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2022 California Electrical Code Significant Changes

☐ **110.14 (D) Terminal Connection Torque –** Installation of electrical connections reworded to specify Torqueing: Tightening torque values for terminal connections shall be as indicated on equipment or in installation instructions provided by the manufacturer. An approved means shall be used to achieve the indicated torque value.

☐ **210.8 Ground-Fault Circuit-Interrupter Protection for Personnel** was revised:
(A) Dwelling Units: All 125-volt through 250-volt receptacles installed in locations specified in 210.8(A)(1) through (11) are supplied by single-phase branch circuits rated 150 volts or less to ground shall have ground-fault circuit-interrupter protection for personnel.

☐ **210.8(A)(5) Basements** – All 125-volt through 250-volt receptacles supplied by a single-phase branch circuit rated 150 volts or less to ground installed in any and all dwelling unit basements will require ground-fault circuit-interrupter (GFCI) protection for personnel.

☐ **210.8(A)(11) – NEW** - (11) Indoor damp and wet locations.
All 125-volt through 250-volt receptacles supplied by a single-phase branch circuit rated 150 volts or less to ground installed in indoor damp or wet locations will require ground-fault circuit-interrupter (GFCI) protection for personnel.

☐ **210.8(B) Other Than Dwelling Units –** Reworded and some new locations were added to:
All 125-volt through 250-volt receptacles supplied by single-phase branch circuits rated 150 volts or less to ground, 50 amperes or less, and all receptacles supplied by three-phase branch circuits rated 150 volts or less to ground, 100 amperes or less installed in the locations specified in 210.8(B)(1) through B(12) shall have ground-fault circuit-interrupter protection for personnel.

(2) Kitchens or areas with a sink and permanent provisions for either food preparation or cooking.
(6) Indoor damp and wet locations
(8) Garages, accessory buildings, service bays, and similar areas.
(11) NEW - Laundry areas
(12) NEW - Bathtubs and shower stalls – where receptacles are installed within 1.8m (6 ½ ft) of the outside edge of the bathtub or shower stall

☐ **210.8(D) Specific Appliances (NEW)**
Unless GFCI protection is provided in accordance with 422.5(B)(3) through (B)(5), the outlets supplying the appliances specified in 422.5(A) shall have GFCI protection in accordance with 422.5(B)(1) or (B)(2). Where the appliance is a vending machine as specified in 422.5(A)(5) and GFCI protection is not provided in accordance with 422.5(B)(3) or (B)(4), branch circuits supplying vending machines shall have GFCI protection in accordance with 422.5(B)(1) or (B)(2).

☐ **210.8(E) Equipment Requiring Servicing (NEW)**
GFCI protection shall be provided for the receptacles required by 210.63

210.63(A) HVAC and Refrigeration Equipment
210.63(B)(1) Indoor Service Equipment
210.63(B)(2) Indoor Equipment Requiring Dedicated Equipment Space

☐ **210.8(F) Outdoor Outlets (NEW)**

All outdoor outlets for dwellings, other than those covered in 210.8(A)(3), Exception to (3), that are supplied by single-phase branch circuits rated 150 volts to ground or less, 50 amperes or less, shall have ground-fault circuit-interrupter protection for personnel.

Exception: Ground-fault circuit-interrupter protection shall not be required on lighting outlets other than those covered in 210.8(C).

☐ **210.15 Reconditioned Equipment (NEW)**

The following shall **not** be reconditioned:

(1) Equipment that provides ground-fault circuit-interrupter protection for personnel
(2) Equipment that provides arc-fault circuit-interrupter protection
(3) Equipment that provides ground-fault protection of equipment

☐ **210.52(C) Countertops and Work Surfaces**

In kitchens, pantries, breakfast rooms, dining rooms an similar areas of dwelling units, receptacle outlets for counter top and work surfaces that are 300mm (12in.) or wider shall be installed in accordance with 210.52(C)(1) through (C)(3) and shall not be considered as receptacle outlets required by 210.52(A).

(1) Wall Spaces – "Countertop and Work Surface" has been moved to (2) below.
Receptacle outlets shall be installed so that no point along the wall line is more than 600mm (24in.) measured horizontally from a receptacle outlet in that space.

(2) Island and Peninsular Countertops and Work Surfaces (NEW)
Receptacle outlets shall be installed in accordance with 210.52(C)(2)(a) and 210.52(C)(b).

(a) At least one receptacle shall be provided for the first 9 square feet, or fraction thereof, of the countertop or work surface. A receptacle outlet shall be provided for every additional 18 square feet or fraction thereof, of the countertop or work surface.
(b) At least one receptacle outlet shall be located within 600 mm (2ft) of the outer end of a peninsular countertop or work surface. Additional required receptacle outlets shall be permitted to be located as determined by the installer, designer, or building owner. The location of the receptacle outlets shall be in accordance with 210.52(C)(3). A peninsular countertop shall be measured from the connected perpendicular wall.

(3) Receptacle Outlet Location.
Receptacle outlets shall be located in one or more of the following:

(1) On or Above Countertop or Work Surfaces:
On or above, but not more than 500mm (20in) above, the counter or work surface.

(2) In Countertop or Work Surfaces:
Receptacle outlet assemblies listed for use in countertops or work surfaces shall be permitted to be installed in countertops or work surfaces.

(3) Below Countertop or Work Surfaces:
Not more than 300mm (12in) below the countertop or work surface. Receptacles installed below a countertop or work surface shall not be located where the countertop or work surface extends more than 150mm (6in) beyond its support base.

☐ **220.12 Lighting Load for Specified Non-Dwelling Occupancies** – Information added:

(A) General (NEW) - A unit load of not less than that specified in Table 220.12 for non-dwelling occupancies and the floor area determined in 220.11 shall be used to calculate the minimum lighting load. Motors rated less than 1/8 HP and connected to a lighting circuit shall be considered general lighting load.

☐ **220.14 Other Loads – All Occupancies** – Information added:

220.14(J) Dwelling Units. In one-family, two-family, and multifamily dwellings, the minimum unit load shall be not less than 33VA volt-amperes/m^2 (3 VA volt-amperes/ft^2). The lighting and receptacle outlets specified in 220.14(J)(1), (J)(2), and (J)(3) are included in the minimum unit load. No additional load calculation shall be required for such outlets. The minimum lighting load shall be determined using the minimum unit load and the floor area as determined in 220.11 for dwelling occupancies. Motors rated less than 1/8 hp and connected to a lighting circuit shall be considered part of the minimum lighting load.

(1) All general-use receptacle outlets of 20-ampere rating or less, including receptacles connected to the circuits in 210.11(C)(3) and 210.11(C)(4)
(2) The receptacle outlets specified in 210.52(E) and (G)

(3) The lighting outlets specified in 210.70

☐ **220.53 Appliance Load – Dwelling Units(s)** – Information added:

It shall be permissible to apply a demand factor of 75 percent to the nameplate rating load of four or more appliances rated ¼ hp or greater, or 500 watts or greater, that are fastened in place, and that are served by the same feeder or service in a one-family, two-family or multifamily dwelling. This demand factor shall not apply to:

(1) Household electric cooking equipment that is fastened in place
(2) Clothes dryers
(3) Space heating equipment
(4) Air-conditioning equipment

☐ **220.60 Noncoincident Loads** – Sentence added:

Where a motor is part of the noncoincident load and is not the largest of the noncoincident loads, 125 percent of the motor load shall be used in the calculation if it is the largest motor.

☐ **225.30 Number of Supplies.**

225.30(B) Common Supply Equipment (NEW)

Where feeder conductor originate in the same panel board, switchboard, or other distribution equipment and each feeder terminates in a single disconnecting means, not more than six feeders shall be permitted. Where more than one feeder is installed in accordance with this section, all feeder disconnects supplying the building or structure shall be grouped in the same location, and the requirements of 225.33 shall not apply. Each disconnect shall be marked to indicate the load served.

☐ **230.46 Spliced and Tapped Conductors** – **NEW** Requirements added:

Power distribution blocks, pressure connectors, and devices for splices and taps shall be listed. Power distribution blocks installed on service conductors shall be marked "suitable for use on the line side of the service equipment" or equivalent.

Effective January 1, 2023, pressure connectors and devices for splices and taps installed on service conductors shall be marked "suitable for use on the line side of the service equipment" or equivalent.

☐ **230.62 Service Equipment – Enclosed or Guarded**

230.62(C) Barriers (NEW) Barriers shall be placed in service equipment such that no uninsulated, ungrounded service busbar or service terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load termination.

☐ **230.67 Surge Protection (NEW)**

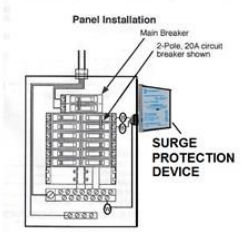
(A) Surge-Protective Device. All services supplying dwelling units shall be provided with a surge-protective device (SPD).

(B) Location. The SPD shall be an integral part of the service equipment or shall be located immediately adjacent thereto.

Exception: The SPD shall not be required to be located in the service equipment as required in (B) if located at each next level distribution equipment downstream toward the load.

(C) Type. The SPD shall be a Type 1 or Type 2 SPD.

(D) Replacement. Where service equipment is replaced all of the requirements of this section apply



☐ **240.88 Reconditioned Equipment. (NEW)**

Reconditioned equipment shall be listed as "reconditioned" and the original listing mark removed.

(A) Circuit Breakers. The use of reconditioned circuit breakers shall comply with (1) through (3):

(1) Molded-case circuit breakers shall **not** be permitted to be reconditioned.
(2) Low- and medium-voltage power circuit breakers shall be permitted to be reconditioned.
(3) High-voltage circuit breakers shall be permitted to be reconditioned.

(B) Component. The use of reconditioned trip units, protective relays, and current transformers shall comply with (1) and (2):

(1) Low-voltage power circuit breaker electronic trip units shall **not** be permitted to be reconditioned.

(2) Electromechanical protective relays and current transformers shall be permitted to be reconditioned.

☐ **Article 242 Overvoltage Protection (NEW ARTICLE)**

Part I. General

242.1 Scope. This article provides the general requirements, installation requirements, and connection requirements for overvoltage protection and overvoltage protective devices. Part II covers surge-protective devices (SPDs)

☐ **310 Conductor for General Wiring**

310.10 Uses Permitted. Type XHHN, XHWN, and XHWN-2 were added to the 310.10 "Uses Permitted" locations and the ampacity tables based on appropriate temperature ratings.

☐ **334.2 Nonmetallic-Sheathed Cable – Type NMS Deleted**

All references to Type NMS cable has been deleted from Article 334 as this cable construction is no longer manufactured.

☐ **406.4(D)(4) Arc-Fault Circuit-Interrupter Protection.**

If a receptacle outlet located in any areas specified in 210.12(A), (B), or (C) is replaced, a replacement receptacle at this outlet shall be AFCI protected**.**

☐ **406.9 Receptacles in Damp or Wet Locations.**

(C) Bathtub and Shower Space. Receptacles shall not be installed within a zone measured 900mm (3 ft) horizontally and 2.5m (8ft) vertically from the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and shall include the space directing over the tub or shower stall.

☐ **408.8 Reconditioning of Equipment *(Switchboards, Switchgear, and Panelboards)* (NEW)**

(A) Panelboards. Panelboards shall not be permitted to be reconditioned.

(B) Switchboards and Switchgear. Switchboards and switchgear, or sections of switchboards or switchgear shall be permitted to be reconditioned.

☐ **445.6 Listing *(Generators)*** Stationary generators 600 volts and less shall be listed.

☐ **445.18(D) Disconnecting Means and Emergency Shutdown (NEW)**

An outdoor emergency generator shutdown device is required for generators installed at one- and two-family dwelling units (other than cord-and-plug-connected generators).

☐ **480.7 DC Disconnect Methods *(Storage Batteries)***

(B) Emergency Disconnect.

(C) Disconnection of Series Battery Circuits

(D) Remote Actuation.

(E) Busway.

(F) Notification

(G) Identification of Power Sources. (NEW) Battery systems shall be indicated by 480.7(G)(1) and (G)(2).

(1) Facilities with Utility Services and Battery Systems. Plaques or directories shall be installed in accordance with 705.10 and 712.10.

Exception: *This requirement does not apply where a disconnect in 480.7(A) is not required.*

(2) Facilities with Stand-Alone Systems. A permanent plaque or directory shall be installed in accordance with 710.10.

☐ **600.5(B) & 600.6(A)(4) Marking Requirements at Disconnect (NEW)**

600.5(B) Marking. A disconnecting means for a sign, outline lighting system or controller is now required to be marked to identify the sign, outline lighting system, or controller it controls.

600.6(A)(4) Remote Location. The disconnecting means, if located remote from the sign, sign body, or pole, shall be mounted at an accessible location available to first responders and service personnel. The location and the disconnect shall be marked as the disconnect for the sign or outline lighting system. The label shall comply with 110.21(B)

☐ **Article 625 Electric Vehicle Power Transfer Systems (& 625.1 Scope) (NEW)**

This article covers the electrical conductors and equipment connecting an electric vehicle to premises wiring for the purpose of charging, power export, or bidirectional current flow.

☐ **625.54 Ground-Fault Circuit-Interrupter Protection for Personnel. (NEW)**

(Electric Vehicle Power Transfer System)

In addition to the requirements in 210.8, all receptacles installed for connection of electric vehicle charging shall have ground-fault circuit-interrupter protection for personnel.

☐ **625.56 Receptacle Enclosures.** *(Electric Vehicle Power Transfer System)*

All receptacles installed in a wet location for electric vehicle charging shall have an enclosure that is weather proof with the attachment plug cap inserted or removed.

☐ **680.21(C) GFCI Protection for Motors**

Outlets supplying all pool motors on branch circuits, rated 150 voltes or less to ground and 60 amperes or less, single- or 3-phas, shall be provided with Class A ground-fault circuit-interrupter protection.

☐ **680.21(D) Pool Pump Motor Replacement.**

Where a pool pump motor in 680.21(C) is replaced for maintenance or repair, the replacement pump motor shall be provided with ground-fault circuit-interrupter protection.

☐ **680.26(B)(2)(c) Copper Grid for Perimeter Surfaces.**

Where structural reinforcing steel is not available or is encapsulated in a non-conductive compound, copper grid shall be utilized where the following requirements are met:

(1) The copper grid shall be constructed of 8AWG solid bare copper and be arranged in accordance with 680.26(B)(1)(b)(3).
(2) The copper grid shall follow the contour of the perimeter surface extending 1m (3ft) horizontally beyond the inside walls of the pool.
(3) Only listed splicing devices or exothermic welding shall be permitted.
(4) The copper grid shall be secured within or under the deck or unpaved surfaces between 100mm to 150mm (4in to 6in) below subgrade.

☐ **690.13 Photovoltaic System Disconnecting Means.**

(A) Location. The PV system disconnecting means shall be installed at a readily accessible location. Where disconnecting means of systems above 30 volts are readily accessible to unqualified persons, any enclosure door or hinged cover that exposes live parts when open shall be locked or require a tool to open.

(E) Type of Disconnect. The PV system disconnecting means shall simultaneously disconnect the PV system conductors that are not solidy grounded from all conductors of other wiring systems. The PV system disconnecting means or its remote operating device or the enclosure providing access to the disconnecting means shall be capable of being locked in accordance with 110.25. The PV system disconnecting means shall be one of the following:

(1) A manually operable switch or circuit breaker
(2) A connector meeting the requirements of 690.33(D)(1) or (D)(3)
(3) A pull-out switch with the required interrupting rating
(4) A remote-controlled switch or circuit breaker that is operable locally and opens automatically when controlled power is interrupted.
(5) A device listed or approved for the intended application.

Informational Note: Circuit breakers marked “line” and ”load” may not be suitable for backfeed or reverse current.

☐ **706.4 System Requirements (Energy Storage Systems) - Nameplates for Energy Storage Systems**

Each ESS shall be provided with a nameplate plainly visible after installation and marked with the following:

(1) Manufacturer’s name, trademark, or other descriptive marking by which the organization responsible for supplying the ESS can be identified.
(2) Rated frequency
(3) Number of phases, if ac
(4) Rating (kW or kVA)
(5) Available fault current derived by the ESS at the output terminals
(6) Maximum output and input current of the ESS at the output terminals
(7) Maximum output and input voltage of the ESS at the output terminals
(8) Utility-interactive capability, if applicable