

Western Section IAEI

2013 Code Panel Questions

1. Do the factory wings that many fluorescent troffers have designed to fold out over the grid meet the requirements for “securely fastened to the framing”?
2. A 200 ampere, 277/480 volt feeder is installed in 50 feet of 2½", Schedule 80, PVC Rigid Nonmetallic Conduit on the south side of a steel building. During the winter months, the outdoor temperature differs by as much as 50 degrees (°F). How much will the conduit expand in length with this change of temperature? And would an expansion type of fitting be required?
3. Is it allowed to use the grounding grid of a swimming pool's patio to be used as the grounding electrode system for a separate structure's pool equipment room?
4. Is it permissible to use 240.4(b) and round up to the next standard size over current device on a feeder tap? Example; Can 23 feet of 500 kcmil, Type THHN/THWN copper conductors be tapped off of a 1200 ampere feeder and terminated on a 400 amperes main breaker in a subpanel?
5. 2011 NEC 250.32 Buildings or Structures Supplied by a Feeder(s) or Branch Circuit(s) requires that an EGC be installed with the feeder conductors and bonded to the subpanel in the outbuilding. In addition, a GEC is to be installed to all available electrodes at the separate structure. If there are no available electrodes and a ground rod is driven and an appropriately sized GEC installed, is it required that this ground rod be supplemented as required in Article 250.53(A)(2), or can the one ground be considered supplemented by the main electrode system using the EGC to bond them together?
6. A basement is finished except for the concrete floor which remains original. Is GFCI protection required for all 120volt outlets in this area?
7. Is an equipment bonding jumper required between a cable tray and free- standing switchgear when uncoated -type MC cables drop from the tray to the switchgear?
8. In a small aircraft hangar where the aircraft has its fuel tanks in the wings, is it allowed to have electrical outlets on the side walls by the wings for servicing the aircraft?
9. Can PVC conduit be installed under the floor of a Commercial Garage (NEC 511) and if so are there any restrictions?

10. Can I bond the water line to a sub panel ground bar and not at the main panel if the incoming waterline is plastic and the house waterline is copper? If so, what size wire do I need to bond it with if I've fed the house with 4/0 aluminum?
11. An RTU is placed on a metal frame for weight dissipation & built up to where the controller and the breaker (disconnect) is now 8' AFF. Is it required to install a working platform 30" x 36" or is a ladder to access and service the unit NEC- compliant using the exception to 404.8 exception (2) & 240.24(a)(4)?
12. Are ground bushings listed for a choke on the GEC when installed in a ferrous raceway?
13. SE cable is allowed to be used for interior branch circuit or feeder wiring. It can be sized from the 75 degree column unless it is encased in insulation. Table 310.15(b)(7) allows a 200 amp main power feeder to be 2/0 copper which has an ampacity of 175 on the 75 degree column, but only 145 amps on the 60 degree column. Is 2/0 copper SE cable OK to use as a 200 amp main power feeder regardless of it being encased in insulation?
14. What is the minimum size junction box that can be installed to enclose a power distribution block that measures 6" x 6" and has two parallel 3/0 AWG copper conductors per phase terminated on both sides of the block?
15. Are dust tight "Hoffman type" junction boxes with Meyers Hubs listed for use in a Class II, Division I location approved for use in a Class II, Division II location as a junction box when sized correctly, even though the box is not identified for use in a class II location?
16. Can you run NM cable from a panel in a residence through wood walls & ceiling and then run it in $\frac{1}{2}$ "EMT surface- mounted? This is run to several devices in a concrete basement. Can it be done without stripping the outer jacket off the NM cable, or does it need to be removed?
17. In our jurisdiction we are required to install a UFER sized, not by the NEC which has a number 4 the largest required, but based on the service entrance conductors from Table 250.66. Not only that, for services over 200 amps, we have to install 20 feet of the bare conductor in the footer. What does this accomplish?

18. When running parallel conductors for a feeder, one phase of the parallel run has a couple of inches difference in length on one of the conductors. The electrical engineer does a voltage drop calculation that shows that one 500 KCMIL copper conductor carries 399.974 amps and the other carries 400.026 amps and says there is no problem with this installation. Because the engineering supervision is taking responsibility for this installation, is this legal?
19. Since there is only one inverter that is third party listed as being arc-fault protected, should the requirements of NEC 690.11 be enforced for all inverters, therefore only approving 1 type that has many restrictions? Are only 3-5kws listed?
20. For Power distribution units (PDU's) inside a room designated "information technology" with field installation using MC to 4-plex receptacle boxes under the floor, is it required to secure & support the boxes and wiring methods as stated in 645.(5)(E)(2) Or would this installation meet the requirements of 645.5(f)?
21. There is a residence that has a library 16' x 20' with book cases floor to ceiling along all 4 of the walls. Do I have to install floor boxes to meet wall space receptacle requirement of 210.52 or are no receptacles required?
22. I have two islands in my house, one is for the kitchen and one is for my wet bar in another room. They both have a receptacle within 6' of the sink installed on the back side of the island. The inspector is requiring that the one for the wet bar be GFCI protected and not requiring that for the kitchen. Is that a proper interpretation of the 2011 NEC?
23. Does the NEC require sizing raceways and their support racks to allow for future expansion?
24. Conduits and their end fittings are installed at the bottom of an open-bottom switchboard. How far into the switchboard can these raceways extend?
25. Where ground-fault protection of a service disconnecting means is provided and the available fault current exceeds 10,000 amperes, what is the maximum time-delay setting for the ground-fault equipment?
26. Can a ground rod be used on a light pole or other equipment rather than installing an equipment grounding conductor with the circuit conductors?

27. What is the NEC definition of a "Permanent Barrier" as used in 314.28(D). Does this mean it has to be welded, screwed, etc...?
28. Can you explain the grounding requirements for a service that consists of up to six switches or six circuit breakers in a group of separate enclosures?
29. In a residence I have an electrical panel located in a mechanical room 12'w x 8'd x 8'h meeting all the requirements of 110.26 for space and clearances, but it is only accessed through the crawl space which is only 4 feet in height and 10 feet long. Is this an acceptable location for the electrical panel for the house?
30. Can we install Nonmetallic Sheathed Cable in a wet location above ground if we place it inside a raceway?
31. Can a neutral conductor be used for bonding a meter enclosure to a panelboard mounted right beside the meter? I have installed PVC conduit between the enclosures. The inspector has requested I install a bonding jumper in addition to the neutral in the PVC. Which is correct?
32. The main service disconnect switch in a 277/480 volt panelboard is rated 1200 amperes. The calculated load would allow 900 amp fuses. Would GFI protection of equipment (GFPE) be required since the fuses are less than 1000 amperes?
33. Does UL or other NRTL list aerosol cans of smoke that can be used to test smoke alarms?
34. The interior of a panelboard got a little overspray from the drywall installation. How do we determine what to do with the panel interior?
35. If a metal cover is installed on a concrete hand hole installed in the ground, is the cover required to be grounded? I could not find a reference, but heard it was required.
36. Should the lightning protection system ground terminals be bonded to the electrical grounding electrode system of a building?
37. I installed a short rigid nipple out the back of a panel to an LB that has a 5' length of EMT to a disconnect switch for an AC unit. It only has #10 copper wires in the conduit and the inspector wants a bushing on the inside of the panel. Is he correct?
38. Does the equipment for the requirement for intersystem bonding in 250.94 have to be weather-proof?
39. Can a dry type transformer be loaded to its full rating (i.e. can a 75 kva transformer be used with 75kva of load) or is the maximum load 80%?

40. Does a building ground ring need to be sized per 250.66 or is the minimum size of #2cu per 250.52 sufficient for any size service?
41. Are there differences on how a 15 and 20 amp receptacle is constructed?
42. My grounding electrode system consists of a water pipe, a UFER, and a ground rod. My service conductors are 500kcmil copper. Can I run a 1/0 cu grounding electrode conductor to the water pipe, then a #4 cu conductor from the water pipe to the UFER, then a #6 cu from the UFER to the ground rod?
43. When determining the Maximum Rating or Setting of Motor Branch-Circuit Short-Circuit and Ground-Fault Protective Device using Table 430.52, do I use the motor amperages shown in Tables 430.247 through 430-250 for all type of motor applications or the nameplate rating on the motor(s)? Why?
44. Can the concrete pillars used to support a manufactured home be used for the UFER grounding electrode?
45. I am installing a 20 amp duplex receptacle fed with a 20 amp multi-wire branch circuit. Each half of the duplex receptacle will have a 16 amp load for a total on the duplex of 32 amps. Is each half of the duplex receptacle rated 20 amps, or is the rating for the entire duplex receptacle?
46. Is it permissible to utilize Table 310.15(B)(7) and install two parallel runs of 4/0 aluminum SER cable for a 400 ampere main power feeder for a single family dwelling?
47. I have a duplex dwelling that has the electric hot- water heaters for both units located in the basement of one of the units. They are being fed from circuit breakers in the electrical panels in each unit with breaker locks at the water heaters. If a problem arises with the water heater where the person does not have access to correct the issue, is this a code violation of Art. 210.25?
48. Is it compliant to run Health Care Facility cable through PVC in the concrete floor as long as it is not slab on grade, for dental chair receptacles?
49. Is it a violation to install a GFCI receptacle for the vending machine behind the vending machine indoors in a hallway of a commercial building?

50. Some conference rooms where I work are being equipped with a ceiling lift for the overhead projector that raises the projector to a position above the ceiling when not in use. The lift has a control panel for power connection so it is hard wired. My question concerns the projector cord connection that is above the ceiling when in the up position. NEC 400.8, uses not permitted lists instances where flexible cords are not permitted. Can a cord- connected projector comply with 400.8(5) when in the up position? NEC 400.7(8) could be interpreted by some to allow this installation although it does not specifically state above ceiling locations.

51. Regarding the use of Underground Feeder and Branch-circuit cable (UF) in conduit. Section 340.10 of the NEC "uses permitted", and section 340.12 "uses not permitted" is silent on this question. Therefore I have allowed the use of UF cable within conduit for physical protection or other reasons due to the fact the NEC does not prohibit this type of installation in section 340.12. Am I correct?

52. Insulated service-drop or overhead service conductors of the quadruplex type are used for a 480Y/277-volt service to a swimming pool dressing room, pump room, and rest room building. What is the minimum clearance in any direction required between this service drop and a diving platform?

53. I have mounted transformers in the attic to feed low- voltage light track fixtures in a dwelling living room. Are the 120- volt circuits required to be arc- fault protected?

54. There is a 150 amp 120/240 volt Federal Pacific circuit- breaker panel with spare spaces in a house. They want to add a new 20 amp 120 volt branch circuit in the kitchen. If I can find a breaker for this panel is it allowed? (Installation of equipment from a company no longer in business with known problems for faulty products acceptable).

55. In an operating room that has been identified as a "wet procedure location" can a regular receptacle trim plate be used?

56. What would be the minimum size of grounded service conductor that would be required for an industrial facility with a 2000 ampere service consisting of 5 parallel runs in 5 conduits of 600 KCMIL Type THWN-2 copper conductors? (there are no neutral loads on the system)

57. What size of equipment grounding conductor is required for a 480 volt, 3-phase, 7.5 HP, 11amp motor fed by # 14 THHN conductors? Is NEC 250.122(D)(1) applicable?

58. We are installing 26 – campground RV pedestals that have a 50 amp / 30 amp / 20 amp outlet in them. We are installing a 200 amp feed and connecting 6 pedestals to each 200 amp feeder. We are installing 4 wires to each pedestal. Do we still need to install 2 ground rods per pedestal. We are having a lengthy debate here at the shop and would like to know your thoughts on this installation.

59. I need your opinion, we will be wiring a hotel project. Each guestroom is being heated/ cooled by an individual fan coil unit, with horsepower ratings between .04 to .17 at 115V. They are being serviced by chilled and hot water. Do you feel Article 422.12 applies to these units where individual branch circuits are needed for each unit? In my opinion, it does not because these FCU's are not central. I feel article 424 covers these units were multiple FCU's can share a circuit.

60. I am installing 12- volt low voltage cable lighting in a family room in a residence. The transformer is located in the attic, is this branch circuit required to be on an arc-fault circuit breaker?

61. Where ground-fault protection is required for solidly grounded wye systems, what is the maximum ampere setting of the ground fault protection?

62. Am I allowed to install cord and plug connected heat mats by a swimming pool or hot tub outdoors? The manufacturer's plug comes with ground-fault protection of equipment, do I need to have ground-fault circuit interrupter protection also?

63. I am wiring the front counter of a restaurant that has sensitive electronics that require an isolated ground circuit. Can I install 12/3 MC cable and tape the red wire green, or strip the red wires and use it for my isolated ground? Can I use Medical MC cable or Medical AC cable?

64. A solenoid valve for an automatic irrigation pump oiler has 15" leads that will not reach the j-box. Can these leads be spliced in a "C" Condulet fitting?

65. Can SO cord be dropped from a bar joist to a display shelf (end cap) and hard-wired to a junction box on that display unit or does it have to be installed in conduit?

66. Walls separating (separation walls) dwelling units in the same building are required to meet the integrity provisions of fire partitions. What options are available for receptacle outlets on opposite sides of the wall separating these units when 24 inch horizontal separation is not possible?

67. A long-standing requirement in the National Electrical Code (NEC) is to provide a service disconnecting means for each building or structure served by electricity. The concept is simple; the disconnecting means serves as a ready means for the occupant or other responder to remove all power from the building by operating the service disconnect. What is meant by the term “grouped” as it is used in Section 230.72 of the NEC?
68. Are general-use Rigid Metal Conduit compression-type fittings allowed in a Class 1 Division 2 location?
69. Is it allowed to install a fire alarm panel in the crawl space of a residence?
70. I would like to have a clarification on approved methods about installing Metal Clad (MC) cable. I had an interesting discussion with a coworker. He said MC cable did not require or need an anti-short bushing (red head). So, I went diving into NEC 2011 but did not find anything saying that it is needed like it does for AC cable (320.40). Does the NEC require the anti-short for all MC cable?
71. Can we use pieces of scrap copper wire to secure electrical metallic tubing in a metal stud wall?
72. Does a utility-required disconnect (pedestal breaker) meet the requirements of 230.70(A)? What is the minimum distance that this device can be from the structure?
73. Can I use a 4-foot long piece of 1" liquidtight flexible metal conduit, with listed fittings, as an equipment-grounding conductor on a 40-amp circuit where flexibility is not required?
74. Are there conductor fill requirements for signaling circuits?
75. What rating is needed for a disconnect switch for a long-time rated X-ray machine?
76. When are hospital grade receptacles required? I see them in medical and dental clinics.
77. What would be the proper way to bond a rigid metal 90-degree “ell” used inbetween rigid PVC conduit on a service installation?
78. Where multiple service disconnects are installed in separate enclosures (three in this case) and grouped in accordance with 230.72, do these disconnects have to be within sight from each other?

79. What is the minimum distance a receptacle must be located away from a sink? What about a bathtub with a shower?
80. Are there any specific NEC rules for splicing copper and aluminum conductors?
81. I have been told that I must keep telephone (communication) cables at least two inches away from power cables in a dwelling. Where is this requirement in the NEC?
82. A 100 hp, 3-phase, 480 volt motor is fed with #2/0 AWG, Type THHN/THWN, copper conductors protected with Type NON-400 ampere fuses and a #6 AWG copper EGC. Are the motor circuit conductors, EGC, and fuses properly sized?
83. I want to wire a 75 KVA, 3-phase, 480-volt primary, 208-volt secondary transformer, with both sets of the wiring in the same conduit from a large j-box. There is OC protection on the primary conductors. Is this a NEC violation?
84. My water pipe ground clamp accepts up to a #2 wire size. Can I attach a lug to it to accept a larger conductor?
85. Can two outside breakers of adjacent four -pole, common trip breakers be utilized as a common trip breaker for 240 volt loads, if they are tied with an approved handle tie?
86. Is it a code violation to have general purpose receptacles on the same lighting circuit that has required battery- backup emergency lights?
87. 550.25 states that AFCI protection is required and shall comply with 210.12. Why do these panels leave the factory without the AFCI protection installed?
88. A 3-phase 120/208-volt generator nameplate shows the rating to be 275KW and 285KVA. The load calculation by the engineer shows the load on the generator to be 790-amperes. Is this acceptable?
89. Why are sunrooms specifically listed to be AFCI protected but not an enclosed porch or patio?
90. Does the NEC allow a 4" square box for a t-grid lighting fixture branch-circuit conductor to be attached to the t-grid if a support bracket made for this purpose is used?

91. I have a detached 2- car garage. I am supplying 100amp power from the house feeding the garage panel. I have 6-20 amp breakers in the panel feeding lights and receptacles. The inspector wants me to install a main breaker. Does the 6 switch rule in NEC Art 230.71 apply?

92. If I have a separate underground service for a fire pump entering the fire pump controller at the nearest point of entry, and the controller has a disconnecting means built into it (they are all service rated by code), do I need an additional disconnecting means ahead of the controller?

93. A 500 gallon gravity fed gas tank has no electrical power to it. The bottom of the tank is 5' off the ground. What, if any, is the classified area around the tank?

94. Is it permissible to install compact fluorescent lamps in existing 6-inch recessed luminaires?

95. A filling station has leakage sensors installed. Is the conduit for the sensors required to be sealed off?

96. I am installing recessed can lights in a dwelling. The 12/2 NM attaches to a junction box that is built off to the side of the can (a typical recessed can). The j- box is, strictly speaking, located in the attic space and not in the living room. An outlet, by NEC definition is where the wiring attaches to the energy using device. If the outlet is in the attic, it does not require arc fault protection, correct?

97. An existing strip mall has been split into smaller spaces. The new spaces do not have access to the overcurrent devices in their tenant space and no maintenance personnel are on site. Is this a violation of Section 240.24(B)?

98. If I size a service I use calculated load per the 220 of the NEC. If I size a generator to carry the entire premises wiring I have to use the connected load. Is this true for optional and required standby loads?

99. I have a 10KW 120/240 generator with 100amp automatic transfer switch supplying a house with 100amp service, gas heat and gas stove. The transfer switch will supply either utility or generator power. The calculated load is 60 amps and the inspector says I have to use load shedding. Why?

100. Are all lighting fixtures required to be listed and labeled?

101. In a residential building does the 2011 NEC have requirements for how many lights can be installed on 1- 20 amp circuit? How about how many receptacles? What about combination lights and receptacles?
102. Now that some jurisdictions have passed the 2012 IRC the inspector requires an additional smoke detector in the living room and Carbon monoxide detectors. What Code reference is he using?
103. We are installing a 277/480Y, 1200 A frame, main electronic trip circuit breaker with a 1200A sensor for a service disconnect. The ampere rating is set at .75 and in effect giving the circuit breaker a 900 ampere trip rating. The trip unit has a removable and sealable cover in compliance with Section 240.6(C)(1) for restricted access adjustable-trip circuit breakers. Is ground-fault protection of equipment required for this installation?
104. If an LED emergency light has only one driver does that meet the redundancy requirement of Article 700?
105. Are there special grounding requirements for vehicle mounted generators?
106. Are there any special termination requirements for copper wire?
107. The NEC is not a design manual. Good engineering practice would include 3 way switching at the top and bottom of all stairways. Section 210.70 (A)(2)(c) requires a switch at each floor level and landings for interior stairways for what should be noted as the heading of 210.70 (A) is Dwelling Units. In a commercial building we are renovating we can find no reference to required switching for the stairways. If we do not install switches at the top and bottom is it a violation?
108. We are installing a single-phase 208 Volt coffee maker next to the sink in the kitchen of a new restaurant. It will be plugged into a 30 ampere receptacle. Is GCI protection required?
109. I have a 3000 amp generator with no main breaker, the conductors from the generator terminals to the first distribution switchboard is over 115% of the nameplate current of the generator. The overcurrent protection is set at 3200 amps. Is this OK?
110. Can a panelboard be installed in a stairwell? The inspector says it is not permitted.
111. Does the emergency generator for a high-rise building need to be sized for the locked-rotor current of the fire pump in addition to the other emergency loads it will carry?

112. Can commercial cooking equipment be installed within a dwelling unit?
113. Can USE cable with dual rated conductors (RHH, RHW or THWN) be taken into a structure? An example would be from the load side of a meter base to a main disconnect.
114. Does the NEC allow the Grounding Electrode Conductor to be connected to the cold water pipe at the water heater area if it is the only accessible point in a finished basement for a service upgrade to avoid unnecessary damage to finished ceilings?
115. Are hold-down clips or screws required for PV system back-fed breakers?
116. What is the “service factor” that is required to be marked on Fire Pumps?
117. Does a circuit breaker used to control the lighting in a tenant area have to have the SWD mark on the breaker?
118. Is a standard wire-nut approved for a wet location as in an outside j-box? Is there a listed wet location wire-nut other than the ones approved for direct burial or in below grade j-boxes?
119. Does the requirement for eight foot clearance above roofs with less than a 4/12 pitch only apply to non-utility owned services or feeders since the utility has a four foot minimum requirement?
120. A freestanding bank is built having about 75% full-length windows mostly for security reasons. Is it required to have the contractor install show window receptacles every 12' per 210.62 even if the engineer does not design them, stating the bank will not hang any electric signs in them?