



Homeowner's Residential Electrical Inspection Guidelines

For you and your family's safety, if you are at all unsure of any of the information in this packet you are strongly urged to employ the services of a licensed electrical contractor that utilizes certified individuals.

In general, the law allows a homeowner to perform electrical installation on his or her property without electrical licensing or individual certification. Although this exemption exists it does not provide the homeowner with a realization of the potential safety hazards of a substandard electrical installation. The Departments experience with homeowner electrical installations has led us to compile a list of the most common violations. This list is not comprehensive or inclusive. Successfully completing all items on this list will not cover everything that you will need to know to do a compliant installation.

For information on a specific electrical contractor or an electrician please visit our website at

<http://www.lni.wa.gov/TradesLicensing/Contractors/HireCon/>

The # 1 Written Electrical Correction

D NEC 110.3 Failure to read the manufacturer's instructions.

Services

- D **WAC 296-46B-230 (3)** The height of the service meter must be as required by the serving utility. Contact the local utility to determine the requirements.
- D **WAC296.46B.250 and NEC 250.53** Except for mobile/manufactured homes a concrete encased grounding electrode (aka "ufer" ground) must be installed and used at each new building or structure that is built upon a permanent concrete foundation. The electrode must comply with NEC 50.52(A)(3). If a concrete encased electrode is not required and installed all premises electrical services shall be connected to a grounding electrode system consisting of two 8' ground rods driven at least 6' apart, or a metal underground water pipe in direct contact with earth for 3.0 m [10'] or more and bonded within 5 feet of entering the premises and supplemented by a rod, pipe, or plate electrode.
- D **NEC 250.64 & 250.66** The grounding electrode conductor shall be unspliced. The size is determined by the size of the service-entrance conductors
- D **NEC 250.28** A main bonding jumper or the green bonding screw provided by the panel manufacturer shall be installed in the service panel to electrically bond the grounded service conductor and the equipment grounding conductors to the service enclosure.
- D **NEC 250.104** The interior metal water piping and other metal piping that may become energized shall be bonded to the service equipment with a bonding jumper sized in accordance with NEC250.104(A)(1).
- D **NEC 300.5** Underground service laterals shall have their location identified by a warning ribbon placed in the trench at least 300 mm [12"] above the underground installation.
- D **NEC 300.5** Conductors emerging from underground shall be installed in rigid metal conduit, intermediate metal conduit, or Schedule 80 rigid nonmetallic conduit to provide protection from physical damage. This protection shall extend from 450 mm [18"] below grade or the minimum cover distance to the point of termination above ground.
- D **NEC 230.70** The electrical service disconnecting means shall be installed at a readily accessible location either outside a building or structure or inside nearest the point of entrance of the service entrance conductors.
- D **NEC 230.70 & 240.24** Electrical panels shall be readily accessible and shall not be located in bathrooms or in the vicinity of easily ignitable materials such as clothes closets.
- D **NEC 110.26** Sufficient-working space shall be provided around electrical equipment. When the voltage to ground does not exceed 150 volts, the depth of that space in the direction of access to live parts, shall be a minimum of 900 mm [3']. The minimum width of that space in front of electrical equipment shall be the width of the equipment or 750 mm [30"] whichever is greater. This workspace shall be clear and extend from the floor to a height of 2 m [6½']. This space shall not be used for storage.
- D **NEC 230.54** Where exposed to weather, service entrance conductors shall be rain tight and arranged to drain.
- D **NEC 110.14** Conductors of dissimilar metals shall not be intermixed in a terminal or splicing device unless the device is listed for the purpose. Listed anti-oxidant compound shall be used on all aluminum conductor terminations, unless information from the device manufacturer specifically states that it is not required
- D **NEC 110.14** Only one conductor shall be installed under a terminal screw. In boxes with more than one ground wire, the ground wires shall be spliced with a "wire tail" or "pig tail" attached to the grounding terminal screw of the device.

General Circuitry

- D **NEC 210.11 and 422.12** In addition to the branch circuits installed to supply general illumination and receptacle outlets in dwelling units, the following minimum requirements apply:
 - D **Two 20-amp circuits for the kitchen receptacles**
 - D **One 20-amp circuit for the laundry receptacles**
 - D **One 20-amp circuit for the bathroom receptacles**
 - D **One separate, individual branch circuit for central heating equipment**
- D **NEC 300.3** All conductors of the same circuit, including grounding and bonding conductors, shall be contained in the same raceway, cable, or trench.
- D **NEC 408.4** All circuits and circuit modifications shall be legibly identified as to purpose or use on a directory located on the face or inside of the electrical panel doors.

- D **NEC 406.4 and 200.11** Receptacle outlets shall be of the grounding type, be effectively grounded, and have proper polarity.
- D **NEC 210.52** Generally, receptacle outlets in habitable rooms shall be installed so that no point measured horizontally along the floor line in any wall space is more than 1.8 m [6'] from a receptacle outlet. A receptacle shall be installed in each wall space 2 feet or more in width.
- D **NEC 210.52** At kitchen countertops, receptacle outlets shall be installed so that no point along the wall line is more than 600 mm [24"] measured horizontally from a receptacle outlet in that space.
- D **NEC 210.52** A receptacle outlet shall be installed at each counter space 300 mm [12"] or wider, and at each island counter or peninsular space 600 mm [24"] by 300 mm [12"] or larger. Countertop spaces separated by, range tops, sinks or refrigerators are separate spaces
- D **NEC 210.52** Outdoor receptacles, accessible at grade level and no more than 2 m [6.5'] above grade, shall be installed at the front and back of a dwelling.

Arc-Fault (AFCI) Protection

- D **NEC 210.12** All branch circuits supplying 125-volt, 15 and 20-ampere outlets in dwelling units, except in garages and bathrooms shall be protected by a listed arc-fault circuit interrupter device. Generally, these are circuit breaker type devices and cannot be installed on multi-wire branch circuits. All AFCIs shall be readily accessible (capable of being reached quickly without use of tools, climbing over or removing obstacles, or using portable ladders).

Ground-Fault (GFCI) Protection

- D **NEC 210.8** At dwellings, ground-fault circuit-interrupter (GFCI) protection shall be provided for the kitchen dishwasher branch circuit and for all receptacle outlets in bathrooms, garages, crawl spaces, unfinished basements, kitchen countertops, laundry areas, boathouses, outdoors and within 6 feet of sinks, bathtubs, and shower stalls. All GFCIs shall be readily accessible.
- D **NEC 680.71** A hydromassage bathtub, (defined as a permanently installed bathtub with a re-circulating piping system, designed to discharge water upon each use, and its associated components) shall have ground-fault circuit-interrupter protection. All 125 volt receptacles not exceeding 30 amperes installed within 6 feet of the inside walls of the hydromassage bathtub shall be GFCI protected. All equipment associated with a hydromassage bathtub shall be accessible without damaging the building structure or finish.

Wiring Methods

- D **NEC 314.27** When boxes are used as the sole support for a ceiling paddle fan, they shall be listed and labeled for such use.
- D **NEC 334.30** Type NM (nonmetallic) cable shall be secured at intervals not exceeding 1.4 m [4.5'] and within 300 mm [12"] of each box.
- D **NEC 314.17** The outer jacket of NM cable shall extend into the box a minimum of ¼ inch.
- D **NEC 300.14** The minimum length of conductors, including grounding conductors, at all boxes shall be 150 mm [6"]. At least 75 mm [3"] shall extend outside the box.
- D **NEC 300.4** Where cables are installed through bored holes in joists, rafters, or wood framing members, the holes shall be bored so that the edge of the hole is not less than 1¼ inch from the nearest edge of the wood member. Where this distance cannot be maintained, or where screws or nails are likely to penetrate the cable, it shall be protected by a steel plate at least 1.6 mm [1/16"] thick and of appropriate length and width.
- D **NEC 250.134; 314.4; 404.9** All electrical equipment, metal boxes, cover plates, and plaster rings shall be grounded. All switches, including dimmer switches, shall be grounded.
- D **NEC 110.12 & 314.17** Unused openings in boxes shall be effectively closed. When openings in non-metallic boxes are broken out and not used, the entire box must be replaced.
- D **NEC 314.29** Junction boxes shall be installed so that the wiring contained in them can be rendered accessible without removing any part of the building.
- D **NEC 410.16** Luminaires (lighting fixtures) installed in clothes closets shall have the following minimum clearances from the defined storage area (see NEC 410.2 for definition):

300 mm [12"] for surface incandescent or LED fixtures with completely enclosed light source installed on wall above door or on the ceiling.
150 mm [6"] for recessed incandescent or LED fixtures
150 mm [6"] for fluorescent fixtures

- D **NEC 410.16** Incandescent luminaires with open or partially enclosed lamps and pendant fixtures or lamp-holders are not permitted in clothes closets.
- D **NEC 410-116** Recessed lighting fixtures installed in insulated ceilings or installed within 13 mm [1/2"] of combustible material shall be approved for insulation contact and labeled Type IC.