


G O D F R E Y

ILLINOIS

You can see your future from here

IN GROUND POOL PERMIT
**** TO BE COMPLETED BY POOL COMPANY ****
Attach drawing and setbacks
PART A

DATE: _____

Permit Cost: \$50.00

NAME OF POOL COMPANY: _____

ADDRESS: _____

PHONE: _____

RETAIL VALUE _____

OWNER: _____

ADDRESS: _____

PHONE: _____

Part A Needs to be submitted with Part B before either Permit is issued
homeowners can submit both permits if all information is completed on
both forms



IN GROUND POOL BONDING APPLICATION

PART B

Bonding needs to be done before setup and water is in pool

Date: _____

Name of Owner: _____

Address: _____

Phone: _____

Person/Company doing the Bonding: _____

Permit Fee: \$25

ATTACH DRAWING OF POOL AND LOCATIONS WHERE IT WILL BE BONDED ALSO A LIST OF APPROVED BONDING SUPPLIES: (EXAMPLES IN PACKET). If you do not use bonding equipment list a new list must be submitted before inspection.

Contractors that have done pool bonding in Godfrey:

Bickle Electric-259-4499

Franks Electric-465-4573

Camp Electric-462-9287

Wood-N-Electric-217-723-4413

Jericho Electric-972-1273

JA Electric-791-3898

Wegman Electric-258-1130

Section 60.211. - Swimming pools.

No swimming pool, whether public or private, shall be located in any front yard. All swimming pools of more than two feet in depth shall have appropriate fencing installed which shall be not less than four feet in height around the pool to limit access to it unless, upon application, the zoning administrator, subject to review by the planning and zoning commission, approves a different, but equivalent, means of limiting access to the swimming pool. Unless otherwise approved by the zoning administrator upon application, subject to review by the planning and zoning commission, no fence installed around a private swimming pool may exceed a height of eight feet. A permit from the building and zoning administrator is required for all new swimming pool construction or renovation. The construction must comply with all building code requirements and the 2011 NEC as adopted by the Village of Godfrey. The electrical and bonding must be done by a certified electrician and he/she must sign the building permit along with the property owner or general contractor.

(Ord. No. 07-2009, 3-3-2009; Ord. No. 18-2017, § 2, 9-19-2017)

2012 INTERNATIONAL PROPERTY MAINTENANCE CODE

SECTION 303

SWIMMING POOLS, SPAS AND HOT TUBS

303.1 Swimming pools. Swimming pools shall be maintained in a clean and sanitary condition, and in good repair.

303.2 Enclosures. Private swimming pools, hot tubs and spas, containing water more than 24 inches (610 mm) in depth shall be completely surrounded by a fence or barrier at least 48 inches (1219 mm) in height above the finished ground level measured on the side of the barrier away from the pool. Gates and doors in such barriers shall be self-closing and self-latching. Where the self-latching device is a minimum of 54 inches (1372 mm) above the bottom of the gate, the release mechanism shall be located on the pool side of the gate. Self-closing and self-latching gates shall be maintained such that the gate will positively close and latch when released from an open position of 6 inches (152 mm) from the gatepost. No existing pool enclosure shall be removed, replaced or changed in a manner that reduces its effectiveness as a safety barrier.

Exception: Spas or hot tubs with a safety cover that complies with ASTM F 1346 shall be exempt from the provisions of this section.

Grounding Requirements

The following swimming pool and outdoor spa and hot tub equipment is required to be grounded:

- "1) Through-wall lighting assemblies and underwater luminaires (lighting fixtures), other than those low-voltage systems listed for the application without a grounding conductor
- "2) All electric equipment located within 1.5 m (5 ft) of the inside wall of the specified body of water
- "3) All electric equipment associated with the recirculating system of the specified body of water
- "4) Junction boxes
- "5) Transformer enclosures
- "6) Ground-fault circuit interrupters
- "7) Panelboards that are not part of the service equipment and that supply any electric equipment associated with the specified body of water." ³¹

Cord-Connected Equipment

Where fixed or stationary equipment is connected with a flexible cord to facilitate removal or disconnection for maintenance, repair, or storage as provided in 680.7, the equipment grounding conductor must "be connected to a fixed metal part of the assembly. The removable part must be mounted on or bonded to the fixed metal part" [see 680.7(C)].

All other electrical equipment must be grounded in accordance with Article 250 and be connected by an approved wiring method covered in NEC chapter 3.

Methods of Grounding

Section 680.23(F)(2) reiterates that "through-wall lighting assemblies, wet-niche, dry-niche, and no-niche luminaries (lighting fixtures) shall be connected to an insulated copper equipment grounding conductor installed with the circuit conductors. The equipment grounding conductor shall be installed without joint or splice except as permitted in (F)(2)(a) and (F)(2)(b). The equipment grounding conductor shall be sized in accordance with Table 250.122 but shall not be smaller than 12 AWG." The equipment grounding conductor installed "between the wiring chamber of the secondary winding of a transformer and a junction box [must] be sized in accordance with the overcurrent device in this circuit" (see Table 250.122). The equipment grounding conductor must be an insulated

copper conductor and generally be installed with the circuit conductors in rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit, or rigid nonmetallic conduit.

Electrical metallic tubing is permitted to be used for these conductors where installed on or within buildings. Electrical nonmetallic tubing is permitted to be used to protect circuit conductors where installed within buildings as ENT is generally limited to installation inside buildings as it is not suitable for direct-sunlight exposure [see 680.23(F)(1)].

Where connecting to transformers for pool luminaires (lights), liquidtight flexible metal conduit or liquidtight flexible nonmetallic conduit Type B (LFNC-B) is permitted to be used. Any one length is limited to not more than 1.8 m (6 ft) feet and a total of not more than 3.0 m (10 ft) is permitted. Liquidtight flexible nonmetallic conduit, Type B (LFNC-B), is permitted in lengths longer than 1.8 m (6 ft).

"The junction box, transformer enclosure, or other enclosure in the supply circuit to a wet-niche or no-niche luminaire (lighting fixture) and the field-wiring chamber of a dry-niche luminaire (lighting fixture) shall be grounded to the equipment grounding terminal of the panelboard. This terminal shall be directly connected to the panelboard enclosure." ³²

"a) If more than one underwater luminaire (lighting fixture) is supplied by the same branch circuit, the equipment grounding conductor, installed between the junction boxes, transformer enclosures, or other enclosures in the supply circuit to wet-niche luminaries (fixtures), or between the field-wiring compartments of dry-niche luminaries (fixtures), shall be permitted to be terminated on grounding terminals.

"b) If the underwater luminaire (lighting fixture) is supplied from a transformer, ground-fault circuit interrupter, clock-operated switch, or a manual snap switch that is located between the panelboard and a junction box connected to the conduit that extends directly to the underwater luminaire (lighting fixture), the equipment grounding conductor shall be permitted to terminate on grounding terminals on the transformer, ground-fault circuit interrupter, clock-operated switch enclosure, or an outlet box used to enclose a snap switch." ³³

Grounding and Bonding for Special Locations and Conditions

Section 680.23(B)(3) requires "wet-niche luminaries (lighting fixtures) that are supplied by a flexible cord or cable shall have all their exposed non-current-carrying metal parts grounded by an insulated copper equipment grounding conductor that is an integral part of the cord or cable. This grounding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure, or other enclosure. The grounding conductor shall not be smaller than the supply conductors and not smaller than 16 AWG."³⁴

Pool-Associated Motors

All pool-associated motors must be connected to an equipment grounding conductor sized in accordance with Table 250.122 [see 680.21(A)]. This equipment grounding conductor must be a copper conductor and cannot be smaller than 12 AWG. "The branch circuits for pool-associated motors shall be installed in rigid metal conduit, intermediate metal conduit, rigid nonmetallic conduit, or Type MC cable listed for the location."³⁵ This Type MC cable will have an overall outer jacket of PVC material and an insulated equipment grounding conductor not smaller than 12 AWG. Electrical metallic tubing is permitted to be used to protect conductors where it is installed on or within buildings.

Where flexible connections are necessary at or adjacent to the motor, liquidtight flexible metal or liquidtight flexible nonmetallic conduit with approved fittings are permitted.

"In the interior of one-family dwellings, or in the interior of accessory buildings associated with a one-family dwelling, any of the wiring methods recognized in Chapter 3 of this Code that comply with the provisions of this paragraph shall be permitted. Where run in a raceway, the equipment grounding conductor shall be insulated. Where run in a cable assembly, the equipment grounding conductor shall be permitted to be uninsulated, but it shall be enclosed within the outer sheath of the cable assembly."³⁶

Permanently installed pools are permitted to be provided with listed cord-and-plug connected pool pumps that are protected by a system of double insulation. They are to be provided with a means for grounding only the internal and nonaccessible non-current-carrying metal parts of the pump [680.21(A)(5)].

Panelboard Grounding

A panelboard and, where installed, a disconnecting means that are not part of the service equipment or source of a separately derived system are required to have an equipment grounding conductor installed between its equipment grounding terminal and the equipment grounding terminal located at the service equipment or source of a separately derived system. This conductor must be sized in accordance with Table 250.122 and be an insulated conductor of copper, aluminum or copper-clad aluminum and can never be smaller than 12 AWG. This conductor must generally be installed with the feeder conductors in a rigid metal conduit, intermediate metal conduit, liquidtight flexible metal conduit, or rigid nonmetallic conduit.

Electrical metallic tubing is permitted to be used to protect conductors where installed on or within buildings in accordance with Article 338. Electrical nonmetallic tubing is permitted to be used to protect conductors where installed within buildings in accordance with Article 362. The equipment grounding conductor must be connected to an equipment grounding terminal of the panelboard and, where installed, to the enclosure for a disconnecting means.

Panelboards from Separately Derived Systems

There are several ways of grounding swimming pool panelboards that are supplied from a separately derived system. It is important to follow the rules for grounding the separately derived system as given in 250.30 and as covered extensively in chapter twelve.

Section 680.25(B) requires that the equipment

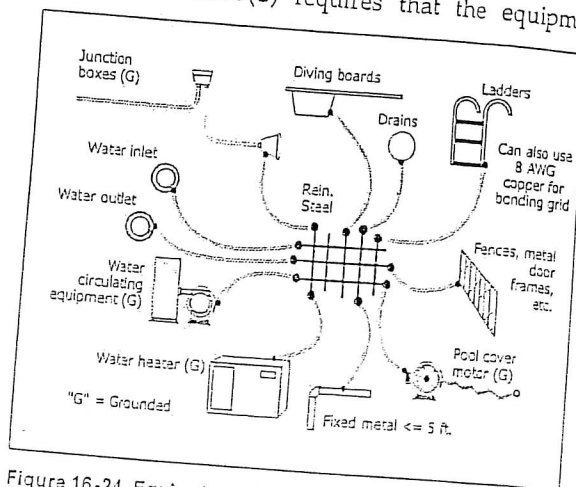


Figure 16-24. Equipotential bonding required

Grounding and Bonding for Special Locations and Conditions

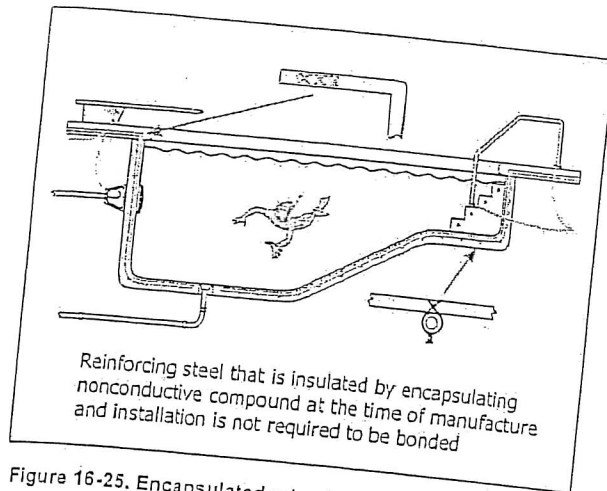


Figure 16-25. Encapsulated rebar is not required to be bonded

required to be bonded. Included are the following: "1) Metallic Structural Components. All metallic parts of the pool structure, including the reinforcing metal of the pool shell, coping stones, and deck, shall be bonded. The usual steel tie wires shall be considered suitable for bonding the reinforcing steel together, and welding or special clamping shall not be required."

Rebar coated with an encapsulating nonconductive compound at the time of the manufacture shall not be required to be bonded (see figure 16-25). Where reinforcing steel is encapsulated with a nonconductive compound, "provisions shall be made for an alternate means to eliminate voltage gradients that would otherwise be provided by unencapsulated, bonded reinforcing steel."

[The Code recognizes an 8 AWG solid copper conductor for bonding purposes, which could be installed for this purpose.]

"2) Underwater Lighting. All forming shells and mounting brackets of no-niche luminaries (fixtures) shall be bonded unless a listed low-voltage lighting system with nonmetallic forming shells not requiring bonding is used.

"3) Metal Fittings. All metal fittings within or attached to the pool structure shall be bonded. Isolated parts that are not over 100 mm (4 in.) in any dimension and do not penetrate into the pool structure more than 1 mm (1 in.) shall not require bonding.

"4) Electrical Equipment. Metal parts of electric equipment associated with the pool water circulating system, including pump motors and metal parts of

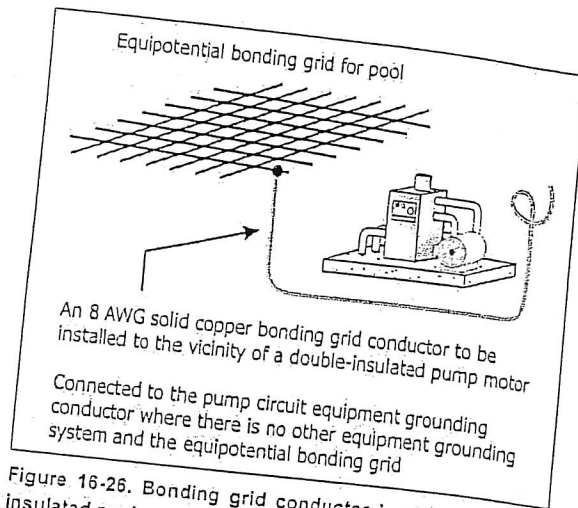


Figure 16-26. Bonding grid conductor in vicinity of double-insulated pool pump motors

equipment associated with pool covers, including electric motors, shall be bonded. Accessible metal parts of listed equipment incorporating an approved system of double insulation and providing a means for grounding internal nonaccessible, non-current-carrying metal parts shall not be bonded...Where a double-insulated water-pump motor is installed under the provisions of this rule, a solid 8 AWG copper conductor that is of sufficient length to make a bonding connection to a replacement motor shall be extended from the bonding grid to an accessible point in the motor vicinity (see figure 16-26). Where there is no connection between the swimming pool bonding grid and the equipment grounding system for the premises, this bonding conductor shall be connected to the equipment grounding conductor of the motor circuit."

"5) Metal Wiring Methods and Equipment. Metal-sheathed cables and raceways, metal piping, and all fixed metal parts that are within the following distances of the pool except those separated from the pool by a permanent barrier shall be bonded"

"1) Within 1.5 m (5 ft) horizontally of the inside walls of the pool

"2) Within 3.7 m (12 ft) measured vertically above the maximum water level of the pool, or any observation stands, towers, or platforms, or any diving structures."

Equipotential Bonding Grid

The parts identified in 680.26(B) "shall be connected to a common bonding grid with a solid copper conductor,

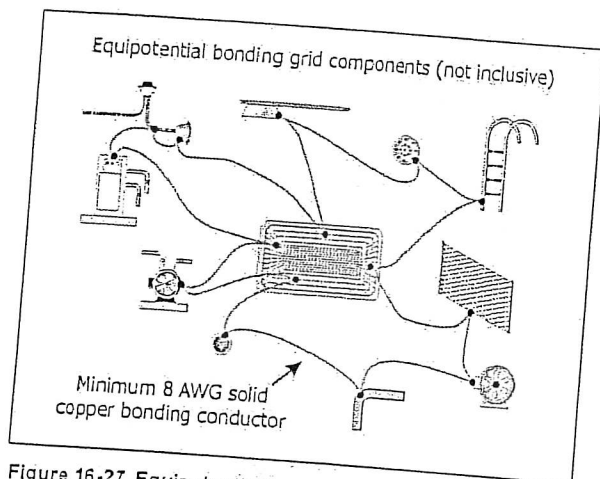


Figure 16-27. Equipotential bonding grid

insulated, covered or bare, not smaller than 8 AWG," (see figure 16-27). The conductor can be insulated, covered or bare. Connections to the parts to be bonded and to the common bonding grid must be made in accordance with 250.8 by using exothermic welding or by pressure connectors or clamps of that are labeled as being suitable for that specific purpose or use and are of the following compatible material: stainless steel, brass, copper or copper alloy.

The equipotential bonding grid shall be permitted to be any of the following: (1) The structural reinforcing steel of a concrete pool where the reinforcing rods are bonded together by the usual steel tie wires or the equivalent; (2) The wall of a bolted or welded metal pool; (3) A an alternate means such as a solid copper conductor(s), insulated, covered, or bare, not smaller than 8 AWG. The conductors are required to be bonded at all points where they cross and these connections are to be made to meet the requirements of 680.26(D).

The grid structure is required to follow the contour of the pool and pool deck extending 1 m (3 ft) horizontally from the inside walls of the pool. This grid must be arranged in a 300 mm (12 in.) x 300 mm (12 in.) network of conductors in a uniformly spaced perpendicular grid pattern with a tolerance not exceeding 100 mm (4 in.). This grid is required to be secured within or under the pool and deck media.²³

Any electrical pool water heaters rated more than 50 amperes that have specific instructions related to the grounding and bonding connections must be grounded and bonded according to such instructions,

particularly to those parts identified to be bonded and those parts to be grounded [680.26(E)].

Bonding of Wet-Niche Luminaires (Light Fixtures)

Where mounted in a pool or fountain structure, a wet-niche luminaire (lighting fixture) must be installed in a forming shell that is designed to support a wet-niche luminaire (lighting fixture) assembly. The fixture will be completely surrounded by water [see definition of wet-niche luminaire (lighting fixture) in Article 680 and 680.23(B)(1)].

A forming shell must be installed for the mounting of all wet-niche underwater luminaries (lighting fixtures). The forming shell must also be equipped with provisions for threaded conduit entries.

Wiring methods permitted to be used to connect the forming shell to a suitable junction box or other permitted enclosure include rigid metal conduit, intermediate metal conduit, liquidtight flexible nonmetallic conduit or rigid nonmetallic conduit [see 680.23(B)(2)].

Rigid metal or intermediate metal conduit used to connect the wet-niche fixture housing must be made of brass or other approved corrosion resistant metal, such as stainless steel.

Where rigid nonmetallic or liquidtight flexible nonmetallic conduit is used, an 8 AWG insulated copper conductor must be installed along with the pool flexible cord assembly so that it can be terminated on a suitable lug in the forming shell, junction box, transformer enclosure or ground-fault circuit-interrupter enclosure (see figures

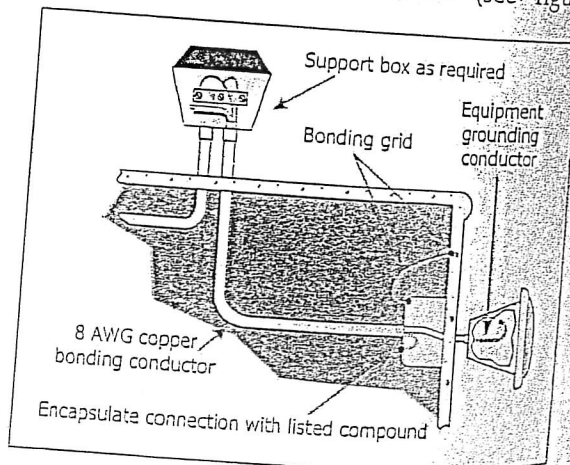


Figure 16-28. Bonding of forming shells of wet-niche luminaires (fixtures) required

Grounding and Bonding for Special Locations and Conditions

16-28). This conductor is referred to as a bonding jumper in this section but the sizing must be 8 AWG copper minimum. This conductor performs as a bonding jumper to connect non-current-carrying electrical equipment together. Where a metallic method is used from the junction box to the forming shell, the bonding of the two enclosures is accomplished through the metal conduit. An equipment grounding conductor is included in the cord assembly of the wet-niche luminaire (lighting fixture) for returning any line-to-ground fault current back to the source (see photo 16-28).

At the point of termination within the forming shell, the 8 AWG bonding jumper must be covered with, or encapsulated in, a listed potting compound [680.23(B)(2)(b)]. This compound provides protection from deteriorating effects often caused by the pool water. Where a listed potting compound is not used to encapsulate the 8 AWG bonding jumper inside the forming shell, brass or stainless steel conduit must be used between the pool junction box and the forming shell to eliminate the need for the bonding jumper.

Where in contact with the pool water, metal parts of the luminaire (fixture) and forming shell must also be of brass or other approved corrosion-resistant metal. Forming shells used with nonmetallic conduit systems other than those that are part of a listed low-voltage lighting system not requiring grounding, include provisions for the termination of an 8 AWG copper conductor [see 680.23(B)(1)]. The end of the flexible cord jacket and flexible cord conductor terminations located within a wet-niche fixture must be covered with, or encapsulated in, a suitable potting compound. This will help to prevent the siphoning of water into the luminaire (fixture) through the cord jacket or its contained conductors. This requirement is met by the manufacturer of the wet-niche luminaire (fixture). In addition, an equipment grounding conductor connection within a wet-niche fixture must be similarly treated to protect it from the deteriorating effect of pool water in the event of water entry into the luminaire (fixture).

The luminaire (fixture) must be bonded to and secured to the forming shell by a positive locking device that will ensure a low resistance contact. A special tool is required to remove the fixture from the forming shell. Bonding is not required for fixtures listed for the

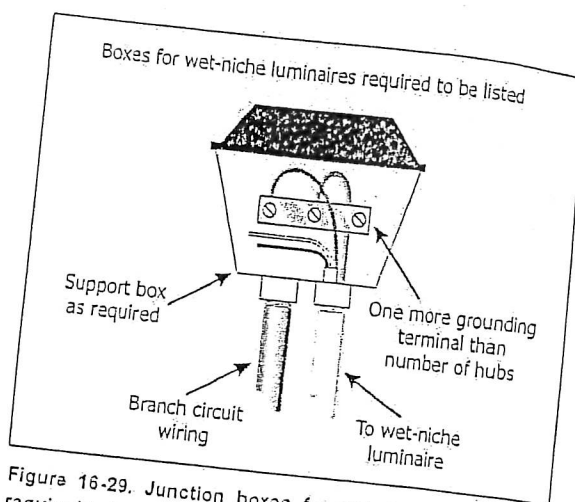


Figure 16-29. Junction boxes for wet-niche luminaires are required to be listed.

application, having no non-current-carrying metal parts.

Underwater wet-niche lighting fixtures include markings that will indicate the proper housing or housings with which they are to be used, and the fixture housings are marked to indicate the fixture or fixtures with which the housings are to be used. These luminaires (fixtures) are provided with a factory-installed permanently-attached flexible cord that extends at least 3.7 m (12 ft) outside the luminaire (fixture) enclosure. This will permit removal of the fixture from the forming shell so that it can be lifted onto the pool or spa deck for servicing without lowering the water level or disconnecting the fixture from the branch-circuit conductors.

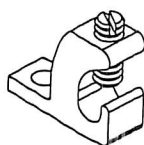
Luminaires (fixtures) with longer cords are available for installation where the junction box or splice enclosure is so located that a 12-foot-long cord will not permit the fixture to be removed from the forming shell and placed on the deck for servicing. To avoid possible cord damage, any cord length in excess of that necessary for servicing should be trimmed from the supply end rather than stored in the forming shell.

Listed Junction Boxes and Enclosures

Special requirements are contained in 680.24(A) for "a junction box connected to a conduit that extends directly to a forming shell or mounting bracket for a no-niche luminaire (fixture)..."

"1) Construction. The junction box shall be listed as a swimming pool junction box and shall comply with the following conditions:

Pool Grounding & Bonding Components



UL Listed 486
UL Listed 467

1 - One-Hole Tinned Copper Lay-In Lug

Part No.	Conductor Range (AWG)	Bolt Hole Size
TCL1414DB	4 - 14	#10

- Suitable for direct burial.

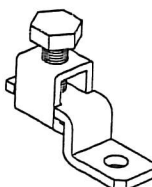


UL Listed 486
UL Listed 467

2 - Copper Split Bolt

Part No.	Range for Equal Main (AWG)	Minimum Tap
GESB6	4 Sol. - 8 Sol.	16 Sol.

- Suitable for direct burial.



UL Listed 486

3 - Copper Offset Terminal Lug

Part No.	Conductor Range (AWG)	Bolt Hole Size
GEOL2	14 Str. - 6 Str.	#8

- Not suitable for direct burial.



RB12A

UL Listed 467



RB12B

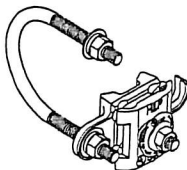
4 & 5 - Rebar & Water Pipe Ground Clamps

Part No.	Pipe & Rebar Range	Conductor Range (AWG)
RB12A	3/8" - 1"	10 Sol. - 2 Str.
RB12B	3/8" - 1"	10 Sol. - 2 Str.

- Suitable for direct burial.

UL Listed 486

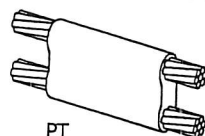
UL Listed 467



6 - CPC Pipe Clamps

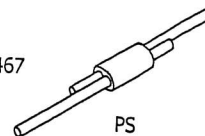
Part No.	Material	Nom. Pipe Size Range	Pipe Outside Diameter
CPC1.5/2	Tinned Bronze	1.5" - 2"	1" - 2.4"
CPC2.5/3	Tinned Bronze	2.5" - 3"	2.25" - 3.5"

- Suitable for direct burial.
- Conductor Range #6 - 250 MCM.
- Other sizes available.



PT

UL Listed 467

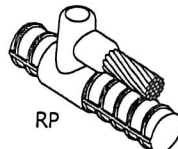


PS

7 & 8 - Cable to Cable

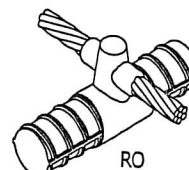
Ultraweld Exothermic Connection Molds

Part No.	Weld Metal		Required Handle
	UltraShot	NUWTUBE	
PT8S8SB	US25	NUWTUBE25	MH1
PS8S8SL	US25	NUWTUBE25	MH3 (Included)
PS8S6SL	US25	NUWTUBE25	MH3 (Included)



RP

UL Listed 467

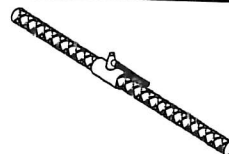


RO

9 & 10 - Cable to Rebar

Ultraweld Exothermic Connection Molds

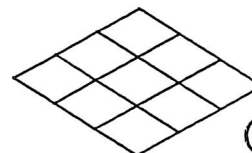
Part No.	Weld Metal		Required Handle	Packing Mat'l No.
	UltraShot	NUWTUBE		
RP38SB	US25	NUWTUBE25	MH1	WRPSLV
RP4L8SA	US25	NUWTUBE25	Included	CERPM1
RO38SB	US65	NUWTUBE65	MH1	WRPSLV
RO48SB	US65	NUWTUBE65	MH1	WRPSLV
RO58SB	US65	NUWTUBE65	MH1	WRPSLV



11 - Rebar Grounding Assembly

Part No.	Rebar Size	Conductor Type (AWG)	Conductor Length (ft.)
RB3GA8SX5	3	8 Sol.	5

- Prefabricated rebar grounding assembly with exothermically welded connection.
- Standard 24" long rebar.
- Can be wire tied or welded to rebar cage prior to concrete pour.



UL Listed 467

12 - UL Listed Prefabricated #8 Solid Copper Ground Mesh

Part No.	Width (ft.)	Length (ft.)	Conductor Spacing (in.)	Approx. Wt. (lbs.)
GM350812	3	50	12	32
GM375812	3	75	12	42
GM3100812	3	100	12	51

- Other mesh sizes and wire gauges available.

TECHNICAL NOTES:

• 680.26 Equipotential Bonding* (Summarized)

(A) **Performance.** The equipotential bonding required by this section shall be installed to reduce voltage gradients in the pool area.
(B) **Bonded Parts.** The parts specified in 680.26(B)(1) through (B)(7) shall be bonded together using solid copper conductors, insulated covered, or bare, not smaller than 8 AWG or with rigid metal conduit of brass or other identified corrosion-resistant metal. Connections to bonded parts shall be made in accordance with 250.8**. An 8 AWG or larger solid copper bonding conductor provided to reduce voltage gradients in the pool area shall not be required to be extended or attached to remote panelboards, service equipment, or electrodes.

(1) **Conductive Pool Shells.** Bonding to conductive pool shells shall be provided as specified in 680.26(B)(1)(a) or (B)(1)(b). Poured concrete, pneumatically applied or sprayed concrete, and concrete block with painted or plastered coatings shall all be considered conductive materials due to water permeability and porosity. Vinyl liners and fiberglass composite shells shall be considered to be nonconductive materials.

(a) **Structural Reinforcing Steel.** Unencapsulated structural reinforcing steel shall be bonded together by steel tie wires or the equivalent. Where structural reinforcing steel is encapsulated in a nonconductive compound, a copper conductor grid shall be installed in accordance with 680.26(B)(1)(b).

(b) **Copper Conductor Grid.** A copper conductor grid shall be provided and shall comply with (b)(1) through (b)(4).
(1) Be constructed of minimum 8 AWG bare solid copper conductors bonded to each other at all points of crossing. The bonding shall be in accordance with 250.8 or approved means.

(2) Conform to the contour of the pool and the pool deck.

(3) 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.).

(4) Be secured within or under the pool no more than 150 mm (6 in.) from the outer contour of the pool shell.

(2) **Perimeter Surfaces.** The perimeter surface shall extend for 1 m (3 ft.) horizontally beyond the inside walls of the pool and shall include unpaved surfaces as well as poured concrete surfaces and other types of paving. Perimeter surfaces less than 2 m (3 ft) separated by a permanent wall or building 1.5 m (5 ft) in height or more shall require equipotential bonding on the pool side of the permanent wall or building. Bonding to perimeter surfaces shall be provided as specified in 680.26(B)(2)(a) or (2)(b) and shall be attached to the pool reinforcing steel or copper conductor grid at a minimum of four (4) points uniformly spaced around the perimeter of the pool. For nonconductive pool shells, bonding at four points shall not be required.

(a) **Structural Reinforcing Steel.** Structural reinforcing steel shall be bonded in accordance with 680.26(B)(1)(a).

(b) **Alternate Means.** 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 450 to 600 mm (18 to 24 in.) from the inside walls of the pool.

(5) The required conductor shall be secured within or under the perimeter surface 100 to 150 mm (4 in. to 6 in.) below the subgrade.

(3) **Metallic Components.** All metallic parts of the pool structure, including reinforcing metal not addressed in 680.26(B)(1)(a), shall be bonded. Where reinforcing steel is encapsulated with a nonconductive compound, the reinforcing steel shall not be required to be bonded.

(4) **Underwater Lighting.**

(5) **Metal Fittings.**

(6) **Electrical Equipment.**

(7) **Fixed Metal Parts.** All fixed metal parts shall be bonded including, but not limited to, metal-sheathed cables and raceways, metal piping, metal awnings, metal fences, and metal door and window frames.

Exception No 1: Those separated from the pool by a permanent barrier that prevents contact by a person shall not be required to be bonded.

Exception No 2: Those greater than 1.5 m (5 ft.) horizontally of the inside walls of the pool shall not be required to be bonded.

Exception No 3: Those greater than 3.7 m (12 ft.) measured vertically above the maximum water level of the pool, or as measured vertically above any observation stands, towers, or platforms, or any diving structures, shall not be required to be bonded.

(C) **Pool Water.** An intentional bond of a minimum conductive surface area of 5600 mm² (9 in.²) shall be installed in contact with the pool water. This bond shall be permitted to consist of parts that are required to be bonded in 680.26(B).

• 250.8 Connection of Grounding and Bonding Equipment**

(A) **Permitted Methods.** Equipment grounding conductors, grounding electrodes conductors, and bonding jumpers shall be connected by one of the following means:

(1) Listed pressure connectors

(2) Terminal bars

(3) Pressure connectors listed as grounding and bonding equipment

(4) Exothermic welding process

(5) Machine screw-type fasteners that engage not less than two threads or are secured with a nut

(6) Thread-forming machine screws that engage not less than two threads in the enclosure

(7) Connections that are part of a listed assembly

(8) Other listed means

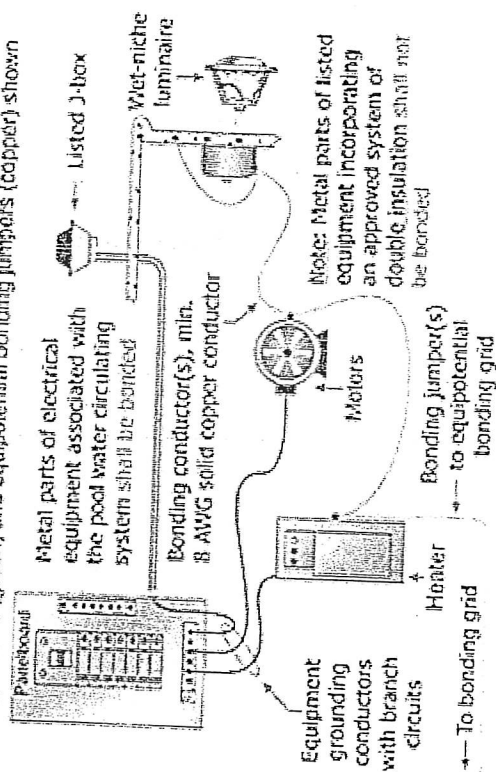
(B) **Methods Not Permitted.** Connection devices or fittings that depend solely on solder shall not be used.

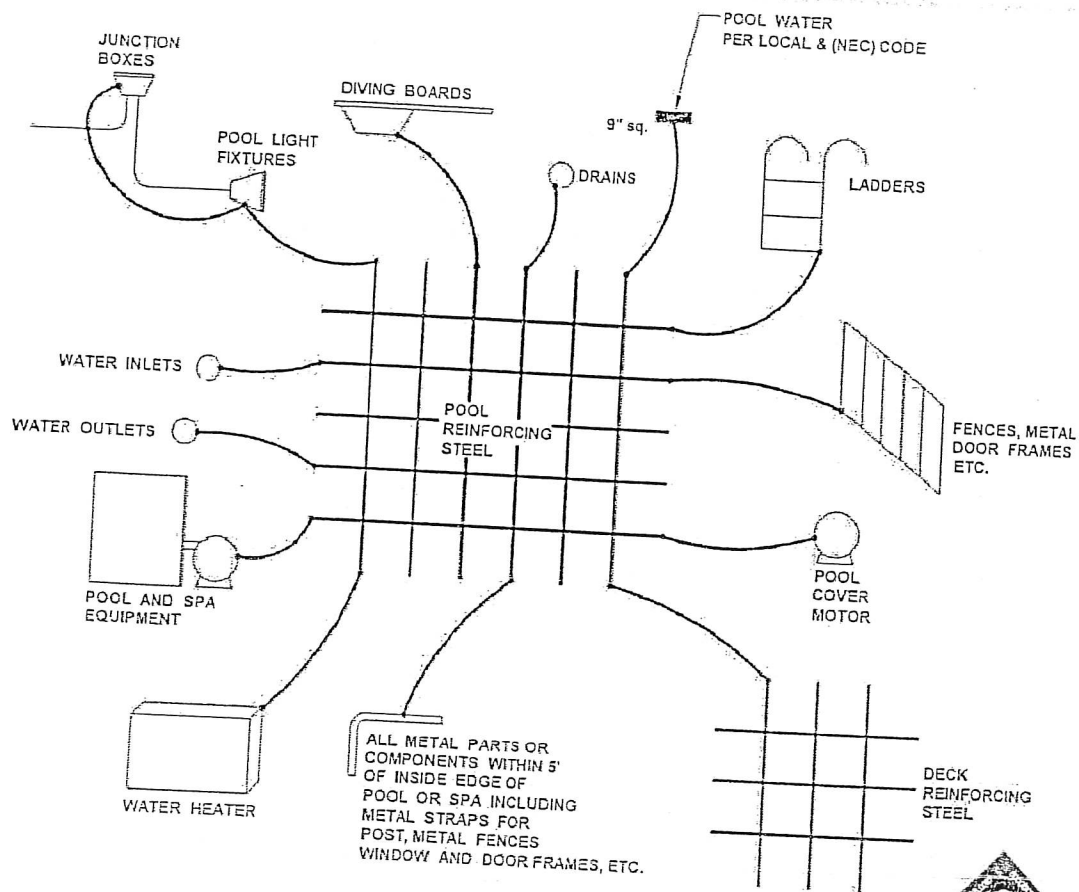
*NEC 2011 Equipotential Bonding Article 680.26

**NEC 2011 Connection of Grounding and Bonding Equipment Article 250.8

680.26(B)(6) Bonding of Electrical Equipment

Note: EGCs (green) and equipotential bonding jumpers (copper) shown





POOL AND SPA BONDING DETAIL

GENERAL NOTES:

- 1.) ALL CONNECTIONS WILL BE MADE BY EXOTHERMIC WELDING OR BY PROVIDING A LISTED PRESSURE CONNECTOR OR CLAMPS THAT ARE SUITABLE FOR THE REQUIRED PURPOSE AND ARE MADE OF STAINLESS STEEL, BRASS OR COPPER
- 2.) ALL BONDING CONNECTIONS WILL BE #8
- 3.) WHERE AS STEEL REINFORCEMENT IS NOT INSTALLED THEN ALL ITEMS WILL BE BONDED TOGETHER WITH #8 COPPER

NTS

