

May 11, 2007

To whom it may concern:



RE: Equipotential Bonding Grid

This is in response to your correspondence regarding the requirements for equipotential bonding grids for swimming pools.

As you know, the 2005 National Electrical Code (NEC) was adopted May 1, 2006 at N.J.A.C. 5:23-3.16 as the electrical subcode. There has been much confusion about how to apply Section 680.26(C), the equipotential bonding grid. The publishers of the NEC/2005, the National Fire Protection Association, also realized this and published a Tentative Interim Amendment (TIA) to help clear things up. The Department has adopted the TIA. However, there are still many questions, so further explanation is necessary.

The current text of Section 680.26(C) and (D) is included with the TIA language in the text for a clearer understanding.

Now the question remains, how does one apply the above requirements to the paved walking surfaces and what are the options? The key here is whether there is a “paved”, conductive walking surface (including pavers) surrounding the pool, spa or hot tub, located indoors or outdoors. If this is the case, an equipotential bonding grid must be installed. Proper installations include:

1. #8 AWG copper wire mesh arranged in 12”x12” sections (this is permitted to be in direct contact with the earth directly under the paved surface); or
2. Steel wire mesh, which is listed/labeled to be encased in concrete, is permitted and there is no specific size (this must be raised off the ground by “chairs” or other means to keep the mesh up to be encased).

Note: It has determined that the deck reinforcing steel (wire mesh) is acceptable to be utilized for the equipotential bonding grid as per the TIA and Section 547.10(B) of NEC/2005 which requires the wire mesh to be bonded to the grid.

In all cases, interconnection of the wire mesh to the bonding grid must be connected with a listed clamp or connector.

The above installations are typical for all paved walking surfaces. Pavers being used as walking surfaces around pools, etc. would follow one of the installations above however, #2 would require the pavers to be placed on top of concrete slurry that encases steel wire mesh.

Section 680.26. Equipotential Bonding.

(C) Equipotential Bonding Grid. The parts specified in 680.26(B) shall be connected to an equipotential bonding grid with a solid copper conductor, insulated, covered, or bare, not smaller than 8 AWG or rigid metal conduit of brass or other identified corrosion-resistant metal conduit. Connection shall be made by exothermic welding or by listed pressure connectors or clamps that are labeled as being suitable for the purpose and are of stainless steel, brass, copper, or copper alloy. The equipotential bonding grid shall **conform to the contours of the pool and shall** extend **within or** under paved walking surfaces for 1 m (3 ft) horizontally beyond the inside walls of the pool and shall be permitted to be any of the following:

(1) Structural Reinforcing Steel. The structural reinforcing steel of a concrete pool **or deck** where the reinforcing rods are bonded together by the usual steel tie wires or the equivalent. **Where deck reinforcing steel is not an integral part of the pool, the deck reinforcing steel shall be bonded to other parts of the bonding grid using a minimum 8 AWG solid copper conductor. Connection shall be per 680.26(D).**

(2) Bolted or Welded Metal Pools. The wall of a bolted or welded metal pool.

(3) Alternate Means. This system shall be permitted to be constructed as specified in (a) through (c):

a. Materials and Connections. The grid shall be constructed of minimum 8 AWG bare solid copper conductors. Conductors shall be bonded to each other at all points of crossing. Connections shall be made as required by 680.26(D).

b. Grid Structure. The equipotential bonding grid shall cover the contour of the pool and the pool deck extending 1 m (3 ft) horizontally from the inside walls of the pool. The equipotential bonding grid shall be arranged in a 300 mm (12 in.) by 300 mm (12 in.) network of conductors in a uniformly spaced perpendicular grid pattern with a tolerance of 100 mm (4 in.).

c. Securing. The below-grade grid shall be secured within or under the pool and deck media.

Exception: The equipotential bonding grid shall not be required to be installed under the bottom of or vertically along the walls of vinyl lined polymer wall, fiberglass composite, or other pools constructed of nonconductive materials. Any metal parts of the pool, including metal structural supports, shall be bonded in accordance with 680.26(B). For the purposes of this section, poured concrete, pneumatically applied (sprayed) concrete, and concrete block, with painted or plastered coatings, shall be considered conductive material.

(D) Where structural reinforcing steel or the walls of bolted or welded metal pool structures are used as an equipotential bonding grid for nonelectrical parts, the connections shall be made in accordance with 250.8.

Please keep in mind, packaged spas or hot tubs to be installed on conductive paved surfaces with a “walking” surface around the packaged unit must also have an equipotential bonding grid installed, to the extent of the paved walking surface.

Where the packaged spa or hot tub is installed on an existing paved area and then creates a paved walking surface, the equipotential bonding grid is required as per sections 680.42 and 680.43 of the 2005 NEC which are not exempt in the Rehabilitation Subcode.

For packaged spa or hot tubs installed on new or existing paved areas, a non-conductive mat or wood is also permitted. It should extend 3 feet out or to the extent of the paved walking surface from the wall of the packaged spa or hot tub. These materials are non-conductive which negates the requirement for the equipotential bonding grid.

Remember, NO paved walking surface, NO bonding grid required.

I trust this answers your questions on this matter. Should you be in need of further assistance, please contact me at (609) 984-7609.

Very truly yours,

Suzanne Borek
Code Specialist