FBC 2020 Advanced: Residential Swimming Pools Internet

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Course Information

FBC 2020 Advanced: Residential Swimming Pools Internet
2 Hours Advanced Credit
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Outline

- Scope
- General Requirements
- Child Safety
- Electrical Requirements

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Scope

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Scope

What is a swimming pool?

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Scope

SWIMMING POOL, PRIVATE. Any structure, located in a residential area, that is intended for swimming or recreational bathing and contains water over 24 inches deep.

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Scope

What is a “residential area”?

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Scope

RESIDENTIAL. Means situated on the premises of a detached one-family or two-family dwelling or a one-family townhouse not more than three stories high.

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General Requirements

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General Requirements

R4501.3 Mechanical requirements. Unless otherwise specified in this code, all piping, equipment and materials used in the process piping system of swimming pools that are built in place shall conform to the *Florida Building Code, Plumbing*.

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General Requirements

R4501.4.1 Compliance

- Conform to this code
- NRTL
- Other approved standards

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General Requirements

R4501.4.2 Items not covered. For any items not specifically covered in these requirements, … shall be proven to function adequately, effectively and without excessive maintenance and operational difficulties.

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General Requirements

R4501.4.3 Applicant responsibility. It shall be the responsibility of the applicant to provide such data, tests or other adequate proof that the device, material or product . . . before such item shall be approved or accepted for tests.

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General Requirements

R4501.5 Alternate materials and methods

- Code not designed to limit materials and methods
- May require tests
- Proof of compliance
- Approved

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General Requirements

R4501.6 Engineering Design

- ANSI/APSP/ICC 3
- ANSI/APSP/ICC 4
- ANSI/APSP/ICC 5
- ANSI/APSP/ICC 6
- ANSI/APSP/ICC 7

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General Requirements

R4501.6.2 Pool shall be equipped and complete

- Filter
- Pump
- Piping and valves
- Component parts

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General Requirements

R4501.6.3 Water velocity

- Pressure piping can not exceed 10 feet per second
- Suction piping can not exceed 8 feet per second
- Main suction outlet-ANSI/APSP/ICC 7

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General Requirements

R4501.6.4 Piping to heater shall be made and have velocities indicated in manufacturer's instructions.

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General Requirements

R4501.6.5 Piping materials installed in accordance with manufacturer's instructions.

- Not required to use colored primer where exposed

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General Requirements

R4501.6.6 Entrapment protection.

- Installed per ANSI/APSP/ICC 7.
- Channel drain
- Two drains three feet a part
- Three drains

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General Requirements

R4501.7 Pumps

- Hair and lint strainer
- Installed according to manufacturer's instructions
- Pump parts of corrosion resistant materials

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General Requirements

R4501.8 Valves

- Approved in plumbing code
- Readily accessible for maintenance and removal
- Installed by manufacturer's instructions

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General Requirements

R4501.9 Water supply

- Backflow protection
- Not over the rim

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General Requirements

R4501.10 Waste water disposal locations must be approved

- Storm drains
- Sewer
- Drainage system
- Underground leaching system

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General Requirements

R4501.10 Waste water disposal in public sewer

- 3” or larger P-trap
- Indirect connection
- No venting necessary
- Extends 3” or more above grade

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General Requirements

R4501.12.1 Pressure test. All pool piping shall be tested . . . under a static water or air pressure test of not less than 35 pounds per square inch (psi) for 15 minutes.

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General Requirements

R4501.13.1 Slope to discharge. Drain piping serving gravity overflow gutter drains and deck drains shall be installed to provide continuous grade to point of discharge.

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General Requirements

R4501.14 and M2006 Water heating

- NRTL
- Flanges or union connection
- Pressure relief valve must be installed if a valve is located on discharge side
- Temperature relief valve

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General Requirements

Chapter 23 Solar pool heating must be installed in accordance with this chapter.

- Solar thermal energy systems

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General Requirements

R4501.15 and R4501.16 Electrical and gas installations shall be installed according to appropriate codes

- GFCI protection required for all pool equipment above the low voltage contact limit

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General Requirements

R4501.18 Ladders or steps

- Required in shallow end
- Ladder, stairs, or swim out in deep end if depth exceeds 5’

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General Requirements

R4501.19 Inspections required before filling pool with water

- Pool barrier inspection
- Final electrical inspection

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General Requirements

R4501.20 Filters

- Must be able to filter pool for a complete turnover in 12 hours or less

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General Requirements

R4501.21.2 Skimmers

- Approved surface skimmers
- One per 800 square feet
- Flow rate of at least 25 gallons per minute

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General Requirements

R4501.21.5 Inlet fittings

- One per 300 square feet
- Seal to the pool structure
- At least 10 feet a part

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Child Safety

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Child Safety

R4501.17 Child safety

- Safety pool cover-ASTM F1346 or
- Barrier

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Child Safety

R4501.17.1 Barrier requirements

- At least 48” high
- Up to 2” gap under barrier at grade
- Up to 4” gap under barrier at deck
- No gaps or openings
- Not climbable

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Child Safety

R4501.17.1 Barrier requirements, cont.

- Openings can not allow a 4” sphere
- One end removable by tools
- Horizontal members less than 45” high must be on swimming pool side
- Vertical members 1 ¾” or less

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Child Safety

R4501.17.1 Barrier requirements, cont.

- Chain link maximum 2 ¼" square or fasten slats that reduce openings to less than 1 ¾"
- Diagonal members limited to 1 ¾" width or less

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Child Safety

R4501.17.1.8 Gates used as barriers

- Meet previous requirements
- Self-latching
- Locking device on pool side
- Release minimum 54" high with no openings larger than ½" within 18"
- Open away from pool

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Child Safety

R4501.17.1.11 Screen enclosures are acceptable as barriers if they meet the climbing requirements.

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Child Safety

R4501.17.1.9 Wall used as barriers

- Doors and window alarm meets UL 2017, or
- Self-latching, self-closing door with handle above 54”, or
- Pool alarm that meets ASTM F2208

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Child Safety

R4501.17.1.9 Windows do not need alarms when

- Sill height is above 48” when screened or protected
- Second floor
- Pass through kitchen window with counter

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Child Safety

R4501.17.1.10 Aboveground pool walls can be used as barrier if ladder can be locked or removed.

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Child Safety

R4501.17.1.13 Barriers must be located at least 20” away from the pool edge

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National Electrical Code Requirements

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Article 680: Swimming Pools

I. General

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Article 680 Part I

680.1 Scope includes wiring for and adjacent

- Swimming pools
- Wading pools
- Therapeutic pools
- Decorative pools
- Hot tubs and spas

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Article 680 Part I

680.1 Scope includes wiring for and adjacent

- Fountains
- Hydromassage bathtubs
- Permanent
- Storable

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Article 680 Part I

680.6 Grounding and Other Articles

- All materials and methods not covered in this article shall comply with other applicable provisions of the code.
- Includes Chapter 3
- Includes Article 250

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Article 680 Part I

680.7 Grounding and Bonding Terminals

- Identified for wet and corrosive environments
- Copper
- Stainless steel

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Article 680 Part I

680.8 Cord and plug connected equipment

- Length limited to 3 feet
- Grounding conductor 12 AWG or larger

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Article 680 Part I

680.9 Overhead clearances for power conductors within 10 feet horizontally of pool(Typical, see table)

- 22.5 feet vertical over pool
- 14.5 from observation stand, tower, or diving platform

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Article 680 Part I

680.9(B) Overhead clearances for communications systems

- 10 Feet

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Article 680 Part I

680.11 Underground wiring location

- Rigid metal conduit
- PVC
- Only pool wiring under pool
- Burial depths Table 300.5

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Article 680 Part I

680.13 Maintenance Disconnecting Means

- Within sight of equipment
- At least 5 feet from pool (Watch small lots)

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Article 680 Part I

680.14 Corrosive Environment

- Code now defines corrosive environment area
- Chemical storage
- Pumps, automatic chlorinators, and filters
- Adjacent to the pool structure

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Article 680 Part I

680.14 Corrosive Environment Wiring Methods

- Identified for corrosive areas
- Rigid metal conduit
- PVC

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Article 680: Swimming Pools

II. Permanently Installed Pools

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Article 680 Part II

680.21 Motor branch circuit wiring flexible connections

- Liquidtight flexible metallic conduit
- Liquidtight flexible nonmetallic conduit

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Article 680 Part II

680.21(C) GFCI Protection

- Pump motors must be GFCI protected

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Article 680 Part II

680.22(A) Required receptacles

- One or more between 6 and 20 feet from pool
- GFCI Protected

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Article 680 Part II

680.22(B) Luminaires and Fans

- If within 5 feet, then 12 feet above pool
- Indoor reduced to 7'6" in some cases
- Existing location can be GFCI protected
- New 5'-10' from pool GFCI protected

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Article 680 Part II

680.22(B) Luminaires and Fans

- Some low voltage can be within 5'
- Swimming pool transformer
- Lighting
- Fire pits
- Fireplaces
- Bonded

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Article 680 Part II

680.22(C) Switching devices

- Switches must be located at least 5 feet from pool or protected by barrier

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Article 680 Part II

680.23 Underwater luminaires under LV contact limit

- Transformers must be listed for swimming pools
- Isolated windings
- Grounded metal barrier

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Article 680 Part II

680.23 Underwater luminaires over LV contact limit

- GFCI protected
- Less than 150 volts

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Article 680 Part II

680.23 Underwater luminaires

- Not less than 18” below water level
- Unless listed for other depths
- Always at least 4” deep

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Article 680 Part II

680.23(B) Wet-Nitch luminaire conduit

- Brass or corrosion resistant
- Nonmetallic conduit required #8 AWG bonding jumper
- Termination protected from pool water

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Article 680 Part II

680.23(B) Wet-Nitch luminaire

- Cord must be long enough to remove fixture from pool for servicing or relamping.

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Article 680 Part II

680.24 Junction boxes for pool lighting

- Listed for use as a pool junction box
- At least 4” above the pool deck
- At least 4’ horizontally from pool
- Can not connect conduit from light to transformer enclosure in most cases

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Article 680 Part II

680.25 Feeders

- Wiring methods must be suitable for corrosive environments if appliable.
- Any Chapter 3 method acceptable for noncorrosive environment

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Article 680 Part II

680.26 Equipotential bonding

- Solid # 8 AWG or larger
- Corrosion resistant connections
- Does not have to extend to remote panelboards or electrodes

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Article 680 Part II

680.26 Equipotential bonding-Bonded parts

- Conductive pool shells
- Reinforcing steel or copper grid

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Article 680 Part II

680.26 Equipotential bonding-Bonded parts

- Perimeter surfaces
- Reinforcing steel within 3 feet of pool, or
- Copper grid, or
- 8 AWG bare conductor 18-24” from pool, 4-6” below subgrade around perimeter

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Article 680 Part II

680.26 Equipotential bonding-Bonded parts

- Pool metallic parts
- Underwater lighting
- Metal fittings 4” or larger unless they penetrate pool structure
- Metal parts within 5’ of pool

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Article 680 Part II

680.26 Equipotential bonding-Bonded parts

- Electrical equipment
- Pool water (Pools with liners)

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Article 680: Swimming Pools

VII. Hydromassage Bathtubs

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Article 680 Part VII

680.71 Protection

- Hydromassage bathtubs shall be GFCI protected
- Device required to be readily accessible
- 210.8 requires bathroom receptacles to be GFCI protected

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Article 680 Part VII

680.73 Accessibility

- Electrical equipment shall be accessible without damaging the structure or finish
- Receptacle located within 1'of access
- Large enough to remove motor
- FBC, Residential has specific language related to the size of opening.

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Article 680 Part VII

680.74 Bonding

- Metal piping system and metal parts must be bonded together
- #8 AWG or larger
- Can be factory installed
- Check for inline heaters

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