

## Introducing the 2015 ISPSC

International Swimming Pool and Spa Code (ISPSC)



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## Goal

- The goal of this seminar is to highlight the 2015 *International Swimming Pool & Spa Code*® (ISPSC).



2012 ISPSC Introduction 2

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## Code Book Layout

Arrangement and Format of the 2015 ISPSC

- Chapter 1 (Scope and Administration)
- Chapter 2 (Definitions)
- Chapter 3 (General Compliance)
- Chapter 4 (Public Swimming Pools)
- Chapter 5 (Public Spas & public Exercise Spas)
- Chapter 6 (Aquatic Recreation Facilities)



2012 ISPSC Introduction 3

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### Code Book Layout

- Chapter 7 (Onground Storable Residential Swimming Pools)
- Chapter 8 (Permanent Inground Residential Swimming Pools)
- Chapter 9 (Permanent Residential Spas & Permanent Residential Exercise Spas)
- Chapter 10 (Portable Residential Spas & Portable Residential Exercise Spas)
- Chapter 11 (Reference Standards)



2012 ISPSC Introduction 4

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### Key Definitions



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### Aquatic Recreation Facility

- A facility that is designed for free-form aquatic play and recreation. The facilities may include, but are not limited to, wave or surf action pools, leisure rivers, sand bottom pools, vortex pools, activity pools, inner tube rides and body slides, and interactive play attractions.



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### Public Swimming Pool (Public Pool)

- A pool, other than a residential pool, that is intended to be used for swimming or bathing and is operated by an owner, lessee, operator, licensee, or concessionaire, regardless of whether a fee is charged for use. Public pools shall be further classified and defined in the following slides:

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### Public Swimming Pool (Public Pool) Cont.

- **CLASS A, COMPETITION POOL.** A pool intended for use for accredited competitive aquatic events such as USA Swimming, USA Diving, USA Synchronized Swimming, etc. The use of the pool is not limited to competitive events.
- **CLASS B, PUBLIC POOL.** A pool intended for public recreational use.
- **CLASS C, SEMI-PUBLIC POOL.** A pool operated solely for and in conjunction with lodgings such as hotels, motels, apartments, condominiums.

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### Public Swimming Pool (Public Pool) Cont.

- **CLASS D-1, WAVE ACTION POOL.** A pool designed to simulate breaking or cyclic waves for general play or surfing.
- **CLASS D-2, ACTIVITY POOL**  
A pool designed for casual water play ranging from simple splashing activity to the use of attractions placed in the pool for recreation.
- **CLASS D-3, CATCH POOL.** A body of water located at the termination of a manufactured waterslide attraction.



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### CLASS D-1, WAVE ACTION POOL



Courtesy of Jon Barnes Photography

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### Public Swimming Pool (Public Pool) Cont.

- **CLASS D-4, LEISURE RIVER.** A manufactured stream of water of near-constant depth in which the water is moved by pumps or other means of propulsion to provide a river-like flow that transports bathers over a defined path that may include water features and play devices.
- **CLASS D-5, VORTEX POOL.** A circular pool equipped with a method of transporting water in the pool for the purpose of propelling riders at speeds dictated by the velocity of the moving stream of water.



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### CLASS D-5, VORTEX POOL



Courtesy of Association of Pool & Spa Professionals™

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### Public Swimming Pool (Public Pool) Cont.

▪ **CLASS D-6, INTERACTIVE PLAY ATTRACTION.**

A pool with manufactured water play devices or activities such as slides, climbing and crawling structures, visual effects, user-actuated mechanical devices and other elements of bather-driven and bather-controlled play.



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### Public Swimming Pool (Public Pool) Cont.

- **CLASS E.** Pools used for instruction, play or therapy and with temperatures above 86°F (30°C). Public pools are either a diving or nondiving type. Diving types of public pools are classified into types as an indication of the suitability of a pool for use with diving equipment.
- **TYPES VI-IX.** Public pools suitable for the installation of diving equipment by type.
- **TYPE O.** A nondiving public pool.



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**General**



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**Electrical, Plumbing, Mechanical,  
& Fuel Gas Requirements**



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**Section 302.1 Electrical**

- **Electrical Requirements for Aquatic Facilities**
  - NFPA 70 or the International Residential Code as applicable with Section 102.7.1.
  - There is an exception for the internal wiring for potable residential spas and portable residential exercise spas.



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### Section 302.2 Water Service and Drainage

- Piping and fittings used for water service , makeup, and drainage piping for Pool and spa shall comply with the International Plumbing Code. Fittings shall be approved for installation with the piping installed.



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



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### Section 302.4 Concealed Piping Inspection

- Piping, including process piping, that is installed in trenches, shall be inspected prior to backfilling.



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### Section 302.5 Backflow Protection

- Water supplies for Pool and spa shall be protected against backflow in accordance with the International Plumbing Code or the International Residential Code, as applicable in accordance with Section 102.7.1



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### Section 302.6 Waste Water Discharge.

- Where wastewater from Pool and spa, backwash from filters and water from deck drains discharge to the building drainage system, such installation shall be in accordance with the International Plumbing Code or the International Residential Code, as applicable in accordance with Section 102.7.1.



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### Section 302.7 Test

- Tests on piping systems constructed of plastic piping shall not use compressed air for the test.



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### Section 302.8.1 Manuals

- An operating and maintenance manual in accordance with industry-accepted standards shall be provided for each piece of equipment requiring maintenance.



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### Barrier Requirements



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### Section 305 Barrier Requirements

- This section of the code applies to the design of barriers for Pool and spa and its restriction of unauthorized access.
- The exceptions allow for spas and hot tubs with a lockable safety cover and pools with a powered safety cover (ASTM F 1346) from having barriers.



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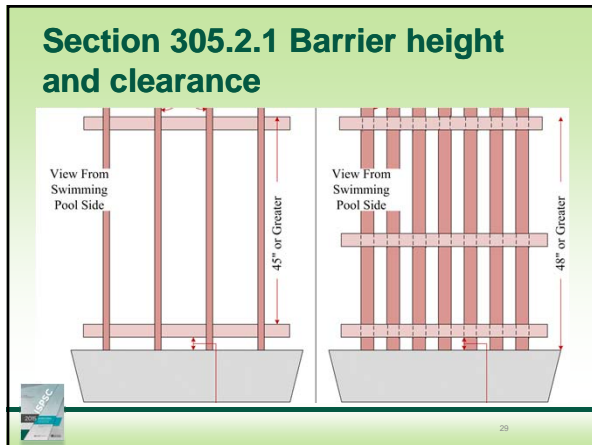
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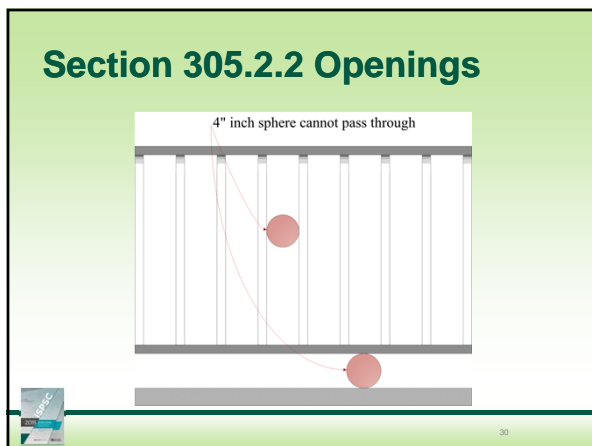
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### Section 305.2.4 Mesh Barrier/fence

- No more than 1" above the deck
- Fence cannot be lifted more than 4" from grade or decking
- Does not allow passage of a four inch sphere under any mesh panel
- Panel attachment device shall attach no lower than 45" above grade (hook and eye type latch)
- Gate shall comply with section 305.3
- Deck sleeves-noncorrosive
- Not allowed on top of on ground residential pools



Courtesy of Association of Pool & Spa Professionals™



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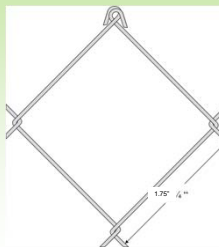
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### Section 305.2.7 Chain Link Dimensions.

- The maximum opening formed by a chain link fence shall be not more than 1.75 inches (44 mm). Where the fence is provided with slats fastened at the top and bottom which reduces the openings, such openings shall be not more than 1.75 inches (44 mm).



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### Section 305.4 Structure Wall as a Barrier.

- Where a wall of a dwelling or structure serves as part of the barrier, doors and operable windows with a sill height of less than 48 inches (1219 mm) that provide direct access to the aquatic vessel through the wall, shall be equipped with one or more of the following:



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### 305.4 Structure Wall as a Barrier.

1. An alarm that produces an audible warning when the door or its screen or window, is opened.
  - The alarm shall be listed and labeled as a water hazard entrance alarm in accordance with UL 2017.
  - In dwellings or structures not required to be Accessible units, Type A units or Type B units, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door.
  - In dwellings or structures required to be Accessible units, Type A units or Type B units, the deactivation switch shall be located not greater than 54 inches (1372 mm) and not less than 48 inches (1219mm) above the threshold of the door.



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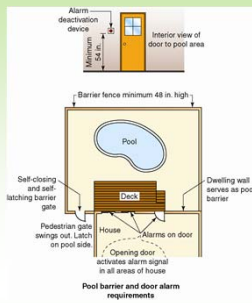
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### 305.4 Structure Wall as a Barrier(cont.)



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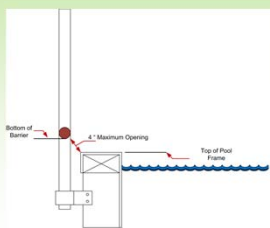
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### Section 305.5 Pool Structure as a Barrier



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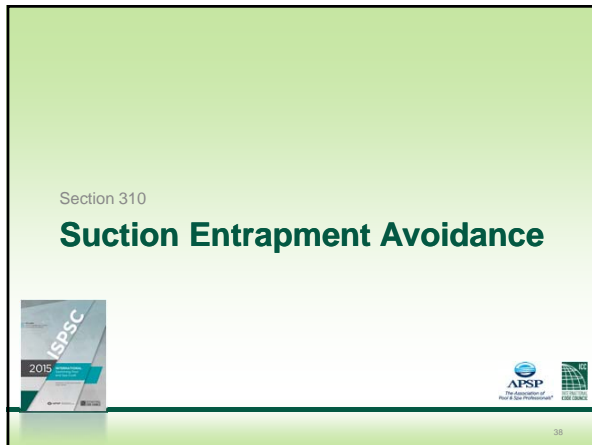
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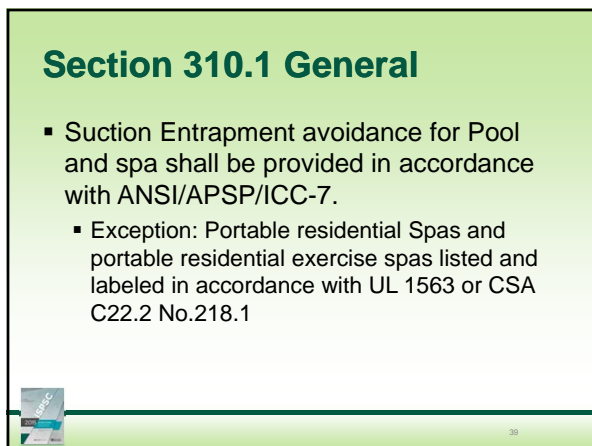
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### General Requirements

There is no backup for a missing or damaged suction outlet cover/grate. If any cover/grate is found to be damaged or missing, the pool or spa shall be immediately closed to bathers.

Limb entrapments have occurred when no water was flowing through the pipe – it was just exposed.



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### General Requirements

- Section Outlets are optional
- Suction outlets are certified to ANSI/APSP-16
- Secondary system certification
- Multiple outlet spacing



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### Maximum System Flow Rate

- The maximum system flow rate shall be determined according to control system type:
  - For unsecured systems open all valves to their full open position for pool or spa circulation. (For secured systems, do not adjust valves)
  - Remove eyeball fittings from return inlets, when removable by hand.
  - Turn off suction from skimmers to isolate submerged outlets if possible.
  - Backwash or clean filters



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### Unsecured Systems

- Measure with a flow meter accurate to +/- 10% installed per manufactures specifications.
- Compute using system TDH calculations and use manufactures certified pump curve.
- Measuring system TDH at the pump's drain plugs and look up flow rate using manufacturers certified pump curve.



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### Certified Secured Control Systems

- Pump at it's highest operating speed with the lowest operating system resistance as defined by the Registered Design Professional.
- Measure with a flow meter accurate to +/- 10% installed per manufacturers specifications. The manufactures claims must be NIST traceable and viewed by a third party.



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### Listed Safety Covers

- **Listed suction outlet(s).** Suction outlet covers/grates shall be tested and listed by a nationally recognized testing laboratory as conforming to the most recent edition of ANSI/APSP-16 2011 and include a permanently marked flow rating tested to prevent hair entrapment.



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### Covers may be verified with Plans and/or Inspection

- Permit application can include the Manufacturer, make and model of the drain covers, including the flow rating.
- Covers may be required to be on site at one of the inspection phrases. They must have the following language embossed on them or permanently marked in a location that is visible when installed.

ANSI/APSP-16 2011 and, a flow rating "X GPM", and "Life: X Years", and Manufacturer and Model



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### Minimum flow ratings

When used, submerged suction outlet arrangements shall be single unblockable, dual, or three-or-more.

- **Single or dual outlets.** The flow rating for each listed cover/grate shall be greater than the maximum system flow rate.
- **Three or more outlets.** For a system with three or more covers/grates, the sum of the flow ratings shall be at least twice the maximum system flow rate.

*Example:* Two (2) 100 GPM cover/grates and one (1) 60 GPM cover/grate would have an allowable maximum system flow rate of 130 GPM  $(100 + 100 + 60) / 2 = 130$



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### Drain Placement

- **Dual cover/grate separation.** Two covers/grates shall be separated by a minimum of 3 feet measured from center to center of suction pipes or located on two (2) different planes; i.e., one (1) on the bottom and one (1) on the vertical wall, or one (1) each on two (2) separate vertical walls.



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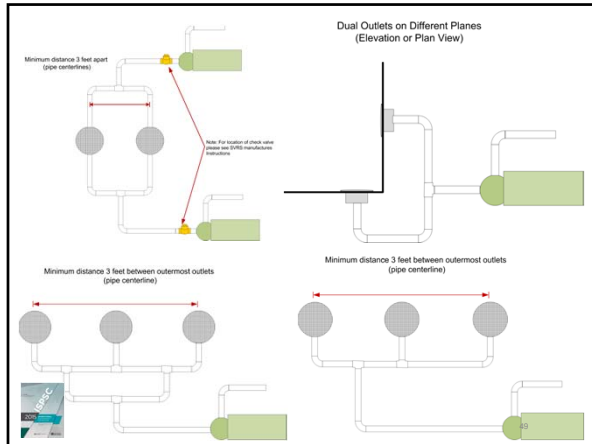
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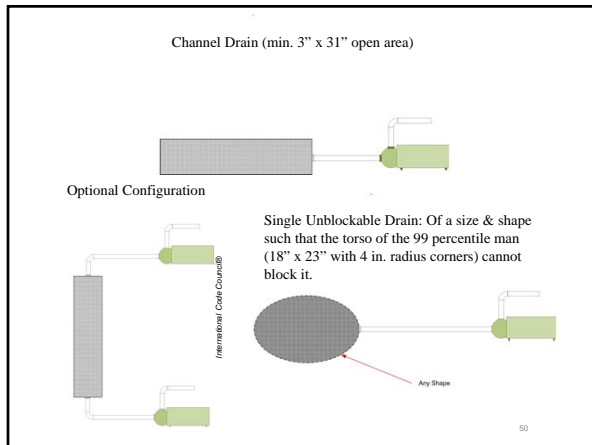
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### Channel Drain Example

- Single unblockable drain has no branch piping

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### Single Unblockable Drains

16 in. (406 mm)

20.5 in. (521 mm)

23 in. (584 mm)

18.4 in. (467 mm)

18 in. (457 mm)

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### Field Built Sumps

If manufacturer's instructions do not specify field built sump design they must be constructed as shown here

Sump Cover

Suction outlet pipe

1.0 in. (25.4 mm)

0.75 in. (19.0 mm)

D

Dotted line represents the "recommended" configuration

Sump Cover

Suction outlet pipe

1.5 in. (38.1 mm)

0.75 in. (19.0 mm)

D

Sump Cover

Suction outlet pipe

1.5 in. (38.1 mm)

0.75 in. (19.0 mm)

D

D = Inside Diameter of Suction Outlet Pipe

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### Drain Options

- Submerged Suction Outlets are Not Required
- Dual Drains w/Listed Covers (Limited Velocity)
- Multiple Drains w/Listed Covers (Limited Velocity)
- Single Unblockable Drains w/Listed Covers (Limited Velocity)
- Gravity Flow Systems w/Listed Covers (Except Skimmers)

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### Drain Placement may be verified with Plans & Inspection

- Drain placement details should be shown on the Permit application drawings.
- Field inspection; measuring for distance between suction pipe centers or observing placement on different planes.
- Field inspection; for field fabricated sumps, measure from top of pool shell floor to top of suction pipe.



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Section 311

### Circulation systems



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### Section 311.1 General

- The provisions of this section apply to *circulation systems* for pools and spas.

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



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### Section 311.2 System design

- A *circulation system* consisting of pumps, piping, *return inlets* and outlets, *filters*, and other necessary equipment shall be provided for the complete circulation of water. Wading pools and spas shall have separate dedicated filtering systems.
- **Note: submerged suction outlets are prohibited in newly constructed wading pools.**

**Exception:** Separate filtering systems are not required for *residential pools and spas*.




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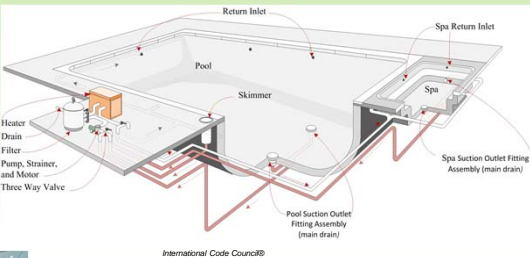
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### Section 311.2




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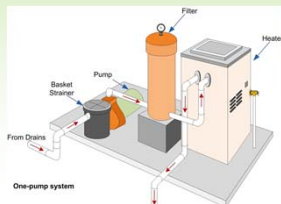
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### Section 311.2.1 Turnover rate

- The equipment shall be sized to turn over the volume of water that the pool or spa is capable of containing as specified in this code for the specific installation.




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### Section 311.2.2 Servicing

- Circulation system components that require replacement or servicing shall be provided with access for inspection, repair, or replacement and shall be installed in accordance with the manufacturer's specifications



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### Section 311.2.3 Equipment Anchorage

- Pool and spa equipment and related piping shall be designed and installed in accordance with the manufacturer's installation instructions.



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### Section 311.3 Water Velocity

- **Summary:** Water flow should never exceed recommended maximum velocities through the circulation system for two reasons.
- First, high velocities in branch piping between multiple suction outlets can exacerbate suction entrapment incidents.



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### Section 311.3 Water Velocity (cont.)

- In addition, high velocities create greater resistance to flow, increasing the total dynamic head in the system, leading to higher amperage draws and increased operating costs.
- The ANSI/APSP/ICC-15 standard requires the maximum water velocity in filtration suction piping shall be limited to 6 feet per second (fps) (1.829 mps), lowering amperage draws and operating costs.



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### Section 311.3 Water Velocity (cont.)

- All other suction piping velocities shall be 6 fps (1.829 mps) for public pools or 8 fps (2.438 mps) for residential pools. Sizing charts are available from manufacturers of PVC pipe, which illustrate flow rates in feet per second.



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### Section 311.4 Piping and Fittings

- Plastic pipe and fittings used in circulation systems shall be nontoxic and shall be able to withstand the design operating pressures pool or spa. Plastic pipe shall be listed and labeled as complying with NSF 14. Circulation system piping shall be listed and labeled as complying with one of the standards in Table 311.4.



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### Table 311.4 Circulation System Pipe Material Standard

Material	Standard
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 1527
Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing	ASTM D 2846; CSA B137.6
Copper or copper-alloy tubing	ASTM B 88; ASTM B 447
Polyvinyl chloride (PVC) hose	ASTM D 1785; ASTM D 2241; ASTM D 2672; CSA B137.3
Polyvinyl chloride (PVC) plastic pipe	ASTM D 1785; CSA B 137.3
Stainless steel pipe, Types 304, 304L, 316, 316L	ASTM A 312

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### Section 311.4.1 Fittings

- Fittings used in circulation systems shall be listed and labeled as complying with one of the standards in Table 311.4.1.
- **Exceptions:**
  1. Suction outlet fitting assemblies and manufacturer-provided components certified in accordance with APSP 16
  2. Skimmers and manufacturer-provided components.
  3. Gutter overflow grates and fittings installed above or outside of the overflow point of the pool or spa.

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### Table 311.4.1 Circulation System Fittings

Material	Standard
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 1527
Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing	ASTM D2846; ASTM F437; ASTM F 438; ASTM F 439; CSA B137.6
Copper or copper-alloy tubing	ASME B 16.15
Polyvinyl chloride (PVC) plastic pipe	ASTM D2464; ASTM D 2466; ASTM D2467; CSA B137.2; CSA B137.3
Stainless steel pipe, Types 304, 304L, 316, 316L	ASTM A 182; ASTM A 403

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### Section 311.4.3 Piping Subject to Freezing

- Piping subject to damage by freezing shall have a uniform slope in one direction and shall be equipped with valves for drainage or shall be capable of being evacuated to remove the water.



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### Section 311.5 System Draining

- Equipment shall be designed and fabricated to drain the water from the equipment, together with exposed face piping, by removal of drain plugs, manipulating valves, or by other methods. Drainage shall be in accordance with manufacturer's specifications.



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### Section 311.6 Pressure or Vacuum Gauge

- Gauges shall be provided for public pools in the circulation system. Gauges shall be provided with ready access.
  1. A pressure gauge shall be located downstream of the pump and between the pump and filter.
  2. A vacuum gauge shall be located and upstream of the pump.



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### Section 311.6 Pressure or Vacuum Gauge



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### Section 311.7 Flow Measurement

- Public swimming pools and wading pools shall be equipped with a flow-measuring device that indicates the rate of flow through the filter system. The flow rate measuring device shall indicate gallons per minute and shall be selected and installed to be accurate within plus or minus 10 percent of actual flow



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### Section 311.8 Instructions



- Written operation and maintenance instructions shall be provided for the *circulation system* of *public pools*.



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### Section 311.9 Hydrostatic Pressure Test

- Circulation system piping, other than that integrally included in the manufacture of the pool or spa, shall be subjected to a hydrostatic pressure test of 25 pounds per square inch (psi) (172.4 kPa). This pressure shall be held for not less than 15 minutes.



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### Section 312 Filters



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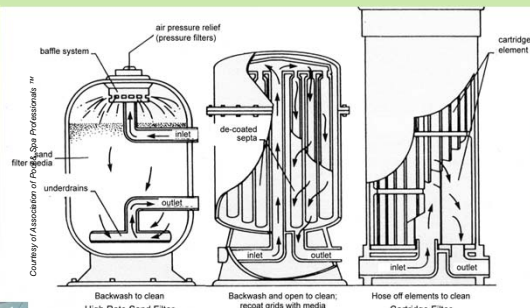
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### Section 312 Filters



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### Section 312.3 Internal Pressure

- For pressure-type filters, a means shall be provided to permit the release of internal pressure.



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### Section 312.3.1 Air release

- Filters incorporating an automatic means of internal air release as the principal means of air release shall have one or more lids that provide a slow and safe release of pressure as a part of the design and shall have an manual air release in addition to an automatic release.



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### 312.3.2 Separation Tanks

- A separation tank used in conjunction with a filter tank shall have a manual method of air release or a lid that provides for a slow and safe release of pressure as it is opened



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Section 313

## PUMPS AND MOTORS



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### Section 313 Pump & Motors

- **Section 313.1 General**
- The provisions of this section apply to pumps and motors for all pools and spas.
- **Exception:** Portable residential spas and portable residential exercise spas.



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### Section 313.2 Performance

- A pump shall be provided for circulation of the pool water. The pump shall be capable of providing the flow required for filtering the pool water against the total dynamic head developed by the complete system and filter cleaning, if applicable.



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### Section 313.3 Intake protection

- A cleanable strainer, skimmer basket, or screen shall be provided up stream or as an integral part of circulation pumps, to remove solids, debris, hair, and lint on pressure filter systems.



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### Section 313 Pump & Motors

- **Section 313.4 Location**
  - Pumps and motors shall be accessible for inspection and service in accordance with the manufacturer's specifications.
- **Section 313.5 Safety.**
  - The design, construction, and installation of pumps and component parts shall be in accordance with the manufacturer's specifications.



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### Section 313.6 Isolation Valves

- Shutoff valves shall be installed on the suction and discharge sides of pumps that are located below the waterline. Such valves shall be accessible.



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### Section 313.7 Emergency Shutoff Switch

- An emergency shutoff switch shall be provided to disconnect all power to recirculation and jet system pumps and air blowers. Emergency shutoff switches shall be: provided with access; located within sight of the spa and located not less than 5 feet (1524 mm) horizontally from the inside walls of the pool or spa.
- **Exception:** Onground storable and permanent inground residential swimming pools.



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### Section 313.8 Motor Performance

- Motors shall comply with UL 1004-1, UL 1081, CSA C22.2 No. 108 or the relevant motor requirements of UL 1563 or CSA C22.2 No. 218.1, as applicable.



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Section 314

### Return and Suction Fittings



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### Section 314.1 General

- The provisions of this section apply to return and suction fittings for pools and spas.
  - **Exception:** Portable residential spas and portable residential exercise spas.



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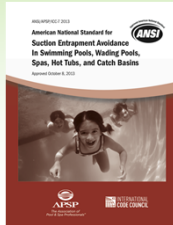
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### Section 314.2 Entrapment Avoidance

- Entrapment avoidance means shall be provided in accordance with Section 310.



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### Section 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.



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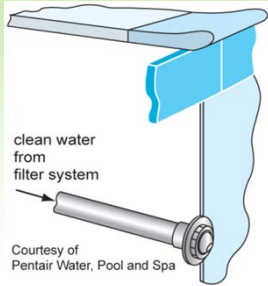
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### Section 314.4 Return Inlets



clean water from filter system

Courtesy of Pentair Water, Pool and Spa

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### Section 303 Energy Requirements

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### Section 303 Energy

- **303.1 General.** The energy requirements for pools and inground permanently installed spas shall be as specified in Sections 303.2 through 303.4 and **APSP 15**. The energy requirements for residential portable electric spas shall be in accordance with **APSP 14**.

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### Section 303.2 Heaters (4.3.1 APSP-15)

- Heaters shall be equipped with an external on-off switch to allow the heater to be shutoff without adjusting the thermostat setting. Such switch shall be provided with ready access. Gas-fired heaters shall not be equipped with continuous pilot burners.
- **Exception:** *Portable residential spas and portable residential exercise spas.*



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### Federal Heater Requirements

- **APSP-15, Section 4.3.2**, following federal DOE minimum standards, requires the following:
  - Heat pumps = Minimum 4.0 COP
  - Gas = Minimum 82%



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### Section 303.3 Time switches (5.3.4 APSP-15)

- Time switches or other control methods that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed with or on all heaters and pumps. Heaters, pumps and motors that have built-in timers shall be deemed in compliance with this requirement.



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### Section 303.3 (cont.)

▪ **Exceptions:**

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate waste-heat recovery pool heating systems.
3. Portable residential spas and portable residential exercise spas.



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### Section 303.4 Covers

- Heated pools and inground permanently installed spas shall be provided with a vapor retardant cover.
- **Exception:** Where more than 70 percent of the energy for heating, computed over an operating season, is from site recovered energy such as from a heat pump or solar energy source.



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### APSP-15

▪ **Objective of Standard**

- Provide energy efficiency performance specification for swimming pool filtration systems
- Provide efficiency level for pool and spa heaters



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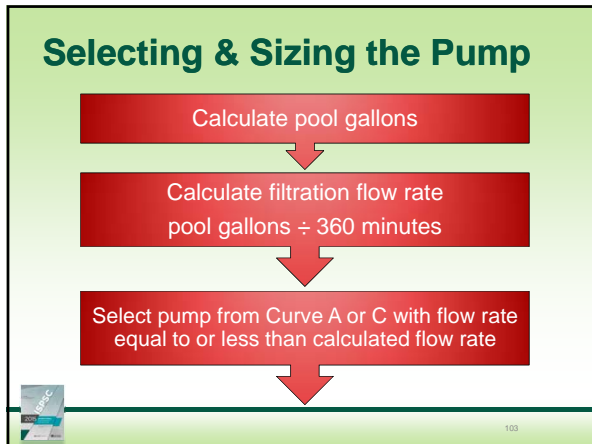
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### ANSI/APSP/ICC-15 2011

- Applies only to Residential Pool Filtration Pumps & Pump Motors
  - Does not regulate pumps used for other features, such as booster pumps for cleaners, waterfall pumps, etc. Only pumps that filter water for the main filter pump are regulated.
  - Spa pumps are also not included unless using the same pump for pool filtration.
  - Excludes auxiliary filters not used to maintain water quality, example: fountains, waterfalls

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### APSP-15 Design Requirements

- Pool filter pump sized for minimum 6 hour turnover
- Timer/controller
- Filtration pipe from pool-to-pump-to-pool
  - 6 feet-per-second all suction pipe
  - 8 feet-per-second all return pipe & backwash valve
- Filter
  - Sized for 6-hour turnover
    - Cartridge 0.375 (gpm/ft<sup>2</sup>)
    - Sand 15 (gpm/ft<sup>2</sup>)
    - Diatomaceous Earth 2 (gpm/ft<sup>2</sup>)

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### The Process

- Determine volume
- Calculate filtration flow rate
- Select a pump from the database
- Size the piping system and filter



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### How it Works

- Pool area x average depth x 7.48 (gal. per cu. ft.) = volume
- Volume ÷ 360 (minutes in 6 hours) = flow rate (or 36 gpm)
- Use flow rate to select a pump from the database
- Size filtration piping to accommodate the filtration flow rate
- Size filter using filtration flow rate

NOTE: Calculating any auxiliary flow rate and sizing the filter for the greater flow rate is a good idea – not required but will enhance efficiency



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### ANSI/APSP/ICC-15 2011

- 5.2 Maximum filtration flow rate: Depending on the volume of the pool, the pool filtration flow rate shall not be greater than the rate needed to turn over the pool water volume in six hours or 36 gpm, whichever is greater.
- This means that for pools of less than 13,000 gallons the pump shall be sized to have a flow rate of 36 gpm or less and for pools of greater than 13,000 gallons, the pump shall be sized using the pool volume ÷ 360 minutes.



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### ANSI/APSP/ICC-15 2011

- 5.3.3 For multi-speed and variable-speed filter pumps, at least one speed shall have the flow listed for Curve (A or C) that equal to or less than the maximum filtration flow rate.



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### Selecting the Pump: APSP-15

- Residential pool filtration pumps shall be selected from the CEC Appliance Efficiency Database for Residential Pool Pumps, or the APSP Appliance Efficiency Pool Pump Database (per APSP-15).
- Either database can be used to verify compliance.



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### ANSI/APSP/ICC-15 2011

- 4.1.1 Motors.
  - Prohibits split-phase, shaded-pole or capacitor start-induction run type pump motors.
- 4.1.1.2 Two-speed, multi-speed, or variable-speed capability.
  - Requires pool pumps & pump motors with a total horsepower of 1HP or greater to have the capability of operating at two or more speeds.



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## Filter Pump Database

APSP Appliance Efficiency Pool Pump Database List Revised Feb. 26, 2014														
Manufacturer Name	Model Name	Model Number	Type	1/2" HP	1/2" Design	Flow @ GPM	Flow @ Pump Curve A Energy	Flow @ Pump Curve B Energy	Flow @ Pump Curve C Energy	Flow @ Pump Curve D Energy	Flow @ Pump Curve E Energy	Flow @ Pump Curve F Energy	Flow @ Pump Curve G Energy	Flow @ Pump Curve H Energy
299	Aqualtra Systems	Sumpmaster	SUMP2200	3450	Quat-speed	65	1865	239	83	2055	2.48			
300	Aqualtra Systems	Sumpmaster	SUMP2000	3450	Quat-speed	65	1865	239	83	1917	2.63			
301	Spexx Pumps	Spexx Pumps	SP11	3450	Single speed	45	770	330	55	792	4.14			
302	Aqualtra Systems	Sumpmaster	SUMP22500	3175	Quat-speed	70	495	434	49	440	3.86			
303	Jandco Pool Systems, Inc.	Jandy Pro Series	HW1125	1725	Single speed	37	178	330	53	659	4.81			
304	Aqualtra Systems	Sumpmaster	SUMP5125	3450	Multi-speed	51	1715	244	69	134	3.55			
305	Aqualtra Systems	Sumpmaster	SUMP5125	2600	Multi-speed	43	178	4.41	53	600	5.52			
306	Aqualtra Systems	Sumpmaster	SUMP5125	1725	Multi-speed	39	295	830	88	152	16.59			
307	Jandco Pool Systems, Inc.	Jandy Pro Series	HW1110	3450	Single speed	54	1362	238	39	1225	3.41			
308	Hayward	Hayward	SP1381002	3450	Quat-speed	51	1055	364	44	1651	3.75			
309	Hayward	Hayward	SP2374100	1725	Quat-speed	25	271	534	82	274	7.52			
310	Hayward	Hayward	SP1324112	3450	Quat-speed	33	1212	253	46	1643	3.26			
311	Hayward	Hayward	SP2324112	1725	Quat-speed	25	299	532	82	304	4.32			
312	Hayward	Hayward	SP2310100	3450	Quat-speed	29	448	338	38	1551	3.20			
313	Hayward	Hayward	SP2333020	1725	Quat-speed	29	391	445	39	1698	5.44			
314	Pentair Aquatic Systems	Pentair IntelliFlo II Variable Speed Pump	R11068	3450	Variable-Speed	63	1615	251	62	1681	3.62			
315	Pentair Aquatic Systems	Pentair IntelliFlo II Variable Speed Pump	R11068	1725	Variable-Speed	33	261	733	43	274	4.96			
316	Pentair Aquatic Systems	Pentair IntelliFlo II Variable Speed Pump	R11068	750	Variable-Speed	13	72	2233	23	20	14.57			
317	Pentair Aquatic Systems	Pentair IntelliFlo II Variable Speed Pump	R11068	450	Variable-Speed	3	53	647	11	58	11.33			
318	Spexx Pumps	Spexx Pumps	Spexx L6043 V	3450	Variable-speed	54	1148	260	55	1276	3.88			
319	Spexx Pumps	Spexx Pumps	Spexx L6043 V*	2600	Variable-speed	41	129	4.65	54	132	5.84			
320	Spexx Pumps	Spexx Pumps	Spexx L6043 V**	1725	Variable-speed	28	191	835	38	191	11.89			
321	Spexx Pumps	Spexx Pumps	Spexx L6043 V***	1500	Variable-speed	26	82	1535	23	146	11.69			
322	Spexx Pumps	Spexx Pumps	SP1	3450	Single speed	40	683	343	46	1017	4.40			
323	Spexx Pumps	SP1	2600	Single speed	33	1153	338	43	1344	3.83				
324	Fluidra	PH3	PH3000	1575	Variable speed	24	136	1340	30	127	14.26			
325	Fluidra	PH3	PH3000	2000	Variable speed	31	509	630	41	1814	3.24			

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## APSP-15: System Piping & Circulation

- Pool piping and pipe fittings must be sized so that the velocity of the water at maximum design flow does not exceed 8 feet per second in the return line and 6 feet per second in the suction line.

Pipe Size	1.5"	2"	2.5"	3"	3.5"	4"	5"	6"
Nominal GPM @ 6fps	38	63	90	138	185	238	374	540
Nominal GPM @ 8fps	51	84	119	184	247	317	499	720

- EXCEPTION:** Pipe and fittings do not include equipment connections or internal equipment piping of, but not limited to, suction safety systems, pumps, heaters, and sanitizing devices.

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## ANSI/APSP/ICC-15 2011

- 4.2 Pump Controllers
  - Pool pump motor controls for use with a two-speed or greater pump shall have the capability of operating the pool pump at a minimum of two speeds.

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### APSP-15 System Equipment

- 5.1.3 Sweep elbows encouraged, not required.
- 5.4.2 When used, filter backwash valves must be 2 inches or the diameter of the return pipe, whichever is greater.
- 5.6 Directional inlet fittings are required.



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### APSP-15: System Piping & Circulation

- 5.5.2 For pool filtration pumps a length of straight pipe that is at least 4 pipe diameters shall be installed before the pump.
- 5.5.3 At least 18 inches of horizontal or vertical pipe shall be installed between the filter and the heater or built-in or built-up connections shall be installed to allow for the future addition of solar heating equipment.



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### Additional APSP-15 Requirements

- Specify controller for multi-speed pumps – must default to low speed within 24 hours.
- Show efficiency rating for heaters.
- Minimum 4 pipe diameters in front of pump.
- Minimum 18 in. pipe after filter for solar.
- Directional return fittings must be used.



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### APSP-15 System Equipment

- **Maximum flow rates per Filter Type:**
  - Cartridge 0.375 (gpm/ft<sup>2</sup>)
  - Sand 15 (gpm/ft<sup>2</sup>)
  - Diatomaceous Earth 2 (gpm/ft<sup>2</sup>)



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### Additional APSP-7 Requirements

- Velocity limits through Suction Outlet Fitting Assemblies (SOFAs) set by APSP-16 (velocity limits in piping systems set by APSP-5 and APSP-15)
- Skimmer equalizer lines prohibited
- Maximum system flow rates must be determined
- Submerged suction outlets prohibited in Wading Pools



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### Additional APSP-7 Requirements

- Suction outlets are optional.
- Secondary systems must be certified.
- Multiple outlet spacing requirements.
- Maximum system flow defined.



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### APSP-14

- Objective of the Standard: To establish minimum energy efficiency requirements for portable electric spas.
  - These requirements do not apply to public spas (ANSI/APSP-2), permanently installed spas (ANSI/APSP-3), or other spas, such as those operated for medical treatment, physical therapy or other purposes.
- These requirements apply to factory-built residential portable electric spas that are operated by a private owner. Residential exercise spas (also known as swim spas) and portions of combination spas/swim spas are included in this standard.



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### APSP-14 Compliance

- Portable Spa Manufacturers will need to ensure compliance with the standby power and all requirements found in APSP-14.
- The contractor and building department simply need to ensure the labeling requirement found in Section 7 is provided for to determine whether or not a portable spa is in compliance with APSP-14.



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### APSP-14, Section 7 Labeling

- 7.1 The manufacturer shall include either on or in close proximity to the spa's product label, the standby watts rating.
- 7.2 Wording to be in the following format:
  - Per ANSI-14 Measured Standby Power Consumption XXXX Watts (Maximum Allowable Standby Power Consumption XXXX Watts)



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Section 315

## SKIMMERS

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### Section 315.1 (Summary)

- The provisions of Section 315 apply to skimmers for all Pools and spas with the exception of portable residential spas and portable residential exercise spas.



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### Section 315.2 Required (Summary)

- Requires a surface skimming system be provided for public Pool and spa. However there is an exception for
- Public pools designed in accordance with Chapter 6. This chapter covers public pools and water containment systems for aquatic recreation.



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### Section 315.4 (Summary)

- Perimeter skimming systems are not required to be completely around the aquatic vessel but they must occupy at least 50 percent of the perimeter.



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### 315.4.1 Surge Capacity. (Summary)

- A perimeter surface skimming system could become “flooded” if a large number of bathers enter the vessel in a short amount of time. Flooding of the system would allow the particulates already captured by the system to refloat out onto the surface of the water. This section requires that perimeter skimming systems have a minimum surge capacity based upon the water surface area of the vessel so that the potential for a flooding condition is minimized.



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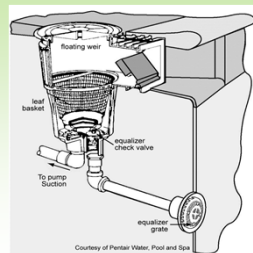
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### Section 315.5 Equalizer Lines

- Because the inlet of the equalizer pipe could constitute a suction inlet, equalizers are prohibited in new construction.



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Section 316

## Heaters



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### Section 316.4.1 Temperature

- A means shall be provided to monitor water temperature.



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### Section 316.4.2 Access Prohibited

- For public pools and spas, public access to controls shall not be allowed.



International Code Council®



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Section 319

## Sanitizing Equipment



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### Section 319.1 Equipment Standards

- Sanitizing equipment installed in public pools and spas shall be capable of introducing the quantity of sanitizer necessary to maintain the appropriate levels under all conditions of intended use.



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### Section 319.2 Chemical Feeders

- Where installed, chemical feed systems shall be installed in accordance with the manufacturer's specifications. Chemical feed pumps shall be wired so that they cannot operate unless there is adequate return flow to disburse the chemical throughout the vessel as designed.



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Section 320

## Waste Water Disposal



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### Section 320.1 Backwash Water or Drainage Water

- Shall discharge to
  - Sanitary sewer
  - Storm sewer
  - Approved disposal system on the premises
  - Other means approved by State or Local Authority



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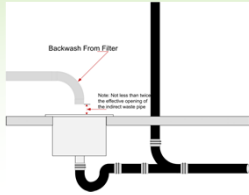
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### Section 320.1 (cont.)

- Direct connections shall not be made between the end of the backwash line and the disposal system.  
Drains shall discharge through an air gap.



Note: The backwash line shall be connected to the disposal system through an air gap.



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### Section 320.2 Water Salvage

- Back wash water can return to the vessel only after:
  - Water has been filtered to remove particulates
  - Treated to eliminate coli form bacteria & waterborne pathogens
  - And such return has been approved by the state or local authority



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### Chapter 7 – Onground Storable Residential Swimming Pools



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### Section 701.4

For onground storable *residential* pools with a vinyl liner, the manufacturer's name and the liner identification number shall be affixed to the liner.

For onground storable *residential* pools without a liner, the manufacturer's name and identification number shall be affixed to the exterior of the pool structure.



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### Section 702

702.1 Pools shall have a means of entry and exit consisting of not less than one ladder or a ladder and staircase combination.

702.2.1 Ladders in the pool shall have a physical barrier to prevent children from swimming through the riser openings or behind the ladder.



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### Section 703

703.1 General. Decks provided by the pool manufacturer shall be installed in accordance with the manufacturer's instructions. Decks fabricated on-site shall be in accordance with the *International Residential Code*.



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### Section 705

**705.1. Signs to be installed prior to final inspection.** Safety signage such as "NO DIVING" signs and other safe use instruction signs that are provided by the pool and ladder manufacturer shall be posted in accordance with the manufacturer's instructions prior to final inspection.



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## Chapter 8 – Permanent Inground Residential Swimming Pools

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## Section 803.1

**Construction tolerances.** The construction tolerance for dimensions for the overall length, width and depth of the pool shall be  $\pm 3$  inches (76 mm). The construction tolerance for all other dimensions shall be  $\pm 2$  inches (51 mm), unless otherwise specified by the design engineer.

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**Table 1. Minimum diving water envelope for swimming pools designated types I-V**

Pool Types	Minimum Depths at Point				Minimum Widths at Point				Minimum Lengths between Points					
	A	B	C	D	A	B	C	D	WA	AB	BC	CD	DE	WE
0	Manufactured diving equipment is prohibited.													
1	6' 0" (1.82 m)	7' 6" (2.29 m)	5' 0" (1.52 m)	2' 9" (838 mm)	10' 0" (3.05 m)	12' 0" (3.66 m)	10' 0" (3.05 m)	8' 0" (2.44 m)	1' 6" (457 mm)	7' 0" (2.13 m)	7' 6" (2.29 m)	Varies	6' 0" (1.82 m)	28' 9" (8.76 m)
2	6' 0" (1.82 m)	7' 6" (2.29 m)	5' 0" (1.52 m)	2' 9" (838 mm)	12' 0" (3.66 m)	15' 0" (4.57 m)	12' 0" (3.66 m)	8' 0" (2.44 m)	1' 6" (457 mm)	7' 0" (2.13 m)	7' 6" (2.29 m)	Varies	6' 0" (1.82 m)	28' 9" (8.76 m)
3	6' 10" (2.08 m)	8' 0" (2.44 m)	5' 0" (1.52 m)	2' 9" (838 mm)	12' 0" (3.66 m)	15' 0" (4.57 m)	12' 0" (3.66 m)	8' 0" (2.44 m)	2' 0" (610 mm)	7' 6" (2.29 m)	9' 0" (2.74 m)	Varies	6' 0" (1.82 m)	31' 3" (9.53 m)
4	7' 6" (2.34 m)	9' 0" (2.74 m)	5' 0" (1.52 m)	2' 9" (838 mm)	15' 0" (4.57 m)	18' 0" (5.49 m)	15' 0" (4.57 m)	9' 0" (2.74 m)	2' 6" (762 mm)	8' 0" (2.44 m)	10' 6" (3.20 m)	Varies	6' 0" (1.82 m)	33' 9" (10.33 m)
5	8' 6" (2.59 m)	9' 0" (2.74 m)	5' 0" (1.52 m)	2' 9" (838 mm)	15' 0" (4.57 m)	18' 0" (5.49 m)	15' 0" (4.57 m)	9' 0" (2.74 m)	3' 0" (914 mm)	9' 0" (2.74 m)	12' 0" (3.66 m)	Varies	6' 0" (1.82 m)	36' 9" (11.2 m)

**NOTES**

- Minimum length between points CD may vary based upon water depth at point D and the slope between points C and D.
- Drawings are not to scale.
- Negative construction tolerances (see para. 5.1.1) shall not be applied to any of the dimensions shown in the Minimum Water Envelopes given in Table 1.
- Pool types designate minimum water envelope sizes as specified by the diving board manufacturers.

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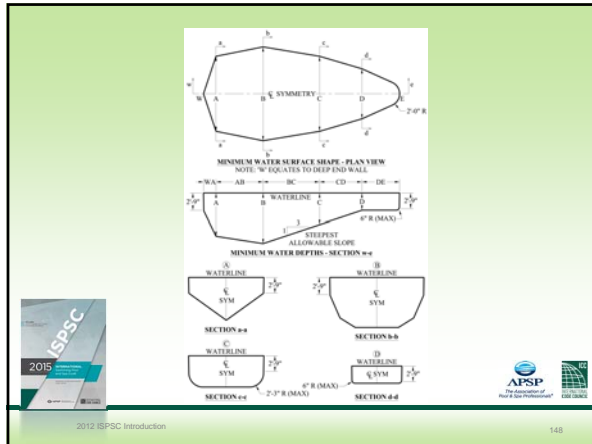
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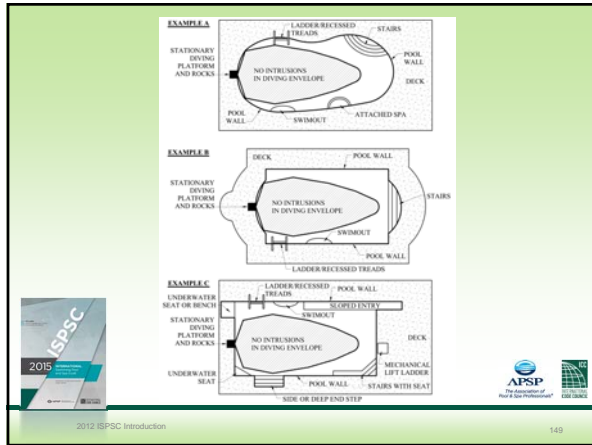
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**Section 808.6**

Point A shall be the point from which all dimensions of width, length and depth are established for the minimum diving water envelope. If the tip of the diving board or diving platform is located at a distance of WA or greater from the deep end wall and the water depth at that location is equal to or greater than the water depth requirement at Point A, then the point on the water surface directly below the center of the tip of the diving board or diving platform shall be identified as Point A.

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**Swimming Pool & Accessibility Requirements**

"Per Accessible and Usable Buildings and Facilities-ICC A117.1-2009"




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**Chapter 11 – Recreational Facilities**

- Adds a new chapter into the standard to provide the technical requirements for making sports and recreational facilities accessible. Includes provisions for items such as amusement rides, boating facilities and fishing piers, golf, playground equipment, swimming pools and more.



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**Section 1109 Swimming Pools, Wading Pools, Hot Tubs and Spas**

- This section provides the technical criteria for swimming pools, wading pools, hot tubs and spas. While these items previously needed to be on an accessible route, these provisions include the number and means of entry points to make different types of pools accessible.



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### Section 1109.1.1

- Two accessible means of entry for swimming pools
  - Swimming pool lift (Section 1109.2)
  - Sloped entries (Section 1109.3), transfer walls (Section 1109.4), transfer systems (Section 1109.5), and pool stairs (Section 1109.6)
  - Exception: swimming pool that has less than 300 linear feet (91 m) of swimming pool wall.  
*(Only one accessible means of entry required.)*



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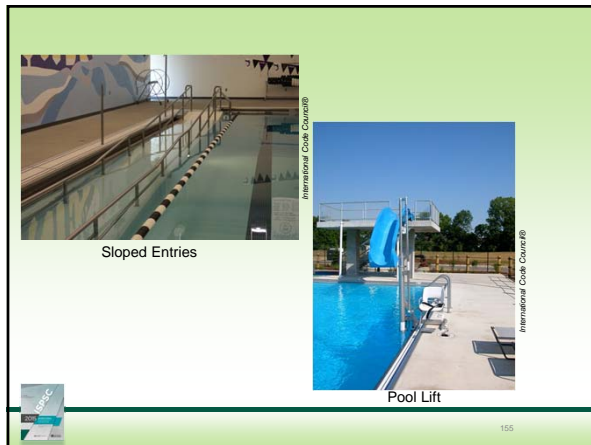
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### Section 1109.1.1 (cont.)

- Exception (cont.):
  - Wave action pools, leisure rivers, sand bottom pools, and other pools where the user's access is limited to one area shall not be required to provide more than one accessible means of entry provided that the accessible means of entry is a lift(Section 1109.2); a sloped entry (Section 1109.3) or a transfer system (Section 1109.5).
  - Catch pools shall not be required to provide an accessible means of entry provided that the catch pool edge is on an accessible route.



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### Section 1109.1.2 Wading Pools

- At least one sloped entry complying with Section 1109.3 shall be provided in wading pools.



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### Section 1109.1.3

- At least one accessible means of entry shall be provided for hot tubs and spas. Accessible means of entry shall comply with swimming pool lifts complying with Section 1109.2; transfer walls complying with Section 1109.4; transfer systems complying with Section 1109.5.
  - Exception: Where hot tubs or spas are provided in a cluster, no more than 5 percent, but not less than one hot tub or spa in each cluster shall be required to comply with Section 1109.1.3.



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### Section 1109.2 Pool Lifts

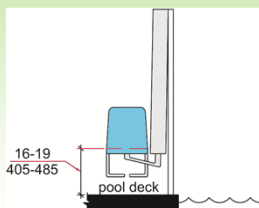


Figure 1109.2.4 Pool Lift Seat Height

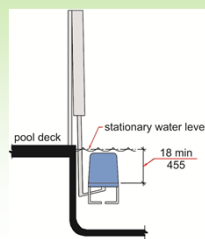


Figure 1109.2.8 Pool Lift Submerged Depth



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### Section 1109.3 Sloped Entry Route

stationary water level  
24-30  
610-760  
International Code Council®  
landing

Figure 1109.3.2  
Sloped Entry Submerged Depth

width of sloped entry  
33-38  
840-965  
International Code Council®

Figure 1109.3.3  
Handrails For Sloped Entry

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### Section 1109.4 Transfer Walls

16-19  
405-485  
pool deck  
International Code Council®

Section 1109.4.2 Transfer Wall Height

60 min  
1525  
water  
pool wall  
pool deck  
12-16  
305-405  
International Code Council®

Section 1109.4.3 Depth and Length of Transfer Walls

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### Summary/Question & Answer/Discussion

ISPPC  
2015

APSP  
The American Pool & Spa Professionals  
USA 2015

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