

Town of Lenox / Village of Wampsville
Code Enforcement Office
205 S. Peterboro Street, Canastota, NY 13032
E-Mail: tolcodes@cnyemail.com / www.lenoxny.com
Josh Stagnitti Code Enforcement Office
315-697-5575 Fax: 315-697-5514

BUILDING PERMIT APPLICATION

(Swimming Pools, Spa's & Hot Tubs)

1. Project Location and Information

- a. Number and Street Address: _____
- b. Tax Map Number: _____
- c. Current use of premises: _____
- d. Proposed use of premises: _____

2. Owner Identification

- a. Owners name: _____
- b. Owners Address: _____
- c. Phone number: _____

3. Type of Construction or Improvement

- | | |
|--|---|
| <input type="checkbox"/> Above Ground Pool | <input type="checkbox"/> In Ground Pool |
| <input type="checkbox"/> Spa | <input type="checkbox"/> Hot Tub |
| <input type="checkbox"/> Decking | <input type="checkbox"/> Barrier (fencing). |
| <input type="checkbox"/> Electrical | <input type="checkbox"/> Pool Alarm |

4. Description of project:

5. Estimated Project Cost:

Official Use Only

Date Received: _____ Received By: _____

Special Review By: ☐ ZBA ☐ Planning BD ☐ Historic Review

Date Issued: _____ Approved By: _____

PERMIT NUMBER: _____

IMPORTANT NOTICES: READ BEFORE SIGNING!

1. Work conducted pursuant to a building permit must be visually inspected by the Code Enforcement Officer and must conform to the documents submitted, New York State Uniform Fire Prevention and Building Code and all applicable codes, rules and regulations.
2. It is the owner's responsibility to contact the Code Enforcement Office at 697-5575 at least 48 hours before any requested inspection. **DONOT PROCEED TO THE NEXT STEP OF CONSTRUCTION UNTIL INSPECTIONS HAVE BEEN COMPLETED.** Otherwise, work may need to be removed at the owners or contractors expense to conduct the required inspections. Close coordination with the Code Enforcement Office will greatly reduce this possibility.
3. **THE OWNER HEREBY AGREES TO ALLOW THE CODE ENFORCEMENT OFFICER TO INSPECT THE SUFFICIENCY OF THE WORK BEING DONE PURSUANT TO THIS PERMIT, PROVIDED HOWEVER, THAT SUCH INSPECTIONS ARE LIMITED TO THE WORK BEING CONDUCTED PURSUANT TO THIS PERMIT AND ANY OTHER NON WORK RELATED VIOLATIONS WHICH ARE READILY DISCERNIBLE FROM SUCH INSPECTIONS.**
4. New York State Law requires contractors to maintain Worker's Compensation and Disability Insurance for their employees. No permit will be issued unless a currently valid Worker's Comp and Disability Insurance certificate is attached to this application. If the contractor believes that they are not required to have the described insurance then the contractor must complete form C-105.21, attached hereto.
5. If a certificate of occupancy is required, the structure shall not be occupied until such certificate has been issued.
6. Work undertaken pursuant to this permit is conditioned upon and subject to any state and federal regulations relating to asbestos materials.
7. The building permit card must be displayed so as to be visible from the street nearest to the site of the work being conducted.

I _____, the above named applicant, hereby attest that I am the lawful owner or agent of the property described within and affirm under penalty of perjury that all statements made by me on this application are true.

(Signature) x _____ Date: _____

(Print Name) _____

(Title) _____

Current Requirements for Swimming Pools Contained in the Uniform Fire Prevention and Building Code (Uniform Code)

April 2011

For a printable PDF version of this document please [click here](#).

Definition of "Swimming Pool"

Barrier Requirements: Outdoor Residential Swimming Pools

Barrier Requirements: Indoor Residential Swimming Pools

Barrier Requirements: Public Swimming Pools

Temporary Pool Enclosures

Pool Alarm Requirements

Entrapment Protection Requirements

Design and Construction

Maintenance Requirements

Other Requirements

State Energy Conservation Construction Code

Endnotes

Introduction

The State Uniform Fire Prevention and Building Code (the "Uniform Code") is promulgated by the State Fire Prevention and Building Code Council (the "Code Council") pursuant to Article 18 of the Executive Law. The Uniform Code includes provisions contained in Parts 1219 to 1228 of Title 19 of the New York Code, Rules and Regulations (the "NYCRR") and the provisions contained in the publications that are mentioned in Parts 1220 to 1227. Those publications include the 2010 editions of the Residential Code of New York State, the Building Code of New York State, the Plumbing Code of New York State, the Mechanical Code of New York State, the Fuel Gas Code of New York State, the Fire Code of New York State, the Property Maintenance Code of New York State, and the Existing Building Code of New York.

The Uniform Code includes a number of provisions relating to swimming pools. This document is intended to summarize the requirements for swimming pools currently found in the Uniform Code.

Please note that local laws regarding fencing and other safety requirements for swimming pools may be more restrictive than requirements for swimming pools contained in the Uniform Code. If you are considering the purchase of a swimming pool, you should review the Uniform Code provisions summarized in this document and, in addition, you should consult the local laws, ordinances, codes and regulations of the municipality where the pool is to be installed for any further requirements.

Definition of "Swimming Pool"

The term "swimming pool" is defined in the Uniform Code as "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 fixed-in-place wading pools."¹

NOTE: A pool which is capable of containing more than 24 inches of water is a "swimming pool" (and is subject to all applicable Uniform Code provisions relating to "swimming pools") even if the pool is filled to a depth of less than 24 inches.

Back to Top

Barrier Requirements: Outdoor Residential Swimming Pools

An outdoor residential swimming pool must be provided with a barrier which completely surrounds the swimming pool and obstructs access to the swimming pool. The barrier may consist of a fence, a wall, a building wall, or any combination thereof.² The barrier must be at least 4 feet (48 inches) high, and must satisfy certain specified requirements (which are discussed in more detail below).

Access gates must satisfy the requirements applicable to barriers, as well as certain additional requirements (which are discussed in more detail below). In addition, access gates must 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.

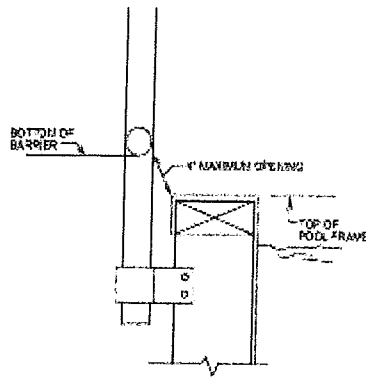
NOTE: In general, the barrier requirements discussed in this document apply to all swimming pools, without regard to the date of construction or installation of the pool.³

NOTE: As mentioned above, the definition of "swimming pool" includes hot tubs and spas. However, a hot tub or spa with a safety cover that complies with reference standard ASTM F 1346, entitled Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs, is exempt from the barrier requirements discussed here.

NOTE: The principal purpose of the Uniform Code's barrier requirements is to make swimming pools inaccessible to young children. The specific requirements discussed below are intended to prevent a child from crawling under the barrier, fitting through the barrier, or climbing over the barrier. The requirements for access gates are intended to prevent a child from opening an access gate.

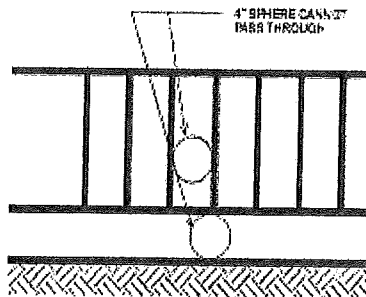
Barriers provided for outdoor residential swimming pools must satisfy the following requirements:

- The barrier must completely surround the swimming pool and must obstruct access to the swimming pool.
- The barrier must be at least 4 feet (48 inches) high.
- The space between the bottom of the barrier and the ground cannot exceed 2 inches.
- In the case of an above-ground pool, the barrier may be at ground level or mounted on top of the pool structure; however, if the barrier is mounted on top of the pool structure, the space between the top of the pool structure and the bottom of the barrier cannot exceed 4 inches. See Figure 3109.4.1 on Page 3.
- Any opening in the barrier must be small enough to prevent the passage of a 4-inch-diameter sphere through the opening. See Figure 3109.4.1.1 on Page 3.



For SI: 1 inch = 25.4 mm

Figure 3109.4.1
OPENING LIMITATIONS



For SI: 1 inch = 25.4 mm

Figure 3109.4.1.1
BARRIER OPENINGS

- A barrier that does not have openings, such as a masonry or stone wall, cannot contain indentations or protrusions (except for normal construction tolerances and tooled masonry joints).
- 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:
 - the horizontal members must be located on the swimming pool side of the fence;
 - the spacing between vertical members cannot exceed 1.75 inches; and
 - the spacing within any decorative cutouts in vertical members cannot exceed 1.75 inches. See Figure 3109.4.1.3 below.
- Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches or more:
 - the spacing between vertical members cannot exceed 4 inches; and
 - the spacing within any decorative cutouts in vertical members cannot exceed 1.75 inches. See Figure 3109.4.1.3 below.

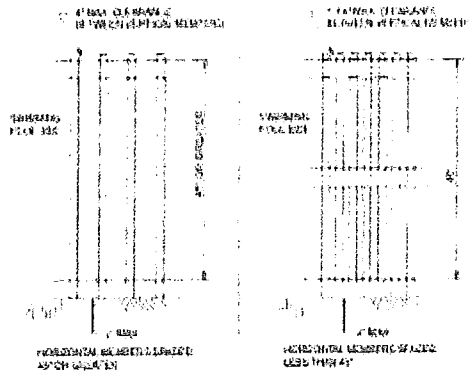


FIGURE 3109.4.1.1

PRIVATE SWIMMING POOL BARRIER CONSTRUCTION

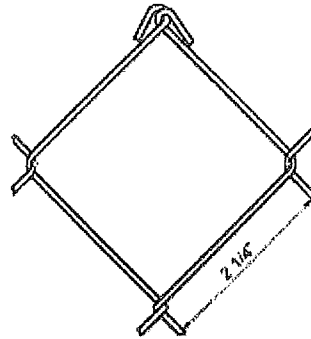


FIGURE 3109.4.1.6

CHAIN-LINK FENCE MESH FOR PRIVATE SWIMMING POOLS

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- If a chain link fence is used as the barrier, the mesh size cannot exceed 2.25-inch square unless the fence is provided with slats fastened at the top or the bottom which reduce the openings to not more than 1.75 inches. See Figure 3109.4.1.6 above.
- Where the barrier is composed of diagonal members, such as a lattice fence, the opening formed by the diagonal members cannot exceed 1.75 inches.
- Access gates must satisfy the requirements stated above, and with the following additional requirements:
 - All gates must be self-closing.
 - In addition, if the gate is a pedestrian access gate, the gate must open outward, away from the pool.

All gates shall be self-latching, 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 the bottom of the gate, 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.

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.

A building wall can form part of the required barrier. However, where a wall of a dwelling serves as part of the barrier, at least one of the following requirements must be satisfied:

the pool must be equipped with a powered safety cover in compliance with reference standard ASTM F1346, entitled Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs; or

all doors with direct access to the pool through that wall must be equipped with an alarm which:

1. produces an audible warning when the door and its screen, if present, are opened,
2. sounds continuously for a minimum of 30 seconds immediately after the door is opened,
3. is capable of being heard throughout the house during normal household activities,
4. automatically resets under all conditions, and

5. is equipped with a manual means, such as touchpad or switch, to deactivate the alarm temporarily for a single opening (such deactivation cannot last for more than 15 seconds, and the deactivation switch[es] must be located at least 54 inches above the threshold of the door); or

other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body and which afford a degree of protection not less than the protection afforded by the powered safety cover and door alarm described above, must be provided.

In the case of an above-ground pool, the pool structure itself can serve as a part of the required barrier, provided that the pool structure is sufficiently rigid to obstruct access to the pool. However, where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, then:

the ladder or steps shall be capable of being secured, locked or removed to prevent access, or the ladder or steps shall be surrounded by a complying swimming pool barrier ;

when the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter sphere.

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

Back to Top

Barrier Requirements: Indoor Residential Swimming Pools

All walls surrounding an indoor residential swimming pool must comply with the above-stated requirements for building walls used as all or part of a barrier around an outdoor residential swimming pool. ⁴

Back to Top

Barrier Requirements: Public Swimming Pools

A public swimming pool must be completely enclosed by a fence at least 4 feet in height or a screen enclosure. Openings in the fence must not permit the passage of a 4-inch diameter sphere. The fence or screen enclosure must be equipped with self-closing and self-latching gates.⁵

See also Section 302.7.2.1 of the *Property Maintenance Code of New York State*, which provides that an approved enclosure, at least 4 feet in height, must be provided around outdoor swimming pools, so that such pools are inaccessible to children. The enclosure may surround either the pool area or the property.

NOTE: The State Sanitary Code (10 NYCRR Chapter 1) is a regulation promulgated by the New York State Department of Health. Subpart 6-1 of the State Sanitary Code applies to all swimming pools except:

- (1) a swimming pool "owned and/or maintained by an individual for the use of his family and friends;
- (2) spa pools used under medical supervision or associated with hospitals; and
- (3) float tank or relaxation tank used for solitary body immersion in skin-temperature salt water."

Therefore, Subpart 6-1 applies to most "public" swimming pools. If a swimming pool is subject to the provisions of Subpart 6-1 of the State Sanitary Code, then:

- The pool must be enclosed within a fence or other barrier, at least four feet high, which can only be entered by bathers through self-closing and positive self-latching doors or gates;
- the knob or handle controlling the latch must be at least 40 inches above grade;
- the gate or door must be locked, and access to pool prevented, when the pool is not supervised;
- swimming pool fences constructed after the effective date of Subpart 6-1 (March 30, 1988) must meet the requirements of the Uniform Code; and
- in the case of a swimming pool fence constructed prior to March 30, 1988, no opening shall exceed four inches.

Back to Top

Temporary Pool Enclosures ⁶

During the installation or construction of a swimming pool, the swimming pool must be enclosed by a temporary enclosure. The temporary enclosure may consist of a temporary fence, a permanent fence, the wall of a permanent structure, any other structure, or any combination of the foregoing. However:

- all portions of the temporary enclosure must be at least four(4) feet high, and
- all components of the temporary enclosure must be sufficient to prevent access to the swimming pool by any person not engaged in the installation or construction process and to provide for the safety of all such persons.

The temporary enclosure must remain in place throughout the period of installation or construction of the swimming pool, and thereafter until the installation or construction of a permanent enclosure has been completed. The temporary enclosure must be replaced by a permanent enclosure. The permanent enclosure must comply with all applicable "Barrier Requirements" described at pages 2 to 7 of this publication, and with any additional requirements that may be imposed by any other New York State codes or regulations applicable to swimming pool enclosures or by any local law applicable to swimming pool enclosures and in effect in the location where the swimming pool has been installed or constructed.

The permanent enclosure must be completed within ninety days after the date of issuance of the building permit for the installation or construction of the swimming pool, or the date of commencement of the installation or construction of the swimming pool, whichever is later. (If the swimming pool is installed or constructed without the issuance of a building permit, the permanent enclosure must be completed within ninety days after the date of commencement of the installation or construction of the swimming pool - note, however, that this provision does not

permit the installation or construction of a pool without a building permit where such a permit is required by applicable law.) The local code enforcement official has authority to extend the 90 day period for completion of the permanent enclosure for good cause, such as a delay in construction caused by bad weather.

Back to Top

Pool Alarm Requirements ^z

Every swimming pool that is installed, constructed or substantially modified after December 14, 2006 must be equipped with an approved pool alarm which:

- is capable of detecting a child entering the water and giving an audible alarm when it detects a child entering the water;
- is audible poolside and at another location on the premises where the swimming pool is located;
- is installed, used and maintained in accordance with the manufacturer's instructions;
- is classified to reference standard ASTM F2208, entitled *Standard Specification for Pool Alarms* (either the version adopted in 2002 and editorially corrected in June 2005, or the version adopted in 2007); and
- is not an alarm device which is located on person(s) or which is dependent on device(s) located on person(s) for its proper operation.

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 must be installed.

Pool alarms are not required in:

- a hot tub or spa equipped with a safety cover classified to reference standard ASTM F1346 (2003), entitled *Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs*, or
- any swimming pool (other than a hot tub or spa) equipped with an automatic power safety cover classified by to reference standard ASTM F1346 (2003).

Back to Top

Entrapment Protection Requirements ⁸

- Suction outlets must be designed to produce circulation throughout the pool or spa.
- Single outlet systems, such as automatic vacuum cleaner systems, or other such multiple suction outlets whether isolated by valves or otherwise must be protected against user entrapment.
- All pool and spa suction outlets (except surface skimmers) must be provided with:
 - a cover that conforms with reference standard ASME/ANSI A112.19.8M, entitled *Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Appliances*, or

- a drain gate that is 18" × 23" or larger, or
 - a channel drain system approved by the local code enforcement official.
- All pool and spa single or multiple outlet circulation systems must be equipped with atmospheric vacuum relief should grate covers located therein become missing or broken. Such vacuum relief systems shall include at least one the following:
 - safety vacuum release system conforming to reference standard ASME A112.19.17, entitled *Manufacturers Safety Vacuum Release Systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub and Wading Pool*, or
 - a gravity drainage system approved by the local code enforcement official.
- Single or multiple pump circulation systems must be provided with a minimum of two (2) suction outlets of the approved type.
- The suction outlets must be separated by a minimum horizontal or vertical distance of three (3) feet.
- These suction outlets must be piped so that water is drawn through them simultaneously through a vacuum relief-protected line to the pump or pumps.
- If the pool or spa is equipped with vacuum or pressure cleaner fitting(s), each fitting must be located:
 - in an accessible position which is at least six (6) inches and not greater than twelve (12) inches below the minimum operational water level, or
 - as an attachment to the skimmer(s).

Back to Top

Design and Construction Requirements

In-ground pools must be designed and constructed in conformance with reference standard ANSI/NSPI-5, entitled *Standard for Residential In-ground Swimming Pools*.²

Above-ground and on-ground pools must be designed and constructed in conformance with reference standard ANSI/NSPI-4, entitled *Standard for Above-ground/On-ground Residential Swimming Pools*.¹⁰

NOTE: A "public" swimming pool that is subject to Subpart 6-1 of the State Sanitary Code must comply with the design standards and construction provisions of Subpart 6-1.

Back to Top

Maintenance Requirements

The *Property Maintenance Code of New York State* provides that swimming pools must be maintained in a clean and sanitary condition, and in good repair.¹¹

NOTE: A "public" swimming pool that is subject to Subpart 6-1 of the State Sanitary Code must comply with the operation, supervision and maintenance provisions of Subpart 6-1.

Back to Top

Other Requirements

Many other technical requirements are covered by the Uniform Code:

- **Safety glazing material** is required in the walls and fences enclosing indoor and outdoor swimming pools where certain conditions are met. See *Building Code of New York State* Section 2406.2.9.
- **Support provisions for membrane structures:** see *Building Code of New York State* Section 3102.8.3.
- **Recirculation of supply air** to a swimming pool and associated deck areas: see *Mechanical Code of New York State* Section 403.2.1.2.
- Regulation of **solar heating systems:** see *Mechanical Code of New York State* Section 1401.
- Swimming pools shall be **protected against backflow** in accordance with *Plumbing Code of New York State* Section 608. See *Plumbing Code of New York State* Section 423.1.
- Where **waste water from swimming pools**, backflow from filters and water from pool deck drains discharge to the building drainage system, the discharge must be through an indirect waste pipe via an air gap. See *Plumbing Code of New York State* Section 802.1.4.
- **Suction fittings for use in swimming pools** shall comply with reference standard ASME/ANSI A112.19.8M, entitled *Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Appliances*. See *Residential Code of New York State* Section 2701.1.
- The installation of **electric wiring and equipment associated with swimming pools**, wading pools, hot tubs and spas, and hydromassage bathtubs, whether permanently installed or storable, and metallic auxiliary equipment, such as pumps, filters and similar equipment, are subject to the provisions of Chapter 41 of the *Residential Code of New York State*. For example:
 - Section 4102 contains requirements for wiring methods.

- Section 4103 contains requirements for equipment locations and clearances.
- Section 4104 contains requirements for the bonding of metallic parts, and permitted methods of bonding.
- Section 4105 contains requirements for the grounding of equipment.
- Section 4106 contains requirements for the installation of equipment.
- Section 4107 contains special provisions for storable swimming pools.
- Section 4108 contains special provisions for spas and hot tubs.
- Section 4109 contains special provisions for hydromassage bathtubs.

Back to Top

State Energy Conservation Construction Code

The *State Energy Conservation Construction Code of New York State* (Energy Code) is promulgated by the Code Council pursuant to Article 11 of the Energy Law. The Energy Code is included provisions in Part 1240 of Title 19 of the NYCRR and in the publication mentioned in that Part. That publication is the *Energy Conservation Construction Code of New York State*.

Energy conservation requirements for residential and commercial swimming pools can be found in Chapters 4 and 5 of the Energy Code.

Back to Top

ENDNOTES

1. See 19 NYCRR Sections 1220.1(d)(7), 1221.1(d)(2), 1222.1(c)(1), 1228.2(b)(4), and 1228.4(b)(3).
2. See *Residential Code of New York State*, Appendix G, Section 105.2 and the definitions in *Residential Code of New York State*, Appendix G, Section 102.1. See also *Property Maintenance Code of New York State* Section 302.7.2.1, which provides that an approved enclosure, at least 4 feet in height, must be provided around outdoor swimming pools, so that such pools are inaccessible to children.
3. See *Tarquini v. Town of Aurora*, 77 N.Y.2d 354 (1991).
4. See *Residential Code of New York State*, Appendix G, Section 105.3.
5. See *Building Code of New York State* Section 3109.3.
6. See 19 NYCRR, Part 1228, Section 1228.4.
7. See 19 NYCRR, Part 1228, Section 1228.2.
8. See *Residential Code of New York State*, Appendix G, Section 106.
9. See *Residential Code of New York State*, Appendix G, Section 103.1.

10. See *Residential Code of New York State*, Appendix G, Section 103.2.

11. See *Property Maintenance Code of New York State* Section 302.7.2

CHAPTER R42

SWIMMING POOLS

SRE4201: GENERAL

SRE4201.1 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 RE4202 through RE4206 provide general rules for permanent pools, spas and hot tubs. Section RE4207 provides specific rules for storable pools and storable/portable spas and hot tubs. Section RE4208 provides specific rules for spas and hot tubs. Section RE4209 provides specific rules for hydromassage bathtubs. (680.1)

SRE4201.2 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. Those that are constructed on or above the ground and are capable of holding water with a maximum depth of 42 inches (1067 mm), or a pool 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.

SRE4202: WIRING METHODS FOR POOLS, SPAS, HOT TUBS AND HYDROMASSAGE BATHTUBS

SRE4202.1 General.

Wiring methods used in conjunction with permanently installed swimming pools, spas, hot tubs or hydromassage bathtubs shall be installed in accordance with Table RE4202.1 and Chapter R38 except as otherwise stated in this section. Storable swimming pools shall comply with Section RE4207. [680.7; 680.21(A); 680.23(B) and (F); 680.25(A); 680.42; 680.43; and 680.70]

TABLE RE4202.1

ALLOWABLE APPLICATIONS FOR WIRING METHODS^a, b, c, d, e, f, g, h, k

For SI: 1 foot = 304.8 mm.

- a. For all wiring methods, see Section RE4205 for equipment grounding conductor requirements.
- b. Limited to use within buildings.
- c. Limited to use on or within buildings.
- d. Metal conduit shall be constructed of brass or other approved corrosion-resistant metal.
- e. Limited to where necessary to employ flexible connections at or adjacent to a pool motor.
- f. Sections installed external to spa or hot tub enclosure limited to individual lengths not to exceed 6 feet. Length not limited inside spa or hot tub enclosure.

- g. Flexible cord shall be installed in accordance with Section RE4202.2.
- h. Nonmetallic conduit shall be rigid polyvinyl chloride conduit Type PVC or reinforced thermosetting resin conduit Type RTRC.
- i. Aluminum conduits shall not be permitted in the pool area where subject to corrosion.
- j. Where installed as direct burial cable or in wet locations, Type MC cable shall be listed and identified for the location.
- k. See Section RE4202.3 for listed, double-insulated pool pump motors.
- 1. 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.

SRE4202.2 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. [680.7(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)]

SRE4202.3 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 R38 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 RE4204.2, Item 6.1, the branch circuit wiring shall comply with Sections RE4202.1 and RE4205.5. [680.21(B)]

SRE4203: EQUIPMENT LOCATION AND CLEARANCES

SRE4203.1 Receptacle outlets.

Receptacles outlets shall be installed and located in accordance with Sections RE4203.1.1 through RE4203.1.5. 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)]

SRE4203.1.1 Location.

Receptacles that provide power for water-pump motors or other loads directly related to the circulation and sanitation system shall be permitted to be located between 6 feet and 10 feet (1829 mm and 3048 mm) from the inside walls of pools and outdoor spas and hot tubs, where the receptacle is single and of the grounding type and protected by ground-fault circuit interrupters.

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)(2) and (A)(3)]

SRE4203.1.2 Where required.

At least one 125-volt, 15- or 20-ampere receptacle supplied by a general-purpose branch circuit shall be located a minimum of 6 feet (1829 mm) from and not more than 20 feet (6096 mm) from the inside wall of 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)]

SRE4203.1.3 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)]

SRE4203.1.4 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)]

SRE4203.1.5 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)]

SRE4203.2 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]

SRE4203.3 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.
(680.12)

SRE4203.4 Luminaires and ceiling fans.

Lighting outlets, luminaires, and ceiling-suspended paddle fans shall be installed and located in accordance with Sections RE4203.4.1 through RE4203.4.6. [680.22(B)]

SRE4203.4.1 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)]

SRE4203.4.2 Indoor locations.

In indoor pool areas, the limitations of Section RE4203.4.1 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; and
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)]

SRE4203.4.3 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 RE4206.1 shall be permitted to be located less than 1.5 m (5 ft) from the inside walls of the pool.
[680.22(B)(6)]

SRE4203.4.4 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)]

SRE4203.4.5 Indoor spas and hot tubs.

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

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

2. Luminaires protected by a ground-fault circuit interrupter and complying with Item 2.1 or 2.2 shall be permitted to be installed less than 7 feet, 6 inches (2286 mm) over a spa or hot tub.

2.1. Recessed luminaires shall have a glass or plastic lens and nonmetallic or electrically isolated metal trim, and shall be suitable for use in damp locations.

2.2. Surface-mounted luminaires shall have a glass or plastic globe and a nonmetallic body or a metallic body isolated from contact. Such luminaires shall be suitable for use in damp locations. [680.43(B)(1)(c)]

§RE4203.4.6 GFCI protection in adjacent areas.

Luminaires and outlets 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 fixtures and outlets 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)]

§RE4203.5 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 RE4203.1. [680.22(D)]

TABLE RE4203.5

[Table R680.8(A)] OVERHEAD CONDUCTOR CLEARANCES

For SI: 1 foot = 304.8 mm.

§RE4203.6 Overhead conductor clearances.

Except where installed with the clearances specified in Table RE4203.5, 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 RE4203.5 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)]

§RE4203.7 Underground wiring.

Underground wiring shall not be installed under or within the area extending 5 feet (1524 mm) horizontally from the inside walls of pools and outdoor hot tubs and spas except where the wiring is installed to supply pool, spa or hot tub equipment or where space limitations prevent wiring from being routed 5 feet (1524 mm) or more horizontally from the inside walls. Where installed within 5 feet (1524 mm) of the inside walls, the wiring method shall be a complete raceway system of rigid metal conduit, intermediate metal conduit or a nonmetallic raceway system. Metal conduit shall be corrosion resistant and suitable for the location. The minimum cover depth shall be in accordance with Table RE4203.7. (680.10)

TABLE RE4203.7
(680.10) MINIMUM BURIAL DEPTHS

WIRING METHOD	UNDERGROUND WIRING (inches)
Rigid metal conduit	6
Intermediate metal conduit	6
Nonmetallic raceways listed for direct burial and under concrete exterior slab not less than 4 inches in thickness and extending not less than 6 inches (162 mm) beyond the underground installation	6
Nonmetallic raceways listed for direct burial without concrete encasement	18
Other approved raceways ^a	18
For SI: 1 inch = 25.4 mm.	

a. Raceways approved for burial only where concrete-encased shall require a concrete envelope not less than 2 inches in thickness.

SRE4204: BONDING

SRE4204.1 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.

SRE4204.2 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. Structural reinforcing steel. Unencapsulated structural reinforcing steel shall be bonded together by steel tie wires or the equivalent. Where structural

reinforcing steel is encapsulated in a nonconductive compound, a copper conductor grid shall be installed in accordance with Item 1.2.

1.2. Copper conductor grid. A copper conductor grid shall be provided and shall comply with Items 1.2.1 through 1.2.4:

1.2.1. It shall be constructed of minimum 8 AWG bare solid copper conductors bonded to each other at all points of crossing.

1.2.2. It shall conform to the contour of the pool .

1.2.3. It shall be arranged in a 12-inch (305 mm) by 12-inch (305 mm) network of conductors in a uniformly spaced perpendicular grid pattern with a tolerance of 4 inches (102 mm).

1.2.4. It shall be secured within or under the pool not more than 6 inches (152 mm) from the outer contour of the pool shell. [680.26(B)(1)]

2. Perimeter surfaces. The perimeter surface shall 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 extend less than 3 feet (914 mm) beyond the inside wall of the pool and that are separated from the pool by a permanent wall or building 5 feet (1524 mm) or more in height shall require equipotential bonding 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. The spa or hot tub is listed as a self-contained spa for aboveground use.

1.2. The spa or hot tub is not identified as suitable only for indoor use.

1.3. The installation is in accordance with the manufacturer's instructions and is located on or above grade.

1.4. To top rim of the spa or hot tub is not less than 28 in. (711 mm) above all perimeter surfaces that are within 30 in. (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.

2.1. Structural reinforcing steel. Structural reinforcing steel shall be bonded in accordance with Item 1.1.

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:

2.2.1. At least one minimum 8 AWG bare solid copper conductor shall be provided.

2.2.2. The conductors shall follow the contour of the perimeter surface.

2.2.3. Splices shall be listed.

2.2.4. The required conductor shall be 18 to 24 inches (457 to 610 mm) from the inside walls of the pool.

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]

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)]

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]

SRE4204.3 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 in.2 (5800 mm²) 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 RE4204.2.

SRE4204.4 Bonding of outdoor hot tubs and spas.

Outdoor hot tubs and spas shall comply with the bonding requirements of Sections RE4204.1 through RE4204.3. 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 RE4204.2. [680.42 and 680.42(B)]

SRE4204.5 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)]

SRE4204.5.1 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)]

SRE4204.5.2 Connections.

Connections to bonded parts shall be made in accordance with Section RE3406.13.1.

SRE4205: GROUNDING

SRE4205.1 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)

SRE4205.2 Luminaires and related equipment.

Other than listed low-voltage luminaires not requiring grounding, all through-wall lighting assemblies, wet-niche, dry-niche, or no-niche luminaires shall be connected to an insulated copper equipment grounding conductor sized in accordance with Table RE3908.12 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 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)(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)]

SRE4205.3 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)]

SRE4205.4 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)]

SRE4205.5 Motors.

Pool-associated motors shall be connected to an insulated copper equipment grounding conductor sized in accordance with Table RE3908.12, but not smaller than 12 AWG. Where the branch circuit supplying the motor is installed in the interior of a one-family dwelling or in the interior of accessory buildings associated with a one-family dwelling, using a cable wiring method permitted by Table RE4202.1, an uninsulated equipment grounding conductor shall be permitted provided that it is enclosed within the outer sheath of the cable assembly. [680.21(A)(1) and (A)(4)]

SRE4205.6 Feeders.

An equipment grounding conductor shall be installed with the feeder conductors between the grounding terminal of the pool equipment panelboard and the grounding terminal of the applicable service equipment. The equipment grounding conductor shall be insulated, shall be sized in accordance with Table RE3908.12, and shall be not smaller than 12 AWG.

SRE4205.6.1 Separate buildings.

A feeder to a separate building or structure shall be permitted to supply swimming pool equipment branch circuits, or feeders supplying swimming pool equipment branch circuits, provided that the grounding arrangements in the separate building meet the requirements of Section RE3607.3. The feeder equipment grounding conductor shall be an insulated conductor. [680.25(B)(2)]

SRE4205.7 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 RE4202.2, 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)]

SRE4205.8 Other equipment.

Other electrical equipment shall be grounded in accordance with Section RE3908. (Article 250, Parts V, VI, and VII; and 680.6)

SRE4206: EQUIPMENT INSTALLATION

SRE4206.1 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 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)]

SRE4206.2 Ground-fault circuit-interrupters.

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

SRE4206.3 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 RE4206.4, 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)]

SRE4206.4 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 RE4206.1, 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, a ground-fault circuit-interrupter shall be installed in the branch circuit supplying luminaires operating at more than the low-voltage contact limit, such that there is no shock hazard during relamping. 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)]

SRE4206.4.1 Maximum voltage.

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

SRE4206.4.2 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)]

SRE4206.5 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 RE4206.9. 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)]

SRE4206.5.1 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)]

SRE4206.6 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 RE4206.9 if the luminaire is specifically identified for the purpose. [680.23(C)(1) and (C)(2)]

SRE4206.7 No-niche luminaires.

No-niche luminaires shall be listed for the purpose and shall be installed in accordance with the requirements of Section RE4206.5. Where connection to a forming shell is specified, the connection shall be to the mounting bracket. [680.23(D)]

SRE4206.8 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 RE4205.4 and be installed in accordance with the requirements of Section RE4206.5. Where connection to a forming shell is specified, the connection shall be to the conduit termination point. [680.23(E)]

SRE4206.9 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 the following: [680.24(A)]

SRE4206.9.1 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)]

SRE4206.9.2 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)]

SRE4206.9.3 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)]

SRE4206.9.4 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)]

SRE4206.9.5 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)]

SRE4206.10 Underwater audio equipment.

Underwater audio equipment shall be identified for the purpose. [680.27(A)]

SRE4206.10.1 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)]

SRE4206.10.2 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 RE4206.9. 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)]

SRE4206.10.3 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)]

SRE4206.11 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. [680.27(B)(1) and (B)(2)]

SRE4206.12 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)

SRE4206.13 Pool area heating.

The provisions of Sections RE4206.13.1 through RE4206.13.3 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)]

SRE4206.13.1 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)]

SRE4206.13.2 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)]

SRE4206.13.3 Radiant heating cables prohibited.

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

**SRE4207: STORABLE SWIMMING POOLS, STORABLE SPAS,
AND STORABLE HOT TUBS**

SRE4207.1 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)

SRE4207.2 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)

SRE4207.3 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 RE4207.3.1 or RE4207.3.2. (680.33)

SRE4207.3.1 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 RE4206.1 with a primary rating not over 150 volts; and
4. Have no exposed metal parts. [680.33(A)]

SRE4207.3.2 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 RE4206.4.
5. It has no exposed metal parts. [680.33(B)]

SRE4207.4 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)

SRE4207.5 Clearances.

Overhead conductor installations shall comply with Section RE4203.6 and underground conductor installations shall comply with Section RE4203.7.

SRE4207.6 Disconnecting means.

Disconnecting means for storable pools and storable/portable spas and hot tubs shall comply with Section RE4203.3.

SRE4207.7 Ground-fault circuit interrupters.

Ground-fault circuit interrupters shall comply with Section RE4206.2.

SRE4207.8 Grounding of equipment.

Equipment shall be grounded as required by Section RE4205.1.

SRE4207.9 Pool water heaters.

Electric pool water heaters shall comply with Section RE4206.12.

SRE4208: SPAS AND HOT TUBS

SRE4208.1 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)]

SRE4208.2 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)

SRE4208.3 Underwater audio equipment.

Underwater audio equipment used with spas and hot tubs shall comply with the provisions of Section RE4206.10. [680.43(G)]

SRE4208.4 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 single-family dwellings. (680.41)

SRE4209: HYDROMASSAGE BATHTUBS

SRE4209.1 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)

SRE4209.2 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)

SRE4209.3 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)

SRE4209.4 Bonding.

Both metal piping systems and grounded metal parts in contact with the circulating water shall be bonded together using an insulated, covered or bare solid copper bonding jumper not smaller than 8 AWG. The bonding jumper shall be connected to the terminal on the circulating pump motor that is intended for this purpose. The bonding jumper shall not be required to be connected to a double insulated circulating pump motor. The 8 AWG or larger solid copper bonding jumper 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 any electrode. Where a double-insulated circulating pump motor is used, the 8 AWG or larger solid copper bonding jumper shall be long enough to terminate on a replacement nondouble-insulated pump motor and shall be terminated to the equipment grounding conductor of the branch circuit for the motor. (680.74)

