

# SWIMMING POOL, HOT TUB BUILDING PERMIT APPLICATION PROCEDURES AND CHECKLIST

## ☐ 1. MUST COMPLY WITH SECTION 303, SWIMMING POOLS, SPAS AND HOT TUBS, OF THE PROPERTY AND MAINTENANCE CODE OF NEW YORK STATE:

### SECTION 303 SWIMMING POOLS, SPAS AND HOT TUBS 2020 Property Maintenance Code of New York State

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

**303.2 Enclosures.** The provisions of this section shall control the maintenance of barriers for swimming pools, spas and hot tubs installed, constructed or substantially modified after December 14, 2006. Design controls are intended to provide protection against potential drowning and near-drowning by restricting access to swimming pools, spas and hot tubs.

#### [NY] 303.2.1 Compliance with other codes

Enclosures for residential swimming pools, spas and hot tubs shall be in compliance with [Section R326](#) of the [Residential Code of New York State](#). Enclosures for public swimming pools, spas and hot tubs shall be in compliance with [Section 3109](#) of the [Building Code of New York State](#).

#### [NY] 303.2.2 Temporary Barriers

An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be surrounded by a temporary barrier during installation or construction in compliance with Section R326.4 of the [Residential Code of New York State](#) or Section 3109.3.2 of the [Building Code of New York State](#), as applicable.

#### [NY] 303.3 Swimming Pool and Spa Alarms

A swimming pool or spa installed, constructed or substantially modified after December 14, 2006, shall be equipped with an approved pool alarm in compliance with Section R326.7 of the [Residential Code of New York State](#) or Section R3109.5 of the [Building Code of New York State](#).

#### Exceptions:

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

#### [NY] 303.4 Entrapment Protection for Swimming Pools and Spas

Swimming pools and spas shall maintain body entrapment protections for suction outlets in accordance with the [Building Code of New York State](#) or the [Residential Code of New York State](#), as applicable.

## ☐ 2. MUST COMPLY WITH SECTION R326, SWIMMING POOLS, SPAS AND HOT TUBS, OF THE RESIDENTIAL CODE OF NEW YORK STATE:

### Section R326 Swimming Pools, Spas and Hot Tubs 2020 Residential Code of State of New York

#### [NY] R326.1 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 pools for the shared use of multiple [townhouse](#) units shall be regulated by the [Building Code of New York State](#).

#### [NY] R326.1.1 Compliance With Other Sections



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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 Section 8003 (Federal swimming pool and spa [drain](#) cover standard) of Title 15 of the United States Code (CPSC 15 USC 8003), where applicable.

### [NY] R326.2 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 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, waterheating 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 OUTLET.** A fitting, fitting assembly, cover/ grate, [sump](#), and related components that provide a localized low-pressure area for the transfer of water from a swimming pool.

**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] R326.3 Compliance With Other Standards

#### [NY] R326.3.1 In-Ground Pools

In-ground pools shall be designed and constructed in conformance with ANSI/APSP/ICC 5 (American National Standard for Residential Inground Swimming Pools, 2011).

#### [NY] R326.3.2 Above-Ground and On-Ground Pools

Above-ground and on-ground pools shall be designed and constructed in conformance with ANSI/APSP/ICC 4 (American National Standard for Aboveground/Onground Residential Swimming Pools, 2012).



**[NY] R326.3.3 Permanently Installed Spas and Hot Tubs**

Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/ APSP/ICC 3 (American National Standard for Permanently Installed Residential Spas and Swim Spas, 2014).

**[NY] R326.3.4 Portable Spas and Hot Tubs**

Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/APSP/ICC 6 (American National Standard for Residential Portable Spas and Swim Spas, 2013).

**[NY] R326.4 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 the [dwelling](#), and persons in other parts of the property not contained within the pool enclosure.

**[NY] R326.4.1 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 [R326.4.2](#) is provided.

Exception:

1. Above-ground or on-ground pools where the pool structure constitutes a barrier in compliance with [Section R326.4.2.9](#).
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] R326.4.1.1 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] R326.4.1.2 Replacement by a Permanent Barrier**

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

1. 90 days of the date of issuance of the building [permit](#) for the installation or construction of the swimming pool; or
2. 90 days of the date of commencement of the installation or construction of the swimming pool.

**[NY] R326.4.1.2.1 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] R326.4.2 Permanent Barriers**

Swimming pools shall be completely enclosed by a permanent barrier complying with Sections [R326.4.2.1](#) through [R326.4.2.6](#).

**[NY] R326.4.2.1 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 [R326.4.2.2](#) and [R326.4.2.3](#).

**[NY] R326.4.2.2 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] R326.4.2.3 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<sup>3</sup>/<sub>4</sub> inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall be not greater than 1<sup>3</sup>/<sub>4</sub> inches (44 mm) in width.

**[NY] R326.4.2.4 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  $1\frac{3}{4}$  inches (44 mm) in width.

#### [NY] R326.4.2.5 Chain Link Dimensions

Maximum mesh size for chain link fences shall be a  $2\frac{1}{4}$  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  $1\frac{3}{4}$  inches (44 mm).

#### [NY] R326.4.2.6 Diagonal Members

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

#### [NY] R326.4.2.7 Gates

Gates shall comply with the requirements of Sections [R326.4.2.1](#) through [R326.4.2.6](#), and with the following requirements:

##### [NY] R326.4.2.7.1 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 pool.

##### [NY] R326.4.2.7.2 Latching

All gates shall be selflatching, with the latch handle located within the enclosure (i.e., on the pool side of the enclosure) and at least 40 inches (1016 mm) above [grade](#). In addition, if the latch handle is located less than 54 inches (1372 mm) from [grade](#), the latch handle shall be located at least 3 inches (76 mm) below the top of the gate, and neither the gate nor the barrier shall have any opening greater than 0.5 inch (12.7 mm) within 18 inches (457 mm) of the latch handle.

##### [NY] R326.4.2.7.3 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] R326.4.2.8 Dwelling Wall as Barrier

A wall or [walls](#) of a [dwelling](#) may serve as part of the barrier, provided that the wall or [walls](#) meet the applicable barrier requirements of Sections [R326.4.2.1](#) through [R326.4.2.6](#), and one of the following conditions shall be met:

1.
  - a. Doors with direct [access](#) to the 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 in accordance with UL 2017. The audible alarm shall activate within 7 seconds and 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; and
  - b. Operable windows in the wall or [walls](#) used as a barrier shall have a latching device located no less than 48 inches above the floor. Openings in operable windows shall not allow a 4-inch-[diameter](#) (102 mm) sphere to pass through the opening when the window is in its largest opened position; and
  - c. Where the [dwelling](#) is wholly contained within the pool barrier or enclosure, alarms shall be provided at every door with direct [access](#) to the pool; or
2. Other approved means of protection, such as selfclosing 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] R326.4.2.8.1 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] R326.4.2.9 Pool Structure as Barrier

Where an above-ground 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 [R326.4.2.1](#) through [R326.4.2.8](#). 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; or



2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Sections [R326.4.2.1](#) through [R326.4.2.8](#).

**[NY] R326.4.3 Indoor Swimming Pool**

[Walls](#) surrounding an indoor swimming pool shall comply with Section [R326.4.2.8](#).

**[NY] R326.4.4 Prohibited Locations**

Barriers shall be located so as to prohibit permanent structures, [equipment](#) or similar objects from being used to climb the barrier.

**[NY] R326.5 Entrapment Protection for Swimming Pool and Spa Suction Outlets**

Suction outlets shall be designed to produce circulation throughout the pool or spa. Single-outlet systems, such as [automatic](#) vacuum cleaner systems, or multiple suction outlets, whether isolated by valves or otherwise, shall be protected against user entrapment.

**[NY] R326.5.1 Compliance**

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] R326.6 Suction Outlets**

Suction outlets shall be designed to produce circulation throughout the pool or spa. Single-outlet systems, such as [automatic](#) vacuum cleaner systems, or multiple suction outlets, whether isolated by valves or otherwise, shall be protected against user entrapment.

**[NY] R326.6.1 Compliance Alternative**

Suction outlets may be designed and installed in accordance with ANSI/ APSP/ICC 7.

**[NY] R326.6.2 Suction Fittings**

Pool and spa suction outlets shall have a cover that conforms to ANSI/ASME A112.19.8, or an 18 inch by 23 inch (457 mm by 584 mm) [drain](#) grate or larger, or an approved channel [drain](#) system.

Exception: Surface skimmers.

**[NY] R326.6.3 Atmospheric Vacuum Relief System Required**

Pool and spa single- or multiple-outlet circulation systems shall be equipped with atmospheric vacuum relief should grate covers located therein become missing or broken. This vacuum relief system shall include at least one approved or engineered method of the type specified herein, as follows:

1. Safety vacuum release system conforming to ASME A112.19.17; or
2. An approved gravity drainage system.

**[NY] R326.6.4 Dual Drain Separation**

Single or multiple pump circulation systems have a minimum of two suction outlets of the approved type. A minimum horizontal or vertical distance of 3 feet (914 mm) shall separate the outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum-relief- protected line to the pump or pumps.

**[NY] R326.6.5 Pool Cleaner Fittings**

Where provided, vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least 6 inches (152 mm) and not more than 12 inches (305 mm) below the minimum operational water level or as an attachment to the skimmer(s).

**[NY] R326.7 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 (Standard Specification for Pool Alarms), and shall be installed, used and maintained in accordance with the manufacturer's instructions and this section.

Exception:

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] R326.7.1 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] R326.7.2 Alarm Activation**

Pool alarms shall activate upon detecting entry into the water and shall sound poolside and inside the [dwelling](#).

**[NY] R326.7.3 Prohibited Alarms**

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

**☒ 3. MUST COMPLY WITH CHAPTER 42 SECTION E4201, SWIMMING POOLS  
RESIDENTIAL CODE OF NEW YORK STATE:****Chapter 42: Section E4201 Swimming Pools**  
2020 Residential Code of State of New York**Chapter 42 Swimming Pools****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, fountains, 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)

**E4201.2 Definitions**

(680.2)

**CORD-AND-PLUG-CONNECTED LIGHTING ASSEMBLY.** A lighting assembly consisting of a cord-and-plug-connected transformer and a luminaire intended for installation in the wall of a spa, hot tub, or storable pool.

**DRY-NICHE LUMINAIRE.** A luminaire intended for installation in the floor or wall of a pool, spa or fountain in a niche that is sealed against the entry of water.

**FORMING SHELL.** A structure designed to support a wet-niche luminaire assembly and intended for mounting in a pool or fountain structure.

**FOUNTAIN.** Fountains, ornamental pools, display pools, and reflection pools. The definition does not include drinking fountains.

**HYDROMASSAGE BATHTUB.** A permanently installed bathtub equipped with a recirculating piping system, pump, and associated [equipment](#). It is designed so it can accept, circulate and discharge water upon each use.

**LOW-VOLTAGE CONTACT LIMIT.** A voltage not exceeding the following values:

1. 15 volts (RMS) for sinusoidal ac.
2. 21.2 volts peak for nonsinusoidal ac.
3. 30 volts for continuous dc.
4. 12.4 volts peak for dc that is interrupted at a rate of 10 to 200 Hz.

**MAXIMUM WATER LEVEL.** The highest level that water can reach before it spills out.

**NO-NICHE LUMINAIRE.** A luminaire 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, luminaires, controls and sanitizer generators.

**PERMANENTLY INSTALLED SWIMMING, WADING, IMMERSION AND THERAPEUTIC POOLS.** Those that are constructed in the ground or partially in the ground, and all others capable of holding water with a depth greater than 42 inches (1067 mm), and all





pools installed inside of a building, regardless of water depth, whether or not served by electrical circuits of any nature.

**POOL.** Manufactured or field-constructed [equipment](#) designed to contain water on a permanent or semipermanent basis and used for swimming, wading, immersion, or therapeutic purposes.

**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.** A 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, luminaires, controls and sanitizer generators.

**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. They are 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, WADING OR IMMERSION POOLS; OR STORABLE/PORTABLE SPAS AND HOT TUBS.

Swimming, wading, or immersion pools that are intended to be stored when not in use, that are constructed on or above the ground and that are capable of holding water with a maximum depth of 42 inches (1067 mm), or a pool, spa, or hot tub that is constructed on or above the ground with nonmetallic, molded polymeric [walls](#) or inflatable fabric [walls](#) regardless of dimension.

**THROUGH-WALL LIGHTING ASSEMBLY.** A lighting assembly intended for installation above [grade](#), on or through the wall of a pool, consisting of two interconnected groups of components separated by the pool wall.

**WET-NICHE LUMINAIRE.** A luminaire intended for installation in a forming shell mounted in a pool or fountain structure where the luminaire will be completely surrounded by water.

### 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 E4202.2.1](#) 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 (A) and (B); 680.21(A); 680.23(B) and (F); 680.25(A); 680.42; 680.43; and 680.70]

[TABLE E4202.1](#) <sup>a</sup>

#### PERMITTED WIRING METHODS IN CORROSIVE ENVIRONMENTS

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

For SI: 1 foot = 304.8 mm.



1. For all wiring methods, see [Section E4205](#) for [equipment](#) grounding conductor requirements.
2. See [Section E4202.2.1](#) for use of metal conduits in corrosive environments.
3. Limited to where necessary to employ flexible connections at or adjacent to a pool motor.
4. Flexible cord shall be installed in accordance with [Section E4202.2](#).
5. Nonmetallic conduit shall be rigid polyvinyl chloride conduit Type PVC or reinforced thermosetting resin conduit Type RTRC.
6. Aluminum conduits shall not be permitted in the pool area where subject to corrosion.
7. Where installed as direct burial cable or in wet locations, Type MC cable shall be listed and identified for the location.
8. See [Section E4202.3](#) for listed, double-insulated pool pump motors.
9. 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.
10. Metal conduit shall be constructed of brass or other approved corrosion-resistant metal.

## **E4202.2 Corrosive Environment**

Areas where pool sanitation chemicals are stored, areas with circulation pumps, [automatic](#) chlorinators or filters, open areas under decks adjacent to or abutting the pool structure and similar locations shall be considered to be corrosive environments. The air in such areas shall be considered to be laden with acid, chlorine and bromine vapors or any combination of acid, chlorine or bromine vapors; and any liquids or condensation in those areas shall be considered to be laden with acids, chlorine and bromine vapors, or any combination of acid, chlorine or bromine vapors. [680.14 (A)]

### **E4202.2.1 Wiring Methods**

Wiring methods in the areas described in [Section E4202.2](#) shall be listed and identified for use in such areas. Rigid metal conduit (RMC), intermediate metal conduit (IMC), rigid polyvinyl chloride conduit (RNC) and reinforced thermosetting resin conduit shall be considered to be resistant to the corrosive environment specified in [Section E4202.2](#). [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 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), (B), and (C); 680.21(A)(5)]
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 grounded by an insulated copper [equipment](#) grounding conductor that is an integral part of the cord or cable. Such grounding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure, or other enclosure and 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 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 bonding grid is connected to the [equipment](#) grounding conductor of the motor circuit 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**

Receptacle outlets shall be installed and located in accordance with Sections [E4203.1.1](#) through [E4203.1.5](#). Distances shall be measured as the shortest path that an [appliance](#) supply cord connected to the receptacle would follow without penetrating 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 of the grounding type, located not less than 6 feet (1829 mm) from the inside [walls](#) of pools and outdoor spas and hot tubs, and ground-fault circuit-interrupter protected.

**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**

Not 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 15- and 20-ampere, single phase, 125-volt receptacles located within 20 feet (6096 mm) of the inside [walls](#) of pools and outdoor spas and hot tubs shall be protected by a ground-fault circuit interrupter. Outlets supplying pool pump motors supplied from [branch](#) circuits rated at 120 volts through 240 volts, single phase, whether by receptacle or direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel. [680.21(C) and 680.22(A)(4)]

**E4203.1.5 Indoor Locations**

Receptacles shall be located not less than 6 feet (1829 mm) from the inside [walls](#) of indoor spas and hot tubs. A minimum of one 125-volt receptacle 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 125-volt receptacles rated 30 amperes or less and located within 10 feet (3048 mm) of the inside [walls](#) of spas and hot tubs installed indoors, shall be protected by ground-fault circuit interrupters. [680.43(A)(2)]

**E4203.2 Switching Devices**

Switching devices shall be located not less than 5 feet (1524 mm) horizontally from the inside [walls](#) of pools, spas and hot tubs except where separated from the pool, spa or hot tub by a [solid](#) fence, wall, or other permanent barrier or the switches are listed for use within 5 feet (1524 mm). Switching devices located in a room or area containing a hydromassage bathtub shall be located in accordance with the general requirements of this code. [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 at least 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 ground-fault circuit interrupter. [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.
  1. 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. 2.2. 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 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. [680.22(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 4204.2(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 Overhead Conductor Clearances

Except where installed with the clearances specified in [Table E4203.6](#), the following parts of pools and outdoor spas and hot tubs shall not be placed under existing service-drop conductors, overhead service conductor, 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 E4203.6](#) for conductors operating at 0 to 750 volts to ground.

Utility-owned, -operated and -maintained communications conductors, community antenna system coaxial cables and the supporting messengers 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. [680.8(A), (B), and (C)]

<b>TABLE E4203.6 [Table 680.8(A)]</b>			
<b>OVERHEAD CONDUCTOR CLEARANCES</b>			
	<b>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)</b>	<b>ALL OTHER SUPPLY OR SERVICE DROP CONDUCTORS (feet)</b>	
		<b>Voltage to ground</b>	
		<b>0-15 kV</b>	<b>Greater than 15 to 50 kV</b>
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.

### **E4203.7 Underground Wiring**

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 or Type MC cable, suitable for the conditions subject to that location. The minimum cover depth shall be in accordance with [Table E3803.1](#). (680.11)

## **Section E4204 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.

### **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. 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. Connections shall be made by exothermic welding, by listed pressure connectors or clamps that are [labeled](#) as being suitable for the purpose and that are made of stainless steel, brass, copper or copper alloy, machine screw-type fasteners that engage not less than two threads or are secured with a nut, thread-forming machine screws that engage not less than two-threads, or terminal bars. Connection devices or fittings that depend solely on solder shall not be used. Sheet metal screws shall not be used to connect bonding conductors or connection devices: [680.26(B)]

1. Conductive pool shells. Bonding to conductive pool shells shall be provided as specified in Item 1.1 or 1.2. Poured [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. Vinyl liners and fiberglass composite shells shall be considered to be nonconductive materials.

1. 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.
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. 1.2.1. It shall be constructed of minimum 8 AWG bare [solid](#) copper conductors bonded to each other at all points of crossing.
  2. 1.2.2. It shall conform to the contour of the pool.
  3. 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).
  4. 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 and shall include unpaved surfaces, poured [concrete](#) surfaces 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 or 2.2 and 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. For nonconductive pool shells, bonding at four points shall not be required.

#### Exceptions:

1. Equipotential bonding of perimeter surfaces shall not be required for spas and hot tubs where all of the following conditions apply:
  1. 1.1. The spa or hot tub is listed as a self-contained spa for above-ground use.
  2. 1.2. The spa or hot tub is not identified as suitable only for indoor use.
  3. 1.3. The installation is in accordance with the manufacturer's instructions and is located on or above [grade](#).
  4. 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.
  1. 2.1. Structural reinforcing steel. Structural reinforcing steel shall be bonded in accordance with Item 1.1.
  2. 2.2. Alternate means. Where structural reinforcing steel is not available or is encapsulated in a nonconductive compound, a copper conductor(s) shall be used in accordance with Items 2.2.1 through 2.2.5:
    1. 2.2.1. At least one minimum 8 AWG bare [solid](#) copper conductor shall be provided.
    2. 2.2.2. The conductors shall follow the contour of the perimeter surface.
    3. 2.2.3. Splices shall be listed.
    4. 2.2.4. The required conductor shall be 18 to 24 inches (457 to 610 mm) from the inside [walls](#) of the pool.
    5. 2.2.5. The required conductor shall be secured within or under the perimeter surface 4 to 6 inches (102 mm to 152 mm) below the subgrade. [680.26(B)(2)]
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. 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. [680.26(B)(5)]
6. 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. [680.26(B)(6)]

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

1. 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 bonding grid to an accessible point in the vicinity of the pool pump motor. 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. [680.26(B)(6)(a)]
2. 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. [680.26(B)(7)]

**Exceptions:**

1. 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]
2. Those greater than 5 feet (1524 mm) horizontally from the inside [walls](#) of the pool shall not be required to be bonded. [680.26(B)(7) Exception No. 2]
3. Those greater than 12 feet (3658 mm) measured vertically above the maximum water level of the pool, or as measured vertically above any observation stands, towers, or platforms, or any diving structures, shall not be required to be bonded. [680.26(B)(7) Exception No. 3]

### E4204.3 Pool Water

Where none of the bonded parts is 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<sup>2</sup>) 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](#).

### 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. 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 the intent to require 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)]

#### E4204.5.2 Connections

Connections to bonded parts shall be made in accordance with [Section E3406.14.1](#).

### Section E4205 Grounding

#### E4205.1 Equipment to Be Grounded

The following [equipment](#) shall be grounded:

1. Through-wall lighting assemblies and underwater luminaires other than those [low-voltage lighting](#) products listed for the application without a grounding conductor.
2. All electrical [equipment](#) located within 5 feet (1524 mm) of the inside wall of the pool, spa or hot tub.
3. All electrical [equipment](#) associated with the recirculating system of the pool, spa or hot tub.
4. Junction boxes.
5. Transformer and power supply enclosures.
6. Ground-fault circuit interrupters.
7. Panelboards that are not part of the service [equipment](#) and that supply any electrical [equipment](#) associated with the pool, spa or hot tub. (680.7)

#### E4205.2 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 E4202.2.1](#) or shall be liquid-tight flexible nonmetallic conduit (LFNMC). 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 E3908.12](#) 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 overcurrent device in such circuit.

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), (F)(2) and 680.23(F)(2) Exception]

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)]

### E4205.3 Nonmetallic Conduit

Where a nonmetallic conduit is installed between a forming shell and a junction box, transformer enclosure, or other enclosure, a 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)]

### E4205.4 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 grounded by an insulated copper [equipment](#) grounding conductor that is an integral part of the cord or cable. This grounding conductor shall be connected to a grounding terminal in the supply junction box, transformer enclosure, or other enclosure. The grounding conductor shall not be smaller than the supply conductors and not smaller than 16 AWG. [680.23(B)(3)]

### E4205.5 Pool Motors

Wiring methods installed in the corrosive environment described in [Section E4202.2.1](#) shall comply with Section E4202.2.2 or shall be Type MC cable listed for that location. Wiring methods installed in corrosive environments described in [Section E4202.2.1](#) shall contain an insulated copper [equipment](#) conductor sized in accordance with [Table E3908.12](#) but not smaller than 12 AWG.

Where installed in noncorrosive environments, [branch](#) circuit wiring methods shall comply with [Chapter 38](#). [680.21(A)(1)].

### E4205.6 Feeders

These provisions shall apply to any feeder on the supply side of panelboards supplying [branch](#) circuits for pool [equipment](#) covered in this chapter and on the load side of the service [equipment](#). Where feeders are installed in corrosive environments as described in [Section E4202.2](#), the wiring method of that portion of the feeder shall comply with [Section E4202.2.1](#) or shall be liquid-tight flexible nonmetallic conduit (LFNMC). Wiring methods installed in corrosive environments as described in [Section E4202.2.1](#) shall contain an insulated copper [equipment](#) grounding conductor sized in accordance with [Table E3908.12](#), but not smaller than 12 AWG.

Where installed in noncorrosive environments, feeder wiring methods shall comply with [Chapter 38](#). [680.25(A)].

### 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. [680.7(C)]

### E4205.8 Other Equipment

Other electrical [equipment](#) shall be grounded in accordance with [Section E3908](#). (Article 250, Parts V, VI, and VII; and 680.6)

### E4205.9 Grounding and Bonding Terminals

Grounding and bonding terminals shall be identified for use in wet and corrosive environments. Field-installed grounding and bonding connections in a damp, wet or corrosive environment shall be composed of copper, copper alloy or stainless steel and shall be listed for direct burial use. (680.7)

## 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**

Ground-fault circuit interrupters shall be self-contained units, circuit-breaker types, receptacle types or other approved types. (680.5)

#### **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. The installation of the ground-fault circuit interrupter shall be such that there is no shock hazard with any likely fault-condition combination that involves a person in a conductive path from any ungrounded part of the [branch](#) circuit or the luminaire to ground. 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)]

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 grounding connection 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. [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 E4205.4](#) 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 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 an approved 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)]
2. Equipped with threaded entries or hubs or a nonmetallic hub; [680.24(B)(2)]
3. Provided with an approved seal, such as [duct](#) seal at the conduit connection, that prevents circulation of air between the conduit and the enclosures; [680.24(B)(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)(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 for the purpose. [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 operator has full view of the pool.

##### **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.
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(B)(1) and (B)(2)]

#### **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. (680.9)

#### **E4206.13 Pool Area Heating**

The provisions of Sections [E4206.13.1](#) through [E4206.13.3](#) 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)]

##### **E4206.13.1 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)]





**E4206.13.2 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)]

**E4206.13.3 Radiant Heating Cables Prohibited**

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

**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 grounding only the internal and nonaccessible noncurrent-carrying metal parts of the [appliance](#).

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. 125-volt, 15- and 20-ampere receptacles 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 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 E4203.6](#) and underground conductor installations shall comply with [Section E4203.7](#).

#### **E4207.6 Disconnecting Means**

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

#### **E4207.7 Ground-Fault Circuit Interrupters**

Ground fault circuit interrupters shall comply with [Section E4206.2](#).

#### **E4207.8 Grounding of Equipment**

[Equipment](#) shall be grounded as required by [Section E4205.1](#).

#### **E4207.9 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 with a heater load of 50 amperes or less, 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 that the outlet supply be protected by a ground-fault circuit-interrupter. [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. (680.9)

#### **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)

### **Section E4209 Hydromassage Bathtubs**

#### **E4209.1 General**

Installations of hydromassage bathtubs shall be required to comply only with [Section E4209](#). The [branch](#) circuit wiring method(s) supplying a hydromassage bathtub shall comply with [Chapter 38](#).

#### **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 and 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. Electrical devices and controls that are not associated with the hydromassage tubs and that are located within 5 feet (1524 mm) from such units.

**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.

**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)

## BUILDING/ZONING PERMIT APPLICATION TOWN OF PORTLAND

**General Information:**

- A. COMPLIANCE – Applicants are responsible for complying with all regulations in the NYS Building Code and Town of Portland Zoning Law as well as other laws (e.g. Health Dept. Permits, etc.)
- B. ASSISTANCE – Forms shall be filled out as accurately and completely as possible. Assistance is available from the Code Enforcement Officer.
- C. FEE – A fee specified in the Zoning Law must be paid prior to processing this application.
- D. TIME FOR PROCESSING – Approval or denial will be sent or given to the applicant within 2 weeks from the date the application and all supporting documentation is received.
- E. ANSWERING QUESTIONS – All questions must be answered prior to the processing of the permit.

**APPLICANT INFORMATION:**

- A. **APPLICANT NAME:** \_\_\_\_\_
- Mailing Address:** \_\_\_\_\_
- Phone Number:** \_\_\_\_\_ **DATE:** \_\_\_\_\_
- B. **OWNER/NAME:** \_\_\_\_\_
- Mailing Address** \_\_\_\_\_
- Phone Number:** \_\_\_\_\_



C. **CONTRACTOR'S NAME:** \_\_\_\_\_

**Mailing Address:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_

**CONSTRUCTION TIME PERIOD – Start Date:** \_\_\_\_\_ **Completion Date** \_\_\_\_\_

**PROPERTY LOCATION:** (Construction Site)

A. **Street or Road** \_\_\_\_\_

B. **Section/Block/Lot from tax map** \_\_\_\_\_

C. **Zoning District (check one):** AG\_\_\_\_, AG-R\_\_\_\_, NC\_\_\_\_, R2\_\_\_\_, R3\_\_\_\_, HC\_\_\_\_, LC\_\_\_\_, LL\_\_\_\_, CR\_\_\_\_

**PROJECT USE & DESCRIPTION:** (answer all applicable questions)

A. **Type Use (check one):** Residential\_\_\_\_, \*Commercial\_\_\_\_, \*Industrial\_\_\_\_, Other \_\_\_\_\_

**Explain in more detail (e.g., two family, farm machinery sales, etc.)** \_\_\_\_\_

B. **Which describes the project (Permit is for) check one:**

Single Family Home\_\_\_\_, New Building\_\_\_\_, Addition\_\_\_\_, Repair/Retrofit\_\_\_\_, Alteration\_\_\_\_, Demolition\_\_\_\_, Sign\_\_\_\_,

Conversion\_\_\_\_, Fence\_\_\_\_, Land Use Only\_\_\_\_, No Structures\_\_\_\_,

Other (please explain in detail) \_\_\_\_\_

C. **TYPE OF CONSTRUCTION:** Wood Frame\_\_\_\_, Block\_\_\_\_, Pole Barn\_\_\_\_, Manufactured Housing\_\_\_\_, Modular\_\_\_\_,

Other (Explain in more detail) \_\_\_\_\_

**\* For Commercial Structures or Commercial Land Use: See Site Plan Review Application and Requirements.**

D. **SIZE: Floor space in dimensions** \_\_\_\_\_ **Square Footage** \_\_\_\_\_

**Height in Stories and feet to Eaves** \_\_\_\_\_

E. **COST: Estimated Construction Cost** \_\_\_\_\_

F. **BUILDING MATERIALS:** Please list on Separate Sheet

G. **MANUFACTURED HOUSING:** Single Wide\_\_\_\_, Double Wide\_\_\_\_

**Year of Manufacturer** \_\_\_\_\_, **Serial Number** \_\_\_\_\_, **Model** \_\_\_\_\_

**PLOT PLAN (See Page 4):** On the separate enclosed sheet, graphically and approximately to scale, describe the proposed structure as it relates to its surroundings. Include: buildings, driveways, parking/loading areas, sign locations, fences, adjacent roadways, steep slope areas, distance of structures to road/boundary lines, lot dimensions, and other important features. Include 2 copies of any blue prints (1 copy will be returned to you with any required changes).

**ENVIRONMENTAL CONCERNS:** Prior to granting the building/zoning permit, assurances must be received that the applicant has complied with all environmental laws. County Health Department approved water and sewer is mandatory where applicable. Check which of the following laws apply: (1) Health (sewer & water)\_\_\_\_, (2) Flood



[illegible]



Left side depth of lot \_\_\_\_ ft.

Right side depth of lot \_\_\_\_ ft.

Frontage of lot \_\_\_\_ ft.

Street Name \_\_\_\_\_

Electrical Permit # \_\_\_\_\_

Sec. \_\_\_\_\_ Blk. \_\_\_\_\_ Lot \_\_\_\_\_

**APPLICATION FOR NEW OR EXTENDED ELECTRIC SERVICE**  
**TOWN OF PORTLAND**  
**(PLEASE PRINT CLEARLY AND FILL IN ALL BLANKS)**

NAME AND MAILING ADDRESSGENERAL CONTRACTORS INFORMATION

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



716-792-9614x4



87 W Main St, Brocton, NY 14716



716-792-9610



code@town.portland.ny.us

(Phone) \_\_\_\_\_ (Cell) \_\_\_\_\_ (Phone) \_\_\_\_\_ (Cell) \_\_\_\_\_

**WORKER'S COMPENSATION POLICY #** \_\_\_\_\_**(Copy of Policy or an approved Affidavit must be on file prior to issuance of the Permit)****PROPOSED WORK:**                      **New Service**                      **Alteration to an existing service****DESCRIPTION OF PROJECT:**    Single Phase                      Three Phase

Size of New Service in Amps: \_\_\_\_\_

Voltage: 120/240                      120/208                      277/480                      4800/320Y

Single Family                      Multi-Family                      Commercial

**Will any additional electric meters be required?** \_\_\_\_\_**List any single loads in excess of 2,000 watts:** \_\_\_\_\_**Describe the type of work to be performed:** \_\_\_\_\_**Name of Electrical Inspector:** \_\_\_\_\_**SIGNATURES: The above information is accurate to the best of my knowledge:****Owner of Property:** \_\_\_\_\_  
(Signature)    DATE**Applicant:** \_\_\_\_\_  
(Signature)    DATE**BUILDING INSPECTOR****DATE**



Code Enforcement/Zoning Office  
87 West Main Street, Brocton, New York 14716  
Telephone: (716) 792-9618  
Fax: (716) 792-9610

**THE PERMIT HOLDER MUST NOTIFY THE**  
**CODE ENFORCEMENT OFFICER AT (716) 792-9614**  
**WHEN ANY ELEMENT OF WORK INDICATED**  
**BELOW IS READY FOR INSPECTION.**

**WORK SHALL REMAIN ACCESSIBLE AND EXPOSED  
UNTIL INSPECTED AND ACCEPTED BY THE CODE  
ENFORCEMENT OFFICER OR AN INSPECTOR AUTHORIZED  
BY THE CODE ENFORCEMENT OFFICER.**

1. Footer (rebar in Trench)
2. Foundation Walls
3. Framing
4. Electrical
5. Plumbing
6. Insulation
7. Stairs/Deck
8. Code Enforcement Officer must do a Final Inspection  
**AND/OR** an Electrical Inspection Certificate must be  
received in our office

