



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

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## ● Upcoming Electrical Stakeholders Meetings

Stakeholder meetings will run through June 2008 at the locations listed below. It is important for you to stay up to date with changes that might affect you. You have an opportunity to get your questions answered and give the Electrical Program your valued input when you attend a stakeholder meeting. Please join us at 6:00 p.m., at one of the remaining stakeholder meetings near you.

### Safety Tip of the Month!

Be alert for hazardous confined spaces. Toxic gas and lack of oxygen kill. Tanks, trenches, containers, and even an open manure pit can have deadly gases.

### 2008 Remaining Stakeholder Meetings

May 20	3001 W. Broadway, Moses Lake	May 21	Cowlitz County PUD, 961 12 <sup>th</sup> St., Longview
May 21	Walla Walla University, CTC Room 105, Walla Walla	May 22	Pacific Power, 500 North Keys Rd., Yakima
June 11	Hampton Inn, 3985 Bennett Dr, Bellingham		

## ● 2008 WAC Rule Process

The proposal period for WAC changes is closed. No additional proposals will be considered from outside L&I at this time. The Technical Advisory Committee (TAC) application period is also closed. When we have completed reviewing the TAC applications, the membership list for the TAC is posted on our Web site at: <http://www.lni.wa.gov/TradesLicensing/Electrical/LawRulePol/RuleDev/Default.asp>

The November 2007 Special Edition Electrical Currents details the complete 2008 WAC process and is available at: <http://www.lni.wa.gov/TradesLicensing/Electrical/files/currents/elc0711special.pdf>

The TAC will meet in June to review all the external proposals. Use the "[Get E-mail Updates](#)" button on the electrical Web site to join the Electrical Listserv and stay informed about all Electrical Program news.

## ● 2008 Legislative Session

The 2008 legislative session is over. There were no successful bills that require electrical rule making or affect the Electrical Program.

## ● Pool Equipotential Grids

NEC 680.26(C) describes the specific requirements for the equipotential bonding grid for pools with paved walking areas (e.g. concrete, tiles, pavers, wood, etc.). The grid must extend from the inside walls of the pool at least 3' under the walking area. Depending on the type of pool construction, you have three options for constructing a grid under the walking area:

Structural reinforcing steel – This option can only be used with a steel reinforced concrete pool. Uninsulated steel structural reinforcing bars may be used to make a grid if they are bonded together with steel tie wire or equivalent.

Bolted/welded metal pools – The wall of a bolted or welded metal pool may be used as the grid.

Alternate means – This option can be used when a deck media exists (e.g. concrete, pavers, wood deck, etc.). The grid must be made of a minimum #8 solid copper conductor that is bonded at all crossing points. The grid must cover the entire area from the contour of the pool and extending at least 3' under the pool deck. The grid must be made in a 1' x 1' perpendicular pattern ± 4". The grid must be secured within or under the pool and deck media.

The 2005 NEC does not have specific grid installation methods for a pool with no paved walking area (e.g. grass, gravel, etc.). The lack of description does not eliminate the requirement for a grid. For the perimeter area around these pools, L&I inspectors will accept a single, minimum #8 solid copper, conductor that is installed between 18" and 24" of the contour of the inside wall of the pool and is buried under the perimeter surface at least 6" below grade. Only listed splices will be accepted.

All metal parts requiring bonding in NEC 680.26(B) must be bonded to the equipotential bonding grid.

The 2008 NEC modifies some of these requirements. They will be covered in a future newsletter.

## ● Physical Protection For Nonmetallic Sheathed Cable

Nonmetallic sheathed cable (NM) regulated by NEC 334 is allowed to be installed in many environments and structure types. The physical protection requirements for NM cable are located in several places in the National Electrical Code (NEC).

**Concealed work** – NEC 300.4 has the protection requirements for several types of concealed cable installations (i.e. in wood structural members, in metal structural members, behind accessible panels, installed in shallow grooves, and at cable fitting points).

Concealing NM cable in shallow grooves in concrete walls formed and insulated by expanded polystyrene panels which remain on the interior and exterior surfaces of the walls; in foam-core OSB or plywood sheathed interlocking building panels; and in buildings where the primary wall construction materials are compressed straw require special consideration.

Conduit wiring systems are suitable for these types of construction. However, conduit systems must be inspected before concealment and must be installed by certified (01) journeymen electricians, with trainees in a maximum one-to one ratio. Nonmetallic-sheathed cable wiring methods can be used in these types of construction if the following guidelines are followed:

- All boxes must be rigidly supported from a structural member of the building by securing as described in NEC 314.23. Inspectors will not approve glue or spray foam adhesive to secure boxes. The installer must insure that the location of boxes in walls or ceilings complies with NEC 314.20.
- As allowed in NEC 300.4(E), nonmetallic-sheathed cables may be set in routed grooves or slots, or voids precast within the foam materials. The department will allow daubs of spray foam adhesive placed in the groove to secure NM cables at intervals not to exceed 4½ ft and within 12 in. of every cabinet, box, or fitting. Cables must be left visible for inspection and additional foam may be added after cover is approved. Spray foam adhesive/insulation must be a type approved for use with type NM cable.

Other requirements for NM cable protection in concealed work are straightforward and will not be discussed in this article.

**Exposed work** – NEC 334.15 has the protection requirements for installing exposed NM cable. These requirements are straightforward and will not be discussed in this article. However, the NEC does not define the term “protected from physical damage” for NM cable. NM cable is considered to be free from physical damage if the cable is installed in a manner that significantly reduces the chance of damage. Using a common sense approach, the installation method should not allow:

- Another object to lay on, lean against, or hang from the installed cable; or
- Expose the cable to direct hazard (e.g. be installed on a vertical face exposed to vehicle, or other similar damage).

## ● Ground Rod Installation

NEC 250-53(A) and (G) require that ground rods be driven straight down to a depth of not less than 8 feet. If this fails then the electrode must be driven at an oblique angle not to exceed 45 degrees from the vertical. Where a rock bottom is encountered the electrode may be buried at the bottom of a trench that is at least 2 ½ ft. deep. Do not cut a ground rod off and use the shortened piece as an electrode. If you forget to put the ground rod clamp on the rod before driving it and mushroom the rod's head, you may cut no more than 1" off the top of the rod using an angled cut (i.e. 20° to 45° across the rod) if you leave the cut piece attached (e.g. tape or other method) to the grounding electrode conductor just above the connection to the electrode. The inspector will use the cut piece to determine if the rod is full length.

Do not install a shortened ground rod for use as an electrode. If you do this or allow the trainee you are supervising to do this, you will be issued a gross violation citation and will likely receive a suspension of your electrician certificate.

## ● Question of the Month

The electrical inspector has the right, at all hours, to enter a building in the discharge of his or her official duties. **Answer:** True or False

**March's Question was:** Given: In general, on a single-motor circuit continuous duty 1 HP, 1-phase, 208 volt squirrel cage motor with a nameplate full load current of 12 amps. What is the minimum conductor ampacity? **Answer:** 11 amps [NEC 430.22, NEC 430.6(A)(1), NEC Table 430.248]

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