Residential Electrical Code Updates

Beginning January 1st 2025

*The following is a list of the more notable changes to the **NEC** (National Electrical Code) that affects residential construction industry. This is not all of the changes or all of the codes that apply to residential construction.*

Ground-Fault Circuit-Interrupter: (NEC 210.8), (GFCI)

: Shall be a **Listed** Class A GFCI

: Bathrooms: **All** 125 volt through 250 volt **receptacles** must be GFCI protected. "Bathroom" applies to the entire area whether or not separated by a door. *(**Exception**: the factory mounted receptacle within the bathroom exhaust/vent fan unless specified or required by manufacturer)*

: Garages and **Accessory buildings: All** 125 volt through 250 volt **receptacles** must be GFCI protected (No exceptions)

: Outdoors: All 125 volt through 250 volt receptacles must be GFCI

: Basements and **Crawl spaces: All** 125 volt through 250 volt receptacles must be GFCI. (**Exception:** fire and burglar systems)

: Kitchens: All 125 volt through 250 volt receptacles within the kitchen area. Including receptacles for refrigerators, ranges, microwaves, disposals, and hardwired appliances such as cooktops and wall ovens.)
Note: GFCI protective devices **must be readily accessible**. A GFCI receptacle located behind a refrigerator or under/inside a cabinet where obstacles must be moved to access the "test" button is **not** readily accessible. This would be the case for garbage disposals and micro-wave ovens.

: Permanent food preparation with sinks: (Butler's pantry): **All** 125 volt through 250 volt receptacles must be GFCI.

: **Sinks: All** 125 volt through 250 volt receptacles within 6' from the top inside edge of the bowl of the sink.

: **Boathouses: All** 125 volt through 250 volt receptacles must be GFCI.

: **Bathtubs** and **Shower stalls: All** 125 volt through 250 volt receptacles must be GFCI. (Pool house)

: **Laundry area: All** 125 volt through 250 volt receptacles must be GFCI. GFCI protection of receptacles in laundry areas of dwelling unit applies regardless of what the area or room is called

: **Indoor damp** and **wet locations: All** 125 volt through 250 volt receptacles must be GFCI. (Mud room)

: **Specific appliances requiring GFCI:** Sump pumps; dishwashers; electric ranges; wall-mounted ovens; counter-mounted cooking units; clothes dryers; microwave ovens.

: **Equipment requiring servicing:** GFCI protection is required for receptacles that Are used for servicing of heating, air-conditioning, and refrigeration equipment. The receptacle(s) are required to be within 25 feet of the appliance that would need servicing. (Attic, Hallway)

: **Outdoor outlets:** GFCI protection required for all outdoor outlets 150 volts or less to ground 50 amps or less.

: **Note: GFCI protection shall not be required for listed HVAC equipment. This exception shall expire September 1, 2026.**

NEC 210.11: (Refresher):

: **Small-Appliance Receptacle Outlet Circuits:** At least two (2) 20A, 120V branch circuits is required to supply kitchen, dining room, breakfast room, pantry, or similar areas.

: **Laundry Room Circuit:** At least one 20A, 120V branch circuit shall provide the laundry room receptacle(s). No other outlets allowed on this circuit.

: **Bathroom Circuit:** At least one 20A, 120V branch circuit shall be provided to supply bathroom(s) receptacle outlet(s) at any countertop and similar work surface receptacle outlets. This circuit shall have **no** other outlets.

: **Garage Branch Circuit:** At least one 20A, 120V branch circuit shall be installed to supply receptacle outlets in each vehicle bay of the garage. This circuit shall have no other outlets. Additional circuits may be added for additional outlets. (**Exception No. 1**: This circuit is permitted to supply outdoor receptacle outlets)

NEC 210.12: Arc-Fault Circuit-Interrupter Protection: The only locations **not** required to have arc-fault protection are the garage, bathroom(s), outdoors, and attic(s). (No exceptions)

NEC 210.52(C) Countertop and Work Surface: Receptacle outlets for countertop and work spaces 12 in. or wider must be installed so no point along the countertop or work space is more 2ft, measured horizontally.
If a receptacle outlet is **not provided** to serve an island or peninsular countertop or work surface, provisions must be provided at the island or peninsular for the future addition of a receptacle outlet to serve the island or peninsular countertop or work surface. **Receptacle outlets installed at islands and peninsulas must be located on or above the countertop or work surface.**

NEC 215.18 Surge Protection: Although surge protection is already required for dwelling unit services it will now be required for feeders suppling power from services to dwelling units, e.g. think townhomes, apartments, dormitory units, hotels, nursing homes and limited care units.
The surge protection device shall be either a Type 1 or Type 2 and must have a nominal discharge current rating of not less than 10kA. The device must be installed in or adjacent to distribution equipment which contains the branch-circuit overcurrent protective device(s), (breakers, fuses, etc.). NEC 242.9 requires that the SPD have the capability of indicating that it is functioning properly.

NEC 225.41: Emergency Disconnects: An emergency disconnect is required at a readily accessible outdoor location for one-and two-family dwelling units that are served by feeders. This disconnect must be on or within sight of the dwelling unit. This would apply to "mother-in-law" units where the power is from the main unit where the service originates to the other unit via feeder conductors.

NEC 240.4(D)(3): 14 AWG Copper-clad Aluminum: The 14 AWG copper-clad aluminum was added to the list of small conductors permitted per NEC 240.4(D). The over current protection device rating for the conductors cannot exceed 10 amperes, and the maximum continuous load on the circuit cannot exceed 8 amperes. Additionally, the breaker or fuses must be *listed* and marked for use with such conductors.
Note: As more of the copper-clad aluminum conductors are coming into the area, caution is needed to make sure outlet boxes are not *over-filled.* Wiring manufacturer(s) are using the colors of their copper non-metallic sheathed cables (Romex) for the copper-clad aluminum equivalence. However, to achieve their intentions of having the conductor's ratings remain the same the copper-clad aluminum is one size larger than the copper of the same color of sheath. (14/2 copper "Romex" has a white color sheath and is rated for 15A where 12/2 copper-clad aluminum has a white sheath for the 15A.

NEC 250.52(A)(3): Concrete-Encased Grounding Electrode: This is not new, but with more electronics and sensitive equipment now in residence , there is more need to emphasize the importance of this requirement. It requires a connection of 20 ft. or more of rebar connected by steel wire. It also requires bare copper 4awg or larger or a piece of rebar turned up into a wall for connection after framing.
Note: No vapor barrier can be between the concert and bare earth)

NEC 250.148: Continuity of Equipment Grounding Conductors and Attachment in Boxes: If multiple circuits are spliced within the box, ***all*** the EGCs must be connected together and to the box, (if conductive). This is not a new code but vastly overlooked.

NEC 406.9(A): Receptacles in Damp or Wet Locations: Receptacles installed in a damp location must be of the weather-resistant (WR) type.

NEC 406.9(C): Receptacles shall not be installed inside of the tub or shower or within a zone measured 3 ft. horizontally from any outside edge of the bathtub or shower stall, including the space outside the bathtub or shower stall space below the zone.

NEC 408.4: Every circuit and circuit modification shall be provided with a legible and permanent description that complies with all of the following conditions as applicable:

(1) Located at each switch or circuit breaker in a switchboard or switchgear.
(2) Included in a circuit directory that is located on the face of, inside of, or in an approved adjacent to the panel door in the case of a panel board.
(3) Clear, evident, and specific to the purpose or use of each circuiting including spare positions with an unused overcurrent device.
- Mark unused breakers as spares
- Mark multiple water heaters, condensers, air handlers, etc. as 1 & 2, A & B, first floor or second floor, etc.

(4) Described with a degree of detail and clarity that is unlikely to result in confusion between circuits.
- When labeling for kitchen receptacles: which kitchen receptacles: island, wall by stove, counter space by refrigerator, etc.

(5) Not dependent on transient conditions of occupancy.
- Example: top floor bedroom, left side- instead of "Bobby's room"

(6) Clear in explaining abbreviations and symbols when used.
- Examples: WH—water heater; a/h—air handler; DW—dishwasher

NEC 410.10(D)(1): No part of chain or cord-suspended luminaires, track lighting, pendants, or luminaire (light kit) on paddle fans can be within 3ft. horizontally and 8 ft. vertically of the top of the bathtub rim or shower stall threshold.

NEC 422.16(B)(2)(4) & (5): Built-in Dishwashers and Trash Compactors: If a flexible cord passes through an opening, it shall be protected against damage by a bushing, grommet, smoothed edge, or other approved means. The receptacle must be accessible.

NEC 440.8: Air conditioning equipment cannot be installed within a zone measured 3ft. horizontally and 8ft vertically from the top of a bathtub rim or shower stall threshold. A mini-split system over a bathtub or in a shower stall.

NEC 440.14: A disconnect for air-conditioning equipment must be within sight and readily accessible from the air-conditioning equipment. It must also meet the required working space requirements of NEC 110.26(A)- a clearance of 30in. wide a depth of 3ft. in front of the disconnect.

Swimming Pools, Fountains, and Similar Installations

NEC 680.7(C): Field-installed terminals in damp and wet locations, and corrosive environments must be *listed* for direct burial.

NEC 680.26: Equipotential Bonding: Equipotential Bonding is intended to reduce voltage gradients in the area around a permanently installed pool. It is not intended to extend, or be attached to any panel board, service disconnect, or grounding electrode.

NEC 680.26(C): The pool water shall be in direct contact with an approved corrosion-resistant conductive surface that exposes not less than 9sq. in. of surface area to the pool water at all times.

Solar

NEC 690.4(B): Components of a PV system must be ***listed*** or be evaluated by a ***field evaluation body*** and labeled by such.

NEC 690.4(C): The installation of PV systems must be performed by a **qualified person.**

NEC 690.7(2): For one-and-two-family dwelling units, the maximum PV system dc circuit voltage cannot exceed 600V.