-parking lot areas and 100% in parking lot areas. The 2019 Energy Code included only primary as Mandatory, and secondary was a Prescriptive requirement. The 2019 Energy Code also required only ≥ 65% reduction in non-parking lot areas. Additional guidance is given on determining and controlling lighting in primary versus secondary in which general lighting in overlapping primary and secondary sidelit daylit zones must be controlled as part of the primary sidelit daylit zone. Linear LED and other solid state lighting (SSL) light sources in linear form may be treated as linear lamps in increments of 4-ft segments or less, where each segment is separately controlled based on the type of the daylit zone in which the segment is primarily located. All photo sensors must be located so that they are not readily accessible to unauthorized personnel. The 2019 Energy Code required only one sensor. EXCEPTIONS: 1-2. No change 3. It is clarified that rooms where the combined total installed wattage of the general lighting in the skylit and primary sidelit zones is < 120 watts are not required to have daylighting controls for those zones. Rooms where the total installed wattage of the general lighting in the secondary sidelit zones is < 120 watts are not required to have daylighting controls for those zones. 4-7. No change
Revised	**130.1(e)**	160.5(b)4E *Matches.*	**Demand-responsive Controls**	See §110.12(c) for the new requirements associated with lighting and §110.12(e) demand-responsive controls for controlled receptacles.
Revised	**130.1(f)**	160.5(b)4F *Matches.*	**Control Interactions**	i-vii. No change viii. RESERVED ix. When lighting occupancy sensors are required per §160.5(b)4C AND Table 160.5-B allows the ventilation in the space to be reduced to zero in occupied stand-by mode, then the occupancy-sensor ventilation requirements §120.2(e)3 apply. These spaces include office spaces (≤ 250 ft² and > 250 ft²), multipurpose rooms < 1,000 ft², conference rooms, corridors and stairwells.
Section 160.5(c) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: OUTDOOR LIGHTING CONTROLS AND EQUIPMENT				
Revised	**130.2(b)**	160.5(c)1 *Matches.*	**Luminaire Shielding Requirements**	There is a new exception for public art; otherwise there are no changes.
Revised	**130.2(c)**	160.5(c)2 *Matches.*	**Controls for Outdoor Lighting**	A. **Daylight Availability:** No change B. **Automatic Scheduling Controls:** Minor changes C. **Motion-sensing Controls:** It is clarified that a single sensor, or lighting controlled as a single zone, is limited to ≤ 1,500 watt lighting power. The motion sensor must be capable of reducing lighting by ≥ 50% but no more than 90%. EXCEPTIONS: 1-3. No change
Section 160.5(d) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: SIGN LIGHTING				
No Change	**130.3(a)**	160.5(d) *Matches.*	**Controls for Sign Lighting**	No change

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 160.5(e) – MANDATORY LIGHTING REQUIREMENTS FOR INDOOR AND OUTDOOR SPACES: ACCEPTANCE AND INSTALLATION CERTIFICATE				
Revised	**130.4(a)**	**160.5(e)1** *Matches.*	**Lighting and Receptacle Control Acceptance Requirements**	New acceptance testing requirements are added for demand-responsive controlled receptacles of §110.12(e) per Nonresidential Appendix NA7.6.5.
Revised	**130.4(b)**	**160.5(e)2** *Matches.*	**Lighting Control Installation Certificate Requirements**	Installation Certificates (NRCI form) are no longer required for track lighting integral current limiter and track lighting supplementary over-current protection panel(s).
No Change	**130.4(c)**	**160.5(e)3** *Matches.*		NRCA Documentation per Title 24, Part 1
Section 160.6 – MANDATORY REQUIREMENTS FOR ELECTRIC POWER DISTRIBUTION SYSTEMS				
Minor	**130.5(a)-(d)**	**160.6(a)-(d)** *Matches.*	**Service Electrical Metering; Separation of Electrical Circuits for Electrical Energy Monitoring; Voltage Drop; Circuit Controls for 120-Volt Receptacles and Controlled Receptacles**	Minor changes
Revised	**130.5(e)**	**160.6(e)** *Matches.*	**Demand-responsive Controls and Equipment**	See §110.12 for demand-responsive control requirements including the new requirements for demand-responsive controlled receptacles.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Performance Change Summaries
Title 24, Part 6 Subchapter 11 – MULTIFAMILY BUILDINGS – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES				
Section 170.0 – GENERAL				
Minor	**140.0**	170.0	**Performance and Prescriptive Compliance Approaches**	Minor changes
Section 170.1 – PERFORMANCE APPROACH				
Revised	**140.1(a)-(c)**	170.1(a)-(c) *Does not match single family requirements in which energy design rating (EDR) will not be used to document multifamily buildings when using the Performance Method.*	**Performance Approach: Energy Budgets** *Source energy compliance is required and must comply independently from building time-dependent valuation.*	a. **Energy Budget for the Standard Design Building.** The energy budget for the Standard Design Building is expressed in terms of source energy and time-dependent valuation (TDV) energy, and they are determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The source energy budget and the TDV energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, photovoltaic (PV) and battery storage system, service water heating and covered process loads. b. **Energy Budget for the Proposed Design Building**. The energy budget for a Proposed Design Building is expressed in terms of source energy and TDV energy, and they are determined by calculating the source energy and TDV energy for the Proposed Design Building. The source energy budget and the TDV energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, PV and battery storage system, and service water heating and covered process loads. The Proposed Building must separately comply with the source energy budget and the TDV energy budget. EXCEPTION: There is an exception for community solar or battery per Title 24, Part 1 §10-115 c. **Calculation of Energy Budget:** The Standard Design energy budget and Proposed Design energy use shall be calculated using compliance software approved by the California Energy Commission.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 11 – MULTIFAMILY BUILDINGS – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES				
Section 170.2 – PRESCRIPTIVE APPROACH				
No Change	**140.2**	170.2	**Prescriptive Approach**	No change
Section 170.2(e)1-5 – PRESCRIPTIVE APPROACH: COMMON USE AREA LIGHTING				
	140.6	170.2(e)1-5	***Common Use Area*** **Lighting**	Lighting systems in common use areas providing shared provisions for living, eating, cooking, or sanitation to dwelling units that would otherwise lack these provisions (for example, dormitories including a shared kitchen and living room with a group of bedrooms) may instead comply with §160.5(a).
No Change	**140.6**	170.2(e)1 *Matches.*	**Interior *Common Use Area* Lighting**	No change
Revised	**140.6(a)**	170.2(e)2 *Does not match small aperture power adjustments changes in §140.6(a).*	***Common Use Area*** **Calculation of Adjusted Indoor Lighting Power**	A. **Two Interlocked Lighting Systems:** No change B. **Reduction of Wattage Through Controls:** Table 170.2-L (Lighting Power Adjustment Factors [PAF]): i-vii: No change viii. Daylight Continuous Dimming Plus OFF: Allowed for luminaires in primary, skylit and secondary daylit zones only ix. Open Office Occupancy Sensors: Applicable for open plan office area(s) > 250 ft² x. Institutional Tuning: No change xi. Demand-responsive Controls: Applicable for when not required by §110.12(c): When general lighting that is subject to the multilevel requirements of Table 160.5-B for a project is ≥ 4,000 watts. xii. No change C. **Lighting Wattage Excluded:** No change. D. **Luminaire Classification and Power Adjustment:** The Small Aperture Tunable-White and Dim-to-Warm Luminaires *Lighting Power Adjustment remains 0.75.*
Revised	**140.6(b)**	170.2(e)3-5	**Calculation of Allowed Indoor Lighting Power** *The complete building method does not apply to multifamily occupancies.*	Allowed indoor lighting power allotment of Area Category (Table 170.2-M), and Tailored (Tables 170.2-N/P/Q) Methods have been revised. Additional lighting power allowances has replaced "ornamental" with "decorative" supporting the change in the definition of this lighting function.
Section 170.2(e)6-7 – PRESCRIPTIVE APPROACH: PRESCRIPTIVE OUTDOOR AND SIGN LIGHTING				
	140.7	170.2(e)6	**Prescriptive Outdoor Lighting**	All multifamily buildings, including those that are mixed-use, will be required to meet these requirements.
Revised	**140.7(a)-(d)**	170.2(e)6 *Does not match §140.7.*	**Outdoor Lighting** *The Lighting Zone application of Title 24, Part 1, §10-114 has changed. Multifamily building wattage allowance is based on area wattage allowance and initial wattage allowance. Linear wattage does not apply.*	Table 170.2-R (General Hardscape Multifamily Lighting Power Allowance) has revised wattage allowances and has removed concrete vs. asphalt allowances. The multifamily building wattage allowance is based on area wattage allowance and initial wattage allowance. Linear wattage does not apply. A security camera additional allowance is added to Table 170.2-S (Additional Lighting Power Allowance for Specific Applications). This allowance applies when a security camera is installed within 2 mounting heights of the general hardscape area and mounted > 10 ft away from a building.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(e)6-7 – PRESCRIPTIVE APPROACH: PRESCRIPTIVE OUTDOOR AND SIGN LIGHTING *(continued)*				
No Change	**140.8**	170.2(e)7 *Matches.*	**Prescriptive Sign Lighting**	No change

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 12 – MULTIFAMILY BUILDINGS – ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING MULTIFAMILY BUILDINGS						
Section 180.0 – GENERAL						
No Change	**141.0(a)**	180.0	**General**	No change		
Section 180.1 – ADDITIONS						
Minor	**141.0(a)**	180.1(a)	**Additions**	Minor changes		
Section 180.2(b)4A – ALTERATIONS: DWELLING UNIT LIGHTING						
New	**141.0(b) N/A**	180.2(b)4A	***Dwelling Unit* Lighting**	The altered lighting system must meet the lighting requirements of §160.5(a). The altered luminaires must meet the luminaire efficacy requirements of §160.5(a) and Table 160.5-A. Where existing screw-base sockets are present in ceiling-recessed luminaires, removal of these sockets is not required provided that new JA8-compliant trim kits or lamps designed for use with recessed downlights or luminaires are installed.		
Section 180.2(b)4B – ALTERATIONS: COMMON USE AREA LIGHTING						
No Change	**141.0(b)2H**	180.2(b)4Biii *Matches.*	**Alterations – New Signs**	No change		
Revised	**141.0(b)2I**	180.2(b)4Biv *Does not match exception for open office occupancy sensors.*	**Alterations – Indoor**	Open office occupancy sensors will be required for all lighting Alterations methods (unlike nonresidential 2022 lighting Alteration projects). Otherwise, there are no changes.		
Minor	**141.0(b)2L**	180.2(b)4Bv *Matches.*	**Alterations – Outdoor**	Minor changes		
No Change	**141.0(b)2M**	180.2(b)4Bvi *Matches.*	**Alterations – Altered Signs**	No change		
No Change	**141.0(b)2P**	180.2(b)4Bvii *Matches.*	**Alterations - Electrical Power Distribution Systems**	No change		

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Photovoltaic and Battery Storage Systems, Electric Ready and Solar Ready: Multifamily Buildings

Building Application		Mandatory: All Occupancy Subchapters 1-2, 7 (§§100.0-110.12, 150.0)	Mandatory: Multifamily Subchapter 10 (§§160.0-160.6)	Prescriptive Subchapter 11 (§§170.0-170.2)	Performance Subchapter 11 (§170.1)	Additions Alterations Subchapter 12 (§180.0)	Reference Appendices
General		§§100.0, 100.1-2, 110.0-2, 110.5	§160.0	§170.2	§170.1	§180.0	JA1 Definitions, JA2 Weather/ Climate, JA3 TDV
Electric Ready	Dwelling Unit	N/A	§§160.9(a)-(c)	N/A			N/A
	Common Use Area		§160.9(c)2				
Photovoltaic (PV) Systems	≤ 3 Habitable Stories	§§100.0, 100.1-2	N/A	§170.2(f)	§§170.0, 170.1	N/A	JA11 PV Qualifications
	≥ 4 Habitable Stories			§170.2(g)			
Battery Storage Systems		§110.10		§170.2(h)			JA12 Battery Qualifications
Solar Ready		§110.10	§160.8	N/A	N/A	N/A	N/A

Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 1 – ARTICLE 1 – ENERGY BUILDING REGULATIONS				
Section 10-115 – COMMUNITY-SHARED SOLAR ELECTRIC GENERATION SYSTEM OR COMMUNITY-SHARED BATTERY STORAGE SYSTEM COMPLIANCE OPTION FOR ON-SITE SOLAR ELECTRIC GENERATION OR BATTERY STORAGE REQUIREMENTS				
Revised		10-115(a)	**Community-shared Solar Electric Generation System or Battery Storage System Offset**	1. **Enforcement Agency:** No change 2. **Energy Performance:** No change 3. **Participating Building Energy Savings Benefits:** Revised 4. **Durability, Participation and Building Opt-out:** Revised to guarantee owner can opt out in favor of installing on-site equipment 5. **Additional:** Revised 6. **Location:** *New.* The community-shared solar electric generation system and/or community-shared battery storage system must be located on a distribution system of the load-serving entity providing service to the participating buildings. 7. **Size:** *New.* The community-shared solar electric generation system and/or community-shared battery storage system must not be served by any individual source > 20 MW. 8. **Accountability and Record keeping:** Revised
Revised		10-115(b)	**Application for Commission Approval**	New requirements for applications from public agencies must be submitted to the California Energy Commission (CEC) only after public review through at least one public meeting within the jurisdiction of the public entity or service area of the load-serving entity and adoption by the public agency. The CEC has the authority to not approve any application that the CEC determines to be inconsistent with the requirements of §10-115. Otherwise, there are no changes.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Section 10-115 – COMMUNITY-SHARED SOLAR ELECTRIC GENERATION SYSTEM OR COMMUNITY-SHARED BATTERY STORAGE SYSTEM COMPLIANCE OPTION FOR ON-SITE SOLAR ELECTRIC GENERATION OR BATTERY STORAGE REQUIREMENTS *(continued)*				
New		10-115(c)	**Executive Director Approval of Revised Applications**	The Administrator of an approved community-shared solar electric generation system and/or community-shared battery storage system must submit a revised application demonstrating compliance with the §10-115 requirements to the CEC Executive Director for approval, when: 1. A new renewable resource is proposed to be added to a community-shared solar electric generation system and/or community-shared battery storage system; AND/OR 2. The CEC modifies the requirements of §10-115 in a building standards rule making. Such modified requirements would not apply retroactively to the buildings for which building permit applications are submitted prior to the effective date of the modified standards or to the continued use of previously approved renewable resources developed to serve a community-shared solar electric generation system and/or community-shared battery storage system. Within 60 days of receiving a revised application, the CEC Executive Director may either: ◊ Approve the revised application by letter if the Executive Director concludes that the requirements of §10-115 will be met. ◊ Request that the Administrator resubmit a revised application with changes. ◊ Disapprove the application. If the Executive Director disapproves the application, the applicant may request that the CEC review the Executive Director's determination. ◊ The petition must be filed in writing in accordance with Title 20, California Code of Regulations, Section 1208 within 15 days of the date of the filing of the Executive Director's determination and must state the basis for requesting review of the Executive Director's determination. ◊ Within 45 days of receiving a request for review, the CEC will issue a written decision affirming or modifying the Executive Director's determination. If the CEC does not issue a written decision within 45 days, the request for review will be deemed denied. ◊ The Administrator has the burden of proof to establish that its revised application should be approved.
Title 24, Part 6 Subchapter 1 – ALL OCCUPANCIES – GENERAL PROVISIONS				
Section 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION				
New		100.1(b)		**Azimuth** is the degrees of clockwise rotation from true north.
New				**Energy Storage System (ESS)** is one or more devices, assembled together, that are capable of storing energy used for safely supplying electrical energy to selected loads at a future time. **ESS Ready Interconnection Equipment** is equipment, including but not limited to an ESS ready panelboard, that can accommodate the connection of a distributed energy resource or an ESS capable of either automatic or manual isolation from the utility power source. **ESS Ready Panelboard** is a panelboard that can accommodate either automatic or manual switching between a utility power source to a distributed energy resource or an energy storage system, such as a split bus panelboard.
New				**Multifamily Building** is any of the following: a building of Occupancy Group R-2, other than a hotel/motel building or timeshare property; a building of Occupancy Group R-3 that is a non-transient congregate residence other than boarding houses of more than 6 guests and alcohol or drug abuse recovery homes of more than 6 guests; or a building of Occupancy Group R-4.
Title 24, Part 6 Subchapter 2 – ALL OCCUPANCIES – MANDATORY REQUIREMENTS FOR THE MANUFACTURE, CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS				
Section 110.10 – MANDATORY REQUIREMENTS FOR SOLAR READINESS				
Revised		110.10(a)	**Covered Occupancies**	2. **Low-rise Multifamily Buildings:** No change 3. **High-rise Multifamily Buildings:** Required when no PV system installed

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries
Title 24, Part 6 Subchapter 10 – MULTIFAMILY BUILDINGS – MANDATORY REQUIREMENTS				
Section 160.8 – MANDATORY REQUIREMENTS FOR SOLAR READY BUILDINGS				
✳ New		160.8	**Mandatory Requirements for Solar-ready Buildings**	See §110.10
Section 160.9 – MANDATORY REQUIREMENTS FOR ELECTRIC-READY BUILDINGS: DWELLING UNITS AND COMMON USE AREAS				
✳ New		160.9(a)-(c)1	***Dwelling Units*** **Mandatory Requirements for Electric-ready Buildings**	
✳ New		160.9(a) *Matches new* 150.0(t)	**Heat Pump Space Heater Ready**	If natural or propane gas furnaces are installed to serve individual dwelling units, the following are required: 1. A dedicated, 240-volt branch circuit rated at 30 amps minimum, must be installed within 3 ft of the installed furnace and accessible to the furnace with no obstructions, identified as "240V ready." 2. There must be reserved space on the main electrical service panel to allow for the installation of a double pole circuit breaker permanently marked as "For Future 240V use."
✳ New		160.9(b) *Matches new* 150.0(u)	**Electric Cooktop Ready**	Systems using gas or propane cooktop to serve individual dwelling units must include the following: 1. A dedicated, 240-volt branch circuit must be installed within 3 ft from the cooktop and accessible to the cooktop with no obstructions. The branch circuit must be rated at 50 amps minimum. The blank cover must be identified as "240V ready." All electrical components must be installed in accordance with the California Electrical Code. 2. The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future electric cooktop installation. The reserved space must be permanently marked as "For Future 240V use."
✳ New		160.9(c)1 *Matches new* 150.0(v)	**Electric Clothes Dryer Ready**	In systems with gas or propane plumbing, a clothes dryer to serve an individual dwelling unit must include the following: A. A dedicated, 240-volt branch circuit must be installed within 3 ft from the clothes dryer and accessible to the clothes dryer with no obstructions. The branch circuit must be rated at 30 amps minimum. The blank cover must be identified as "240V ready." All electrical components must be installed in accordance with the California Electrical Code. B. The main electrical service panel must have a reserved space to allow for the installation of a double pole circuit breaker for a future electric clothes dryer installation. The reserved space must be permanently marked as "For Future 240V use."
✳ New		160.9(c)2	**Common Use Area Clothes Dryer Ready**	A. Conductors or raceway must be installed with termination points at the main electrical panel, via subpanels if applicable, to a location no more than 3 ft from each gas outlet or a designated location of future electric replacement equipment. Both ends of the conductors or raceway must be labeled "Future 240V Use." The conductors or raceway and any intervening subpanels, panelboards, switchboards and busbars must be sized to meet the future electric power requirements, at the service voltage to the point at which the conductors serving the building connect to the utility distribution system, as specified below. The capacity requirements may be adjusted for demand factors in accordance with the California Electrical Code. Gas flow rates must be determined in accordance with the California Plumbing Code. Capacity must be one of the following: i. 24 amps at 208/240 volts per clothes dryer ii. 2.6 kVA for each 10,000 Btuh of rated gas input or gas pipe capacity iii. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by the responsible person associated with the project

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Title 24, Part 6 Subchapter 11 – MULTIFAMILY BUILDINGS – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES				
Section 170.2 – PRESCRIPTIVE APPROACH				
No Change	**140.2**	170.2	**Prescriptive Approach**	No change
Title 24, Part 6 Subchapter 5 – NONRESIDENTIAL AND HOTEL/MOTEL OCCUPANCIES – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY				
Section 170.2(f) – PRESCRIPTIVE APPROACH: PHOTOVOLTAIC REQUIREMENTS ≤ 3 HABITABLE STORIES				
Revised	**150.1(c)14**	170.2(f) *Matches.*	**Photovoltaic Requirements ≤ 3 Habitable Stories** **Equation 170.2-C PV Direct Current Size** $kW_{PVdc} = (CFA \times A)/1000 + (N_{du} \times B)$ Table 170.2-T *Matches 2019 Table 150.1-C with no changes.*	All multifamily buildings ≤ 3 habitable stories must have a newly installed photovoltaic (PV) system or newly installed PV modules meeting the minimum qualification requirements specified in Joint Appendix JA11. The annual electrical output of the PV system must be no less than the smaller of a PV system size determined using Equation 170.2-C or the maximum PV system size that can be installed on the building's Solar Access Roof Area (SARA). A. **SARA includes** the area of the building's roof space capable of structurally supporting a PV system and the area of all roof space on covered parking areas, carports and all other newly constructed structures on the site that are compatible with supporting a PV system per the California Building Code §1511.2. B. **SARA does NOT include:** i. Any roof area that has < 70% annual solar access. Annual solar access is determined by dividing the total annual solar insulation, accounting for shading obstructions, by the total annual solar insulation if the same areas were unshaded by obstructions. For steep-slope roofs, only shading from existing permanent natural or man-made obstructions that are external to the dwelling (including but not limited to trees, hills and adjacent structures) must be considered for annual solar access calculations. For low-slope roofs, all obstructions (including those that are external to the dwelling unit and obstructions that are part of the building design and elevation features) must be considered for the annual solar access calculations. ii. Occupied roof areas as specified by the California Building Code §503.1.4. iii. Roof area that is otherwise not available due to compliance with other building code requirements if confirmed by the CEC Executive Director. EXCEPTIONS: 1. **Steep-sloped Roofs:** SARA must not consider roof areas with a northerly azimuth that lies between 300 degrees and 90 degrees from true north. No PV system is required if the SARA is < 80 contiguous ft². 2. **No PV System** is required when the minimum PV system size specified by §170.2(f) is < 1.8 kW_{dc}. 3. **Snow Loads:** Buildings with enforcement-authority-approved roof designs, where the enforcement authority determines it is not possible for the PV system (including panels, modules and components and supports and attachments to the roof structure) to meet the requirements of the American Society of Civil Engineers (ASCE), Standard 7-16, Chapter 7, Snow Loads. 4. For buildings that are **approved by the local planning department prior to January 1, 2020**, shading from roof designs and configurations and roof areas that are not allowed to have PVs, which are required by mandatory conditions of approval, may be considered in determining the SARA. 5. **Battery Storage System - Reduced PV kW:** PV system sizes determined using Equation 170.2-C may be reduced by 25% if installed in conjunction with a battery storage system. The battery storage system must meet the qualification requirements specified in Joint Appendix JA12 and have capacity ≥ 7.5 kWh.

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(g) – PRESCRIPTIVE APPROACH: PHOTOVOLTAIC REQUIREMENTS ≥ 4 HABITABLE STORIES				
New		170.2(g) *Matches new* 140.10(a)	**Photovoltaic Requirements ≥ 4 Habitable Stories** Equation 170.2-D **PV Direct Current Size** **kW_{PVdc} = (CFA x A)/1000** *Where:* *kW_{PVdc} = Size of the PV system in kW* *CFA = Conditioned floor area in square feet* *A = PV capacity factor specified in Table 170.2-U for the building type*	All newly constructed building types specified in Table 170.2-U, or mixed occupancy buildings where one or more of these building types constitute at least 80% of the floor area of the building, must have a PV system meeting the minimum qualification requirements of Joint Appendix JA11. The PV size in kW_{dc} must be not less than the smaller of the PV system size determined by Equation 170.2-D, or the total of all available SARA multiplied by 14 W/ft². Where the building includes more than one of the space types listed in Table 170.2-U, the total PV system capacity for the building must be determined by applying Equation 170.2-D to each of the listed space types and summing the capacities determined for each.

Table 170.2-U PV Capacity Factors

Building Type	Factor A – Minimum PV Capacity (W/ft² of conditioned floor area)		
	CZ 1,3,5,16	CZ 2,4,6-14	CZ 15
Grocery	2.62	2.91	3.53
High-rise Multifamily (≥ 4 habitable stories)	1.82	2.21	2.77
Office, Financial Institutions, Unleased Tenant Space	2.59	3.13	3.80
Retail	2.62	2.91	3.53
School	1.27	1.63	2.46
Warehouse	0.39	0.44	0.58
Auditorium, Convention Center, Hotel/Motel, Library, Medical Office Building/Clinic, Restaurant, Theater	0.39	0.44	0.58

CZ = Climate Zone; PV = photovoltaic.

1. **SARA includes** the area of the building's roof space capable of structurally supporting a PV system and the area of all roof space on covered parking areas, carports, and all other newly constructed structures on the site that are compatible with supporting a PV system per Title 24, Part 2, §1511.2.
2. **SARA does NOT include:**
   A. Any area that has < 70% annual solar access. Annual solar access is determined by dividing the total annual solar insulation (accounting for shading obstructions) by the total annual solar insulation if the same areas were unshaded by those obstructions. For all roofs, all obstructions including those that are external to the building, and obstructions that are part of the building design and elevation features may be considered for the annual solar access calculations.
   B. Occupied roofs as specified by California Building Code §503.1.4
   C. Roof space that is otherwise not available due to compliance with other building code requirements if confirmed by the CEC Executive Director

EXCEPTIONS:

1. No PV system is required where the total of all available SARA is < 3% of the conditioned floor area.
2. No PV system is required where the required PV system size is < 4 kW_{dc}.
3. No PV system is required if the SARA contains < 80 contiguous ft².
4. A building has an enforcement-authority-approved roof design, where the enforcement authority determines it is not possible for the PV system, including panels, modules, components, supports, and attachments to the roof structure, to meet ASCE 7-16, Chapter 7, Snow Loads.
5. Multi-tenant buildings in areas where a load serving entity does not provide either a Virtual Net Metering (VNEM) or community solar program

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Level of Change	2019 Section	2022 Section	Subtitle & Notes	Prescriptive Change Summaries
Section 170.2(h) – PRESCRIPTIVE APPROACH: BATTERY STORAGE REQUIREMENTS ≥ 4 HABITABLE STORIES				
New		**170.2(h)** *Matches new* **140.10(b)**	**Battery Storage System Requirements ≥ 4 Habitable Stories** *Equation 170.2-E Battery Storage Rated Energy Capacity* $kWh_{batt} = kW_{PVdc} \times B / D^{0.5}$ *WHERE:* kWh_{batt} *= Rated Usable Energy Capacity of the battery storage system in kWh* kW_{PVdc} *= PV system capacity required by §170.2(g) in* kW_{dc} *B = Battery energy capacity factor specified in Table 170.2-V for the building type* *D = Rated single charge-discharge cycle AC to AC (round-trip) efficiency of the battery storage* *Equation 170.2-F Battery Storage Rated Power Capacity* $kW_{batt} = kW_{PVdc} \times C$ *WHERE:* kW_{batt} *= Power capacity of the battery storage system in* kW_{dc} kW_{PVdc} *= PV system capacity required by §170.2(g) in* kW_{dc} *C = Battery power capacity factor specified in Table 170.2-V for the building type*	All buildings that are required by §170.2(g) (PV) to have a PV system must also have a battery storage system meeting the minimum qualification requirements of Joint Appendix JA12. The rated energy capacity and the rated power capacity must be not less than the values determined by Equation 170.2-E and Equation 170.2-F. Where the building includes more than one of the space types listed in Table 170.2-V, the total battery system capacity for the building must be determined by applying Equations 170.2-E and 170.2-F to each of the listed space types and summing the capacities determined for each space type and equation.

Table 170.2-V Battery Storage Capacity Factors

Building Type	Factor B – Energy Capacity	Factor C – Power Capacity
	Wh/W	W/W
Grocery	1.03	0.26
Highrise Multifamily (≥ 4 habitable stories)	1.03	0.26
Office, Financial Institutions, Unleased Tenant Space	1.68	0.42
Retail	1.03	0.26
School	1.87	0.46
Warehouse	0.93	0.23
Auditorium, Convention Center, Hotel/Motel, Library, Medical Office Building/ Clinic, Restaurant, Theater	0.93	0.23

EXCEPTIONS:

1. No battery storage system is required if the installed PV system size is < 15% of the size determined by Equation 170.2-D.
2. No battery storage system is required in buildings with battery storage system requirements with < 10 kWh rated capacity.

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	2019 Section	2022 Section	Subtitle & Notes	Mandatory Change Summaries	Prescriptive Change Summaries	Performance Change Summaries
Title 24, Part 6 Subchapter 12 – MULTIFAMILY BUILDINGS — ADDITIONS, ALTERATIONS, AND REPAIRS TO EXISTING MULTIFAMILY BUILDINGS						
	Additions		Additions and alterations do not require PV or battery storage, and they do not have to be electric or solar ready. Be aware of new Addition and Alterations requirements for HVAC and water-heating systems.			
	Alterations					

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2022 Building Energy Efficiency Standards

bit.ly/CEC-2022-Standards

Explore the main CEC web portal for the 2022 Energy Code, including information, documents and historical information.

2022 Building Energy Efficiency Standards Summary

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◊ Of Special Interest:
2022 Title 24, Part 6 Essentials – Residential Standards: What's New
bit.ly/ECA-training-2022-res-whats-new

Resources

www.energycodeace.com/resources

Downloadable materials provide practical and concise guidance on how and when to comply with California's building and appliance energy efficiency standards.
Of Special Interest:

Fact Sheets

◊ Multifamily Buildings: What's New in 2022

Check EnergyCodeAce.com for our latest 2022 tools, training and resources!

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