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DESIGN GUIDELINE FOR ELECTRIC-READY BUILDINGS

The City of Encinitas Municipal Code Section [23.12.080](#) amended the [2022 California Energy Code](#) to expand electric readiness requirements for new construction. The amended code (the “Code”) requires that new buildings with natural gas or propane piping and appliance locations be designed and constructed to be ready for future replacement with electric appliances. The Code applies to gas water heaters and water heating systems, space heaters, residential ranges and clothes dryers. This guidance includes advice for pool heaters and commercial cookline equipment as well.

An electric-ready design provides space, drainage, ventilation, electrical capacity (service, bus bar, raceway and/or conductors, reserved space for overcurrent protective devices) for future replacement of all gas-dependent equipment with all-electric equipment.

These guidelines are adapted, in part, from the 2022 California Code, the proposed 2025 California Energy Code, and the City of Encinitas amendments to the California Energy Code. They are intended to assist applicants to fulfill the electric-ready requirements of the City of Encinitas Municipal Code Section 23.12.080. Adherence to the guidelines does not assure that conversion to all-electric equipment will be feasible in all cases, particularly with respect to large central systems and pool heaters. Instead, they provide electrical system, space, drainage and ventilation guidance for systems serving individual dwelling units and design criteria for central systems and pool heaters. The California Energy Code also specifies certain readiness requirements for EV charging, solar photovoltaics and battery storage; these topics are not included in these guidelines. Applicants should refer to the Code for specific compliance requirements.

RESIDENTIAL BUILDINGS

Electrical Capacity

Electrical panel boards serving individual dwelling units in single family homes, duplexes and townhomes should have a busbar rating of at least 225 amps [CA Energy Code Section [150.0\(s\)](#)].

The electric service and building electrical system of multifamily buildings should be sized to meet the future electric requirements for all-electric equipment, including space heating, water heating, cooktops and ranges, clothes dryers and pool heaters. The building main service conduit, the electrical system to the location of each gas appliance, and any on-site distribution transformers should have sufficient capacity to supply full rated amperage at each electric ready appliance in accordance with the California Electrical Code.

Space Heating

Systems using gas space heating equipment should include the following components for each gas terminal or stub out:

- A dedicated 240 volt, 30 amp or greater electrical circuit for a future electric replacement heater;
- The circuit should terminate within 3 feet from the designated future location of an electric replacement heater with no obstructions into a listed cabinet, box or enclosure labelled “For Future Electric Space Heater” [CA Energy Code Sections [150.0\(t\)](#) and [160.9\(a\)](#)];

- The circuit should be served by a dedicated double pole circuit breaker in the electrical panel labeled with the words “For Future Electric Space Heater” [CA Energy Code Sections [150.0\(t\)](#) and [160.9\(a\)](#)]; and
- A designated exterior location for a future heat pump compressor unit with either a drain or natural drainage for condensate [[EMC 23.12.080](#)].

Water Heating

Single Family, Duplexes and Townhomes [CA Energy Code Section [150.0\(n\)](#)]

Systems using gas water heaters to serve individual dwelling units should designate a space at least 2.5 feet by 2.5 feet wide and 7 feet tall suitable for the future installation of a heat pump water heater (HPWH). All electrical components should be installed in accordance with the California Electrical Code.

If the designated space is within 3 feet from the water heater, then this space should include the following:

- A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor, branch circuit rated at 30 amps minimum, within 3 feet from the water heater and accessible to the water heater with no obstructions;
- Both ends of the unused conductor should be labeled with the word “spare” and be electrically isolated;
- A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit above and labeled with the words “Future 240V Use”; and
- A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance.

If the designated space is more than 3 feet from the water heater, then this space should include the following:

- A dedicated 240 volt branch circuit should be installed within 3 feet from the designated space. The branch circuit should be rated at 30 amps minimum. The blank cover should be identified as “240V ready”;
- The main electrical service panel should have a reserved space to allow for the installation of a double pole circuit breaker for a future HPWH installation. The reserved space should be permanently marked as “For Future 240V use”;
- Either a dedicated cold water supply, or the cold water supply should pass through the designated HPWH location just before reaching the gas water heater;
- The hot water supply pipe coming out of the gas water heater should be routed first through the designated HPWH location before serving any fixtures;
- The hot and cold water piping at the designated HPWH location should be exposed and readily accessible for future installation of an HPWH; and
- A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance.

Multifamily

For equipment serving multiple dwelling units or common areas, refer to [Guidance for Electric Readiness of Multifamily Central Hot Water Systems](#).

Equipment serving individual dwelling units should include the following:

- Electrical and plumbing elements [CA Energy Code Section [160.4\(a\)](#)]:

- A dedicated 125 volt, 20 amp electrical receptacle that is connected to the electric panel with a 120/240 volt 3 conductor branch circuit rated to 30 amps minimum, within 3 feet from the water heater and accessible to the water heater with no obstructions. In addition, all the following:
 - Both ends of the unused conductor should be labeled with the word “spare” and be electrically isolated;
 - A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit above and labeled with the words “Future 240V Use”;
- A condensate drain that is no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance;
- Space and ventilation elements [[EMC 23.12.080](#)]
 - The construction drawings should designate a space at least 39 inches by 39 inches and 96 inches tall for the future location of heat pump water heater;
 - A ventilation method meeting one of the following:
 - The designated space for the future heat pump water heater should have a minimum volume of 700 cubic feet; or
 - If the future HPWH space is designed to vent to the indoors, the designated space for the future heat pump water heater should vent to a communicating space in the same pressure boundary. The total combined volume connected via permanent openings should be 700 cubic feet or larger and vent to the interior via:
 - Fully louvered doors with fixed louvers; or
 - Two permanent fixed openings located within 12 inches from the enclosure top and bottom; or
 - Two 8-inch ducts to a communicating space.
 - If the future HPWH space is designed to vent to the building exterior, the designated space for the future heat pump water heater vent to the exterior via:
 - Fully louvered doors with fixed louvers consisting of a single layer of fixed flat slats and a minimum total NFA of 250 square inches; or
 - Two permanent fixed openings of equal area with a minimum total NFA of 250 square inches located within 12 inches from the enclosure top and bottom; or
 - Two 8 inches capped ducts. All ducts that cross the pressure boundary should be insulated to a minimum insulation level of R-6 and the ducts, connections, and building penetrations should be sealed.

Clothes Drying

Buildings plumbed for gas equipment should include the following components for each gas terminal or stub out [[CA Energy Code Sections 150.1\(v\)](#) and [160.9\(c\)](#)]:

Equipment Serving Individual Dwelling Units

A dedicated 240 volt branch circuit should be installed within 3 feet from the clothes dryer location and accessible to the clothes dryer location with no obstructions. The branch circuit conductors should be rated at 30 amps minimum. The blank cover should be identified as “240V ready”. All electrical components should be installed in accordance with the California Electrical Code.

The main electrical service panel should 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 should be permanently marked as “For Future 240V use”.

Equipment in Common Use Areas

Conductors or raceway should be installed with termination points at the main electrical panel, via subpanels panels if applicable, to 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 should be labelled "Future 240V Use." Gas flow rates should be determined in accordance with the California Plumbing Code. Capacity should be one of the following:

- 24 amps at 208/240 volts per clothes dryer;
- 2.6 kVA for each 10,000 Btu per hour of rated gas input or gas pipe capacity; or
- 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.

Cooktops and Ranges

Buildings plumbed for gas equipment should include the following components for each gas terminal or stub out [CA Energy Code Sections [150.1\(u\)](#) and [160.9\(c\)](#)]:

- A dedicated 240 volt branch circuit should be installed within 3 feet from the appliance and accessible to the appliance with no obstructions. The branch circuit conductors should be rated at 50 amps minimum. The blank cover should be identified as "240V ready". All electrical components should be installed in accordance with the California Electrical Code.
- The main electrical service panel should have a reserved space to allow for the installation of a double pole circuit breaker for a future electric cooktop installation. The reserved space should be permanently marked as "For Future 240V use".

Pool and Spas

Gas equipment serving pools and/or spas should have conductors or raceway installed from the main electrical panel (via subpanels panels, if applicable) to termination points at a location no more than 3 feet from each gas outlet or a designated location of future electric replacement equipment. The conductors or raceway and any intervening subpanels should be sized to meet the future electric power requirements for a heat pump pool heater(s) that can provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional. Permit applicants are encouraged to conduct some level of initial design to address future locations for heat absorption, transfer and distribution equipment and electric power systems.

NONRESIDENTIAL BUILDINGS

General

New nonresidential buildings should have electrical systems and designs that provide capacity for a future retrofit of all gas equipment to all-electric equipment. This includes space, drainage, ventilation, thermal conveyance, electrical conductors or raceways, service and bus bar capacity, and space for overcurrent protective devices. Permit applicants are encouraged to conduct some level of design to address future locations for heat absorption, transfer and distribution equipment, and electric power systems.

The electrical service, panel boards and subpanels should have sufficient capacity and reserved space to meet all the building's potential future electrical requirements. Electric load calculations should reflect all loads for systems as installed at the time of construction and reflect expected future loads or increases to load as a result of compliance conversion to all-electric equipment. Conductors or raceway should be installed with termination points no more than 3 feet from each gas outlet or a designated

location of future electric replacement equipment. [\[EMC 12.23.080\]](#) and proposed 2025 CA Energy Code Section 160.9]

For central hot water systems, refer to [Guidance for Electric Readiness of Multifamily Central Hot Water Systems](#).

Cookline Appliances

Quick-service commercial kitchens and institutional commercial kitchens should include a dedicated branch circuit and outlet that would be accessible to cookline appliances. The electrical service panel should have a minimum capacity of 800 connected amps, the electrical service panel should be sized to accommodate an additional either 208v or 240v 50-amp breaker, and branch circuit conductors should be rated at 50 amps minimum [Proposed 2025 CA Energy Code Section 120.6(k)].