Plans Review and Inspections

Significant Changes to the 2023 NEC

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Changes to the Code:

Changes in the NEC are indicated as follows:

-Rules that were changed since the previous edition are identified by shading the revised text.

-New rules aren’t shaded like a change, instead they have a shaded “N” in the margin to the left of the section number.

-Relocated rules are treated like new rules with a shaded “N” in the left margin by the section number.

-Deleted rules are indicated by a bullet symbol “•” located in the left margin where the rule was in the previous edition. Unlike older editions the bullet symbol is only used where one or more complete paragraphs have been deleted.

-A “Δ” represents partial text deletions and or figure/table revisions somewhere in the text. There’s no specific indication of which word, group of words, or a sentence was deleted.

New Articles

-Article 235 addresses branch circuits, feeders and services over 1,000 VAC, 1,500 VDC, nominal.

-Article 245 addresses the installation of overcurrent protection for systems rated over 1,000 VAC, 1,500 VDC.

-Article 305 (replacing Article 399) addresses general requirements for wiring methods and materials for systems rated over 1,000 VAC, 1,500 VDC, nominal.

-Article 315 (replacing Article 311) adds installation requirements for medium voltage conductors, cable, cable joints and cable terminations.

-Article 495 addresses equipment over 1,000 VAC, 1,500 VDC, nominal.

90.2 Scope Updated.

New areas covered:

(5): Installations supplying shore power to ships and watercraft in marinas and boatyards, including monitoring for leakage current.

(6) Installations used to export electric power from vehicles to premises wiring or for bidirectional current flow

Article 100:

Numerous new and revised definitions.

Previous editions of The Code had the definitions in Article 100 separated into three parts: Part I. General Part II. Over 1000 Volts, Nominal Part III. Hazardous (Classified) Locations. The three parts have been removed so definitions are listed in alphabetical order and no longer separated for over 1000V or hazardous locations. Article 100 now contains close to 800 definitions.

All definitions will now be located in Article 100. In previous code cycles, definitions could be found throughout the code. In addition, and as a result, the subdivisions within Articles were removed.

110.16 Arc-Flash Hazard Warning

-Feeder supplied equipment is now included in addition to service equipment

-Lowered the equipment rating from 1200 amperes or more to 1000 amperes or more

-Removed specific requirements for nominal system voltage, available fault current and clearing and refers instead to “applicable industry practice”. Note No. 2 directs users to NFPA 70E

Reconditioned Equipment: 110.21(A)(2), 240.2, 404.16(A)(B)(C)(D),406.2

Several new sections have been added and relocated to address equipment that is permitted to be reconditioned and equipment not permitted to be reconditioned. The reconditioned equipment shall be listed as reconditioned and comply with the additional marking requirements per 110.21(A)(2).

E3404.11/E3404.14

110.22 Identification of Disconnecting Means

110.21(A): General. Each disconnecting means shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident. In other than one- or two-family dwellings, the markings shall include the identification and location of the circuit source that supplies the disconnecting means unless located and arranged so the identification of the circuit source is evident.The markings shall be of sufficient durability to withstand the environment involved.

110.26 Spaces About Electrical Equipment:

110.26 Spaces About Electrical Equipment: Working space, and access to and egress from working space, shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment.Open equipment doors shall not impede access to and egress from the working space. Access or egress is impeded if one or more simultaneously opened equipment doors restrict access to be less than 610 mm (24 in.) wide and 2.0 m (6.5 ft.) high.

(N)110.26(A)(6) Grade,Floor, or Working Platform

110.26 (6): Grade,Floor, or Working Platform. The grade,floor, or working platform in the required working space shall be kept clear, and the floor, grade, or platform in the working space shall be as level and flat as practical for the entire required depth and width of the working space.

110.26(C)(2) Large Equipment

110.26(C)(2) Large Equipment: For large equipment that contains overcurrent devices, switching devices, or control devices, there shall be one entrance to and egress from the required working space not less than 610 mm (24 in.) wide and 2.0 m (6.5 ft) high at each end of the working space. This requirement shall apply to either of the following conditions:

(1) For equipment rated 1200 amperes or more and over 1.8m/(6’) wide.

(2) For service disconnecting means installed in accordance with 230.71(B) where the combined ampere rating is 1200 amperes or more and where the combined width is over 1.8m/(6’)

110.26 (C)(3) Personnel Doors

110.26(C)(3) Personnel Doors. A revision was added to clarify appropriate hardware (equipped with listed panic hardware or listed fire exit hardware) for personnel doors within 7.6m (25 ft) from the working space around electrical equipment rated 800 amperes or more.

- Listed fire exit hardware was added as an option in the 2020 edition.

210.8(A)(5) Basements

GFCI protection is now required for all dwelling unit basements regardless of finished/unfinished.

210.8(A)(12) Indoor Damp and Wet Locations

- GFCI protection is now required for “Indoor damp and wet locations.”

210.8(A)(6)(7) GFCI Requirements in Dwelling Unit Kitchens Modified and Expanded

The GFCI requirements for receptacles in kitchens expanded to include all 125 – 250V receptacles 150V to ground or less, not just those that serve countertop surfaces.

Section 210.8(A)(6) removes the term “receptacles serving the countertop” to expand GFCI protection to any plug- and cord-connected appliances in kitchens. It removes the distance limitations between the kitchen sink and 125-240 volt receptacle outlets connected to single phase branch circuits, 150 volt to ground or less.

210.8(B)(2)(3)(4) and (7) GFCI Requirements in Non-Dwelling Kitchens Modified and Expanded

The GFCI requirements for receptacles in non-dwelling kitchens were expanded.

- The definition of kitchen clarified to include “beverage preparation”
- Buffets are addressed and require GFCI protection
- Cord-and-Plug appliances need GFCI protection

210.8(D) GFCI Protection for Specific Appliances

-GFCI protection is required for the branch circuit or outlets supplying appliances.The appliances are put in list format.

-This revision adds clarity to what specific appliances shall be required to have GFCI protection and the methods the installer can use to provide this GFCI protection.

-Section 210.8(D) now includes new list items (8) through (12), as these are sometimes hard wired to outlets and would not be a part of the GFCI requirements found for receptacles in laundry areas as part of 210.8(A) and 210.8(B).

-Section 210.8(D) expands required GFCI protection to branch circuits or outlets of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers and microwave ovens.

210.8(F) Dwelling Unit Outdoor Outlets

The NEC has included Garages with below grade floors, accessory buildings and boathouses in this article that relates to outdoor outlets.

E3902

210.11(C)(4) Dwelling Unit Garage Branch Circuits

- A revision has been made to clarify that the required receptacle outlets from 210.52(G)(1) must be served from at least one 120-volt, 20-ampere branch circuit, and that this 20-ampere branch circuit is also permitted to serve other receptacle outlets within the garage.
- Other kinds of outlets within the garage or in other space(s) not included by Exception 1 are prohibited from being connected to the required 120-volt, 20-ampere branch circuit.

210.12(C)(D) Other Occupancies

- A revision has been made to clarify that areas designed for use exclusively as sleeping quarters in fire stations, police stations, ambulance stations, rescue stations, ranger stations, and similar locations are required to be AFCI protected.

210.17 Branch Circuit Requirements: Hotel/Motel and Assisted Living Facilities

- A revision has been made to clarify that assisted living facilities are now included in the list of occupancies, where guest rooms and guest suites, have the same branch circuit requirements as dwelling units.
- The section was reformatted in a list to add clarity. Informational Notes were added to provide appropriate guidance in the application of this section.
- The revision was made to distinguish between facilities that are equipped with or without permanent cooking apparatus.

210.23(A)(1)(2), 210.24, 240.4(D)(3), 310.3 (A)(B) and 406.3(C)(D) 10 Amp Branch Circuits

This change establishes a new section allowing 10-ampere branch circuits for lighting and exhaust fans. Certain loads are also prohibited, such as receptacle outlets, garage door openers and laundry equipment. The change addresses higher efficiencies in lighting and other equipment which result in lower electrical loads and may lead to oversizing circuit wiring and connected devices, such as circuit breakers. This change is one of several that are necessary to recognize 14 AWG copper-clad aluminum for branch circuit applications installed using a 10-ampere branch circuit

E3702.15

210.52(C) Receptacle Requirements for Islands and Peninsulas

- A revision has been made to not require receptacles in countertop or work surface areas, however if receptacle outlets are not provided, provisions shall be made at the island or peninsula, for future addition of a receptacle outlet to serve the island or peninsula countertop or work surface.

E3901.4

210.65 Meeting Rooms

210.65(B)(2): Floor Outlets. A meeting room with any floor dimension that is 12 ft or greater in any direction and has a floor area of at least 215 sq.ft. shall have at least one floor receptacle outlet, or at least one floor outlet to serve a receptacle(s), located at a distance not less than 6ft. from any fixed wall for each 215 sq.ft. or fraction thereof.

210.70 Limitations on Battery Powered Light Switches and Laundry Area Switch

- A new sentence has been added to clarify the need to support illumination upon failure of a control device powered exclusively by a battery to insure safe egress. The failure mode of a battery powered device must ensure illumination. The new sentence is included to permit battery powered control where the lighting outlets are automatically energized upon battery failure.
- A revision has been made to clarify that laundry areas be illuminated.

210.70(A)(2) Lighting Outlet Locations and Limitations

- A revision has been made to clarify that accessory structures are similar to attached and detached garages and have been added to the list in Section 210.70(A)(2). Requiring lighting in these areas enhances safety. In addition, the exception to (2) recognizes bulkhead doors with stairway access to basements. The NEC clarifies that they want these steps illuminated and controlled by a switch.

215.15 Barriers in Electrical Equipment

New section requires barriers over uninsulated ungrounded busbars or terminals that are exposed in panelboards, switchgear, or motor control centers

A new section has been added to clarify that barriers can mitigate the potential for shock for personnel working on electrical equipment. The new requirement for barriers to provide protection against inadvertent contact mirrors the requirements in 230.62(C).

215.18(A)-(E), 225.42(A)-(E) and 230.67(A)-(E) Surge Protection Requirements Expanded

- Surge protection is required for feeders supplying dwelling units, dormitory units, guest rooms and suites of hotels and motels, and areas of nursing homes and limited-care facilities used as patient sleeping rooms
  - The SPD must be installed in or adjacent to the distribution equipment on the load side of the feeder OCPD
- The SPD must be a Type 1 or Type 2 SPD and have a nominal discharge current rating (In) of 10kA

220.5(C) Load Calculations

This adds the requirement for the floor area of garages to be included when calculating the minimum lighting load for dwelling units.

220.53 Appliance Load-Dwelling Unit(s)

- All household electric cooking equipment that is fastened in place (not just the electric range) has been added to the list of appliances that cannot be included in the four or more appliances eligible for a 75% derating demand factor.

220.57 EVSE Demand Factor Calculations

A revision has been made to clarify that electric vehicle supply equipment (EVSE) shall not be included in the fixed appliance load when performing calculations for the appliance load in a one-family, two-family, or multifamily dwelling.

220.70 Energy Management Systems (EMS)

New section classifies a single value equal to the maximum ampere setpoint of the energy management system shall be permitted to be used in load calculations for the feeder or service.

225.41(A)(B)(C) Emergency Disconnects for One- and Two-family Dwelling Units

Article 225 Outside Branch Circuits and Feeders

225.41 Emergency Disconnects. For one-and two-family dwelling units, an emergency disconnecting means shall be installed.

(A) General.

(1) Location. The disconnecting means shall be installed in a readily accessible outdoor location on or within sight of the dwelling unit.

A new section has been added to correlate with existing requirements for service supplied dwelling units and the revisions in 230.85. The new section will help first responders and provide the ability to disconnect the power to the dwelling without regard to whether it's a feeder or service supplied.

230.46 Spliced and Tapped Conductors

Requirement for power distribution blocks installed on service conductors are required to be marked “suitable for use on the line side of the service equipment” or equivalent was moved to 230.46. All devices used to splice service conductors must be listed and marked as “suitable for use on the line side of the service equipment” or equivalent by January 1, 2023.

230.67 Surge Protection

A new requirement was added to require surge protection on all services for:

- Dwelling units
- Dormitory units
- Guest rooms and guest suites of hotels and motels
- Areas of nursing homes and limited-care facilities used exclusively as patient sleeping rooms

230.71(B) Two to Six Service Disconnecting Means.

-Added references for inadvertent contact protection required in 230.62

-Added transfer switches, metering centers and motor control centers as equipment that can contain service disconnecting means if they meet specific requirements

230.85(A)(B)(C)(D)(E) Emergency Disconnects for One- and Two-family Dwelling Units

230.85 Emergency Disconnects. For one- and two-familydwelling units, an emergency disconnecting means shall be installed.

(A) General. (1) Location. The disconnecting means shall be installed in a readily accessible outdoor location on or within sight of the dwelling unit.

Exception: Where the requirements of 225.41 are met, this section shall not apply.

A revision has been made to clarify the location, rating, and grouping of an emergency disconnecting means for one- and two-family dwelling units.

Clarification was given on the type of each emergency disconnecting means for one- and two-family dwelling units.

240.4(D) Small Conductors.

Class CF fuses were added as an acceptable overcurrent protective device for protection of 18 AWG and 16 AWG conductors

240.24(E) Overcurrent Devices Not Permitted in Locker Rooms or Showering Facilities

A revision has been made to prohibit overcurrent protective devices in all bathrooms. Also overcurrent protective devices are prohibited in showering facilities, or locker rooms with showering facilities, as they represent similar hazards. This revision recognizes the difficulty of accessing occupied bathrooms.

New Article 242: Overvoltage Protection

A new article was added to provide the general, installation, and connection requirements for overvoltage protection and overvoltage protective devices. Relocates Articles 280 and 285 into the new Article 242.

334.15(B), 334.19 Protecting Conductors – Bushings and Sheath Length

A new section has been added at 334.15 to ensure protection of the insulated conductors when they enter any type of electrical component. A new sentence has been added at 334.19 to provide consistency with other abrasion protection requirements when cable is installed in conduit or tubing.

406.9(C) Space Around Shower Stalls and Bathtub

A revision has been made to clarify that receptacles shall not be installed inside of the tub or shower or within a zone measured 3 ft (900 mm) horizontally from any outside edge of the bathtub or shower stall, which includes the space outside the bathtub, or shower stall, or within the space below the zone

406.12 Tamper-Resistant (TR) Receptacle Requirements Expanded

A revision has been made to clarify the locations where tamper-resistant receptacles are required to be installed.

Among the new areas are nursing homes, fitness centers, substance abuse/rehab, foster care, psych hospitals, and areas of agricultural buildings that are accessible to the general public.

422.18(B) Locating Paddle Fans in Bathrooms

Article 422 Appliances 422.18 Ceiling-Suspended (Paddle) Fans. (B) Location. No metal parts of ceiling-suspended (paddle) fans in bathrooms and shower spaces shall be located within a zone measured 900 mm (3 ft) horizontally and 2.5 m (8 ft) vertically from the top of the bathtub rim or shower stall threshold. This zone is all-encompassing and shall include the space directly over the tub or shower stall.

A new subsection has been added to address the requirements pertaining to ceiling-suspended (paddle) fans located in bathrooms and shower spaces.

E3501,E3905.6.3,E4106

424.48 Requirements for Heating Cables in Walls

A new section has been added to address the requirements for installation of heating cables in,on, or behind walls. Also, review 424.93(C) for similar installation requirements.

430.6(A) Sizing Conductors and Switches for Motors

A revision has been made to clarify the requirements when applying nameplate or table values for general motor applications.

440.11 AC/Refrigeration Disconnect Requires Lock or Tool to Access

Where the disconnecting means is readily accessible to an unqualified person per 440.11, a tool to open is required, or be capable of being locked.

445.18(A)(B) Generator Disconnect – Parallel Installations and Location

Modifications are made to clarify the permitted locations for emergency shutdown devices and marking. Section 445.18(B) is revised from “paralleling equipment” to “paralleling system bus” to clarify the intent of the requirement.

555.14 Equipotential Planes and Bonding of Equipotential Planes in Marinas

A revision has been made to clarify that enhanced safety will be achieved by requiring an equipotential plane to mitigate step and touch voltages for electrical equipment that supply power to equipment located at or on docks. In addition, this section correlates with section 682.33 with the same title.

555.15 Replacement of Electrical Equipment at Marinas

A new section has been added to address the requirements for modified or replaced equipment including an inspection of the circuit. Any damage found must be repaired. The goal is to eliminate defects that could contribute to electric shock or drowning. The new language does not require the entire circuit to be brought into compliance with the current code, only the replaced electrical equipment that was originally modified or changed.

680.5(A)(B(C) GFCI and SPGFCI for Swimming Pools and Similar Installations

A revision has been made to clarify the requirements for ground-fault protection to protect personnel from shock hazards. The ground-fault circuit-interrupter protection (GFCI) and special purpose ground-fault circuit-interrupter protection (SPGFCI), unless otherwise noted, are in addition to the requirements in 210.8, which address the requirements for 150 volts or less to ground and above 150 volts to ground.

New Articles:

2020:
242 SPDS
311 MV CONDUCTORS AND CABLE
337 TYPE P CABLE
800 GEN REQ FOR COMMUNICATIONS SYSTEMS