

# 2019 California Energy Code (CEC) Changes

## SUMMARY

New and altered homes are to become more efficient in several ways to create energy and environmental savings for Californians. Building systems that include updates are: Luminaires and controls, air infiltration and air filtering, more efficient forced air systems as well as ventilation.

Changes to the nonresidential requirements include energy conservation measures related to the following building systems: Demand management, increased efficiency of HVAC (especially the most common of installations), increased air filtration, additional attention to HVAC ventilation controls and occupancy sensors and a series of indoor and outdoor lighting efficiency changes.

## SIGNIFICANT CHANGES

NEW - CHANGE	CEC SECTION/TABLE NUMBER	COMMENTARY (RESIDENTIAL)	MASTER PLAN IMPACT YES - NO
<input checked="" type="checkbox"/> <input type="checkbox"/>	150.0©	<b>Mandatory Features and Requirements (Residential Envelope).</b> Masonry walls have been added and R-value to meet U-Factor is provided.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/> <input type="checkbox"/>	150.0(d)	<b>Mandatory Features and Requirements (Residential Envelope).</b> Raised floor insulation has been revised to include R-value to meet U-Factor.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(e)	<b>Fireplaces, decorative gas appliances and gas logs.</b> Shall comply with 110.5 and CGBC 4.503.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/> <input type="checkbox"/>	150.0(j)	<b>Water system piping and insulation for piping, and tanks.</b> Code provides specific requirements for insulating water piping. Locations and minimum distances.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(k)	<b>Luminaires.</b> Lamps without JA8 markings shall not be installed in enclosed or recessed luminaires.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/> <input type="checkbox"/>	150.0(k)	<b>Luminaires.</b> Various light sources provided with wattage limitations and controls. i.e. Night lights, step lighting, path lights, lighting internal to drawers, cabinetry or linen closets.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(k2J)	<b>Luminaires...</b> that meet JA8 requirements for dimming, and that are not controlled by occupancy or vacancy sensors, shall have dimming controls.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(k) 3.	<b>Outdoor lighting.</b> Changes have been provided regarding controls.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/> <input type="checkbox"/>	150.0(m)	<b>Air-distribution and ventilation system ducts, plenums and fans.</b> New requirements and exceptions for ducts in walls and transitions from conditioned to non-conditioned spaces. Air sealing and insulation – visual inspection required.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(m) 12.	<b>Air Infiltration.</b> Air Filtration has been revised. Now includes heat recovery ventilators and energy recovery ventilators.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(m) 12.C.	<b>Air Filter Efficiency.</b> MERV 13 (increased from MERV 6) when tested in accordance with ASHRAE Standard 52.2 is	<input checked="" type="checkbox"/> <input type="checkbox"/>

**SIGNIFICANT CHANGES** (cont'd)

NEW - CHANGE	CEC SECTION/TABLE NUMBER	COMMENTARY ( <b>RESIDENTIAL</b> )	MASTER PLAN IMPACT YES - NO
		the new minimum. Optional particle size efficiency ratings changed and are per testing utilizing AHRI Standard 680.	
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(m)13.B.&C	<b>Single Zone Central Forced Air Systems. Zonally controlled central forced air systems.</b> Airflow rate and fan efficacy requirements shall be confirmed by field verification and diagnostic testing i. 0.45 W/CFM for gas furnace air-handling units. ii. 0.58 W/CFM for air-handling units that are not gas furnaces.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(m)13.D.	<b>Small duct high velocity forced air system.</b> New requirements and exceptions have been added including cut-off date for testing procedures, July 3, 2019.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(n)	<b>Water Heating.</b> Revised requirements for the receptacle, labeling of conductors, and a reserved circuit breaker at main panel.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(o)	<b>Requirements for ventilation and indoor air quality.</b> Amendments to ASHRAE 62.2 requirements have been added to the energy code. Window operation not permissible for ventilation airflow. Central forced air not permissible for ventilation airflow. Specific equations have been added for calculation of mechanical airflow for SFD's, and attached dwelling units not sharing ceilings or floors with other dwelling units, occupiable spaces, public garages, or commercial spaces.	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	150.0(k)3	<b>Kitchen Range Hoods.</b> Shall be field verified in accordance with the procedures in Reference Residential Appendix RA3.7.4.3 to confirm the model is rated by HVI to comply with the following: i. The minimum ventilation airflow rate as specified in Section 5 of ASHRAE 62.2 ii. The maximum sound rating as specified in Section 150.0(o) G. Labeling of hood per 150.0(o) 1.I.; This switch controls the indoor air quality ventilation for the home. "Leave it on unless the outdoor air quality is very poor."	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	110.9	<b>Residential and Non-Residential lighting.</b> Multiple changes have been included for Mandatory Requirements for Lighting controls including; <ul style="list-style-type: none"> <li>- Time-switch lighting controls</li> <li>- Time-switch controls</li> <li>- Astronomical time-switch controls</li> <li>- Time-Switch controls installed outdoors</li> <li>- Daylighting control</li> <li>- Dimmers</li> <li>- Occupant Sensing Controls</li> <li>- Part-night outdoor lighting controls</li> </ul>	<input checked="" type="checkbox"/> <input type="checkbox"/>

**SIGNIFICANT CHANGES** (cont'd)

NEW - CHANGE	CEC SECTION/TABLE NUMBER	COMMENTARY ( <b>RESIDENTIAL</b> )	MASTER PLAN IMPACT YES - NO
		- Sensors used to detect occupants - Indicator lights  AND  Section 110.12 Mandatory Requirements for Demand Management.	
<input type="checkbox"/> <input checked="" type="checkbox"/>	110.10	<b>Mandatory requirement for Solar Ready Buildings.</b>	<input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	Table 110.2H	Electrically operated variable refrigerant flow air conditioners minimum efficiency ratings have increased.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	110.12	<b>Consolidates all Mandatory Requirements for Demand Management</b>  (a) Open ADR 2.0a or Open ADR 2.0b (b) HVAC Controls (c) Lighting Controls (d) Electric Message controls	<input type="checkbox"/> <input checked="" type="checkbox"/>

SIGNIFICANT CHANGES (cont'd)

NEW - CHANGE	CEC SECTION/TABLE NUMBER	COMMENTARY ( <b>NONRESIDENTIAL</b> )	MASTER PLAN IMPACT YES - NO
<input checked="" type="checkbox"/> <input type="checkbox"/>	110.5	<b>Natural Gas Central Furnaces, Cooking Equipment, and Pool Spa Heaters, and Fireplaces.</b> Pilots lights prohibited – Indoor and outdoor fireplaces have been added.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	120.1	<b>Air Filtration.</b> Section has been complete revised. Includes requirements for air filtration, location of filtration, clean-filter pressure drop imposed on filters, air filter efficiency requirements, filter labeling and a New Table 120.1 A for minimum ventilation rates has been included that covers multiple Use types. MERV13 air filtration AND Mechanical ventilation is also required for spaces being served by space conditioning system: Exceptions are present.. Natural ventilation permanently open <b>or</b> have controls to prevent closure of openings while occupied.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	120.2(i)	<b>Fault Detection and Diagnostics.</b> All newly installed air handlers with a mechanical cooling capacity greater than 54,000 Btu/hr and an installed air economizer shall include a stand-alone or integrated Fault Detection and Diagnostics system. Exceptions for HVAC Alterations	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	120.3	<b>Pipe insulation.</b> Refrigerant suction, chilled water, brine fluid distribution systems, steam condensate and hot water fluid distribution, etc. Insulation thickness is listed in 120.3, subsection c. Table 120.3 Pipe Insulation Thickness.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	140.4	<b>Fan systems.</b> For space-conditioning fan systems, fan systems having a total fan system motor nameplate horsepower exceeding 5 hp used for space conditioning shall meet requirements as per 140.4© 1, 2 and 3. Table 140.4-A should be utilized.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input type="checkbox"/>	120.1(d)3	<b>Required demand control ventilation.</b> Required for space with design occupant load of 25 people per 1000 s.f. (40 s.f. or less per person) if the system serving the space includes one or more of the following: 1. An air economizer : or 2. Modulating outside air control: or 3. Design outdoor airflow rate greater than 3000 cfm Exceptions are applicable.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	120.1(d)5	<b>Occupancy Sensor ventilation control devices.</b> Required for same space as lighting occupancy sensor controls are required, including restroom of any size (new).	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	120.2(e)3	<b>Occupancy Sensing Zone Controls.</b> If ventilation Table 120.1-A does not allow for ventilation to go to Zero, then the room type is exempt. Thermostat settings to be reset to standby mode when space is vacant for more than 5 minutes.	<input type="checkbox"/> <input checked="" type="checkbox"/>

SIGNIFICANT CHANGES (cont'd)

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<input checked="" type="checkbox"/> <input type="checkbox"/>	Table 120.1-B	<b>New Table.</b> Minimum exhaust rates. Exhaust make up air can use a combination of: Outdoor air and/or Recirculated air and/or transfer air. See 140.4(o) for Exhaust system Transfer air.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	130.0⑥6	<b>Indoor Lighting Controls.</b> Track lighting includes 3 categories for wattage calculations; no current limiter, with current limiter and other modular lighting systems with power supplied by a driver =, power supply or transformer.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	130.1	<b>Manual area controls:</b> (new) relating to healthcare for location of switching. <b>Multi-level controls:</b> removed classrooms exception, but adds a new exception for bathrooms and healthcare. <b>Shut-off controls:</b> (new) occupant sensor requirements to restrooms and new exceptions for healthcare. <b>Automatic Daylighting Controls:</b> New specifications regarding stable level of light and requirements that at least one sensor in daylit zone to be readily accessible to public New exceptions regarding spaces blocked from direct sunlight (skylights and vertical fenestration) New exception for retail sidelit zones	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	Table 140.6-B	<b>New Table for complete building method lighting power density values</b>	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	141.0(b)2l	<b>Altered indoor lighting system</b> Alterations to indoor lighting systems that include 10 percent or more of the luminaires service an enclosed space shall 1. Comply with 140.6 and 141.0F. OR 2. Not exceed 80 percent of indoor lighting power per section 140.6 and comply with Table 141.0-F. OR 3. One for One luminaire alteration within a building or tenant space of 5000 s.f. or less shall be at least 40 percent lower than existing. <i>Exceptions are present.</i>	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	130.2(b)	<b>Outdoor lighting controls and equipment.</b> BUG light change. 6200 initial luminaire lumens or greater, shall comply with BUG. Refer to BUG in CGBC Sec. 5.106.8	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	130.2c2	<b>Automatic Scheduling Controls</b> Automatic scheduling controls reduce power to at least 50 percent and no more than 90 percent AND at least two nighttime periods to be programmed. (time limits provided)	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	130.2(c)3	<b>Motion Sensors.</b> Must be able to reduce lighting power of each luminaire by at 50% (90% max.). Sales lot and sales canopies are no longer exempt.	<input type="checkbox"/> <input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/>	141.(b)2L	<b>Outdoor Lighting Alterations.</b> General hardscape lighting table 140.7-A includes updated watts per s.f. lighting table 140.7-B includes updated watts per s.f.	<input type="checkbox"/> <input checked="" type="checkbox"/>