

**To: California Department of Housing and Community Development**

Brandon Estes  
Codes and Standards Administrator I

**From:** Chris Kuch, P.E.

Codes and Standards Engineer – Title 24 & Reach Codes  
Southern California Edison  
on Behalf of California Statewide Utility Codes and Standards Program

**Date:** December 16, 2020

**Subject: Electric Infrastructure for Mixed-Fuel Buildings**

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## 1. Introduction

The Statewide Utility Codes and Standards (C&S) Program support achieving statewide energy and climate goals by advocating for new and revised appliance standards and building codes on the local, state, and national level. This includes recommending code changes for the California Green Building Standards Code (CALGreen or Title 24, Part 11). Three California Investor Owned Utilities (IOUs) – Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison – and two Publicly Owned Utilities – Los Angeles Department of Water and Power and Sacramento Municipal Utility District (herein referred to as the Statewide C&S Team) – sponsor this effort. The program goal is to prepare and submit proposals that would result in cost-effective enhancements to improve energy efficiency and energy performance in California buildings.

The Statewide C&S Team would like to thank the California Department of Housing and Community Development for the opportunity to present the following recommendation that mixed-fuel buildings be equipped with electric infrastructure, which will facilitate a change from gas or propane to electric equipment when the original equipment is replaced in the future. The Statewide C&S Team has supported many local jurisdictions as they have adopted similar language for reach code ordinances. Although many jurisdictions have opted to exclude natural gas entirely from many or all building types, including requirements to prepare for electrification reduces expected retrofit costs and allows the building owner or occupant to more easily make the switch in the future. In the 2022 California Energy Code (Title 24, Part 6), it has been proposed by the Energy

Commission to move towards an all-electric heating baseline, and electric-ready water heating requirements were added several code cycles ago. This proposal focuses on the remaining end uses likely to occur in a dwelling space. We look forward to working collaboratively with staff and other stakeholders to discuss this recommendation and refine the proposal as appropriate.

## 2. Recommended Express Terms

Express terms for the recommended code change are provided below with mark-up language provided as follows:

- Existing California amendments appear upright
- Amended or new California amendments appear underlined
- Repealed California language appears ~~upright and in-strikeout~~
- Ellipsis (...) indicate existing text remains unchanged

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### CHAPTER 2, DEFINITIONS

**MIXED-FUEL BUILDING** is a building that is plumbed for the use of natural gas or propane as fuel for space heating, water heating, cooking, clothes drying, or other building loads.

### CHAPTER 4, RESIDENTIAL MANDATORY MEASURES

#### DIVISION 4.1, PLANNING AND DESIGN

**Section 4.106.5 Electric Infrastructure for Mixed-Fuel Buildings.** Mixed-fuel buildings must comply with the following when gas or propane plumbing is installed for the specified end-use:

**4.106.5.1 Electric Infrastructure for Single Family Mixed-Fuel Buildings.**

**4.106.5.1.1 Electric Circuits for Space Heating.** A dedicated 240-volt, 30 amp or greater electrical circuit shall be provided that terminates within 3 feet from the heater or designated future location of an electric replacement heater with no obstructions into a listed cabinet, box, enclosure, or receptacle labelled “For Future Heat Pump Space Heater”. In the electrical panel the circuit shall be served by a dedicated double pole circuit breaker or a single pole circuit breaker with a reserved single pole circuit breaker space adjacent, and shall be labeled with the words “For Future Heat Pump Space Heater”; and

**4.106.5.1.2 Electric Circuits for Combined Cooktop/Oven, Stand-Alone Cooktop, and Stand-Alone Oven.** A dedicated 240-volt, 50 amp or greater circuit shall be provided that terminates within 3 feet of all combined or stand-alone cooking equipment with no obstructions into a listed cabinet, box, enclosure, or

receptacle labelled “For Future Electric Cooking”. Each circuit shall be served by a dedicated double pole circuit breaker in the electrical panel labeled with the words “For Future Electric Cooking”; and

**4.106.5.1.3 Electric Circuits for Clothes Dryer.** A dedicated 240-volt, 30 amp or greater electrical receptacle shall be provided within 3 feet of the clothes dryer location and accessible with no obstructions. The circuit shall be served by a double pole circuit breaker in the electrical panel labeled with the words “For Future Electric Clothes Dryer”.

#### **4.106.5.2 Electric Infrastructure for Multifamily and Hotel/Motel Mixed-Fuel Buildings.**

**4.106.5.2.1 Electric Circuit Capacity.** For the following end-uses where gas or propane plumbing is installed, mixed-fuel buildings shall have conductors or raceway installed with termination points at the main electrical panel (via subpanels panels, if applicable) into a listed cabinet, box or enclosure and at a location no more than 3 feet from each gas outlet or a designated location of future electric replacement equipment. Both ends of the conductors or raceway shall be labelled appropriately to indicate the type of future electric replacement equipment. The conductors or raceway and any intervening subpanels shall be sized to meet the future electric power requirements, as specified below, at the service voltage. The capacity requirements may be adjusted for demand factors in accordance with the California Electric Code, Title 24, Part 3, Article 220. Gas flow rates shall be determined in accordance with the California Plumbing Code, Title 24, Part 5, Section 1208.4.

**4.106.5.2.1.1 Domestic Hot Water Circuit Capacity.** Domestic hot water systems shall comply with the following:

1. For equipment serving multiple dwelling units, common areas, or nonresidential space:
  - a. 24 amps at 240 volts per dwelling unit, or
  - b. 1.2 kVA for each 10,000 Btus per hour of rated gas input or gas pipe capacity, or
  - c. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.1.2 Space Heating Circuit Capacity.** Space heating systems shall comply with either:

1. Equipment serving individual dwelling units shall have a dedicated 240 volt, 30 amp or greater electrical circuit for a future electric replacement heater.

2. For equipment serving multiple dwelling units, common areas, or nonresidential space:
  - a. 24 amps at 240 volts per dwelling unit, or
  - b. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**EXCEPTION to Section 4.106.2.1.2** If permanent space cooling equipment is installed for all of the affected conditioned space the conductors or raceway serving the cooling equipment may be increased in size to accommodate the future electric space heating equipment.

**4.106.5.2.1.3 Clothes Dryer.** Clothes dryer infrastructure shall comply with either:

1. For systems serving individual dwellings, a dedicated 240 volt, 30 amp or greater electrical receptacle shall be provided within 3 feet of the clothes dryer location and accessible with no obstructions.
2. For equipment serving multiple dwelling units or common areas
  - a. 24 amps at 240 volts per dwelling unit, or
  - b. 0.85 kVA for each 10,000 Btus per hour of rated gas input or gas pipe capacity for commercial dryers; or
  - c. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.1.4 Cooking Equipment.** Cooking equipment infrastructure in residential spaces shall comply with either:

1. For equipment serving individual dwelling units, a dedicated 240 volt, 50 amp or greater circuit and 50 amp or greater electrical receptacle shall be provided within 3 feet of the cooktop and oven and accessible with no obstructions, or
2. For equipment serving common space or nonresidential spaces, the electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.1.5 Pools and Spas** shall comply with either:

1. 0.75 kVA per 10,000 Btus per hour of rated gas input or gas pipe capacity, or

2. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.2 Service Capacity.** Mixed-Fuel Buildings shall comply with the following:

**4.106.5.2.2.1 Overcurrent protection and bus bar capacity.** All newly installed electrical panels and subpanels in Mixed-fuel Buildings shall have physical space for overcurrent protective devices and bus bars of adequate capacity in the main electrical panel and any subpanels to meet all of the building's potential future electrical requirements as specified in Section 4.106.5.2.1.

**Exception to Section 4.106.5.2.2.1** If the electric load serving entity requires that the electric service be upgraded as a result of the requirements of Section 4.106.5.2.2.

**4.106.5.2.2.2 Raceway sizing.** All newly installed raceways in a Mixed-Fuel Building between the main electric panel and any subpanels, and the point at which the conductors serving the building connect to the common conductors of the utility distribution system, shall be sized for conductors adequate to serve all of the building's potential future electric loads as specified in Section 4.106.5.2.1.

**4.106.5.2.4 Condensate Drains.** The conductors or raceway required in Sections 4.106.5.2.1.1 and 4.106.5.2.1.2 shall terminate in areas that have condensate drains that are:

1. No less than ¾ inch in diameter;
2. Compliant with the California Plumbing Code, Title 24, Part 5, Section 814; and
3. No more than two inches higher than the floor.

**4.106.5.2.5 Water Heating Space for Equipment**

1. Individual Residential Units. The conductors or raceway required in Section 5.508.31.1 shall terminate in an area that is at least three (3) feet by three (3) feet by seven (7) feet high.
2. Multiple Residential Units. Construction documents shall indicate the physical space necessary and reserved for future heat pump water heating equipment, including future equipment footprint and a future pathway reserved for routing of ductwork from the outside to the heat pump evaporator. The footprint necessary for future heat pump water heating equipment may overlap with non-structural partitions.

### 3. Rationale

#### **Chapter 2, DEFINITIONS**

##### **ALL-ELECTRIC BUILDING**

Rationale: The purpose of this change is to define an all-electric building, as fuel type determines the appropriate Total EDR Target in Appendix A4.

##### **MIXED-FUEL BUILDING**

Rationale: The purpose of this change is to define a mixed-fuel building, as the proposed change for Chapter 4 adds requirements specifically for these buildings.

#### **Chapter 4, RESIDENTIAL MANDATORY MEASURES, DIVISION 4.1, PLANNING AND DESIGN**

##### **Electric Infrastructure for Mixed-Fuel Buildings.**

Rationale: The purpose of this change would require the installation of the necessary electric infrastructure during new construction to facilitate a change from gas or propane to electric equipment when the original equipment is replaced in the future. This code change complements revisions to Title 24, Part 6 that the California Energy Commission is considering a shift to electric baselines and encourage all-electric construction. This mandatory requirement is necessary to ensure that the proper infrastructure is in place at the time of equipment replacement. It will aid California in reducing statewide building related GHG emissions to a level at least 40 percent below 1990 levels by 2030, as directed by AB 3232.