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Question of the Month – What is the minimum size copper nonmetallic-sheathed cable required for the branch circuit, and the maximum overcurrent protection size to protect a single electric water heater rated 3800 watts at 240 volts? (Overcurrent protection rating is not marked on the appliance) – See *correct answer on page 2*.

Administrator Suspended for Continuous Noncompliance

At the April 28 meeting of the [Electrical Board](#), the board upheld the department's decision to suspend the (01) General Electrical Administrator certificate of Vladislav Razumovich for two years for repeated, continuous non-compliance with the electrical laws and rules of Washington. Mr. Razumovich had been the assigned administrator for several different electrical contracting businesses. He was warned twice, and cited twelve times, for 104 separate incidents during a three-year period. Mr. Razumovich was also cited for being an absentee administrator. These violations occurred in multiple regions of the state and were issued by ten different electrical inspectors. While Mr. Razumovich was serving as the electrical administrator for these companies, he was a full-time employee for another contracting business.

The electrical administrator is the responsible person for an electrical contracting business to ensure all electrical work complies with the laws and rules of Washington. This is a very important position and requires a person to be a full-time supervisory employee or member of the firm and be available during business hours to carry out the duties described in [RCW 19.28.061](#).

UL Warns of Potential Hazards from Improper Installation of Lighting Retrofit Kits

Advances in lighting technology have resulted in many building owners seeking to realize significant savings by upgrading their existing incandescent or magnetic ballast-driven lighting systems to newer electronic and light-emitting diode (LED) lighting. Converting incandescent, fluorescent, or high-intensity discharge luminaires to LED technology typically involves re-wiring a listed luminaire and installing a new LED power supply or driver. Lighting retrofit work is not exempt from permit and inspection requirements. Many options exist for installers to perform this work and inspectors have been encountering upgrades to lighting systems that are performed using products that are not certified as meeting applicable product safety standards. Improperly installed lighting retrofits using un-certified products can cause significant risk of fire or shock hazard. 2014 National Electrical Code® article 410.6 requires all luminaires, lampholders, and retrofit kits to be listed. Listed retrofit kits will contain manufacturers installation instructions that must be followed, which will include required labeling of the luminaire to alert those working on it in the future of the modifications. Underwriters Laboratories urges those installing a lighting retrofit to use only retrofit kits that have been certified by a third-party [testing laboratory](#) and follow the accompanying installation instructions. You can verify UL Certified lighting retrofit kits on ul.com at <http://iq.ul.com/ssl/> and selecting LED Retrofit Kits from the product category pull-down. You can find more detailed information about retrofits and retrofit safety at <http://industries.ul.com/lighting/retrofit-kits>.

Fees for Photovoltaic Systems

Photovoltaic (PV) systems are generators, but the terms the NEC® uses to describe PV system wiring can make applying the fee schedule in WAC [296-46B-906](#) somewhat confusing. The purpose of this article is to relate the fee schedule to the wiring of common PV systems so everyone can properly determine fees. For permanently installed generators (PV systems), refer to the appropriate residential or commercial new/altered service or feeder section.

Safety Tip of the Month

Prevent [Heat Related Illness](#):

- Drink lots of water, about 1 cup every 15 minutes.
- Know the signs/symptoms of heat-related illness; monitor yourself and co-workers.
- Block out direct sun or other heat sources.
- Use cooling fans/air-conditioning; rest regularly.
- Wear lightweight, light colored, loose-fitting clothes.
- Avoid alcohol, caffeinated drinks, or heavy meals.

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- When outputs of micro-inverters are combined into a common output circuit, that circuit is counted as one feeder. When it is the largest feeder in the system being installed, this largest feeder is counted as a first feeder (full price column), even if less than 30 amps. If all are equal in size, one of them must be counted as a first feeder (full price column). In this scenario, additional combined micro-inverter output circuits count as additional feeders (reduced price column).
- When micro-inverters are not used, if the largest ampacity is the output of your inverter(s), the output rating of the largest inverter determines what the largest first feeder size is. This largest feeder is counted as a first feeder (full price column), even if less than 30 amps. If all inverters are equal in size, one of them must be counted as a first feeder (full price column). In this scenario, additional inverters count as additional feeders (reduced price column).

Examples:

- For single, two-family or multi-family dwellings with three inverters with an output rating from 0 to 200 amperes connected to an existing service: the current fee for the PV system will be \$155.20 (i.e. \$97.40 for the first inverter and \$28.90 for each of the two remaining inverters).
- For a nonresidential PV system with three inverters with each having an output rating from 0 to 100 amperes connected to an existing service: the current fee for the PV system will be \$216.40 (i.e. \$97.40 for the first inverter and \$59.50 for each of the two remaining inverters).

Other considerations: When another feeder, rated 30 amperes or larger, is created on the input or output side of an inverter because of a need to combine things for some reason (e.g., DC combiner panel or new panel to combine inverter outputs), it must be counted. Storage battery systems must be counted as a feeder fee based on the size of the overcurrent device protecting the battery conductors. There will be no additional charge for disconnect switches; including utility required AC disconnect switches regardless of overcurrent protection if present. The surcharge for over 600 volts does not apply to the DC side of PV systems. If such systems are present, low voltage or telecommunications fees (Class B eligible) may apply (rapid shutdown control wiring, etc.).

Class B Labels are not Valid for Work in Factory Assembled Structures

All electrical wiring performed within or attached to a factory assembled structure (FAS), such as a mobile or manufactured home, must be permitted and inspected by L&I's FAS division. Some electrical contractors, especially those installing low-voltage thermostat systems are validating and affixing Class B labels to new or replacement HVAC units in mobile and manufactured homes. This is not required, as the FAS alteration permit covers all wiring required in this situation. You can find information about FAS permits and inspection requirements on the [Manufactured or Mobile Homes Permits & Inspections](#) page of our website.

[WAC 296-46B-550](#) describes permit requirements for various work associated with mobile or manufactured homes. Generally, if the circuit or feeder originates from the mobile/manufactured home's electrical panel and feeds an addition or equipment that is attached (e.g., garage, heat pump or air conditioning unit) it requires an FAS alteration permit and not an electrical permit from the electrical program.

All on-site electrical wiring associated with FAS structures must be performed by properly licensed electrical contractors and certified electricians.

Ugly Picture: *If viewing this document online, click on the picture to open a larger image.* The renter of this property had an illegal marijuana growing operation located in a detached outbuilding. It is suspected, but not known if the unpermitted wiring contributed to the fire. The house used for drying and processing, including butane honey oil extraction, was not affected. The property owner purchased a permit and requested an inspection so power could be restored to the house. The renter will not be available for comment for many years.



Answer to Question of the Month: #10 AWG, and 25 amperes. WAC 296-46B-422, and NEC® 422.11(E)

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