



Question of the Month – What is the allowable ampacity of four 12-2 with ground nonmetallic-sheathed (Type NM) cables run through a single hole in wood framing that is to be sealed with foam insulation? All cables serve single-phase loads supplied by a 120/240-volt single-phase system. *See correct answer on page 2.*

Submit Rule Revision Proposals and Technical Advisory Committee Applications During October

The Department will accept proposals for revisions to [WAC 296-46B](#) from all stakeholders during the month of October. All proposals must be submitted to the department electronically using the 2017 NEC WAC 296-46B Proposal Form which is available on the [Rule Development](#) page of our website. Follow the instructions on the form for submitting a proposal. All proposals must be received by 11:59 p.m. on October 31, 2016.

During the month of October, you can also apply to serve on the Technical Advisory Committee (TAC). The TAC will meet in December and will review and make recommendations to the department regarding adoption of each proposal. Read the details about how to apply and the various stakeholder groups represented in the [August 2016 Special Edition](#) newsletter.

Ampacity Correction and Adjustment of Conductors

National Electrical Code® (NEC®) Table 310.15(B)(16) gives the allowable ampacities of insulated conductors based on a temperature rating of 60° C through 90° C, not more than three current-carrying conductors in raceway, cable, or earth (directly buried), and ambient temperature of 30° C (86° F). Many factors must be considered when determining the correct conductor size for a given installation, such as the calculated load, size of the overcurrent protective device protecting it, temperature rating of terminals, number of current-carrying conductors in the raceway or cable, ambient temperature the conductors are installed in, and if nonmetallic-sheathed cables are bundled together for more than 24 inches or installed through holes in wood framing that will be sealed with thermal insulation, caulk, or sealing foam, etc. Before selecting a conductor size, purchasing, and installing the conductors, make sure you have reviewed and applied all applicable NEC® requirements for determining the proper ampacity of the conductors. Apply ambient temperature correction and other adjustment factors in accordance with NEC 310.15(B)(2) and (3).

The rated ampacity of a conductor can be used for correction and adjustment as long as the final ampacity does not exceed the temperature rating of the termination in accordance with the provisions of 110.14(C). See the example in this edition's question of the month. The ampacity of NM cables must be derated because there are 8 current-carrying conductors installed in the same hole in wood framing that is to be sealed with foam insulation. The ampacity of the 12-2 NM cables is 30 amperes based on the 90° C column of table 310.15(B)(16). This ampacity may be used as the starting point, but the final adjusted ampacity cannot exceed that of the 60° column ampacity of 20 amperes. The overcurrent protective device must be sized in accordance with NEC 240.4. In the example, if one more cable were installed, the adjustment factor would be 50%, reducing the ampacity of all cables to 15 amperes and requiring them to be protected by 15A breakers.

Safety Tip of the Month

The work of an electrician is very challenging and rewarding. Current knowledge of safe work practices and electrical laws, codes, and rules are essential to maintaining worker safety and ensuring installations meet the minimum requirements for safety to life and property.

Those learning the trade do not have the experience and knowledge required to make safe installation choices and must be supervised throughout their training period. [RCW 19.28.161\(3\)](#) and [WAC 296-46B-100](#) describes proper supervision. Proper supervision consists of the trainee being on the same job site and under the control of an appropriately certified supervising electrician. Lack of proper supervision not only creates potentially hazardous conditions, it is illegal and could result in civil penalties being assessed to the contractor, administrator, and trainee.

Plug-in Household Appliances

RCW 19.28.006(9) exempts plug-in appliances from all the requirements of chapter 19.28 RCW (e.g., licensing, certification, permitting, inspection, etc.). For this exemption, appliances are limited, by the definition in WAC 296-46B-100 to household appliances. For any other appliance (e.g., hard wired household appliances, and all non-household appliances), all the requirements of chapter 19.28 RCW apply.

There is another exemption in WAC 296-46B-925(10) from licensing and certification requirements for the installation of plug and cord connected utilization equipment (other than plug-in household appliances which are completely exempt). This exemption allows the first-time, new installation of plug and cord connected utilization equipment. The plug and cord must be a single listed unit consisting of a molded plug and cord and not exceeding 250 volts 60 amperes single-phase. The plug and cord can be field installed per the manufacturer's instructions and the product listing requirements. The utilization equipment must be a single manufactured unit, including the plug and cord, that does not require any electrical field assembly except for the installation of the plug and cord and is allowed to be plug and cord connected by the NEC. Firms who perform field electrical servicing, maintenance, or repairing of plug-in equipment or appliances (except plug-in household appliances) are not included in this exemption. The last sentence of WAC 296-46B-925(10) contains an error by mentioning household appliances. This error will be corrected during the upcoming WAC 296-46B revision cycle.

For more information, see the [Appliance Installation & Repair](#) page of our website.

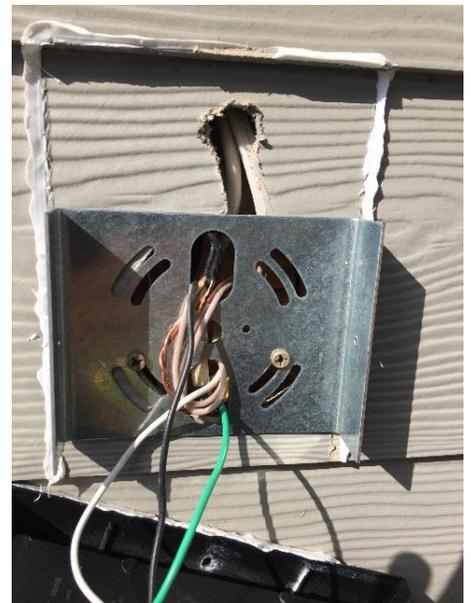
Lightning Protection Systems

To install Lightning Protection Systems without being a licensed electrical contractor, you must be a registered general contractor under chapter 18.27 RCW. If you are not a licensed (01) electrical contractor, the only electrical equipment or conductors you may install are the conductors detailed in [NFPA 780](#) – Standard for the Installation of Lightning Protection Systems. You may make the required (NEC® 250.106) inter-system bonding connections to building structural steel, reinforcing steel in concrete encased electrodes, metallic piping systems, and premises made electrodes of rods, pipes or plates.

You may not install any of the required components of the premises grounding electrode system or terminate the lightning protection system conductors on any electrical system equipment enclosures, boxes, or raceways. You may not terminate the lightning protection system conductors on the premises grounding electrode conductor. Any termination of lightning protection system conductors on a premises grounding electrode conductor must be done by an electrical contractor. The electrical contractor doing the termination work is responsible for permitting and inspection of this connection. Other than the connection to the premises grounding electrode system, electrical work permits and electrical inspection will not be required for the installation of NFPA 780 Lightning Protection Systems.

Ugly Picture: *If viewing this document online, click on the picture to open a larger image.* The wiring terminations for this outdoor luminaire are exposed to the inside of the wall behind the mounting plate for the luminaire creating a potential fire hazard. This is a violation of NEC® 300.15 which says a box or conduit body shall be installed at each conductor splice point, outlet point, switch point, junction point, termination point, or pull point. Also, the luminaire appears to be grounded, but the mounting plate is not creating a potential shock hazard.

Answer to Question of the Month: 20 Amperes. When more than two NM cables containing two or more current-carrying conductors are installed in the same hole in wood framing that is to be sealed with insulation, NEC® 334.80 requires the ampacity of each conductor to be adjusted in accordance with Table 310.15(B)(3)(a). The ampacity of conductors of NM cable is based on the 90° C ampacity column of Table 310.15(B)(16). For #12 conductors rated at 90° C, the ampacity is 30 amperes. Table 310.15(B)(3)(a) requires the ampacity to be derated by 70 percent for this installation based on 8 current-carrying conductors, leaving a corrected ampacity of 21 amperes. This exceeds the 60° ampacity, so the final ampacity is 20 amperes.



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