



Building Standards for New Licensed Healthcare Facilities

Gabriel D. Taylor, P.E.
California Energy Commission
Energy Efficiency Division

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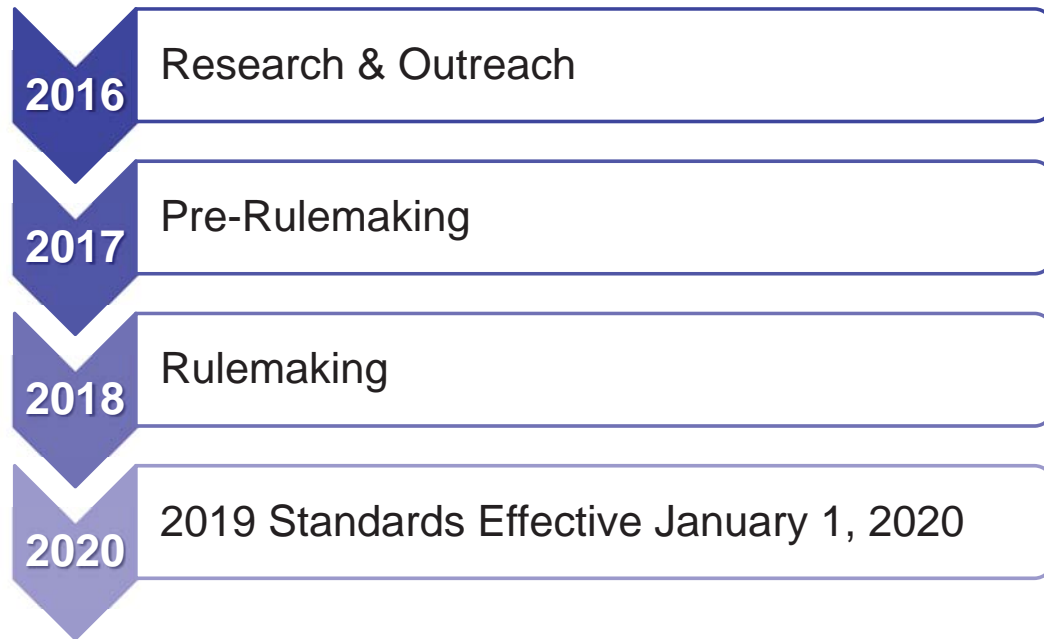
Today's Goals

- **Legal Requirement**
- **Proposed Changes**
 - ✓ Focus on Code
 - ✓ Note Exceptions
- **Schedule**





Schedule: 2019 Title 24 Standards



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Legal Requirement

- UBC 1973 **Type H** are hotels, apartments, convents, and monasteries
- UBC 1973 **Type I** are dwellings and lodging houses
- UBC 1973 **Type J** are garages, sheds, and fences

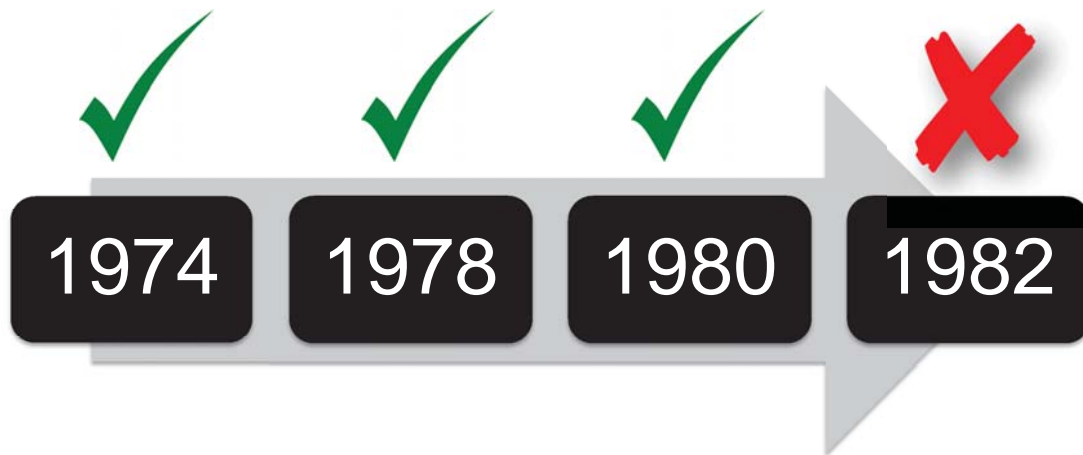
§ 25130. Nonresidential building
"Nonresidential" building means any building which is heated or cooled in its interior, and is of an occupancy type other than Type H, I, or J, as defined in the Uniform Building Code, 1973 edition, as adopted by the International Conference of Building Officials.

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Legal Requirement



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Basis & Design of Code

- **Cost Effective**
- **Technically Feasible**
- **Owner/Operator Centric**
- **Flexible**



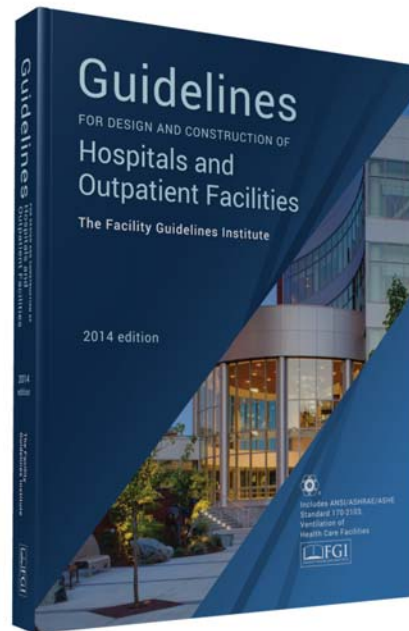
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Basis of Proposal

- OSHPD
- FGI Guidelines
- ASHRAE 90.1



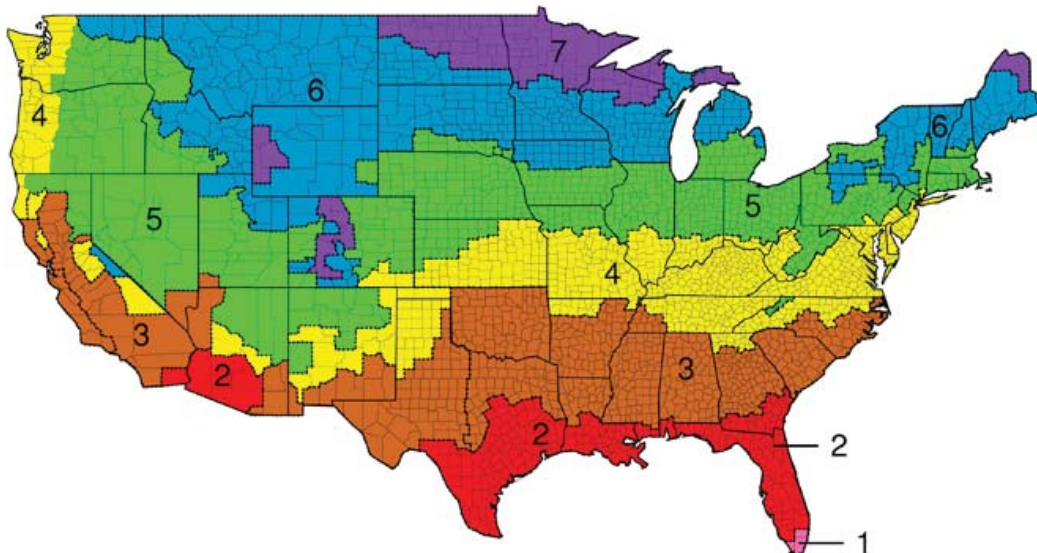
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Climate Zones

ASHRAE 90.1 – 7 CZs, 5 in CA

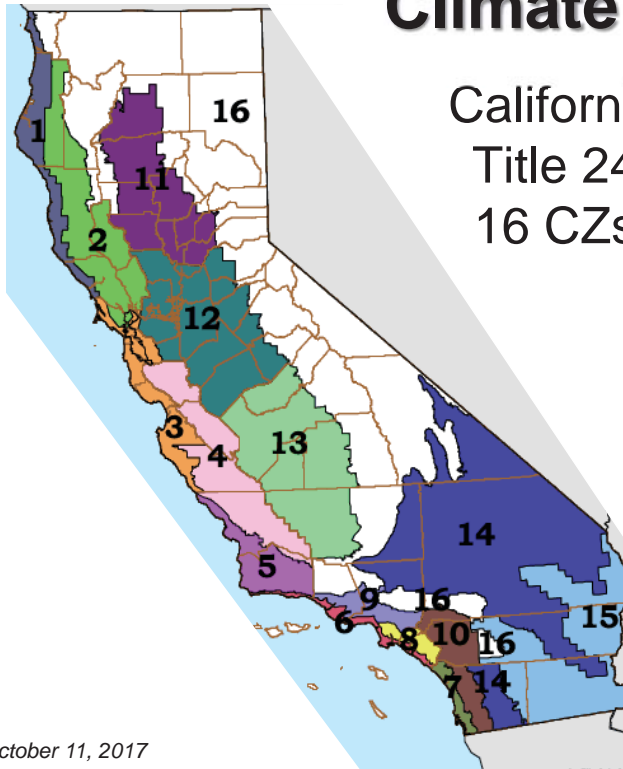


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Climate Zones



California
Title 24
16 CZs



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California Code of Regulations Title 24 (Building Standards) Part 6 (Energy Code)



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2019 Title 24, Part 6: Building Energy Efficiency Standards

Home → title24 → 2019standards → prerulemaking → documents → 2017-10-0405 workshop

Draft 2019 Standards - October 4 & 5, 2017
Staff Workshop on the Draft 2019 Building Energy Efficiency Standards

Parent Directory

- »  [Draft 2019 Standards Chapter 1-100](#) TN-221248 Submitted 9/20/2017.
- »  [Draft 2019 Standards Chapter 2-110](#) TN-221249 Submitted 9/20/2017.
- »  [Draft 2019 Standards Chapter 3-120](#) TN-221250 Submitted 9/20/2017.
- »  [Draft 2019 Standards Chapter 4-130](#) TN-221258 Submitted 9/20/2017.
- »  [Draft 2019 Standards Chapter 5-140](#) TN-221295 Submitted 9/22/2017.
- »  [Draft 2019 Standards Chapter 6-141](#) TN-221251 Submitted 9/20/2017.

http://www.energy.ca.gov/title24/2019standards/prerulemaking/documents/2017-10-0405_workshop/2017-10-0405_documents.php

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Title 24, Part 6: Building Energy Efficiency Standards

- §100 Scope & Definitions
- §110 Systems & Equipment
- §120 Design & Installation
- §130 Lighting & Electrical
- §140 Performance & Prescriptive
- §141 Additions & Alterations

EXCEPTIONS in Green



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Title 24, Part 6: Building Energy Efficiency Standards

§100 Scope & Definitions

§110 Systems & Equipment

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EXCEPTIONS in Green



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SUBCHAPTER 1 ALL OCCUPANCIES—GENERAL PROVISIONS

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Scope & Definitions (§100)

SECTION 100.0 – SCOPE

(a) **Buildings Covered.** The provisions of Part 6 apply to all buildings:

1. That are of Occupancy Group A, B, E, F, H, I, M, R, S, or U; and
2. For which an application for a building permit or renewal of an existing permit is filed (or is required by law to be filed) on or after the effective date of the provisions for which are constructed by a governmental agency; and
3. That are:
 - A. Unconditioned; or
 - B. Indirectly or directly conditioned by mechanical heating or mechanical cooling, or process spaces; ~~or~~
 - ~~C. Low-rise residential buildings that are heated by a non-mechanical heating system.~~

EXCEPTION 1 to Section 100.0(a): Certified historic buildings, as regulated by the California Historic Building Code (Title 24, Part 8) and listed on the National Register of Historic Places shall comply with the applicable requirements in Section 140.6(a).

EXCEPTION 2 to Section 100.0(a): Building departments, at their discretion, may exempt temporary buildings, temporary outdoor lighting, or temporary lighting in an unconditioned building, or structures erected in response to a natural disaster. Temporary buildings or structures shall be completely removed upon the expiration of the time limit specified in the permit.

EXCEPTION 3 to Section 100.0(a): Buildings in Occupancy Group I-3 and I-4.

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Scope & Definitions (§100)

- **Add Occupancy Group I**
- **Exclude I-3 and I-4**
 - I-3 = Prisons and Jails
 - I-4 = Day Care (both child and adult)

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Scope & Definitions (§100)

SECTION 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION

(a) **Rules of Construction.**

1. Where the context requires, the singular includes the plural and the plural includes the singular.
2. The use of "and" in a conjunctive provision means that all elements in the provision must be complied with, or must exist to make the provision applicable. Where compliance with one or more elements suffices, or where existence of one or more elements makes the provision applicable, "or" (rather than "and/or") is used.
3. "Shall" is mandatory and "may" is permissive.

- (b) **Definitions.** Terms, phrases, words and their derivatives in Part 6 shall be defined as specified in Section 100.1. Terms, phrases, words and their derivatives in Section 100.1 shall be defined as specified in the "Definitions" chapters of Title 24, Parts 1 through 4 of the California Code of Regulations. Where terms, phrases, words and their derivatives are not defined in any of the references above, they shall be defined as specified in *Webster's Third New International Dictionary of the English Language, Unabridged* (1961 edition, through the 2002 addenda), unless the context requires otherwise.

HEALTHCARE FACILITY is any building or portion thereof licensed pursuant to California Health and Safety Code Division 2, Chapter 1, §1204 or Chapter 2, §1250.



Scope & Definitions (§100)

- **Define "Healthcare Facility"**

HEALTHCARE FACILITY is any building or portion thereof licensed pursuant to California Health and Safety Code Division 2, Chapter 1, §1204 or Chapter 2, §1250.

- **Remove Old Definitions**



Title 24, Part 6: Building Energy Efficiency Standards

§100 Scope & Definitions

§110 Systems & Equipment

§120 Design & Installation

§130 Lighting & Electrical

§140 Performance & Prescriptive

§141 Additions & Alterations

EXCEPTIONS in Green



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SUBCHAPTER 2 ALL OCCUPANCIES—MANDATORY REQUIREMENTS FOR THE MANUFACTURING CONSTRUCTION AND INSTALLATION OF SYSTEMS, EQUIPMENT AND BUILDING COMPONENTS

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Systems & Equipment (§110)



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Systems & Equipment: General (§110.0)

SECTION 110.0 – SYSTEMS AND EQUIPMENT—GENERAL

Sections 110.1 through ~~110.11~~110.12 specify requirements for manufacturing, construction, and installation of certain systems, equipment, appliances and building components that are installed in buildings within the scope of Section 100.0(a).

NOTE: The requirements of Sections 110.0 through ~~110.11~~110.12 apply to newly constructed buildings. Sections 141.0 and 150.2 specify which requirements of Sections 110.1 through ~~110.11~~110.12 also apply to additions and alterations to existing buildings.

- (a) **General Requirements.** Systems, equipment, appliances and building components shall only be installed in a building within the scope of Section 100.0(a) if:
1. The manufacturer has certified that the system, equipment, appliances or building component complies with the applicable manufacturing provisions of Sections 110.1 through ~~110.11~~110.12, and
 2. The system, equipment, appliance or building component complies with all applicable installation provisions of Sections 110.1 through ~~110.11~~110.12.

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Systems & Equipment (§110) Exceptions in Green

110.1 Appliances

110.2 HVAC Equipment

110.3 Water Heating

110.4 Pool & Spa

110.5 Pilot Lights

110.6 Fenestration

110.7 Air Leakage

110.8 Insulation & Roofing

110.9 Lighting Controls

110.10 Solar Ready

110.11 Electrical Equipment

**110.12 Demand
Management**

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Systems & Equipment: Appliances (§110.1)

SECTION 110.1 – MANDATORY REQUIREMENTS FOR APPLIANCES

- (a) Any appliance regulated by the Appliance Efficiency Regulations, Title 20 California Code of Regulations, Section 1601 et seq., may be installed only if the appliance fully complies with Section 1608(a) of those regulations.
- (b) Except for those circumstances described in Section 10-109, conformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards shall be verified utilizing data from either:
 1. The Energy Commission's database of certified appliances maintained pursuant to Title 20 California Code of Regulations, Section 1606, and which is available at: www.energy.ca.gov/appliances/database/; or
 2. An equivalent directory published by a third-party agency; or
 3. An approved trade association directory as defined in Title 20 California Code of Regulations, Section 1606(h).
- (c) Conformance with efficiency levels required to comply with Part 6 mandatory, prescriptive and performance standards shall be demonstrated either by default to the mandatory efficiency levels specified in Part 6 or by following procedures approved by the Commission pursuant to Section 10-109 of Title 24, Part 1, when:

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Systems & Equipment: Appliances (§110.1)

- Illegal Appliances Prohibited
 - ✓ CCR Title 20, Appliance Efficiency



Systems & Equipment: HVAC Equipment (§110.2)

SECTION 110.2 – MANDATORY REQUIREMENTS FOR SPACE- CONDITIONING EQUIPMENT

Certification by Manufacturers. Any space-conditioning equipment listed in this section may be installed only if the manufacturer has certified to the Commission that the equipment complies with all the applicable requirements of this section.

- (a) **Efficiency.** Equipment shall meet the applicable efficiency requirements in TABLE 110.2-A through TABLE 110.2-K subject to the following:
1. If more than one efficiency standard is listed for any equipment in TABLE 110.2-A through TABLE 110.2-K, the equipment shall meet all the applicable standards that are listed; and
 2. If more than one test method is listed in TABLE 110.2-A through TABLE 110.2-K, the equipment shall comply with the applicable efficiency standard when tested with each listed test method; and
 3. Where equipment serves more than one function, it shall comply with the efficiency standards applicable to each function; and
 4. Where a requirement is for equipment rated at its "maximum rated capacity" or "minimum rated capacity," the capacity shall be as provided for and allowed by the controls, during steady-state operation.



Systems & Equipment: HVAC Equipment (§110.2)

- Minimum Equipment Efficiency
- Cooling Tower Best Practices
 - ✓ Drift Elimination
 - ✓ Meters and Alarms

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Systems & Equipment: Water Heating (§110.3)

SECTION 110.3 – MANDATORY REQUIREMENTS FOR SERVICE WATER-HEATING SYSTEMS AND EQUIPMENT

- (a) Certification by Manufacturers. Any service water-heating system or equipment may be installed only if the manufacturer has certified that the system or equipment complies with all of the requirements of this subsection for that system or equipment.
1. Temperature controls for service water heating systems. Service water-heating systems shall be equipped with automatic temperature controls capable of adjustment from the lowest to the highest acceptable temperature settings for the intended use as listed in Table 3, Chapter 50 of the ASHRAE Handbook, HVAC Applications Volume 2, or the California Plumbing Code for healthcare facilities.

EXCEPTION to Section 110.3(a). Residential occupancies.

- (b) **Efficiency.** Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations as required by Section 110.1, subject to the following:

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Systems & Equipment: Water Heating (§110.3)

- **Water Heating Temperature Controls:**
 - ✓ **Reference California Plumbing Code for healthcare facilities (§110.3)**
- Minimum Energy Efficiency
- Tank & Recirculation System Insulation
- Isolation Valves
- No Continuous Pilot Lights

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Systems & Equipment: Pool & Spa (§110.4)

SECTION 110.4 – MANDATORY REQUIREMENTS FOR POOL AND SPA SYSTEMS AND EQUIPMENT

- (a) **Certification by Manufacturers.** Any pool or spa heater system or equipment may be installed only if the manufacturer has certified that the system or equipment meets all of the following:
1. **Efficiency.** A thermal efficiency that complies with the Appliance Efficiency Regulations; and
 2. **On-off switch.** A readily accessible on-off switch, mounted on the outside of the heater that allows shutting off the heater without adjusting the thermostat setting; and
 3. **Instructions.** A permanent, easily accessible and weatherproof plate or card that gives instruction for the energy efficient operation of the pool or spa heater and for the proper care of pool or spa water when a cover is used; and
 4. **Electric resistance heating.** No electric resistance heating; ~~and~~

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Systems & Equipment: Pool & Spa (§110.4)

- Accessible On-Off Switch
- Minimum Insulation
- Installation Best Practices



Systems & Equipment: Pilot Lights (§110.5)

SECTION 110.5 – NATURAL GAS CENTRAL FURNACES, COOKING EQUIPMENT, ~~AND POOL AND SPA HEATERS~~, AND FIREPLACES: PILOT LIGHTS PROHIBITED

Any natural gas system or equipment listed below may be installed only if it does not have a continuously burning pilot light:

- (a) Fan-type central furnaces.
- (b) Household cooking appliances.

EXCEPTION to Section 110.5 Household cooking appliances without an electrical supply voltage connection and in which each pilot consumes less than 150 Btu/hr.

- (c) Pool heaters.
- (d) Spa heaters.
- (e) Indoor and outdoor fireplaces.



Systems & Equipment: Pilot Lights (§110.5)

- No Continuously Burning Gas Pilot Lights
 - ✓ Central Furnaces
 - ✓ Cooking Appliances & Fireplaces
 - ✓ Pool & Spa Heaters



Systems & Equipment: Fenestration (§110.6)

SECTION 110.6 – MANDATORY REQUIREMENTS FOR FENESTRATION PRODUCTS AND EXTERIOR DOORS

- (a) **Certification of Fenestration Products and Exterior Doors other than Field-fabricated.** Any fenestration product and exterior door, other than field-fabricated fenestration products and field-fabricated exterior doors, may be installed only if the manufacturer has submitted the product to the Commission, or if an independent certifying organization approved by the Commission has certified that the product complies with all of the applicable requirements of this subsection.
1. **Air leakage.** Manufactured fenestration products and exterior doors shall have air infiltration rates not exceeding 0.3 cfm/ft² of window area, 0.3 cfm/ft² of door area for residential doors, 0.3 cfm/ft² of door area for nonresidential single doors (swinging and sliding), and 1.0 cfm/ft² for nonresidential double doors (swinging), when tested according to NFRC-400 or ASTM E283 at a pressure differential of 75 pascals (or 1.57 pounds/ft²), incorporated herein by reference.



Systems & Equipment: **Fenestration (§110.6)**

- Air Leakage Limits
- U-factor (Insulation)
- Solar Heat Gain
- Visible Transmittance
- Labeling
- Additional Limits on Site-Built Fenestration

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Systems & Equipment: **Air Leakage (§110.7)**

SECTION 110.7 – MANDATORY REQUIREMENTS TO LIMIT AIR LEAKAGE

All joints, penetrations and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weather stripped, or otherwise sealed to limit infiltration and exfiltration.

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Systems & Equipment: Air Leakage (§110.7)

- Caulking & Weather Stripping Required



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Systems & Equipment: Insulation & Roofing (§110.8)

SECTION 110.8 – MANDATORY REQUIREMENTS FOR INSULATION, ROOFING PRODUCTS AND RADIANT BARRIERS

- (a) **Insulation Certification by Manufacturers.** ~~Any~~ insulation shall be certified by Department of Consumer Affairs, Bureau of Home Furnishing and Thermal Insulation that the insulation conductive thermal performance is approved pursuant to the California Code of Regulations, Title 24, Part 12, Chapters 12-13, Article 3, "Standards for Insulating Material."
- (b) **Installation of Urea Formaldehyde Foam Insulation.** Urea formaldehyde foam insulation may be applied or installed only if:
1. It is installed in exterior side walls.
 2. A four-mil-thick plastic sheathing vapor retarder or equivalent plastic sheathing vapor retarder is installed between the urea formaldehyde foam insulation and the interior space in all applications.
- (c) **Flame Spread Rating of Insulation.** All insulating material shall be installed in compliance with the flame spread rating and smoke density requirements of the CBC.

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Systems & Equipment: Insulation & Roofing (§110.8)

- Manufacturer Certification
- Fire Risk Mitigation
- Roof Solar & Heat Performance

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Systems & Equipment: Lighting Controls (§110.9)

SECTION 110.9 – MANDATORY REQUIREMENTS FOR LIGHTING CONTROL ~~S~~ DEVICES AND SYSTEMS, BALLASTS, AND LUMINAIRES LIGHT SOURCES

- (a) All lighting control devices and systems, ~~ballasts, and luminaires~~ all light sources subject to the requirements of Section 110.9 shall meet the following requirements:
1. Shall be installed only if the lighting control ~~device, system, ballast, or luminaire~~ light source complies with all of the applicable requirements of Section 110.9.
 2. Lighting controls may be individual ~~devices~~ Self-Contained Lighting Control or systems ~~(Lighting Control Systems)~~ consisting of two or more components.
 3. ~~Self-Contained Lighting Control~~ Self-Contained Lighting Control, as defined in Section 100.1, shall be certified by the Manufacturer as required by the Title 24 ~~Appliances~~ Appliances Efficiency Regulations.
 4. ~~Lighting Control System~~ Lighting Control System, as defined in Section 100.1, shall be a fully functional lighting control system complying with the applicable requirements in Section 110.9(b), and shall meet the Lighting Control Installation requirements in Section 130.4.

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Systems & Equipment: Lighting Controls (§110.9)

- Specifications for Lighting Controls
 - ✓ Only apply if control is required
- **Exceptions in §130**
- **Color Minimums are Residential Only**



Systems & Equipment: Solar Ready (§110.10)

SECTION 110.10 – MANDATORY REQUIREMENTS FOR SOLAR READY BUILDINGS

(a) Covered Occupancies.

1. **Single Family Residences.** Single family residences located in subdivisions with ten or more single family residences and where the ~~application for a tentative~~ subdivision map for the residences has been ~~deemed complete~~ approved by the enforcement agency shall comply with the requirements of Section 110.10(b) through 110.10(e).
2. **Low-rise Multi-family Buildings.** Low-rise multi-family buildings shall comply with the requirements of Section 110.10(b) through 110.10(d).
3. **Hotel/Motel Occupancies and Low-rise Multi-family Buildings.** Hotel/motel occupancies and high-rise multi-family buildings with three habitable stories or fewer shall comply with the requirements of Section 110.10(b) through 110.10(d).
4. **All Other Nonresidential Buildings.** ~~All other~~ Nonresidential buildings with three habitable stories or fewer, other than healthcare facilities, shall comply with the requirements of Section 110.10(b) through 110.10(d).



Systems & Equipment: Solar Ready (§110.10)

- **Full Exception for Healthcare Facilities**

4. ~~All Other Nonresidential Buildings~~ ~~All other~~ Nonresidential buildings with three habitable stories or fewer, other than healthcare facilities, shall comply with the requirements of Section 110.10(b) through 110.10(d).

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Systems & Equipment: Electrical Equipment (§110.11)

SECTION 110.11 – MANDATORY REQUIREMENTS FOR ELECTRICAL POWER DISTRIBUTION SYSTEM

Certification by Manufacturers. Any electrical power distribution system equipment listed in this section may be installed only if the manufacturer has certified to the Commission that the equipment complies with all the applicable requirements of this section.

- (a) **Low-voltage dry-type distribution transformers** shall be certified by the Manufacturer as required by the Title 20 Appliance Efficiency Regulations.

EXCEPTION to Section 110.11(a):

1. autotransformer;
2. drive (isolation) transformer;
3. grounding transformer;
4. machine-tool (control) transformer;
5. non-ventilated transformer;
6. rectifier transformer;
7. regulating transformer;
8. sealed transformer;
9. special impedance transformer;

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Systems & Equipment: Electrical Equipment (§110.11)

- “Low-voltage dry-type distribution transformers”
- Illegal Appliances Prohibited
 - ✓ CCR Title 20, Appliance Efficiency
- **Exceptions for Certain Transformers**

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Systems & Equipment: Demand Management (§110.12)

SECTION 110.12 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT

Buildings, other than healthcare facilities, shall comply with the applicable requirements of Sections 110.12(a) through 110.12(d).

- (a) Demand responsive controls and equipment. All demand responsive controls and equipment shall be capable of receiving and automatically responding to signals using the OpenADR 2.0a or OpenADR 2.0b communications protocol, in addition to any other communications protocols used.
- (b) Automatic Demand ShedRes on HVAC Controls. HVAC systems with DDC to the Zone level shall be programmed to allow centralized demand shed for non-critical zones as follows:
1. The controls shall have the capability to remotely setup the operating cooling temperature set points by 4 degrees or more in all non-critical zones on signal from a centralized contact or software point within an Energy Management Control System (EMCS).
 2. The controls shall have the capability to remotely setdown the operating heating temperature set points by 4 degrees or more in all non-critical zones on signal from a centralized contact or software point within an EMCS.

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Systems & Equipment: Demand Management (§110.12)

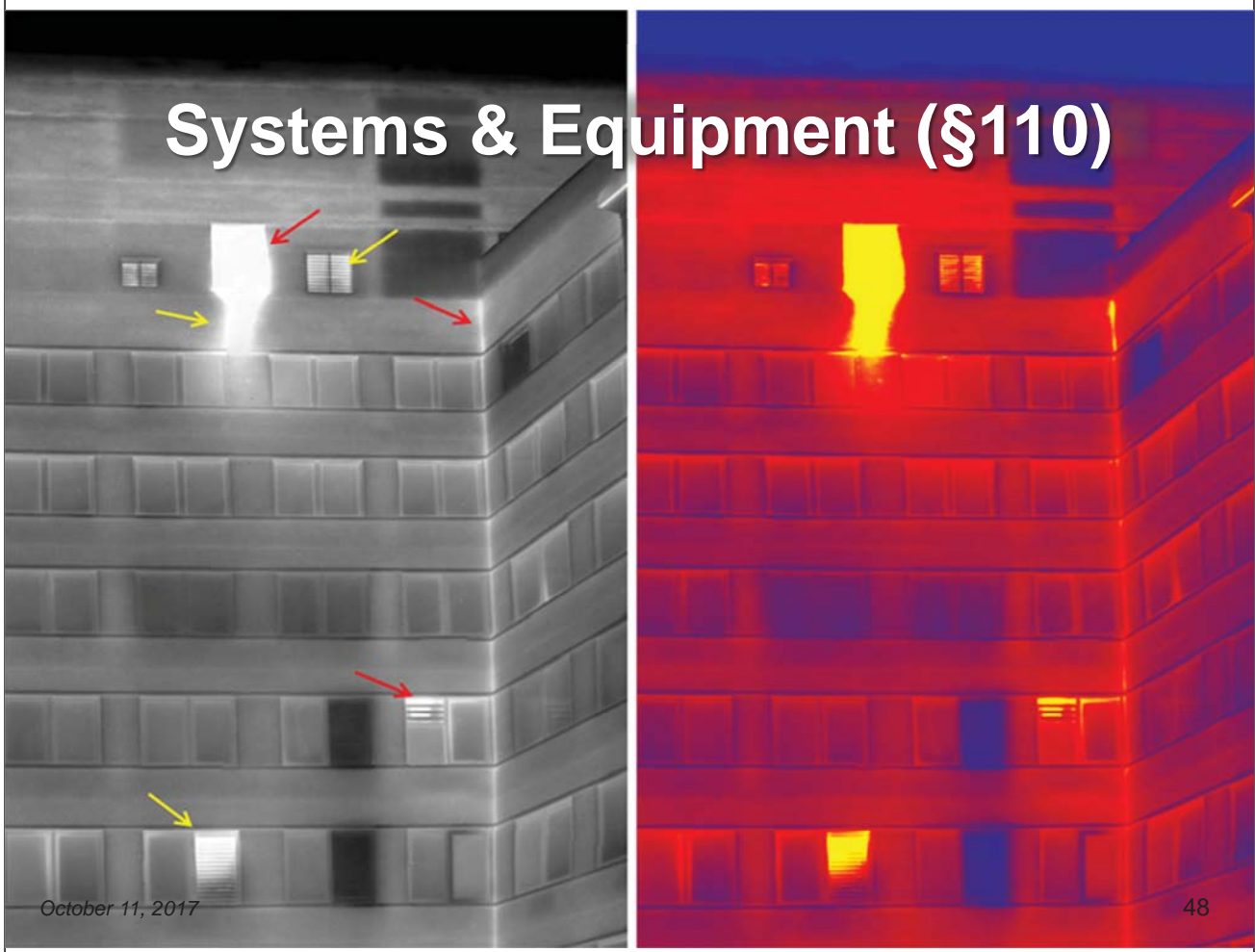
SECTION 110.12 – MANDATORY REQUIREMENTS FOR DEMAND MANAGEMENT

Buildings, other than healthcare facilities, shall comply with the applicable requirements of Sections 110.12(a) through 110.12(d)

- **Full Exception for Healthcare Facilities**

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Title 24, Part 6: Building Energy Efficiency Standards

§100 Scope & Definitions

§110 Systems & Equipment

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EXCEPTIONS in Green



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SUBCHAPTER 3 NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES—MANDATORY REQUIREMENTS

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Design & Installation: General (§120.0)

SECTION 120.0— GENERAL

Sections 120.1 through 120.9 establish requirements for the design and installation of building envelopes, ventilation, space-conditioning and service water heating systems and equipment in nonresidential, high-rise residential, and hotel/motel buildings as well as covered processes that are within the scope of Section 100.0(a).

NOTE: The requirements of Sections 120.1 through 120.9 apply to newly constructed buildings. Section 141.0 specifies which requirements of Sections 120.1 through 120.9 also apply to additions or alterations to existing buildings.

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Design & Installation (§120) Exceptions

120.1 Ventilation

120.2 HVAC Systems

120.3 Pipe Insulation

120.4 Ducts & Plenums

120.5 Mechanical

120.6 Covered Processes

120.7 Insulation

120.8 Commissioning

120.9 Boilers

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Design & Installation: Ventilation (§120.1)

SECTION 120.1 – REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY

~~Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the requirements of Section 120.1(a) through 120.1(e).~~

(a) **General Requirements.**

- ~~1. All occupiable spaces in high-rise residential buildings, hotel/motel buildings, and nonresidential buildings other than healthcare facilities shall comply with the applicable requirements of Section 120.1(a) through 120.1(g). Healthcare facilities shall be ventilated in accordance with Chapter 4 of the California Mechanical Code, as amended by OSHPD.~~



Design & Installation: Ventilation (§120.1)

- **Full Exception for Healthcare Facilities**
 - ✓ **Reference to California Mechanical Code**

1. All occupiable spaces in high-rise residential buildings, hotel/motel buildings, and nonresidential buildings other than healthcare facilities shall comply with the applicable requirements of Section 120.1(a) through 120.1(g). Healthcare facilities shall be ventilated in accordance with Chapter 4 of the California Mechanical Code, as amended by OSHPD.



Design & Installation: HVAC Systems (§120.2)

SECTION 120.2 – REQUIRED CONTROLS FOR SPACE-CONDITIONING SYSTEMS

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements of Sections 120.2(a) through 120.2(k).

- (a) **Thermostatic Controls for Each Zone** The supply of heating and cooling energy to each space-conditioning zone or dwelling unit shall be controlled by an individual thermostatic control that responds to temperature within the zone and that meets the applicable requirements of Section 120.2(b). An Energy Management Control System (EMCS) may be installed to comply with the requirements of one or more thermostatic controls if it complies with all applicable requirements for each thermostatic control.

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Design & Installation: HVAC Systems (§120.2)

- **Exceptions for:**
 - ✓ **Auto Reset**
 - ✓ **Auto Shutoff**
 - ✓ **Demand Shed**
 - ✓ **5° F Dead Band**
- **Zonal Controls**
- **Fan & Pump Efficiency**
- **Restrict Heat Pump use of Resistance Heat**

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Design & Installation: Pipe Insulation (§120.3)

SECTION 120.3 – REQUIREMENTS FOR PIPE INSULATION

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements of Sections 120.3(a) through 120.3(c).

(a) **General Requirements.** The piping conditions listed below for space-conditioning and service water-heating systems with fluid temperatures listed in TABLE 120.3 shall have at least the amount of insulation specified in Subsection (c):

1. **Space Cooling Systems.** All refrigerant lines, chilled water, and brine lines.
2. **Space Heating Systems.** All return air, steam condensate and hot water lines.
3. **Service water-heating systems.**
 - A. Recirculating systems including the supply and return piping of the water heater.
 - B. The first 8 feet of hot and cold outlet piping for a nonrecirculating storage system.
 - C. The inlet pipe between the storage tank and a heat trap in a nonrecirculating storage system.
 - D. Pipes that are externally heated.

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Design & Installation: Pipe Insulation (§120.3)

- **Space Conditioning**
- **Hot Water**
- **Insulation Protection**



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Design & Installation: Ducts & Plenums (§120.4)

SECTION 120.4 – REQUIREMENTS FOR AIR DISTRIBUTION SYSTEM DUCTS AND PLENUMS

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements of Sections 120.4(a) through 120.4(f).

EXCEPTION to Section 120.4: Systems serving healthcare facilities shall comply with the applicable requirements of the California Mechanical Code, as amended by OSHPD.

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Design & Installation: Ducts & Plenums (§120.4)

- **Full Exception for Healthcare Facilities**
 - ✓ **Reference to California Mechanical Code**

EXCEPTION to Section 120.4: Systems serving healthcare facilities shall comply with the applicable requirements of the California Mechanical Code, as amended by OSHPD.

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Design & Installation: Mechanical Testing (§120.5)

SECTION 120.5 – REQUIRED NON-RESIDENTIAL MECHANICAL SYSTEM ACCEPTANCE

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements of Sections 120.5(a) and 120.5(b).

EXCEPTION to Section 120.5: Systems serving healthcare facilities.

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Design & Installation: Mechanical Testing (§120.5)

- Full Exception for Healthcare Facilities

EXCEPTION to Section 120.5: Systems serving healthcare facilities.

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Design & Installation: Covered Processes (§120.6)

SECTION 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES

Nonresidential, high-rise residential, and commercial buildings shall comply with the applicable requirements of Sections 120.6(a) through 120.6(g).

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Design & Installation: Covered Processes (§120.6)

- Parking Garage Ventilation
- **Compressed Air Systems**
- Process Boilers
- Escalators & **Elevators**



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Design & Installation: Insulation (§120.7)

SECTION 120.7 – MANDATORY INSULATION REQUIREMENTS

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements in Sections 120.7(a) through 120.7(c).

- (a) **Roof/Ceiling Insulation.** The opaque portion of the ceiling that separates conditioned spaces from unconditioned spaces or ambient air shall meet the applicable requirements of Items 1 through 3 below:
1. **Metal Building-** The weighted average U-factor of the roof assembly shall not exceed 0.098.
 2. **Wood Framed and Others-** The weighted average U-factor of the roof assembly shall not exceed 0.075.
 3. **Insulation Placement-** Insulation is installed to limit heat loss and gain from conditioned spaces to unconditioned spaces shall comply with all of the following:

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Design & Installation: Insulation (§120.7)

- Design, Installation, & Durability
- Roof, Wall, & Floor



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Design & Installation: Commissioning (§120.8)

SECTION 120.8 – NONRESIDENTIAL BUILDING COMMISSIONING

Nonresidential buildings with conditioned space of 10,000 square feet or more shall comply with the applicable requirements of Sections 120.8(a) through 120.8(i) in the building design and construction processes. All building systems and components covered by Sections 110.0, 120.0, 130.0, and 140.0 shall be included in the scope of the commissioning requirements in this Section, excluding those related solely to covered processes.

(a) **Summary of Commissioning Requirements.** Commissioning shall include completion of the following items:

1. Owner's or owner representative's project requirements;
2. Basis of design;
3. Design phase design review;
4. Commissioning measures shown in the construction documents;
5. Commissioning plan;
6. Functional performance testing;
7. Documentation and training; and
8. Commissioning report.

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Design & Installation: Commissioning (§120.8)

- Documentation of:
 - ✓ Owner's Expectations & Basis of Design
 - ✓ Commissioning in Construction Documents
- Coordinated with OSHPD
- **Partial Exception: Performance Testing**

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Design & Installation: Boilers (§120.9)

SECTION 120.9 – MANDATORY REQUIREMENTS FOR COMMERCIAL BOILERS.

- (a) Combustion air positive shut-off shall be provided on all newly installed boilers as follows:
1. All boilers with an input capacity of 2.5 MMBtu/h (2,500,000 Btu/h) and above, in which the boiler is designed to operate with a nonpositive vent static pressure.
 2. All boilers where one stack serves two or more boilers with a total combined input capacity per stack of 2.5 MMBtu/h (2,500,000 Btu/h).
- (b) Boiler combustion air fans with motor horsepower or larger shall meet one of the following for newly installed boilers:
1. The fan motor shall be driven by a variable speed drive, or
 2. The fan motor shall include controls that limit the fan motor demand to no more than 30 percent of the total design wattage at 50 percent of design air volume.
- (c) Newly installed boilers with an input capacity 5 MMBtu/h (5,000,000 Btu/h) and greater shall maintain excess (stack-gas) oxygen concentration at less than or equal to 5.0 percent by volume on a dry basis over firing rates of 70 percent to 100 percent. Combustion air volume shall be controlled with respect to firing rate or flue gas

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Design & Installation: Boilers (§120.9)

- Best Practice for Large Boilers
- Efficiency of Large Combustion Air Fans



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Design & Installation (§120)



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SUBCHAPTER 4 NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES—MANDATORY REQUIREMENTS FOR LIGHTING SYSTEMS AND EQUIPMENT, AND ELECTRICAL POWER DISTRIBUTION SYSTEMS

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Lighting & Electrical: General (§130.0)

SECTION 130.0 – LIGHTING SYSTEMS AND EQUIPMENT, AND ELECTRICAL POWER DISTRIBUTION SYSTEMS —GENERAL

- (a) The design and installation of all lighting systems and equipment in nonresidential, high-rise residential, hotel/motel buildings, outdoor lighting, and electrical power distribution systems within the scope of Section 100.0(a) shall comply with the applicable provisions of Sections 130.0 through 130.5.

NOTE: The requirements of Sections 130.0 through 130.5 apply to newly constructed buildings. Section 141.0 specifies which requirements of Sections 130.0 through 130.5 also apply to additions and alterations to existing buildings.

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Lighting & Electrical (§130) Exceptions

130.1 Indoor Controls

130.4 Acceptance Testing

130.2 Outdoor Controls

130.5 Power Distribution

130.3 Sign Controls



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Lighting & Electrical: Indoor Controls §130.1

SECTION 130.1 – MANDATORY INDOOR LIGHTING CONTROLS

Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the applicable requirements of Sections 130.1(a) through 130.1(e), in addition to the applicable requirements of Sections 110.9 and 130.0.

EXCEPTION to Section 130.1: Lighting connected to a Type Safety Branch or Critical Branch as specified in Section 517 of the California Electrical Code is not subject to the requirements of this Section.

(a) Manual Area Controls.

1. All luminaires shall be functionally controlled by manual ON and OFF lighting controls. Each area enclosed by ceiling-height partitions shall be independently controlled provide lighting controls that allow the lighting in that area to be manually turned on and off. The manual control shall:

1. Be readily accessible; and
2. Be located in the same room as the lighting it controls; and

EXCEPTION 1 to Section 130.1(a)2: For psychiatric and secure areas in healthcare facilities, malls and atria, auditorium areas, retail merchandise sales areas, wholesale showroom areas, commercial and industrial storage areas, general commercial and industrial work areas, convention centers, and arenas, the manual area control may instead be located so that a person using the control can see the lights or area.

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Lighting & Electrical: Indoor Controls §130.1

- **Area (on/off)**
- Dimming
- **Occupancy Sensors**
- Automatic Daylighting



General Lighting

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Lighting & Electrical Area Control (§130.1(a))

- Accessible On/off switch
- Each Area
- **Psychiatric & Secure Areas**
- **Life Safety & Critical Branch**



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Lighting & Electrical Multi-Level Control (§130.1(b))

- Dimmer
- Bi-level switch



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Lighting & Electrical Automatic Shut-OFF (§130.1(c))

*Automatically
turn the lights off
when nobody's there*

- **Full Exception for
Healthcare Facilities**



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Lighting & Electrical Automatic Daylighting (§130.1(d))

- Windows & Skylights
- Reduce Power, Not Light!
 - ✓ Maintain Ambient Light



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Lighting & Electrical: Outdoor Controls (§130.2)

SECTION 130.2 – OUTDOOR LIGHTING CONTROLS AND EQUIPMENT

Nonresidential, high-rise residential and hotel/motel buildings shall comply with the applicable requirements of Sections 130.2(a) through 130.2(c).

- (a) ~~RESERVED Outdoor Incandescent Lighting.~~ All outdoor incandescent luminaires rated over 100 watts, determined in accordance with Section 130.0(c)2, shall be controlled by a motion sensor.
- (b) **Luminaire Cutoff Requirements.** All outdoor luminaires rated for use with lamps greater than 30150 lamp watts, determined in accordance with Section 130.0(c)2, shall comply with Backlight, Uplight, and Glare (collectively referred to as "BUG" in accordance with the IESNA TM-15-11, Addendum A) requirements as follows:
1. ~~Maximum zonal lumens for Backlight, Uplight, and Glare shall be in accordance with Title 24, Part 11, Section 5.106.8. There are no Backlight, Uplight, and Glare requirements in Section 130.2 of Part 6; and~~
 2. ~~Maximum zonal lumens for Uplight shall be in accordance with TABLE 130.2 A; and~~
 3. ~~Maximum zonal lumens for Glare shall be in accordance with TABLE 130.2 B.~~

NOTE: Title 24, Part 11, Section 5.106.8 includes additional restrictions on backlight, uplight and glare that may apply.

EXCEPTION 1 to Section 130.2(b): Signs

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Lighting & Electrical: Outdoor Controls (§130.2)

- Backlight, Uplight, and Glare (BUG)
- Daylight Sensor or Timer



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Lighting & Electrical: Sign Controls (§130.3)

SECTION 130.3 – SIGN LIGHTING CONTROLS

Nonresidential buildings other than healthcare facilities, high-rise residential buildings, and hotel/motel buildings shall comply with the applicable requirements of Section 130.3(a)1 through 130.3(a)3.

(a) **Controls for Sign Lighting.** All sign lighting shall meet the requirements below as applicable:

1. **Indoor Signs.** All indoor sign lighting shall be controlled with an automatic time-switch control or astronomical time-switch control.

EXCEPTION to Section 130.3(a)1: Exit signs.

2. **Outdoor Signs.** Outdoor sign lighting shall meet the following requirements as applicable:

- A. All outdoor sign lighting shall be controlled with a photocontrol in addition to an automatic time-switch control, or an astronomical time-switch control.

EXCEPTION to Section 130.3(a)2A: Outdoor signs in tunnels, and signs in large permanently covered outdoor areas that are intended to be continuously lit, 24 hours per day and 365 days per year.

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Lighting & Electrical: Sign Controls (§130.3)

- Full Exception for Healthcare Facilities



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Lighting & Electrical: Acceptance Testing (§130.4)

SECTION 130.4 –LIGHTING CONTROL ACCEPTANCE AND INSTALLATION CERTIFICATE REQUIREMENTS

Nonresidential buildings other than healthcare facilities, high-rise residential buildings, and hotel/motel buildings shall comply with the applicable requirements of Sections 130.4(a) through 130.4(c). Healthcare facilities shall comply with the applicable acceptance and installation documentation requirements of OSHPD.

- (a) **Lighting Control Acceptance Requirements.** Before an occupancy permit is granted, indoor and outdoor lighting controls serving the building, area, or room shall be certified as meeting the Acceptance Requirements for Code Compliance in accordance with Section 130.4. A Certificate of Acceptance shall be submitted to the enforcement agency under Section 10-11000 of the Code, that:
1. Certifies that all of the lighting acceptance testing necessary to meet the requirements of Part 6 is completed;
 2. Certifies that the applicable procedures in Reference Nonresidential Appendix NA7.6 and NA7.8 have been followed;
 3. Certifies that automatic dimming controls comply with Section 130.1(d) and Reference Nonresidential Appendix NA7.6.1;
 4. Certifies that lighting shut-OFF controls comply with Section 130.1(e) and Reference Nonresidential

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Lighting & Electrical: Acceptance Testing (§130.4)

- Full Exception for Healthcare Facilities



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Lighting & Electrical: Power Distribution (§130.5)

SECTION 130.5 –ELECTRICAL POWER DISTRIBUTION SYSTEMS

Nonresidential, high-rise residential and hotel/motel buildings shall comply with the applicable requirements of Sections 130.5(a) through 130.5(e).

- (a) **Service Electrical Metering.** Each electrical service or feeder shall have a permanently installed metering system which measures electrical energy use in accordance with TABLE 130.5-A.

EXCEPTION 1 to Section 130.5(a): Service or feeder which the utility company provides a metering system that indicates instantaneous kW demand and kWh in a utility-defined period.

EXCEPTION 2 to Section 130.5(a): Electrical power distribution systems subject to California Electrical Code Article 517.

- (b) **Separation of Electrical Circuits and Electrical Energy Monitoring.** Electrical power distribution systems shall be designed so that measurement devices can monitor the electrical energy usage of load types according to TABLE 130.5-B.

EXCEPTION 1 to Section 130.5(b): For each separate load type, up to 10 percent of the connected load may be of any type.

EXCEPTION 2 to Section 130.5(b): Electrical power distribution systems subject to California Electrical Code Article 517.

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Lighting & Electrical: Power Distribution (§130.5)

- **Partial Exception for Healthcare Facilities**
 - ✓ **Reference to California Electrical Code 517**
- Voltage Drop Limits
 - ✓ Maximum of 5% Drop at Farthest Load
 - ✓ Consistent with Best Practice & Safety

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Lighting & Electrical (§130)





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SUBCHAPTER 5 NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, AND HOTEL/MOTEL OCCUPANCIES—PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES FOR ACHIEVING ENERGY EFFICIENCY

DRAFT

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Performance & Prescriptive (§140)

140.0 Performance & Prescriptive Compliance	140.5 Prescriptive: Water Heating
140.1 Performance: Energy Budgets	140.6 Prescriptive: Indoor Lighting
140.2 Prescriptive Approach	140.7 Prescriptive: Outdoor Lighting
140.3 Prescriptive: Building Envelopes	140.8 Prescriptive: Signs
140.4 Prescriptive: HVAC	140.9 Prescriptive: Covered Processes

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Performance & Prescriptive: Compliance (§140.0)

SECTION 140.0 – PERFORMANCE AND PRESCRIPTIVE COMPLIANCE APPROACHES

Nonresidential, high-rise residential and hotel/motel buildings shall comply with all of the following:

- The requirements of Sections 100.0 through 110.10 are applicable to the building project (mandatory measures for all buildings).
- The requirements of Sections 120.0 through 130.5 (mandatory measures for nonresidential, high-rise residential and hotel/motel buildings).
- Either the performance compliance approach (energy budgets) specified in Section 140.1 or the prescriptive compliance approach specified in Section 140.2, of the Climate Zone in which the building will be located. Climate zones are shown in FIGURE 100.0A.

NOTE to Section 140.0(c): The Commission periodically updates, publishes, and makes available to interested persons and local enforcement agencies precise descriptions of the Climate Zones, which is available by zip code boundaries depicted in the Reference Joint Appendices along with a list of the communities in each zone.

NOTE to Section 140.0: The requirements of Sections 140.1 through 140.9 apply to newly constructed buildings. Section 141.0 specifies which requirements of Sections 140.1 through 140.9 also apply to additions or alterations to existing buildings.

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Performance & Prescriptive:

- Flexible Compliance Approach:
 - ✓ Performance or Prescriptive
- **Performance** allows customized trade-offs
- **Prescriptive** is a list of requirements
- All Buildings must meet Mandatory Measures



Performance & Prescriptive: Performance: Energy Budgets (§140.1)

SECTION 140.1 – PERFORMANCE APPROACH: ENERGY BUDGETS

A building complies with the performance approach if the energy budget calculated for the Proposed Design Building under Subsection (b) is no greater than the energy budget calculated for the Standard Design Building under Subsection (a).

- Energy Budget for the Standard Design Building.** The energy budget for ~~a proposed building~~ the Standard Design Building is determined by applying the mandatory and prescriptive requirements to the Proposed Design Building. The energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation, service water heating, and covered process loads.
- Energy Budget for the Proposed Design Building.** The energy budget for a Proposed Design Building is determined by calculating the TDV energy for the Proposed Design Building. The energy budget is the sum of the TDV energy for space-conditioning, indoor lighting, mechanical ventilation and service water heating and covered process loads.
- Calculation of Energy Budget.** The TDV energy for both the Standard Design Building and the Proposed Design Building shall be computed using Compliance Software certified for this use by the Commission. The



Performance & Prescriptive: **Performance:** **Energy Budgets (§140.1)**

1. Meet Mandatory Measures
2. Calculate Standard Building Energy Budget
 - Standard Building is the Prescriptive
3. Calculate Proposed Building Energy Budget
4. Compare & Iterate

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Performance & Prescriptive: **Prescriptive Approach (§140.2)**

SECTION 140.2 – PRESCRIPTIVE APPROACH

~~In order to comply with using the prescriptive approach in this section, a building shall be designed with and shall have constructed and installed systems and components meeting the applicable requirements of Sections 140.3 through 140.9.~~

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Performance & Prescriptive: Prescriptive Approach (§140.2)

- No Modeling
- No Iterations
- Design & Build per 140.3 through 140.9

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Performance & Prescriptive: Building Envelopes (§140.3)

SECTION 140.3 – PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES

A building complies with this section by being designed with and having constructed to meet all prescriptive requirements in Subsection (a) and the requirements of Subsection (c) and (d) where they apply.

(a) Envelope Component Requirements.

1. **Exterior roofs and ceilings.** Exterior roofs and ceilings shall comply with each of the applicable requirements in this subsection:
 - A. **Roofing Products.** Shall meet the requirements of Section 110.8 and the applicable requirements of Subsections i through ii:
 - i. **Nonresidential buildings.**
 - a. **Low-sloped roofs.** Climate Zones 1 through 16 shall have:
 1. A minimum solar reflectance of 0.63 and a minimum thermal emittance of 0.75; or
 2. A minimum Solar Reflectance Index (SRI) of 75.

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Performance & Prescriptive: Building Envelopes (§140.3)

- Minimum Roof Solar Reflectance
- Minimum Insulation
 - ✓ Walls, Roof, Doors, & Windows
- Restrictions on West Facing Fenestration and Percent Fenestration
- Daylighting Requirements

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Performance & Prescriptive: HVAC (§140.4)

SECTION 140.4 – PRESCRIPTIVE REQUIREMENTS FOR SPACE CONDITIONING SYSTEMS

A building complies with this section by being designed with and having constructed and installed a space-conditioning system that meets the applicable requirements of Subsection (a) through (d).

- (a) **Sizing and Equipment Selection.** Mechanical heating and mechanical cooling equipment serving health care facilities shall be sized to meet the design heating and cooling loads as calculated according to the subsection (b). Mechanical heating and mechanical cooling equipment serving high-rise residential buildings, hotel/motel buildings and nonresidential buildings other than health care facilities, shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building, as calculated according to subsection (b).

EXCEPTION 1 to Section 140.4(a). Oversizing can be demonstrated to the satisfaction of the enforcing agency that oversizing will not increase the building's TDV energy use.

EXCEPTION 2 to Section 140.4(a). Standby equipment with controls that allow the standby equipment to operate only when the primary equipment is not operating.

EXCEPTION 3 to Section 140.4(a): Multiple units of the same equipment type, such as multiple chillers and boilers, having combined capacities exceeding the design load, if they have controls that sequence or otherwise

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Performance & Prescriptive: HVAC (§140.4)

- **Partial Exception for Healthcare Facilities**
 - ✓ Reference California Mechanical Code, or
 - ✓ Full Exception from Individual Requirement
- Economizer Requirements, unless 100 Percent Outside Air at all times
- Electric Resistance Heating Prohibition
- Best Practices for:
 - ✓ Cooling Towers & Hydronic Systems

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Performance & Prescriptive: Water Heating (§140.5)

SECTION 140.5 – PRESCRIPTIVE REQUIREMENTS FOR SERVICE WATER HEATING SYSTEMS

- (a) **Nonresidential Occupancies.** A service water heating system installed in a nonresidential building complies with this section if it complies with the applicable requirements of Sections 110.1, 110.3 and 120.3.
- (b) **High-Rise Residential and Hotel/Motel Occupancies.** A service water heating system installed in a high-rise residential or hotel/motel building complies with this section if it meets the requirements of Section 150.1(c)8.

EXCEPTION 1 to Section 140.5(b). The requirements for Quality Insulation Installation (QII) in Section 150.1(c)8Aii are not applicable to service water heating systems installed in high-rise residential or hotel/motel buildings.

EXCEPTION 2 to Section 140.5(b). Buildings of four or more stories or greater are not required to comply with the solar fraction requirement of Section 150.1(c)8Biii.

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Performance & Prescriptive: Water Heating (§140.5)

- 110.1, 110.3, & 120.3
- Illegal Appliances Prohibited
 - ✓ CCR Title 20, Appliance Efficiency
- **Partial Exception for Healthcare Facilities**
 - ✓ **Water Heating Temperature Controls**
- Pipe Insulation

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Performance & Prescriptive: Indoor Lighting (§140.6)

SECTION 140.6 – PRESCRIPTIVE REQUIREMENTS FOR INDOOR LIGHTING

A building complies with this section if:

- The Calculation of Actual Indoor Lighting Power of all proposed building areas combined, calculated under Subsection (a) is no greater than the Calculation of Allowed Indoor Lighting Power, Specific Methodologies calculated under Subsection (c); and
 - The Calculation of Allowed Indoor Lighting Power General Rules comply with Subsection (b); and
 - General lighting complies with the automatic Daylighting Controls in Secondary Daylit Zone requirements in Subsection (d).
- (a) **Calculation of Actual Indoor Lighting Power.** The actual indoor Lighting Power of all proposed building areas is the total watts of all permanent and portable lighting systems in all areas of the proposed building; subject to the applicable adjustments under Subdivisions 1 through 3-4 of this subsection and the requirements of Subdivision 5 of this subsection.

EXCEPTION to Section 140.6. Up to 0.3 watts per square foot of portable lighting for office areas shall not be required to be included in the calculation of actual indoor Lighting Power.

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Performance & Prescriptive: Indoor Lighting (§140.6)

- Calculation of Actual Indoor Lighting Power
- Calculation of Allowed Indoor Lighting Power: General Rules
- Calculation of Allowed Indoor Lighting Power: Specific Methodologies
- Automatic Daylighting Controls in Secondary Daylit Zones

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Performance & Prescriptive: Indoor Lighting (§140.6)

- General Lighting Must be LED
 - ✓ Or equivalent energy efficiency
- **Special Allowances for Healthcare**
- **No Limits on Exam Lighting**

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Performance & Prescriptive: Outdoor Lighting (§140.7)

SECTION 140.7 – PREScriptive REQUIREMENTS FOR OUTDOOR LIGHTING

- (a) An outdoor lighting installation complies with this section if it meets the requirements in Subsections (b) and (c), and the actual outdoor lighting power installed is not greater than the allowed outdoor lighting power calculated under Subsection (d). The allowed outdoor lighting power shall be calculated according to Outdoor Lighting Zone in Title 24, Part 1, Section 10-114.

EXCEPTIONS to Section 140.7(a): When more than 10 percent of the light from a luminaire falls within one or more of the following applications, the lighting power for that luminaire shall be exempt from Section 140.7:

1. Temporary outdoor lighting.
2. Lighting required and regulated by the Federal Aviation Administration, and the Coast Guard.
3. Lighting for public streets, roads, highways, and traffic signage lighting, including lighting for driveway entrances occurring in public right-of-way.
4. Lighting for sports and athletic fields, and children's playgrounds.
5. Lighting for industrial sites, including but not limited to, rail yards, maritime shipyards and docks, piers and

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Performance & Prescriptive: Outdoor Lighting (§140.7)

- Lighting Must be High Efficiency
 - ✓ LED, HPS, etc.
- **Special Allowances for Healthcare**
- **References Exceptions in §130**

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Performance & Prescriptive: Signs (§140.8)

SECTION 140.8 – PREScriptive REQUIREMENTS FOR SIGNS

This section applies to all internally illuminated and externally illuminated signs, unfiltered light emitting diodes (LEDs), and unfiltered neon, both indoor and outdoor. Each sign shall comply with either Subsection (a) or (b), as applicable.

(a) **Maximum Allowed Lighting Power.**

1. For internally illuminated signs, the maximum allowed lighting power shall not exceed the product of the illuminated sign area and 12 watts per square foot. For double-faced signs, only the area of a single face shall be used to determine the allowed lighting power.
2. For externally illuminated signs, the maximum allowed lighting power shall not exceed the product of the illuminated sign area and 2.3 watts per square foot. Only areas of an externally lighted sign that are illuminated without obstruction shall be used. Illumination shall be provided by one or more luminaires, shall be used.
3. Lighting for unfiltered light emitting diodes (LEDs) and unfiltered neon shall comply with Section 140.8(b).

(b) **Alternate Lighting Source.** The sign shall comply if it is equipped only with one or more of the following light sources:

1. High pressure sodium lamps; or

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Performance & Prescriptive: Signs (§140.8)

- Lighting Must be High Efficiency
✓ LED, HPS, etc.
- **Special Allowances for Healthcare**
- **References Exceptions in §130**



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Performance & Prescriptive: Covered Processes (§140.9)

SECTION 140.9 – PRESCRIPTIVE REQUIREMENTS FOR COVERED PROCESSES

- (a) **Prescriptive Requirements for Computer Rooms.** Space conditioning systems serving a computer room with a power density greater than 20 W/ft² shall comply with this section, being designed with and having constructed and installed a cooling system that meets the requirements of Subsections 1 through 6.

1. **Economizers.** Each individual cooling system primarily serving computer rooms shall include either:

- A. An integrated air economizer capable of providing 100 percent of the expected system cooling load as calculated in accordance with a method approved by the Commission, at outside air temperatures of 55°F dry-bulb/50°F wet-bulb and below, and be equipped with a fault detection and diagnostic devices as specified by Section 120.0(d).
- B. An integrated water economizer capable of providing 100 percent of the expected system cooling load as calculated in accordance with a method approved by the Commission, at outside air temperatures of 40°F dry-bulb/35°F wet-bulb and below.

EXCEPTION 1 to Section 140.9(a)1: Individual computer rooms under 5 tons in a building that does not have any economizers.

EXCEPTION 2 to Section 140.9(a)1: New cooling systems serving an existing computer room in an



Performance & Prescriptive: Covered Processes (§140.9)

- **Full Exception for Healthcare Facilities**
- **Including:**
 - ✓ **Computer Rooms**
 - ✓ **Commercial Kitchens**
 - ✓ **Laboratory & Process Exhaust**



Performance & Prescriptive (§140) Flexibility

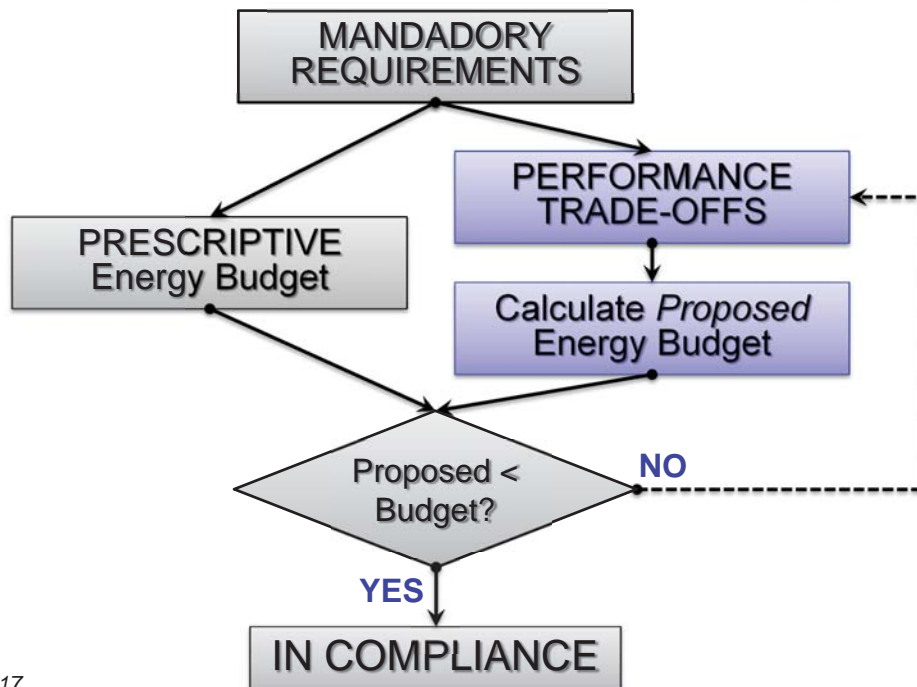
1. Prescriptive Requirements
 - ✓ Calculate Energy Budget
2. Performance Trade-Offs
 - ✓ Calculate *Proposed* Energy Use
3. Compare & Iterate

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Performance & Prescriptive (§140)



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Additions & Alterations (§141)

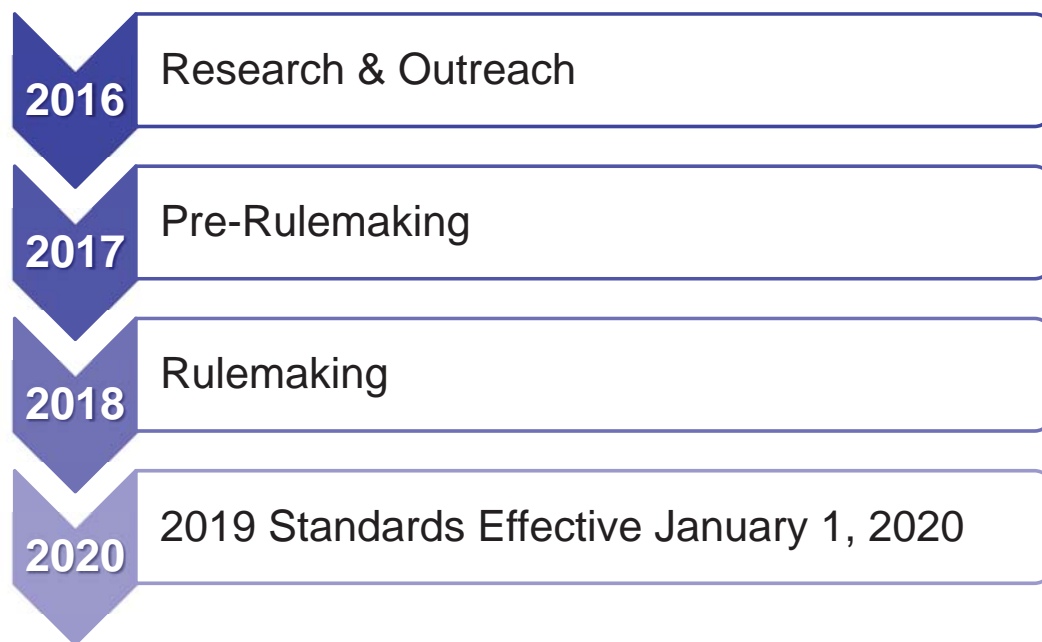
- **Full Exception for Healthcare Facilities**

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Schedule: 2019 Title 24 Standards

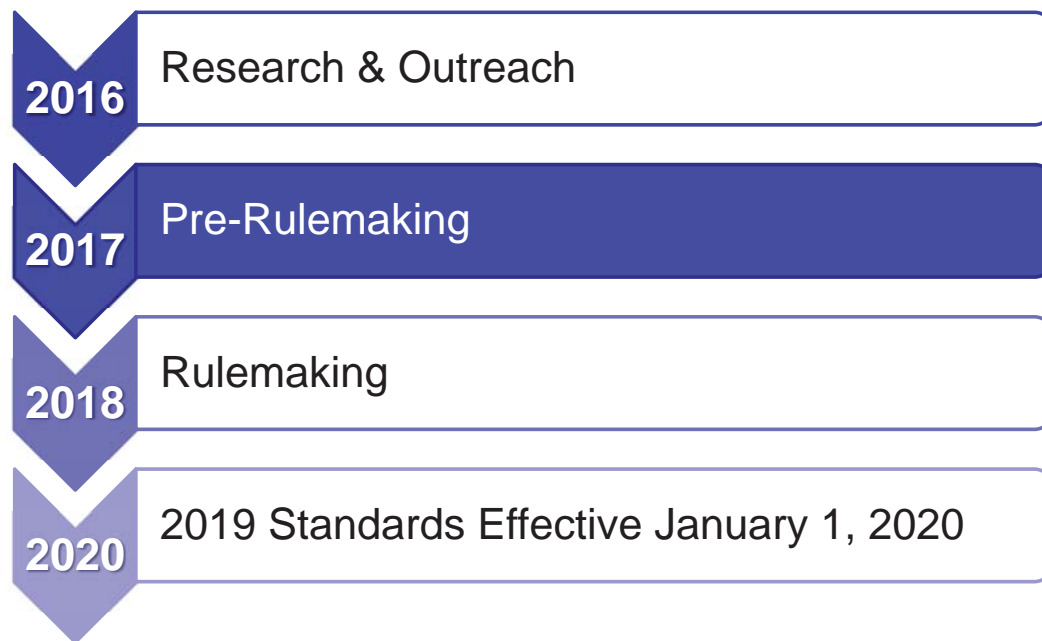


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Schedule: Pre-Rulemaking (2017)



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Schedule: Pre-Rulemaking (2017)

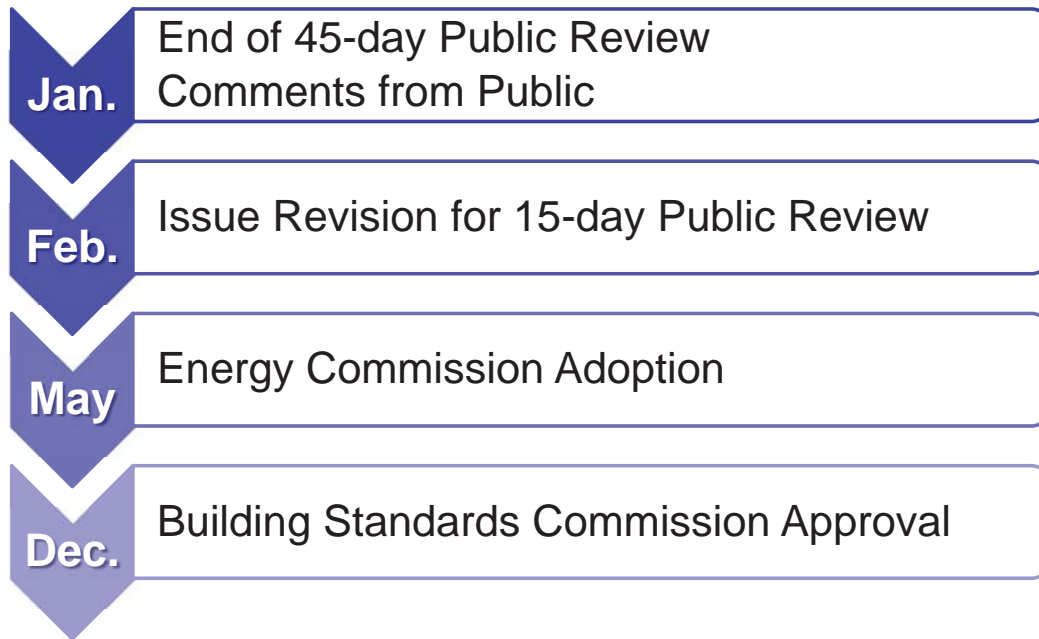


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Closing Thoughts

- Public & Open Process
- Coordination with OSHPD & Healthcare Community
- Focus on Health & Safety



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Key Web-Links/Resources

Pre-Rulemaking Draft 2019 Standards (10/2017 version)

http://www.energy.ca.gov/title24/2019standards/prerulemaking/documents/2017-10-0405_workshop/2017-10-0405_documents.php

2019 Title 24 Utility-Sponsored Stakeholder Info

<http://www.title24stakeholders.com/>

Building Energy Efficiency Program

<http://www.energy.ca.gov/title24/>

Docket for Comments (17-BSTD-01)

<https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=17-BSTD-01>

Compliance Software

<http://bees.archenergy.com/index.html>

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Contact Information

Gabriel D. Taylor, P.E.

Building Standards Office

Gabriel.Taylor@energy.ca.gov

(916) 654-4482

Christopher Meyer

Manager, Building Standards Office

Christopher.Meyer@energy.ca.gov

(916) 654-4052

Payam Bozorgchami, P.E.

Project Manager, 2019 Standards

Payam.Bozorgchami@energy.ca.gov

(916) 654-4618

Peter Strait

Supervisor, Standards Development

Peter.Strait@energy.ca.gov

(916) 654-2817



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Questions?



Gabriel D. Taylor, P.E.

(916) 654-4482

gabriel.taylor@energy.ca.gov

Building Standards Development Unit
Energy Efficiency Division
California Energy Commission