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Significant changes in the 2018 Virginia Residential Code (Electrical)

HENRICO COUNTY

Department of Building Construction and Inspections



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Virginia Residential Code

- The Virginia Residential Code (VRC) combines the 2018 International Residential Code (IRC) and the 2018 Virginia amendments in one document
- The VRC is published by the International Code Council and is available from www.ICCsafe.org



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Chapter 2

New DEFINITIONS

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Accessory Dwelling Unit (ADU)

- A dwelling unit, on the same lot, that is accessory to the primary residence with separate living, sleeping, eating, cooking and sanitation
- May share living space, utilities
- Return air within two-family dwellings are permitted to discharge into either dwelling unit (M1602.2.7)
- Even though it may share a means of egress with the primary dwelling, an ADU must have a code compliant means of egress
- For one or more occupants



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Significant Changes to 2017 NEC and 2018 Virginia Residential Code

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- The following slides are a short summary of the changes to the 2017 NEC and the 2018 Virginia Residential Code
- For more information, please refer to the actual code text



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Article 100 Definitions

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Readily Accessible (Accessible Readily)

- Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to take actions such as to use tools (other than keys), to climb over or under, to remove obstacles, or to resort to portable ladders, and so forth.
- Revisions were made to indicate that the use of a key does not fall under the “use of tools”.
- Crawling “under” something to get to equipment is no longer acceptable.
- Informational Note: Use of keys is a common practice under controlled or supervised conditions and a common alternative to the ready access requirements under such supervised conditions as provided elsewhere in the NEC.



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Article 100 Definitions

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Receptacle (CMP-18)

- Receptacle: A contact device installed at the outlet for the connection of an attachment plug for the direct connection of listed and labeled electrical utilization equipment designed to make with the corresponding contact device. A single receptacle is ...(remainder of definition unchanged)
- This change was made to accommodate a new type of mounting receptacle that can be used for ceiling fans or other ceiling installations.
- This change appears again later in 314.27 (E) Separable attachment fittings



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Article 110 Requirements for Electrical Installations

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Reconditioned Equipment

- The change to this code section recognizes that equipment can be new, reconditioned, refurbished, or remanufactured but places specific marking and labeling requirements on reconditioned equipment
- 110 (3) (A) (1): Includes a new Informational Note: “Equipment may be new, reconditioned, refurbished, or remanufactured.”
- New section 110.3 (C) & Informational Note 1: OSHA provides a list of NRTLs for qualified Third-party testing laboratories.
- **110.21 (A) (2) Reconditioned Equipment:** Reconditioned equipment shall be marked with the name, trademark, or other descriptive marking by which the organization responsible for reconditioning the electrical equipment can be identified, along with the date of reconditioning



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Article 110 Requirements for Electrical Installations

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Reconditioned Equipment Continued

- Reconditioned equipment shall be identified as “reconditioned” and approval of the reconditioned equipment shall not be based solely on the equipment’s original listing.
- Exception: In industrial occupancies, where conditions of maintenance and supervision ensure that only qualified persons service the equipment, the markings indicated in 110.21 (A) (2) shall not be required.
- Informational Note: Industry standards are available for application of reconditioned and refurbished equipment. Normal servicing of equipment that remains within a facility should not be considered reconditioned or refurbished.



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Article 110 Requirements for Electrical Installations

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110.26(A) (4)

Limited Access

- This change is intended to help installers comply with code for working clearances around equipment located in areas that cannot comply with the requirements for general locations.
- This applies to equipment 1000 Volts or less and “likely to require examination, adjustment, servicing, or maintenance while energized.”
 - (a) Access Openings – not smaller than 22” X 22” for drop ceilings and not less than 22” X 30” for crawl spaces
 - (b) Width of the Working Space – width of equipment or 30” whichever is greater
 - (c) Enclosure doors or hinged panels
 - Capable of opening at least 90 degrees
 - (d) Working Space
 - The depth of the working space shall comply with Table 110.26 (A) (1).
 - Maximum height shall be height necessary to install equipment in the space.
 - A horizontal ceiling structural member or access panel shall be permitted in this space.



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Article 210 Branch Circuits

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210.5 (C)(1)

Branch Circuits Supplied from More Than One Nominal Voltage System

- New wording and an exception were added to the labeling requirements for installations on a premises where more than one nominal electrical system voltage exists.
- Posting of Identification Means. The method utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment. The label shall be of sufficient durability to withstand the environment involved and shall not be handwritten.
- Exception: In existing installations where a voltage system(s) already exists and a different voltage system is being added, it shall be permissible to mark only the new system voltage. Existing unidentified systems shall not be required to be identified at each termination, connection, and splice point in compliance with 210.5 (C)(1)(a) and (b). Labeling shall be required at each voltage system distribution equipment to identify that only one voltage system has been marked for a new system(s). The new system label(s) shall include the words “other unidentified systems exist on the premises.”



Article 210 Branch Circuits

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210.8

Measurements for GFI Protection

- 210.8 - New language clarifies the measurement requirement
 - “shortest path” without piercing a floor, wall, ceiling, or fixed barrier, or through a door, doorway, or window.
- 210.8 (7) Sinks
 - Clarification now specifies “...from the top inside edge”
- **210.8 Ground-Fault Circuit-Interrupter Protection for Personnel.** Ground-fault circuit-interrupter protection for personnel shall be provided as required by 210.8 (A) through (E). The ground-fault circuit interrupter shall be installed in a readily accessible location
- For the purposes of this section, when determining distance the receptacles the distance shall be measured as the shortest path the cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, or fixed barrier, or passing through a door, doorway, or window.
- 210.8 (7) Sinks – where receptacles are installed within 1.8 m (6ft) from the top inside edge of the bowl of the sink



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Article 210 Branch Circuits

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210.8 (E)

GFCI Protection: Crawl Space Lighting Outlets

- All crawl space lighting outlets, residential and commercial, require GFCI protection
 - The new (E) applies to all crawl spaces, residential and Commercial buildings.



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Article 210 Branch Circuits

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210.11 (C)(4)

Garage Branch Circuits

- A new code section was added to require a 20 amp circuit for a dwelling unit garage. This new requirement applies to attached garages or detached garages with electrical power. This circuit is prohibited from feeding other outlets except a readily accessible exterior receptacle outlet GFCI protected.
- In addition to the number of branch circuits required by other parts of this section, at least one 120-volt, 20-ampere branch circuit shall be installed to supply receptacle outlets in attached garages and in detached garages with electric power. This circuit shall have no other outlets.
- Exception: This circuit shall be permitted to supply readily accessible outdoor receptacle outlets.



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VRC E3902 – Arc-Fault Protection

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VRC E3902

Arc-Fault Protection

- This change expands the requirements for AFCI throughout the dwelling unit.
- AFCI required for kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas and similar rooms or areas.
- New Exception – Not required where GFCI protection is required in accordance with E3902 and NEC 210.8 (A)



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Article 210 Branch Circuits

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210.52 (B)(1)

Exception 2 – Appliance Branch Circuit

- Any dwelling unit appliance is now permitted (by the exception) to be supplied by an individual branch circuit rated 15 amperes or greater
 - 210.52(B)(1) requires receptacle outlet serving the refrigeration equipment to be supplied from one of the 20-ampere small-appliance branch circuits



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Article 210 Branch Circuits

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210.52 (C)(3)

Peninsular Countertop Spaces (E3901.4.3)

- The measurement point for peninsular countertops has been changed from the “connecting edge” to the “connected perpendicular wall.”
 - This change requires measurement to be taken from the “connected perpendicular wall”, which will allow the wall outlet near the peninsula to serve as the required outlet in most cases.
 - This change is intended to reduce or eliminate the need for receptacles on the ends and sides of the peninsula for safety reasons.



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Article 210 Branch Circuits

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210.52 (G)

Receptacle for Basements, Garages, and Accessory Dwellings

- Receptacle requirements for dwelling unit garages, basements, and accessory buildings are expanded to two-family dwellings.
- **210.52 (G)(1) – Dwelling Unit Garage Receptacles**
- At least one receptacle outlet is required to be installed “in each vehicle bay and not more than 5 ½ ft. above the floor.”
 - The change from “for” to “in” each vehicle bay will eliminate the interpretation of one receptacle outlet being shared by two adjacent spaces.
 - The term “car space” was changed to “vehicle bay” to recognize that vehicles other than a car such as pickup trucks, sports utility vehicles, tractors, etc. could be parked in a dwelling unit garage.
 - The “not more than 1.7m (5 ½ ft.) above the floor” requirement eliminates interpretations that a duplex receptacle outlet installed in the ceiling specifically for a garage door opener can serve double-duty.
 - The branch circuit supplying these receptacle(s) cannot serve outlets outside of the garage with the exception of readily accessible receptacles located outdoors. This requirement is now located at 210.11 (C)(4) and should be referenced for branch circuit requirements.



Article 210 Branch Circuits

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210.70 (A)(2)(4), VRC E3903.3.1

Additional Locations – Dimmer Switches at Stairways

- Additional code language clarifies the use of dimmer switches at interior stairways
 - The use of dimmer switches in these locations is now allowed, but only if they provide the full range of dimming control at each location
 - Applies to all occupancy types
- **210.70 (A)(2)(4) Additional Locations.** Additional lighting outlets shall be installed in accordance with the following.
- (1) through (3) are unchanged. (3) included for reference.
- (3) Where one or more lighting outlet(s) are installed for interior stairways, there shall be a wall switch at each floor level, and landing level that includes an entryway, to control the lighting outlet(s) where the stairway between floor rises has six risers or more.
- (4) Lighting outlets controlled in accordance with 210.70 (A)(2)(3) shall not be controlled by use of dimmer switches unless they provide the full range of dimming control at each location.



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Article 210 Branch Circuits

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210.70 (C)

Lighting Outlet(s) All Occupancies

- This change now applies to all occupancies, for basements, attics, crawl spaces, utility rooms, equipment spaces and storage spaces.
 - Changed from “other than Dwelling Units” to “All Occupancies”
- (C) All Occupancies. For attics and underfloor spaces, utility rooms, and basements, at least one lighting outlet containing a switch or controlled by a wall switch shall be installed where these spaces are used for storage or contain equipment requiring servicing. At least one point of control shall be at the usual point of entry to these spaces. The lighting outlet shall be provided at or near the equipment requiring servicing.



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Article 250 Grounding and Bonding

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250.30 (A)(4) & (A)(5)

Grounding Electrode Conductor for a Single Separately Derived System

- Proper methods for grounding a single separately derived AC system have been revised
 - This change recognizes that the building steel framing and metallic water piping used as the Main Service Electrode System and bonded together.
 - In the 2017 NEC, much of this code language in 250.30(A)(4) was deleted and simplified. Now, the building or structure grounding electrode system shall be used as the grounding electrode for the separately derived system even if the building or structure grounding electrode system is nowhere near the separately derived system.



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Article 250 Grounding and Bonding

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250.30 (A)(4) & (A)(5)

Grounding Electrode Conductor for a Single Separately Derived System Continued

- **250.30 (A)(4) Grounding Electrode.** The building or structure grounding electrode system shall be used as the grounding electrode system for the separately derived system. If located outdoors, the grounding electrode shall be in accordance with 250.30(C).
- Exception: If a separately derived system originates in equipment that is listed and identified as suitable for use as service equipment, the grounding electrode used as the grounding electrode for the separately derived system.
- (5) Grounding Electrode Conductor, Single Separately Derived System. A grounding electrode conductor for a single separately derived system shall be sized in accordance with 250.66 for the derived ungrounded conductors. It shall be used to connect the grounded conductor of the derived system to the grounding electrode in accordance with 250.30(A)(4), or as permitted in 250.68(C)(1) and (2). This connection shall be made at the same point on the separately derived system where the system bonding jumper is connected.



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Article 250 Grounding and Bonding

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250.30 (A)(6)(a)

Grounding Electrode Conductor: Multiple Separately Derived Systems

- Metal water piping that complies with 250.68(C)(1) is now allowed to be used as common grounding electrode conductor for multiple separately derived systems.
 - In order for the pipe to qualify as CGEC, it must be electrically continuous with a metal underground water pipe electrode and be located not more than 5' from the point of entrance into the building; 250.68(C)(1)
 - According to 250.30(A)(6), a common GEC must be one of the following:
 - (1) A conductor of the wire type not smaller than 3/0 AWG copper or 250 kcmil aluminum.
 - (2) A metal water pipe that complies with 250.68(C)(1).
 - (3) The metal structural frame of the building or structure that complies with 250.68(C)(2) or is connected to the grounding electrode system by a conductor not smaller than 3/0 AWG copper or 250 kcmil aluminum.
 - In order to use item 2 above, the water pipe must comply with 250.68(C)(1) which means it must qualify as a grounding electrode and be connected within the first 5 feet from the point of entrance to the building.
 - In order to use item 3 above, the code language makes it clear that the metal frame of the building must be “structural”. As well, the structural metal must comply with 250.68(C)(2) which provides the rules to follow when using the structural steel as a conductor to interconnect electrodes.



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Article 250 Grounding and Bonding

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250.52(B)(3)

Swimming Pools not Permitted for Use as a Grounding Electrode

- The structures and structural reinforcing steel of an in-ground swimming pool as described in 680.26(B)(1) and (B)(2) are now prohibited from being used as a grounding electrode.
 - Equipotential bonding requirements 680.26 are to reduce voltage gradients (difference of voltage potential between two conducting objects), not to create a grounding electrode system for building or structure.
 - A third item is added to the list of objects that are prohibited from being used as grounding electrode at 250.52(B)
 - Items that shall not be used as a grounding electrode include:
 - Underground gas piping systems
 - An aluminum electrode
 - Structures and structural reinforcing steel of an in-ground swimming pool.



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Article 300 General Requirements for Wiring Methods and Materials

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300.5 (D)(4)

Enclosure or Raceway Damage

- EMT is now permitted to be used to protect cables subject to physical damage. If the EMT is subject to corrosive environments it shall be provided with Corrosion protection. Per Art. 358 section 358.10



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Article 300 General Requirements for Wiring Methods and Materials

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300.5

Minimum Cover Requirements

- Table 680.10 has been deleted and all requirements are now covered under Table 300.5. There are also two new footnotes for low voltage lighting.
- The two footnotes added
 - A lesser depth shall be permitted where specified in the installation instructions of a listed low-voltage lighting system
 - A depth of 150mm (6 in.) shall be permitted for pool, spa, and fountain lighting, installed in a non metallic raceway, limited to not more than 30 volts where part of a listed low-voltage lighting system.



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Article 300 General Requirements for Wiring Methods and Materials

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300.5 (G)

Raceway Seals

- Additional requirements are added to 300.5 (G)
 - Conduits or raceways “through which moisture may contact live parts” were already required to be “sealed or plugged at either or both end.”
 - Spare and unused raceways are now required to be sealed
 - Sealant must now be identified for use with the products being sealed.
- **300.5(D)(G) Raceway Seals.** Conduits or raceways through which moisture may contact live parts shall be sealed or plugged at both ends. Spare or unused raceways shall also be sealed. Sealants shall be identified for use with the cable insulation, conductor insulation, bare conductor, shield, or other components.



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Article 310 Conductors for General Wiring

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310.15 (B)(3)(c)

Raceways & Cables Exposed to Sunlight on Rooftops

- 310.15(B)(3)(c) is deleted and replaced with a simple rule for raceways or cables exposed to direct sunlight on or above rooftops.
- **310.15(B)(3)(c) Raceways and Cables Exposed to Sunlight on Rooftops.** Where raceways or cables are exposed to direct sunlight on or above rooftops, raceways or cables shall be installed a minimum distance above the roof to the bottom of the raceway or cable of 23 mm (7/8 in.). When the distance above the roof to the bottom of the raceway is less than 23 mm (7/8 in.), a temperature added of 33°C (60°F) shall be added to the outdoor temperature to determine the applicable ambient temperature for application of the correction factors in Table 310.15(B)(2)(a) or Table 310.15(B)(2)(b).
- Exception: Type XHHW-2 insulated conductors shall not be subject to this ampacity adjustment.



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Article 314 Outlet, Device, Pull, and Junction Boxes; Conduit Bodies; etc.

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314.27 (E)

Separable Attachment Fittings

- Outlet boxes are now permitted to support listed locking support and mounting receptacles used in combination with compatible attachment fittings for supporting a luminaire, lampholder, or ceiling suspended (paddle) fan.
 - The equipment has to be listed for the weight of the luminaire or fan installed
 - Included in Box Fill calculations per NEC 314.27 / VRC E3905.12.1



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Article 320 Armored Cable: Type AC

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320.6

Listing Requirements

- New requirements are added requiring most wiring method (cable) and associated fittings to be listed.
 - A non-listed cable-type wiring method may not function correctly with listed termination fittings
 - This will ensure that the cable installed in the field has been evaluated to the appropriate product standard listed in accordance with the NEC.



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Article 336 Power and Control Tray Cable: Type TC

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336.10 (9)

Uses Permitted for Type TC Cable

- Type TC-ER cable with a designation “JP” (joist pull) will now be allowed to be installed exposed without a raceway at one- and two-family dwelling units.
 - Type Tc-ER Cables that contain both power and control cables and the “JP” designation means the cable is designed to be pulled through structural members.
 - This will help simplify the installation of generators for residential dwellings.



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Article 350 Liquidtight Flexible Metal Conduit: Type LFMC

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350.28

Trimming of LFMC

- New language added requiring cut ends of liquidtight flexible metal conduit (LFMC) to be trimmed inside and outside to remove rough edges.
 - Proper trimming is necessary to allow the proper installation of the steel grounding ferrule and to maintain ground continuity of the steel sheath of the LFMC.



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Article 404 Switches

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404.2 (C) & VRC E4001.15

Grounded Conductor at Switch Locations

- Revisions were made to the requirement to provide a grounded neutral conductor at specific switch locations.
 - The previous seven “conditions” have been revised and reduced to only five “conditions.”
 - Exception added to limit the number of electronic lighting control switches on a branch circuit (5) or feeder (25)
 - 404.22 Now prohibits the use of the Equipment Grounding Conductor as the Grounded Conductor for Electronic Devices.



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Article 404 Switches

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404.22

Electronic Lighting Control Switches (related to previous change)

- This new requirement aligns with and provides supporting language for the new changes in 404.2 (C) which address electronic lighting control devices that require a neutral return path in order for the circuitry in the switch to function.
 - Now, electronic lighting control switches are not permitted to introduce current on the equipment ground during normal operation.
 - This will force manufacturers to create electronic lighting control switches (like occupancy sensors) with a neutral terminal so that return current is not normally returned on the equipment ground
 - The requirement to not introduce current on the equipment ground is effective January 1, 2020.



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Article 406 Receptacles, Cord Connectors, and Attachment Plugs

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406.3 (F)

Receptacle with USB Charger

- New provisions require these devices to be listed and constructed such that the Class 2 circuitry is integral with the receptacle.



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Article 406 Receptacles, Cord Connectors, and Attachment Plugs

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406.6 (D)

**Receptacle Faceplate with
Integral Night Light
and/or USB Charger**

- New provisions require these devices to be listed and constructed such that the Class 2 circuitry is “integral with the flush device cover plate.”



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Article 408 Switchboards, Switchgear, and Panelboards

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408.3 (A)(2)

Barriers at Service Panelboards

- New requirements added for barriers to be placed in all service panelboards. This has been identified as a safety concern by installers and proponents of electrical safety in the workplace.
 - Barriers are now required on all panelboards so that no uninsulated, ungrounded service busbar or service terminals are exposed to contact by anyone.
- **408.3 (A)(2) Service Panelboards, Switchboards, and Switchgear.** Barriers shall be placed in all service panelboards, switchboards, and switchgear so that no uninsulated, ungrounded service busbar or service terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load terminations.
- Exception: This requirement shall not apply to service panelboards with provisions for more than one service disconnect within a single enclosure as permitted in 408.36, Exceptions 1,2, and 3.



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Article 422 Appliances

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422.5

GFCI Protection for Personnel (appliances) Continued

- **422.5 Ground-Fault Circuit-Interrupter (GFCI) Protection for Personnel.**
- (B) Type. The GFCI shall be readily accessible, listed, and located in one or more of the following locations:
 - (1) Within the branch circuit overcurrent device
 - (2) A device or outlet within the supply circuit
 - (3) An integral part of the attachment plug
 - (4) Within the supply cord not more than 300 mm (12 in.) from the attachment plug
 - (5) Factory installed within the appliance



Article 422 Appliances

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422.16 (B)(2)

Built-In Dishwashers and Trash Compactors

- This change addresses the location of the receptacles and the permitted length of the flexible cords.
 - Dishwasher: Outlet in adjacent spaces only, cord length 3-6.5 ft.
 - Trash Compactor: Same or adjacent space, cord length 3-4 ft.
- **422.16 (B)(2) Built-in Dishwashers and Trash Compactors.** Built-in dishwashers and trash compactors shall be permitted to be cord-and- plug-connected with a flexible cord identified as suitable for the purpose in the installation instructions of the appliance manufacturer where all of the following conditions are met:
 - (1) The flexible cord shall be terminated with a grounding-type attachment plug.
 - Exception: A listed dishwasher or trash compactor distinctly marked to identify it as protected by a system of double insulation shall not be required to be terminated with a grounding-type attachment plug.
 - (2) For a trash compactor, the length of the cord shall be 0.9 m to 1.2 m (3 ft. to 4 ft.) measured from the face of the attachment plug to the plane of the rear of the appliance.
 - (3) For a built-in dishwasher, the length of the cord shall be 0.9 m to 2.0 m (3 ft. to 6.5 ft.) measured from the face of the attachment plug to the plane of the rear of the appliance.
 - (4) Receptacles shall be located to protect against physical damage to the flexible cord
 - (5) The receptacle for a trash compactor shall be located in the space occupied by the appliance or adjacent thereto.
 - (6) The receptacle for a built-in dishwasher shall be located in the space adjacent to the space occupied by the dishwasher.
 - (7) The receptacle shall be accessible.



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Article 555 Marinas and Boatyards

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555

Marinas, Boatyards, and Commercial/Noncommercial Docking Facilities

- Adopted from 2020 NEC. Now applies to all dwelling unit boat docking facilities.
- Virginia adopts the 2020 edition of the NEC for Article 555 only. This change is intended to increase the level of safety around Docks and Marinas and improve requirements for GFCI protection, GFPE Protection and Bonding requirements for public.
- This includes a Change to Scope to include docking facilities associated with One Family, Two Family dwellings, multi family and residential condominiums.
- Article 555 was completely re-written with an expanded requirement on where exactly what type of ground fault protection shall be used. Also, a leakage current measurement requirement was added.
 - Shore Power Receptacles- not exceeding 30 mA GFPE
 - Receptacles for other than shore power- GFCI for 125V, single phase, 15 & 20
 - Feeder & Branch-Circuit conductors – not exceeding 100 mA GFPE
 - Where more than 3 receptacles provide for shore power to boats, a leakage current measurement device shall be available.



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Article 555 Marinas and Boatyards

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555.10

(2020) Signage – Marinas, Boatyards, and Commercial/ Noncommercial Docking Facilities

- New requirement for precautionary signage clearly visible from all approaches
 - New signage requirement for precautionary signage related to electric shock hazard in water around marinas and boatyards
 - Signage must comply with 110.21 (B)(1) and be clearly visible from all approaches to a marina or boatyard facility. (by land OR sea)
 - The signs shall state” WARNING- POTENTIAL SHOCK HAZARD- ELECTRICAL CURRENTS MAY BE PRESENT IN THE WATER



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Article 625 Electric Vehicle Charging System

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625.2

Definitions – Electric Vehicle Charging Systems

- Two new definitions
 - Wireless Power Transfer (WPT). The transfer of electrical energy from a power source to an electrical load via electric and magnetic fields or waves by a contactless inductive means between a primary and secondary device.
 - Wireless Power Transfer Equipment (WPTE). Equipment consisting of a charger power converter and a primary pad. The two devices are either separate units or contained within one enclosure.



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Article 680 Swimming Pools, Fountains, and Similar Installations

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680.2 and 680.80

Definitions AND New Part VIII

- These changes address new definition and Part VIII was added for electrically powered pool lifts.
- Article 680 now addresses these types of installations with adequate safety requirements for all pool users.
- **Electrically Powered Pool Lift.** An electrically powered lift that provides accessibility to and from a pool or spa for people with disabilities.
- **680.2 Definitions- Storable Pools** – Changes to the definition of storable that identifies the equipment is installed on or above the ground regardless of the dimension.



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Article 680 Swimming Pools, Fountains, and Similar Installations

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680.7

Swimming Pools: Grounding and Bonding Terminals

- Grounding and Bonding Terminals shall be identified for use in wet and corrosive environments
- Field-installed grounding and bonding connections in a damp, wet, or corrosive environment shall be composed of copper, copper alloy, or stainless steel and listed for direct burial use.



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Article 680 Swimming Pools, Fountains, and Similar Installations

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680.11

Table 680.10

Underground wiring location – Info now in 680.11

- This change deleted Table 680.10 and all underground installations for Pools, Spas, Hot Tubs, etc. shall be installed per Table 300.5
 - Table 680.10 (Underground Wiring Location) moved to 680.11
 - Table 300.5 (burial depth requirements) will now apply around swimming pools, hot tubs, fountains, and similar installations.
 - Also, underground wiring is now permitted to be installed in close proximity of the pool regardless of whether “necessary to supply pool equipment” or not.
 - Revised text will allow service lateral or underground feeder to be routed within 1.5 m (5 ft.) or close proximity to the pool even though this service or feeder is not necessary to supply pool equipment.”



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Article 680 Swimming Pools, Fountains, and Similar Installations

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680.12 & 680.14

Indoor pool equipment installations for Pools, Spas, Hot Tubs, etc.

- New requirement for protection against a corrosive environment for electrical equipment installed in equipment rooms and pits added to 680.12 and 680.14
- New provisions added at 680.14 for locations considered to be a corrosive environment.



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690.7

Maximum Voltage of PV Systems

- Part II of 690 has been rewritten and reorganized to include several new code sections.
- Maximum Voltages Updated
 - On 1 & 2 family dwellings: 600 Volts DC
 - On Commercial Buildings: 1000 Volts DC
 - Free-Standing Systems: 1500 Volts DC



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690.12

Rapid Shutdown of PV Systems on Buildings

- Part II of 690 has been rewritten and reorganized to include several new code sections.
 - “Rapid Shutdown” requirements have been revised and divided into four sub-sections.
 - Emphasizes that the main purpose is reduced shock hazard for emergency responders.
 - Controlled conductors outside the “array boundary” (1’ in all directions) must comply with new 690.12 (B)(1).
 - Switches must be located outside for 1 & 2 family dwellings.



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690.13 & 690.15

Part III Disconnecting Means

- Part III of 690 has been rewritten and reorganized to include several new code sections to address requirements for Disconnecting Means.
 - New 690.15 (B) Interrupting Rating
 - New 690.15 (C) Isolating Device



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690.56 (C)

Identification of Power

Sources: Rapid Shutdown

- Part VI of 690 has been rewritten to include several new code sections to address requirements for Shut Down requirements and Labels to identify the Shutdown requirements
 - Identification label requirements are revised extensively
 - Switch must be labeled “RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM”
 - Two label option based on what type of rapid shutdown system is present.
 - Option 1: Label for PV Systems that Shut Down the Array and the Conductors Leaving the Array
 - Option 2: Label for PV Systems that Shut Down the Conductors Leaving the Array Only