TOWN CODE

§ 98-16. Swimming pools.

No commercial or private swimming pool shall be constructed, installed or maintained on any premises unless it complies with the following provisions:

A. The term "swimming pool" shall mean any permanently constructed variety which will cause the retention of water to a depth of two feet or more below the level of the surrounding land, or an above-surface pool which will cause the retention of water to a depth of two feet or more, designed, used and maintained for swimming or bathing purposes and which is not readily portable.

B. Private pools shall be constructed or installed within the confines of the rear or side yard of a premises.

   (1) Construction of swimming pools may be allowed in the front or side yard, but not within the required such front or side yard, on lots containing five acres or more. However, such swimming pool and any accessory structure shall not be visible from the road on which the parcel fronts.

C. The pool shall be located at least 15 feet from any rear or side line of a premises and shall be at least 25 feet away from any septic tank and its fields.

D. No person, membership club or organization shall construct or have constructed a swimming pool without having first applied for and secured approval by the issuance of a permit from the Building Inspector. Upon application for permit, there shall be submitted plans and specifications detailing the pool dimensions, depth, volume in gallons and the distance of the pool from all lot lines and, if any, septic tanks and their fields; a pool fencing proposal shall also accompany these specifications.

E. After issuance of permit, construction or installation shall be accomplished within a sixty-day period; otherwise, the permit will have expired. The Building Inspector may authorize in writing an additional extension period not to exceed 20 days. If construction of a below-surface pool is not completed within the sixty-day period or extension thereof, any excavation shall be completely filled and the surface restored to its original state.

F. All material used in the construction of a swimming pool shall be of durable quality and waterproof and designed so as to facilitate its emptying and cleaning. Filter pumps and other mechanical devices shall be located at least 20 feet away from any adjoining premises so as not to interfere with the comfort, health and safety of the occupant of the adjoining premises.

G. A fence or enclosure of substantial design contiguous to the pool area and not less than 3 1/2 feet in height shall be constructed to completely surround a swimming pool having a depth of two feet or more below ground level. The fence shall be constructed during the sixty-day or extension period. The gate or door opening providing access into the pool area shall be of the same height as the fence or enclosure and shall be equipped with a self-closing and latching device. Any access ladder or steps used in connection with an above-surface-type swimming pool shall be removed when not in use.

H. Any lighting and electrical fixtures, wiring and installation shall be in accordance with the standard practices as required by the National Electric Code.

I. Above-surface pools shall be exempt from the fencing requirement unless the Building Inspector shall determine that safety conditions warrant the installation of complete or partial fencing not to exceed the maximum requirements for below-surface pools. Any appeal from a decision of the Building Inspector on fencing shall be made to the Zoning Board of Appeals and shall follow the procedure required in seeking a variance.

J. If any swimming pool is abandoned or permanently discontinued, the owners of the land upon which it is located shall completely fill the pool area and return the surface to its original state.

K. All swimming pools shall be provided with drainage to a drainage easement or swale or storm drain, but in no case to a sanitary sewer or toward the direction of a septic field. Below-surface pools shall be provided with washed gravel or crushed stone on the exterior of the pool sides where deemed necessary by the Building Inspector for proper drainage.

L. No pool located on a lot which is served by a public or central water system shall have its initial filling or seasonal refilling provided from the central water supply system.

M. Aboveground pools shall be leveled and not located on fill areas.

N. Safety covers capable of being adequately secured shall be required on all pools during normal off-season periods.

NYS CODE

SECTION R328—SWIMMING POOLS, SPAS AND HOT TUBS

[NY] R328.1 General.

The provisions of this section shall control the design and construction as well as substantial modification of *swimming pools*, *spas* and *hot tubs* installed in or on the lot of *dwellings* regulated under this code, and detached one- and two-family *dwellings* classified as Group R-3 and constructed under the *Building Code of New York State*.

Exception: Communal *swimming pools* for the shared use of multiple *townhouse units* shall be regulated by the *Building Code of New York State*.

[NY] R328.1.1 Compliance with other sections.

Swimming pools, *spas* and *hot tubs* shall comply with this section and other applicable sections of this code. The requirements of this section and of the other applicable sections of this code shall be in addition to, and not in replacement of or substitution for, the requirements of other applicable federal, state and local laws and regulations, including, but not necessarily limited to the requirements of CPSC 15 USC 8003, where applicable.

[NY] R328.2 Definitions.

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

BARRIER, PERMANENT. A fence, the walls of a permanent structure, any other structure or combination thereof which completely surrounds the *swimming pool* and sufficiently obstructs access to the *swimming pool*.

BARRIER, TEMPORARY. An approved temporary fence, permanent fence, the walls of a permanent *structure*, any other *structure*, or any combination thereof that sufficiently prevents access to the *swimming pool* by any person not engaged in the installation or construction of the *swimming pool* during its installation or construction.

HOT TUB. See "Spa."

RESIDENTIAL. That which is situated on the premises of *dwellings* regulated under this code, and also detached *dwellings* classified as R-3 and constructed under the *Building Code of New York State*.

SPA. A portable or nonportable *structure* intended for recreational or therapeutic bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product. *Spas* are shallow in depth and are not designed for swimming or diving.

SUBSTANTIAL DAMAGE. For the purpose of determining compliance with the pool alarm provisions of this section, damage of any origin sustained by a *swimming pool*, whereby the cost of restoring the *swimming pool* to its before-damaged condition would equal or exceed 50 percent of the market value of the *swimming pool* before the damage occurred.

SUBSTANTIAL MODIFICATION. For the purpose of determining compliance with the pool alarm provisions of this section, any *repair*, *alteration*, *addition* or improvement of a *swimming pool*, the cost of which equals or exceeds 50 percent of the market value of the *swimming pool* before the improvement or *repair* is started. If a *swimming pool* has sustained substantial damage, any repairs are considered substantial modification regardless of the actual repair work performed.

SUCTION FITTINGS. All components, including the sump and/or body cover/grate and hardware.

SUCTION OUTLET. A submerged fitting, fitting assembly, cover/grate and related components that provide localized low-pressure area for the transfer of water from a *swimming pool*, *spa* or *hot tub*. Submerged suction outlets have been referred to as main drains.

SWIMMING POOL. Any *structure*, basin, chamber or tank which is intended for swimming, diving, recreational bathing or wading and which contains, is designed to contain, or is capable of containing water more than 24 inches (610 mm) deep at any point. This includes in-ground, above-ground and on-ground pools, indoor pools, *hot tubs*, *spas*, and wading pools.

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.

[NY] R328.3 Compliance with other standards.

Swimming pools, *hot tubs*, and *spas* shall comply with other standards as specified in Sections R328.3.1 through R328.3.4.

[NY] R328.3.1 In-ground pools.

In-ground *swimming pools* shall be designed and constructed in conformance with ANSI/APSP/ICC 5.

[NY] R328.3.2 Above-ground and on-ground pools.

Above-ground and on-ground *swimming pools* shall be designed and constructed in conformance with ANSI/APSP/ICC 4.

[NY] R328.3.3 Permanently installed spas and hot tubs.

Permanently installed *spas* and *hot tubs* shall be designed and constructed in conformance with ANSI/APSP/ICC 3.

[NY] R328.3.4 Portable spas and hot tubs.

Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/APSP/ICC 6.

[NY] R328.4 Barriers, application.

The provisions of this section shall control the design of barriers for *swimming pools*, *spas* and *hot tubs*. These design controls are intended to provide protection against potential drowning and near-drowning by sufficiently preventing access to *swimming pools*, *spas* and *hot tubs* by persons outside the property, persons within *buildings* on the property, and persons in other parts of the property not contained within the *swimming pool* enclosure.

[NY] R328.4.1 Temporary barriers.

An outdoor *swimming pool* shall be surrounded by a temporary barrier during installation or construction that shall remain in place until a *permanent barrier* in compliance with Section R328.4.2 is provided.

Exceptions:

1. Above-ground or on-ground *swimming pools* where the pool structure constitutes a barrier in compliance with Section R328.4.2.9.
2. *Spas* or *hot tubs* with a safety cover which complies with ASTM F1346, provided that such safety cover is in place during the period of installation or construction of such *hot tub* or *spa*. The temporary removal of a safety cover as required to facilitate the installation or construction of a *hot tub* or *spa* during periods when at least one person engaged in the installation or construction is present is permitted.

[NY] R328.4.1.1 Height.

The top of the *temporary 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*.

[NY] R328.4.1.2 Replacement by a permanent barrier.

A *temporary barrier* shall be replaced by a complying *permanent barrier* within either of the following periods:

1. Within 90 days of the date of issuance of the *permit* for the installation or construction of the *swimming pool*.
2. Within 90 days of the date of commencement of the installation or construction of the *swimming pool*.

[NY] R328.4.1.2.1 Replacement extension.

Subject to the approval of the *building official*, the time period for completion of the *permanent barrier* may be extended for good cause, including, but not limited to, adverse weather conditions delaying construction.

[NY] R328.4.2 Permanent barriers.

Swimming pools, spas, and hot tubs shall be completely enclosed by a permanent barrier complying with Sections R328.4.2.1 through R328.4.2.9.

Exception: A *hot tub* or *spa* with a safety cover which complies with ASTM F1346 shall not be required to comply with Section R328.4.2.

[NY] R328.4.2.1 Barrier height and clearances.

The top of the barrier shall be no less than 48 inches (1219 mm) above grade measured on the side of the barrier that faces away from the swimming pool. The vertical clearance between grade and the bottom of the barrier shall be not greater than 2 inches (51 mm) measured on the side of the barrier that faces away from the swimming pool. Where the top of the pool structure is above grade, the barrier may be at ground level, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the barrier shall comply with Sections R328.4.2.2 and R328.4.2.3.

[NY] R328.4.2.2 Solid barrier surfaces.

Solid barriers which do not have openings shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

[NY] R328.4.2.3 Closely spaced horizontal members.

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 $1^3/_4$ inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall be not greater than $1^3/_4$inches (44 mm) in width.

[NY] R328.4.2.4 Widely spaced horizontal members.

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 be not greater than 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall be not greater than $1^3/_4$ inches (44 mm) in width.

[NY] R328.4.2.5 Chain link dimensions.

Maximum mesh size for chain link fences shall be a $1^3/_4$ inch (57 mm) square, unless the fence has vertical slats fastened at the top or the bottom which reduce the openings to not more than $1^3/_4$ inches (44 mm).

[NY] R328.4.2.6 Diagonal members.

Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be not greater than $1^{3}/_{4}$ inches (44 mm).

[NY] R328.4.2.7 Gates.

Gates shall comply with the requirements of Sections R328.4.2.1 through R328.4.2.6 and Sections R328.4.2.7.1 through R328.4.2.7.3.

[NY] R328.4.2.7.1 Self-closing and opening configuration.

All gates shall be self-closing. In addition, if the gate is a pedestrian access gate, the gate shall open outward, away from the *swimming pool*.

[NY] R328.4.2.7.2 Latching.

All gates shall be self-latching. For doors and gates in barriers, the door and gate latch release mechanisms shall be in accordance with the following:

1. Where door and gate latch release mechanisms are accessed from the outside of the barrier and are not of the selflocking type, such mechanism shall be located not less than 54 inches (1372 mm) above the finished floor or ground surface.
2. Where door and gate latch release mechanisms are of the self-locking type such as where the lock is operated by means of a key, an electronic opener or the entry of a combination into an integral combination lock, the lock operation control and the latch release mechanism shall be located not greater than 54 inches (1372 mm) above the finished floor or ground surface.
3. At private pools, where the only latch release mechanism of a self-latching device for a gate is located on the pool and spa side of the barrier, the release mechanism shall be located at a point that is at least 3 inches (76 mm) below the top of the gate.

[NY] R328.4.2.7.3 Locking.

All gates shall be securely locked with a key, combination or other child-proof lock sufficient to prevent access to the *swimming pool* through such gate when the *swimming pool* is not in use or supervised.

[NY] R328.4.2.8 Dwelling wall as barrier.

A wall or walls of a *dwelling* and its *accessory structures* may serve as part of the barrier, provided that the wall or walls meet the applicable barrier requirements of Sections R328.4.2.1 through R328.4.2.6, and one of the following conditions shall be met:

1. All of the following:
   1.1. Doors with direct access to the *swimming pool* through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be *listed* and *labeled* in accordance with UL 2017. The audible alarm shall activate within 7 seconds; sound continuously for a minimum of 30 seconds after the door and/or its screen, if present, are opened; and be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm system shall be equipped with a manual means, such as touch pad or switch, to temporarily deactivate the alarm for a single opening. Deactivation shall last for not more than 15 seconds.
   1.2. Operable windows providing direct access to the *swimming pool*, having a sill height of less than 48 inches above the indoor finished floor in the wall and a sill height of less than 72 inches (1829 mm) above the adjacent exterior surface, in the wall or walls used as a barrier, shall have a latching device located no less than 48 inches (1219 mm) above the floor. Openings in operable windows which provide direct access to the *swimming pool* shall not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position.
   1.3. Where the *dwelling* or *accessory structure* is wholly contained within the pool barrier or enclosure, alarms shall be provided at every door with direct access to the *swimming pool*.
2. Other approved means of protection, such as self-closing with self-latching devices, so long as the degree of protection afforded is not less than the protection afforded by Item 1 described above.

[NY] R328.4.2.8.1 Alarm deactivation switch location.

Where an alarm is provided, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings required to be Accessible units, Type A units, or Type B units, the deactivation switch shall be located 48 inches (1219 mm) above the threshold of the door.

[NY] R328.4.2.8.2 Multiple dwelling wall as a barrier.

A wall or walls of a multiple dwelling may serve as part of the barrier, provided there is no direct access from the dwelling to the pool.

[NY] R328.4.2.9 Pool structure as barrier.

Where an above-ground *swimming pool* structure is used as a barrier, or where the barrier is mounted on top of the pool structure, the structure shall be designed and constructed in compliance with ANSI/APSP/ICC 4 and meet the applicable barrier requirements of Sections R328.4.2.1 through R328.4.2.8. Where the means of access is a ladder or steps, one of the following conditions shall be met:

1. The ladder or steps shall be capable of being secured, locked or removed to prevent access. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.
2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Sections R328.4.2.1 through R328.4.2.8.

[NY] R328.4.3 Indoor swimming pool.

Walls surrounding an indoor *swimming pool* shall comply with Section R328.4.2.8.

[NY] R328.4.4 Prohibited locations.

Barriers shall be located so as to prohibit permanent *structures*, equipment or similar objects from being used to climb the barriers.

[NY] R328.5 Suction entrapment avoidance.

Suction outlets shall be designed and installed in accordance with the requirements of CPSC 15 USC 8003 and ANSI/APSP/ICC 7, where applicable.

[NY] R328.5.1 Suction Fittings.

Swimming pool and spa suction outlets shall have a cover that conforms to ANSI/APSP/ICC 16.

Exception: Surface skimmers.

[NY] R328.6 Swimming pool and spa alarms, applicability.

A *swimming pool* or spa installed, constructed or substantially modified after December 14, 2006, shall be equipped with an approved pool alarm. Pool alarms shall comply with ASTM F2208, and shall be installed, used and maintained in accordance with the manufacturer's instructions and this section.

Exceptions:

1. A *hot tub* or *spa* equipped with a safety cover which complies with ASTM F1346.
2. A *swimming pool* (other than a *hot tub* or *spa*) equipped with an automatic power safety cover which complies with ASTM F1346.

[NY] R328.6.1 Multiple alarms.

A pool alarm must be capable of detecting entry into the water at any point on the surface of the *swimming pool*. If necessary to provide detection capability at every point on the surface of the *swimming pool*, more than one pool alarm shall be provided.

[NY] R328.6.2 Alarm activation.

Pool alarms shall activate upon detecting entry into the water and shall sound poolside and inside the *dwelling* where it is monitored.

[NY] R328.6.3 Prohibited alarms.

The use of personal immersion alarms shall not be construed as compliance with this section.

SECTION M2006—POOL HEATERS

M2006.1 General.

Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool heaters shall be *listed* and *labeled* in accordance with UL726. Electric pool and spa heaters shall be listed and *labeled* inaccordance with UL 1261. Pool and spa heat pump water heaters shall be *listed* and *labeled* in accordance with UL1995 or UL/CSA/ANCE 60335-2-40.

Exception: Portable residential spas and portable residential exercise spas shall be *listed* and *labeled* in accordance with UL 1563 or CSA C22.2 No.218.1.

M2006.2 Clearances.

The clearances shall not interfere with *combustionair*, draft hood or flue terminal relief, or accessibility for servicing.

M2006.3 Bypass valves.

Where an integral bypass system is not provided as a part of the pool heater, a bypassline and valve shall be installed between the inlet and outlet piping for use in adjustingthe flow of water through the heater.

SECTION G2441 (617)— POOL AND SPA HEATERS

G2441.1 (617.1) General.

Pool and spa heaters shall be *listed* in accordance with ANSI Z21.56/CSA 4.7 and shall be installed in accordance with the manufacturer's instructions.

CHAPTER 42 SWIMMING POOLS

ICC user notes:

About this chapter: *Chapter 42 addresses all aspects of wiring, fixtures, motors and electrical accessories for swimming pools, wading pools, hot tubs, spas and hydromassage bathtubs.*

This chapter focuses on protection of occupants from electrical shock. The dangers of using electricity around water, wet surfaces, grounded surfaces and plumbing are well known, and this chapter is intended to minimize or eliminate those hazards.

SECTION E4201— GENERAL

E4201.1 Scope.

The provisions of this chapter shall apply to the construction and installation of electric wiring and equipment associated with all swimming pools, wading pools, decorative pools, hot tubs and spas, and hydromassage bathtubs, whether permanently installed or storable, and shall apply to metallic auxiliary equipment, such as pumps, filters and similar equipment. Sections E4202 through E4206 provide general rules for permanent pools, spas and hot tubs. Section E4207 provides specific rules for storable pools and storable/portable spas and hot tubs. Section E4208 provides specific rules for spas and hot tubs. Section E4209 provides specific rules for hydromassage bathtubs. (680.1)

SECTION E4202— WIRING METHODS FOR POOLS, SPAS, HOT TUBS AND HYDROMASSAGE BATHTUBS

E4202.1 General.

Wiring methods used in conjunction with permanently installed swimming pools, spas or hot tubs that are installed in corrosive environments described in Section E4202.2 shall comply with Table E4202.1, Sections E4202.2 and E4205 and Chapter 38 except as otherwise stated in this section. Wiring methods used in conjunction with permanently installed swimming pools, spas or hot tubs that are not installed in corrosive environments shall comply with Chapter 38. Storable swimming pools shall comply with Section E4207.

Hydromassage bathtubs shall comply with Section E4209. [680.7, 680.14, 680.21(A), 680.23(B) and (F), 680.25(A), 680.42, 680.43 and 680.70]

TABLE E4202.1—PERMITTED WIRING METHODS IN CORROSIVE ENVIRONMENTS[a]

WIRING LOCATION OR PURPOSE (Application allowed where marked with an "A")	IMC[b], RMC[b], RNC[e]	LFMC	LFNMC	MC[g]	FLEX CORD
Panelboard(s) that supply pool equipment: from service equipment to panelboard	A[f]	—	A	—	—
Wet-niche and no-niche luminaires: from branch circuit OCPD to deck or junction box	A	—	A	—	—
Wet-niche and no-niche luminaires: from deck or junction box to forming shell	A[j]	—	A	—	A[d]
Dry niche: from branch circuit OCPD to luminaires	A	—	A	—	—
Pool-associated motors: from branch circuit OCPD to motor[h]	A	A[c]	A[c]	A	A[d]
Packaged or self-contained outdoor spas and hot tubs with underwater luminaire: from branch circuit OCPD to spa or hot tub	A	A	A	—	A[d]
Packaged or self-contained outdoor spas and hot tubs without underwater luminaire: from branch circuit OCPD to spa or hot tub	A	A	A	—	A[d]
Indoor spas and hot tubs, and other pool, spa or hot tub associated equipment: from branch circuit OCPD to equipment	A	A	A	—	A[d]
Connection at pool lighting transformers or power supplies	A	A[i]	A	—	—

For SI: 1 foot = 304.8 mm.

a. For all wiring methods, see Section E4205 for equipment grounding conductor requirements.
b. See Section E4202.2 for use of metal conduits in corrosive environments.
c. Limited to where necessary to employ flexible connections at or adjacent to a pool motor.
d. Flexible cord shall be installed in accordance with Section E4202.3.
e. Nonmetallic conduit shall be rigid polyvinyl chloride conduit Type PVC or reinforced thermosetting resin conduit Type RTRC.
f. Aluminum conduits shall not be permitted in the pool area where subject to corrosion.
g. Where installed as direct burial cable or in wet locations, Type MC cable shall be listed and identified for the location.
h. See Section E4202.4 for listed, double-insulated pool pump motors.
i. Limited to use in individual lengths not to exceed 6 feet. The total length of all individual runs of LFMC shall not exceed 10 feet.
j. Metal conduit shall be constructed of brass or other approved corrosion-resistant metal.

E4202.2 Wiring methods and equipment in corrosive environment.

Wiring methods in a corrosive environment shall be *listed* and suitable for use in such areas. Rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit and liquidtight flexible nonmetallic conduit shall be considered suitable for the use. Aluminum conduit and tubing shall not be used. [680.14(A)]

Other equipment shall be suitable for use in corrosive environments or be installed in identified corrosion-resistant enclosures. Equipment listed for pool and spa use shall be considered suitable for the use. [680.14(B)]

E4202.3 Flexible cords.

Flexible cords used in conjunction with a pool, spa, hot tub or hydromassage bathtub shall be installed in accordance with the following:

1. For other than underwater luminaires, fixed or stationary equipment shall be permitted to be connected with a flexible cord and plug to facilitate removal or disconnection for maintenance or repair. For other than storable pools, the flexible cord shall not exceed 3 feet (914 mm) in length. Cords that supply swimming pool equipment shall have a copper equipment grounding conductor not smaller than 12 AWG and shall terminate in a grounding-type attachment plug. [680.8(A) and (B) and 680.21(A)(2)]
2. Other than *listed* low-voltage lighting systems not requiring grounding, wet-niche luminaires that are supplied by a flexible cord or cable shall have all exposed noncurrent-carrying metal parts connected to an insulated copper equipment grounding conductor that is an integral part of the cord or cable. This equipment grounding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure or other enclosure. The equipment grounding conductor shall be not smaller than the supply conductors and not smaller than 16 AWG. [680.23(B)(3)]
3. A *listed* packaged spa or hot tub installed outdoors that is ground-fault circuit interrupter (GFCI) protected shall be permitted to be cord-and-plug-connected provided that such cord does not exceed 15 feet (4572 mm) in length. [680.42(A)(2)]
4. A *listed* packaged spa or hot tub rated at 20 amperes or less and installed indoors shall be permitted to be cord-and-plug-connected to facilitate maintenance and repair. (680.43 Exception No. 1)
5. For other than underwater and storable pool lighting luminaire, the requirements of Item 1 shall apply to any cord-equipped luminaire that is located within 16 feet (4877 mm) radially from any point on the water surface. [680.22(B)(5)]

E4202.4 Double-insulated pool pumps.

A *listed* cord-and-plug-connected pool pump incorporating an *approved* system of double insulation that provides a means for grounding only the internal and nonaccessible, noncurrent-carrying metal parts of the pump shall be connected to any wiring method recognized in Chapter 38 that is suitable for the location. Where the equipment grounding conductor of the motor circuit is connected to the equipotential bonding means in accordance with Section E4204.2, Item 6.1, the branch circuit wiring shall comply with Sections E4202.1 and E4205.5. [680.21(B)]

SECTION E4203— EQUIPMENT LOCATION AND CLEARANCES

E4203.1 Receptacle outlets.

Receptacles outlets shall be installed and located in accordance with Sections E4203.1.1 through E4203.1.7. In determining the dimensions in this section addressing receptacle spacings, the distance to be measured shall be 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. [680.22(A)(5)]

E4203.1.1 Location.

Receptacles that provide power for water-pump motors or other loads directly related to the circulation and sanitation system shall be located at least 6 feet (1829 mm) from the inside walls of pools, outdoor spas and hot tubs. These receptacles shall have GFCI protection and be of the grounding type. [680.22(A)(2)].

E4203.1.2 Other receptacles.

Other receptacles on the property shall be located not less than 6 feet (1829 mm) from the inside walls of pools and outdoor spas and hot tubs. [680.22 (A)(3)]

E4203.1.3 Where required.

No less than one 125-volt, 15- or 20-ampere receptacle supplied by a general-purpose branch circuit shall be located not less than 6 feet (1829 mm) from and not more than 20 feet (6096 mm) from the inside wall of permanently installed pools and outdoor spas and hot tubs. This receptacle shall be located not more than 6 feet 6 inches (1981 mm) above the floor, platform or grade level serving the pool, spa or hot tub. [680.22(A)(1)]

E4203.1.4 GFCI protection.

All receptacles rated 125 volts through 250 volts, 60 amperes or less, located within 20 feet (6096 mm) of the inside walls of pools and outdoor spas and hot tubs shall be protected by a Class A ground-fault circuit interrupter. Outlets supplying all pool motors shall be provided with Class A ground-fault circuit-interrupter protection. [680.21(C) and 680.22(A)(4)]

Exceptions:

1. Receptacles and outlets that are part of listed equipment, with ratings not exceeding the low-voltage contact limit that are supplied by listed transformers or power supplies that comply with Section E4206.1, shall not be required to be provided with ground-fault protection. [680.5(B) Exception]
2. Listed low-voltage motors not requiring grounding, with ratings not exceeding the low-voltage contact limit that are supplied by listed transformers or power supplies that comply with Section E4206.1, shall be permitted to be installed without ground-fault protection. [680.21(C) Exception]

E4203.1.5 Indoor locations.

Receptacles shall be located not less than 6 feet (1829 mm) measured horizontally from the inside walls of indoor spas and hot tubs. A minimum of one 125-volt, 15- or 20-ampere receptacle on a general-purpose branch circuit shall be located between 6 feet (1829 mm) and 10 feet (3048 mm) from the inside walls of indoor spas or hot tubs. [680.43(A) and 680.43(A)(1)]

E4203.1.6 Indoor GFCI protection.

All receptacles rated 125 volts through 250 volts, 60 amperes or less, and located within 10 feet (3048 mm) of the inside walls of a spa or hot tub installed indoors shall be provided with Class A ground-fault circuit interrupter protection. [680.43(A)(2)].

E4203.1.7 Pool equipment room.

At least one GFCI-protected 125-volt, 15- or 20-ampere receptacle on a general-purpose circuit shall be located within a pool equipment room, and all other receptacles supplied by branch circuits rated 150 volts or less to ground within a pool equipment room shall be GFCI protected. [680.12(B)]

E4203.2 Switching devices.

Switching devices shall be located at least 5 feet (1524 mm) horizontally from the inside walls of pools, spas and hot tubs unless separated from the pool, spa or hot tub by a solid fence, wall or other permanent barrier that provides at least a 5-foot (1524 mm) reach distance. Alternatively, a switch that is *listed* as being acceptable for use within 5 feet (1524 mm) shall be permitted. Switching devices located in a room or area containing a hydromassage bathtub shall be located in accordance with the general requirements for installing equipment in bathrooms. [680.22(C), 680.43(C) and 680.72]

E4203.3 Disconnecting means.

One or more means to simultaneously disconnect all ungrounded conductors for all utilization equipment other than lighting shall be provided. Each of such means shall be readily accessible and within sight from the equipment it serves and shall be located not less than 5 feet (1524 mm) horizontally from the inside walls of a pool, spa, or hot tub unless separated from the open water by a permanently installed barrier that provides a 5-foot (1524 mm) or greater reach path. This horizontal distance shall be measured from the water's edge along the shortest path required to reach the disconnect. (680.13)

E4203.4 Luminaires, equipment and ceiling fans.

Lighting outlets, luminaires, equipment and ceiling-suspended paddle fans shall be installed and located in accordance with Sections E4203.4.1 through E4203.4.7. [680.22(B)]

E4203.4.1 Outdoor location.

In outdoor pool, outdoor spas and outdoor hot tubs areas, luminaires, lighting outlets and ceiling-suspended paddle fans shall not be installed over the pool or over the area extending 5 feet (1524 mm) horizontally from the inside walls of a pool except where no part of the luminaire or ceiling-suspended paddle fan is less than 12 feet (3658 mm) above the maximum water level. [680.22(B)(1)]

E4203.4.2 Indoor locations.

In indoor pool areas, the limitations of Section E4203.4.1 shall apply except where the luminaires, lighting outlets and ceiling-suspended paddle fans comply with all of the following conditions:

1. The luminaires are of a totally enclosed type.
2. Ceiling-suspended paddle fans are identified for use beneath ceiling structures such as porches and patios.
3. A ground-fault circuit interrupter is installed in the branch circuit supplying the luminaires or ceiling-suspended paddle fans.
4. The distance from the bottom of the luminaire or ceiling-suspended paddle fan to the maximum water level is not less than 7 feet 6 inches (2286 mm). [680.22(B)(2)]

E4203.4.3 Low-voltage luminaires.

Listed low-voltage luminaires not requiring grounding, not exceeding the low-voltage contact limit, and supplied by *listed* transformers or power supplies that comply with Section E4206.1 shall be permitted to be located less than 5 feet (1.5 m) from the inside walls of the pool. [680.22(B)(6)]

E4203.4.4 Existing lighting outlets and luminaires.

Existing lighting outlets and luminaires that are located within 5 feet (1524 mm) horizontally from the inside walls of pools and outdoor spas and hot tubs shall be permitted to be located not less than 5 feet (1524 mm) vertically above the maximum water level, provided that such luminaires and outlets are rigidly attached to the existing structure and are protected by a Class A ground-fault circuit interrupter. [680.5(B) and 680.22(B)(3)]

E4203.4.5 Indoor spas and hot tubs.

1. Luminaires, lighting outlets and ceiling-suspended paddle fans located over the spa or hot tub or within 5 feet (1524 mm) from the inside walls of the spa or hot tub shall be not less than 7 feet 6 inches (2286 mm) above the maximum water level and shall be protected by a ground-fault circuit interrupter. [680.43(B)(1)(b)]

Luminaires, lighting outlets and ceiling-suspended paddle fans that are located 12 feet (3658 mm) or more above the maximum water level shall not require ground-fault circuit-interrupter protection. [680.43(B)(1)(a)]

2. Luminaires protected by a ground-fault circuit interrupter and complying with Item 2.1 or 2.2 shall be permitted to be installed less than 7 feet 6 inches (2286 mm) over a spa or hot tub.
   2.1. Recessed luminaires shall have a glass or plastic lens and nonmetallic or electrically isolated metal *trim* and shall be suitable for use in damp locations.
   2.2. Surface-mounted luminaires shall have a glass or plastic globe and a nonmetallic body or a metallic body isolated from contact. Such luminaires shall be suitable for use in damp locations. [680.43(B)(1)(c)(1) and (2)]

E4203.4.6 GFCI protection in adjacent areas.

Luminaires, lighting outlets and ceiling-suspended paddle fans that are installed in the area extending between 5 feet (1524 mm) and 10 feet (3048 mm) from the inside walls of pools and outdoor spas and hot tubs shall be protected by Class A ground-fault circuit interrupters except where such luminaires, lighting outlets and ceiling-suspended paddle fans are installed not less than 5 feet (1524 mm) above the maximum water level and are rigidly attached to the structure. [680.5(B) and 680.22(B)(4)]

E4203.4.7 Low-voltage gas-fired luminaires, decorative fireplaces, fire pits and similar equipment.

Listed low-voltage gas-fired luminaires, decorative fireplaces, fire pits and similar equipment that use low-voltage ignitors that do not require grounding, and that are supplied by *listed* transformers or power supplies that comply with Section E4206.1 with outputs that do not exceed the low-voltage contact limit, shall be permitted to be located less than 5 feet (1524 mm) from the inside walls of the pool. Metallic equipment shall be bonded in accordance with the requirements in Section E4204.2. Transformers and power supplies supplying this type of equipment shall be installed in accordance with the requirements of Section E4206.9.1. Metallic gas piping shall be bonded in accordance with the requirements of Sections E3609.7 and E4204.2, Item 7. [680.22 (B)(7)]

E4203.5 Other outlets.

Other outlets such as for remote control, signaling, fire alarm and communications shall be not less than 10 feet (3048 mm) from the inside walls of the pool. Measurements shall be determined in accordance with Section E4203.1. [680.22(D)]

E4203.6 Other equipment.

Other equipment with ratings exceeding the low-voltage contact limit shall be located at least 5 feet (1524 mm) horizontally from the inside walls of a pool unless separated from the pool by a solid fence, wall or other permanent barrier. [680.22(E)]

E4203.7 Overhead conductor clearances.

Except where installed with the clearances specified in Table E4203.7, the following parts of pools and outdoor spas and hot tubs shall not be placed under existing service-drop conductors, overhead service conductors or any other open overhead wiring; nor shall such wiring be installed above the following:

1. Pools and the areas extending not less than 10 feet (3048 mm) horizontally from the inside of the walls of the pool.
2. Diving structures and the areas extending not less than 10 feet (3048 mm) horizontally from the outer edge of such structures.
3. Observation stands, towers, and platforms and the areas extending not less than 10 feet (3048 mm) horizontally from the outer edge of such structures.

Overhead conductors of network-powered broadband communications systems shall comply with the provisions in Table E4203.7 for conductors operating at 0 to 750 volts to ground.

Communications, radio conductors, television conductors, coaxial cables and the supporting messengers within the scope of Chapter 8 of NFPA 70 shall be permitted at a height of not less than 10 feet (3048 mm) above swimming and wading pools, diving structures, and observation stands, towers, and platforms. [680.9(A), (B) and (C)]

TABLE E4203.7 [Table 680.8(A)]—OVERHEAD CONDUCTOR CLEARANCES

	INSULATED SUPPLY OR SERVICE DROP CABLES, 0-750 VOLTS TO GROUND, SUPPORTED ON AND CABLED TOGETHER WITH AN EFFECTIVELY GROUNDED BARE MESSENGER OR EFFECTIVELY GROUNDED NEUTRAL CONDUCTOR (feet)	ALL OTHER SUPPLY OR SERVICE DROP CONDUCTORS (feet)	
		Voltage to ground	
		0 to 15 kV	Greater than 15 to 50 kV
A. Clearance in any direction to the water level, edge of water surface, base of diving platform, or permanently anchored raft	22.5	25	27
B. Clearance in any direction to the diving platform	14.5	17	18

For SI: 1 foot = 304.8 mm.

E4203.8 Underground wiring.

Underground wiring within 5 feet (1524 mm) horizontally from the inside wall of the pool shall be permitted. Underground wiring shall not be installed under the pool except where this wiring is necessary to supply pool equipment permitted by this chapter. Underground wiring shall be installed in rigid metal conduit, intermediate metal conduit, rigid polyvinyl chloride conduit, reinforced thermosetting resin conduit, jacketed Type MC cable listed for burial use, liquidtight flexible nonmetallic conduit listed for direct burial use or liquidtight flexible metal conduit listed for direct burial use, suitable for the conditions subject to that location. The underground wiring method shall be installed completely between outlets, junctions or splicing points. The minimum cover depth shall be in accordance with Table E3803.1. [680.11(A) and (B)]

SECTION E4204— EQUIPOTENTIAL BONDING

E4204.1 Performance.

The equipotential bonding required by this section shall be installed to reduce voltage gradients in the prescribed areas of permanently installed swimming pools and spas and hot tubs other than the storable/portable type. The equipotential bonding shall be installed for pools, spas and hot tubs with or without associated electrical equipment related to the pool, spa or hot tub.

[NY] E4204.2 Bonded parts.

The parts of pools, spas and hot tubs specified in Items 1 through 7 shall be bonded together using insulated, covered or bare solid copper conductors not smaller than 8 AWG or using rigid metal conduit of brass or other identified corrosion-resistant metal. Connections to bonded parts shall be made in accordance with Section E3406.14. An 8 AWG or larger solid copper bonding conductor provided to reduce voltage gradients in the pool, spa or hot tub area shall not be required to be extended or attached to remote panelboards, service equipment or electrodes. [680.26(B)]

1. Conductive pool shells. Bonding to conductive pool shells shall be provided as specified in Item 1.1 or 1.2. Cast-in-place concrete, pneumatically applied or sprayed concrete and concrete block with painted or plastered coatings shall be considered to be conductive materials because of their water permeability and porosity. Reconstructed pool shells shall also meet the requirements of this section. Vinyl liners and fiberglass composite shells shall be considered to be nonconductive materials and not subject to these requirements.
   1.1. 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 Item 1.2.
   1.2. Copper conductor grid. A copper conductor grid shall be provided and shall comply with Items 1.2.1 through 1.2.4.
      1.2.1. It shall be constructed of minimum 8 AWG bare solid copper conductors bonded to each other at all points of crossing.
      1.2.2. It shall conform to the contour of the pool.
      1.2.3. It shall be arranged in a 12-inch (305 mm) by 12-inch (305 mm) network of conductors in a uniformly spaced perpendicular grid pattern with a tolerance of 4 inches (102 mm).
      1.2.4. It shall be secured within or under the pool not more than 6 inches (152 mm) from the outer contour of the pool shell. [680.26(B)(1)]
2. Perimeter surfaces. The perimeter surface to be bonded shall be considered to extend for 3 feet (914 mm) horizontally beyond the inside walls of the pool while also at a height between 3 feet (914 mm) above and 2 feet (610 mm) below the maximum water level. The perimeter surface shall include unpaved surfaces, concrete and other types of paving. Perimeter surfaces that are separated from the pool by a permanent wall or building 5 feet (1524 mm) or more in height shall require equipotential bonding only on the pool side of the permanent wall or building. Bonding to perimeter surfaces shall be provided as specified in Item 2.1, 2.2, 2.3 and 2.4. For conductive pool shells where bonding to perimeter surfaces is required, it shall be attached to the pool, spa or hot tub reinforcing steel or copper conductor grid at a minimum of four points uniformly spaced around the perimeter of the pool, spa or hot tub, or if the bonded perimeter surface does not surround the entire pool, it shall be attached to the pool, spa or hot tub reinforcing steel or copper grid at a minimum of four uniformly spaced points along the bonded perimeter surface. For nonconductive pool shells where bonding to the perimeter surfaces is required, bonding at four points shall not be required, and the perimeter bonding shall be attached to the 8 AWG copper equipotential bonding conductor and, if present, to any conductive support for the pool, spa or hot tub.

   Exceptions:

   1. Equipotential bonding of perimeter surfaces shall not be required for spas and hot tubs if all of the following conditions apply:
      1.1. The spa or hot tub is listed as a self-contained spa for above-ground use.
      1.2. The spa or hot tub is not identified as suitable only for indoor use.
      1.3. The installation is in accordance with the manufacturer's instructions and is located on or above grade.
      1.4. The top rim of the spa or hot tub is not less than 28 inches (711 mm) above all perimeter surfaces that are within 30 inches (762 mm), measured horizontally from the spa or hot tub. The height of nonconductive external steps for entry to or exit from the self-contained spa is not used to reduce or increase this rim height measurement.
   2. The equipotential bonding requirements for perimeter surfaces shall not apply to a listed self-contained spa or hot tub located indoors and installed above a finished floor. [680.26(B)(2), 680.42(B) and 680.43 Exception No.2]

2.1. Conductive paved portions of perimeter surfaces. Conductive paved portions of perimeter surfaces, including masonry pavers, if used, shall be bonded with unencapsulated structural reinforcing steel in accordance with Item 1.1, or with unencapsulated steel structural welded wire reinforcement (welded wire mesh, welded wire fabric), bonded together by steel tie wires or the equivalent. Steel welded wire reinforcement shall be fully embedded within the pavement unless the pavement will not allow for embedding. If the reinforcing steel is absent, or is encapsulated in a nonconductive compound, or embedding is not possible, unencapsulated welded wire steel reinforcement or a copper conductor grid shall be provided and shall be secured directly under the paving and not more than 6 inches (152 mm) below finished grade.

Unencapsulated steel welded wire reinforcement that is not fully embedded in concrete, and copper grid regardless of location, used for equipotential bonding, shall be listed for corrosion resistance and mechanical performance. This listing requirement shall become effective January 1, 2025. The copper grid or unencapsulated steel welded wire reinforcement shall also meet the following:

2.1.1. Copper grid is constructed of 8 AWG solid bare copper and arranged in accordance with Item 1.2.3.

2.1.2. Steel welded wire reinforcement is minimum ASTM 6x6-W2.0 x W2.0 or minimum No. 3 rebar constructed in a 12-inch (305 mm) grid.

2.1.3. Copper grid and steel welded wire reinforcement follow the contour of the perimeter surface extending not less than 3 feet (914 mm) horizontally beyond the inside walls of the pool.

2.1.4. Only listed splicing devices or exothermic welding are used. [680.26(B)(2)(a)]

2.2. Unpaved portions of perimeter surfaces. Unpaved portions of perimeter surfaces shall be bonded with any of the following methods:

2.2.1. Copper conductor(s) shall be used in accordance with Items 2.2.1.1 through 2.2.1. 6:

2.2.1.1. At least one minimum 8 AWG bare solid copper conductor, including the 8 AWG copper equipotential bonding conductor, if available.

2.2.1.2. The conductors follow the contour of the perimeter surface.

2.2.1.3. Only listed splicing devices or exothermic welding are used.

2.2.1.4. The conductor(s) is 18 to 24 inches (457 to 610 mm) from the inside walls of the pool.

2.2.1.5. The conductor(s) is under the perimeter surface 4 to 6 inches (102 mm to 152 mm) below the finished grade.

2.2.1.6. Be installed only in perimeter surfaces not intended to have direct access to swimmers in the pool.

2.2.2. Copper grid or unencapsulated steel welded wire reinforcement used for equipotential bonding of unpaved portions of perimeter surfaces shall meet the following:

2.2.2.1. Be installed in accordance with 2.1.

2.2.2.2. Be located within unpaved surfaces between 4 to 6 inches (102 to 152 mm) below finished grade. [680.26(B)(2)(b)]

2.3. Nonconductive perimeter surfaces. Equipotential bonding shall not be required for nonconductive portions of perimeter surfaces that are separated from earth or raised on nonconducting supports, and it shall not be required for any perimeter surface that is electrically separated from the pool structure and raised on nonconductive supports above an equipotentially bonded surface. [680.26(B)(2)(c)]

2.4. Interconnection of bonded portions of perimeter surfaces. All surfaces where equipotential bonding is required shall be interconnected using listed splicing devices or exothermic welding. Where copper wire is used for this purpose, it shall be solid copper not smaller than 8 AWG. The conductor shall be permitted to encircle the pool to facilitate bonding connections to portions of the perimeter covered in 2.1 and 2.2 that are not contiguous. [680.26(B)(2)(d)]

3. Metallic components. All metallic parts of the pool structure, including reinforcing metal not addressed in Item 1.1, shall be bonded. Where reinforcing steel is encapsulated with a nonconductive compound, the reinforcing steel shall not be required to be bonded. [680.26(B)(3)]
4. Underwater lighting. All metal forming shells and mounting brackets of no-niche luminaires shall be bonded. [680.26(B)(4)]

   Exception: *Listed* low-voltage lighting systems with nonmetallic forming shells shall not require bonding. [680.26(B)(4) Exception]
5. Metal fittings. All metal fittings within or attached to the pool structure shall be bonded. [680.26(B)(5)]

   Exceptions:

   1. Isolated parts that are not over 4 inches (102 mm) in any dimension and do not penetrate into the pool structure more than 1 inch (25.4 mm) shall not require bonding.
   2. Metallic pool cover anchors intended for insertion in a concrete or masonry deck surface, 1 inch (25 mm) or less in any dimension and 2 inches (51 mm) or less in length, shall not require bonding.
   3. Metallic pool cover anchors intended for insertion in a wood or composite deck surface, 2 inches (51 mm) or less in any flange dimension and 2 inches (51 mm) or less in length, shall not require bonding. [680.26(B)(5) Exception]
6. Electrical equipment. Metal parts of the following electrical equipment shall be bonded: electrically powered pool covers; pool water circulation, treatment, heating, cooling or dehimidification equipment; and equipment not separated from the pool by a permanent barrier that prevents contact by a person, any other electrical equipment within 5 feet (1.5 m) measured horizontally from the inside wall of the pool or 12 feet (3.7 m) measured vertically above the maximum water level of the pool, or as measured vertically above any observation stands, towers, platforms or diving structures.

   Exception: Metal parts of listed equipment incorporating an *approved* system of double insulation shall not be bonded. [680.26(B)(6) Exception]

6.1. Double-insulated water pump motors. Where a double-insulated water pump motor is installed under the provisions of this item, a solid 8 AWG copper conductor of sufficient length to make a bonding connection to a replacement motor shall be extended from the swimming pool equipotential bonding means to an accessible point in the vicinity of the pool pump motor. Where there is no connection between the swimming pool equipotential bonding means and the equipment grounding system for the premises, this bonding conductor shall be connected to the equipment grounding conductor of the motor circuit. [680.26(B)(6)(a)]

6.2. 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. [680.26(B)(6)(b)]

7. All fixed metal parts including, but not limited to, metal-sheathed cables and raceways, metal piping, metal awnings, metal fences and metal door and window frames, shall be bonded where located no greater than either of the following:

7.1. Five feet (1.5 m) horizontally from the inside walls of the pool. Those separated from the pool by a permanent barrier that prevents contact by a person shall not be required to be bonded. [680.26(B)(7) Exception No. 1]

7.2. Twelve feet (3.7 m) vertically above the maximum water level of the pool, observation stands, towers, or platforms or any diving structures. [680.26(B)(7)]

E4204.3 Pool water.

Where none of the bonded parts in Section E4204.2 are in direct connection with the pool water, the pool water shall be in direct contact with an *approved* corrosion-resistant conductive surface that exposes not less than 9 square inches (5800 mm^2) of surface area to the pool water at all times. The conductive surface shall be located where it is not exposed to physical damage or dislodgement during usual pool activities, and it shall be bonded in accordance with Section E4204.2. [680.26(C)]

E4204.4 Bonding of outdoor hot tubs and spas.

Outdoor hot tubs and spas shall comply with the bonding requirements of Sections E4204.1 through E4204.3. Bonding by metal-to-metal mounting on a common frame or base shall be permitted. The metal bands or hoops used to secure wooden staves shall not be required to be bonded as required in Section E4204.2. [680.42 and 680.42(B)]

E4204.5 Bonding of indoor hot tubs and spas.

The following parts of indoor hot tubs and spas shall be bonded together:

1. All metal fittings within or attached to the hot tub or spa structure. [680.43(D)(1)]
2. Metal parts of electrical equipment associated with the hot tub or spa water circulating system, including pump motors unless part of a *listed* self-contained spa or hot tub. [680.43(D)(2)]
3. Metal raceway and metal piping that are within 5 feet (1524 mm) of the inside walls of the hot tub or spa and that are not separated from the spa or hot tub by a permanent barrier. [680.43(D)(3)]
4. All metal surfaces that are within 5 feet (1524 mm) of the inside walls of the hot tub or spa and that are not separated from the hot tub or spa area by a permanent barrier. [680.43(D)(4)]

   Exception: Small conductive surfaces not likely to become energized, such as air and water jets and drain fittings, where not connected to metallic piping, towel bars, mirror frames, and similar nonelectrical equipment, shall not be required to be bonded. [680.43(D)(4) Exception]
5. Noncurrent-carrying metal parts of electrical devices and controls that are not associated with the hot tubs or spas and that are located less than 5 feet (1524 mm) from such units. [680.43(D)(5)]

E4204.5.1 Methods.

All metal parts associated with the hot tub or spa shall be bonded by any of the following methods:

1. The interconnection of threaded metal piping and fittings. [680.43(E)(1)]
2. Metal-to-metal mounting on a common frame or base. [680.43(E)(2)]
3. The provision of an insulated, covered or bare solid copper bonding jumper not smaller than 8 AWG. It shall not be required that the 8 AWG or larger solid copper bonding conductor be extended or attached to any remote panelboard, service equipment or any electrode, but only that it shall be employed to eliminate voltage gradients in the hot tub or spa area as prescribed. [680.43(E)(3) and 680.26(B)]

E4204.5.2 Connections.

Connections to bonded parts shall be made in accordance with Section E3406.14. [680.26(B)]

SECTION E4205— BONDING AND GROUNDING

E4205.1 Feeders and branch circuits.

Feeders and branch circuits installed in a corrosive environment or wet location shall contain an equipment grounding conductor (EGC) that is an insulated copper conductor sized in accordance with Table E3908.13 (Table 250.122), but not smaller than 12 AWG. [680.7(A), (Table250.110)]

E4205.2 Cord-and-plug connected equipment.

The flexible cord shall contain an EGC that is an insulated copper conductor sized in accordance with Table E3908.13 (Table 250.122), but not smaller than 12 AWG. The flexible cord shall terminate in a grounding-type attachment plug having a fixed grounding contact member. [680.7(B), (Table 250.110)]

E4205.3 Terminals.

Terminals used for bonding and equipment grounding shall be identified for use in wet locations. Field-installed terminals in damp or wet locations or corrosive environments shall be composed of copper, copper alloy or stainless steel and shall be listed for direct burial use. [680.7(C)]

E4205.4 Luminaires and related equipment.

Where branch-circuit wiring on the supply side of enclosures and junction boxes connected to conduits run to underwater luminaires are installed in corrosive environments as described in Section E4202.2, the wiring method of that portion of the branch circuit shall be as required in Section E4202.2 . Where not installed in corrosive environments, branch circuits shall comply with Chapter 38. Wiring methods shall contain an insulated copper equipment grounding conductor sized in accordance with Table E3809.13 but not smaller than 12 AWG. The 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 transformer secondary overcurrent protection provided.

The insulated copper equipment grounding conductor shall be connected to all through-wall lighting assemblies, wet-niche, dry-niche or no-niche luminaires other than *listed* low-voltage luminaires not requiring grounding. The junction box, transformer enclosure or other enclosure in the supply circuit to a wet-niche or no-niche luminaire and the field-wiring chamber of a dry-niche luminaire shall be grounded to the equipment grounding terminal of the panelboard. The equipment grounding terminal shall be directly connected to the panelboard enclosure. The equipment grounding conductor shall be installed without joint or splice. [680.23(F)(1) and (F)(2), 680.23(F)(2) Exception and 680.24(F)]

Exceptions:

1. Where more than one underwater luminaire 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 luminaires, or between the field-wiring compartments of dry-niche luminaires, shall be permitted to be terminated on grounding terminals. [680.23(F)(2)(a)]
2. Where an underwater luminaire 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, 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. [680.23(F)(2)(b)]

E4205.5 Nonmetallic conduit.

Where a nonmetallic conduit is installed between a forming shell and a junction box, transformer enclosure or other enclosure, an 8 AWG insulated copper bonding jumper shall be installed in this conduit except where a *listed* low-voltage lighting system not requiring grounding is used. The bonding jumper shall be terminated in the forming shell, junction box or transformer enclosure, or ground-fault circuit-interrupter enclosure. 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. [680.23(B)(2)(b)]

E4205.6 Flexible cords.

Other than *listed* low-voltage lighting systems not requiring grounding, wet-niche luminaires that are supplied by a flexible cord or cable shall have all exposed noncurrent-carrying metal parts connected to an insulated copper equipment grounding conductor that is an integral part of the cord or cable. This equipment grounding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure or other enclosure. The equipment grounding conductor shall not be smaller than the supply conductors and not smaller than 16 AWG. [680.23(B)(3)]

E4205.7 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 Section E4202.3, the equipment grounding conductors shall be connected to a fixed metal part of the assembly. The removable part shall be mounted on or bonded to the fixed metal part. [680.8(C)]

SECTION E4206— EQUIPMENT INSTALLATION

E4206.1 Transformers and power supplies.

Transformers and power supplies used for the supply of underwater luminaires, together with the transformer or power supply enclosure, shall be *listed*, labeled and identified for swimming pool and spa use. The transformer or power supply shall incorporate either a transformer of the isolated-winding type with an ungrounded secondary that has a grounded metal barrier between the primary and secondary windings, or a transformer that incorporates an *approved* system of double insulation between the primary and secondary windings. [680.23(A)(2)]

E4206.2 Ground-fault circuit interrupters.

Where required in this chapter, ground-fault protection of receptacles and outlets on branch circuits rated 150 volts or less to ground and 60 amperes or less, single- or three-phase, shall be provided with a listed Class A GFCI. The GFCI requirements in this chapter, unless otherwise noted, are in addition to the requirements in Section E3902. [680.5(A) and (B)]

E4206.3 Wiring on load side of ground-fault circuit interrupters and transformers.

For other than grounding conductors, conductors installed on the load side of a ground-fault circuit interrupter or transformer used to comply with the provisions of Section E4206.4, shall not occupy raceways, boxes or enclosures containing other conductors except where 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. [680.23(F)(3)]

E4206.4 Underwater luminaires.

The design of an underwater luminaire supplied from a branch circuit, either directly or by way of a transformer or power supply meeting the requirements of Section E4206.1, shall be such that, where the fixture is properly installed without a ground-fault circuit interrupter, there is no shock hazard with any likely combination of fault conditions during normal use (not relamping). In addition, ground-fault circuit-interrupter protection for personnel shall be installed in the branch circuit supplying luminaires operating at voltages greater than the low-voltage contact limit to protect personnel performing lamping, relamping or servicing. Compliance with this requirement shall be obtained by the use of a *listed* underwater luminaire and by installation of a *listed* ground-fault circuit-interrupter in the branch circuit or a *listed* transformer or power supply for luminaires operating at more than the low-voltage contact limit. Luminaires that depend on submersion for safe operation shall be inherently protected against the hazards of overheating when not submerged. [680.23(A)(1), (A)(3), (A)(7) and (A)(8)]

E4206.4.1 Maximum voltage.

Luminaires shall not be installed for operation on supply circuits over 150 volts between conductors. [680.23(A)(4)]

E4206.4.2 Luminaire location.

Luminaires mounted in walls shall be installed with the top of the fixture lens not less than 18 inches (457 mm) below the normal water level of the pool, except where the luminaire is *listed* and identified for use at a depth of not less than 4 inches (102 mm) below the normal water level of the pool. A luminaire facing upward shall have the lens adequately guarded to prevent contact by any person or shall be *listed* for use without a guard. [680.23(A)(5) and (A)(6)]

E4206.5 Wet-niche luminaires.

Forming shells shall be installed for the mounting of all wet-niche underwater luminaires and shall be equipped with provisions for conduit entries. Conduit shall extend from the forming shell to a suitable junction box or other enclosure located as provided in Section E4206.9. Metal parts of the luminaire and forming shell in contact with the pool water shall be of brass or other *approved* corrosion-resistant metal. [680.23(B)(1) and (B)(2)]

The end of flexible-cord jackets and flexible-cord conductor terminations within a luminaire shall be covered with, or encapsulated in, a suitable potting compound to prevent the entry of water into the luminaire through the cord or its conductors. If present, the connection of the equipment grounding conductor within a luminaire shall be similarly treated to protect such connection from the deteriorating effect of pool water in the event of water entry into the luminaire. [680.23(B)(4)]

Luminaires shall be bonded to and secured to the forming shell by a positive locking device that ensures a low-resistance contact and requires a tool to remove the luminaire from the forming shell. [680.23(B)(5)]

E4206.5.1 Servicing.

All wet-niche luminaires shall be removable from the water for inspection, relamping or other maintenance. The forming shell location and length of cord in the forming shell shall permit personnel to place the removed luminaire on the deck or other dry location for such maintenance. The luminaire maintenance location shall be accessible without entering or going into the pool water. In spa locations where wet-niche luminaires are installed low in the foot well of the spa, the luminaire shall only be required to reach the bench location, where the spa can be drained to make the bench location dry. [680.23(B)(6)]

E4206.6 Dry-niche luminaires.

Dry-niche luminaires shall have provisions for drainage of water. Other than *listed* low-voltage luminaires not requiring grounding, a dry-niche luminaire shall have means for accommodating one equipment grounding conductor for each conduit entry. Junction boxes shall not be required but, if used, shall not be required to be elevated or located as specified in Section E4206.9 if the luminaire is specifically identified for the purpose. [680.23(C)(1) and (C)(2)]

E4206.7 No-niche luminaires.

No-niche luminaires shall be *listed* for the purpose and shall be installed in accordance with the requirements of Section E4206.5. Where connection to a forming shell is specified, the connection shall be to the mounting bracket. [680.23(D)]

E4206.8 Through-wall lighting assembly.

A through-wall lighting assembly shall be equipped with a threaded entry or hub, or a nonmetallic hub, for the purpose of accommodating the termination of the supply conduit. A through-wall lighting assembly shall meet the construction requirements of Section E4205.6 and be installed in accordance with the requirements of Section E4206.5 Where connection to a forming shell is specified, the connection shall be to the conduit termination point. [680.23(E)]

E4206.9 Junction boxes and enclosures for transformers or ground-fault circuit interrupters.

Junction boxes for underwater luminaires and enclosures for transformers and ground-fault circuit interrupters that supply underwater luminaires shall comply with Sections E4206.9.1 through E4206.9.5. [680.24(A)]

E4206.9.1 Junction boxes.

A junction box connected to a conduit that extends directly to a forming shell or mounting bracket of a no-niche luminaire shall be:

1. *Listed, labeled and identified* as a swimming pool junction box; [680.24(A)(1)]
2. Equipped with threaded entries or hubs or a nonmetallic hub; [680.24(A)(1)(1)]
3. Constructed of copper, brass, suitable plastic, or other *approved* corrosion-resistant material; [680.24(A)(1)(2)]
4. Provided with electrical continuity between every connected metal conduit and the grounding terminals by means of copper, brass or other *approved* corrosion-resistant metal that is integral with the box; and [680.24(A)(1)(3)]
5. Located not less than 4 inches (102 mm), measured from the inside of the bottom of the box, above the ground level or pool deck, or not less than 8 inches (203 mm) above the maximum pool water level, whichever provides the greatest elevation, and shall be located not less than 4 feet (1219 mm) from the inside wall of the pool, unless separated from the pool by a solid fence, wall or other permanent barrier. Where used on a lighting system operating at the low-voltage contact limit or less, a flush deck box shall be permitted provided that a potting compound is used to fill the box to prevent the entrance of moisture; and the flush deck box is located not less than 4 feet (1219 mm) from the inside wall of the pool. [680.24(A)(2)]

E4206.9.2 Other enclosures.

An enclosure for a transformer, ground-fault circuit interrupter or a similar device connected to a conduit that extends directly to a forming shell or mounting bracket of a no-niche luminaire shall be:

1. *Listed* and *labeled* for the purpose, comprised of copper, brass, suitable plastic or other *approved* corrosion-resistant material; [680.24(B)(1), 680.24(B)(1)(2)]
2. Equipped with threaded entries or hubs or a nonmetallic hub; [680.24(B)(1)(1)]
3. Provided with an *approved* sealing compound identified for use with cable insulation, conductor insulation, bare conductor shield or other components at the conduit connection, that prevents circulation of air between the conduit and the enclosures; [680.24(B)(1)(3)]
4. Provided with electrical continuity between every connected metal conduit and the grounding terminals by means of copper, brass or other *approved* corrosion-resistant metal that is integral with the enclosures; and [680.24(B)(1)(4)]
5. Located not less than 4 inches (102 mm), measured from the inside bottom of the enclosure, above the ground level or pool deck, or not less than 8 inches (203 mm) above the maximum pool water level, whichever provides the greater elevation, and shall be located not less than 4 feet (1219 mm) from the inside wall of the pool, except where separated from the pool by a solid fence, wall or other permanent barrier. [680.24(B)(2)]

E4206.9.3 Protection of junction boxes and enclosures.

Junction boxes and enclosures mounted above the grade of the finished walkway around the pool shall not be located in the walkway unless afforded additional protection, such as by location under diving boards or adjacent to fixed structures. [680.24(C)]

E4206.9.4 Grounding terminals.

Junction boxes, transformer and power supply enclosures, and ground-fault circuit-interrupter enclosures connected to a conduit that extends directly to a forming shell or mounting bracket of a no-niche luminaire shall be provided with grounding terminals in a quantity not less than the number of conduit entries plus one. [680.24(D)]

E4206.9.5 Strain relief.

The termination of a flexible cord of an underwater luminaire within a junction box, transformer or power supply enclosure, ground-fault circuit interrupter, or other enclosure shall be provided with a strain relief. [680.24(E)]

E4206.10 Underwater audio equipment.

Underwater audio equipment shall be identified as underwater audio equipment. [680.27(A)]

E4206.10.1 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. [680.27(A)(1)]

E4206.10.2 Wiring methods.

Rigid metal conduit of brass or other identified corrosion-resistant metal, rigid polyvinyl chloride conduit, rigid thermosetting resin conduit or liquid-tight flexible nonmetallic conduit (LFNC-B) shall extend from the forming shell to a suitable junction box or other enclosure as provided in Section E4206.9. Where rigid nonmetallic conduit or liquid-tight flexible nonmetallic conduit is used, an 8 AWG solid or stranded insulated copper bonding jumper shall be installed in this conduit with provisions for terminating 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 suitable potting compound to protect such connection from the possible deteriorating effect of pool water. [680.27(A)(2)]

E4206.10.3 Forming shell and metal screen.

The forming shell and metal screen shall be of brass or other *approved* corrosion-resistant metal. Forming shells shall include provisions for terminating an 8 AWG copper conductor. [680.27(A)(3)]

E4206.11 Electrically operated pool covers.

The electric motors, controllers and wiring for pool covers shall be located not less than 5 feet (1524 mm) from the inside wall of the pool except where 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 electric motor and controller shall be connected to a branch circuit protected by a ground-fault circuit interrupter. The device that controls the operation of the motor for an electrically operated pool cover shall be located so that the device operator has full view of the pool. [680.27(B)(1) and (B)(2)]

Exceptions:

1. Motors that are part of *listed* systems with ratings not exceeding the low-voltage contact limit and that are supplied by *listed* transformers or power supplies that comply with Section E4206.1 shall be permitted to be located less than 5 feet (1524 mm) from the inside walls of the pool. [680.27(B)(1) Exception]
2. Motors that are part of *listed* systems with ratings not exceeding the low-voltage contact limit and that are supplied by *listed* transformers or power supplies that comply with Section E4206.1 shall not be required to be connected to a branch circuit protected by a ground fault circuit-interrupter. [680.27 and (B)(2) Exception]

E4206.12 Electric pool water heaters.

Electric pool water heaters shall have the heating elements subdivided into loads not exceeding 48 amperes and protected at not more than 60 amperes. The ampacity of the branch-circuit conductors and the rating or setting of overcurrent protective devices shall be not less than 125 percent of the total nameplate load rating. (680.10)

E4206.13 Electrically powered swimming pool heat pumps and chillers.

Electrically powered swimming pool heat pumps and chillers using the circulating water system and providing heating, cooling, or both, shall be listed and rated for their intended use. The ampacity of the branch-circuit conductors and the rating or setting of overcurrent protective devices shall be sized to comply with the nameplate. [680.10(B)]

E4206.14 Pool area heating.

The provisions of Sections E4206.14.1 through E4206.14.3 shall apply to all pool deck areas, including a covered pool, where electrically operated comfort heating units are installed within 20 feet (6096 mm) of the inside wall of the pool. [680.27(C)]

E4206.14.1 Unit heaters.

Unit heaters shall be rigidly mounted to the structure and shall be of the totally enclosed or guarded types. Unit heaters shall not be mounted over the pool or within the area extending 5 feet (1524 mm) horizontally from the inside walls of a pool. [680.27(C)(1)]

E4206.14.2 Permanently wired radiant heaters.

Electric radiant heaters shall be suitably guarded and securely fastened to their mounting devices. Heaters shall not be installed over a pool or within the area extending 5 feet (1524 mm) horizontally from the inside walls of the pool and shall be mounted not less than 12 feet (3658 mm) vertically above the pool deck. [680.27(C)(2)]

E4206.14.3 Radiant Heating Cables Prohibited.

Radiant heating cables embedded in or below the deck shall be prohibited. [680.27(C)(3)]

E4206.15 Gas-fired water heater.

Circuits serving gas-fired swimming pool and spa water heaters operating at voltages above the low-voltage contact limit shall be provided with ground-fault circuit-interruper protection.

SECTION E4207— STORABLE SWIMMING POOLS, STORABLE SPAS AND STORABLE HOT TUBS

E4207.1 Pumps.

A cord-and-plug-connected pool filter pump for use with storable pools shall incorporate an *approved* system of double insulation or its equivalent and shall be provided with means for the termination of an equipment grounding conductor for the connection to the internal and nonaccessible noncurrent-carrying metal parts of the pump.

The means for grounding shall be an equipment grounding conductor run with the power-supply conductors in a flexible cord that is properly terminated in a grounding-type attachment plug having a fixed grounding contact. Cord-and-plug-connected pool filter pumps shall be provided with a ground-fault circuit-interrupter that is an integral part of the attachment plug or located in the power supply cord within 12 inches (305 mm) of the attachment plug. (680.31)

E4207.2 Ground-fault circuit interrupters required.

Electrical equipment, including power-supply cords, used with storable pools shall be protected by ground-fault circuit interrupters. All receptacles rated 125-volts through 250 volts, 60 amperes or less, located within 20 feet (6096 mm) of the inside walls of a storable pool, storable spa or storable hot tub shall be protected by a Class A ground-fault circuit interrupter. In determining these dimensions, the distance to be measured shall be the shortest path that the supply cord of an appliance connected to the receptacle would follow without passing through a floor, wall, ceiling, doorway with hinged or sliding door, window opening or other effective permanent barrier. (680.32)

E4207.3 Luminaires.

Luminaires for storable pools, storable spas and storable hot tubs shall not have exposed metal parts and shall be *listed* for the purpose as an assembly. In addition, luminaires for storable pools shall comply with the requirements of Section E4207.3.1 or E4207.3.2. (680.33)

E4207.3.1 Within the low-voltage contact limit.

A luminaire installed in or on the wall of a storable pool shall be part of a cord-and-plug-connected lighting assembly. The assembly shall:

1. Have a luminaire lamp that is suitable for the use at the supplied voltage;
2. Have an impact-resistant polymeric lens, luminaire body and transformer enclosure;
3. Have a transformer meeting the requirements of Section E4206.1 with a primary rating not over 150 volts; and
4. Have no exposed metal parts. [680.33(A)]

E4207.3.2 Over the low-voltage contact limit but not over 150 volts.

A lighting assembly without a transformer or power supply, and with the luminaire lamp(s) operating at over the low-voltage contact limit, but not over 150 volts, shall be permitted to be cord-and-plug-connected where the assembly is *listed* as an assembly for the purpose and complies with all of the following:

1. It has an impact-resistant polymeric lens and luminaire body.
2. A ground-fault circuit interrupter with open neutral conductor protection is provided as an integral part of the assembly.
3. The luminaire lamp is permanently connected to the ground-fault circuit interrupter with open-neutral protection.
4. It complies with the requirements of Section E4206.4.
5. It has no exposed metal parts. [680.33(B)]

E4207.4 Receptacle locations.

Receptacles shall be located not less than 6 feet (1829 mm) from the inside walls of a storable pool, storable spa or storable hot tub. In determining these dimensions, the distance to be measured shall be the shortest path that the supply cord of an appliance connected to the receptacle would follow without passing through a floor, wall, ceiling, doorway with hinged or sliding door, window opening or other effective permanent barrier. (680.34)

E4207.5 Clearances.

Overhead conductor installations shall comply with Section E4203.7, and underground conductor installations shall comply with Section E4203.8. [680.30]

E4207.6 Disconnecting means.

Disconnecting means for storable pools and storable/portable spas and hot tubs shall comply with Section E4203.3. [680.30]

E4207.7 Ground-fault circuit interrupters.

Ground-fault circuit interrupters shall comply with Section E4206.2. [680.30]

E4207.8 Pool water heaters.

Electric pool water heaters shall comply with Section E4206.12.

SECTION E4208— SPAS AND HOT TUBS

E4208.1 Ground-fault circuit interrupters.

The outlet(s) that supplies a self-contained spa or hot tub, or a packaged spa or hot tub equipment assembly, or a field-assembled spa or hot tub shall be protected by a ground-fault circuit interrupter. (680.44)

A *listed* self-contained unit or *listed* packaged equipment assembly marked to indicate that integral ground-fault circuit-interrupter protection is provided for all electrical parts within the unit or assembly, including pumps, air blowers, heaters, lights, controls, sanitizer generators and wiring, shall not require additional ground-fault protection. [680.44(A)]

E4208.2 Electric water heaters.

Electric spa and hot tub water heaters shall be *listed* and shall have the heating elements subdivided into loads not exceeding 48 amperes and protected at not more than 60 amperes. The ampacity of the branch-circuit conductors, and the rating or setting of overcurrent protective devices, shall be not less than 125 percent of the total nameplate load rating. (680.10)

E4208.3 Underwater audio equipment.

Underwater audio equipment used with spas and hot tubs shall comply with the provisions of Section E4206.10. [680.43(G)]

E4208.4 Emergency switch for spas and hot tubs.

A clearly *labeled* emergency shutoff or control switch for the purpose of stopping the motor(s) that provides power to the recirculation system and jet system shall be installed at a point that is readily accessible to the users, adjacent to and within sight of the spa or hot tub and not less than 5 feet (1524 mm) away from the spa or hot tub. This requirement shall not apply to one-family *dwellings*. [680.41(A)]

E4208.5 Equipment exceeding the low-voltage contact limit.

Except for self-contained spas and hot tubs, equipment with ratings exceeding the low-voltage contact limit shall be located at least 5 feet (1.5 meters) horizontally from the inside walls of a spa or hot tub, unless separated from the spa or hot tub by a solid fence, wall, or other permanent barrier. [680.41(B)]

E4208.6 Receptacles supplying power to spas and hot tubs.

Receptacles that provide power for a spa or hot tub shall not exceed 150 volts to ground and shall be GFCI protected. [680.43(A)(3)]

SECTION E4209— HYDROMASSAGE BATHTUBS

E4209.1 General.

Installations of hydromassage bathtubs, as defined in Chapter 35, shall be required to comply only with Section E4209. The branch circuit wiring method(s) supplying a hydromassage bathtub shall comply with Chapter 38. (680.70)

E4209.2 Ground-fault circuit interrupters.

Hydromassage bathtubs and their associated electrical components shall be supplied by an individual branch circuit(s) and protected by a readily accessible ground-fault circuit interrupter. All 125-volt, single-phase receptacles not exceeding 30 amperes and located within 6 feet (1829 mm) measured horizontally of the inside walls of a hydromassage tub shall be protected by a ground-fault circuit interrupter(s). (680.71)

E4209.3 Other electric equipment.

Luminaires, switches, receptacles and other electrical equipment located in the same room, and not directly associated with a hydromassage bathtub, shall be installed in accordance with the requirements of this code relative to the installation of electrical equipment in bathrooms. (680.72)

E4209.4 Accessibility.

Hydromassage bathtub electrical equipment shall be accessible without damaging the building structure or building finish.

Where the hydromassage bathtub is cord- and plug-connected with the supply receptacle accessible only through a service access opening, the receptacle shall be installed so that its face is within direct view and not more than 12 inches (305 mm) from the plane of the opening. (680.73)

E4209.5 Bonded parts.

The following parts shall be bonded together:

1. Metal fittings within or attached to the tub structure that are in contact with the circulating water.
2. Metal parts of electrical equipment associated with the tub water circulating system, including the pump and blower motors.
3. Metal-sheathed cables, metal raceways and metal piping that are within 5 feet (1524 mm) of the inside walls of the tub and that are not separated from the tub area by a permanent barrier.
4. Exposed metal surfaces that are within 5 feet (1524 mm) of the inside walls of the tub and not separated from the tub area by a permanent barrier.
5. Noncurrent-carrying metal parts of electrical devices and controls that are not associated with the hydromassage tubs and that are located within 5 feet (1524 mm) from such units. [680.74(A)]

Exceptions:

1. Double-insulated motors and blowers shall not be bonded.
2. Small conductive surfaces not likely to become energized, such as air and water jets, supply valve assemblies and drain fittings not connected to metal piping, and towel bars, mirror frames and similar nonelectric equipment not connected to metal framing shall not be required to be bonded. [680.74(A) Exceptions 1 and 2]
3. Small conductive surfaces of electrical equipment not likely to become energized, such as the mounting strap or yoke of a listed light switch or receptacle that is grounded, shall not be required to be bonded. [680.74(A) Exceptions 1, 2 and 3]

E4209.6 Method of bonding.

Metal parts required to be bonded by this section shall be bonded together using a solid copper bonding jumper, insulated, covered or bare, not smaller than 8 AWG. The bonding jumper(s) shall be required for equipotential bonding in the area of the hydromassage bathtub and shall not be required to be extended or attached to any remote panelboard, service equipment or electrode. In all installations, a bonding jumper long enough to terminate on a replacement nondouble-insulated pump or blower motor shall be provided and shall be terminated to the equipment grounding conductor of the branch circuit of the motor where a double-insulated circulating pump or blower motor is used. [680.74(B)]