



ELECTRICAL

**PART 1 OF 1
WITH COMMENTS**

Proposed Code Modifications

**This document created by the Florida Department of Business and Professional Regulation -
850-487-1824**

Date Submitted	7/31/2012	Section	4201 Swimming Pools	Proponent	BOAF CDC
Chapter	42	Affects HVHZ	No	Attachments	No
TAC Recommendation	No Affirmative Recommendation with a Second			NAR with A Second by the Swimming Pool TAC	
Commission Action	Pending Review				

Comments

General Comments No **Alternate Language** Yes

Related Modifications

Revise Section 454 FBCB to reference International Swimming Pool and Spa Code (ISPSC)
 Add reference standard in ch 35 FBCB International Swimming Pool and Spa Code (ISPSC)
 Add reference standard in ch 44 FBCR International Swimming Pool and Spa Code (ISPSC)

Summary of Modification

The ICC codes are the base code for Florida, there is now an International Swimming Pool and Spa Code (ISPSC) and that should be the base code for Florida.

Rationale

The ICC codes are the base code for Florida, there is now an International Swimming Pool and Spa Code (ISPSC) and that should be the base code for Florida, and should be added as the referenced standard.

Fiscal Impact Statement**Impact to local entity relative to enforcement of code**

None, the International Swimming Pool and Spa Code (ISPSC) is similar to the current Florida requirements and will provide the same level of lifesafety.

Impact to building and property owners relative to cost of compliance with code

None, the International Swimming Pool and Spa Code (ISPSC) is similar to the current Florida requirements and will provide the same level of lifesafety.

Impact to industry relative to the cost of compliance with code

None, the International Swimming Pool and Spa Code (ISPSC) is similar to the current Florida requirements and will provide the same level of lifesafety.

Requirements**Has a reasonable and substantial connection with the health, safety, and welfare of the general public**

The International Swimming Pool and Spa Code (ISPSC) is similar to the current Florida requirements and will provide the same level protection of health, safety and welfare.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The International Swimming Pool and Spa Code (ISPSC) is similar to the current Florida requirements and will provide the same level of lifesafety, and is a consensus code that will follow the same tri annual review and update process as the rest of the base codes.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The International Swimming Pool and Spa Code (ISPSC) is similar to the current Florida requirements and will provide the same level of lifesafety, and does not discriminate against materials, products, methods, or systems of construction.

Does not degrade the effectiveness of the code

The International Swimming Pool and Spa Code (ISPSC) is similar to the current Florida requirements and will provide the same level of lifesafety.

Is the proposed code modification part of a prior code version? No

5841-A1

Proponent	BOAF CDC	Submitted	12/14/2012	Attachments	Yes
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Rationale

The ICC codes are the base code for Florida, there is now an International Swimming Pool and Spa Code (ISPSC) and that should be the base code for Florida. The International Swimming Pool and Spa Code (ISPSC) is based in part on the Florida provisions and is a consensus code that will follow the same tri annual review and update process as the rest of the base codes.

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Is the proposed code modification part of a prior code version? No

Revise Chapter 42 of the Florida Building Code, Residential as follows

Revise as follows:

Part VIII-Electrical

Chapter 42

SWIMMING POOLS

SECTION E4201 GENERAL

E4201.1 Scope.

The provisions of the International Swimming Pool and Spa Code (ISPSC) 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.

~~**SECTION E4201 GENERAL**~~

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~~**E4201.2 Definitions.**~~

~~**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 OR WADING POOL.** 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.~~

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, hot tubs or hydromassage bathtubs shall be installed in accordance with Table E4202.1 and [Chapter 38](#) except as otherwise stated in this section. Storable swimming pools shall comply with [Section E4207](#).

TABLE E4202.1 ALLOWABLE APPLICATIONS FOR WIRING METHODS^{a, b, c, d, e, f, g, h, i}

WIRING LOCATION OR PURPOSE (Application allowed where marked with an "A")	AC, FMC, NM, SR, SE	EMT	ENT	IMC^d, RMC^d, RNC^d	LFMC	LFNMC	UF	MC^k	FLEX CORD
Panelboard(s) that supply pool equipment: from service equipment to panelboard	A ^{b,c} SR not permitted	A ^e	A ^b	A	—	A	A ^e	A ^e	—
Wet niche and no niche luminaires: from branch circuit OCPD to deck or junction box	AC ^b only	A ^e	A ^b	A	—	A	—	A ^b	—
Wet niche and no niche luminaires: from deck or junction box to forming shell	—	—	—	A ^d	—	A	—	—	A ^h
Dry niche: from branch circuit OCPD to luminaires	AC ^b only	A ^e	A ^b	A	—	A	—	A ^b	—
Pool associated motors: from branch circuit OCPD to motor	A ^b	A ^e	A ^b	A	A ^f	A ^f	A ^b	A	A ^h
Packaged or self-contained outdoor spas and hot tubs with underwater luminaire: from branch circuit OCPD to spa or hot tub	AC ^b only	A ^e	A ^b	A	A ^g	A ^g	—	A ^b	A ^h
Packaged or self-contained outdoor spas and hot tubs without underwater luminaire: from branch circuit OCPD to spa or hot tub	A ^b	A ^e	A ^b	A	A ^g	A ^g	A ^b	A	A ^h
Indoor spas and hot tubs, hydromassage bathtubs, and other pool, spa or hot tub associated equipment: from branch circuit OCPD to equipment	A ^b	A ^e	A ^b	A	A	A	A	A	A ^h
Connection at pool lighting transformers or power supplies	AC ^b only	A ^e	A ^b	A	A ^{m,g}	A ^g	—	A ^b	—

For SI: 1 foot = 304.8 mm.

a. For all wiring methods, see [Section E4205](#) 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. Permitted only for existing installations in accordance with the exception to [Section E4205.6](#).~~
- ~~f. Limited to where necessary to employ flexible connections at or adjacent to a pool motor.~~
- ~~g. 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.~~
- ~~h. Flexible cord shall be installed in accordance with Section E4202.2.~~
- ~~i. Nonmetallic conduit shall be rigid polyvinyl chloride conduit Type PVC or reinforced thermosetting resin conduit Type RTRC.~~
- ~~j. Aluminum conduits shall not be permitted in the pool area where subject to corrosion.~~
- ~~k. Where installed as direct burial cable or in wet locations, Type MC cable shall be listed and identified for the location.~~
- ~~l. See Section E4202.3 for listed, double-insulated pool pump motors.~~
- ~~m. Limited to use in individual lengths not to exceed 6 feet. The total length of all individual runs of LEMC shall not exceed 10 feet.~~

E4202.2 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.~~
- ~~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.~~
- ~~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.~~
- ~~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.~~
- ~~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.~~

E4202.3 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 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](#).~~

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.

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 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 locking and 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.

E4203.1.2 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.

E4203.1.3 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 from branch circuits with short circuit and ground fault protection rated 15 or 20 amperes, 125 volts through 240 volts, single phase, whether by receptacle or direct connection, shall be provided with ground fault circuit interrupter protection for personnel.

E4203.1.4 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.

E4203.1.5 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.

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.

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.

E4203.4 Luminaires and ceiling fans.

~~Lighting outlets, luminaires, and ceiling suspended paddle fans shall be installed and located in accordance with Sections E4203.4.1 through E4203.4.5.~~

~~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.~~

~~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. A ground fault circuit interrupter is installed in the branch circuit supplying the luminaires or ceiling suspended (paddle) fans; and~~
- ~~3. 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).~~

~~E4203.4.3 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.~~

~~E4203.4.4 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 a minimum of 7 feet, 6 inches (2286 mm) above the maximum water level and shall be protected by a ground fault circuit interrupter.~~

~~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.~~

- ~~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.~~

~~E4203.4.5 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.~~

~~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.~~

TABLE E4203.5 OVERHEAD CONDUCTOR CLEARANCES

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

For SI: 1 foot = 304.8 mm.

~~E4203.6 Overhead conductor clearances.~~

~~Except where installed with the clearances specified in Table E4203.5, the following parts of pools and outdoor spas and hot tubs shall not be placed under existing service drop conductors or any other open overhead wiring; nor shall such wiring be installed above the following:~~

- ~~1. Pools and the areas extending 10 feet (3048 mm) horizontally from the inside of the walls of the pool;~~
- ~~2. Diving structures; or~~
- ~~3. Observation stands, towers, and platforms.~~

~~Overhead conductors of network powered broadband communications systems shall comply with the provisions in Table E4203.5 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.~~

~~E4203.7 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 E4203.7.~~

TABLE E4203.7 MINIMUM BURIAL DEPTHS

WIRING METHOD	UNDERGROUND (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*	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.

SECTION E4204 BONDING

E4204.1 Performance.

The equipotential bonding required by this section shall be installed to reduce voltage gradients in the pool area as prescribed.

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.

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 and the pool deck.~~

~~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.~~

~~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.~~

~~Exception: 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.~~

~~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.~~

~~4. Underwater lighting. All metal forming shells and mounting brackets of no niche luminaires shall be bonded.~~

~~Exception: Listed low voltage lighting systems with nonmetallic forming shells shall not require bonding.~~

~~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.~~

~~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.~~

~~Exception: Metal parts of listed equipment incorporating an approved system of double insulation shall not be bonded.~~

~~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.~~

~~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.~~

~~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.~~

~~Exceptions:~~

~~1. Those separated from the pool by a permanent barrier that prevents contact by a person shall not be required to be bonded.~~

~~2. Those greater than 5 feet (1524 mm) horizontally from the inside walls of the pool shall not be required to be bonded.~~

~~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.~~

~~E4204.3 Pool water.~~

~~The pool water shall be intentionally bonded by means of a conductive surface area not less than 9 square inches (5806 mm²) installed in contact with the pool water. This bond shall be permitted to consist of parts that are required to be bonded in 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.~~

~~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.~~

~~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.~~

~~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.~~

~~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.~~

~~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.~~

~~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.~~

~~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.~~
- ~~2. Metal to metal mounting on a common frame or base.~~
- ~~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.~~

~~E4204.5.2 Connections.~~

~~Connections shall be made by exothermic welding or 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. 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.~~

~~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.~~

~~E4205.2 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 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 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.

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.
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.

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.

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.

E4205.5 Motors.

Pool associated motors shall be connected to an insulated copper equipment grounding conductor sized in accordance with Table E3908.12, 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 E4202.1, an uninsulated equipment grounding conductor shall be permitted provided that it is enclosed within the outer sheath of the cable assembly.

E4205.6 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 or source of a separately derived system. The equipment grounding conductor shall be insulated, shall be sized in accordance with Table E3908.12, and shall be not smaller than 12 AWG.

Exception: An existing feeder between an existing remote panelboard and service equipment shall be permitted to run in flexible metal conduit or an approved cable assembly that includes an equipment grounding conductor within its outer sheath. The equipment grounding conductor shall not be connected to the grounded conductor in the remote panelboard.

E4205.6.1 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 E3607.3](#). Where installed in other than existing feeders covered in the exception to Section E4205.6, a separate equipment grounding conductor shall be an insulated conductor.

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 E4202.2](#), 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.

E4205.8 Other equipment.

Other electrical equipment shall be grounded in accordance with [Section E3908](#).

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 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.

E4206.2 Ground fault circuit interrupters.

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

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.

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, 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.

E4206.4.1 Maximum voltage.

Luminaires shall not be installed for operation on supply circuits over 150 volts between conductors.

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.

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.

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.

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.

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.

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.

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.

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.

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 the following:

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;
2. Equipped with threaded entries or hubs or a nonmetallic hub;

~~3. Constructed of copper, brass, suitable plastic, or other approved corrosion resistant material;~~

~~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~~

~~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.~~

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;~~

~~2. Equipped with threaded entries or hubs or a nonmetallic hub;~~

~~3. Provided with an approved seal, such as duct seal at the conduit connection, that prevents circulation of air between the conduit and the enclosure;~~

~~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 enclosure; and~~

~~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.~~

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.~~

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.~~

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.~~

E4206.10 Underwater audio equipment.

~~Underwater audio equipment shall be identified for the purpose.~~

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.~~

~~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.~~

~~E4206.10.3 Forming shell and metal screen.~~

~~The forming shell and metal screen shall be of brass or other approved corrosion resistant metal. All forming shells shall include provisions for terminating an 8 AWG copper conductor.~~

~~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 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.~~

~~E4206.12 Electric pool water heaters.~~

~~All 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.~~

~~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.~~

~~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.~~

~~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.~~

~~E4206.13.3 Radiant heating cables prohibited.~~

~~Radiant heating cables embedded in or below the deck shall be prohibited.~~

SECTION E4207 STORABLE SWIMMING POOLS

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.~~

~~**E4207.2 Ground fault circuit interrupters required.**~~

~~Electrical equipment, including power supply cords, used with storable pools shall be protected by ground fault circuit interrupters. All 125 volt, 15 and 20 ampere receptacles located within 20 feet (6096 mm) of the inside walls of a storable pool 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.~~

~~**E4207.3 Luminaires.**~~

~~Luminaires for storable pools 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.~~

~~**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.~~

~~**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.~~

~~**E4207.4 Receptacle locations.**~~

~~Receptacles shall be located not less than 6 feet (1829 mm) from the inside walls of a pool. 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.~~

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.~~

~~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.~~

~~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.~~

~~E4208.3 Underwater audio equipment.~~

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

~~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 single family dwellings.~~

SECTION E4209 HYDROMASSAGE BATHTUBS**~~E4209.1 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).~~

~~E4209.2 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.~~

~~E4209.3 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.~~

~~E4209.4 Bonding.~~

~~All metal piping systems and all 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.~~

Revise Chapter 42 of the Florida Building Code, Residential as follows

Revise as follows:

Part VIII-Electrical
Chapter 42
SWIMMING POOLS

SECTION E4201 GENERAL

E4201.1 Scope.

The provisions of the International Swimming Pool and Spa Code (ISPSC) 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.

~~**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. Section E4208 provides specific rules for spas and hot tubs. Section E4209 provides specific rules for hydromassage bathtubs.~~

~~**E4201.2 Definitions.**~~

~~**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 OR WADING POOL. 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.

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, hot tubs or hydromassage bathtubs shall be installed in accordance with Table E4202.1 and Chapter 38 except as otherwise stated in this section. Storable swimming pools shall comply with Section E4207.

TABLE E4202.1 ALLOWABLE APPLICATIONS FOR WIRING METHODS^{a, b, c, d, e, f, g, h, i}

WIRING LOCATION OR PURPOSE	AC, FMC, NM, SR, SE	EMT	ENT	IMC ^j , RMC ^j	LFMC	LFNMC	UF	MC ^k	FLEX CORD
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(Application allowed where marked with an "A")				RNC ^d					
Panelboard(s) that supply pool equipment: from service equipment to panelboard	A ^{b,e} SR not permitted	A ^e	A ^b	A	—	A	A ^e	A ^e	—
Wet niche and no-niche luminaires: from branch circuit OCPD to deck or junction box	AC ^b only	A ^e	A ^b	A	—	A	—	A ^b	—
Wet niche and no-niche luminaires: from deck or junction box to forming shell	—	—	—	A ^d	—	A	—	—	A ^h
Dry niche: from branch circuit OCPD to luminaires	AC ^b only	A ^e	A ^b	A	—	A	—	A ^b	—
Pool-associated motors: from branch circuit OCPD to motor	A ^b	A ^e	A ^b	A	A ^f	A ^f	A ^b	A	A ^h
Packaged or self-contained outdoor spas and hot tubs with underwater luminaire: from branch circuit OCPD to spa or hot tub	AC ^b only	A ^e	A ^b	A	A ^g	A ^g	—	A ^b	A ^h
Packaged or self-contained outdoor spas and hot tubs without underwater luminaire: from branch circuit OCPD to spa or hot tub	A ^b	A ^e	A ^b	A	A ^g	A ^g	A ^b	A	A ^h
Indoor spas and hot tubs, hydromassage bathtubs, and other pool, spa or hot tub associated equipment: from branch circuit OCPD to equipment	A ^b	A ^e	A ^b	A	A	A	A	A	A ^h
Connection at pool lighting transformers or power supplies	AC ^b only	A ^e	A ^b	A	A ^{m,g}	A ^g	—	A ^b	—

For SI: 1 foot = 304.8 mm.

- a. For all wiring methods, see Section E4205 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. Permitted only for existing installations in accordance with the exception to Section E4205.6.
- f. Limited to where necessary to employ flexible connections at or adjacent to a pool motor.
- g. 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.
- h. Flexible cord shall be installed in accordance with Section E4202.2.
- i. Nonmetallic conduit shall be rigid polyvinyl chloride conduit Type PVC or reinforced thermosetting resin conduit

Type RTRC.

- j. Aluminum conduits shall not be permitted in the pool area where subject to corrosion.
- k. Where installed as direct burial cable or in wet locations, Type MC cable shall be listed and identified for the location.
- l. See Section E4202.3 for listed, double-insulated pool pump motors.
- m. 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.

E4202.2 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.
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.
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.
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.
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.

E4202.3 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 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.

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.

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 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 locking and 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.

E4203.1.2 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.

E4203.1.3 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 from branch circuits with short-circuit and ground-fault protection rated 15 or 20 amperes, 125 volts through 240 volts, single-phase, whether by receptacle or direct connection, shall be provided with ground-fault circuit interrupter protection for personnel.

E4203.1.4 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.

E4203.1.5 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.

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.

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.

E4203.4 Luminaires and ceiling fans.

Lighting outlets, luminaires, and ceiling-suspended paddle fans shall be installed and located in accordance with Sections E4203.4.1 through E4203.4.5.

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.

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. A ground-fault circuit interrupter is installed in the branch circuit supplying the luminaires or ceiling-suspended (paddle) fans; and
3. 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).

E4203.4.3 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.

E4203.4.4 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 a minimum of 7 feet, 6 inches (2286 mm) above the maximum water level and shall be protected by a ground-fault circuit interrupter.

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.

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.

E4203.4.5 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.

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.

TABLE E4203.5 OVERHEAD CONDUCTOR CLEARANCES

INSULATED SUPPLY OR SERVICE DROP CABLES, 0-750 VOLTS TO GROUND, SUPPORTED ON AND CABLED TOGETHER WITH AN	ALL OTHER SUPPLY OR SERVICE DROP CONDUCTORS (feet)	
	Voltage to ground	
	0-15 kV	Greater than 15

EFFECTIVELY GROUNDED BARE MESSENGER OR EFFECTIVELY GROUNDED NEUTRAL CONDUCTOR (feet)

to 50 kV

A. Clearance in any direction to the water level, edge of water surface, base of diving platform, or permanently anchored raft	22.5	25	27
B. Clearance in any direction to the diving platform	14.5	17	18

For SI: 1 foot = 304.8 mm.

E4203.6 Overhead conductor clearances.

Except where installed with the clearances specified in Table E4203.5, the following parts of pools and outdoor spas and hot tubs shall not be placed under existing service drop conductors or any other open overhead wiring; nor shall such wiring be installed above the following:

1. Pools and the areas extending 10 feet (3048 mm) horizontally from the inside of the walls of the pool;
2. Diving structures; or
3. Observation stands, towers, and platforms.

Overhead conductors of network-powered broadband communications systems shall comply with the provisions in Table E4203.5 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.

E4203.7 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 E4203.7.

TABLE E4203.7 MINIMUM BURIAL DEPTHS

WIRING METHOD	UNDERGROUND (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.

SECTION E4204 BONDING

E4204.1 Performance.

The equipotential bonding required by this section shall be installed to reduce voltage gradients in the pool area as prescribed.

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:

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 and the pool deck.

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.

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.

Exception: 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.

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.

4. Underwater lighting. All metal forming shells and mounting brackets of no-niche luminaires shall be bonded.

Exception: Listed low-voltage lighting systems with nonmetallic forming shells shall not require bonding.

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.

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.

Exception: Metal parts of listed equipment incorporating an approved system of double insulation shall not be bonded.

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.

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.

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.

Exceptions:

1. Those separated from the pool by a permanent barrier that prevents contact by a person shall not be required to be bonded.
2. Those greater than 5 feet (1524 mm) horizontally from the inside walls of the pool shall not be required to be bonded.
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.

E4204.3 Pool water.

The pool water shall be intentionally bonded by means of a conductive surface area not less than 9 square inches (5806 mm²) installed in contact with the pool water. This bond shall be permitted to consist of parts that are required to be bonded in 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.

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.
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.
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.
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.

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.

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.

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.
2. Metal to metal mounting on a common frame or base

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.

E4204.5.2 Connections.

Connections shall be made by exothermic welding or 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. 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.

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.

E4205.2 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 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 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.

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.
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.

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.

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.

E4205.5 Motors.

Pool-associated motors shall be connected to an insulated copper equipment grounding conductor sized in accordance with Table E3908.12, 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 E4202.1, an uninsulated equipment grounding conductor shall be permitted provided that it is enclosed within the outer sheath of the cable assembly.

E4205.6 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 or source of a separately derived system. The equipment grounding conductor shall be insulated, shall be sized in accordance with Table E3908.12, and shall be not smaller than 12 AWG.

Exception: An existing feeder between an existing remote panelboard and service equipment shall be permitted to run in flexible metal conduit or an approved cable assembly that includes an equipment grounding conductor within its outer sheath. The equipment grounding conductor shall not be connected to the grounded conductor in the remote panelboard.

E4205.6.1 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 E3607.3. Where installed in other than existing feeders covered in the exception to Section E4205.6, a separate equipment grounding conductor shall be an insulated conductor.

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 E4202.2, 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.

E4205.8 Other equipment.

Other electrical equipment shall be grounded in accordance with Section E3908.

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 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.

E4206.2 Ground-fault circuit interrupters.

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

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.

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, 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.

E4206.4.1 Maximum voltage.

Luminaires shall not be installed for operation on supply circuits over 150 volts between conductors.

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.

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.

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.

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.

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.

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.

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.

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.

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 the following:

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;
2. Equipped with threaded entries or hubs or a nonmetallic hub;
3. Constructed of copper, brass, suitable plastic, or other approved corrosion-resistant material;
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
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.

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;
2. Equipped with threaded entries or hubs or a nonmetallic hub;
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;
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
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.

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.

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.

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.

E4206.10 Underwater audio equipment.

Underwater audio equipment shall be identified for the purpose.

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.

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.

E4206.10.3 Forming shell and metal screen.

The forming shell and metal screen shall be of brass or other approved corrosion-resistant metal. All forming shells shall include provisions for terminating an 8 AWG copper conductor.

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 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.

E4206.12 Electric pool water heaters.

All 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.

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.

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.

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.

E4206.13.3 Radiant heating cables prohibited.

Radiant heating cables embedded in or below the deck shall be prohibited.

SECTION E4207 STORABLE SWIMMING POOLS**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.

E4207.2 Ground fault circuit interrupters required.

Electrical equipment, including power supply cords, used with storable pools shall be protected by ground fault circuit interrupters. All 125-volt, 15- and 20-ampere receptacles located within 20 feet (6096 mm) of the inside walls of a storable pool 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.

E4207.3 Luminaires.

Luminaires for storable pools 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.

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.

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.

E4207.4 Receptacle locations.

Receptacles shall be located not less than 6 feet (1829 mm) from the inside walls of a pool. 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.

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.

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.

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.

E4208.3 Underwater audio equipment.

Underwater audio equipment used with spas and hot tubs shall comply with the provisions of Section E4206.10.

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 single-family dwellings.

SECTION E4209 HYDROMASSAGE BATHTUBS**E4209.1 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).

E4209.2 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.

E4209.3 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.

E4209.4 Bonding.

All metal piping systems and all 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.

Florida Supplement to the I Codes:

This draft is prepared under the following assumptions:

For the purposes of using this supplement the following references apply throughout:

International Building Code, use the current Florida Building Code, Building

International Residential Code, use the current Florida Building Code, Residential

International Plumbing Code, use the current International Plumbing Code with the Florida Supplement to the I Codes Florida Building Code, Plumbing Section.

International Mechanical Code, use the current International Mechanical Code with the Florida Supplement to the I Codes Florida Building Code, Mechanical Section.

International Fire Code, use the current Florida Fire Prevention Code.

International Fuel Gas Code, use the current International Fuel Gas Code with the Florida Supplement to the I Codes Florida Building Code, Fuel Gas Section.

International Energy Conservation, use the current Florida Building Code, Energy Conservation

Where accessibility is required, Use the current Florida Building Code, Building, Accessibility

The Florida Supplement lists the Florida Code Changes and the sections that do not apply in Florida

FLORIDA BUILDING CODE, INTERNATIONAL SWIMMING POOL AND SPA CODE SUPPLEMENT 2013

Chapter 1 - Scope and Administration

101.1 Title. These regulations shall be known as the Swimming Pool and Spa Code of the State of *Florida* [NAME OF JURISDICTION], hereinafter referred to as “this code.”

103, 104, 107 & 108 are Reserved and The provisions of Chapter 1 Sections 103 - 109, & 111 - 117 *Florida Building Code, Building* shall govern the administration and enforcement of the *Florida Building Code, ISPSC supplement*.

SECTION 106 INSPECTIONS

106.3 Required inspections and testing.

All *aquatic vessel* installations or alterations thereto, including equipment, piping, and appliances related thereto, shall be inspected by the *code official* to ensure compliance with all of the requirements of this code. Inspections shall include the following as applicable, but shall not be limited to:

Ø **Pool Steel:** Inspection of the steel reinforcing bar creating the shell of the pool. (Prior to shooting the pool) (Can be performed with the pool bonding and the 1st pool piping inspection)

Ø **Pool Bonding:** Inspection of the electrical bonding to the wet niche, the shell and any embedded metal accessories associated with the pool shell. (Prior to shooting the pool) (Can be performed with the pool steel and the 1st pool piping inspections)

Ø **1st Pool Piping:** Inspection of the piping to be concealed by the pool shell, including the main drain and suction lines. (Prior to shooting the pool) (Can be performed with the pool bonding and the pool steel inspections)

Ø **Underground Electrical:** Inspection of any underground/under deck electrical conduit, wiring or required grounding or bonding, (inspected prior to the pool deck inspection.) (Can be made with the 2nd pool piping inspection.)

Ø 2nd Pool Piping: Inspection of the pool piping under the deck to the equipment. A pressure test shall be performed at this time. (Inspected prior to the pool deck inspection.) (Can be made with the underground electrical inspection.)

Ø Pool Equipotential Bonding: Inspection of the method of providing equipotential bonding grid. (Inspection prior to pouring/placing the pool deck) (Can be made with the pool deck inspection.)

Ø Pool Deck: Inspection of the pool deck area (prior to pouring/placing the pool deck) (Can be made with the pool equipotential bonding inspection.)

Ø Pool Pre-final Safety Inspection: Inspection of the electrical bonding system prior to energizing the system and inspection of the required barriers prior to filling the pool with water.

Ø Final Pool Piping: Inspection of the finished pool piping and the TDH flow test. (Can be made with the final electrical and final building inspections.)

Ø Final Electric: Inspection of the finished electrical system. (Can be made with the final pool piping and final building inspections.)

Ø Final Building: Inspection of the finished pool. (Can be made with the final pool piping and final electrical inspections.)

In order to pass final inspection and receive a certificate of completion, The Florida Department of Health form DH-914 shall be filled out and signed by the owner, contractor, and the designer of record and shall be submitted to the Building Department prior to the issuance of the Certificate of Completion.

106.12 Special inspections:

~~Special inspections of alternative engineered design systems shall be conducted in accordance with Section 104.11.6:~~

Chapter 2 - Definitions

201.4 Terms not defined. Where terms are not defined through the methods authorized by this section, such terms shall have the meanings as defined in Webster's *Third New International Dictionary of the English Language Unabridged*. ~~ordinarily accepted meanings such as the context implies.~~

Chapter 3 - General Compliance

301.1 Scope.

The provisions of this chapter shall govern the general design and construction of public and *residential aquatic vessels* and all related piping, equipment, and materials. Provisions that are unique to a specific type of *aquatic vessel* are located in Chapters 4 through 10. Public pools and spas shall be designed to meet the safety and sanitation requirements of the current edition of rule 64E-9 F. A.C.

301.1.1 Application of Chapters 4 through 10.

Where differences occur between the provisions of this chapter and the provisions of Chapters 4 through 10, the provisions of Chapter 4 through 10 shall apply.

302.3 Pipe, fittings and components.

Pipe, fittings and components shall be *listed and labeled* in accordance with NSF 50 or NSF 14. Plastic jets, fittings, and outlets used in public *spas* shall be *listed and labeled* in accordance with NSF 50. Pipe, fittings and components shall be installed to the manufactures installation specifications and any prescriptive requirements contained in this code.

305.2.10 Poolside barrier setbacks.

The *aquatic vessel* side of the required *barrier* shall be not less than 20 inches (508 mm) from the water's edge. For public pools and spas the *aquatic vessel* side of the required *barrier* shall be not less than 48 inches (1219 mm) from the water's edge

306.1 General.

Decks shall be designed and installed in accordance with the *International Residential Code* or the *International Building Code*, as applicable in accordance with Section 102.7, except as provided in this section.

306.1.1 Wood decks or carpet decks are not allowed for public pools.

306.8.2 For public pools equipped with restrooms a hose bibb with vacuum breaker shall be provided in or within 25 feet of each restroom to allow for ease of cleaning, additionally the hose bib shall be in a flush to grade box.

306.9 Deck width. Decks for public pools shall have an unobstructed minimum width of 48 inches (1219 mm)

307.3 Materials.

Aquatic vessels and appurtenances thereto shall be constructed of materials that are nontoxic to humans and the environment; that are generally or commonly regarded to be impervious and enduring; that will withstand the design stresses; and that will provide a watertight structure with a smooth and easily cleanable surface without cracks or joints, excluding structural joints, or that will provide a watertight structure to which a smooth, easily cleaned surface/finish is applied or attached. Material surfaces that come in contact with the user shall be finished, so that they do not constitute a cutting, pinching, puncturing or abrasion hazard under casual contact and intended use.

307.3.1 Beach pools.

Clean sand or similar material, where used in a beach pool environment, shall be used over an impervious surface. The sand area shall be designed and controlled so that the *circulation system*, maintenance, safety, sanitation, and operation of the pool are not adversely affected. Sand area for a beach pool environment is not allowed for public pools.

307.3.2 Compatibility.

Assemblies of different materials shall be chemically and mechanically compatible for their intended use and environment.

307.7 Colors and finishes.

The colors, patterns, or finishes of the vessel interior shall not obscure objects or surfaces within the vessel, and shall be of white or light pastel colors.

Exception: *Residential pools and spas.*

308.1 Floor slope.

The slope of the floor from the point of the first slope change to the deep area shall not exceed one unit vertical in three units horizontal. For public pools any transition in floor slope shall occur at a minimum of 5 feet (1524 mm) of water depth. A slope transition must have a 2 to 6 inch (51 to 152 mm) wide dark contrasting tile marking across the bottom and must extend up both sides of the pool at the transition point. The marking shall be continuous except for recessing grouting. A slope transition must have a safety line mounted by use of recessed cup anchors, 2 feet (610 mm) before the contrasting marking, towards the shallow end. The safety line shall have visible floats at maximum 7-foot (2134 mm) intervals.

Exception: *Portable residential spas and portable residential exercise spas.*

308.2 Walls.

Walls shall intersect with the floor at an angle or a transition profile. Where a transitional profile is provided at water depths of 3 feet (914 mm) or less, a transitional radius shall not exceed 6 inches (150 mm) and shall be tangent to the

wall and is permitted to be tangent to or intersect the floor. For public pools any pool walls shall have a clearance of 15 feet (4572 mm) perpendicular to the wall (as measured at design water level from gutter lip to gutter lip, or on skimmer pools, from vertical wall to vertical wall). Offset steps spa coves, spa pools and wading pools are exempt from this clearance requirement. Where interior steps protrude into the pool resulting in less than 15 feet (4572 mm) of clearance from any wall, such protrusion shall not exceed 6 feet (1828 mm) on any perpendicular line from a tangent to any pool wall from which the steps emanate. The upper part of pool walls in areas 5 feet deep or less shall be within 5 degrees (4572 mm) vertical for a minimum depth of 2¹/₂ feet (762 mm) from which point the wall may join the floor with a maximum radius equal to the difference between the pool depth and 2¹/₂ feet. The upper part of pool walls in areas over 5 feet deep shall be within 5 degrees vertical for a minimum depth equal to the pool water depth minus 2¹/₂ feet (762 mm) from which point the wall may join the floor with a maximum radius of 2¹/₂ feet (762 mm). Corners shall be a minimum 90-degree angle. The corner intersections of walls which protrude or angle into the pool water area shall be rounded with a minimum radius of 2 inches (51 mm). This radius shall be continued through the top of the gutter edge; chamfering is allowed, pool coping shall not overhang into the pool more than 1¹/₂ inches (38 mm).

Exceptions:

1. *Portable residential spas and portable residential exercise spas.*
2. *Onground storable pools.*

308.3 Shape.

This code is not intended to regulate the shape of *aquatic vessels* other than to take into account the effect that a given shape will have on the safety of the occupants and to maintain the minimum required level of circulation to ensure sanitation. A minimum width of 15 feet, and a minimum depth of 3 feet is required for public pools.

310.1 General.

Suction entrapment avoidance for aquatic vessels shall be provided in accordance with the appropriate section of APSP 7. Public pools shall be required to have a gravity system per FS 514.0315 (1) designed and constructed with a collector tank and gravity drainage system (aka: a vented reservoir) serving all recirculation and therapy drain suction outlets.

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

312.2 Design.

Filters shall have a flow rating equal to or greater than the design flow rate of the system. Filters shall be installed in accordance with the manufacturer's instructions. Filters shall be designed so that *filtration* surfaces can be inspected and serviced.

312.2.1 Public pool and Public Spa Filter requirements

312.2.1.1 Filter capacities.

The maximum filtration rate in gallons per minute per square foot of filter area shall be: 15 [20 if so approved using the procedure stated in Section 424.1.6.5.1 for high rate sand filters, 3 for rapid sand filters, 0.075 for pleated cartridge filters and 2 for Diatomaceous Earth (D.E.) type filters].

312.2.1.2 Filter appurtenances.

312.2.1.2.1 Pressure filter systems.

Pressure filter systems shall be equipped with an air relief valve, influent and effluent pressure gauges with minimum face size of 2 inches (51 mm) reading 0-60 psi (0-414 kPa), and a sight glass when a backwash line is required.

312.2.1.2.2 Vacuum filter systems.

Vacuum filter systems shall be equipped with a vacuum gauge which has a 2-inch (51 mm) face and reads from 0-30 inches of mercury.

312.2.1.2.3 D.E. systems.

A precoat pot or collector tank shall be provided for D.E.-type systems.

312.2.1.3 Filter tanks and elements.

The filter area shall be determined on the basis of effective filtering surfaces with no allowance given for areas of impaired filtration, such as broad supports, folds, or portions which may bridge. D.E.-type filter elements shall have a minimum 1-inch (25 mm) clear spacing between elements up to a 4 square foot (0.4 m²) effective area. The spacing between filter elements shall increase 1/8 inch (3 mm) for each additional square foot of filter area or fraction thereof above an effective filter area of 4 square feet (0.4 m²). All cartridges used in public pool filters shall be permanently marked with the manufacturer's name, pore size and area in square feet of filter material. All cartridges with end caps shall have the permanent markings on one end cap. Vacuum filter tanks shall have coved intersections between the wall and the floor and the tank floor shall slope to the filter tank drain. The D.E.-type filter tank and elements shall be installed such that the recirculation flow draw down does not expose the elements to the atmosphere whenever only the main drain valve is open or only the surface overflow gutter system valve is open.

314.3. Flow distribution.

The suction outlet fitting assemblies, where installed, and the skimming systems shall each be designed to accommodate 100 percent of the circulation turnover rate.

314.3.1 Multiple systems.

Where multiple systems are used in a single pool to meet this requirement, each subsystem shall proportionately be designed such that the maximum design flow rates cannot be exceeded during normal operation.

314.3.2 Flow for public pools, public spas

The suction outlet fitting assemblies, where installed, and the skimming systems shall each be designed to accommodate 60 percent of the circulation turnover rate.

314.4 Return inlets.

There shall be one *return inlet* for each 300 square feet (27.87 m²) of pool surface area, or fraction thereof. Public pools shall have one return inlet every 20 feet maximum and the flow shall be 20 gpm maximum, if the pool width is over 30 feet floor inlets shall be used..

Exception: *Onground storable pools.*

315.1 General.

The provisions of this section apply to *skimmers for aquatic vessels*. For public pools recessed automatic surface skimmers may be utilized when the pool water surface area is 1,000 square feet (93 m²) or less excluding offset stairs and swimouts and the width of the pool is not over 20 feet (6096 mm).

Exception: *Portable residential spas and portable residential exercise spas.*

315.4 Perimeter coverage.

Where a perimeter-type *surface skimming system* is used as the sole surface skimming system, the system shall extend around not less than of 50 percent of the aquatic vessel perimeter. Public Pools the system shall extend around not less than of 90 percent of the aquatic vessel perimeter.

315.4.1 Surge capacity.

Where perimeter *surface skimming systems* are used, they shall be connected to a circulation system with a system surge capacity of not less than 1 gallon for each square foot (40.7 liters per square meter) of water surface. The capacity of the perimeter overflow system and related piping is permitted to be considered as a portion of the *surge capacity*.

315.4.2 Collector Tanks.

Public pool collector tank dimensions min.2.25 sq ft open area, 63fps max velocity, capacity is one minute of recirculation flow, and IWFs to have a capacity of 3 minutes of recirculation and feature water flow.

315.5 Equalizers.

Equalizers on *skimmers* shall be prohibited.

Exception: Allowed on public pools with ANSI/APSP-16 certified drain cover/grate is installed.

318.3 Over-the-rim spouts.

Over-the-rim spouts shall be located under a *diving board*, adjacent to a *ladder*, or otherwise shielded so as not to create a hazard. The open end of such spouts shall not have sharp edges and shall not protrude more than 2 inches (51 mm) beyond the edge of the pool. The open end shall be separated from the water by an air gap of at least 1.5 pipe diameters measured from the pipe outlet to the rim. For public pools An automatic and manual water makeup control shall be provided to maintain the water level at the lip of the overflow gutter or at the mouth of the recessed automatic surface skimmers and shall discharge through an air gap into a fill pipe or collector tank. Over the rim fill spouts are prohibited.

321.2.2 Illumination intensity.

For outdoor pools, the combination of overhead and underwater lighting shall provide not less than 3 foot-candles of illumination at the pool water surface and the pool deck surface. For indoor pools, the combination of overhead and underwater lighting shall provide not less than of 10 foot-candles at the pool water surface and the pool deck surface.

322.3 Ladders.

Ladder treads shall have a uniform horizontal depth of not less than 2 inches (51 mm). There shall be a uniform distance between *ladder* treads, with a distance of not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The top tread of a *ladder* shall be located not greater than 12 inches (305 mm) below the top of the deck or coping. Ladder treads shall have *slip-resistant* surfaces. Ladders for public pools shall be of the cross-braced type and shall be constructed of corrosion-resistant materials and be securely anchored into the pool deck. Ladders shall extend at least 28 inches (711 mm) and no more than 40 inches (1016 mm) above the pool deck. The back of the ladder shall be between 3 to 6 inches from the pools wall. Ladder bottom braces shall have intact end caps or bumpers that rest firmly against the pool wall.

322.4 Recessed treads.

Recessed treads shall have minimum depth of not less than 5 inches (127 mm) and a width of not less than 12 inches (305 mm). The vertical distance between the pool coping edge, deck, or step surface and the uppermost *recessed tread* shall be not greater than 12 inches (305 mm). *Recessed treads* shall have *slip-resistant* surfaces.

322.4.1 Vertical spacing.

Recessed treads at the centerline shall have a uniform vertical spacing of not less than 7 inches (178 mm) and not greater than 12 inches (305 mm).

322.4.2 Drainage.

Recessed treads shall drain into the pool.

322.4.3 Handrails and grab rails.

Recessed treads shall be provided with a *handrail* or grab rail on each side of the treads. The clear distance between

handrails and grab rails shall be not less than 17 inches (432 mm) and not greater than 24 inches (610 mm). For Public pools the grab rails shall extend a minimum of 28 inches above the deck.

323.2 Handrails.

Where *handrails* are installed, they shall conform to this section.

323.2.1 Height.

Handrails shall be between 34 inches (864 mm) and 38 inches (965 mm) above the ramp or step surface as measured at the nosing of the step or finished surface of the slope.

323.2.2 Material.

Handrails shall be made of corrosion-resistant materials.

323.2.3 Nonremovable.

Handrails shall be installed so that they cannot be removed without the use of tools.

323.2.4 Leading edge distance.

The leading edge of handrails for stairs, pool entries and exits shall be located not greater than 18 inches (457 mm) from the vertical face of the bottom riser. For Public pools the handrail shall be mounted in the deck and the bottom step.

323.2.5 Diameter.

The outside diameter or width of *handrails* shall be not less than 1¹/₄ inches (32 mm) and not greater than 2 inches (51 mm).

Chapter 4 - Public Swimming Pools

401.5 Floor slope.

Except where required to meet the accessibility requirements in accordance with Section 323.1, the slope of the floor in the shallow area of a pool shall not exceed 1 unit vertical in 10 units horizontal for *Class C* pools and 1 unit vertical in 12 units horizontal for *Class B* pools. The slope limit shall apply in any direction to the point of the first slope change, where a slope change exists. The point of the first slope change shall be defined as the point at which the floor slope exceeds 1 unit vertical in 10 units horizontal for *Class C* pools and 1 unit vertical in 12 units horizontal for *Class B* pools. Any transition in floor slope shall occur at a minimum of 5 feet (1524 mm) of water depth. A slope transition must have a 2 to 6 inch (51 to 152 mm) wide dark contrasting tile marking across the bottom and must extend up both sides of the pool at the transition point. The marking shall be continuous except for recessing grouting. A slope transition must have a safety line mounted by use of recessed cup anchors, 2 feet (610 mm) before the contrasting marking, towards the shallow end. The safety line shall have visible floats at maximum 7-foot (2134 mm) intervals. Minimum floor slope of 1:40.

402.12 Water envelopes.

The minimum diving water envelopes shall be in accordance with Table 402.12. Diving facilities for public pools shall meet the minimum requirements of the FINA dimensions for diving facilities in accordance with the 2005-2009 FINA Handbook.

SECTION 403 BATHER LOAD

403.1 Maximum bather load.

The bathing load for swimming pools, wading pools, interactive water features, water activity pools less than 24 inches (610 mm) deep and special purpose pools shall be computed on the basis of one person per 5 gpm (.32 L/s) of recirculation flow. The bathing load for spa type pools shall be based on one person per each 10 square feet (.9 m²) of surface area. The filtration system for swimming pools shall be capable of meeting all other requirements of these rules while providing a flowrate of at least 1 gpm (.06 L/s) for each living unit at transient facilities and 3/4 gpm (.04 L/s) at nontransient facilities. Recreational vehicle sites, campsites and boat slips designated for live-aboards shall be considered a transient living unit. For properties with multiple pools, this requirement includes the cumulative total gpm of all swimming pools, excluding spas, wading pools and interactive water features. All other types of projects shall be sized according to the anticipated bathing load and proposed uses. For the purpose of determining minimum pool size only, the pool turnover period used cannot be less than 3 hours.

The maximum *bather load* of *Class B* and *Class C* pools shall be in accordance with Table 403.1.

TABLE 403.1 MAXIMUM BATHER LOAD

POOL/DECK AREA	SHALLOW INSTRUCTIONAL OR WADING AREAS	DEEP AREA (NOT INCLUDING THE DIVING AREA)	DIVING AREA (PER EACH DIVING BOARD)
Pools with minimum deck area	15 sq. ft. per user	20 sq. ft. per user	300 sq. ft.
Pools with deck area at least	12 sq. ft. per user	15 sq. ft. per user	300 sq. ft.

equal to water surface area			
Pools with deck area at least twice the water surface area	8 sq. ft. per user	10 sq. ft. per user	300 sq. ft.

For SI: 1 square foot = 0.09 square meters.

SECTION 404 REST LEDGES

404.1 Rest ledges.

Rest ledges along the pool walls are permitted. They shall be not less than 4 feet (1220 mm) below the water surface. Where a ledge is provided, the ledge shall be 4 inches (102 mm) minimum in width and 6 inches (152 mm) maximum in width.

409.3 No diving symbol.

Where the pool depth is 5 feet (1524 mm) or less, the "No Diving" symbol shall be displayed. The symbol shall be placed on the deck at intervals of not more than 25 feet (7620 mm). Additional signage shall be in accordance with NEMA Z535. Those areas of the pool that are not part of an approved diving bowl shall have dark contrasting tile, 4-inch-high (102 mm) "NO DIVING" markings installed along the perimeter of the pool on the top of the pool curb or deck within 2 feet (610 mm) of the pool water with a maximum perimeter distance of 25 feet (7620 mm) between markings. A 6-inch (152 mm) tile with a 4-inch (102 mm) or larger red, international "NO DIVING" symbol may be substituted for the "NO DIVING" markings.

409.4.1 Accessory pole.

A swimming pool accessory pole not less than ~~12~~ 16 feet (3658 mm) in length and including a body hook shall be provided. Two hooks are required if the pool is 50 feet or longer.

409.4.2 Throwing rope.

A throwing rope attached to *ring buoy* or similar flotation device shall be provided. The rope shall be not less than 1/4 inch (6 mm) in diameter and shall have a length of not less than 1 1/2 times the maximum width of the pool or 50 feet (15 240 mm), whichever is less. A *ring buoy* shall have an outside diameter is not less than 15 inches (381 mm). Two rings are required if the pool is 50 feet or longer.

411.1 Entry and exit.

Pools shall have at least two means of entry and exit, located so as to serve both ends of a pool. Public pools shall have a means of egress at the deep portion of the pool even if this requires an additional means of egress.

411.2 Pool stairs.

The design and construction of stairs extending into the pool in either shallow or deep water, including recessed pool stairs, shall comply with Sections 411.2.1 through 411.2.4.

411.2.1 Tread dimensions and area.

Treads shall be not less than 24 inches (607 mm) at the leading edge. Treads shall have an unobstructed surface area of not less than 240 square inches (0.154 m²) and an unobstructed horizontal depth of not less than 10 inches (254 mm) at the centerline.

411.2.2 Risers.

Risers, except for the bottom riser, shall have a uniform height of not greater than ~~12~~ 10 inches (305 mm) measured at the centerline. The bottom riser height is allowed to vary to the floor.

411.2.3 Top tread.

The vertical distance from the pool coping, deck, or step surface to the uppermost tread shall be not greater than ~~12~~ 10 inches (305 mm).

411.2.4 Bottom tread.

~~Where stairs are located in water depths greater than 48 inches (1219 mm), the lowest tread shall be not less than 48 inches (1219 mm) below the deck and shall be recessed in the pool wall. The bottom tread shall not be more than 10 inches from the bottom of the pool.~~

411.2.5 Uniformity

Treads and risers between the top and bottom treads shall be uniform to within 1/2 inch (12.7 mm) in width and height.

411.2.6 Marking

For public pools; the riser heights shall be measured at the marked step edges and the differences in elevation shall be considered the riser heights. The front 3/4 to 2 inches (19.1 to 51 mm) of the tread and the top 2 inches (51mm) of the riser shall be tile, dark in color, contrasting with the interior of the pool. Tile shall be slip resistant. Bullnose tile that is slip resistant may be used when the 3/4 inch (19 mm) segment is placed on the tread or horizontal surface and the 2-inch (51 mm) segment is placed on the riser or vertical surface. Where the gutter is used as the top step, the tile on the gutter for the width of the steps shall be slip resistant. Vinyl liner and fiberglass pools may use other material for the step edge marking, provided the material is permanent, permanently secured, dark in color, nonfading and slip resistant.

~~411.3.2 Vertical drops.~~

~~A vertical drop exceeding 12 inches (305 mm) within a sloping entry shall be provided with a handrail.~~

411.5.2 Underwater seats and benches.

Underwater seats and benches, whether used alone or in conjunction with pool stairs, shall comply with all of the following:

1. The horizontal surface shall be not greater than 20 inches (508 mm) below the waterline.
2. An unobstructed surface shall be provided that is not less than of 10 inches (254 mm) in depth and not less than 24 inches (607 mm) in width.
3. *Underwater seats* and benches shall not be used as the required entry and exit access.
4. Where *underwater seats* are located in the deep area of the pool where manufactured or constructed diving equipment is installed, such seats shall be located outside of the minimum water envelope for diving equipment.
5. The leading edge shall be visually set apart.
6. The horizontal surface shall be at or below the waterline.
7. ~~A tanning ledge or sun shelf used as the required entry and exit access shall be located not greater than 12 inches (305 mm) below the waterline.~~

Chapter 6 - Aquatic Recreation Facilities**610.4.3 Steps.**

Where steps are used in conjunction with sloping entries, all of the requirements of ~~Section 605.5.6~~ 610.5.6 shall apply.

610.5.3 Color to mark leading edge.

The leading edge of all steps shall be distinguished by a color contrasting with the color of the steps and the pool floor. The front 3/4 to 2 inches (19.1 to 51 mm) of the tread and the top 2 inches (51mm) of the riser shall be tile, dark in color, contrasting with the interior of the pool.

610.5.6 Tread surface area.

Treads shall have an unobstructed surface area of not less than 240 square inches (.017 m²) and shall be slip resistant.

610.7.2 Surface dimensions.

~~*Underwater seats* shall have an unobstructed surface dimension of not less than 10 inches (254 mm) measured front to back and not less than 24 inches (610 mm) in width.~~

Underwater seat benches may be installed in areas less than five feet (1524 mm) deep. Bench seats must be 14 to 18 inches (356 to 457 mm) wide and must have a dark contrasting tile marking on the seat edge extending two inches (51 mm) on the horizontal and vertical surface. Tile shall be slip resistant.

610.8.1 Floating devices.

~~Floating devices not intended to be mobile shall be anchored in a manner to restrict movement to the range established by the designer. The anchoring of such floating devices shall be configured to minimize the possibility of entrapment of bathers, bodies, hair, limbs, and appendages should they come in contact with any element of the floating device or its anchors.~~

CHAPTER 11 REFERENCED STANDARDS

Florida Codes

Florida Building Commission

c/o Florida Department of Business and Professional Regulation

Building Codes and Standards

1940 North Monroe Street
Tallahassee, FL 32399-1027

Standard Referenced in code

Reference Number Title section number

FBC-B 2013 Florida Building Code, Building 201.3, 305.4, 307.1, 307.2, 307.3, 308.2, 309.1, 310.1, 310.3, 315.1, 403.1, Table 403.1,

404.1, 407.3, 417.6, 502.6, 606.5.2, 1106.5

Ch. 11 Florida Building Code, Building - Accessibility 404.1.1 315.1

Ch. 553.86 Florida Statute, Public Restrooms 403.1.1

Florida Building Code, Energy Conservation 313.1, 607.2, 607.2.1

Ch. 27 Florida Building Code, Building-Electrical (National Electrical Code, NFPA 70)

201.3, 502.1, 504.3, 1113.1.3

FEBC—2013 Florida Existing Building Code 101.2

FBC-FG 2013 Florida Building Code, Fuel Gas 101.2, 201.3, 502.1

FBC-M 2013 Florida Building Code, Mechanical 201.3, 307.6, 310.1, 422.9,

502.1, 612.1, 1202.1

FRC-2013 Florida Residential Code 101.2

FFPC-2013 Florida Fire Prevention Code 201.3, 1201.1

Ch. 62-610 Florida Administrative Code-Reuse of Reclaimed Water

and Land Application 602.4

Ch. 64E-6 Florida Administrative Code-Standards for Onsite Sewage

and Disposal Systems 701.2, 1003.5.2

Ch. 373 Florida Statute, Water Resources 602.3

Ch. 381 Florida Statute, Food Products 317.1

Ch. 500 Florida Statute, Lodging and Food Service Establishments 317.1

Ch. 509 Florida Statute, Public Lodging and Food Service Establishments 317.1