

# **Napa County Building Officials Coalition**

*Striving to provide clear and consistent building code information and handouts for all Napa County jurisdictions. (Please check with each jurisdiction for any local amendments.)*

H/O No. 0517-04

REV. 0717

## **Equipotential Bonding (2016 California Electrical Code, Section 680.26)**

### **What is Equipotential Bonding for Swimming Pools?**

Establishing an electrically safe environment in and around permanently installed swimming pools requires the creation of an equipotential grid. The sole purpose of an equipotential grid is to create an area with no significant difference in voltage between objects that can be touched simultaneously. Examples of objects at a pool that can be touched simultaneously include the concrete decking, ladders, handrails, light fixtures, drains, and the pool water. An equipotential grid is created by intentionally connecting all these objects together electrically, otherwise known as bonding them together.

### **What parts of a swimming pool require bonding?**

Section 680.26(B) of the 2016 California Electric Code (CEC) requires bonding of all the metal structures, fittings and parts that are horizontally within five feet of the pool wall and vertically within twelve feet above the maximum water level of the pool.

The following parts require bonding:

- Reinforcing metal of the pool shell, coping stones and deck
- Perimeter surfaces by bonding to the reinforcing steel of the pool at a minimum of 4 points uniformly spaced around the perimeter of the pool
- Metal conduits, metal door frames and metal window frames within five feet of the inside pool wall
- Metal forming shells and mounting brackets of lighting fixtures
- Metal items and fittings for hand rails, ladders, metal drains and diving boards
- Metal casings of electrical equipment such as pump motors, pool water heaters and equipment associated with pool covers
- Fixed metal parts within 5' horizontally and 12' vertically of water's edge

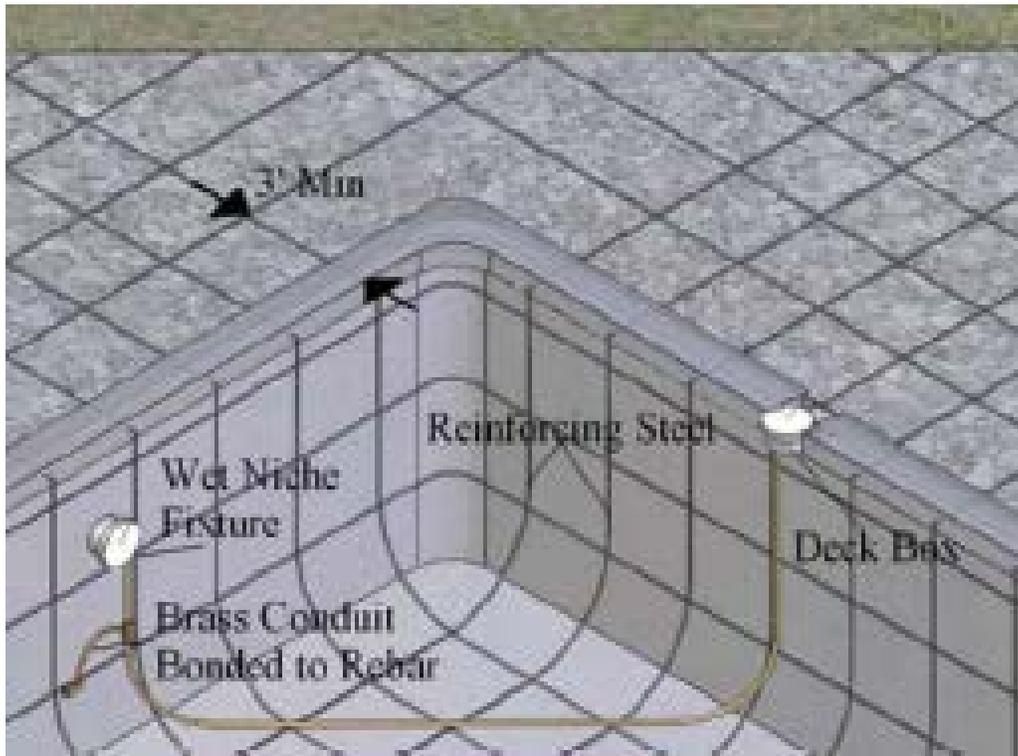
Exception: Where structural reinforcing steel is not available or is encapsulated in a nonconductive compound, a copper conductor(s) shall be utilized where the following requirements are met:

1. At least one minimum 8 AWG bare solid copper conductor shall be provided.
2. The conductors shall follow the contour of the perimeter surface.
3. Only listed splices shall be permitted.
4. The required conductor shall be 18 in. to 24 in. from the inside walls of the pool.
5. The required conductor shall be secured within or under the perimeter surface 4 in. to 6 in below the subgrade.



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**Equipotential Bonding Grid**

Bonding just the metal parts around the pool to each other may not provide a complete equipotential plane. For this reason, Section 680.26(B)(1)(a) of the 2016 CEC requires connecting the metal parts to a common 12" x 12" bonding grid (typically #3 rebar forming the pool shell) that covers the entire contour of the pool. The equipotential grid is required to extend horizontally under the perimeter surfaces for not less than three feet from the inside face of the pool wall (#3 rebar or #8-12" X 12" Wire Welded Mesh if encased in concrete or a copper grid if under pavers or unpaved surfaces) attached per the above requirements. Additionally, an intentional water bond of a minimum conductive surface of 9 square inches installed in contact with the pool water. This bond **may** consist of the above bonded parts.



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