

Common 2017 National Electrical Code and Electricians Law Violations

Noted by Maine Electricians Examining Board staff 2017-2018

Common 2017 National Electrical Code Violations:

1. A commercial service supplied with 2 AWG aluminum service-entrance conductors is protected at 100 amps. [Table 310.15(B)(16)]

For conductor types rated at 75°C, Table 310.15(B)(16) lists the ampacity of AWG 2 aluminum as 90 amps. According to 240.6(A), a 90 amp overcurrent device is a standard size. It is rare that the ampacity in the 90°C column can be used, since all circuit terminations, conductors and equipment would have to be rated for 90°C [see 110.14(C)]. For a *residential service* section 310.15(B)(7) permits 2 AWG aluminum to be protected at 100 amps.

2. At a generator installation with a service rated transfer switch incorporating a service disconnect overcurrent device the grounds and neutrals remain connected together in the subpanel (which used to be the service panel). [250.24(A)(5)]

When a service overcurrent device (circuit breaker) is installed on the line side of the existing service panel that existing service panel becomes a subpanel and the grounds and neutrals in that panel must be separated.

3. Cables and raceways parallel to framing members installed with less than 1.25" between that wiring method and the face of the framing member. [300.4(D)]

1.25" must be maintained between the face of the framing member and a cable or raceway when run parallel with the framing member.

4. Arc-fault circuit-interrupter protection (AFCI) not installed where required. [210.12]

AFCI protection is required for all 120 volt, 15 and 20 amp single phase branch circuits supplying outlets (as defined in Article 100) installed in dwelling unit kitchens, family rooms, dining rooms, living rooms, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas, or similar rooms or areas.

5. Concrete encased electrode is not used where required. [250.50 and 250.52(A)(3)]

250.50 requires that *all* grounding electrodes present at a building shall be used. Concrete encased electrodes (Ufer Grounds) have been commonly used in commercial buildings for a long time. Most buildings now have rebar in the footings and this rebar is required to be used as a grounding electrode if it is over 20' long. This is a far superior electrode and is very easy to install. A piece of rebar attached to at least 20' of rebar can be brought up out of the foundation wall and there are also bond-outs now available that allow access to the rebar right next to the service panel.

6. Emergency lights (unit equipment) not on the same branch circuit as the normal lighting. [700.12(F)(2)(3)]

The branch circuit feeding emergency lights in any area must be the same branch circuit that feeds the normal lighting in that area unless it is a large area with more than 3 normal lighting circuits. One darkened room presents the same danger to the people in that room as if the entire building lost power.

7. GFCI receptacle not readily accessible. [210.8]

GFCI receptacles must be readily accessible. These receptacles are required to be tested on a periodic basis and must be readily accessible to allow for that testing. (By the way, GFCI protection is required for electric drinking fountains, 422.52)

8. Securing and supporting NM and/or MC cable. [330.30, 334.30 and 314.17(C) exc]

As a general rule:

MC: every 6' and if no larger than #10 within 12" of every box.

NM: every 4.5' and within 12" of every box (8" within single gang box without clamps)

9. Separate structure grounding electrodes not installed. [250.32A]

Buildings or structures supplied by a feeder or branch circuit require a grounding electrode system be installed as per Part III of article 250. No grounding electrode system is required for a building or structure supplied by a single branch circuit which includes an equipment grounding conductor.

10. Not securing light fixtures to suspended ceiling grid. [410.36(B)]

Luminaires (light fixtures) must be securely fastened to the suspended ceiling framing member by means of screws, bolts or rivets. Listed clips are also allowed. This applies to any fixtures supported by the ceiling grid system.

11. Unused openings not covered. [110.12(A) and 408.7]

Circuit breaker knockouts and box/enclosure knockouts must be closed with approved knock out seals or plugs.

12. Improper use of "Stuffing" tubes [312.5(C)exc]

Nonmetallic-sheathed cables may be installed in an open ended raceway originating in an enclosure only under certain conditions: raceway must be 18"-10' long and bushed at the open end, the raceway must extend upward only, the cables must be secured within 12" of the end of the raceway, the raceway must be nonflexible, the raceway does not penetrate a structural ceiling, the raceway is sealed or plugged, the cable sheath is continuous through the raceway to at least ¼" into the enclosure, the raceway is fastened in place and the conduit fill must not be more than permitted in Table 1 of Chapter 9.

13. Working clearances about equipment and dedicated equipment space not maintained.

These are 2 different spaces with 2 different intents. #1: The working space mentioned in 110.26(A) is for personnel safety, giving room to move or be moved out of the way in the event of an accident. This space requirement applies not only to electrical panels but any electrical equipment that requires servicing. For a small electrical panel installation this dimension is 30" wide by 36" deep by 6.5' high. Examples would be fuse disconnects, motor starters, VFD's, etc. #2: The dedicated equipment space mentioned in 110.26(E) is intended to maintain space about the equipment that may need to be used for future expansion of the electrical system.

14. Not sealing underground raceways that enter buildings or portions of any raceway that is subject to different temperatures. [225.27, 230.8, 300.7 and 300.5(G)]

Sealing these raceways eliminates the movement of moisture laden air through the raceway which could result in condensation and corrosion of electrical parts.

15. Improper use of flexible cords. [400.7 and 8]

Among other uses, flexible cords cannot be used: over suspended ceilings, as a replacement for permanent wiring methods, where run through holes in walls or ceilings, where attached to building surfaces, where concealed by walls floors or ceilings or where subject to physical damage.

16. Panelboards not labeled. [230.70(B) and 408.4]

Panelboards need to be labeled. Not just labeled but labeled legibly and in a manner that each circuit is distinguished from each other. Spare circuits must be identified as such. The descriptions shall not depend on transient conditions of occupancy (Johnny's room). Service disconnecting means must be labeled in a permanent manner.

17. No intersystem bond (grounding bridge) installed. [250.94]

The intersystem bond must be installed at each service and in a location where the other utilities (CATV, phone) will use it.

18. Underground gas piping systems used as grounding electrodes. [250.52(B)(1)]

This particular issue could be labeled "not our problem" but underground gas piping systems are inadvertently being turned into grounding electrodes anytime there is not a dielectric union installed before the gas piping enters the ground. The gas piping is connected to the equipment grounding conductor of the circuit likely to energize it giving it a conductive path to the grounding electrode system.

Common Electrician Examining Board Law and Rules Violations:

1. Unsupervised apprentice or helper electricians. [Electrician's Examining Board Rules Ch. 125(1) and (3)]

Apprentice and helper electricians must be directly supervised. Directly supervised is defined as the supervising electrician must be "on site at all times".

2. Number of apprentice or helper electricians per journeyman, master or limited licensee is more than allowed.

There can be two apprentices per each journeyman, master or limited licensee. Generally, there can be one helper per each journeyman, master or limited licensee, however, there can be two helpers per each journeyman, master or limited licensee if they are both currently enrolled in, or have completed, a program of study consisting of 576 hours of education as approved by the Electrician's Examining Board or from an accredited institution.

3. Working beyond scope of license. [Electrician's Examining Board Rules Ch. 125]

A journeyman, helper or apprentice electrician cannot work for themselves. They must be in the employ of a master or limited licensee. A person licensed as a limited electrician can work only within that scope of that particular license. A limited license does not equate to another license such as a journeyman or helper. For example, a person licensed as a limited to house wiring electrician can only work on a "commercial" project if they also have a helper or journeyman license and are in the employ of a master.

4. Not taking required code update classes upon license renewal. [Electrician's Examining Board Rules Ch. 130(4)]

A master, journeyman, limited and journeyman-in-training shall certify at the time of renewal to completion of an approved 15 hour current National Electrical Code update course. This certification is subject to audit.

5. Master or limited licensee getting a permit for someone else. [M.R.S. 10 § 8003(5-A), (A)(8) and M.R.S. 10 § 8003(5-A), (A)(1)]

A master or limited licensee who gets an electrical permit for an unlicensed person or someone working beyond the scope of license is guilty of aiding an electrician in working beyond the scope of his/her license and for fraud and misrepresentation in securing an electrical permit for a person not in his/her employ.

6. No permit or starting work before a permit is in hand. [M.R.S 32 § 1102-B]

No electrical equipment may be installed or altered unless the person making the installation first obtains a permit from the board.