

POOLS

A). Zoning

Provide a “to scale” copy of your survey. Provide a completed Permit application – Construction Permit, Building Subcode, Electrical Subcode, Plumbing Subcode (if needed) and Construction Permit Jacket. Show location of pool, pool decks, & any pool equipment or appurtenant structures.

B). Above Ground Pools

Provide a copy of the manufacturers installation instructions.

All pools must have a 48-inch high barrier enclosing the pool with a self-closing and self-latching gate that opens away from the pool or must provide that the pool wall is 48-inches above grade for the entire pool perimeter and the access ladder or stairs are enclosed with a code complying barrier and gate. See code requirements for barrier and gates. You must submit a detailed drawing showing the location and type of barrier and gate you will be installing and location of latching release mechanism.

C). In-Ground Pools

Provide three (3) sets of sealed Construction documents done by a New Jersey Professional Engineer or Architect showing dimensions and construction of the pool and appurtenances as well as details of the water supply system, drainage and water disposal systems and equipment. Detailed construction documents of structures, vertical elevations and sections through the pool showing depth shall be included.

Provide diving board details as per code. See figure & table 421.11

Provide barrier and gate details same as above.

Provide piping diagram, including vacuum release system and 2 drains – 3 FT apart.

APPENDIX G

SWIMMING POOLS, SPAS AND HOT TUBS

SECTION AG101 GENERAL

AG101.1 General. The provisions of this appendix shall control the design and construction of swimming pools, spas and hot tubs installed in or on the lot of a one- or two-family dwelling.

SECTION AG102 DEFINITIONS

AG102.1 General. For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Chapter 2.

ABOVE-GROUND/ON-GROUND POOL. See "Swimming pool."

BARRIER. A fence, wall, building wall or combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool.

HOT TUB. See "Swimming pool."

IN-GROUND POOL. See "Swimming pool."

RESIDENTIAL. That which is situated on the premises of a detached one- or two-family dwelling or a one-family townhouse not more than three stories in height.

SPA, NONPORTABLE. See "Swimming pool."

SPA, PORTABLE. A nonpermanent structure intended for recreational bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product.

SWIMMING POOL. Any structure intended for swimming or recreational bathing that contains water over 24 inches (610 mm) deep. This includes in-ground, above-ground and on-ground swimming pools, hot tubs and spas.

SWIMMING POOL, INDOOR. A swimming pool which is totally contained within a structure and surrounded on all four sides by the walls of the enclosing structure.

SWIMMING POOL, OUTDOOR. Any swimming pool which is not an indoor pool.

SECTION AG103 SWIMMING POOLS

AG103.1 In-ground pools. In-ground pools shall be designed and constructed in conformance with ANSI/NSPI-5 as listed in Section AG108.

AG103.2 Above-ground and on-ground pools. Above-ground and on-ground pools shall be designed and constructed in conformance with ANSI/NSPI-4 as listed in Section AG108.

SECTION AG104 SPAS AND HOT TUBS

AG104.1 Permanently installed spas and hot tubs. Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-3 as listed in Section AG108.

AG104.2 Portable spas and hot tubs. Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-6 as listed in Section AG108.

SECTION AG105 BARRIER REQUIREMENTS

AG105.1 Application. The provisions of this chapter shall control the design of barriers for residential swimming pools, spas and hot tubs subject to this code. These design controls are intended to provide protection against potential drownings and near-drownings by restricting access to swimming pools, spas and hot tubs.

AG105.2 Outdoor swimming pool. An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be surrounded by a barrier which shall comply with the following:

1. The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an above-ground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).
2. Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.
3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed $1\frac{3}{4}$ inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed $1\frac{3}{4}$ inches (44 mm) in width.

5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1³/₄ inches (44 mm) in width.
6. Maximum mesh size for chain link fences shall be a 2¹/₄-inch (57 mm) square unless the fence has slats fastened at the top or the bottom which reduce the openings to not more than 1³/₄ inches (44 mm).
7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 1³/₄ inches (44 mm).
8. Access gates shall comply with the requirements of Section AG105.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the gate, the release mechanism and openings shall comply with the following:
 - 8.1. The release mechanism shall be located on the pool side of the gate at least 3 inches (76 mm) below the top of the gate; and
 - 8.2. The gate and barrier shall have no opening larger than 1/2 inch (13 mm) within 18 inches (457 mm) of the release mechanism.
9. Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps:
 - 9.2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section AG105.2, Items 1 through 8.

AG105.3 Indoor swimming pool. Walls surrounding an indoor swimming pool shall comply with Section AG105.2, Item 9.

AG105.4 Prohibited locations. Barriers shall be located to prohibit permanent structures, equipment or similar objects from being used to climb them.

AG105.5 Barrier exceptions. Spas or hot tubs with a safety cover which complies with ASTM F 1346, as listed in Section AG107, shall be exempt from the provisions of this appendix.

**SECTION AG106
ENTRAPMENT PROTECTION FOR SWIMMING
POOL AND SPA SUCTION OUTLETS**

See N.J.A.C. 5:23-3.15(b) 8vi. of the plumbing subcode.

**SECTION AG107
ABBREVIATIONS**

AG107.1 General.

ANSI—American National Standards Institute
11 West 42nd Street, New York, NY 10036

ASME—American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

ASTM—ASTM International
100 Barr Harbor Drive, West Conshohocken, PA 19428

NSPI—National Spa and Pool Institute
2111 Eisenhower Avenue, Alexandria, VA 22314

UL—Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, Illinois 60062-2096

**SECTION AG108
STANDARDS**

AG108.1 General.

ANSI/NSPI

ANSI/NSPI-3-99 Standard for Permanently Installed Residential Spas. AG104.1

ANSI/NSPI-4-99 Standard for Above-ground/On-ground Residential Swimming Pools AG103.2

ANSI/NSPI-5-99 Standard for Residential In-ground Swimming Pools AG103.1

ANSI/NSPI-6-99 Standard for Residential Portable Spas AG104.2

ANSI/NSPI-5-2003 Standard for Residential In-ground Swimming Pools AG103.1

ANSI/ASME A112.19.8M-1987 (R1996) Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs and Whirlpool Bathing Appliances AG106.2

ASTM

ASTM F 1346-91 (2003) Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs AG105.2, AG105.5

ASME

ASME A112.19.17 Manufacturers Safety Vacuum Release Systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub and Wading Pool. AG106.3

UL

UL2017-2000 Standard for General-purpose Signaling Devices and Systems—with Revisions through June 2004. AG105.2

- (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

(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 common bonding grid shall extend 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 where the reinforcing rods are bonded together by the usual steel tie wires or the equivalent
- (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 tolerance of 100 mm (4 in.).
 - c. **Securing.** The below-grade grid shall be secured within or under the pool and deck media.

(D) **Connections.** 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.

(E) **Pool Water Heaters.** For pool water heaters rated at more than 50 amperes and having specific instructions regarding bonding and grounding, only those parts designated to be bonded shall be bonded and only those parts designated to be grounded shall be grounded.

680.27 Specialized Pool Equipment.

(A) **Underwater Audio Equipment.** All underwater audio equipment shall be identified for the purpose.

(1) **Speakers.** Each speaker shall be mounted in an approved metal forming shell, the front of which is enclosed by a captive metal screen, or equivalent, that is bonded to, and secured to, the forming shell by a positive locking device that ensures a low-resistance contact and requires a tool to open for installation or servicing of the speaker. The forming shell shall be installed in a recess in the wall or floor of the pool.

(2) **Wiring Methods.** Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal, liquidtight flexible nonmetallic conduit (LFNC-B), or rigid nonmetallic conduit shall extend from the forming shell to a listed junction box or other enclosure as provided in 680.24. Where rigid nonmetallic conduit or liquidtight flexible nonmetallic conduit is used, an 8 AWG insulated solid or stranded copper bonding jumper shall be installed in this conduit. The bonding jumper shall be terminated in the forming shell and the junction box. The termination of the 8 AWG bonding jumper in the forming shell shall be covered with, or encapsulated in, a listed potting compound to protect such connection from the possible deteriorating effect of pool water.

(3) **Forming Shell and Metal Screen.** The forming shell and metal screen shall be of brass or other approved corrosion-resistant metal. All forming shells shall include provisions for terminating an 8 AWG copper conductor.

(B) Electrically Operated Pool Covers.

(1) **Motors and Controllers.** The electric motors, controllers, and wiring shall be located not less than 1.5 m (5 ft) from the inside wall of the pool unless separated from the pool by a wall, cover, or other permanent barrier. Electric motors installed below grade level shall be of the totally enclosed type. The device that controls the operation of the motor for an electrically operated pool cover shall be located such that the operator has full view of the pool.

FPN No. 1: For cabinets installed in damp and wet locations, see 312.2(A).

FPN No. 2: For switches or circuit breakers installed in wet locations, see 404.4.

FPN No. 3: For protection against liquids, see 430.11.

(2) **Protection.** The electric motor and controller shall be connected to a circuit protected by a ground-fault circuit interrupter.

(C) **Deck Area Heating.** These provisions of this section shall apply to all pool deck areas, including a covered pool, where electrically operated comfort heating units are installed within 6.0 m (20 ft) of the inside wall of the pool.

680.25 Feeders. These provisions shall apply to any feeder on the supply side of panelboards supplying branch circuits for pool equipment covered in Part II of this article and on the load side of the service equipment or the source of a separately derived system.

(A) Wiring Methods. Feeders shall be installed in rigid metal conduit, intermediate metal conduit, liquidtight, flexible nonmetallic conduit, or rigid nonmetallic conduit. Electrical metallic tubing shall be permitted where installed on or within a building, and electrical nonmetallic tubing shall be permitted where installed within a building.

Exception: An existing feeder between an existing remote panelboard and service equipment shall be permitted to run in flexible metal conduit or an approved cable assembly that includes an equipment grounding conductor within its outer sheath. The equipment grounding conductor shall comply with 250.24(A)(5).

(B) Grounding. An equipment grounding conductor shall be installed with the feeder conductors between the grounding terminal of the pool equipment panelboard and the grounding terminal of the applicable service equipment or source of a separately derived system. For other than (1) existing feeders covered in 680.25(A), Exception, or (2) feeders to separate buildings that do not utilize an insulated equipment grounding conductor in accordance with 680.25(B)(2), this equipment grounding conductor shall be insulated.

(1) Size. This conductor shall be sized in accordance with 250.122 but not smaller than 12 AWG. On separately derived systems, this conductor shall be sized in accordance with Table 250.66 but not smaller than 8 AWG.

(2) Separate Buildings. A feeder to a separate building or structure shall be permitted to supply swimming pool equipment branch circuits, or feeders supplying swimming pool equipment branch circuits, if the grounding arrangements in the separate building meet the requirements in 250.32(B)(1). Where installed in other than existing feeders covered in 680.25(A), Exception, a separate equipment grounding conductor shall be an insulated conductor.

680.26 Equipotential Bonding.

(A) Performance. The equipotential bonding required by this section shall be installed to eliminate voltage gradients in the pool area as prescribed.

FPN: The 8 AWG or larger solid copper bonding conductor shall not be required to be extended or attached to any remote panelboard, service equipment, or any electrode.

(B) Bonded Parts. The parts specified in 680.26(B)(1) through (B)(5) shall be bonded together.

(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. These tie wires shall be made tight. If reinforcing steel is effectively insulated by an encapsulating nonconductive compound at the time of manufacture and installation, it shall not be required to be bonded. Where reinforcing steel of the pool shell or the reinforcing steel of coping stones and deck is encapsulated with a nonconductive compound or another conductive material is not available, provisions shall be made for an alternative means to eliminate voltage gradients that would otherwise be provided by unencapsulated, bonded reinforcing steel.

(2) Underwater Lighting. All metal forming shells and mounting brackets of no-niche luminaires (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 25 mm (1 in.) shall not require bonding.

(4) Electrical Equipment. Metal parts of electrical equipment associated with the pool water circulating system, including pump motors and metal parts of 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 by a direct connection to the equipotential bonding grid. The means for grounding internal nonaccessible, non-current carrying metal parts shall be an equipment grounding conductor run with the power-supply conductors in the case of motors supplied with a flexible cord, or a grounding terminal in the case of motors intended for permanent connection.

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. 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.

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Dry-Niche Lighting Fixture. A lighting fixture intended for installation in the wall of a pool or fountain in a niche that is sealed against the entry of pool water.

Forming Shell. A structure designed to support a wet-niche lighting fixture assembly and intended for mounting in a pool or fountain structure.

Fountain. As used in this article, the term includes fountains, ornamental pools, display pools, and reflection pools. It does not include drinking fountains.

Hydromassage Bath tub. A permanently installed bath tub equipped with a recirculating piping system, pump, and associated equipment. It is designed so it can accept, circulate, and discharge water upon each use.

No-Niche Lighting Fixture. A lighting fixture intended for installation above or below the water without a niche.

Packaged Spa or Hot Tub Equipment Assembly. A factory-fabricated unit consisting of water-circulating, heating, and control equipment mounted on a common base, intended to operate a spa or hot tub. Equipment may include pumps, air blowers, heaters, lights, controls, sanitizer generators, etc.

Packaged Therapeutic Tub or Hydrotherapeutic Tank Equipment Assembly. A factory-fabricated unit consisting of water-circulating, heating, and control equipment mounted on a common base, intended to operate a therapeutic tub or hydrotherapeutic tank. Equipment may include pumps, air blowers, heaters, lights, controls, sanitizer generators, etc.

Permanently Installed Decorative Fountains and Reflection Pools. Those that are constructed in the ground, on the ground, or in a building in such a manner that the fountain cannot be readily disassembled for storage, whether or not served by electrical circuits of any nature. These units are primarily constructed for their aesthetic value and are not intended for swimming or wading.

Permanently Installed Swimming, Wading, and Therapeutic Pools. Those that are constructed in the ground or partially in the ground, and all others capable of holding water in a depth greater than 42 in. (1.07 m), and all pools installed inside of a building, regardless of water depth, whether or not served by electrical circuits of any nature.

Pool. As used in this article, the term includes swimming, wading, and permanently installed therapeutic pools.

Pool Cover, Electrically Operated. Motor-driven equipment designed to cover and uncover the water surface of a pool by means of a flexible sheet or rigid frame.

Self-Contained Spa or Hot Tub. Factory-fabricated unit consisting of a spa or hot tub vessel with all water-

circulating, heating, and control equipment integral to the unit. Equipment may include pumps, air blowers, heaters, lights, controls, sanitizer generators, etc.

Self-Contained Therapeutic Tubs or Hydrotherapeutic Tanks. A factory-fabricated unit consisting of a therapeutic tub or hydrotherapeutic tank with all water-circulating, heating, and control equipment integral to the unit. Equipment may include pumps, air blowers, heaters, light controls, sanitizer generators, etc.

Spa or Hot Tub. A hydromassage pool, or tub for recreational or therapeutic use, not located in health care facilities, designed for immersion of users, and usually having a filter, heater, and motor-driven blower. It may be installed indoors or outdoors, on the ground or supporting structure, or in the ground or supporting structure. Generally, a spa or hot tub is not designed or intended to have its contents drained or discharged after each use.

Storable Swimming or Wading Pool. Those that are constructed on or above the ground and are capable of holding water to a maximum depth of 42 in. (1.07 m), or a pool with nonmetallic, molded polymeric walls or inflatable fabric walls regardless of dimension.

Wet-Niche Lighting Fixture. A lighting fixture intended for installation in a forming shell mounted in a pool or fountain structure where the fixture will be completely surrounded by water.

680-5. Transformers and Ground-Fault Circuit Interrupters.

(a) **Transformers.** Transformers used for the supply of underwater fixtures, together with the transformer enclosure, shall be identified for the purpose. The transformer shall be an isolated winding type that has a grounded metal barrier between the primary and secondary windings.

(b) **Ground-Fault Circuit Interrupters.** Ground-fault circuit interrupters shall be self-contained units, circuit-breaker types, receptacle types, or other approved types.

(c) **Wiring.** Conductors on the load side of a ground-fault circuit interrupter or of a transformer, used to comply with the provisions of Section 680-20(a)(1), shall not occupy raceway, boxes, or enclosures containing other conductors unless the other conductors are protected by ground-fault circuit interrupters or are grounding conductors. Supply conductors to a feed-through type ground-fault circuit interrupter shall be permitted in the same enclosure.

Ground-fault circuit interrupters shall be permitted in a panelboard that contains circuits protected by other than ground-fault circuit interrupters.

680-6. Receptacles, Lighting Fixtures, Lighting Outlets, Switching Devices, and Ceiling-Suspended (Paddle) Fans.

(a) Receptacles.

(1) A receptacle(s) that provides power for a water-pump motor(s) for, or other loads directly related to the circulation and sanitation system, a permanently installed pool or fountain, as permitted in Section 680-7, shall be permitted between 5 ft and 10 ft (1.52 m and 3.05 m) from the inside walls of the pool or fountain, and, where so located, shall be single and of the locking and grounding types and shall be protected by a ground-fault circuit interrupter(s).

Other receptacles on the property shall be located at least 10 ft (3.05 m) from the inside walls of a pool or fountain.

(2) Where a permanently installed pool is installed at a dwelling unit(s), at least one 125-volt 15- or 20-ampere receptacle on a general-purpose branch circuit shall be located a minimum of 10 ft (3.05 m) from and not more than 20 ft (6.08 m) from the inside wall of the pool. This receptacle shall be located not more than 6 ft 6 in. (1.98 m) above the floor, platform, or grade level serving the pool.

(3) All 125-volt receptacles located within 20 ft (6.08 m) of the inside walls of a pool or fountain shall be protected by a ground-fault circuit interrupter.

FPN: In determining the above dimensions, the distance to be measured is the shortest path the supply cord of an appliance connected to the receptacle would follow without piercing a floor, wall, ceiling, doorway with hinged or sliding door, window opening, or other effective permanent barrier.

(b) Lighting Fixtures, Lighting Outlets, and Ceiling-Suspended (Paddle) Fans.

(1) In outdoor pool areas, lighting fixtures, lighting outlets, and ceiling-suspended (paddle) fans shall not be installed over the pool or over the area extending 5 ft (1.52 m) horizontally from the inside walls of a pool unless no part of the lighting fixture or ceiling-suspended (paddle) fan is less than 12 ft (3.66 m) above the maximum water level.

(2) Existing lighting fixtures and lighting outlets located less than 5 ft (1.52 m) measured horizontally from the inside walls of a pool shall be at least 5 ft (1.52 m) above the surface of the maximum water level, shall be rigidly attached to the existing structure, and shall be protected by a ground-fault circuit interrupter.

(3) In indoor pool areas, the limitations of Section 680-6(b)(1) shall not apply if all of the following conditions are complied with

- (a) Fixtures are of a totally enclosed type,
- (b) A ground-fault circuit interrupter is installed in the branch circuit supplying the fixture(s) or ceiling-suspended (paddle) fans, and
- (c) The distance from the bottom of the fixture or ceiling-suspended (paddle) fan to the maximum water level is not less than 7 ft 6 in. (2.29 m).

(4) Lighting fixtures and lighting outlets installed in the area extending between 5 ft (1.52 m) and 10 ft (3.05 m) horizontally from the inside walls of a pool shall be protected by a ground-fault circuit interrupter unless installed 5 ft (1.52 m) above the maximum water level and rigidly attached to the structure adjacent to or enclosing the pool.

(5) Cord-connected lighting fixtures shall meet the same specifications as other cord- and plug-connected equipment as set forth in Section 680-7 where installed within 16 ft (4.88 m) of any point on the water surface, measured radially.

(c) **Switching Devices.** Switching devices on the property shall be located at least 5 ft (1.52 m) horizontally from the inside walls of a pool unless separated from the pool by a solid fence, wall, or other permanent barrier.

(d) **Motors in Other than Dwelling Units.** Wiring supplying pool pump motors rated 15 and 20 amperes, 125 volt or 240 volt, single phase, whether by receptacle or direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel.

680-7. Cord- and Plug-Connected Equipment. Fixed or stationary equipment rated 20 amperes or less, other than an underwater lighting fixture for a permanently installed pool, shall be permitted to be connected with a flexible cord to facilitate the removal or disconnection for maintenance or repair. For other than storable pools, the flexible cord shall not exceed 3 ft (914 mm) in length and shall have a copper equipment grounding conductor not smaller than No. 12 with a grounding-type attachment plug.

FPN: See Section 680-25(e) for connection with flexible cords.

680-8. Overhead Conductor Clearances. The following parts of pools shall not be placed under existing service-drop conductors or any other open overhead wiring; nor shall such wiring be installed above the following:

- (1) Pools and the area extending 10 ft (3.05 m) horizontally from the inside of the walls of the pool,
- (2) Diving structure, or
- (3) Observation stands, towers, or platforms unless the installations provide the clearances in Table 680-8

providing a means for grounding internal nonaccessible, noncurrent-carrying metal parts shall not be bonded.

(5) Metal-sheathed cables and raceways, metal piping, and all fixed metal parts that are within 5 ft (1.52 m) horizontally of the inside walls of the pool, and within 12 ft (3.66 m) above the maximum water level of the pool, or any observation stands, towers, or platforms, or from any diving structures, and that are not separated from the pool by a permanent barrier.

(b) **Common Bonding Grid.** The parts specified in (a) shall be connected to a common bonding grid with a solid copper conductor, insulated, covered, or bare, not smaller than No. 8. Connection shall be made by exothermic welding or by pressure connectors or clamps that are labeled as being suitable for the purpose and are of the following material: stainless steel, brass, copper, or copper alloy. The common 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 solid copper conductor, insulated, covered, or bare, not smaller than No. 8
- (4) Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant metal conduit

Structural reinforcing steel or the walls of bolted or welded metal pool structures shall be permitted as a common bonding grid for nonelectrical parts where connections can be made in accordance with Section 250-8.

(c) **Pool Water Heaters.** For pool water heaters rated at more than 50 amperes that have specific instructions regarding bonding and grounding, only those parts designated to be bonded shall be bonded, and only those parts designated to be grounded shall be grounded.

680-23. Underwater Audio Equipment. All underwater audio equipment shall be identified for the purpose.

(a) **Speakers.** Each speaker shall be mounted in an approved metal forming shell, the front of which is enclosed by a captive metal screen, or equivalent, that is bonded to and secured to the forming shell by a positive locking device that ensures a low-resistance contact and requires a tool to open for installation or servicing of the speaker. The forming shell shall be installed in a recess in the wall or floor of the pool.

(b) **Wiring Methods.** Rigid metal conduit or intermediate metal conduit of brass or other identified corrosion-resistant

metal or rigid nonmetallic conduit shall extend from the forming shell to a suitable junction box or other enclosure as provided in Section 680-21. Where rigid nonmetallic conduit is used, a No. 8 insulated copper conductor shall be installed in this conduit with provisions for terminating in the forming shell and the junction box. The termination of the No. 8 conductor in the forming shell shall be covered with, or encapsulated in, a suitable potting compound to protect such connection from the possible deteriorating effect of pool water.

(c) **Forming Shell and Metal Screen.** The forming shell and metal screen shall be of brass or other approved corrosion-resistant metal.

680-24. Grounding. The following equipment shall be grounded:

- (1) Wet-niche and no-niche underwater lighting fixtures, other than those low-voltage systems listed for the application without a grounding conductor
- (2) Dry-niche underwater lighting fixtures
- (3) All electrical equipment located within 5 ft (1.52 m) of the inside wall of the pool
- (4) All electrical equipment associated with the recirculating system of the pool
- (5) Junction boxes
- (6) Transformer enclosures
- (7) Ground-fault circuit interrupters
- (8) Panelboards that are not part of the service equipment and that supply any electrical equipment associated with the pool

680-25. Methods of Grounding.

(a) **General.** The following provisions shall apply to the grounding of underwater lighting fixtures, junction boxes, metal transformer enclosures, panelboards, motors, and other electrical enclosures and equipment.

(b) **Pool Lighting Fixtures and Related Equipment.**

(1) Wet-niche, dry-niche, or no-niche lighting fixtures shall be connected to an equipment grounding conductor sized in accordance with Table 250-122 but not smaller than No. 12.

Exception: An equipment grounding conductor between the wiring chamber of the secondary winding of a transformer and a junction box shall be sized in accordance with the overcurrent device in this circuit.

(2) The equipment grounding conductor shall be an insulated copper conductor and shall be installed with the circuit conductors in rigid metal conduit, intermediate metal con-

Table 300-5. Minimum Cover Requirements, 0 to 600 Volts, Nominal, Burial in Inches (Cover is defined as the shortest distance in inches measured between a point on the top surface of any direct-buried conductor, cable, conduit, or other raceway and the top surface of finished grade, concrete, or similar cover.)

Location of Wiring Method or Circuit	Type of Wiring Method or Circuit				
	Column 1 Direct Burial Cables or Conductors	Column 2 Rigid Metal Conduit or Intermediate Metal Conduit	Column 3 Nonmetallic Raceways Listed for Direct Burial Without Concrete Encasement or Other Approved Raceways	Column 4 Residential Branch Circuits Rated 120 Volts or Less with GFCI Protection and Maximum Overcurrent Protection of 20 Amperes	Column 5 Circuits for Control of Irrigation and Landscape Lighting Limited to Not More than 30 Volts and Installed with Type UF or in Other Identified Cable or Raceway
All locations not specified below	24	6	18	12	6
In trench below 2-in. thick concrete or equivalent	18	6	12	6	6
Under a building	0 (in raceway only)	0	0	0 (in raceway only)	0 (in raceway only)
Under minimum of 4-in. thick concrete exterior slab with no vehicular traffic and the slab extending not less than 6 in. beyond the underground installation	18	4	4	6 (direct burial) 4 (in raceway)	6 (direct burial) 4 (in raceway)
Under streets, highways, roads, alleys, driveways, and parking lots	24	24	24	24	24
One- and two-family dwelling driveways and outdoor parking areas, and used only for dwelling-related purposes	18	18	18	12	18
In or under airport runways, including adjacent areas where trespassing prohibited	18	18	18	18	18

Notes:

- For SI units, 1 in. = 25.4 mm.
- Raceways approved for burial only where concrete encased shall require concrete envelope not less than 2 in. thick.
- Lesser depths shall be permitted where cables and conductors rise for terminations or splices or where access is otherwise required.
- Where one of the wiring method types listed in Columns 1–3 is used for one of the circuit types in Columns 4 and 5, the shallower depth of burial shall be permitted.
- Where solid rock prevents compliance with the cover depths specified in this table, the wiring shall be installed in metal or nonmetallic raceway permitted for direct burial. The raceways shall be covered by a minimum of 2 in. of concrete extending down to rock.

Residential Swimming Pools and the Plumbing Subcode

There has been some confusion regarding the latest pool and spa requirements and the new suction entrapment prevention language that is referenced in the Uniform Construction Code. In the 2006 International Residential Code (IRC/2006), Appendix G (Swimming Pools, Spas, and Hot Tubs) addresses requirements for constructing new residential swimming pools. When the IRC/2006 was adopted as the One- and Two-Family Dwelling Subcode, Section AG106, "Entrapment Protection for Swimming Pool and Spa Suction Outlets," was deleted, and was replaced with a reference to the Plumbing Subcode, *N.J.A.C. 5:23-3.15(b)8.vi*. This has resulted in confusion with regard to enforcement during the permitting and inspection process for new residential swimming pools. There has also been confusion with the way that swimming pool installers are interpreting the new requirements.

There are two key areas that should be highlighted. Residential swimming pools that are constructed with submerged suction (bottom drains) must now have two suction outlets that are at least three feet apart. These outlets must have American Society of Mechanical Engineers (ASME) -approved type covers. The pool must also have some type of atmospheric safety vacuum release system provided at the pump or pumps. The atmospheric safety vacuum release system must conform to ASME A112.19.17. To date, there are a number a different types of devices that are approved. If the residential swimming pool is constructed without submerged suction outlets, it is not required to be equipped with an atmospheric safety vacuum release system.

An exception to *N.J.A.C. 5:23-3.15(b)8.vi* of the Plumbing Subcode, paragraph 7.23.4.1 of the National Standard Plumbing Code (which was adopted on September 15, 2008) states: "Swimming pools installed in or on the lots of one- or two-family dwellings" are not required to be equipped with main-drain suction outlets in the lowest point of the swimming pool floor.

A permit application for a residential swimming pool with bottom suction drains must include plumbing, building, and electrical technical sections. The plumbing inspector is responsible for the inspection of the bottom suction drains, the vacuum release system, and the pool heater (if one is being installed). If there are no bottom drains and no vacuum release system or pool heater, then a plumbing technical section is not required.

I hope that this article clears up some of the confusion with these new pool requirements.

Should you have any questions, you may contact me at (609) 984-7609.

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