

**2009 Code Update Training**

# **ELECTRICAL CODE UPDATE**

**2008 NEC**

**2009 IRC**

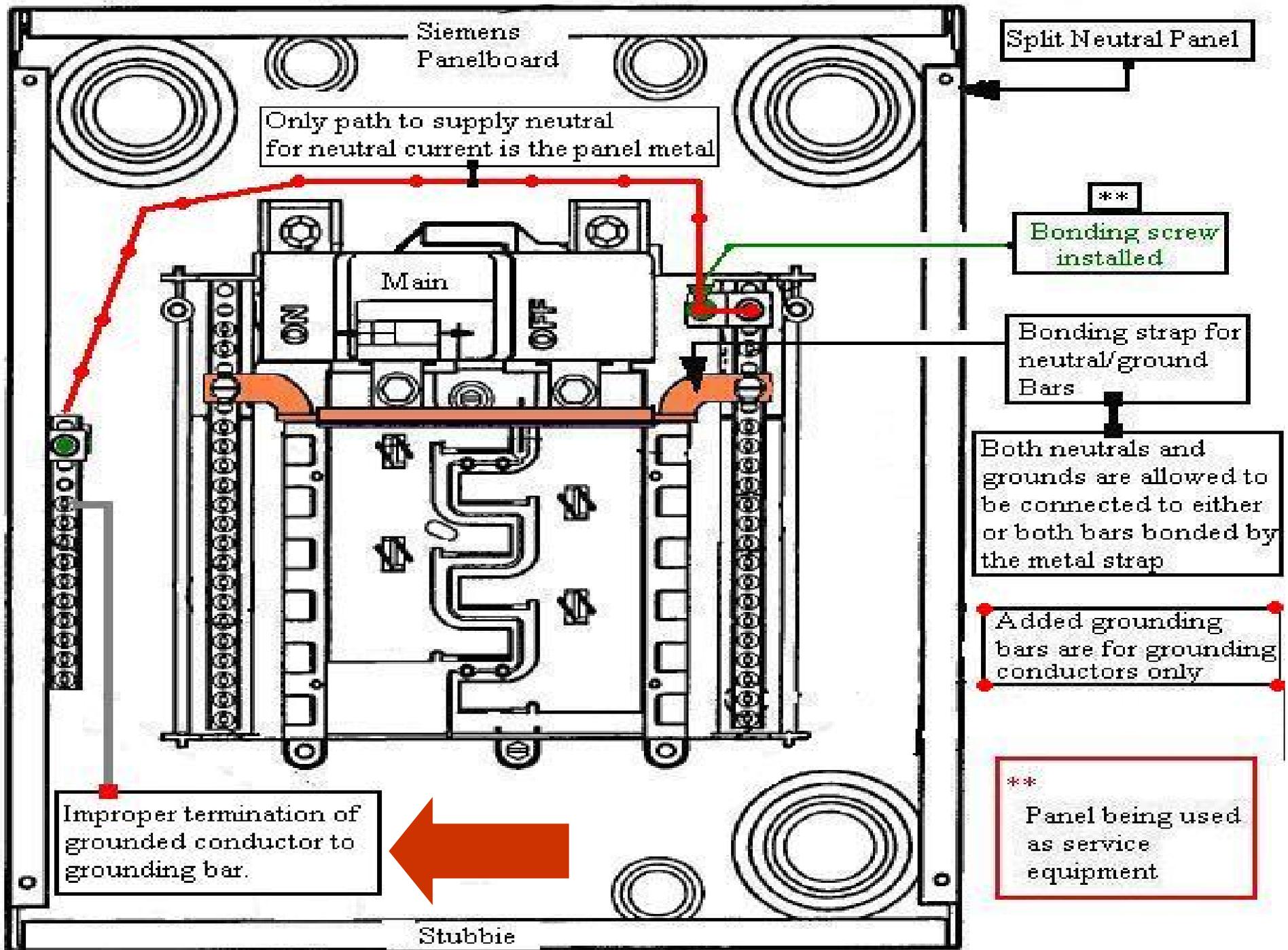
# 2009 Code Update Training

- Please turn cell phones down
- No smoking
- Please sign in
- Please hold questions until end of presentation

## 2009 Code Update Training

### 200.2 (B) Grounded Conductor Continuity

- E3406.11 The continuity of the grounded conductor shall not depend on the connection to a metallic enclosure, raceway, or cable armor.

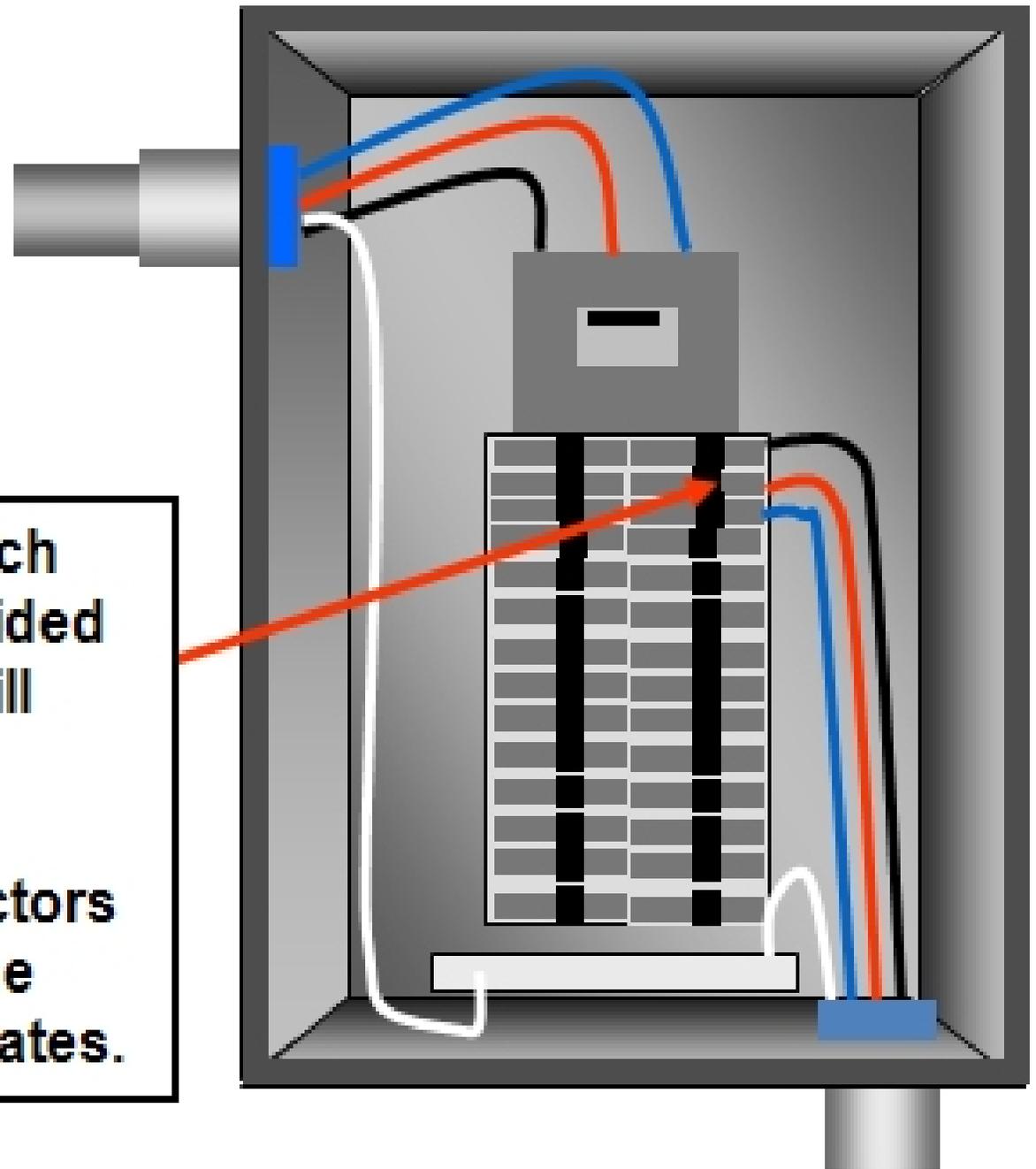


## 2009 Code Update Training

### 210.4 (B) Multiwire Branch Circuits

- E3701.5 Disconnecting Means. Each multiwire branch circuit shall be provided with a means that will simultaneously disconnect all ungrounded conductors at the point where the branch circuit originates.

**Each multiwire branch circuit shall be provided with a means that will simultaneously disconnect all ungrounded conductors at the point where the branch circuit originates.**



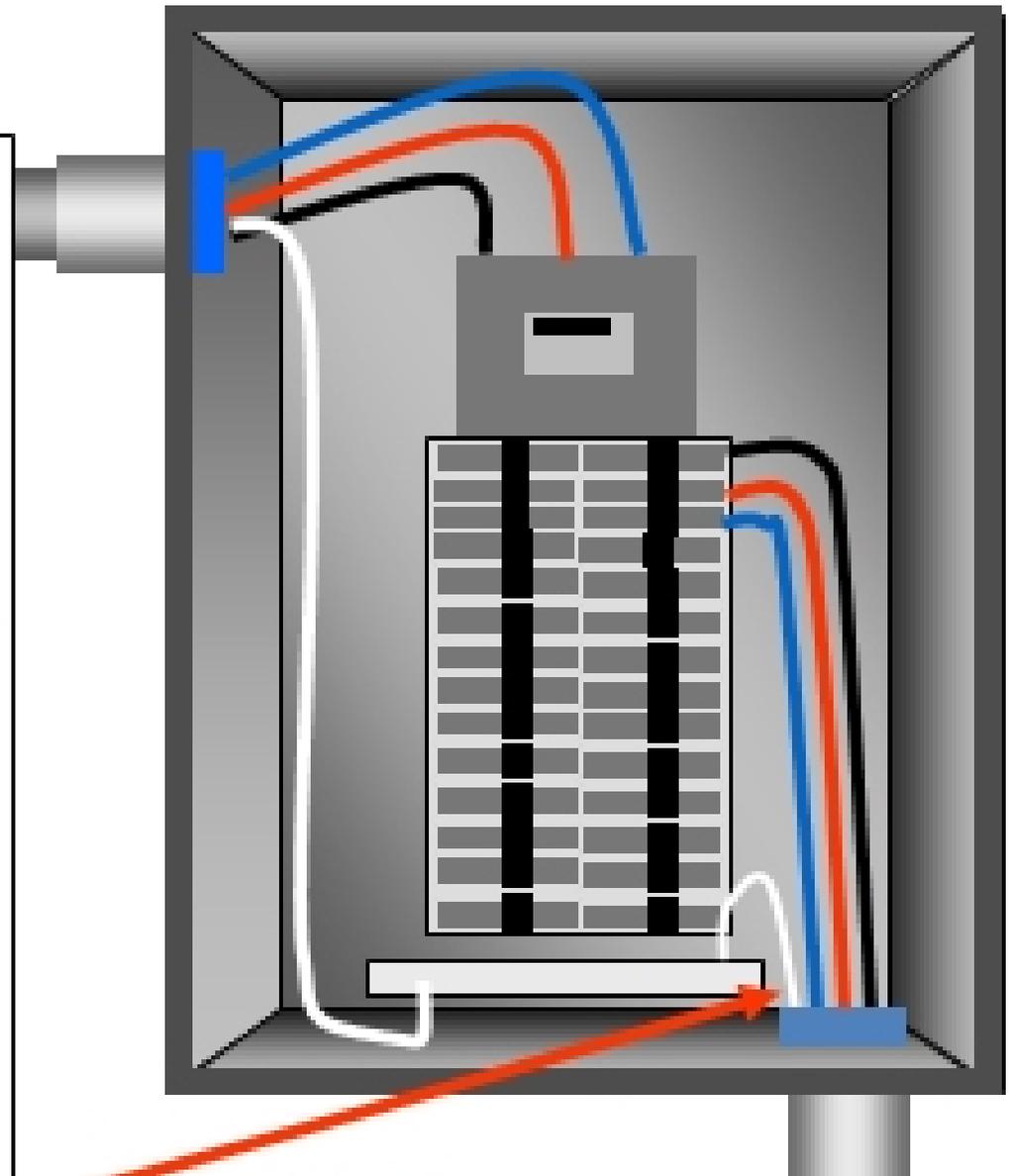
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### 210.4 (D) Grouping

- The ungrounded and grounded conductors of each multiwire branch circuit shall be grouped in at least one location within a panelboard or other enclosure.
- Grouping is not required if the circuit enters the enclosure in a manner that is obvious as to its use.

The ungrounded and grounded conductors of each multiwire branch circuit shall be grouped by wire ties or similar means in at least one location within the panelboard or other point of origination.

Exception: The requirement for grouping shall not apply if the circuit enters from a cable or raceway unique to the circuit that makes the grouping obvious.



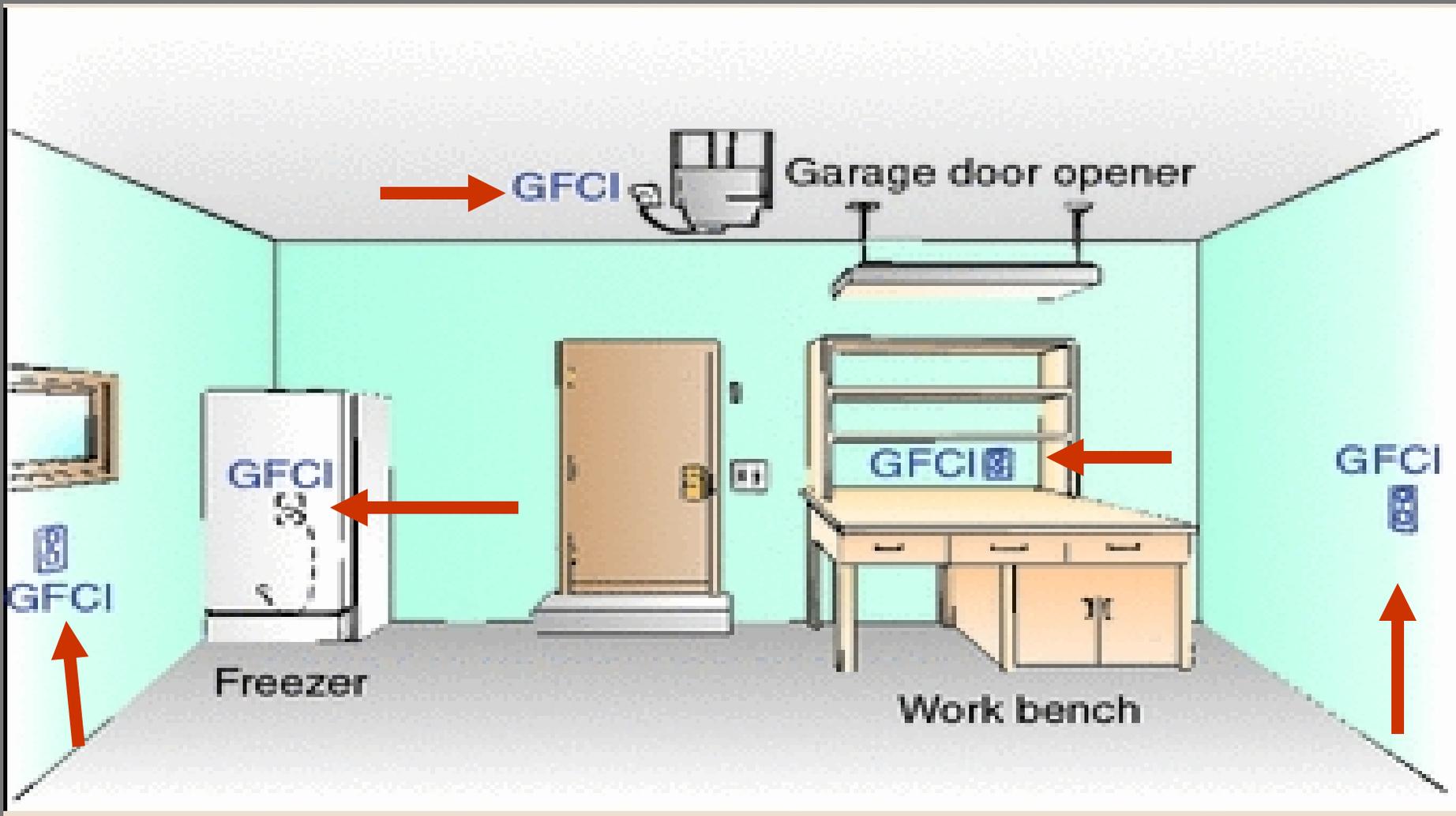
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### 210.8 (A)(2) & (A)(5)

- E3902.2 & 5 All 125 volt, single phase, 15 and 20 ampere receptacles in dwelling unit garages, accessory buildings having a floor at or below grade level and not intended as habitable rooms, and basements are required to have GFCI protection.
- Exception: GFCI protection not required for fire and burglar alarm system receptacles located in basements.

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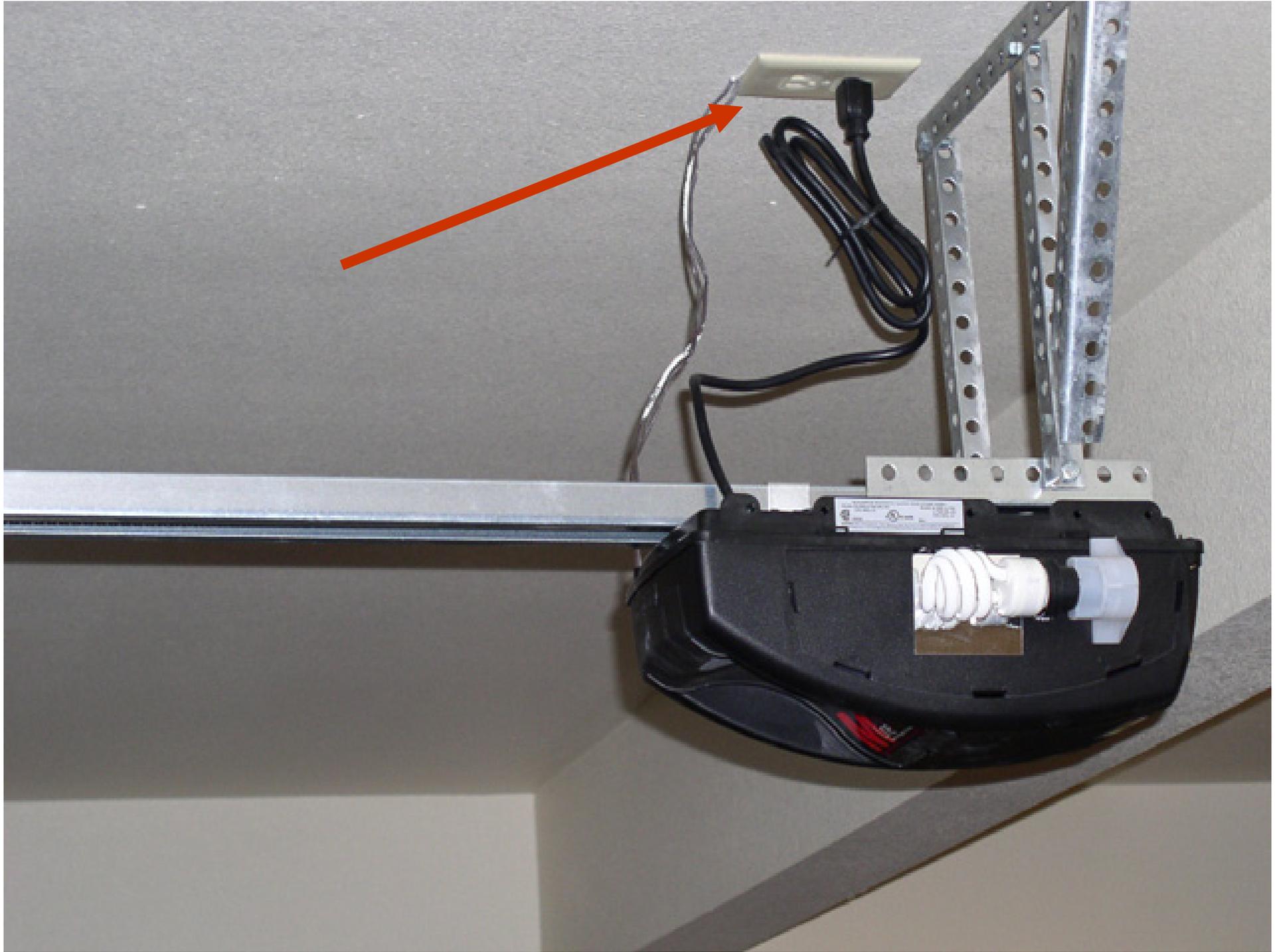
## GFCI Protection of Garage Receptacles



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**Note: Exceptions 1 & 2 Deleted**

- **GFCI protection requirements apply to receptacles that are not readily accessible.**
- **Applies to dwelling unit garages and unfinished basements, and accessory buildings.**



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### 210.8 (B) Other Than Dwelling Units

- All 125 volt, single phase, 15 and 20 ampere receptacles installed in the locations specified in (1) through (5) shall have GFCI protection for personnel.
  1. Bathrooms
  2. Kitchens
  3. Rooftops
  4. Outdoors
  5. Sinks

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## 210.8 (B)(5) Sinks

### Other Than Dwelling Units

- Receptacles installed within 6' of the outside edge of the sink are required to be GFCI protected.
- Exception No. 2 to (5): For receptacles located in patient care areas of health care facilities other than those covered under 210.8 (B)(1), GFCI protection shall not be required.

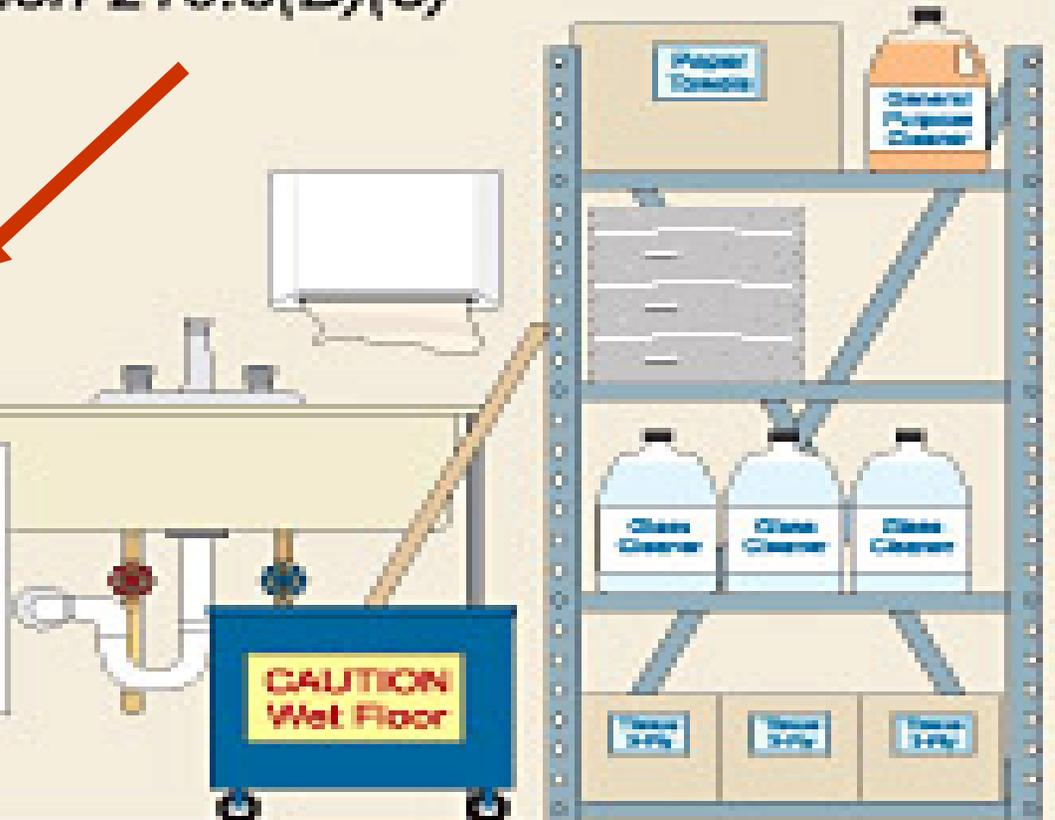
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## Sinks (continued)

### GFCI-Protected Receptacles Other than Dwelling Unit Sinks Section 210.8(B)(5)



All 15A and 20A, 125V receptacles within 6 ft of a sink must be GFCI-protected.



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## Patient Care Sink



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### 210.8 (C) Boat Hoists

- **E3902.9 GFCI protection shall be provided for outlets not exceeding 240 volts that supply residential boat hoists.**

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## Boat Hoist



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### 210.12 (B) Dwelling Units

- E3902.11 Dwelling Units. All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets 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 a listed arc-fault circuit interrupter, combination-type, installed to provide protection of the branch circuit.

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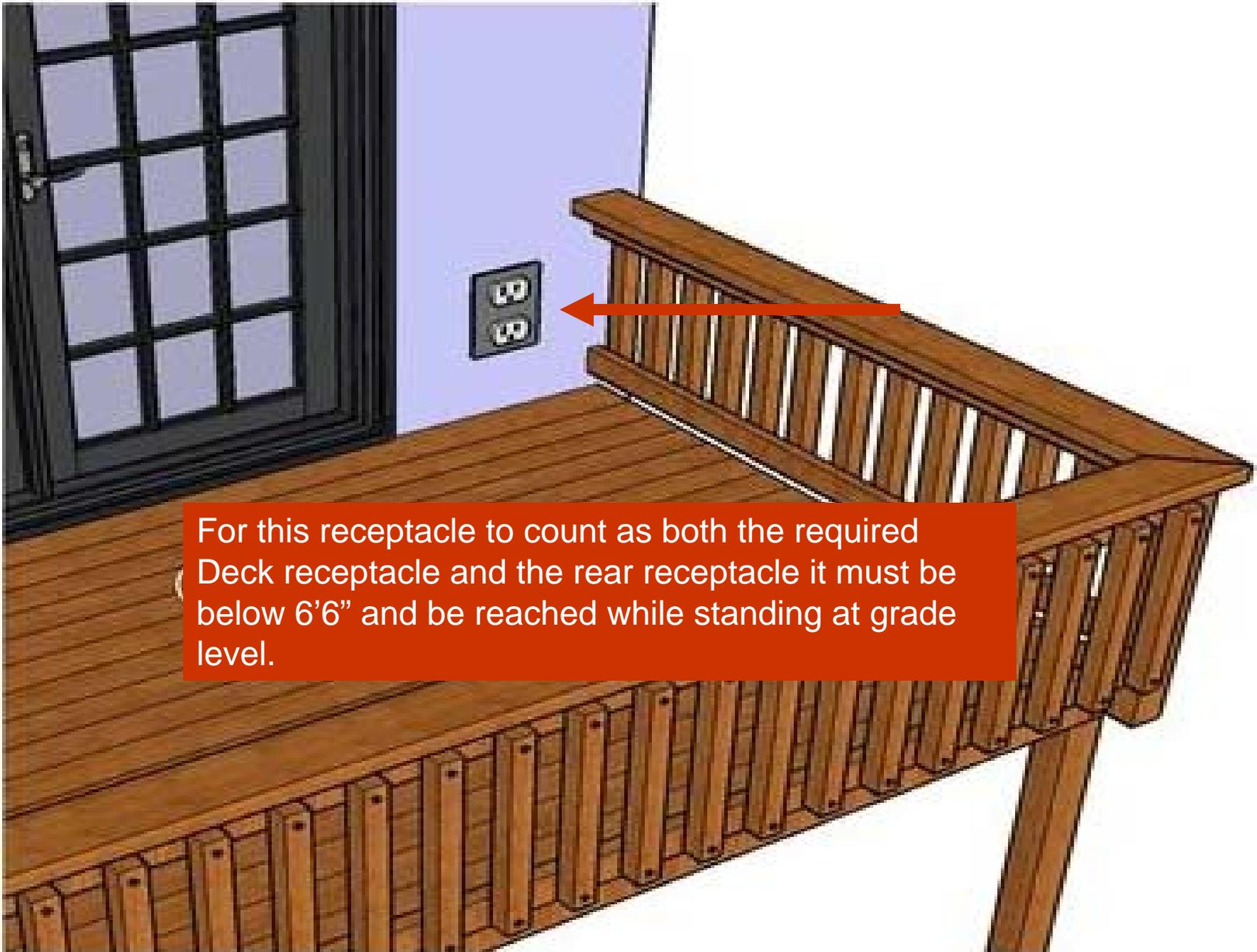
### 210.12(B) Dwelling Unit AFCI Protection

- This section has been modified in the Virginia version of the 2009 IRC to show no change from the requirements of the 2006 IRC and the 2005 NEC.
- All dwelling unit bedroom outlets must be AFCI protected.

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### 210.52(E)(1) Outdoor Outlets

- For one and two family dwellings, at least one receptacle must be accessible at the front and back of the dwelling while standing at grade level and located not more than 6 1/2' above grade.



For this receptacle to count as both the required Deck receptacle and the rear receptacle it must be below 6'6" and be reached while standing at grade level.

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### 210.52 (E)(3) Outdoor Outlets

- E3901.7 Balconies, Decks and Porches that are accessible from the inside of a dwelling unit shall have at least one receptacle outlet installed within the perimeter of the balcony, deck or porch
- The receptacle shall not be located more than 6 1/2' above the balcony, deck or porch.

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## Receptacles on Balconies, Decks and porches



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### 210.52(E)(3) Exception

- **Balconies, decks or porches with a usable area of less than 20 sqft are not required to have a receptacle installed.**

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## Receptacles on Balconies, Decks and Porches



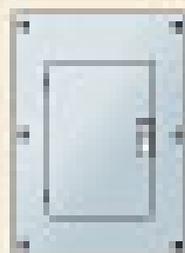
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### 240.24 (F) Not Located Over Steps

- **E3705.7 Overcurrent protective devices shall not be located over steps of a stairway.**

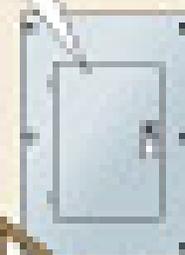
## Location of Overcurrent Devices Section 240.24(F)

Okay



**VIOLATION**

Overcurrent devices must not be located over steps of a stairway.



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Not permitted  
on stairs.



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### 250.32 (B) Grounded Systems

- **E3607.3.1 Equipment grounding conductors are required to be installed with all branch circuit and feeders supplying separate buildings or structures.**

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### 250.52 (A)(3) Concrete-Encased Electrode

- E3608.1.2 Encased by at least 2” of concrete, located horizontally near the bottom or vertically and within the portion of a concrete footing or foundation in direct contact with the earth.
- Where multiple concrete-encased electrodes are present at a building or structure, it is permissible to bond “only one” into the grounding electrode system.



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### 250.94 Bonding for Other Systems

- **E3609.3** An intersystem bonding termination means that includes provisions for connecting at least three grounding and bonding conductors is required for communication systems.

**Termination point location:**

1. **Meter socket enclosure.**
2. **Service equipment enclosure.**
3. **Grounding electrode conductor.**

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## Bonding of Other Systems



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## 300.9 Raceways in Wet Locations Above-Grade

- E3802.7 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 raceways in wet locations above-grade shall comply with 310.8(C) which lists the types of insulated conductors rated for wet locations.

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### 314.27(A) Boxes at Luminaire Outlets

- E3905.6 Ceiling boxes must be designed for the purpose and must be able to support a luminaire weight at least 50 lbs.
- Boxes in walls must be designed for the purpose and if rated for other than 50 lbs, must be marked to indicate the maximum weight permitted to be supported by the box.



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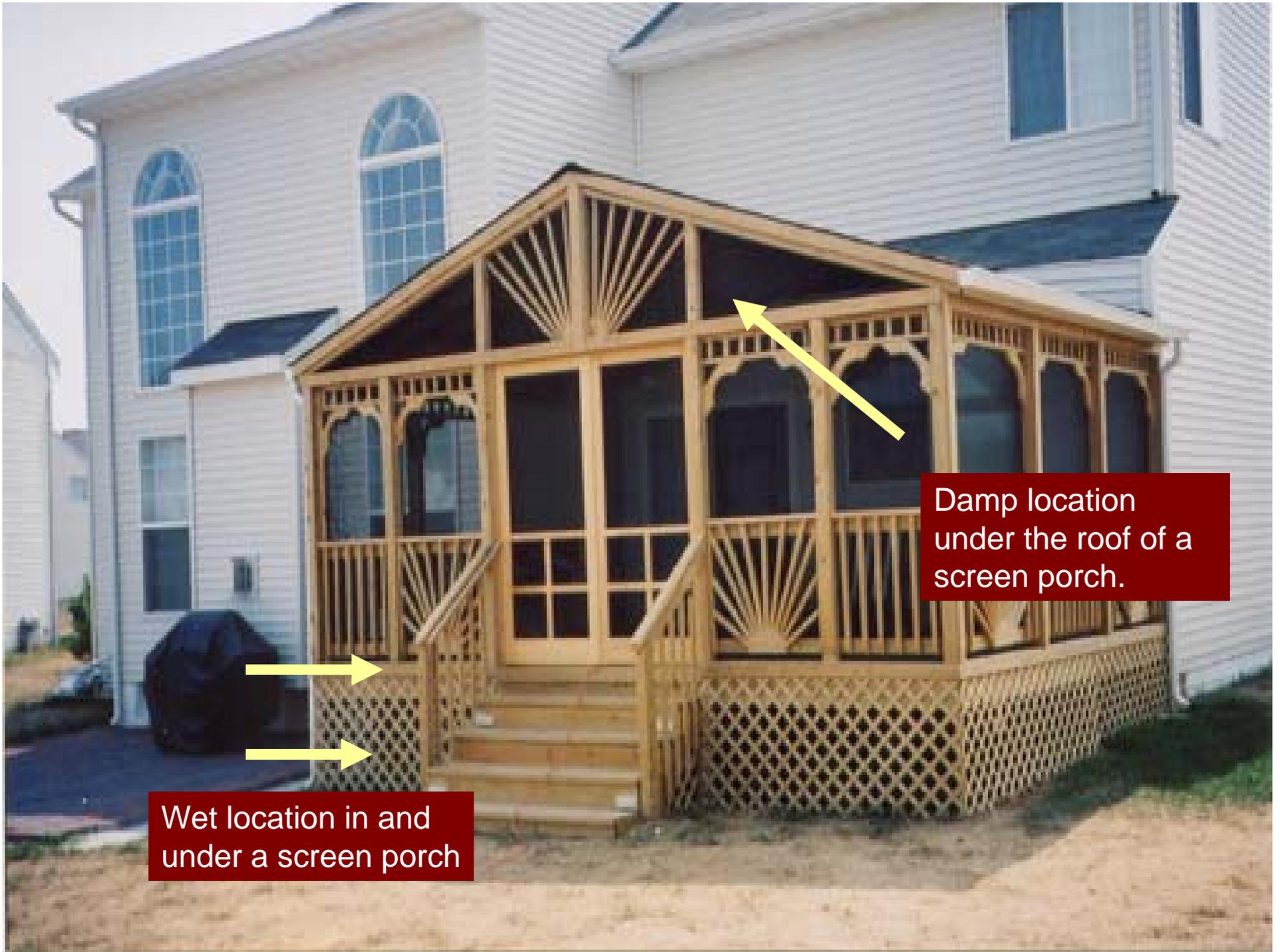
### 334.12(A)(1) Exception

- **Type NM cable is permitted for wiring in fire-rated construction Types I and II provided it is installed in a raceway that is suitable for use in this type of building construction.**

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### 334.12(B)(4) Uses Not Permitted

- Table 3801.4 Type NM and NMS cable *shall not be permitted in wet or damp locations* as defined in Article 100.



Damp location under the roof of a screen porch.

Wet location in and under a screen porch

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## 334.15(C) Unfinished Basements and Crawl Spaces

- **E3802.4** Where type SE or NM cables run at angles with the joists in unfinished basements and crawl spaces, cable assemblies containing two or more conductors of size 6AWG and larger and assemblies containing three or more conductors if size 8AWG and larger shall not require additional protection where attached directly to the bottom of the joists. Smaller cables shall be run either through bored holes in the joists or on running boards.

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### 338.12(A) & (B) Uses Not Permitted

- A new section added to clearly differentiate the uses not permitted between Type SE cable and Type USE cable.

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### SE Cable - Uses Not Permitted

- Where subject to physical damage.
- Underground *with or without* a raceway.
- For exterior branch circuits and feeder wiring unless permitted by Part I of 225.

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### USE Cable – Uses Not Permitted

- For interior wiring.
- For aboveground wiring except where USE cable emerges from the ground and is terminated in an enclosure at an outdoor location and the cable is protected.
- As aerial cable unless it is a multiconductor cable identified for use aboveground and installed as messenger supported wiring.

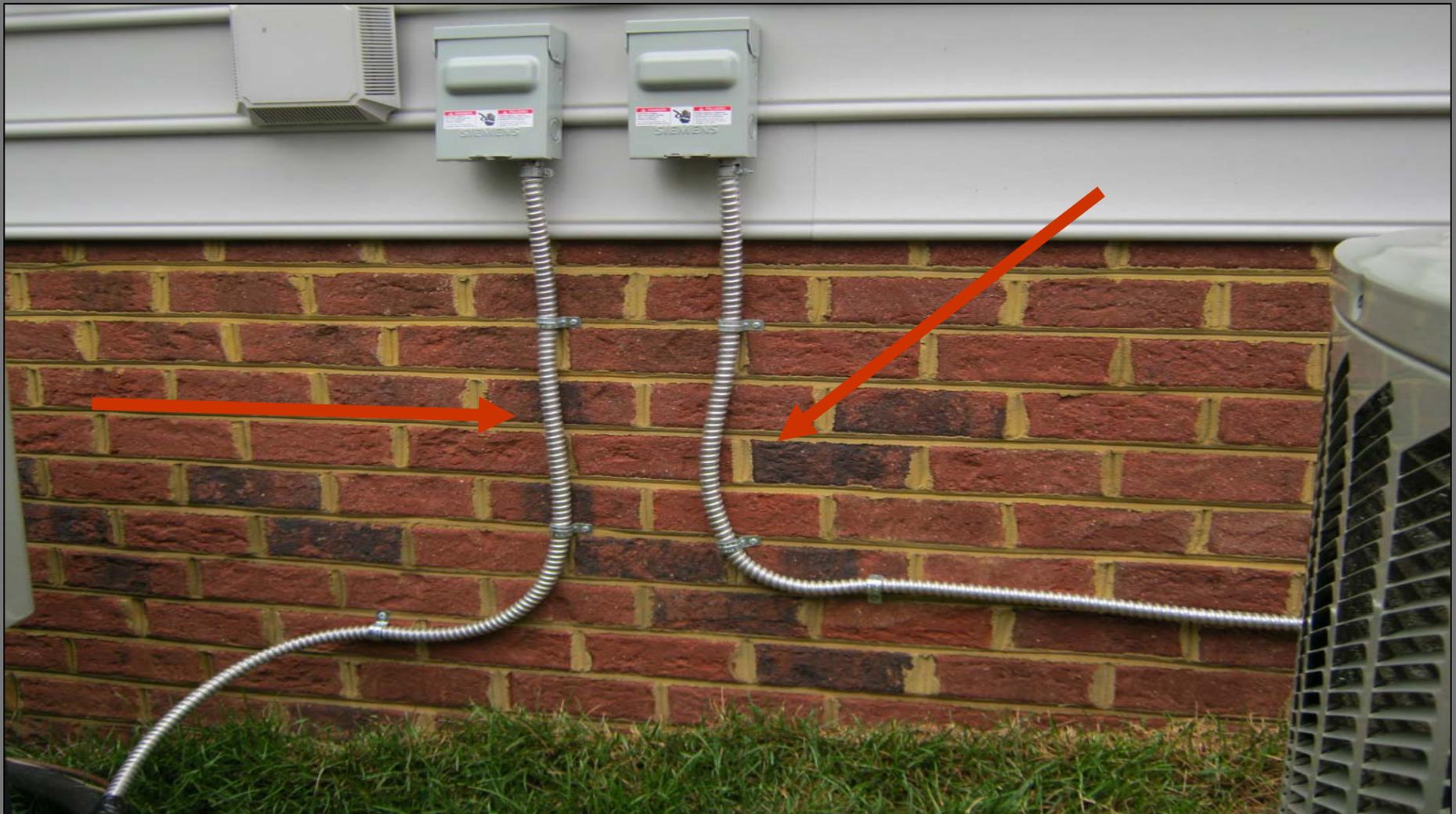
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### 348.12(1) Uses Not Permitted

- **Table E3801.4 Flexible Metal Conduit is no longer permitted in wet locations.**

**Note: The exception for Flexible Metal Conduit was removed for Article 225.22, E3802.7 Raceways on exterior surfaces.**

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## 2009 Code Update Training

### 406.11 Tamper-Resistant Receptacles in Dwelling Units

- **E4002.14 All dwelling unit 125-volt, 15 and 20 ampere receptacles installed in areas specified in 210.52 shall be listed tamper-resistant type.**

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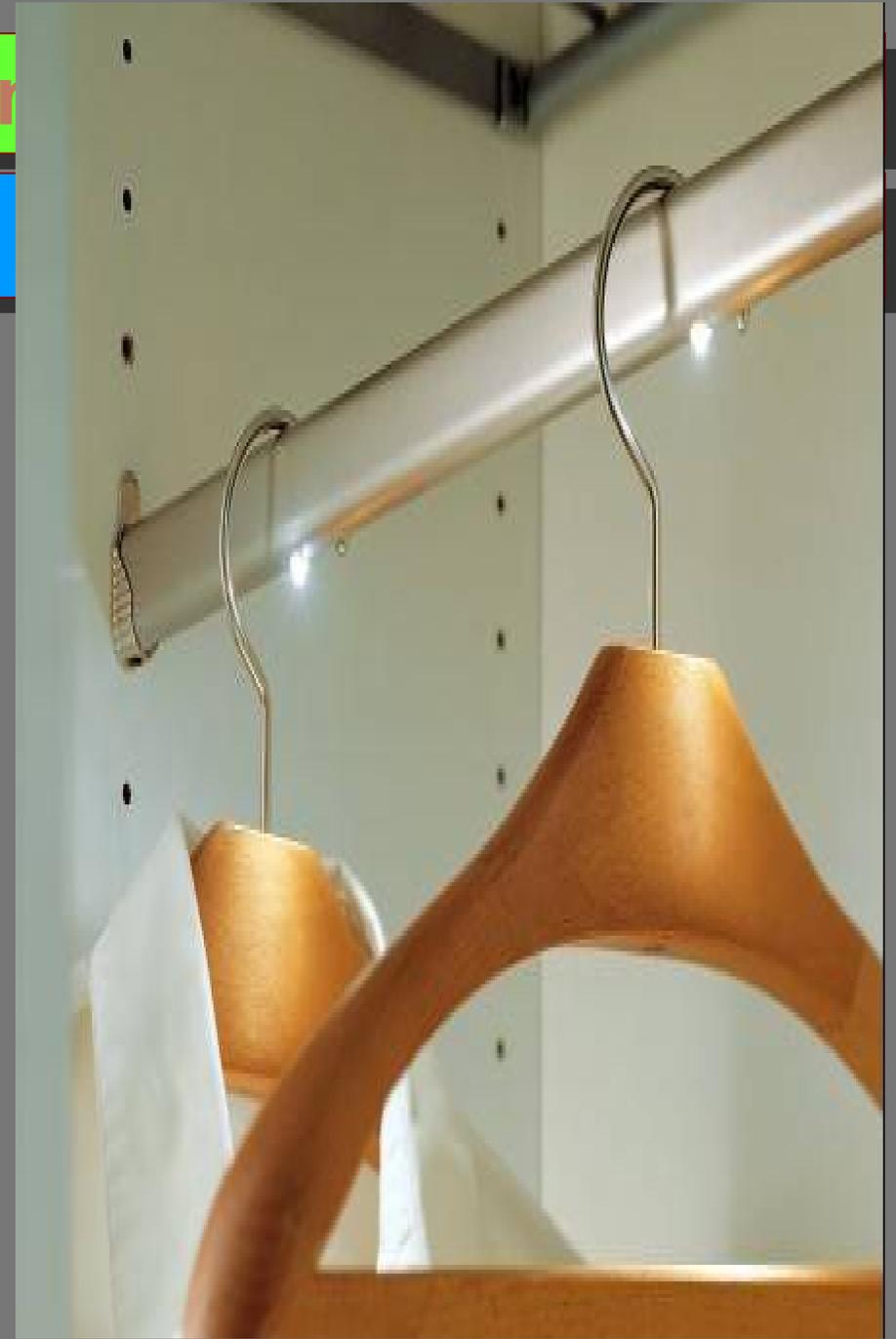
## Tamper-Resistant Receptacles



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## 410.16(C)(5) Luminaires in Clothes Closets

- (A)(3) Surface mounted fluorescent or LED luminaires identified as suitable for installation within the storage area.
- (C)(1) 12” for surface mounted incandescent or LED luminaires...or on the ceiling.
- (C)(3) 6” for recessed incandescent or LED luminaires...or the ceiling.
- (C)(5) Surface mounted fluorescent or LED luminaires shall be permitted to be installed in the storage space where identified for this use.



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### 422.52 Electric Drinking Fountain

- Electric drinking fountains shall be protected with ground-fault circuit-interrupter protection.
- Bottled water coolers are not affected by this rule.



GFCI protection required.



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### 517.32 (C)(3) & (F) Life Safety Branch

**(C)(3)** Mechanical controls and other accessories such as dampers and some motors required for effective life safety systems can be connected to the life safety branch.

**(F)** Generator set accessories such as crankcase heaters, lights and receptacles may now be connected to the life safety branch.

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## 620.21(A)(1)(e) Wiring Methods in Hoistways

- **An elevator pit sump pump is permitted to be cord-connected:**
  1. **Cord length cannot exceed 6'.**
  2. **Cord is hard usage and oil resistant type.**
  3. **Cord is protected from physical damage.**

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**2009 Code Update Training**

# **SWIMMING POOLS**

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### Article 680 Receptacle Locations

- E4203.1 Receptacles shall not be located less than 6' (six feet) from the inside wall of any pool or other body of water specifically identified in each of the following sections:  
680.22, 680.34, 680.43, 680,62, 680.71

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### 680.12 Maintenance Disconnecting Means

- E4203.3 The disconnecting means is required to *simultaneously* disconnect all ungrounded conductors of the circuit.
- The disconnecting means must be located a minimum of 5' from the inside wall of the pool, spa or hot tub.

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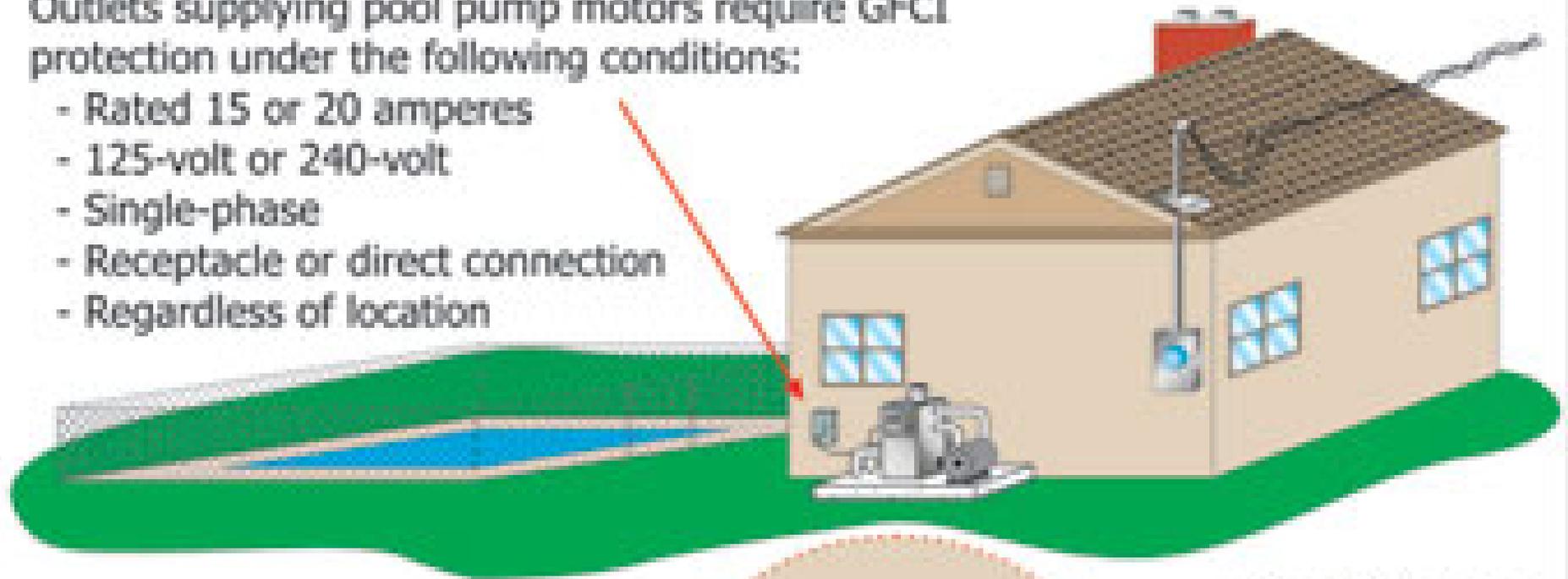
### 680.22(B) GFCI Protection

- **E4203.1.3 All 15 or 20 ampere, 125 or 240 volt, single phase outlets supplying pool pump motors require GFCI protection whether supplied by a receptacle and cord connection or hard wired to the branch circuit outlet.**

## 680.22(B) GFCI Protection

Outlets supplying pool pump motors require GFCI protection under the following conditions:

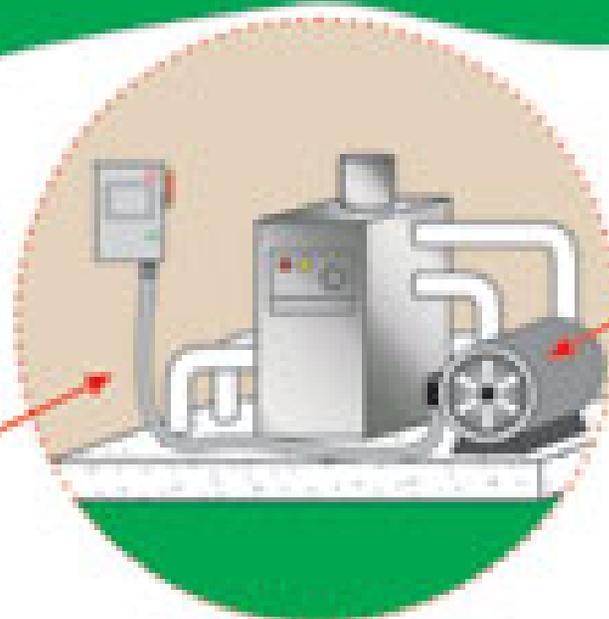
- Rated 15 or 20 amperes
- 125-volt or 240-volt
- Single-phase
- Receptacle or direct connection
- Regardless of location



**GFCI protection required for cord-connected or hard-wired pump motors**

125- or 240-volt pool pump motor

To pool pump motor



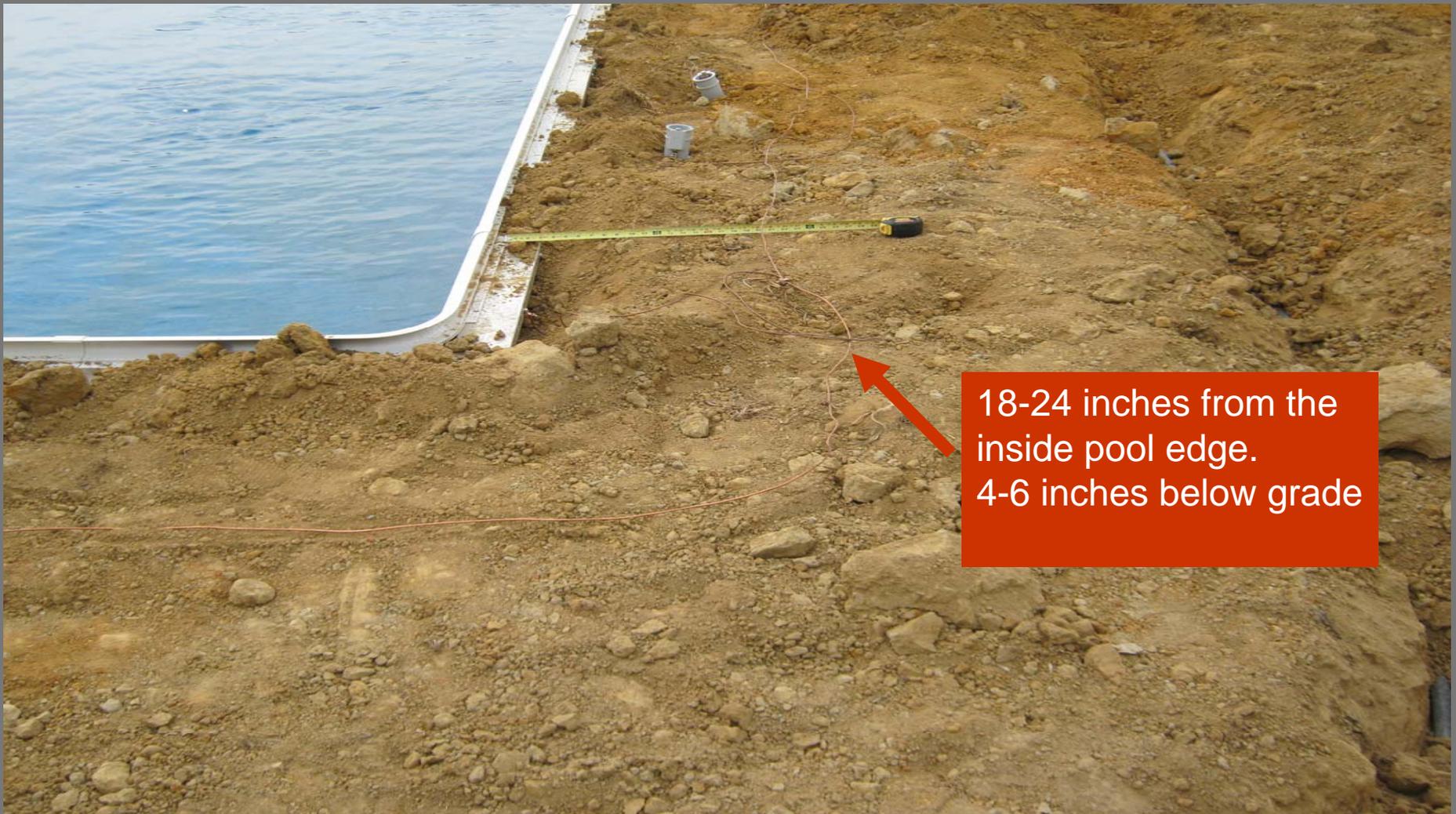
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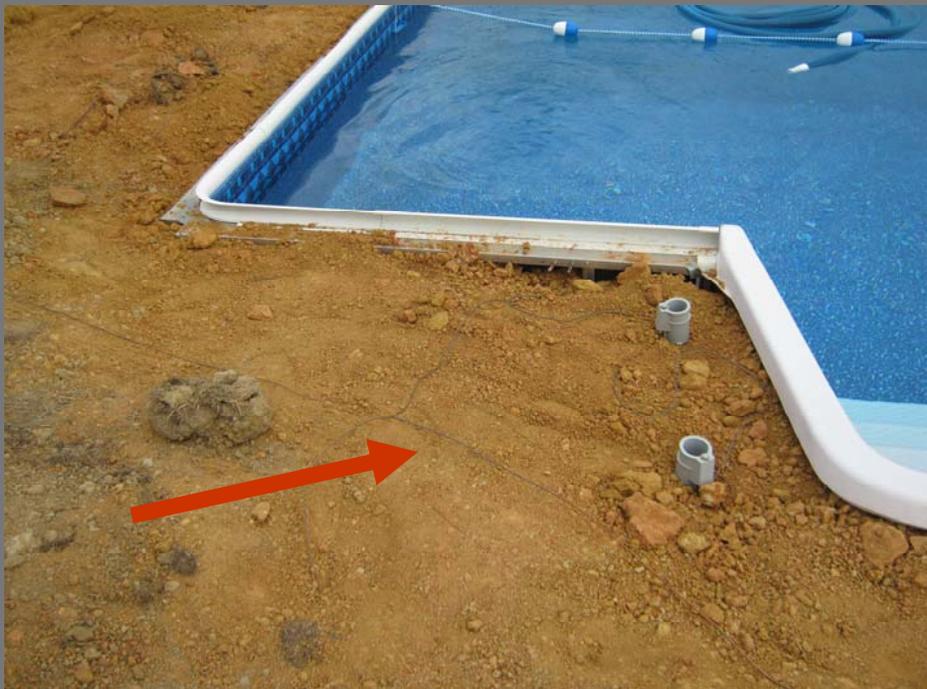
### 680.26(B)(2)(b) Perimeter Surfaces

- **E4204.2 At least one 8 AWG solid copper conductor secured within or under the perimeter surface and installed 18" - 24" measured horizontally from the inside walls of the pool.**
- **Where installed beneath the final grade material, the bonding conductor shall be buried 4" - 6" below the sub-grade.**

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## 680.26(B)(1)(b) Copper Conductor Grid





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## 680.31 Pumps

- E4207.1 Cord connected pump motors for storable pools are required to be provided with GFCI protection that is an integral part of the cord assembly and to be located within 12" of the attachment plug.
- All 125 volt receptacles locate within 20' of the inside walls of a storable pool shall be GFCI protected.

# Storable Pools GFCI-Protected Receptacles Section 680.32

Cord with integral GFCI protection [680.31]

GFCI protection is required for all 15A and 20A, 125V receptacles located within 20 ft of a storable swimming pool.





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**THE END**