

2017
North Carolina
Electrical
Amendments

(Effective Date June 12, 2018)

(Amended 1/29/2020)

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Article 10 - ADMINISTRATIVE SECTION

10.1 TITLE

These Administrative Regulations along with the requirements included in the 2017 Edition of the National Electrical Code (NFPA-70 - 2017) as adopted by the North Carolina Building Code Council on December 12, 2017, to be effective June 12, 2018, with the following amendments:

- | | | |
|--------------------------|--------------------------|---------------------------|
| <u>(1) 110.16</u> | <u>(15) 250.50</u> | <u>(29) 408.4(B)</u> |
| <u>(2) 110.24(A)</u> | <u>(16) 250.53(A)(2)</u> | <u>(30) 409.22(B)</u> |
| <u>(3) 110.26(E)(2)</u> | <u>(17) 250.140</u> | <u>(31) 422.5(B)</u> |
| <u>(4) 110.41</u> | <u>(18) 250.142(B)</u> | <u>(32) 430.99</u> |
| <u>(5) 210.8(A)(3)</u> | <u>(19) 300.3(B)</u> | <u>(33) 430.130(A)(4)</u> |
| <u>(6) 210.8(B)(4)</u> | <u>(20) 300.9</u> | <u>(34) 440.10</u> |
| <u>(7) 210.8(D)</u> | <u>(21) 310.15(B)(7)</u> | <u>(35) Article 445</u> |
| <u>(8) 210.12</u> | <u>(22) 320.30(A)</u> | <u>(36) 555.1</u> |
| <u>(9) 210.12(B)</u> | <u>(23) 328.30</u> | <u>(37) 555.3</u> |
| <u>(10) 210.12(C)</u> | <u>(24) 330.30(A)</u> | <u>(38) 555.24</u> |
| <u>(11) 210.12(D)</u> | <u>(25) 334.15(C)</u> | <u>(39) 680.21(C)(1)</u> |
| <u>(12) 210.52(B)(2)</u> | <u>(26) 404.2(C)(8)</u> | <u>(40) 680.21(C)(2)</u> |
| <u>(13) 210.52(I)</u> | <u>(27) 406.4(D)</u> | |
| <u>(14) 230.95(C)</u> | <u>(28) 406.12</u> | |

(shall be known as the North Carolina Electrical Code, and may be cited as such or as the State Electrical Code; and will be referred to herein as “the code” or “this code”.

10.2 SCOPE Article 80 Administration and Enforcement of the code is hereby not adopted and does not apply for this code. For Scope and Exceptions to Applicability of Technical Codes, refer to the North Carolina Administrative Code and Policies. .

10.3 PURPOSE The purpose of the code is to provide minimum standards, provisions and requirements of safe and stable design, methods of construction, and uses of materials in buildings or structures hereafter erected, constructed, enlarged, altered, repaired, moved, converted to other uses, or demolished and to regulate the electrical systems, equipment, maintenance, use, and occupancy of all buildings or structures. All regulations contained in this code have a reasonable and substantial connection with the public health, safety, morals, or general welfare, and their provisions shall be construed reasonably to those ends

10.4 ADMINISTRATION For administrative regulations pertaining to inspection (rough-ins and finals), permits, and Certificates of Electrical Compliance, see local ordinances and the North Carolina Administrative Code and Policies. When the provisions of other codes are determined to be contrary to the requirements of this code, this code shall prevail.

10.5 DEFINITION Unless the context indicates otherwise, whenever the word “building” is used in this chapter, it shall be deemed to include the word “structure” and all installations such as plumbing systems, heating systems, cooling systems, electrical systems, elevators, and other installations which are parts of, or permanently affixed to, the building or structure.

10.6 APPLICATION OF CODE TO EXISTING BUILDINGS
For requirements of existing structures, refer to the North Carolina Administrative Code and Policies.

10.7 SERVICE UTILITIES 10.7.1 Connection of Service Utilities – No person shall make connections from a utility, source of energy, fuel, or power to any building or system that is regulated by the technical codes until approved by the Inspection Department and a Certificate of Compliance is issued (General Statute 143-143.2)

10.7.2 Authority to disconnect Service Utilities – The Inspection Department shall have the authority to require disconnecting a utility service to the building, structure, or system regulated by the technical codes, in case of emergency or where necessary to eliminate an imminent hazard to life or property. The Inspection Department shall have the authority to disconnect a utility service when a building has been occupied prior to Certificate of Compliance or entry into the building for purposes of making inspections cannot be readily granted. The Inspection Department shall notify the serving utility and whenever possible the owner or occupant of the building, structure, or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant shall be notified in writing within eight (8) working hours (General Statutes 143-143.2, 153A-365, 153A-366, 160A-425 and 160A-426).

10.8 TEMPORARY POWER 10.8.1 Scope. The provisions of this section apply to the utilization of portions of the wiring system within a building to facilitate construction.

10.8.2 Provisions for Temporary Power. The electrical Code Enforcement Official shall give permission and issue a permit to energize the electrical service when the provisions of 10.8 and the following requirements have been met:

- 1) The service wiring and equipment, including the meter socket enclosure, shall be installed, the service wiring terminated, and the service equipment covers installed.
- 2) The portions of the electrical system that are to be energized shall be complete and physically protected.
- 3) The grounding electrode system shall be complete.
- 4) The grounding and the grounded conductors shall be terminated in the service equipment.

- 5) At least one receptacle outlet with ground fault circuit interrupter protection for personnel shall be installed with the circuit wiring terminated.
- 6) The applicable requirements of the North Carolina Electrical Code apply.

10.8.3 Uses Prohibited. In no case shall any portion of the permanent wiring be energized until the portions have been inspected and approved by an electrical Code Enforcement Official. Failure to comply with this section may result in disconnection of power or revocation of permit.

10.8.4 Application for Temporary Power. Application for temporary power shall be made by and in the name of the applicant. The application shall explicitly state the portions of the energized electrical system, mechanical system, or plumbing system for which application is made, its intended use and duration.

10.8.5 Security and Notification. The applicant shall maintain the energized electrical system or that portion of the building containing the energized electrical system in a secured and locked manner or under constant supervision to exclude unauthorized personnel. The applicant shall alert personnel working in the vicinity of the energized electrical system to its presence.

10.9 Requirements of Other State Agencies, Occupational Licensing Boards, or Commissions The North Carolina State Building Codes do not include all additional requirements for buildings and structures that may be imposed by other State agencies, occupational licensing boards, and commissions. It shall be the responsibility of a permit holder, design professional, contractor, or occupational license holder to determine whether any additional requirements exist.

AMENDMENT 110.16

Amend NEC 2017, page 45:

110.16 Arc-Flash Hazard Warning. Electrical equipment, such as switchboards, switchgear, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are in other than dwelling units, and are likely to require examination, adjustment, servicing, or maintenance while energized, shall be field or factory marked to warn qualified persons of potential electric arc flash hazards. The marking shall meet the requirements in 110.21(B) and shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

AMENDMENT 110.24(A)

Amend NEC 2017, page 46:

110.24 Available Fault Current.

(A) Field Marking. Service equipment in other than dwelling units shall be legibly marked in the field with the maximum available fault current. The field marking(s) shall include the date the fault-current calculation was performed and be of sufficient durability to withstand the environment involved.

AMENDMENT 110.26(E)(2)

Amend NEC 2017, page 48:

(2)**Outdoor.** Outdoor installations shall comply with 110.26(E)(2)(a) through (c).

(a)*Installation Requirements.* Outdoor electrical equipment shall be the following:

(1) Installed in identified enclosures

(2) Protected from accidental contact by unauthorized personnel or by vehicular traffic

(3) Protected from accidental spillage or leakage from piping systems

(b) *Work Space.* The working clearance space shall include the zone described in 110.26(A). No architectural appurtenance or other equipment shall be located in this zone.

Exception: Structural overhangs or roof extensions shall be permitted in this zone.

(c) Deleted.

AMENDMENT 110.41

Amend NEC 2017, page 52:

110.41 Inspections and Tests.

Deleted.

AMENDMENT 210.8(A)(3)

Amend NEC 2017, page 59:

(3) Outdoors Exception No. 1 to (3): Receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, deicing, or pipeline and vessel heating equipment shall be permitted to be installed in accordance with 426.28 or 427.22, as applicable.

Exception No. 2 to (3): A single outlet receptacle supplied by a dedicated branch circuit that is located and identified for specific use by a sewage lift pump.

AMENDMENT 210.8(B)(4)

Amend NEC 2017, page 59:

(4)Outdoors

Exception No. 1 to (3) and (4): Receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, deicing, or pipeline and vessel heating equipment shall be permitted to be installed in accordance with 426.28 or 427.22, as applicable.

Exception No. 2 to (4): In industrial establishments only, where the conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in 590.6(B)(3) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power is interrupted or having a design that is not compatible with GFCI protection.

Exception No. 3 to (4): A single outlet receptacle supplied by a dedicated branch circuit that is located and identified for specific use by a sewage lift pump

AMENDMENT 210.8(D)

Amend NEC 2017, page 59:

(D) Kitchen Dishwasher Branch Circuit.

Deleted.

AMENDMENT 210.12

Amend NEC 2017, page 60:

210.12 Arc-Fault Circuit-Interrupter Protection. Arc-fault circuit-interrupter protection shall be provided as required in 210.12(A), (B), (C), and (D). The arc-fault circuit interrupter shall be installed in an accessible location.

(A) Dwelling Units. All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets or devices installed in dwelling unit family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, or similar rooms or areas shall be protected by any of the means described in 210.12(A)

(1) through (6):

AMENDMENT 210.12(B)

Amend NEC 2017, page 61:

(B) Dormitory Units. All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in dormitory unit bedrooms, living rooms, hallways, closets, and similar rooms shall be protected by any of the means described in 210.12(A)(1) through (6).

AMENDMENT 210.12(C)

Amend NEC 2017, page 61:

(C) Guest Rooms and Guest Suites.

Deleted.

AMENDMENT 210.12(D)

Amend NEC 2017, page 61:

(D) Branch Circuit Extensions or Modifications — Dwelling

Units and Dormitory Units. In any of the areas specified in 210.12

(A) or (B), where branch circuit wiring is modified, replaced, or extended, the branch circuit shall be protected by one of the following:

(1) A listed combination-type AFCI located at the origin of the branch circuit

(1) A listed outlet branch-circuit-type AFCI located at the first receptacle outlet of the existing branch circuit

Exception: AFCI protection shall not be required where the extension of the existing conductors is not more than 15.24 m (50 ft) and does not include any additional outlets or devices.

AMENDMENT 210.52(B)(2)

Amend NEC 2017, page 65:

(2) No Other Outlets. The two or more small appliance branch circuits specified in 210.52(B)(1) shall have no other outlets.

Exception No. 1: A receptacle installed solely for the electrical supply to and support of an electric clock in any of the rooms specified in 210.52(B)(1).

Exception No. 2: Receptacles installed to provide power for supplemental equipment and lighting on gas-fired ranges, ovens, or counter mounted cooking units.

Exception No. 3: Receptacles installed inside a dwelling and within 1.8 m (6 ft) of any kitchen sink measured by the shortest path that the cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, or fixed barrier.

AMENDMENT 210.52(I)

Amend NEC 2017, page 66:

(I) Foyers. Foyers that are not part of a hallway in accordance with 210.52 (H) and that have an area that is greater than 5.6 m² (60 ft²) shall have at least one receptacle.

AMENDMENT 230.95(C)

Amend NEC 2017, page 91:

(C) Performance Testing. The ground-fault protection system shall be performance tested when first installed on site. The test shall be conducted in accordance with instructions that shall be provided with the equipment. A written record of this test shall be made and shall be available to the authority having jurisdiction.

AMENDMENT 250.50

Amend NEC 2017, page 112:

250.50 Grounding Electrode System. All grounding electrodes as described in 250.52(A)(1) through (A)(7) that are available at each building or structure served shall be bonded together to form the grounding electrode system. Where none of these grounding electrodes exist, one or more of the grounding electrodes specified in 250.52(A)(4) through (A)(8) shall be installed and used.

Exception: Concrete-encased electrodes of existing buildings or structures shall not be required to be part of the grounding electrode system where the steel reinforcing bars or rods are not accessible for use without disturbing the concrete.

AMENDMENT 250.53(A)(2)

Amend NEC 2017, page 113:

(2)Supplemental Electrode Required. A single rod, pipe, or plate electrode shall be supplemented by an additional electrode of a type specified in 250.52(A)(2) through (A)(8). The supplemental electrode shall be permitted to be bonded to one of the following:

- (1)Rod, pipe, or plate electrode
- (2)Grounding electrode conductor
- (3)Grounded service-entrance conductor
- (4)Nonflexible grounded service raceway
- (5)Any grounded service enclosure

Exception No. 1: If a single rod, pipe, or plate grounding electrode has a resistance to earth of 25 ohms or less, the supplemental electrode shall not be required.

Exception No. 2: The supplemental ground electrode shall not be required at temporary electrical service installation (saw service pole) at a construction site provided all ungrounded circuits do not exceed 150 volts to ground, and the rating of the single disconnecting means or the summation of the ratings of multiple overcurrent devices that serve together as the disconnecting means, does not exceed 100 amperes.

AMENDMENT 250.140

Amend NEC 2017, page 126:

250.140 Frames of Ranges and Clothes Dryers. Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and outlet or junction boxes that are part of the circuit for these appliances shall be connected to the equipment grounding conductor in the manner specified by 250.134 or 250.138

Exception No. 1: For existing branch-circuit installations only where an equipment grounding conductor is not present in the outlet or junction box, the frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and outlet or junction boxes that are part of the circuit for these appliances shall be permitted to be connected to the grounded circuit conductor if all the following conditions are met.

(1) The supply circuit is 120/240-volt, single phase, 3-wire; or 208Y/120-volt derived from a 3-phase, 4-wire, wye-connected system.

(2) The grounded conductor is not smaller than 10 AWG copper or 8 AWG aluminum.

(3) Any of the following:

a. The grounded conductor is insulated;

b. The grounded conductor is uninsulated and part of a Type SE service-entrance cable and the branch circuit originates at the service;

c. The grounded conductor is uninsulated and part of a cable assembly and all current carrying conductors are protected by a ground-fault circuit interrupter at the origination of the branch circuit; or

d. A new 3-wire cable assembly not smaller than the existing conductors shall be permitted to be extended from the service to an enclosure where the existing conductors shall be spliced together and provisions are made so that the grounded conductors are insulated by tape, heat-shrink or other approved means inside the enclosure.

(4) Grounding contacts of receptacles furnished as part of the equipment are bonded to the equipment.

Exception No. 2: For existing branch-circuit installations only where an equipment grounding conductor is not present in the outlet or junction box, an equipment grounding conductor sized in accordance with 250.122 shall be permitted to be run separately from the circuit conductors.

AMENDMENT 250.142(B)

Amend NEC 2017, page 126:

(B) Load-Side Equipment. Except as permitted in 250.30(A)(1) and 250.32 (B) Exception, a grounded circuit conductor shall not be used for grounding non-current-carrying metal parts of equipment on the load side of the service disconnecting means or on the load side of a separately derived system disconnecting means or the overcurrent devices for a separately derived system not having a main disconnecting means.

Exception No. 1: The frames of ranges, wall mounted ovens, counter-mounted cooking units, and clothes dryers under the conditions permitted for existing installations by 250.140 shall be permitted to be connected to the grounded circuit conductor.

Exception No. 2: It shall be permissible to ground meter enclosures by connection to the grounded circuit conductor on the load side of the service disconnect where all of the following conditions apply:

- (1) No service ground-fault protection is installed.*
- (2) All meter enclosures are located immediately adjacent to the service disconnecting means.*
- (3) The size of the grounded circuit conductor is not smaller than the size specified in Table 250.122 for equipment grounding conductors.*

Exception No. 3: Direct-current systems shall be permitted to be grounded on the load side of the disconnecting means or overcurrent device in accordance with 250.164.

Exception No. 4: Electrode-type boilers operating at over 1000 volts shall be grounded as required in 490.72(E)(1) and 490.74.

Exception No. 5: It shall be permissible to ground an existing panelboard enclosure by connection to the grounded circuit conductor for a one- and two-family dwelling where all the following conditions apply:

- (1) When relocating or installing an additional main disconnecting means;
- (2) Enacting 250.142(B) Exception No. 5: (1) redefines the existing service entrance conductors as a feeder as set forth in Article 100;
- (3) An equipment grounding conductor in the existing panelboard is not present;
- (4) Replacement of the existing service entrance conductors either requires the removal of the building finish or is deemed impractical by the authority having jurisdiction.
- (5) All grounding electrode conductors are removed completely from the existing panelboard; and
- (6) The grounded conductors are insulated by tape, heat-shrink, or other approved means except where covered by the sheathing of a cable assembly or as needed for joints, splices, and termination purposes.

AMENDMENT 300.3(B)

Amend NEC 2017, page 134:

(5) Existing Dwelling Panelboards. An equipment grounding conductor for an existing one-and two-family dwelling shall be permitted to be installed separately and outside of the raceway or cable assembly where all the following conditions apply;

- (a) When relocating or installing an additional service disconnecting means;
- (b) Enacting 300.3(B)(5)(a) redefines the existing service entrance conductors as a feeder as set forth in Article 100; and
- (c) Replacement of the existing service entrance conductors either requires the removal of the building finish or is deemed impractical by the authority having jurisdiction.

AMENDMENT 300.9

Amend NEC 2017, page 139:

300.9 Raceways in Wet Locations Above grade. Where raceways are installed in wet locations above grade, the interior of these raceways shall be considered to be a wet location. Insulated conductors and cables installed in raceway in wet locations above grade shall comply with 310.10(C).

Exception: The raceway shall not be considered a wet location if:

(1) The section of raceway routed in a wet location above grade does not exceed 1.8 m (6 ft) in length;

(2) Any fittings or conduit bodies are watertight and listed for use in wet locations; and

(3) All termination points of the raceway are only open in any of the following:

a. A dry location;

b. Equipment suitable for outdoor use; or

c. Equipment listed for use in a wet location.

AMENDMENT 310.15(B)(7)

Amend NEC 2017, page 149:

(7) Single-Phase Dwelling Services and Feeders. For one-family dwellings and the individual dwelling units of two-family and multifamily dwellings, service and feeder conductors supplied by a single-phase, 120/240-volt system shall be permitted to be sized in accordance with 310.15(B)(7) (1) through (4).

For one-family dwellings and the individual dwelling units of two-family and multifamily dwellings, single-phase feeder conductors consisting of 2 ungrounded conductors and the neutral conductor from a 208Y/120 volt system shall be permitted to be sized in accordance with 310.15(B)(7)(1) through (3).

(1)For a service rated 100 through 400 amperes, the service conductors supplying the entire load associated with a one-family dwelling, or the service conductors supplying the entire load associated with an individual dwelling unit in a two-family or multifamily dwelling, shall be permitted to have an ampacity not less than the ampacity as listed in Table 310.15 (B)(7).

(2)For a feeder rated 100 through 400 amperes, the feeder conductors supplying the entire load associated with a one-family dwelling, or the feeder conductors supplying the entire load associated with an individual dwelling unit in a two-family or multifamily dwelling, shall be permitted to have an ampacity not less than the ampacity as listed in Table 310.15 (B)(7).

(3)In no case shall a feeder for an individual dwelling unit be required to have an ampacity greater than that specified in 310.15(B)(7)(1) or (2).

(4)Grounded conductors shall be permitted to be sized smaller than the ungrounded conductors, if the requirements of 220.61 and 230.42 for service conductors or the requirements of 215.2 and 220.61 for feeder conductors are met.

Where correction or adjustment factors are required by 310.15 (B)(2) or (3), they shall be permitted to be applied to the ampacity associated with the temperature rating of the conductor.

**Table 310.15(B)(7) Single-Phase Dwelling Service and Feeders
for Conductor Types RHH, RHW, RHW-2, THHW, THW,
THW-2, THWN-2, XHHW, XHHW-2, SE, USE, USE-2**

Service of Feeder Rating (Ampere)	Conductor (AWG or kcmil)	
	Copper	Aluminum or Copper Clad Aluminum
100	4	2
110	3	1
125	2	1/0
150	1	2/0
175	1/0	3/0
200	2/0	4/0
225	3/0	250
250	4/0	300
300	250	350
350	350	500
400	400	600

Table 310.15(B)(7)

AMENDMENT 320.30(A)

Amend NEC 2017, page 183:

(A) **General.** Type AC cable shall be supported and secured by staples; cable ties; straps, hangers, or similar fittings; or other approved means designed and installed so as not to damage the cable.

AMENDMENT 328.30

Amend NEC 2017, page 187:

328.30 Support. Type MV cable terminated in equipment or installed in pull boxes or vaults shall be secured and supported by metallic or non-metallic supports suitable to withstand the weight by cable ties, or other approved means, at intervals not exceeding 1.5 m (5 ft) from terminations or a maximum of 1.8 m (6 ft) between supports.

AMENDMENT 330.30(A)

Amend NEC 2017, page 189:

(A) **General.** Type MC cable shall be supported and secured by staples; cable ties; straps, hangers, or similar fittings; or other approved means designed and installed so as not to damage the cable.

AMENDMENT 334.15(C)

Amend NEC 2017, page 192:

(C) In Unfinished Basements and Crawl Spaces.

Where cable is run at angles with joists in unfinished basements, it shall be permissible to secure cables not smaller than two 6 AWG or three 8 AWG conductors directly to the lower edges of the joists. Smaller cables shall be run either through bored holes in joists or on running boards. Nonmetallic-sheathed cable installed on the wall of an unfinished basement shall be permitted to be installed in a listed conduit or tubing or shall be protected in accordance with 300.4. Conduit or tubing shall be provided with a suitable insulating bushing or adapter at the point the cable enters the raceway. The sheath of the nonmetallic-sheathed cable shall extend through the conduit or tubing and into the outlet or device box not less than 6 mm (1/4 in.). The cable shall be secured within 300 mm (12 in.) of the point where the cable enters the conduit or tubing. Metal conduit, tubing, and metal outlet boxes shall be connected to an equipment grounding conductor complying with the provisions of 250.86 and 250.148.

AMENDMENT 404.2(C)(8)

Amend NEC 2017, page 254:

(C) Switches Controlling Lighting Loads. The grounded circuit conductor for the controlled lighting circuit shall be installed at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit serving bathrooms, hallways, stairways, or rooms suitable for human habitation or occupancy as defined in the applicable building code. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded circuit conductor shall only be required at one location. A grounded conductor shall not be required to be installed at lighting switch locations under any of the following conditions:

- (1) Where conductors enter the box enclosing the switch through a raceway, provided that the raceway is large enough for all contained conductors, including a grounded conductor
- (2) Where the box enclosing the switch is accessible for the installation of an additional or replacement cable without removing finish materials
- (3) Where snap switches with integral enclosures comply with 300.15 (E)
- (4) Where lighting in the area is controlled by automatic means
- (5) Where a switch controls a receptacle load
- (6) Where installed in residential one- and two family dwellings.

The grounded conductor shall be extended to any switch location as necessary and shall be connected to switching devices that require line to-neutral voltage to operate the electronics of the switch in the standby mode and shall meet the requirements of 404.22

Exception: The connection requirement shall become effective on January 1, 2020. It shall not apply to replacement or retrofit switches installed in locations prior to local adoption of 404.2(C) and where the grounded conductor cannot be extended without removing finish materials. The number of electronic lighting control switches on a branch circuit shall not exceed five, and the number connected to any feeder on the load side of a system or main bonding jumper shall not exceed 25. For the purpose of this exception, a neutral busbar, in compliance with 200.2(B) and to which a main or system bonding jumper is connected shall not be limited as to the number of electronic lighting control switches connected.

AMENDMENT 406.4(D)

Amend NEC 2017, page 258:

(D) Replacements. Replacement of receptacles shall comply with 406.4(D) (1) through (D)(6), as applicable. Arc-fault circuit-interrupter type and ground-fault circuit-interrupter type receptacles shall be installed in an accessible location.

AMENDMENT 406.12

Amend NEC 2017, page 261:

406.12 Tamper-Resistant Receptacles. All 15- and 20-ampere, 125- and 250-volt non-locking type receptacles in the areas specified in 406.12(1) through (7) shall be listed tamper-resistant receptacles.

(1) Dwelling units in all areas specified in 210.52 and 550.13

(2) Guest rooms and guest suites of hotels and motels

(3) Child care facilities

(4) Preschools and elementary education facilities

(5) Deleted

(6) Deleted

(7) Deleted

AMENDMENT 408.4(B)

Amend NEC 2017, page 263:

(B) Source of Supply. All switchboards, switchgear, and panelboards supplied by a feeder(s) in other than one- or two-family dwellings shall be permanently marked to indicate each device or equipment where the power originates. The label shall be permanently affixed, and of sufficient durability to withstand the environment involved.

AMENDMENT 409.22(B)

Amend NEC 2017, page 266:

(B) Documentation. Deleted.

AMENDMENT 422.5(B)

Amend NEC 2017, page 276:

(B) Type. Deleted.

AMENDMENT 430.99

Amend NEC 2017, page 313:

430.99 Available Fault Current. Deleted

AMENDMENT 430.130(A)(4)

Amend NEC 2017, page 317:

(A) Circuits Containing Power Conversion Equipment. Circuits containing power conversion equipment shall be protected by a branch-circuit short-circuit and ground-fault protective device in accordance with the following:

- (1) The rating and type of protection shall be determined by 430.52(C)(1), (C)(3), (C)(5), or (C)(6), using the full-load current rating of the motor load as determined by 430.6.
- (2) Where maximum branch-circuit short-circuit and ground-fault protective ratings are stipulated for specific device types in the manufacturer's instructions for the power conversion equipment or are otherwise marked on the equipment, they shall not be exceeded even if higher values are permitted by 430.130(A)(1).
- (3) A self-protected combination controller shall only be permitted where specifically identified in the manufacturer's instructions for the power conversion equipment or if otherwise marked on the equipment.
- (4) Deleted.

AMENDMENT 440.10

Amend NEC 2017, page 325:

440.10 Short-Circuit Current Rating.

Deleted

AMENDMENT Article 445

Amend NEC 2017, page 329 – 331:

ARTICLE 445 Generators

445.1 Scope. This article contains installation and other requirements for generators.

445.10 Location. Generators shall be of a type suitable for the locations in which they are installed. They shall also meet the requirements for motors in 430.14.

445.11 Marking. Each generator shall be provided with a nameplate giving the manufacturer's name, the rated frequency, the number of phases if of ac, the rating in kilowatts or kilovolt-amperes, the normal volts and amperes corresponding to the rating, the rated revolutions per minute, and the rated ambient temperature or rated temperature rise. Nameplates for all stationary generators and portable generators rated more than 15 kW shall also give the power factor, the sub-transient and transient impedances, the insulation system class, and the time rating. Marking shall be provided by the manufacturer to indicate whether or not the generator neutral is bonded to the generator frame. Where the bonding of a generator is modified in the field, additional marking shall be required to indicate whether the generator neutral is bonded to the generator frame.

445.12 Overcurrent Protection.

(A) Constant-Voltage Generators. Constant voltage generators, except ac generator exciters, shall be protected from overload by inherent design, circuit breakers, fuses, protective relays, or other identified overcurrent protective means suitable for the conditions of use.

(B) Two-Wire Generators. Two-wire, dc generators shall be permitted to have overcurrent

protection in one conductor only if the overcurrent device is actuated by the entire current generated other than the current in the shunt field. The overcurrent device shall not open the shunt field.

(C) 65 Volts or Less. Generators operating at 65 volts or less and driven by individual motors shall be considered as protected by the overcurrent device protecting the motor if these devices will operate when the generators are delivering not more than 150 percent of their full-load rated current.

(D) Balancer Sets. Two-wire, dc generators used in conjunction with balancer sets to obtain neutral points for 3-wire systems shall be equipped with overcurrent devices that disconnect the 3-wire system in case of excessive unbalancing of voltages or currents.

(E) Three-Wire, Direct-Current Generators. Three-wire, dc generators, whether compound or shunt wound, shall be equipped with overcurrent devices, one in each armature lead, and connected so as to be actuated by the entire current from the armature. Such overcurrent devices shall consist either of a double-pole, double-coil circuit breaker or of a 4-pole circuit breaker connected in the main and equalizer leads and tripped by two overcurrent devices, one in each armature lead. Such protective devices shall be interlocked so that no one pole can be opened without simultaneously disconnecting both leads of the armature from the system.

Exception to (A) through (E): Where deemed by the authority having jurisdiction that a generator is vital to the operation of an electrical system and the generator should operate to failure to prevent a greater hazard to persons, the overload sensing device(s) shall be permitted to be connected to an annunciator or alarm supervised by authorized personnel instead of interrupting the generator circuit.

445.13 Ampacity of Conductors. The ampacity of the conductors from the generator terminals to the first distribution device(s) containing overcurrent protection shall not be less than 115 percent of the nameplate current rating of the generator. It shall be permitted to size the neutral conductors in accordance with 220.61. Conductors that must carry ground-fault currents shall not be smaller than required by 250.30(A). Neutral conductors of dc generators that must carry ground-fault currents shall not be smaller than the minimum required size of the largest conductor.

Exception: Where the design and operation of the generator prevent overloading, the ampacity of the conductors shall not be less than 100 percent of the nameplate current rating of the generator.

445.14 Protection of Live Parts. Live parts of generators operated at more than 50 volts to ground shall not be exposed to accidental contact where accessible to unqualified persons.

445.15 Guards for Attendants. Where necessary for the safety of attendants, the requirements of 430.233 shall apply.

445.16 Bushings. Where field-installed wiring passes through an opening in an enclosure, a conduit box, or a barrier, a bushing shall be used to protect the conductors from the edges of an opening having sharp edges. The bushing shall have smooth, well-rounded surfaces where it may be in contact with the conductors. If used where oils, grease, or other contaminants may be present, the bushing shall be made of a material not deleteriously affected.

445.17 Generator Terminal Housings. Generator terminal housings shall comply with 430.12. Where a horsepower rating is required to determine the required minimum size of the generator terminal housing, the full-load current of the generator shall be compared with comparable motors in Table 430.247 through Table 430.250. The higher horsepower rating of Table 430.247 and Table 430.250 shall be used whenever the generator selection is between two ratings.

Exception: This section shall not apply to generators rated over 600 volts.

445.18 Disconnecting Means Required for Generators. Generators shall be equipped with a disconnect(s), lockable in the open position by means of which the generator and all protective devices and control apparatus are able to be disconnected entirely from the circuits supplied by the generator except where the following conditions apply:

(1) Portable generators are cord- and plug connected; or

(2) Both of the following conditions apply:

a. The driving means for the generator can be readily shut down, is rendered incapable of restarting, and is lockable in the OFF position in accordance with 110.25.

b. The generator is not arranged to operate in parallel with another generator or other source of voltage.

Informational Note: See UL 2200-2012, Standard for Safety of Stationary Engine Generator Assemblies.

445.20 Ground-Fault Circuit-Interrupter Protection for Receptacles on 15-kW or Smaller Portable Generators. All 125-volt, single-phase, 15- and 20-ampere receptacle outlets that are a part of a 15-KW or smaller portable generator either shall have ground-fault circuit-interrupter protection for personnel integral to the generator or receptacle or shall not be available for use when the 125/250-volt locking-type receptacle is in use. If the generator does not have a 125/250-volt locking-type receptacle, this requirement shall not apply.

AMENDMENT 555.1

Amend NEC 2017, page 482:

555.1 Scope. This article covers the installation of wiring and equipment in the areas comprising fixed or floating piers, wharves, docks, and other areas in marinas, boatyards, boat facilities associated with residential condominiums; any multiple docking facility or similar occupancies; and facilities that are used, or intended for use, for the purpose of repair, berthing, launching, storage, or fueling of small craft and the moorage of floating buildings. Private, noncommercial docking facilities constructed or occupied for the use of the owner or residents of the associated single-family dwelling are not covered by this article.

AMENDMENT 555.3

Amend NEC 2017, page 482:

555.3 Ground-Fault Protection. The main overcurrent protective device that feeds the marina shall have ground fault protection not exceeding 30 mA. Ground-fault protection not exceeding 30 mA of each individual branch or feeder circuit shall be permitted as a suitable alternative.

AMENDMENT 555.24

Amend NEC 2017, page 485:

555.24 Signage. Permanent safety signs shall be installed to give notice of electrical shock hazard risks to persons using or swimming near a boat dock or marina and shall comply with all of the following:

- (1) The signage shall comply with 110.21(B)(1) and be of sufficient durability to withstand the environment.
- (2) The signs shall be clearly visible from all approaches to a marina or boatyard facility.
- (3) The signs shall state

**“WARNING
POTENTIAL SHOCK HAZARD
ELECTRICAL CURRENTS MAY BE
PRESENT IN THE WATER
NO SWIMMING.”**

Informational Note: See scope for application of this Article.

AMENDMENTS 680.21(C)(1) & (2)

Amend NEC 2017, page 546:

(C) GFCI Protection. Outlets supplying pool pump motors connected to single-phase, 120-volt through 240-volt branch circuits, whether by receptacle or by direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel.

(1) Pool Pump Motor Replacement. Whenever a pool pump motor requires replacing and the existing branch circuit or receptacle providing power to the pump motor does not provide ground-fault circuit-interrupter protection for personnel as required by 680.21(C), the branch circuit or receptacle shall be updated to provide ground-fault circuit-interrupter protection for personnel.

(2) Existing Pool Pump Motor Branch Circuit and Over-current Protection. All existing single phase, 120-volt through 240-volt branch circuits and overcurrent devices that supply power to a pool pump motor by direct connection or outlet shall comply with the provisions of 680.21 (C) when the branch circuits or overcurrent devices are altered, installed, modified, relocated, repaired, or replaced.

Additional Amendments

The Amendments on this document have been approved by the Rules Review Commission. A person who desires to use an amendment prior to its effective date shall make such request with the Code Enforcement Official as an alternate method of construction in accordance with section 102.5 of the NC Administrative Code and Policies. However, the Code Enforcement Official shall not be required to accept such request earlier than the date of approval from the Rules Review Commission. North Carolina Administrative Code and Policies 102.5 Interim use of approved rules. Any rules that are adopted by the Building Code Council and approved by the Rules Review Commission shall be accepted by the Code Enforcement Official as an alternate method of construction prior to the effective date if requested by the owner or his agent.

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.

NOTE: This Amendment is specifically for section 210.8(A)(2). It has no effect on section 210.8(A)(1) or sections 210.8(A)(3) through (10).

J. Starling

(A)**Dwelling Units.** All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in 210.8 (A)(1) through (10) shall have ground-fault circuit-interrupter protection for personnel.

(2)**Garages, and also accessory buildings** that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use

Exception No. 1 to (2): Receptacles that are not readily accessible.

Exception No. 2 to (2): A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord-and-plug connected in accordance with 400.10(A)(6), (A)(7), or (A)(8).

Receptacles installed under the exceptions to 210.8(A)(2) shall not be considered as meeting the requirements of 210.52(G).

The delayed effective date of this Rule is January 1, 2020.

The Statutory authority for Rule-making is G. S. 143-136; 143-138.

2017 NC Electrical Code

Table 300.5 Minimum Cover Requirements.

Table 300.5 Minimum Cover Requirements, 0 to 1000 Volts, Nominal, Burial in Millimeters (Inches)

Location of Wiring Method or Circuit	Type of Wiring Method or Circuit									
	Column 1 Direct Burial Cables or Conductors		Column 2 Rigid Metal Conduit or Intermediate Metal Conduit		Column 3 Nonmetallic Raceways Listed for Direct Burial Without Concrete Encasement or Other Approved Raceways		Column 4 Residential Branch-Circuits Rated 120-125/250 volts or less with GFCI Protection and Maximum Overcurrent Protection of 20 50 Amperes		Column 5 Circuits for Control of Irrigation and Landscape Lighting Limited to Not More Than 30 Volts and Installed with Type UF or in Other Identified Cable or Raceway	
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
All locations not specified below	600	24	150	6	450	18	300	12	150 ^{a,b}	6 ^{a,b}
In trench below 50 mm (2 in.) thick concrete or equivalent	450	18	150	6	300	12	150	6	150	6
Under a building	0	0	0	0	0	0	0	0	0	0
	(in raceway or Type MC or Type MI cable identified for direct burial)						(in raceway or Type MC or Type MI cable identified for direct burial)		(in raceway or Type MC or Type MI cable identified for direct burial)	
Under minimum of 102 mm (4 in.) thick concrete exterior slab with no vehicular traffic and the slab extending not less than 152 mm (6 in.) beyond the underground installation	450	18	100	4	100	4	150	6	150	6
							(direct burial)		(direct burial)	
							100	4	100	4
							(in raceway)		(in raceway)	
Under streets, highways, roads, alleys, driveways, and parking lots	600	24	600	24	600	24	600	24	600	24
One- and two-family dwelling driveways and outdoor parking areas, and used only for dwelling-related purposes	450	18	450	18	450	18	300	12	450	18
In or under airport runways, including adjacent areas where trespassing prohibited	450	18	450	18	450	18	450	18	450	18

^aA lesser depth shall be permitted where specified in the installation instructions of a listed low-voltage lighting system.

^bA depth of 150 mm (6 in.) shall be permitted for pool, spa, and fountain lighting, installed in a nonmetallic raceway, limited to not more than 30 volts where part of a listed low-voltage lighting system.

Notes:

- Cover is defined as the shortest distance in mm (in.) measured between a point on the top surface of any direct-buried conductor, cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover.
- Raceways approved for burial only where concrete encased shall require concrete envelope not less than 50 mm (2 in.) thick.
- Lesser depths shall be permitted where cables and conductors rise for terminations or splices or where access is otherwise required.
- Where one of the wiring method types listed in Columns 1 through 3 is used for one of the circuit types in Columns 4 and 5, the shallowest depth of burial shall be permitted.
- Where solid rock prevents compliance with the cover depths specified in this table, the wiring shall be installed in a metal raceway, or a nonmetallic raceway permitted for direct burial. The raceways shall be covered by a minimum of 50 mm (2 in.) of concrete extending down to rock.

The delayed effective date of this Rule is January 1, 2020.

The Statutory authority for Rule-making is G. S. 143-136; 143-138.

320.23(A) Cables Run Across the Top of Floor Joists.

320.23 In Accessible Attics. Type AC cables in accessible attics or roof spaces shall be installed as specified in 320.23(A) and (B).

~~(A) **Cables Run Across the Top of Floor Joists.** Where run across the top of floor joists, or within 2.1 m (7 ft) of the floor or floor joists across the face of ceiling rafters or studding, the cable shall be protected by guard strips that are at least as high as the cable, unless the cables are physically considered outside any floored area. Where this space is not accessible by permanent stairs or ladders, protection shall only be required within 1.8 m (6 ft) of the nearest edge of the scuttle hole or attic entrance where cables are run across the top of floor (ceiling) joists.~~

(B) Cables Run Across the Top of Floor Joists. The cable shall be protected by guard strips that are at least as high as the cable where one of the following applies:

(1) Where this space is accessible by permanent stairs or ladders, protection shall be required in the area directly over a permanent floor not exceeding 2.1 m (7 ft) vertically from the floor, or where run across the top of floor joists.

(2) Where this space is not accessible by permanent stairs or ladders, protection shall be required within 1.8 m (6 ft) horizontally of the nearest edge of the scuttle hole or attic entrance where run across the top of any flooring, or flooring or ceiling joists. Protection is not required where run across the face of overhead roofing trusts or rafters.

Exception: For the purpose of this section, pull-down type stairs are not to be considered as permanent stairs or ladders.

The delayed effective date of this Rule is January 1, 2019.

The Statutory authority for Rule-making is G. S. 143-136; 143-138.

410.2 Definition. Closet Storage Space. The volume bounded by the sides and back closet walls and planes extending from the closet floor vertically to a height of 1.8 m (6 ft) or to the highest clothes-hanging rod and parallel to the walls at a horizontal distance of 600 mm (24 in.) from the sides and back of the closet walls, respectively, and continuing vertically to the closet ceiling parallel to the walls at a horizontal distance of 300 mm (12 in.) or the width of the shelf, whichever is greater; for a closet that permits access to both sides of a hanging rod, this space includes the volume below the highest rod extending 300 mm (12 in.) on either side of the rod on a plane horizontal to the floor extending the entire length of the rod. See Figure 410.2.

Exception: Where a shelf is not present in the area of wall above the closet's entrance opening or doorway extending from the top of such opening or doorway vertically to the ceiling, including the area of ceiling extending perpendicular from the area of wall directly above the closet's entrance opening or doorway to a horizontal distance of 300 mm (12 in.), shall not be defined as closet storage space. See Figure 410.2 Exception.

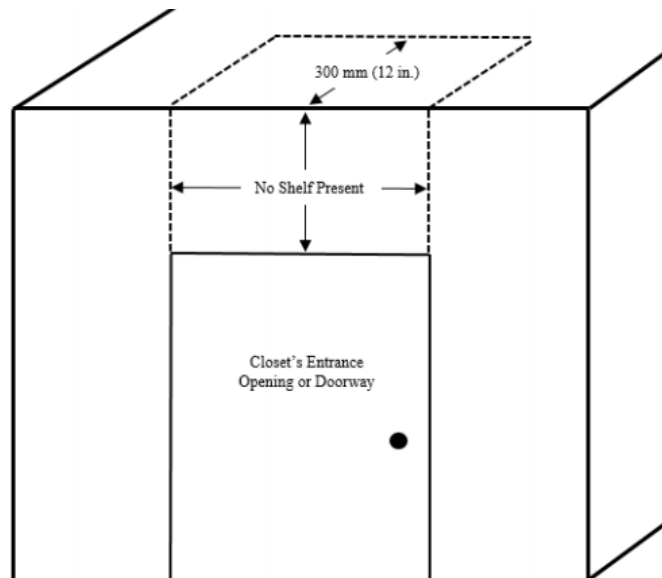


Figure 410.2 Exception Closet Storage Space Exception

The delayed effective date of this Rule is January 1, 2020.

The Statutory authority for Rule-making is G. S. 143-136; 143-138.

410.16 Luminaires in Clothes Closets.

(C) Location. The minimum clearance between luminaires installed in clothes closets and the nearest point of a closet storage space shall be as follows:

- (1) 300 mm (12 in.) for surface-mounted incandescent or LED luminaires with a completely enclosed light source installed on the wall above the door or on the ceiling.
- (2) 150 mm (6 in.) for surface-mounted fluorescent luminaires installed on the wall above the door or on the ceiling.
- (3) 150 mm (6 in.) for recessed incandescent or LED luminaires with a completely enclosed light source installed in the wall or the ceiling.
- (4) 150 mm (6 in.) for recessed fluorescent luminaires installed in the wall or the ceiling.
- (5) Surface-mounted fluorescent or LED luminaires shall be permitted to be installed within the closet storage space where identified for this use.
- (6) LED luminaires with a completely enclosed light source or fluorescent luminaires shall be permitted to be installed within the area defined in 410.2 Exception.

The delayed effective date of this Rule is January 1, 2020.

The Statutory authority for Rule-making is G. S. 143-136; 143-138.

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.

(B) Other Than Dwelling Units. All single-phase receptacles rated 150 volts to ground or less, 50 amperes or less and three phase receptacles rated 150 volts to ground or less, 100 amperes or less installed in the following locations shall have ground-fault circuit-interrupter protection for personnel.

The delayed effective date of this Rule is January 1, 2021. The Statutory authority for Rule-making is G. S. 143-136; 143-138.

406.4(D)(4) Arc Fault Circuit Interrupters. Where a receptacle outlet is located in any areas specified in 210.12(A) or (B), a replacement receptacle at this outlet shall be one of the following:

- (1) A listed outlet branch circuit type arc fault circuit interrupter receptacle
- (2) A receptacle protected by a listed outlet branch circuit type arc fault circuit interrupter type receptacle
- (3) A receptacle protected by a listed combination type arc fault circuit interrupter type circuit breaker

Exception No. 1: Arc fault circuit interrupter protection shall not be required where all of the following apply: (1) The replacement complies with 406.4(D)(2)(b).

(2) It is impracticable to provide an equipment a ground conductor as provided by 250.130(C).

(3) A listed combination type arc fault circuit interrupter circuit breaker is not commercially available.

(4) GFCI/AFCI dual function receptacles are not commercially available.
Exception No. 2: Section 210.12(B),

Exception shall not apply to replacement of receptacles.

The delayed effective date of this Rule is January 1, 2021. The Statutory authority for Rule-making is G. S. 143-136; 143-138.

695.2 Definitions. Fault-Tolerant External Control Circuits. Those control circuits either entering or leaving the fire pump controller enclosure, which if broken, disconnected, or shorted will not prevent the controller from starting the fire pump from all other internal or external means and may cause the controller from starting the fire pump from all other internal or external means and may cause the controller to start the pump under these conditions. **On-Site Power Production Facility.** The normal supply electric power for the site that is expected to be constantly producing power. **On-Site Standby Generator.** A facility producing electric power on site as the alternate supply of electric power. It differs from an on-site power production facility, in that it is not constantly producing power. **Reliable Source of Power.** A source of power that possesses all of the following characteristics: (1) The electric utility supplying the power has not conducted any intentional shut downs longer than 10 continuous hours in the year prior to the plan submittal and is verified in writing by that electric utility. (2) The source of power is not supplied by overhead conductors within 60 feet of the building(s) equipped with fire pump(s). (3) Only the disconnect switches and overcurrent protection devices permitted in Article 695 and NFPA 20-2013 section 9.3.2 are installed in the normal source of power to the fire pump controller.

The delayed effective date of this Rule is January 1, 2021.

The Statutory authority for Rule-making is G. S. 143-136; 143-138.

695.3 Power Source(s) for Electric Motor-Driven Fire Pumps.

Electric motor-driven fire pumps shall have a reliable source of power. Informational Note: See Sections 9.3.2 and A.9.3.2 from NFPA 20- 2019, Standard for the Installation of Stationary Pumps for Fire Protection, for guidance on the determination of power source reliability.

The delayed effective date of this Rule is January 1, 2021.

The Statutory authority for Rule-making is G. S. 143-136; 143-138.

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