

2010 Residential Ques. & Ans.

- 1 .I am replacing several existing receptacles in an older apartment building because they no longer hold the plug securely. Do I need to install tamper resistant receptacles?

Ans. No 406.11, 210.52, Comm. 16.003(4)

It would not need to be replaced with a tamper resistant receptacle. Comm. 16.003(4) indicates repairs made to existing installations may comply with the code that applied at the time of installation. The requirement for the installation of tamper resistant receptacles became effective Jan. 1, 2010. 406.11 indicates all 15 and 20 ampere 120 volt receptacles specified in 210.52 shall be listed tamper resistant receptacles. 210.52 indicates the requirements for receptacle locations in dwelling units and would require all of the 15 & 20 amp 120 volt receptacles installed in the dwelling unit, garage, basement, outside etc. to be tamper resistant.

- 2 By the time we were hired to wire a new home the footings were already poured and they did not install rebar in them. What do we do now?

Ans. Install one of the other grounding electrodes allowed. NEC 250.50, 250.52

NEC 250.50 requires all of the grounding electrodes described by 250.52 that are present to be used and bonded together. 250.52 lists the items permitted to be used as grounding electrodes. These are a metal underground water pipe, the structural metal frame of a building, a concrete encased electrode, a ground ring, rod or pipe electrodes, plate electrodes, or other metal underground systems or structures. You do not have to install a concrete encased electrode however if re-bar is installed you are required to use it.

3. Can you please explain the outdoor receptacle difference between 210.52(E)(1) and (3)

Ans. Requirements are for front and back of dwelling while standing on grade or on deck or porch. 210.52(E)(1) & (3)

210.52(E)(1) applies to front & back receptacles accessible while standing "on grade". (3) applies to a balcony, deck, or porch located either at grade or elevated being 20SF or larger and are in addition to those required by (1) with some overlap. You are required to be able to reach the required front and back receptacles while standing on grade.

4. I hear that brace walls 24" or less are not allowed to have any box opening other than 3" round cut into it unless engineered. Is that true and how do I know when it's a brace wall?

Ans. Yes Comm. 21.25

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Yes, in Comm 21.25(8) there are many types of brace wall construction methods. The brace wall locations and methods are required to be indicated on the construction plans

5. My mother-in-law has a 5th wheel trailer which she wants to park in my yard when she returns from Arizona each summer. It has a 50 ampere 120/240 volt cord and plug connection. What do I need to do?

Ans. Provide a 4-wire feeder to a receptacle. 551.46(C)

Article 551 gives us direction for recreational vehicles. 551.46(C)(4) indicates vehicles with a 50 ampere power supply assembly shall have an attachment plug rated at 50 amperes with a configuration complying with Table 551.46(C).

6. Are we allowed to install a receptacle in a cold air return? There just is no other place to install one to meet our required spacing because of other systems being installed in a 4' wall and the owner does not want to pay for a floor receptacle.

Ans. Yes 300.22(C)

Cold air returns are considered "other space used for environmental air" in 300.22(C). The wiring method requirements are found in (1) and in general would require a metallic wiring method such as a metal raceway, MC or AC cable or an EMT sleeve. (2) indicates a metallic equipment enclosure would be required or a non-metallic enclosure listed for the use. I don't know if there are any that would be approved. Note EXC 1 allows the use of NM cable to be installed perpendicular to the long dimension of the space in dwelling units only.

7. Is a non-fused air conditioner disconnect required to meet the working clearance requirements in 110.26?

Ans. No. 110.26(A)

A disconnect switch is not judged to require servicing while energized. If the disconnect has fuses, overloads, or circuit breakers inside, 110.26 applies. The disconnect must be readily accessible and within sight of the unit per 440.14.

The control panel on the AC unit should have sufficient access for service personnel and otherwise meet 110.26.

8. As a 1&2 Family Dwelling Inspector am I suppose to be inspecting the effluent tank wiring? Is it legal to install a cord body onto an UF cable?

Ans. Yes, No Comm. 20.10(2)(a), Comm. 24.01, Comm. 16.110

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Yes, Comm 20.10(2)(a) and 24.01 when the electrical supply comes from the dwelling it is considered part of the dwelling wiring.

No, Comm 16.110 requires you to follow the listing or manufacturers instructions, cord caps and connectors are for use on "cords" only

9. To determine if a stud plate is required do I measure from the nearest edge of the cable or the hole to the edge of the framing?

Ans. From the edge of the hole. 300.4(A)(1)

NEC 300.4(A)(1) for bored holes the measurement is taken from the edge of the hole to the nearest edge of the framing. If less than 1 1/4" a stud plate is required.

10. I am installing a 320 ampere 120/240 volt service pedestal which will feed 2-200 ampere panelboards in the basement. My question is can I bring my conductor from the ground rods into the pedestal and connect it there?

Ans. Yes 250.24(A)(1)

250.24(A)(1) of the NEC permits connecting the grounding electrode conductor in the metering equipment. Many local utilities do not permit this connection so it is rarely done in Wisconsin. I normally see 250.64(D) used to ground both disconnects with this type of service. Doing it this way you would connect the grounding electrode conductor in one panel and connect the second panel with a tap to the conductor going to the rods.

11. I have whirlpool tub being installed in a single family home. The water system is CPVC and the water connections to the mixing valve are copper stubs less than 2' long. Are we required to bond this copper to the lug of the pump per NEC 680.74.

Ans. No 680.74

I read 680.74 to require bonding of "All metal piping systems and all grounded metal parts in contact with the circulating water". The copper stubs are not metal piping systems. And I don't think that they are in contact with the circulating water. So from this perspective the copper stub does not require bonding.

12. The owner of a new home we are working on would like to install a flat screen TV above her whirlpool tub. I told her I can't install a receptacle in this location and she is not happy. Any ideas on what I can do?

Ans. You may be able to install the receptacle. 406.8(C)

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406.(8)(C) does not allow a receptacle to be installed within or over a bathtub or shower stall. If the tub is installed such that there is a ledge between the edge of the tub and the wall the receptacle would be installed in, and there is no shower head, we would consider the receptacle to be outside the tub. The receptacle would of course be required to be GFCI protected.

13. We just finished wiring a new home that has its own well with a submersible pump. When the inspector did the final inspection he red tagged us for not having a disconnecting means located within sight of the well. Is this now a requirement?

Ans. Not if the controller disconnect is capable of being locked off. 430.102(B)

430.102(A) requires a disconnecting means be located within sight of a motor controller. (B)(1) requires a disconnect be installed within sight of the motor and (B)(2) indicates that where the disconnect for the controller is within sight of the motor it is permitted to act for both pieces of equipment. The exception to 430.102(B) indicates where it is impracticable to install a disconnect within sight of the motor the controller disconnect can be used for the motor where it is capable of being locked off. The provision for locking it off must remain in position with or without the lock being installed. I would allow the disconnect for the controller to be used for this installation if capable of being locked off.

14. I am going to add several receptacles in my family room to supply my new big screen TV, surround sound system, Blue Tooth Player, stereo, and numerous other electronic gadgets. I was going to run a new circuit but now I am being told I would have to purchase an AFCI breaker. Those things are expensive. If I just extend an existing circuit would I still have to AFCI protect it?

Ans. No 210.12 Comm. 16.003(3)

210.12 would require AFCI protection for a new circuit supplying any outlets in this room however Comm. 16.003(3) indicates existing installations shall conform to the code that applied at the time of installation. If you are extending an existing circuit you would not be required to AFCI protect it.

15. Am I now permitted to connect my intersystem bonding to the meter socket?

Ans. No PSC 114.099(C)

Per NEC 250.94(1) Yes This requires provisions to bond telephone, cable, or other systems external to enclosures at service equipment. It must have a capacity of not less than 3 terminals and if not bonded to a service equipment enclosure connected with a minimum #6 AWG copper conductor. But, Per PSC 114.099C. No unless furnished as part of the enclosure. PSC rules apply to all Utilities except Electric Cooperatives.

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16. I replaced an existing panelboard that was located on a stairway. The stairway is 42" wide so I feel I meet the working space requirement but the inspector has indicated I need to find a new location for the panel. Why?

Ans. Yes it needs to be moved. Table 110.26 (A)(1) 240.24(F)

Table 110.26(A)(1) indicates you would need a clear area 30" wide by 36" deep in front of equipment that may need servicing while energized. 240.24(F) does not allow a panelboard to be installed over steps of a stairway. However a landing is acceptable if proper clearances are met

17. We usually take most of our home runs down the first floor wall above our panel located in the basement because it makes for a cleaner job in the basement ceiling. Now I am hearing we need to be careful about bundling these cables in that stud space as well as where we penetrate the floor. I thought bundling of cables in a dwelling was not a concern. Has something changed?

Ans. Yes Comm. 16.310, 310.15(B)(2)

Comm 16.310 adds a 6th exc. to the exceptions in the NEC. Branch circuits supplying individual dwelling units generally do not have to be "derated". However there is a change in the 2008 NEC. The key to avoiding derating is to avoid bundling in locations where the cables are firestopped or are installed in contact with insulation. Three or more cables run through the same opening that is firestopped or in contact with insulation now require "derating".

18. On a new home with a private well are we required ground the metal well casing?

Ans. Yes 250.52(A)(8) 250.110

While a metal well casing can be used as a grounding electrode there is no requirement that it be. 250.110 does require it to be connected to an equipment grounding conductor installed with the branch circuit for the submersible pump.

19. When wiring a "three season room" which will have no permanent heat source. Are we required to install receptacles to meet the 6'-12' rule?

Ans. Yes 210.52

210.52(A) gives us a list of rooms in a dwelling unit that are required to have receptacles installed to meet the requirements of 210.52(A)(1) thru (A)(3). One of them is a sunroom which I would consider similar to a "three season room" if it has permanent glazing. There is no requirement for a heating source for it to be considered a habitable room. If the room is attached to a home with access from the interior, is considered to be a dry location, and is large enough to reasonably assume it will have furniture and cord and plugged appliances, such as a television I would

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require receptacles to be installed to meet the 6'-12' rule. Also 210.70 would require a switched interior lighting outlet and a light on the exterior of any outdoor entrance.

20. Is the low voltage fireplace igniter and 120V blower switch permitted in the same box? What if I use NM cable for the igniter wiring?

Ans. Yes 725.136(B)

Yes, providing there is a manufacturer divider installed in the box separating the two circuits per 725.136(B). You could use NM cable however a divider is still required for the igniters which is generally piezo electric falling under 725.121(A)(3) Ex #2 as a Class 2 circuit equivalent.

21. There seems to be a lot of confusion regarding where tamper resistant receptacles are required to be installed. Can you tell me where they are required?

Ans. In all areas of dwellings. 406.11

406.11 indicates 15 and 20 ampere 125 volt receptacles installed in all areas specified in 210.52 are required to be listed tamper resistant. They include outdoor receptacles, and for single family homes, basements, garages, and detached garages if they have power.

22. In a house I recently inspected the light for the basement stairs is not located directly above the stairs. When I asked the electrician to install another light over the stairs he told me to forget it because the one near the stairs on the basement ceiling is sufficient. What do you think?

Ans. A lighting outlet is required in stairways. 210.70(A)(2) IBC 1205.12

A lighting outlet is required in all stairways. A 3' landing at the top and bottom is considered part of the stairway. If the light is located within 3' of the bottom step and provides adequate light on the risers I would accept it. While IBC 1205.12 of the building code does not apply to a 1 or 2 family home it could be used for guidance. It requires a minimum of 1 FC of light at the tread run. 210.70 requires a switch at each floor level and each landing with an entryway where the stairs has 6 treads or more between levels.

23. We are replacing an air conditioning condenser on an existing home. Do we need to install a receptacle for servicing within 25'?

Ans. No 210.63, Comm. 16.003(4)

Prior to the 2002 NEC the requirement for a receptacle for servicing dwelling unit AC units only applied if they were installed in attics or under floor spaces. For the

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replacement of an existing outdoor unit, installed before 2002, Comm. 16.003(4) would not require you to install a receptacle within 25' of the unit.

24. Are recessed luminaires located over tubs or showers required to have a listed shower trim kit installed?

Ans. No 410.10(D)

410.10(D) describes this area as a damp location unless subject to shower spray (meaning the luminaire is below the shower head). Follow the mfg. instructions for type of bulbs allowed for use in a damp location. Listed shower trims are for damp & wet location use. A larger selection is available for damp locations (air-tight is suggested).

25. Are the garage lighting and receptacles required to be AFCI protected?

Ans. No 210.12(B)

210.12(B) does not identify the garage as requiring AFCI however, the code doesn't prohibit the installation of AFCI protection for this area if desired.

26. Is a close nipple or rigid box spacer suitable for handy-box support to a furnace?

Ans. No 314.23(A)

No, not by itself. NEC 314.23(A) applies to a surface mounted box and additional support is required.

27. I have GFCI receptacle in my unfinished basement by the main panel. The furnace is located 30' away. Do I need to provide another receptacle by the furnace for servicing?

Ans. Yes 210.63

A 125 volt 15 or 20 ampere receptacle is required within 25' of a furnace or AC unit. It has to be in an accessible location and on the same level as the unit. It cannot be connected to the load side of the equipment disconnecting means.

28. If a 20 amp circuit feeds the 125 volt washer receptacle in the laundry room, can a 15 amp circuit feed other 125 volt receptacle outlet(s) in the laundry room also?

Ans. Yes 210.11(C)(2)

210.11(C)(2) requires at least one 20 amp circuit be provided for the laundry receptacle required by 210.52(F). This circuit cannot feed any receptacles that are not in the laundry room however it does not prevent you from feeding other receptacles in

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the laundry room with a 15 amp circuit or you could use the 20 ampere laundry circuit to supply more than one receptacle in the room.

29. We typically take a 20 ampere multi-wire branch circuit to a 2 gang box under the kitchen sink to supply a switch for the adjacent dish washer and a receptacle for the disposal. On the last job the inspector is requiring us to install a 2-pole breaker for this circuit. These are not supplying the same device so I think I can use 2 single pole breakers. What do you think?

Ans. I think the inspector is right. 210.4

You are right previously you were allowed to use 2 single pole breakers if the circuit did not feed the same device however 210.4 now requires all multewire branch circuits to be provided with a disconnect that will simultaneously disconnect all ungrounded conductors. This can be accomplished by using a 2 pole breaker or 2 single pole breakers with an approved handle tie.

30. Am I required to install a receptacle on the counter top near my wet bar sink in my basement rec. room?

Ans. No 210.52

Required receptacle locations in dwelling units are found in 210.52. The general rule in 250.52(A) requires receptacles be installed such that no space measured along the floor line in kitchens, living rooms, bedrooms, rec. rooms, etc and similar rooms be no more than 6'. (A)(2)(1) indicates this measurement continues around the room that is unbroken by doorways, fireplaces, and similar openings. 210.52(C) requires receptacles to be installed above kitchen counter tops but the cabinet you are referring to would not apply. The bar would qualify as a break in the wall space and would require a receptacle within 6' on each side of it. If this receptacle is within 6' of the sink it would be required to be GFCI protected even if it was not above the counter by 210.8(A)(7).

31. Is there anything available other than the obtrusive in-use receptacle bubble covers?

Ans. Yes 406.8

406.8 (A) allows 15 or 20 ampere 120 or 240 volt receptacles installed in a damp location to have a cover that is weatherproof with the plug removed and the cover closed. 406.8B) requires covers for receptacles located in wet locations to be weatherproof whether or not a plug is installed. Taymac has an extendable cover, Arlington Industries and T&B/Red Dot have recessed box/receptacle assemblies to name a few

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32. We constantly are requested to hang side lights on surfaces that do not match with the canopy. How are we supposed to seal these?

Ans. They must be installed to prevent water from entering the enclosure. 410.10

NEC 410.10 requires luminaires installed in wet or damp locations to be installed in such a manner that water cannot enter the wiring compartment. Rock is probably the worst and you'll need to work with the mason. Use caulking, duct seal, & larger siding blocks.

33. I am hearing that we now need to install carbon monoxide detectors in dwelling units. Is this correct?

Ans. Only applies to apartment buildings with 3 or more units, and motels. Comm62.1200. Proposed legislation may extend the requirement to 1 & 2 family dwellings.

The requirement for CO 2 detectors is found in Comm. 62.1200 of the commercial building code, and applies to apartment building of 3 more units, motels, rooming houses, bed and breakfasts etc. Detectors are required in buildings or units that have gas fired appliances.

34. I installed a new 100 ampere underground feeder to a detached garage using URD cable. The inspector turned down the job. It is installed in a raceway where it emerges from the ground and continues several feet inside the building to each panel. What's his problem?

Ans. USE cable is not allowed to enter a building. 338.12(B)(1)

What you are probably using is actually USE cable. URD stands for Underground Residential Distribution, is not a listed cable, and you will not find it in the NEC. USE cable is addressed in Art. 338. Under uses not permitted in 338.12(B)(1) it indicates it is not allowed for interior wiring. If it just has the USE designation it does not have the flame and smoke retardation required for interior installations. Most electricians are now using a dual rated cable such as USE/RHW. The USE designation allows it to be direct buried and the RHW designation allows it to be used inside a building.

35. As a 1&2 Family Dwelling Inspector am I suppose to be inspecting the well pump wiring?

Ans. Yes Comm. 20.10(2)(a), Comm. 24.01

Yes, Comm 20.10(2)(a) and 24.01 when the electrical supply comes from the dwelling it is considered part of the dwelling wiring. The well casing and pump are required to be grounded per 250.112(L)&(M) and waterproof connectors are required per 110.11 for this wet location.

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36. When we had the final inspection on a new home we just finished the inspector told us we did not have weather resistant receptacles installed for the outside receptacles. We have a weather proof cover installed so what else can we do?

Ans. Install a receptacle listed as a "Weather Resistant Type". 406.8

406.8(A)&(B) requires all 15 and 20 ampere 120 and 250 volt receptacles located outdoors to be a listed weather resistant receptacle. They are tested for UV and cold exposure impact resistance as well as corrosion resistance. They will have a WR imprinted on the face. WR receptacles are also available as tamper resistant for residential use.

37. Who has the fisherman's ruler the contractor or the inspector? I keep seeing competitors' jobs with no receptacle outlets in 2'+ walls and over 6' from door openings!

Ans. Receptacles are required in both areas 210.52(A)(1) & (2)

They must shop at the same tool store. NEC 210.52(A)(1) and (2) requires receptacle outlets in kitchens, family rooms, living rooms, bedrooms etc. Hallways of 10' or more are required to have one receptacle. Failure to comply is clear negligence by both party's and is subject to statutory legal prosecution.

38. I am doing a service change from 100 to 200 amperes. Do I need to install AFCI breakers?

Ans. No 210.12, Comm.16.003(4)

You would not have to install AFCI protection for any of the existing circuits if they did not previously require it. If you are adding any new circuits to an area that would be required by 210.12 to be AFCI protected you would be required to provide it.

39. Is a receptacle outlet required within 6' of the direct vent water heater or softener? Is GFCI protection required if located on the bottom of the joists? Does it need tamper-resistant receptacle?

Ans. Yes to all. 210.50(C), 210.8(A)(5), 406.11

Yes, NEC 210.50(C) requires a receptacle be located within 6' of a specific cord and plug connected appliance. Yes, NEC 210.8(A)(5), requires all receptacles in an unfinished basement to have GFCI protection. Yes, NEC 406.11 requires tamper resistant receptacles.

40. I recently had to replace a faulty circuit breaker in my house. It fed several bedrooms. My question is does it need to be an AFCI breaker?

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Ans. No Comm. 16.003(4)

Comm. 16.003 indicates repairs may conform to the code that was in effect at the time of installation. If the existing circuit did not need AFCI protection when installed you would not have to protect it now.

41. The master bathroom in a new house we are wiring has 2 sinks on the same counter. There is a mirror that extends over the entire counter. We installed a receptacle in the wall that is adjacent on one end but the owner does not want us to cut one into a floor to ceiling cabinet on the other end. Do you think this will be alright?

Ans. Both sinks need a receptacle within 3'. 210.52(D)

A receptacle is required within 3' of the outside edge of a bathroom sink. One receptacle can meet this requirement if properly located. You could install one in the mirror or the code allows one located on the face or side of the cabinet within 12" of the top of the counter.

42. I want to extend an underground raceway from a flush outlet box on my house to a remote landscape outlet box. How do I adapt to the flush outlet box?

Ans. Use an extension box.

Taymac and T&B/Red Dot each have flush box to weatherproof surface box extensions. Note how the extension box secures directly to the flush box and is not secured using the device box 314.19. Also note the use of expansion fittings would be required if attached to an underground raceway system. 300.5(J).

43. Do inspectors ever look to see if the outlet box is flush with the combustible surface? Almost every building I go to has the siding block a way out in front of the outlet box!

Ans. They are supposed to. 314.20

They are supposed to be checking for that problem however, the installer is also suppose to know to comply with NEC 314.20. Use of proper boxes is preferred however, there are listed box extensions available for after the fact correction.

44. I ran 8/4 aluminum SER cable to an electric range. The inspector is saying 8 AWG SE cable is only rated for 30 ampere and is inadequate for this installation. We have been wiring ranges with 8 AWG SER for years. What changed?

Ans. The inspector is correct. NEC 338.10(B)(4)(a)

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338.10(B)(4)a indicates interior installations have to comply with part II of Art. 334. Part 2 includes section 334.80 which restricts final ampacity not to exceed 60C. Table 310.16 says 30 amperes at 60C for number 8 AWG AL. You will need to use min. #8 copper or #6 aluminum if the range requires a circuit of more than 30 amperes. You will have to rethink your dryer circuits also for the same reasons.

45. My wife wants me to install a ceiling fan in the kitchen. When I read the instructions that came with the fan it indicates I need to provide a fan rated box or some other support. How do I do this in a finished ceiling?

Ans. Boxes are available for finished ceilings. 314.27(D)

Outlet box for sole support of ceiling fans are required to be listed and marked by the mfg. as suitable for the purpose. There are listed boxes available to be installed in finished ceilings. 422.18 also allows ceiling fans to be independently supported.

46. I am installing a 600 ampere service on a new house. I would like to install 3-200 ampere panels as my service disconnects however I was told I cannot have more than 2 service disconnects on a dwelling. Is this correct?

Ans. No 230.71, 230.72

Previous Comm. 16 codes did limit you to not more than 2 disconnects for a dwelling with an electrical service of 300 amperes or more. This was deleted in the 2008 Comm. 16. We now use the language in 230.71 which allows up to 6 service disconnects for each service allowed in 230.2. Remember 230.72 requires the 2 to 6 disconnects to be grouped.

47. On a new home we are wiring the owner has decided to add a bedroom in the basement and the panel ended up in the closet. Is this going to be a problem?

Ans. Yes 240.24(D)

240.24(D) indicates overcurrent devices are not allowed to be located in the vicinity of easily ignitable material, such as a clothes closet.

48. I have an inspector telling me that we need to install outlets along the step down which runs along one side of a sunken living room. I told him that it is not considered wall space. What do you think?

Ans. Stair risers are not considered wall space. 210.52(A)(2)

If it is open you would not be required to install receptacles along this step. 210.52(A)(2) indicates that wall space shall include the following, fixed room dividers such as free standing bar-type counters or railings.

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49. A customer asked us for a bid to install a standby generator with an auto transfer switch to supply his entire house. We lost the job to a different contractor who is going to install a generator that I feel will not be large enough to supply the entire house. He told the customer that he could just turn off some breakers if the generator became overloaded. Is this code compliant?

Ans. Not any longer 702.5(B)(2)

This is an optional standby system and is addressed in Art. 702. Section 702.5(B)(2) indicates where automatic transfer equipment is used the standby source is required to be capable of supplying the entire load or a method to automatically shed load. 702(B)(1) allows for the user to select the loads to be supplied where a manual transfer switch is used.

50. I have a 2" service lateral running approximately 30 feet under a 4" garage slab. The lateral is approx. 2' deep. The service lateral penetrates the basement wall directly into the service disconnect. Is the area under the garage considered the inside of the building or is the outer surface of the building exterior considered the basement wall?

Ans. The basement wall. 230.6

This issue is addressed by NEC 230.6. Service conductors that are run under a minimum of 2-inches of concrete are considered "out of the building" for the purpose of applying Comm.16.230(3).

If these conductors emerge from the meter pedestal, are routed down the outside of the garage, through the foundation, and then under the slab these service conductors are considered outside of the building until the point where they emerge in the basement.

What is not clear from your description is if the conductors leave the meter pedestal and stay outside the building until they penetrate the outer wall of the garage. If they were to emerge out the back of the pedestal, enter the garage then go under the slab and into the basement. These conductors would be considered inside the building at the point where they enter the garage. A service disconnect has to be provided at the point where they enter the garage.

51. I installed a 320 ampere 120/240 volt meter pedestal on an existing garage on my lot on Little Bearskin Lake near Minocqua. I then took a 100 ampere feeder to my panel in the garage and a 200 ampere underground feeder to my new log home. My neighbor, some guy named Weber, came over and told me I have to provide a disconnect ahead of the feeder to my house. I think he is just worried he may no longer have the biggest and fanciest place on the lake. Is he right?

Ans. Yes Comm.16.230(4), 230.71, 230.72

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Comm. 16.230(4) indicates that a disconnecting means is required where utility wiring ends and premises wiring continues overhead or underground to more than one building. 230.71 allows up to 6 service disconnects to be installed for each service allowed by 230.2. NEC 230.72 requires these disconnects to be grouped at the same location. You would have to install both disconnects either inside or outside on the garage and then you can proceed to feed the house.

52. Is there a maximum height off the floor for a service panel?

Ans. 6'7" above the floor.

NEC 404.8(A) indicates that "They be installed such that the center of the grip of the operating handle of the switch or circuit breaker, when in its highest position, is not more than 6' 7" above the floor or working platform."

53. Some of the newer homes I am seeing built have entrance foyers that are the size of a small room. I have been requiring the electrician to install receptacles to meet the 6'-12' foot rule. They are telling me I am the only area that is requiring this. Am I wrong on this interpretation?

Ans. Yes 210.52(H)

The entrance foyer is generally not used as a kitchen, family room, living room, den, sunroom or similar space. However, if the length along the centerline is greater than 10-feet, at least one receptacle outlet shall be provided per 210.52(G).

54. Can you please address the bonding of a gas system that has some CSST installed at various locations in a building. The piping system changes from black pipe to CSST and back to black pipe. Do I need to install a bonding jumper around the CSST?

Ans. No 250.104(B)

NEC 250.104(B) requires bonding of the gas piping sized using Table 250.122 for the rating of the circuit that may energize the piping. It also indicates the equipment grounding conductor of the circuit that may energize the system is permitted to serve as this bonding means. See the manufacturers' instructions for requirements of bonding CSST systems. Typically they require a connection from the grounded conductor at the service disconnect, or connection to a grounding electrode or the grounding electrode conductor. This connection is also typically required to be as near as possible to where the gas piping enters the building or outside of the building. The size of the conductor is also determined by the mfg. instructions. There are no requirements to install a jumper around each piece of CSST. The use of the intersystem bonding system could be used as a connection point.

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55. I have installed a switch for the shower light next to the combination tub/shower. The inspector says this switch must be moved because it is too close to the unit? Can you tell me how far away it has to be? I don't want to have to move it again.

Ans. It must be located outside of the tub/shower space. 404.4

Switches cannot be installed in a wet location in a tub or shower space unless installed as part of a listed tub or shower assembly. 404.4

56. I am seeing more low voltage lighting being installed for decorative and cabinet lighting. What should I be looking for?

Ans. Article 411 addresses lighting systems of 30 volts or less.

411.3 requires listing of lighting systems operating at 30 volts or less shall comply with (A) which requires the complete system to be listed, or (B) which allows for the assembly of listed parts which are listed for use as part of the same identified lighting system. 411.4 requires conductors concealed within walls or ceilings to either be a Chapter 3 wiring method or where supplied by a Class 2 power supply to be installed per 725.130. 411.6 limits the branch circuit supplying the system to be no larger than 20 amperes.

57. The service panel for a new house is located in the basement laundry room next to a laundry sink. Is this OK?

Ans. Yes

There is no required separation between a sink and an electrical panel. The sink may not occupy the required work space in front of the panel. If the panel is off to one side of the sink, the Code does not require a minimum horizontal separation.

58. I have a question regarding the roughing in of a new outlet in residential remodel job. I am a plumbing contractor installing hot water baseboard heat. My baseboard is a continuous run for 20 feet. The electrician needs to install outlets above heat register. The electrician is telling me that I must stop and start my baseboard hot water heat. Of course I do not want to start and stop my baseboard heat. How could he go about installing outlets either above or below the baseboard.

Ans. Receptacles can be located above a hot water baseboard.

The electrician is probably thinking about the prohibition of installing receptacle outlets above high-density electric baseboard heat. This is a requirement of the way electric baseboard heating units are listed by UL. The requirement is found in the manufacturers installation instructions. There is no rule that I am aware of that

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prohibits receptacle outlets from being located above hot water baseboard heat. Check with the manufacturer of your heating units if you want to verify.

59. The utility company in my area requires the meter pedestal to be installed at the lot line. The pedestal has a 200 ampere circuit breaker installed in it. I have 2 questions. Can I run a 3-wire feeder to the house? Do I need a grounding electrode at the pedestal and at the house?

Ans. No, yes 250.32, 250.24

A 4-wire feeder would be required. 250.32(B) requires an equipment grounding conductor be installed with the supply conductors. 250.24 requires a grounding electrode to be installed at the service. 250.32(A) would also require a grounding electrode at the house. This grounding electrode would be connected to the equipment grounding conductor at the house and sized using Table 250.66 for the ungrounded supply conductors.

60. We have a new house that is being supplied with plastic water line. When the water line enters the house it changes to about 20' of copper to the water heater then the rest of the house is done in plastic. We bonded to the metal water line at the water heater because it is close to the electrical panel. The inspector says we need to make this connection within 5' of where the water line enters the house. Is he correct?

Ans. No 250.104(A)

250.104 requires bonding to metal water piping in a building using Table 250.66 to size the bonding conductor. It would need to be connected to the grounded service enclosure, the grounded conductor at the service, the grounding electrode conductor, or one of the grounding electrodes. Where more than 10" of metal water piping is in direct contact with the earth 250.52(A)(1) requires it to be used as a grounding electrode and the connection would be required within 5' of where it enters the house.

61. I am hanging fluorescent fixtures in a detached garage. I would like to connect them with flexible cord. My question is can I hard wire them or am I required to use a plug and receptacle?

Ans. Cord and plug connection is required. 410.62(C)

Flexible cord is allowed to supply electric-discharge luminaires where the fixture is located directly below the outlet, the cord is visible its entire length, and is terminated in a grounding type attachment plug. 410.62(C)

62. I did a final inspection of a new home wired by a contractor rather new to our community. I asked him to go back to fix the receptacle box under the dishwasher, and add a breaker lock for the disconnecting means requirement. He

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stated he'd never heard of that, for a dishwasher, he floats a box and considers that the disconnect means in conjunction with cord-and-plug. What do you guys think?

Ans. Boxes are required to be secured. 314.23

Boxes are required to be securely fastened in place. Floating boxes have never been permitted on account of 314.23. The cord-and plug is a legitimate disconnecting means per 422.16(B)(2). Last but not least, a breaker lock is permitted as the disconnecting means for a *non*motor operated appliance per 422.31(B). For motor operated appliances, with motor HP greater than 1/8, follow 422.32. In other words, the disconnect must be within sight of the appliance because that's where the motor controller is normally located.

63. We have an installation with 2" PVC feeding into a service disconnect. The conduit is terminated at the cabinet using terminal adapters. The conductors installed in the conduits are 2/0 copper. We have inspector citing 300.4 (f) that the terminal adapter need to have plastic bushing installed. Would you please advise if these bushings are required?

Ans. A bushing would not be required.

Bushing are not generally required to be used with RNC terminal adaptors. 300.4(F) requires the 4 AWG or larger conductors be protected by "a substantial fitting providing a smoothly rounded insulating surface". A listed RNC box fitting or terminal adaptor is tested to meet this requirement without a separate bushing. I have attended many inspector meetings where this question has been answered by the UL representative in this fashion. As long as the fitting has not been damaged, no bushing is required.

64. I had a local contractor ask about using a small "puck lights" as side lights in a stairway. The installation instructions are specific not be recessed into ceilings, but they do not address the stairways. What is your opinion on this use?

Ans. Can't use Comm. 16.110

When I hear "puck" often it meant to be installed in a cabinet such as a hutch. Is the power supply to the transformer or fixture flexible cord meant to be plugged into a receptacle? If that were the case it is definitely not allowed to be permanently connected and of course flexible cord cannot be run through or installed in walls. Also by their indicating it is not to be recessed in a ceiling I would assume it is meant for furniture or cabinets only and would not be allowed recessed in a wall. Read the mfg. instructions.

66. For final elect. inspection on a new home. How do you look at the whirlpool tub motor access hole? Does it need to be finished so you can take the cover off and put it

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back on? Is it ok just to have a cut opening to test the outlet and inspect the motor knowing after the inspection has passed the builder will finish over the hole because they did not want it to be visible?

Ans. No 680.73

680.73 requires access to the motor, receptacle and other electrical parts is required without damaging the building finish. Therefore provisions for access, such as a detachable cover, the cover must be in place at the time of final inspection.

67. In remodeling, an existing home a phone cable or doorbell wire which is damaged or needs be relocated, may it be spliced and buried in the wall or ceiling?

Ans. Yes

There is no requirement in Article 725 that requires splices in a low voltage cable be accessible. The requirement for Chapter 3 wiring methods is found in 300.15. However 725.3 indicates that requirements in Article 300 generally do not apply unless specifically referred to in Articles 725, 800

68. When I installed the wiring to my new detached garage I brought the feeder from the house to one side of the garage and continued through the garage, about 20' to a room I am using for a hobby shop. The inspector now is requiring me to install a disconnect where the feeder enter the garage. Is he right?

Ans. Yes 225.32 Comm. 16.225.(4)

The inspector is referring to Art. 225 for outside feeders and branch circuits. 225.31 would require a disconnecting means for an outside feeder to a separate building. NEC 225.32 would require the disconnect be located either outside or inside nearest the point of entrance to the building. Comm 16.225(4) refers us to Comm.16.230(3) and would limit that distance to no more than 8' into the building.

69. Should I be considering a clothes dryer a continuous load and add 25% when sizing the circuit breaker for the branch circuit?

Ans. No Def. Art. 100

Unlike storage-type water heaters, which is a continuous load per 422.13, the Code does not dictate that a dryer be considered a continuous load. So, we're left with the definition in Article 100. I consider it to fall in the noncontinuous load category based upon typical use.

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70. I have a meter pedestal with a 200 ampere main breaker to feed the house located 50' from my house. I would like to tap off the pedestal to feed 100 amperes to an outbuilding. Do I have to install a 100 ampere breaker to protect this feeder?

Ans. No 240.21(B)(5)

This is considered an outside feeder tap and is addressed in 240.21(B)(5). The conductors need to be protected from physical damage. They also need to terminate in an overcurrent device sized to protect them which is located outside the storage building or if inside no more than 8'. Also consider how you are going to connect them on the load side of the pedestal breaker. You cannot install 2 wires in a lug unless it is rated for them.

71. I have been reviewing the Wisconsin Building Codes as well as the NEC. My question concerns the required height of a electric receptacle in a finished basement application. Can you help me?

Ans. Must be less than 5'6". 210.52

All receptacle required by 210.52 are required to be less than 5'6" above the floor. There is no minimum height. 210.52(A)(3) requires floor receptacles installed to count toward the required receptacles must be located within 18" of the wall.

72. Are receptacles installed on a screen porch required to be GFCI protected?

Ans. Yes 210.8

All outside receptacles are required to have GFCI protection by 210.8. The installation of screens would not eliminate that fact.

73. I installed a 2" PVC conduit to my detached garage for the electrical feeder. I would also like to have cable TV, and telephone installed. Can I put these systems in the same raceway?

Ans. No 820.47, 820.133(A)(1)(b), 800.47, 800.133(A)(1)(c)

CATV and communication cables are not allowed to be installed in the same raceway or junction box with power and light circuits unless separated by a barrier. 820.47, 820.133(A)(1)(b), 800.47, 800.133(A)(1)(c)

74. The central vacuum installer connected his suction outlets onto receptacle outlets. They came with #14 AWG conductors and some of them are tapped onto 20 amp circuits. Is this acceptable?

Ans. No 422.15

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422.15(B) indicates the connecting conductors shall not be less than the ampacity of the branch circuit they are tapped from.