

#2 aluminum conductors used on other than dwelling units are protected at 100 amps. [Table 310.16]

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* table 310.12 permits 2 AWG aluminum to be protected at 100 amps.

Grounding electrode conductor not fastened or connected to the meter enclosure at the service. [312.5 (C)]

The danger of someone or something striking the grounding electrode conductor necessitates the need to have this connected to the enclosure.

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(B)]

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.

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

1.25" must be maintained between the face of the framing member and a cable or raceway when run parallel with, or through the framing member. This requirement would also include running cables parallel to strapping on a ceiling, the cable must be at least 1.25 inches from the strapping.

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. Remember an outlet is any point on the system where you take current to supply utilization equipment. This would include lights, receptacles, smoke detectors, appliances etc.

GFCI protection not installed on receptacles that are 250 volts at dwellings, or receptacles installed in other than dwellings that are 250 volts. [210.8 (A)&(B)]

The branch circuit for these receptacles must be 150 volts or less to ground and 50 amps or less. These are required at all locations as listed in the above article.

GFCI protection not installed on all 125v receptacles in kitchens at dwellings or kitchens in other than dwellings. [210.8(A)&(B)]

All receptacles installed in kitchens shall have GFCI protection. This includes receptacles installed down low on kitchen walls that have no counter top or work surface, receptacles installed in cabinets for above range microwaves and exhaust hoods, refrigerators no matter how far from the sink it is located.

Hazardous location wiring methods not used in commercially installed septic lift stations as required. [500 & 501]

This is based on the requirements of NFPA 820 Table 4.2 requirements of sewer pumping stations.

Any commercial sewer pumping station is considered inside of the wet well to be a class 1 div. 1 area and wiring methods of 500 and 501 must be used including seal offs. This also would include any building or buildings that send sewer from more than 5 dwelling units.

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 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 # 4 copper conductor 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.

Separate Structure fed from another service; main disconnecting means not installed. 225.31

Feeding a building from another building or feeding a building from pole mounted service disconnect requires another disconnect at the building. In the case of a dwelling fed in this manner an emergency disconnect is required on the outside of the building if the service disconnect is not located within sight and within 50 feet of the dwelling. (This must be at a readily accessible location).

Separate structure grounding electrodes not installed. [250.32(A)]

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.

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. There is no code requirement that requires you to support a light to the building structure and if done, does not preclude you from securing to the suspended ceiling.

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.

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 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.

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.

Improper use of flexible cords. [400.10 and 400.12]

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.

Panelboards not labeled. [408.4 (A)&(B)]

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). In other than one and 2 family dwelling units "Sub Panels not labeled as to where their source is fed from.

Liquidtight Flexible Metal Conduit not secured or supported as required. [350.30 (A)&(B)]

Liquidtight metal conduit must be secured within 12 inches of each box, cabinet, or fitting and must be supported every 4.5 feet. (There are exceptions in the article).

When heat pumps are installed, the installer does not follow the nameplate requirements on the unit.

[440.6 (A)&(B)] Table 310.16

When installing a heat pump unit, the name plate of the unit must be taken into consideration for; Minimum circuit size, maximum overcurrent size and the breaker and conductor size feeding the disconnect. Many units are being installed with the wrong overcurrent devices or wrong conductor size.

Weather resistant receptacles including GFCI receptacles not installed outdoors in wet and damp locations. [406.9 (A)&(B)]

When a standard receptacle or GFCI receptacle are installed outdoors in damp or wet locations they shall be of a weather resistant type, WR. This includes all 125- and 250-volt receptacles.

Multiple NM cables installed or "stuffed" into a conduit entering a panel board (Stuff Tubes). [312.5(C)]

When using cable, each cable must be secured to the cabinet, box or enclosure. However; the exception to this article does allow cables with nonmetallic sheaths only to enter the top of a cabinet through a non-flexible conduit if **ALL** 7 conditions are met.

GFCI protection not installed for electric clothes dryers in dwellings [210.8(D)]

GFCI protection shall be provided for all specified appliances listed under this article which includes clothes dryers.

Electrical services and main panels bonded at both locations [250.24(B)]

The grounded conductor shall not be connected to equipment grounding conductors on the load side of a service disconnecting means. This creates a parallel neutral path allowing for current to flow along an unintended path.

Laws and rules violations

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".

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.

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.

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.

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.

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.