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Today’s Presenter

“Layers of Protection 2018 ISPSC”

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Goal

- The goal of this presentation is to highlight the 2018 International Swimming Pool & Spa Code® (ISPSC).
Who is Virginia Graeme Baker?

- The Virginia Graeme Baker Pool & Spa Safety Act (P&SS Act) takes its name from Virginia Graeme Baker, a young girl who drowned after she was trapped under water by the powerful suction from a hot tub drain.
Richmond, Virginia
October 2018

What You Need to Know About the International Swimming Pool and Spa Code (ISPSC)

History of VGB

- Signed by the President on December 19, 2007
- Is the product of the concerted efforts of many people, including:
  - Nancy Baker, mother of Virginia Graeme Baker
  - Senator Amy Klobuchar of Minnesota, who put in the public pool drain cover retro-fit mandate as a result of the tragic evisceration of Abigail Taylor in a public wading pool in Minnesota summer of 2007.
  - Congresswoman Debbie Wasserman Schultz of Florida, a pool safety advocate since her time in the FL Legislature.

VGB Requirements

- Effective December 19, 2008, the Section 1404 of the Act required:
  - All drain covers manufactured or sold in the United States had to conform to the ANSI/APSP-16 2011 Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs.

Basic Requirements

All public pools and spas with a single main must have a compliant cover and
- a safety vacuum release system (SVRS);
- suction limiting vent system;
- gravity drainage system;
- automatic pump shutoff system; or
- disable the drain

CPSC Enforcement Agency

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Key Definitions

Aquatic Recreation Facility (Water Park)

- A facility that is designed for free-form aquatic play and recreation. The facilities may include, wave or surf action pools, leisure rivers, sand bottom pools, vortex pools, activity pools, inner tube rides and body slides, and interactive play attractions.

Aquatic Recreation Facility

Class D-1, Wave Action

Courtey of Tolomato Community Development District

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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

Class D-4, Leisure River

Class D-5, Vortex Pool
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Class D-6, Interactive Play Attraction

Public Pool

- A pool, other than a residential pool, that is intended to be used for swimming or bathing...
- Public pools shall be classified and defined in the following slides:

Class A, Competition

Class B, Public

Intended for public recreational use

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Class C, Semi-public

A pool operated solely for and in conjunction with lodging - hotels, motels, apartments, condominiums, etc.

Public Pool

- **CLASS E.** Pools used for instruction, play or therapy and with temperatures above 86°F (30°C).
- **TYPES VI-IX.** Public pools suitable for the installation of diving equipment by type.
- **TYPE O.** A nondiving public pool.

General

Section Design 311.2
Electrical, Plumbing, Mechanical, & Fuel Gas Requirements

Section 302.1 Electrical

Electrical Requirements for Aquatic Facilities

NFPA 70
National Electric Code

Section 302.2 Water Service and Drainage

Piping and fittings used for water service... **shall be approved for installation** with the piping installed.

Section 302.3 Pipe, fittings and components.

- Pipe, fittings and components shall be listed and labeled in accordance with NSF 50 or NSF 14.

**Exception:** Portable residential hot tubs and exercise spas listed and labeled in accordance with UL 1563 or CSA C22.2 No. 218.1.
Section 302.4 Concealed Piping Inspection

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

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.

Section 302.6 Waste Water Discharge.

- Wastewater treatment ...shall be in accordance with the *International Plumbing Code* or the *International Residential Code*, as applicable in accordance with Section 102.7.1.

Section 302.7 Test

- Tests on piping systems constructed of plastic piping **shall not** use compressed air for the test.
Section 302.8.1 Manuals

- An operating and maintenance manual shall be provided for each piece of equipment requiring maintenance.

Section 305 Barrier Requirements

- Barriers for pool and spas
- **Exceptions** inground spas and hot tubs with a lockable safety cover and pools with a powered safety cover (ASTM F 1346) **do not require a barrier.**
**Section 305.2.1 Barrier height and clearance**

- View from Swimming Pool Side
- View from Outside Pool Side
- 45” of Finishes
- 45” of Finishes

**Section 305.2.2 Openings**

- 4” inch sphere cannot pass through

**Section 305.2.4 Mesh Barrier**

- No more than 1” above the deck
- Fence lift no more than 4” from grade or decking
- Panel attachment device no lower than 45” above grade
- Not allowed on top of aboveground pools

**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).
305.2.9 Clear zone

- There shall be a clear zone of not less than 36 inches (914mm) between the exterior of the barrier and any permanent structures or equipment such as pumps. Filters and heaters that can be used to climb the barrier.

Example of Self Latching Gate

Section 305.3 Gates

305.4 Structure Wall as a Barrier
Section 305.4 Structure Wall as a Barrier

• Doors and operable windows with a sill height less than 48 inches (1219 mm) that provide direct access to the pool through the wall, shall be equipped with an alarm.

  – The alarm shall be listed and labeled in accordance with UL 2017.

Section 305.5
Pool Structure as a Barrier- Aboveground Pool

...
What You Need to Know About the International Swimming Pool and Spa Code (ISPSC)

Section 310
Suction Entrapment Avoidance

Section 310.1 General
Suction Entrapment avoidance for Pool and spa shall be in accordance with ANSI/APSP/ICC-7.

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

Safety Awareness
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 – the opening was exposed.

General Requirements
- Section Outlets are optional- No Main drain
- Suction outlets are certified to ANSI/APSP-16
- Secondary system for single drains
- Multiple outlet spacing
Listed VGB Safety Covers

Suction Outlet Fitting Assemblies (SOFAs)

SOFAs (Drain Covers) shall be in compliance with ANSI/APSP-16 2011.

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 must have the following language embossed on them or permanently marked in an location that is visible when installed.

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

Minimum flow ratings

When used, submerged SOFAs shall be single unblockable, dual, or three-or-more.

- **Single or dual outlets.** The flow rating for each cover/grate shall be greater than the maximum system flow rate.
- **Three or more outlets.** The sum of the flow ratings shall be at least twice the maximum system flow rate.

Drain (SOFA) Placement

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.
Optional Configuration

Channel Drain (min. 3” x 31” open area)

Single Unblockable Drain: Of a size & shape such that the torso of the 99 percentile man (18” x 23” with 4 in. radius corners) cannot block it.

Channel Drain Example

Single Unblockable Drains

- Single unblockable drain has no branch piping
Field Built Sumps

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

Section 311 Circulation systems

Section 311.2 System Design

- A circulation system consisting of pumps, piping, return inlets and outlets, filters, shall be provided.
- 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.
### 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.

### 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.

### 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**.

### Section 311.3 Water Velocity (cont.)

- 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.
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.

- Must comply with NSF 14 and be in compliance with one of the standards in Table 311.4.

Section 311.4.1 Fittings

- Fittings shall comply with one of the standards in Table 311.4.1.

- Exceptions:
  1. Suction outlet fitting assemblies and manufacturer-provided components certified in accordance with ANSI/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.

Table 311.4
Circulation System Pipe

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS) plastic pipe</td>
<td>ASTM D 1527</td>
</tr>
</tbody>
</table>
| 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;    |
| Polyvinyl chloride (PVC) plastic pipe                | ASTM D 2672; CSA B137.3      |
| Stainless steel pipe, Types 304, 304L, 316, 316L     | ASTM D 1785; CSA B 137.3     |

Section 311.5 System Draining

Equipment shall be designed and fabricated to:

- Drain the water from the equipment with exposed face piping...

- Be in accordance with manufacturer’s specifications.
Section 311.6 Pressure or Vacuum Gauge

Gauges shall be provided for public pools in the circulation system and have ready access.

Section 311.7 Flow Measurement

Public swimming pools and wading pools shall be equipped with a flow-measuring device.

Section 311.8 Instructions

- Written operation and maintenance instructions shall be provided for the circulation system of public pools.
Section 311.9 Hydrostatic Pressure Test

Circulation system piping, 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**.

Section 312 Filters

• For pressure-type filters, a means shall be provided to permit the release of internal pressure.
### Section 312.3.1 Air release

- Filters with an automatic means of internal 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.

### 312.3.2 Separation Tanks

A separation tank used in conjunction with a filter tank shall have:

1) a manual method of air release or
1) a lid that provides for a slow and safe release of pressure as it is opened.

### Section 313.2 Performance

- A pump shall be provided for circulation of the pool water.
- Be capable of providing the flow required for filtering the pool water against the total dynamic head developed by the complete system.
Section 313.3 Intake protection

A cleanable strainer, skimmer basket, or screen shall be provided up stream to remove solids, debris, hair, and lint on pressure filter systems.

Section 313 Pump & Motors

– Pumps and motors shall be accessible for inspection and service in accordance with the manufacturer’s specifications.

– The design, construction, and installation of pumps and component parts shall be in accordance with the manufacturer’s specifications.

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.

Section 313.7 Emergency Shutoff Switch

• An emergency shutoff switch shall be provided to disconnect all power located not less than 5 feet (1524 mm) from the inside walls of the pool or spa.

• Exception: Aboveground and permanent inground residential swimming pools.
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.

Section 314

Return and Suction Fittings

Section 314.1 General

• The provisions of this section apply to return and suction fittings for pools and spas.

   Exception: Portable residential hot tubs and exercise spas.

Section 314.2 Entrapment Avoidance

• Entrapment avoidance shall be in accordance with Section 310.
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.

Section 314.4 Return Inlets

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 factory built residential portable electric hot tubs shall be in accordance with APSP 14.
### Section 303.2 Heaters

- Heaters shall be equipped with an external on-off switch to allow the heater to be shut off without adjusting the thermostat setting.
- Gas-fired heaters shall not be equipped with continuous pilot burners.
- **Exception:** *Portable residential hot tubs and exercise spas.*

### Section 303.3 Time switches

- Time switches or other control methods 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.

### 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.

### Exceptions:

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

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>1.5&quot;</th>
<th>2&quot;</th>
<th>2.5&quot;</th>
<th>3&quot;</th>
<th>3.5&quot;</th>
<th>4&quot;</th>
<th>5&quot;</th>
<th>6&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal GPM @ 6fps</td>
<td>38</td>
<td>63</td>
<td>90</td>
<td>138</td>
<td>185</td>
<td>238</td>
<td>374</td>
<td>540</td>
</tr>
<tr>
<td>Nominal GPM @ 8fps</td>
<td>51</td>
<td>84</td>
<td>119</td>
<td>184</td>
<td>247</td>
<td>317</td>
<td>499</td>
<td>720</td>
</tr>
</tbody>
</table>

**Section 315 Skimmers**

Section 315.1

 Applies to skimmers for all pools and spas.

- **Exception:** residential portable hot tubs and exercise spas.

- **Exception:** Aboveground pools

Section 315.2 Required Skimmers

A surface skimming system for public pool and spa shall be provided and be in compliance with NSF 50.

**Exception:** Public pools designed in accordance with Chapter 6.
Section 315.4

• Perimeter skimming systems are not required to be completely around the pool

• but must occupy at least 50 percent of the perimeter.

Section 315.5 Equalizer Lines

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

Section 316

Heaters

Section 316.4.1 Temperature

A means shall be provided to monitor water temperature.
Section 316.4.2 Access Prohibited

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

Section 319
Sanitizing Equipment

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.

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 pool as designed.
Section 320
Waste Water Disposal

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

Section 320.2 Water Salvage

Backwash water can return to the pool 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
Chapter 7
Onground Storable Residential Swimming Pools

Section 701.4

- The manufacturer’s name and the liner identification number shall be affixed to the liner.
- For aboveground pools without a liner, the manufacturer’s name and identification number shall be affixed to the exterior of the pool structure.

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.

Section 705

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.
**Chapter 8**

**Permanent Inground Residential Swimming Pools**

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**Section 803.1**

**Construction tolerances**

- The overall length, width and depth of the pool shall be ± 3 inches (76 mm). The construction tolerance

- For all other dimensions shall be ± 2 inches (51 mm), unless otherwise specified by the design engineer.
Section 1109.1.1

- Two accessible means of entry for swimming pools
  - Swimming pool lift
  - Sloped entries, transfer walls, transfer systems, and pool stairs
  
- **Exception:** swimming pool that has less than 300 linear feet (91 m) of swimming pool wall. (Only one accessible means of entry required.)
Section 1109.1.2 Wading Pools

- At least one sloped entry shall be provided in wading pools.

Section 1109.2 Pool Lifts

Section 1109.3 Sloped Entry Route

Section 1109.4 Transfer Walls