2015 ISPSC - International Swimming Pool and Spa Code

Maine Building Officials Association

Gene Novak, CBO May 23, 2022

Disclaimer

The following information is based on the materials that have been made available, like everything else in life, please confirm this information is in fact the latest and most up to date by reviewing the I-codes (printings/electronic copies) the Massachusetts Amendments and the Department's website for the latest updates and confirmation of requirements... i.e. due diligence...

The information is the opinion of the presenter and does not represent the BBRS, DPL, nor ICC. It is the user responsibility to confirm the latest up to date information.

Foreword

Application, Enforcement and Administration

"due process of law"

"equal protection under the law"

Questions:

- 1. When was the First Edition?
- 2. Who drafted the First Edition?
- 3. Why was this endeavor pursued?

The First Edition of the 2012 International Swimming Pool and Spa Code

The goal of the SPCDC (Swimming Pool Code Drafting Committee) was too coordinate and enhance the provisions found in the...

1. I- codes and the

2. APSP (The Association of Pool & Spa Professionals) standards to upgrade pool and spa safety and to meet the requirements of the

3. Virginia Greame Baker Pool and Safety Act.

History of the ISPSC

1. Work begins 2010 2. First Printing February 2012 3. 2015 ISPSC – 9th Edition MSBC 4. 2018 ISPSC – Mass Skips cycle 5. 2021 ISPSC – 10th Edition MSBC pending 6. 2024 ISPSC – CAH complete – Public Comment Scheduled (Pittsburg PA) Sept 21 – 28, 2021 7. 2027 ISPSC – Future modifications 8. 2018 ISPSC – CLA @ https://www.iccsafe.org/cla/ 9. PHTA-10 Elevated Pool Standard DRAFT

CAH (Code Action Hearings)

15 Codes (17 Committees)

- •Building, Residential: IBC, IRC
- •Fire, Wildland-Urban Interface: IFC, IWUIC
- •Fuel Gas, Mechanical, Plumbing, Pool: IFGC, IMC, IPC, IPSDC, ISPSC
- •Existing Buildings, Property Maintenance: IEBC, IPMC

•Energy, Green, Performance, Zoning: IECC, IgCC, ICC Performance (ICC PC), IZC

2021/2022 Code Development schedule

Steps in code cycle

- * 2021 Edition Published
- Committee Assignments
- Deadline cdpACCESS code change proposals
- * Web posting
- * CAH
- * CAH Web posting report
- Deadline for cdpACCESS public
- Web posting public comment
- * PCH (public comment hearing)
- * Online Gov't Consensus vote
- Web posting final action

Group A - Group B

- Fall 2020/IgCC2021
- * June 1, 2020
- * January 11, 2021
- * March 1, 2021
- * April 11 May 5
- * May 24, 2021
- * July 2, 2021
- * Aug 13, 2021
- Sept 22 29 Pittsburg PA
- * 2 weeks later
- * Certification ICC Board

Typical CAH/Public Comment



Back of House!





ICC 2024 ISPSC

- * PHTA-10
- * New category
- * Elevated Pools

- Energy Code Provisions
 remain in the ISPSC
- * Reason: Definitions
 - * Accessible
 - * Accessibility
 - Access To
 - * Ready Access

Taking you to the Next Level! PHTA – 10 Elevated Pool Standard

- * 29 Broward residents won't be going home after apartment rooftop pool floods for second time
- * Six weeks after an eighth-floor pool leaked thousands of gallons of water into the units below at a Dania Beach apartment complex, it has happened again.
- Just after 1 p.m. on Saturday, about 200 people were evacuated from The Place at Dania Point, 180 E. Dania Beach Blvd., after water began spewing from the rooftop pool, Broward Sheriff Fire Rescue said.

*

https://wsvn.com/news/local/2-floors-of-dania-beach-apartmentbuilding-evacuated-after-rooftop-pool-leaks-for-2nd-time/

Elevated Pool Flood



Dania Beach Florida



Trying not to get the feet wet.



Exercise: ID hazards Associated with Swimming Pools and Spas.

1.
 2.
 3.
 4.
 5.
 6.
 7.
 8.

Exercise

Identify Hazards associated with Swimming Pools and Spas.

- 1. Drowning
- 2. Electrical: shock lightening protection
- 3. Hypo thermia
- 4. Hyper thermia
- 5. slip & fall
- 6. water quality
- 7. chemicals
- 8. suction entrapment
- 9. egress
- 10. other...

Todays Format

Introductions: Philosophy: **Definitions:** Types of Pools: MGL's: 780 CMR: Anti-Entrapment: **Drownings:** Chemicals: Codes & Standards: RWI: Recreational Water-bourne Illnesses. Inspections: **Resources:**

APSP -7 (off set ledge/shelf) (block/stand/platform) The Association of Pool and Spa Professionals



Types of Pools

1. Activity pools 2. Diving Pools 3. Interactive Lazy River 4. Plunge Pools 5. Runout slide 6. Wading Pools 7. Wave Pools 8. Vortex Pool 9. Surf Pools **10.Zero Depth Pool** 11. Perimeter Drain Pool

ASTM

ASTM F3133 - 18

Standard Practice for Classification, Design, Manufacture, Construction, Maintenance, and Operation of Stationary Wave SASTM

F2291 (2006): Standard Practice for Design of Amusement ...

ASTM F2291-2006: Standard Practice for Design of. Amusement Rides and ... (for example, pools, water slides, lazy rivers, interactive aquatic play devices), systems

Float Tank - Not



ISPSC - 2015 (Study)



SCOPE

[A] 101.2 Scope. The provisions of this code shall apply to the construction, alteration, movement, renovation, replacement, repair and maintenance of aquatic recreation facilities, pools and spas. The pools and spas covered by this code are either permanent or temporary, and shall be only those that are designed and manufactured to be connected to a circulation system and that are intended for swimming, bathing or

INTENT

[A] 101.3 Intent. The purpose of this code is to establish minimum standards to provide a <u>reasonable level</u> of safety and protection of health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location and maintenance or use of pools and spas.

Definitions

Natatorium: A swimming pool, especially one that is indoors, aquatic facility. SRVS: Safety Vacuum Release System **SOFA:** Suction Outlet fitting assembly. Accessible: (Modified to Access To) Signifies access that requires the removal of an access panel or similar removable obstruction. **Bather: Bather Load:** Deep Area: > 5 feet Shallow Area: <5 feet Life-line/Ring buoy: Suction Outlet: **Return Inlet:** Ratio: 25 to 1 **NSF: National Sanitation Foundation** Filters: Sand/Cartridge/D.E. (Diatomaceous Earth) 20/10/5 microns **Aquatic Vessel:** Swimming pool no longer in definitions...

MGL 140 Section 206

* CHAPTER 140 LICENSES

- * Section 206 Public and semipublic outdoor inground swimming pools; enclosures; safety equipment; inspection; violations; penalty
- Section 206. Every public and semipublic outdoor inground swimming pool shall be enclosed by a fence six feet in height and firmly secured at ground level provided that any board or stockade fence or structure shall be at least five feet in height, but if over five feet in height, the fence shall be chain link. Such enclosure, including gates therein, shall not be less than six feet above the ground, and any gate shall be self-latching with latches placed four feet above the ground or otherwise made inaccessible from the outside to children up to eight years of age. Such enclosure shall be constructed of such material and maintained so as not to permit any opening in said enclosure, other than a gate, wider than three inches at any point along the enclosure. Any such pool shall be equipped with at least one life ring and a rescue hook.
- Every outdoor inground swimming pool open to the public, other than a public inground swimming pool fed by a spring or stream shall be drained or covered within seven days of closing.
- * For the purposes of this section, "semipublic outdoor inground pool" shall mean a swimming or wading pool on the premises of, or used in connection with, a hotel, motel, trailer court, apartment house, country club, youth club, school, camp, or similar establishment where the primary purpose of the establishment is not the operation of the swimming facilities. Semipublic outdoor inground swimming pool shall also mean a pool constructed and maintained by groups for the purposes of providing bathing facilities for members and guests only.
- * Every public and semipublic outdoor inground swimming pool shall be inspected annually by the inspector of buildings of each city and town in which said pool is located.

Base Code

3109.1 Revise section as follows:

3109.1 General. The design and construction of swimming pools, spas and hot tubs shall comply with the *International Swimming Pool and Spa Code*. Swimming pools shall comply with the requirements of this section and other applicable sections of 780 CMR. See M.G.L. c. 140, § 206 for enclosures to public and semi-public outdoor in-ground swimming pools.

See also:

- 1. 521 CMR 19.00: Recreational Facilities;
- 105 CMR 430.00: Minimum Standards for Recreational Camps for Children (State Sanitary Code: Chapter IV) and 105 CMR 435.00: Minimum Standards for Swimming Pools (State Sanitary Code: Chapter V).

Residential Code

R326.1 Revise the section as follows:

R326.1 General. The design and construction of pools and spas shall comply with the International Swimming Pool and Spa Code and the following notes:

NOTES:

1. Public and semi-public outdoor in-ground swimming pool enclosures shall conform to the requirements of M.G.L. c. 140, § 206.

2. Also see 521 CMR 19.00: Recreational Facilities.

3. Also see 105 CMR 430.00: *Minimum Standards for Recreational Camps for Children* (State Sanitary Code, Chapter IV) and 435.00: *Minimum Standards for Swimming Pools* (State Sanitary Code: Chapter V) as such regulate swimming pool requirements.

 Installation of electrical wiring and electrical devices shall be in accordance with 527 CMR.

5. Installation of gas-fired pool heaters shall be in accordance with the Board of State Examiners of Plumber and Gas Fitters regulations at 248 CMR.

105 Permits Mass Amendments

105.1 Required 105.2 Work Exempt from Permit

9. Prefabricated swimming pools accessory to a Group R – 3 occupancy that are less than 24 inches (610mm) deep, are not greater than 5000 gallons and are installed entirely above ground.

Latest Pool Safely Stats: At Least 163 Children Fatally Drowned in Pools and Spas This Summer

September 18, 2017

Nearly 70% of These Drownings Involved Children Younger Than Age Five

WASHINGTON – From Memorial Day through Labor Day 2017*, at least 163 children younger than age 15 fatally drowned in swimming pools or spas, according to media reports compiled by the USA Swimming Foundation, a Pool Safely campaign partner. Of the 163 reports, 112 of the victims — nearly 70 percent — were children younger than age five. During the same timeframe in 2016, 205 children younger than age 15 drowned in swimming pools or spas, according to media reports. Of the 205 reports, 140 of the victims — nearly 70 percent — were children younger than age five.

"Each one of these deaths is a tragedy, which serves as a sobering reminder of how dangerous water can be for young children," said Ann Marie Buerkle, Acting Chairman, U.S. Consumer Product Safety Commission. "Even though summer is over and children are back in school, pools are still open in warm weather states and indoor swim parks. I encourage all families to follow *Pool Safely* and follow the simple steps that save lives whenever they're enjoying time in or near the water."

The following states suffered the highest number of pool and spa drowning's involving children younger than 15 from Memorial Day through Labor Day 2017*:

Latest *Pool Safely* Stats: At Least 163 Children Fatally Drowned in Pools and Spas This Summer September 18, 2017

Florida: 25 California: 14 Texas: 14 Arizona: 10 Georgia: 7 Ohio: 7 Virginia: 7 Indiana: 6 Louisiana: 6

The <u>Pool Safely</u> campaign, a national public education campaign run by the U.S. Consumer Product Safety Commission (CPSC), provides information on the simple steps that parents, caregivers, and pool owners should take to ensure that children and adults stay safer in and around pools and spas in an effort to reduce fatal and nonfatal drownings. All parents and caregivers are reminded to follow <u>Pool Safely's simple steps</u> to keep children safer in and around the water.

I encourage all families to follow Pool Safely and follow the simple steps that save lives whenever they're enjoying time in or near the water." The following states suffered the highest number of pool and spa drownings involving children younger than 15 from Memorial Day through Labor Day 2017*:

10 Leading Causes of Injury Deaths by Age Group Highlighting Unintentional Injury Deaths, United States – 2010

	Age Groups										
Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1	Unintentional Suffocation 905	Unintentional Drowning 436	Unintentional MV Traffic 354	Unintentional MV Traffic 452	Unintentional MV Traffic 7,024	Unintentional Poisoning 6,767	Unintentional Poisoning 7,476	Unintentional Poisoning 9,662	Unintentional Poisoning 4,451	Unintentional Fall 21,649	Unintentional MV Traffic 33,687
2	Homicide Unspecified 154	Unintentional MV Traffic 343	Unintentional Drowning 134	Suicide Suffocation 168	Homicide Firearm 3,889	Unintentional MV Traffic 5,558	Unintentional MV Traffic 4,552	Unintentional MV Traffic 5,154	Unintentional MV Traffic 4,134	Unintentional MV Traffic 6,037	Unintentional Poisoning 33,041
3	Homicide Other Spec., classifiable 82	Homicide Unspecified 163	Unintentional Fire/Bum 89	Unintentional Drowning 117	Unintentional Poisoning 3,183	Homicide Firearm 3,331	Suicide Firearm 2,914	Suicide Firearm 4,092	Suicide Firearm 3,387	Unintentional Unspecified 4,596	Unintentional Fall 26,009
4	Unintentional MV Traffic 76	Unintentional Fire/Bum 151	Homicide Firearm 58	Homicide Firearm 107	Suicide Firearm 2,046	Suicide Firearm 2,594	Suicide Suffocation 1,839	Suicide Poisoning 2,061	Unintentional Fall 2,011	Suicide Firearm 4,276	Suicide Firearm 19,392
5	Undetermined Suffocation 39	Unintentional Suffocation 134	Unintentional Suffocation 31	Suicide Firearm 80	Suicide Suffocation 1,824	Suicide Suffocation 1,910	Homicide Firearm 1,673	Suicide Suffocation 1,965	Suicide Poisoning 1,382	Unintentional Suffocation 3,400	Homicide Firearm 11,078
6	Unintentional Drowning 39	Unintentional Pedestrian, Other 103	Unintentional Other Land Transport 26	Unintentional Suffocation 48	Unintentional Drowning 656	Suicide Poisoning 787	Suicide Poisoning 1,279	Unintentional Fall 1,283	Suicide Suffocation 1,130	Adverse Effects 1,544	Suicide Suffocation 9,493
7	Undetermined Unspecified 35	Homicide Other Spec., classifiable 84	Unintentional Pedestrian, Other 20	Unintentional Fire/Bum 46	Homicide Cut/Pierce 420	Undetermined Poisoning 580	Undetermined Poisoning 712	Homicide Firearm 1,097	Unintentional Suffocation 613	Unintentional Poisoning 1,402	Suicide Poisoning 6,599
8	Adverse Effects 22	Unintentional Natural/ Environment 52	Adverse Effects 14	Unintentional Other Land Transport 42	Suicide Poisoning 371	Unintentional Drowning 476	Unintentional Fall 493	Undetermined Poisoning 955	Homicide Firearm 533	Unintentional Fire/Burn 1,088	Unintentional Suffocation 6,165
9	Unintentional Fire/Burn 22	Homicide Firearm 43	Unintentional Natural/ Environment 14	Unintentional Poisoning 40	Undetermined Poisoning 282	Homicide Cut/Pierce 438	Unintentional Drowning 409	Unintentional Drowning 578	Undetermined Poisoning 480	Suicide Poisoning 709	Unintentional Unspecified 5,688
10	Unintentional Natural/ Environment 22	Unintentional Struck by or Against 37	Unintentional Poisoning 14	Unintentional Firearm 26	Unintentional Other Land Transport 221	Unintentional Fall 299	Homicide Cut/Pierce 349	Unintentional Suffocation 464	Unintentional Fire/Burn 479	Suicide Suffocation 648	Unintentional Drowning 3,782

Massachusetts Drowning Statistics

Childhood drowning

Drowning was the leading cause of unintentional injury death among Massachusetts children 0-14 years in 2015. Most child drownings involve a brief lapse in supervision — for example, taking one's eyes off of a child to text or talk on a cell phone. Many people assume that if someone is drowning, they will be splashing or calling for help, or waving their arms. In reality, drowning is swift and silent. There is often no struggle or splashing, no cry for help. Many child drownings occur in the presence of other children or adults.

Source: Mass.gov

CDC

How big is the problem?

From 2005-2014, there were an average of 3,536 fatal unintentional drownings (non-boating related) annually in the United States — about ten deaths per day.¹ An additional 332 people died each year from drowning in boating-related incidents.²

About one in five people who die from drowning are children 14 and younger.¹ For every child who dies from drowning, another five receive emergency department care for nonfatal submersion injuries.¹ More than 50% of drowning victims treated in emergency departments (EDs) require hospitalization or transfer for further care (compared with a hospitalization rate of about 6% for all unintentional injuries).^{1,2} These nonfatal drowning injuries can cause severe brain damage that may result in long-term disabilities such as memory problems, learning disabilities, and permanent loss of basic functioning (e.g., permanent vegetative state).^{3,4}

CDC

Who is most at risk?

Males: Nearly 80% of people who die from drowning are male.²

Children: Children ages 1 to 4 have the highest drowning rates. In 2014, among children 1 to 4 years old who died from an unintentional injury, one-third died from drowning.^{1,2} Among children ages 1 to 4, most drownings occur in home swimming pools.² Drowning is responsible for more deaths among children 1-4 than any other cause except congenital anomalies (birth defects).¹ Among those 1-14, fatal drowning remains the second-leading cause of unintentional injury-related death behind motor vehicle crashes.¹

CDC

Minorities: Between 1999-2010, the fatal unintentional drowning rate for African Americans was significantly higher than that of whites across all ages.⁵ The disparity is widest among children 5-18 years old. The disparity is most pronounced in swimming pools; African American children 5-19 drown in swimming pools at rates 5.5 times higher than those of whites. This disparity is greatest among those 11-12 years where African Americans drown in swimming pools at rates 10 times those of whites.⁵ Factors such as access to swimming pools, the desire or lack of desire to learn how to swim, and choosing water-related recreational activities may contribute to the racial differences in drowning rates. Available rates are based on population, not on participation. If rates could be determined by actual participation in water-related activities, the disparity in minorities' drowning rates compared to whites would be much greater.⁶


What factors influence drowning risk?

The main factors that affect drowning risk are lack of swimming ability, lack of barriers to prevent unsupervised water access, lack of close supervision while swimming, location, failure to wear life jackets, alcohol use, and seizure disorders.

Lack of Swimming Ability: Many adults and children report that they can't swim.^{7,8} Research has shown that participation in formal swimming lessons can reduce the risk of drowning among children aged 1 to 4 years.^{9,10} **Lack of Barriers:** Barriers, such as pool fencing, prevent young children from gaining access to the pool area without caregivers' awareness.¹¹ A four-sided isolation fence (separating the pool area from the house and yard) reduces a child's risk of drowning 83% compared to three-sided property-line fencing.¹²

Lack of Close Supervision: Drowning can happen quickly and quietly anywhere there is water (such as bathtubs, swimming pools, buckets), and even in the presence of lifeguards.^{13,14}

CDC

Location: People of different ages drown in different locations. For example, most children ages 1-4 drown in home swimming pools.² The percentage of drownings in natural water settings, including lakes, rivers and oceans, increases with age.² More than half of fatal and nonfatal drownings among those 15 years and older (57% and 57% respectively) occurred in natural water settings.²

- **Failure to Wear Life Jackets:** In 2010, the U.S. Coast Guard received reports for 4,604 boating incidents; 3,153 boaters were reported injured, and 672 died. Most (72%) boating deaths that occurred during 2010 were caused by drowning, with 88% of victims not wearing life jackets.^{15,16} **Alcohol Use:** Among adolescents and adults, alcohol use is involved in up to 70% of deaths associated with water recreation, almost a quarter of ED visits for drowning, and about one in five reported boating deaths.^{2,15,17} Alcohol influences balance, coordination, and judgment, and its effects are heightened by sun exposure and heat.¹⁷ **Seizure Disorders:** For persons with seizure disorders, drowning is the most
- common cause of unintentional injury death, with the bathtub as the site of highest drowning risk.¹⁸

Near Drowning



Near Drowning

https://www.youtube.com/watc h?v=m7U5uhRwO1U

https://www.youtube.com/watch?v=m7U5uh RwO1U

Near Drowning

https://www.youtube.com/watch?v=n78zyyokEDM

Dry Drowning

https://www.youtube.com/watch?v=asoOfEmNAXk

Statistic

Young children are especially at risk — they can drown in less than **2 inches** (6 centimeters) of water. That means drowning can happen where you'd least expect it — the sink, the toilet bowl, fountains, buckets, inflatable pools, or small bodies of standing water around your home, such as ditches filled with rainwater.

- Designate an adult Water Watcher to supervise children at all times around the water.
- Install a four-sided fence with a self-closing, self-latching gate around all pools and spas.
- Learn how to swim and teach your child how to swim.
- Learn how to perform CPR on children and adults.
- Teach children to stay away from pool drains, pipes and other openings to avoid entrapments. (Electricity/Gas/Mechanical)
- Ensure any pool or spa you use has drain covers that comply with federal safety standards. If you do not know, ask your pool service provider about safer drain covers.
- The Pool Safely campaign was launched in 2010 by the U.S. Consumer Product Safety Commission (CPSC) to raise awareness about pool and spa safety, as mandated by the Virginia Graeme Baker Pool and Spa Safety Act.
- Visit <u>PoolSafely.gov/Pledge</u> to take the Pledge to help prevent drownings.
- *Dates defined as Saturday, May 27, 2017 through Monday, Sept. 4, 2017.

Virginia Graeme Baker Pool and Spa Safety Act

Safety Should Always Come First

When it comes to pool safety, multiple layers of protection are crucial. That is one of the reasons why on December 19, 2007, President George W. Bush signed the *Virginia Graeme Baker Pool and Spa Safety Act of 2007*. The act is intended to increase the safety of swimming pools and spas by motivating states to pass laws that incorporate layers of protection in order to help prevent drowning, drain entrapment and hair entanglements.

The Virginia Graeme Baker Pool and Spa Safety Act is named for the granddaughter of former Secretary of State James A. Baker, III. In 2002 at the age of seven, Graeme Baker died in a spa after the powerful suction of a drain entrapped her under water. Baker joined Nancy Baker, Graeme's mother, and Safe Kids USA in a three-year advocacy campaign for this legislation.

It's important for *all pool owners* to know about these safety requirements, make the appropriate upgrades and take precautionary measures to ensure a safe and enjoyable swimming season for family, friends, visitors and members alike. Hayward® strongly encourages all pool owners to add a safety vacuum release system (SVRS), such as our Stratum[™] VRS or EcoStar SVRS variable speed pump with built in SVRS. They provide an additional layer of protection.

Whether you are a residential or public pool owner, safety should always come first. To help you understand the Safety Act and its requirements, we recommend that you review the summary of the Virginia Graeme Baker Pool and Spa Safety Act as presented on the Association of Pool and Spa Professionals (APSP) website.

Virginia Graeme Baker Pool & Spa Safety Act (P&SS Act) FAQ

Q: What are public pool and spa owners/operators obligated to do to comply with the Virginia Graeme Baker Pool & Spa Safety Act (P&SS Act)?

A: As of December 19, 2008, all operating public pools and spas must have drain covers that meet the ANSI/ASME A112.19.8-2007 standard on every drain/grate. In addition, if the pool has a single main drain (other than an unblockable drain), the operator must either disable the drain or install a second anti- entrapment device or system. This can take the form of an automatic shut-off system, gravity drainage system, Safety Vacuum Release System (SVRS) or suction-limiting vent system. A pool may have more than one single main drain. If a pool has dual or multiple main drains more than 3 feet apart, it may be exempt from this second requirement. Pools and spas with single main drains that are unblockable are also exempt from this requirement. (Last Updated: January 30, 2009)

FIELD CHECKLIST FOR IDENTIFYING SUCTION ENTRAPMENT HAZARDS



This field checklist provides information and a systematic process that will help identify and eliminate suction entrapment hazards in swimming pools, wading pools, spas, hot tubs and catch basins. It's appropriate for use ry service companies, builders, installers, facility owners/operators, home inspection specialists, parks and recreation personnel, and others who are responsible for pool and spa safety.



Adult Pledge

- I, Gene Novak, pledge to Pool Safely in 2017.. I pledge to:
 - Designate a water watcher every single time children in my care are in or near the water.
 - Make sure my kids know how to swim.
 - As a parent or guardian, learn CPR.
 - Always remove portable pool ladders when not in use.
 - Ensure all permanent pools have a proper fence and gate and safer drain covers.

Model Aquatic Health code

1.2 Recreational Water-Associated Illness Outbreaks and Injuries 1.2.1^A RWI Outbreaks

Large numbers of recreational water-related outbreaks are documented annually, which is a significant increase over the past several decades. **1.2.2^A Significance of Cryptosporidium**

Cryptosporidium causes a diarrheal disease spread from one person to another or, at AQUATIC VENUES, by ingestion of fecally-contaminated water. This pathogen is tolerant of CHLORINE and other halogen disinfectants. Cryptosporidium has emerged as the leading cause of POOL-associated outbreaks in the United States.

1.2.3^A Drowning and Injuries

Drowning and falling, diving, POOL chemical use, and suction injuries continue to be major public health injuries associated with AQUATIC FACILITIES. Drowning is a leading cause of injury death for young children and a leading cause of unintentional injury death for people of all ages. **1.2.4^A Pool Chemical-Related Injuries**

Pool Safely WATER SAFETY STEPS STAY CLOSE, BE ALERT AND WATCH

Always watch children and never leave them unattended

Keep children away from pool drains, pipes and other openings

Have a charged phone close by at all times

If a child is missing, check the pool first

Share safety instructions with family, friends and neighbors

Even if a lifeguard is present, parents and caregivers should still take the responsibility of being a designated Water Watcher

LEARN AND PRACTICE WATER SAFETY SKILLS

Learn to swim and make sure kids do, too

Know how to perform CPR on children and adults

Understand the basics of life-saving so that you can assist in a pool emergency

HAVE THE APPROPRIATE EQUIPMENT

Install a fence of at least four feet in height around the perimeter of the pool or spa Use self-closing and self-latching gates

Ensure all pools and spas have compliant drain covers

Install an alarm on the door leading from the house to the pool

Keep pool and spa covers in working order

Have life-saving equipment such as life rings or reaching poles available for use

Chemicals

Wetting: Under normal circumstances, pool chemicals are intended to be added to large quantities of water. If, instead, a limited volume (amount) of water is added to a chemical, an unwanted reaction may occur, resulting in an increase in temperature and the release of toxic gas. Even a small amount of water splashed on the chemical may in some cases trigger a strong reaction. The main exception to this rule concerning water addition is when very large quantities of water are needed for fire fighting, as discussed below. Although the chemicals are usually packaged in plastic bags that are stored in sturdy cartons or drums, accidents have occurred when water leaked into damaged or open containers

Chemicals

- * June 20, 1988, Page 00016The New York Times Archives
- More than 20,000 people evacuated for two nights because of chlorine fumes from a factory fire returned home today after firefighters doused the blaze, but thousands of others were still barred from their neighborhoods.

Chemicals

- Although the fire was out, officials said, overheated pellets of chlorine continued to spew the toxic yellow-green gas that the authorities said had sent 275 people to the hospital, including 22 firefighters.
- "I'm miserable, inconvenienced, sweaty, hot, uncomfortable and I want to go home," Shellie Spencer Jr., 30 years old, said from his cot at Municipal Hospital, where he and his family have stayed since early Saturday. Up to 25,000 Flee Homes
- * Up to 25,000 people were evacuated in Springfield and Chicopee because of a series of fires that began Friday at the Advanced Laboratories factory, which manufactured chlorine pellets for swimming pools.
- * Authorities said they would wait until Monday to pour 52 tons of neutralizing chemicals on the remaining chlorine. Firefighters continued pumping water on the remains of the plant.

Chemical pool fire

101210

Secret Network Helps Children Flow Sex Abuse

Rinderground Contends Lings There is a second second second

THE NEW YORK TRACK MATIONAL MUSICAL POINT IS, NO.

Post Charlotte Second

Turning Tables on a Reptilian Terror

A Dignitions are a growing realisant a talbase sensibuser base.

Struggle in a Church Southern Daptist Conservative Wing Tries to Industr Dis Derivinal Excession

Designments will not taken weep flow is chooseder. and more road bing first all they CONTRACTOR.

Thousands Who Fled Toxic Cloud Return to Homes in Massachusetts

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Design of Chemical Storage Area and Pump Room

o Construction

- Include spill containment features, also known as secondary containment, in chemical storage areas to prevent pool chemical leaks or spills from mixing with any other substances.
- Provide aquatics staff and patrons with easily accessible safety showers, eye wash stations, and other appropriate chemical safety equipment.
- Install appropriate fire suppression equipment.
- Consult with local fire department or code enforcement agency for guidance.
- Provide adequate lighting for reading labels on containers throughout the chemical storage area and pump room.

o Air handling (for indoor pools)

- Follow local building codes and/or American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standards.
- Separate the air handling systems for the chemical storage area and pump room

from the rest of the building. - Separate the air handling system for the pool area from the rest of the building.

- If an older aquatic facility does not have separate air handling systems for the chemical storage area and pump room as well as the pool area, consider installing emergency heating, ventilating, and air conditioning (HVAC) cutoffs in these areas.
- Ensure that the chemical storage area and pump room as well as the pool area are well ventilated.
- Ventilate the chemical storage area, pump room, and pool area to the outside.
- o Engineering
- Install an alarm to alert the aquatics staff if the recirculation pump shuts down.
- Install a device that automatically deactivates the chlorine/pH feed pumps when there is no flow in the recirculation system.
- Install check valves in chemical feed lines. These valves allow chemicals (liquid or gas) to flow through only in one direction and stop suction events from causing an overfeeding of chemicals

Table 1	Recent Inci	idents Involving Swim	ming Pool Water Treatment Chemicals							
Month Ye	ear	City State	Brief Description of Incident	Effect						
October	2000 Elizabethtown, Tennessee Fire and smoke from a storage facility that contained chemicals including swimming pool water treatment chemicals. The fire was in an area isolated from the pool chemicals, however particular precautions were taken to prevent the pool chemicals from becoming involved. Local school closed early to relieve traffic congestion; local residents advised to remain indoors. No injuries reported.									
August	1999 Indiana acid that reported.	Avon, Fumes released fron was being used to cle	n container of a strong an a high school swimming pool.	School evacuated. No injuries						
August	1999 New Jers hypochlo resulting hospitaliz	Burlington, ey rite spilled at a wareh in fire and release of p ted from the toxic gas	A pallet containing 400 lbs of calcium ouse. The spill was caused by the corrosior products of combustion and decompositior s exposure. Twenty-four others were treate	n of steel shelving on which the material w n including chlorine gas. ed and released.	as stored. The spilled material mixed with other incompatible materials, Five warehouse workers were					
August	1999 Bergen County, New Jersey Granular chlorinating material, similar to that used for swimming pool water treatment, spilled while moving a container in a warehouse. Released vapors sent 28 government workers to area hospitals.									
July	1999 Virginia release in June 1999 chemicals	Richmond, Chemical exploded a to apartment comple Gleveland, Ohio	as it was prepared for x pool. One employee injure Toxic fumes released at local community o id were inadvertently mixed.	ed. center swimming pool, when pool water Two fire fighters and two others injured a	and area evacuated.					
February	1999 Texas warehous reported;	Fort Worth, Fire, smoke and vapo se containing pool che residents told to rem	ors released from large emicals and other materials. The cause of the lain indoors.	ne fire was not reported.	Warehouse destroyed. No injuries					
Decembe	1998 New Ham when abo treatmen	Auburn, npshire out a cup of swimming t station shut down.	Small explosion and vapors were released g pool chemical was improperly disposed of	l f at a regional waste treatment station.	Four minor injuries. Waste					

CDC

Once these germs **get** in the **pool**, it **can** take anywhere from minutes to days for chlorine to kill **them**. **Swallowing** just a little **water** that contains these germs **can make you sick**. In the past two decades, there has been a substantial increase in the number of RWI outbreaks associated with **swimming**. Jan 25, 2017

Diving Envelope



Types of Swimming Pools: 2015 Public and <u>Residential</u>

- Class A Competition
- Class B Public Pool
- Class C, Semi-public pool
- Class D-1 Wave Action Pool
- class D-2, Activity Pool
- Class D-3, Catch Pool
- Class D-4, Leisure River
- Class D-5, Vortex Pool
- Class D-6, Interactive Play Attraction
- Class E, Instruction, play or therapy and w/ water above 86 degrees.
- Class F, Wading pools see 405.0

CDC - MAHC

Model Aquatic Health Code www.cdc.gov



This page summarizes the data that led to CDC creating the MAHC.

Swimming and other water-related

activities(https://www.cdc.gov/healthywater/swimming/swimmers/health_benefits_water_exercise.html) are excellent ways to get the physical activity and health benefits needed for a healthy life. Americans swim hundreds of millions of times in pools, oceans, lakes, rivers, and hot tubs/spas each year ¹ and most people have a safe and healthy time enjoying the water. However, outbreaks of recreational water illnesses(https://www.cdc.gov/healthywater/swimming/swimmers/rwi.html) (RWIs) have increased significantly over the last several decades ² and drowning and near-

drowning(https://www.cdc.gov/healthywater/swimming/swimmers/drowning-injury-sun-protection.html)³⁻⁶ and pool-related **chemical injuries(https://www.cdc.gov/healthywater/swimming/aquatics-professionals/preventing-pool-chemical-events.html)**⁷⁻¹² continue to occur. This makes it important that public pools and spas are designed, constructed, operated, and inspected to keep swimmers healthy and safe.

Resources

Frequently Asked Questions for Potential MAHC Users(https://www.cdc.gov/mahc/faqs.html) Fact Sheets(https://www.cdc.gov/mahc/fact-sheets.html)

Infographic(https://www.cdc.gov/mahc/infographics.html)

In the United States, there is no federal regulatory agency that regulates aquatic facilities so public pools and spas are regulated at the state or local government level. To assist state and local agencies, CDC has led a national collaborative effort with public health, industry, and academic partners from across the United States to develop a national guidance document, called the Model Aquatic Health Code (MAHC), to prevent drowning, injuries, and the spread of recreational water illnesses at public swimming pools and spas. The MAHC integrates the latest knowledge based on science and best practices with specific code language and explanatory materials covering the design, construction, operation, and maintenance of swimming pools, spas, hot tubs, and

other public disinfected aquatic facilitieS.

105 CMR: DEPARTMENT OF PUBLIC HEALTH

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435.00: Appendix A

Water slides



Spray Pads



Competition type pools Activity Areas



Instructional - CLASS E. Pools used for instruction, play or therapy and with temperatures above 86°F(30°C).





Safety Equipment



Shunt Switch/Emergency Shut-off



Chemical Feeders



Signage

POOL RULES

WARNING: NO LIFEGUARD ON DUTY

NO DIVING

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Inspections



Signage


Inspections

POOL RULES

- During Open Swim Hours, children under age 11 must have a parent, tegal guardian or sponsoring member in the water actively supervising them at all times, regardless of swimming ability. A parent, legal guardian or sponsoring member must within 10 feet of the child at all times.
- 2. During Family Swim Hours, Children under age 11 are allowed in the pool area when accompanied by a parent, legal guardian, sponsoring member. Please note, a parent, guardian or sponsoring member must be present at the same body of water the children are in at all times. Any child under 11 who cannot continuously swim 25 meters must be directly and actively supervised by a parent, legal guardian or sponsoring member who remains within 10 feet of the child at all times.
- Outside of Open Swim and Family Swim Hours, children under 11 are not allowed in the pool unless they
 are participating in an organized Life Time program.
- 4. Children must be at least three months old to be in the pools.
- 5. Please ensure that there are no more than three children under the supervision of one adult.
- 6. Adults should not swim alone.
- Children three months to three years of age must wear light fitting rubber or plastic pants.
- No person with a communicable disease is allowed to use the pool.
- Proper swim attire is required in the pools and/or whirlpools. Jeans and workout apparel are not allowed.
- A t-shirt and shorts (or cover-up) and shoes must be worn when exiting the locker room and/or aquatics area to go to other areas of the club.
- Running, wrestling, or other rough play is not allowed.
- 12. Inappropriate language or behavior is not allowed.
- 13. Animals are prohibited in the Aquatics Center.
- Lifeguards and all Aquatics Team Members must be obeyed at all times. Failure to comply with pool rules, whether written or verbal, may result in removal from the Aquatic Center and/or suspension or revocation of membership.
- Strollers must be kept four feet from the pool to ensure adequate visual and physical clearance for the lifeguards.
- 16. Personal flotation devices are allowed as long as they are not inflatable and they attach securely to the

2016 Model Aquatic Health Code Code Language





U.S. Department of Health and Human Services Centers for Disease Control and Prevention

2nd Edition, July 2016

CS264311A

MAHC – Model Aquatic Health Code

Free download at: <u>www.cdc.gov</u> Certifications: WWW.NSPF.ORG.

Generally Speaking

In ground attached to dwelling.

Above ground attached to dwelling.

in ground detached from dwelling.

above ground detached from dwelling.

COMING SOON! Elevated Pool Standard (PHTA-10 Working committee)

Gene's Strategies for developing Checklists

- 1. Reference Edition of Code or Pre-existing.
- 2. Specify New verses Existing.

3. Consider one checklist for Plan Review and separate for Field Inspections.

- 4. Consider local, special or other retro-active law.
- 5. Consider separate checklists for private/public swimming pools.
- 6. Utilize photo images and graphics.
- 7. Periodically review and update checklist.
- 8. Solicit comment and feedback from users.
- 9. Share with other AHJ's.
- 10. Review old checklists and codes/standards.

Checklists

Eight Hurt When Roof Collapses Into YMCA Pool

FRANCIS HOPKINS September 19, 1989

BOSTON (AP) _ A roof collapsed without warning into a YMCA swimming pool Monday, injuring nine young children in a swimming class and a lifeguard, police said.
Parents were watching the swimming class when cement chunks and beams fell into the water in the shallow end of the pool at West Roxbury-Roslindale YMCA.
"We were looking through a picture window down the other end, and then the whole roof over the shallow end just came down in one piece," said John Welch, whose son, Michael, was not injured in the accident.

Three boys, all 4-year-olds, were taken to Children's Hospital, where two were treated and released and the third was admitted in serious condition, said hospital spokeswoman Kristi Kienholz. A spokeswoman for Faulkner Hospital said a 3 1/2 -yearold child and a 4-year-old were in fair and stable condition with cuts and other injuries.

Checklists

The boys' instructor, 18-year-old David Bortolotto, was admitted with head injuries and cuts. Four other children were treated but not hospitalized. Bortolotto was hit by falling debris but pulled four children from the water. Another instructor pulled the other three boys out. Police Superintendent Gerard McHale called Bortolotto "a real superstar. He collapsed after he got the kids out." No noise preceded the roof's collapse, said YMCA manager Bill Selafani. "We had no reason to believe we would have any problem with the roof." The cause of the collapse was being investigated, authorities said. "Why it collapsed, I don't know," said Fire Capt. Matthew Corbett. "There's a big hole to the sky. The kids were very lucky." A 20-by-15-foot section of roof fell, Corbett said.

Definitions

ALTERATION. Construction or renovation to an existing pool or spa other than repair that requires a permit.

BARRIER. A permanent fence, wall, building wall, or combination thereof that completely surrounds the pool or spa and obstructs the access to the pool or spa. The term "permanent" shall mean not being able to be removed, lifted, or relocated

DECK. An area immediately adjacent to or attached to a pool or spa that is specifically constructed or installed for sitting, standing, or walking.

DESIGN WATERLINE. The centerline of the *skimmer* or other point as defined by the designer of the pool or spa.

HANDHOLD. That portion of a pool or spa structure or a specific element that is at or above the design waterline that users in the pool grasp onto for support.

MAINTAINED ILLUMINATION. The value, in foot-candles or equivalent units, below which the average illuminance on a specified surface is not allowed to fall. *Maintained illumination* equals the initial average illuminance on the specified surface with new lamps, multiplied by the light loss factor (LLF), to account for reduction in lamp intensity over time. DECK: An area immediately adjacent to or attached to a pool or spa that is specifically constructed or installed for sitting, standing, or walking.



Definitions

CLASS B, PUBLIC POOL. A pool intended for public recreational use that is not identified in the other classifications of public pools.

CLASS F. Class F pools are wading pools and are covered within the scope of this code as set forth in Section 405.

SAFETY COVER. A structure, fabric or assembly, along with attendant appurtenances and anchoring mechanisms, that is temporarily placed or installed over an entire pool, spa or hot tub and secured in place after all bathers are absent from the water.

Handhold:





Definitions

SUCTION OUTLET. A submerged fitting, fitting assembly, cover/grate and related components that provide a localized low-pressure area for the transfer of water from a swimming pool, spa or hot tub. Submerged suction outlets have also been referred to as main drains.

SURGE CAPACITY. The storage volume in a surge tank, *gutter*, and plumbing lines.

301.1 Scope.

The provisions of this chapter shall govern the general design and construction of public and *residential* pools and spas and related piping, equipment, and materials. Provisions that are unique to a specific type of pool or spa are located in Chapters 4 through 10.

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

2.2. Onground storable pools supplied by the pool manufacturer as a kit that includes all pipe, fittings and components.

302.5 Backflow protection.

Water supplies for pools and spas 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.

302.6 Waste-water discharge.

Where waste water from pools and spas, 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.

302.7 Tests.

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

302.8 Maintenance.

Pools and spas shall be maintained in a clean and sanitary condition, and in good repair.

303.1 Energy consumption of pools and permanent spas.

The energy consumption of pools and permanent spas shall be controlled by the requirements in Sections 303.1.1 through 303.1.3.

303.1.1 Heaters.

The electric power to heaters shall be controlled by a readily accessible on-off switch that is an integral part of the heater, mounted on the exterior of the heater or external to and within 3 feet (914 mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

303.1.2 Time switches.

Time switches or other control methods that can automatically turn off and on heaters and pump motors according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

Exceptions:

1.1.Where public health standards require 24-hour pump operation.

2.2.Pumps that operate solar- or waste-heat recovery pool heating systems.

303.1.3 Covers.

Outdoor heated pools and outdoor permanent spas shall be provided with a vapor-retardant cover or other *approved* vapor-retardant means in accordance with Section 104.11.

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, covers or other vapor-retardant means shall not be required.

303.2 Portable spas.

The energy consumption of electric-powered portable spas shall be controlled by the requirements of APSP 14.

303.3 Residential pools and permanent residential spas.

The energy consumption of *residential* swimming pools and permanent *residential* spas shall be controlled in accordance with the requirements of APSP 15.

[BS]304.2.1 Pools and spas located in designated floodways.

Where pools and spas are located in designated floodways, documentation shall be submitted to the code official that demonstrates that the construction of the pools and spas will not increase the design flood elevation at any point within the jurisdiction.

[BS]304.2.2 Pools and spas located where floodways have not been designated.

Where pools and spas are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool or spa and any associated grading and filling, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction.

[BS]304.4 Protection of equipment.

Equipment shall be elevated to or above the design flood elevation or be anchored to prevent flotation and protected to prevent water from entering or accumulating within the components during conditions of flooding.

305.2.1 Barrier height and clearances.

Barrier heights and clearances shall be in accordance with all of the following:

1.1.The top of the barrier shall be not less than 48 inches (1219 mm) above grade where measured on the side of the barrier that faces away from the pool or spa. Such height shall exist around the entire perimeter of the barrier and for a distance of 3 feet (914 mm) measured horizontally from the outside of the required barrier.

2.The vertical clearance between grade and the bottom of the barrier shall not exceed 2 inches (51 mm) for grade surfaces that are not solid, such as grass or gravel, where measured on the side of the barrier that faces away from the pool or spa.

3.3.The vertical clearance between a surface below the barrier to a solid surface, such as concrete, and the bottom of the required barrier shall not exceed 4 inches (102 mm) where measured on the side of the required barrier that faces away from the pool or spa.

4.4.Where the top of the pool or spa structure is above grade, the barrier shall be installed on grade or shall be mounted on top of the pool or spa structure. Where the barrier is mounted on the top of the pool or spa, the vertical clearance between the top of the pool or spa and the bottom of the barrier shall not exceed 4 inches (102 mm).

Barriers

305.5 Onground residential pool structure as a barrier.

An onground *residential* pool wall structure or a barrier mounted on top of an onground *residential* pool wall structure shall serve as a barrier where all of the following conditions are present:

1.1.Where only the pool wall serves as the barrier, the bottom of the wall is on grade, the top of the wall is not less than 48 inches (1219 mm) above grade for the entire perimeter of the pool, the wall complies with the requirements of Section 305.2 and the pool manufacturer allows the wall to serve as a barrier.

2.2.Where a barrier is mounted on top of the pool wall, the top of the barrier is not less than 48 inches (1219 mm) above grade for the entire perimeter of the pool, and the wall and the barrier on top of the wall comply with the requirements of Section 305.2.

3.3.Ladders or steps used as means of access to the pool are capable of being secured, locked or removed to prevent access except where the ladder or steps are surrounded by a barrier that meets the requirements of Section 305.

4.4.Openings created by the securing, locking or removal of ladders and steps do not allow the passage of a 4-inch (102 mm) diameter sphere.

5.5.Barriers that are mounted on top of onground *residential* pool walls are installed in accordance with the pool

Steps

306.3 Step risers and treads.

Step risers for decks of public pools and spas shall be uniform and have a height not less than $3^3/_4$ inches (95 mm) and not greater than $7^1/_2$ inches (191 mm). The tread distance from front to back shall be not less than 11 inches (279 mm). Step risers for decks of *residential* pools and spas shall be uniform and shall have a height not exceeding $7^1/_2$ inches (191 mm). The tread distance from front to back shall be not less than 10 inches (254 mm).

307.2 Glazing in hazardous locations.

Hazardous locations for glazing shall be as defined in the *International Building Code* or the *International Residential Code*, as applicable in accordance with Section 102.7.1 of this code. Where glazing is determined to be in a hazardous location, the requirements for the glazing shall be in accordance with those codes, as applicable.

Accessibility

307.9 Accessibility.

An accessible route to public pools and spas shall be provided in accordance with the *International Building Code*. Accessibility within public pools and spas shall be provided as required by the accessible recreational facilities provisions of the *International Building Code*. Accessibility for pools and spas accessory to detached one- and two-family dwellings and townhouses not more than three stories in height shall be provided where required by the *International Residential Code*.

309.2 Treatment and circulation system equipment.

Treatment and circulation system equipment for public pools and spas shall be *listed* and *labeled* in accordance with NSF 50 and other applicable standards.



311.4.4 Suction outlet fitting assemblies.

Suction outlet fitting assemblies shall be *listed* and *labeled* in compliance with APSP 16.

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.

313.3 Intake protection.

A cleanable strainer, skimmer basket, or screen shall be provided for pools and spas, upstream or as an integral part of circulation pumps to remove solids, debris, hair, and lint on pressure filter

Compliments of Aqua Star pool products



Compliments of:

AQUASTAR pool products

Emergency shut-off

313.7 Emergency shutoff switch.

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

Exception: Onground storable pools, permanent inground residential swimming pools, residential spas and residential water features.

314.5 Vacuum fittings.

Where installed, *submerged vacuum fittings* shall be accessible and shall be located not greater than 12 inches (305 mm) below the water level.

Circulation System/Filtration System

315.2.1 Circulation systems.

Public pool circulation systems shall be designed to process not less than 100 percent of the turnover rate through skimmers.

316.4.2 Access prohibited.

For public pools and spas, public access to controls shall be prohibited.

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 or spa as designed.

Lighting in the Pool

321.2 Artificial lighting required.

When a pool is open during periods of low natural illumination, artificial lighting shall be provided so that all areas of the pool, including all suction outlets on the bottom of the pool, will be visible. Illumination shall be sufficient to enable a lifeguard or other persons standing on the deck or sitting on a lifeguard stand adjacent to the pool edge to determine if a pool user is lying on the bottom of the pool and that the pool water is transparent and free from cloudiness.

These two conditions shall be met when all suction outlets are visible from the edge of the deck at all times when artificial lighting is illuminated and when an 8-inch-diameter (152 mm) black disk, placed at the bottom of the pool in the deepest point, is visible from the edge of the pool deck at all times when artificial lighting is illuminated.

Overhead lighting

Overhead lighting, underwater lighting or both shall be provided to illuminate the pool and adjacent deck areas. The lighting shall be *listed* and *labeled*. The lighting shall be installed in accordance with NFPA 70.

GAZINE OF THE NATIONAL FIRE PROTECTION ASSOCIATION



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NFPA – 70 (Journal June 2017) Article 680

In Compliance

Different rules apply if the new occupancy is of the same or lesser hazard category than the existing occupancy. If a warehouse is changed to a nightclub with an occupant load of more than 300, for example, then the new nightclub must meet the criteria applicable to an existing assembly occupancy for everything but sprinklers, alarms, and the main entrance/exit, which must meet the requirements for a new assembly occupancy. Sprinklers must meet those more stringent requirements because the assembly occupancy is, specifically, a nightclub; an alarm system with voice communication is required because the occupant load exceeds 300; and the main entrance/exit must accommodate a minimum of two-thirds of the occupant load because the assembly occupancy is, specifically, a nightclub.

Given that the code requirements vary depending on the occupancy classification, it is important to utilize the permitting process any time the occupancy changes so that the resulting features, systems, and other protective elements provided are those necessary for life safety for the new occupants.

Ron Coté is NFPA technical services lead for life safety. NFPA members and AHJs can use the Technical Questions tabto post queries on NFPA 101 at nfpa.org/101.



NEC changes for electrical safety in swimming pools

By Derek Vigstol



100

his is the time of year to inspect and maintain swimming pool equipment to make sure that life saving measures

such as ground-fault circuit interrupter (GFCI) protection and all grounding and bonding systems are functioning properly. For new installations, the 2017 National Electrical Code* (NEC*) has been revised to improve pool safety.

40 NFPA JOURNAL . MAY/JUNE 2017

Article 680 of the NEC contains the requirements for electrical installations associated with and in close proximity to swimming pools. New for the 2017 edition of the code is Section 680.4, which requires all electrical equipment installed in the water, walls, or decks of pools to follow the requirements found in Article 680. This section also requires equipment and products installed in the water, walls, or deck to be listed, which assists the authority having jurisdiction in determining the suitability of the equipment for a given installation. The listing requirement becomes especially helpful in areas that are included in 680.14, another new section that requires certain pool-related areas to be considered "corrosive environments" due to use and storage of pool sanitation chemicals. Equipment used in those areas must be able to withstand a corrosive environment, and the listing will help AHJs make that determination.

GFCI protection has also been expanded in the 2017 edition. Previously, certain receptacles that supplied power to the circulation and sanitation system could be located further than 10 feet from the inside wall of the pool and not require GFCI protection. For 2017, the 10-foot distance has been removed and now all receptacles supplying circulation and sanitation system equipment must be at least six feet from the inside wall of the pool and must be of the grounding type and GFCI protected. Another new section also requires GFCI protection for circuits above the low-voltage contact limit that supply gas-fired pool water heaters. GFCI protection is now essentially required for all receptacles that supply power above the low-voltage contact limit to equipment that handles pool water. This requirement is in addition to the GFCI protection required for 120V through 240V, single-phase pool pump motors.

Other GFCI requirements for pools remain unchanged in the current edition. GFCI protection is still required for all underwater luminaires operating over the low-voltage contact limit and all 15 and 20 ampere, 125-volt, single-phase receptacles located within 20 feet of a pool. Certain luminaires,

lighting outlets, and paddle fans also require GFCI protection based on their location relative to the inside wall of the pool and the maximum water level. With all of this GFCI protection

required for electrical equipment associated with swimming pools, chances of being shocked or electrocuted in a swimming pool have been reduced dramatically. However, it is important to note that GFCI devices require maintenance according to the manufacturer's instructions. Following the recommended maintenance schedule ensures that the GFCI protection functions when needed. Around swimming pools, the maintenance of GFCI devices is just as important as their installation.

The 2017 NEC has also taken steps to protect the integrity of the grounding and bonding systems associated with swimming pools. (Equipment grounding conductors provide the effective ground-fault current path in order to quickly operate fuses and circuit breakers during a fault; the bonding system simply connects conductive materials together so that they are electrically the same.) Recognizing that areas in and around pools are subject to severe corrosive conditions, the code now requires grounding and bonding terminals to be identified for use in wet and corrosive environments. During pool inspections I often found equipment grounding conductor terminals on circulation pump motor housings to be so corroded that there was no longer an effective connection, if there was a connection at all—a significant problem, since it provides an effective ground-fault current path to facilitate the operation of the circuit breaker or fuse. Likewise, the equipotential bonding system—a conductive grid within the pool shell and around the perimeter-is installed to equalize any voltage gradients in and around a pool, and it is equally important that these terminations retain their integri Differences in potential around a swin ming pool due to broken connections can have tragic results.

Derek Vigstol is an NFPA technical lead, Electric Tech Services. NFPA members and AHJs can use the Technical Questions tab to post queries on NFPA 707 at nfpa.org /705

PSN&AI posted July 20, 2021

* https://www.poolspanews.com/howto/maintenance/keep-power-in-check-how-toperform-electricalinspections_o?utm_source=newsletter&utm_content =Article&utm_medium=email&utm_campaign=PSN_0 72221&

PSN&AI "Pool Spa News & Aquatics International" By; Rebecca Robledo

Keep Power in Check: How to Perform Electrical Inspections

Learn the steps for assessing a pool/spa installation for electrical safety. By Rebecca Robledo



Electrical safety never stops being a concern. However, some believe the industry should pay more attention to it.

25 – 10 Rule

* If your child cannot swim 25 meters, you must stay with 10 feet of them...

Additional Resources available:

- 1. FAQ's APSP unlockable Drain covers.
- 2. Energy STAR certified pool pumps
- 3. DOE releases new standards for pool heaters
- 4. Chemical Hazards Robson Forensics
- 5. Chlorine 10 ppm Immediate danger to life...