



Chris Kaczor
Pool Barrier Corp
3640 Investment Lane
Unit 28
West Palm Beach, FL 33404

DATE: April 5, 2021
RE: Pool Barrier Corp's Flexible Pool Barrier
External Load Testing
EAS Job No.: **21ENG022**

Dear Chris,

Engineering Analyses & Solutions, Inc., the Firm, has upgraded our analyses of the structural integrity of Pool Barrier Corp's flexible pool barrier, the Barrier, to include both deck sleeves, the Sleeves, and direct in-ground pole mounts, the Mounts. Numerous stress calculations were performed, according to the most recent codes, as well as static and dynamic measurements. According to our calculations and measurements, a properly installed Barrier in properly installed either Sleeves or Mounts can not only withstand the structural requirements needed to withstand coastal wind loading, but also the special requirements needed for child and convalescent adult protection. Further, the mesh meets the requirements of **ASTM F2286-16 Standard Design and Performance Specification for Removable Mesh Fencing for Swimming Pools, Hot Tubs, and Spas.**

All stress analyses were performed using the load and calculation requirements of the **Florida Building Code 2020- Residential**, the **Florida Building Code 2020-Building, Chapter 454.2.17 Residential Swimming Barrier Requirement**, **2020 Florida Statutes Chapter 515 (Residential Swimming Pool Safety Act)**, and **EAS-05/18A**

(Flexible Pool Barrier Safety Standard.) All components of the Barrier were found to have a Safety Factor of at least 3.0.

The parameters and conditions used for the wind load calculations were as follows:

WIND SPEED:	194 MPH (Vult) or 150 MPH (Vasd)
POOL LEVEL HEIGHT:	50'
RISK CATEGORY:	II
WIND DIRECTION FACTOR:	0.85
EXPOSURE CATEGORY:	C
TOPOGRAPHIC CATEGORY:	1.00
GUST EFFECT FACTOR:	0.85
ICE THICKNESS:	0"

All measurements were taken on a three-panel, four-pole “typical” segment of the Barrier installed in Mounts at Pool Barrier Corp’s office building. Numerous static and dynamic measurements were taken. All static measurements were taken using an engineer’s scale and tape measure. All dynamic measurements were taken using a calibrated Omega Digital Force Meter. The force meter has been certified accurate to within one one-hundredth of a pound.

The following static measurements were taken:

- The soil in the test area was uncompacted sand.
- Each Barrier post was inserted either four inches (4”) into a four inch (4”) long Sleeve or four inches (4”) into a sixteen inch (16”) long Mount.
- Each Sleeve or Mount was embedded flush with the surrounding deck or grade.
- The top of the Barrier measured forty-eight inches (48”) above the grade.
- The maximum vertical clearance between the bottom of the Barrier and the grade was less than two inches (2”).

- There were no openings or gaps in the Barrier that would allow the passage of a two-inch diameter (\emptyset 2") sphere.
- Both sides of the Barrier were flush and free of any hand and foot holds.
- No horizontal surface protruded more than one-half inch (1/2") from either side of the Barrier.
- The maximum mesh size found throughout the fabric was less than one-sixteenth of one-inch (1/16") square.
- The fabric mesh allowed more than sixty-five percent (65%) of the visible light to pass through either side.
- The maximum horizontal span of fabric between the posts was thirty-six inches (36").

The following dynamic measurements were taken:

- When subjected to two hundred pounds (200 lbs.) of horizontal force applied forty-eight inches above grade, the maximum horizontal deflection of the top of any post was less than eight inches (<8").
- All posts returned to within one inch (<1") of the original position after the force was removed.
- When subjected to two hundred pounds (200 lbs.) of horizontal force applied thirty-six inches above grade, the maximum horizontal deflection of the top of any post was less than eight inches (<8").
- All posts returned to within one inch (<1") of the original position after the force was removed.
- When subjected to fifty pounds (50 lbs.) of force from any direction, the maximum vertical clearance between the bottom of the Barrier and the grade was two inches (2").
- When subjected to fifty pounds (50 lbs.) of normal force, a one-inch diameter (\emptyset 1") hole cut through the fabric did not allow the passage of a two-inch diameter (\emptyset 2") sphere.

Accordingly, the Firm believes that the Barrier, when installed in compliance with **Addendum A** through **Addendum F**, has sufficient structural integrity to prevent a child from breaking through the fabric or other panel components of the Barrier. Furthermore, the Barrier has sufficient structural integrity to prevent buckling under a two hundred pound (**200 lb.**) load from any direction, such as a tripping or falling adult might produce. Finally, the Barrier has sufficient structural integrity to withstand coastal wind loads. Please see attached Addendums (and provide a copy of **Addendum F** to each homeowner for every new installation):

Addendum A

Engineering Analyses & Solutions, Inc. Drawing **L21ENG022**, *In-Ground Pole Mount Option*

Addendum B

2020 Florida Building Code- Residential, Chapter 45- Swimming Pools, **Section R4501.17 Residential Swimming Barrier Requirement**

Addendum C

2020 Florida Building Code- Building, Chapter 4- Special Detailed Requirements Based on Use and Occupancy, **Section 454.2.17 Residential Swimming Barrier Requirement**

Addendum D


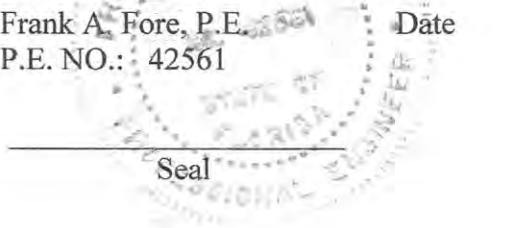
The 2020 Florida Statutes, **Chapter 515**, *Residential Swimming Pool Safety Act*

Addendum E

ASTM F2286-16 Standard Design and Performance Specification for Removable Mesh Fencing for Swimming Pools, Hot Tubs, and Spas

Addendum F

Safety Barrier Guidelines for Residential Pools


Frank A. Fore, P.E. Date
P.E. NO.: 42561

Seal

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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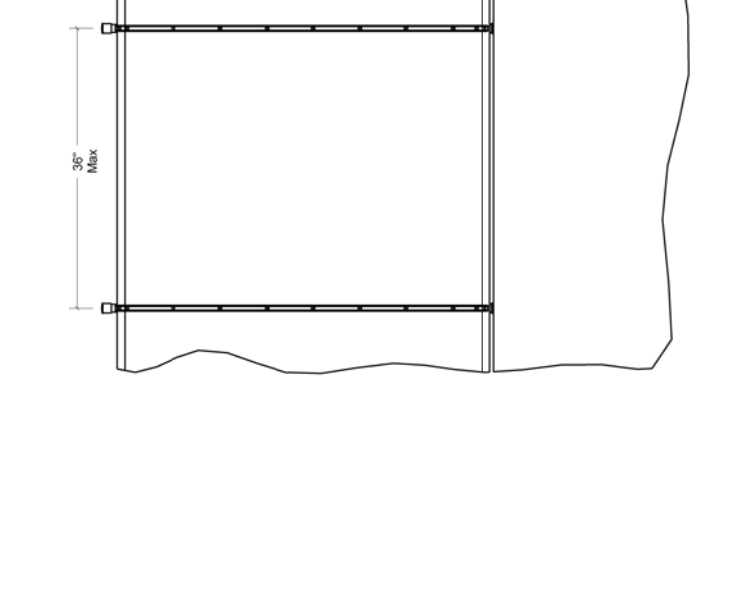
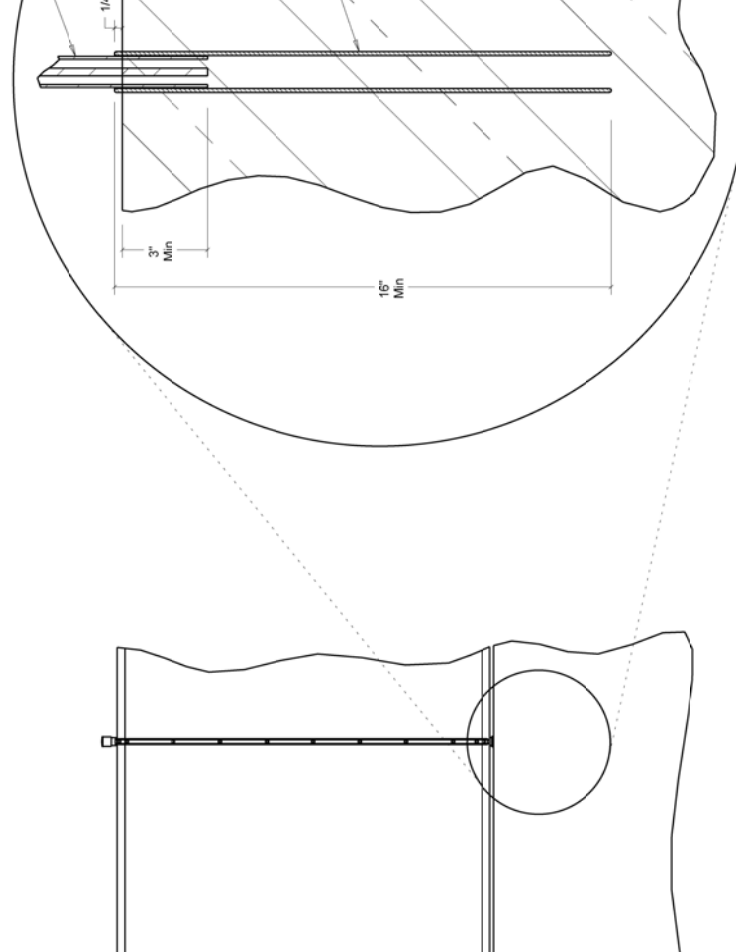
D C B A

ADDENDUM A

REVISION STATUS OF SHEETS

SHT	REV	DATE	DESCRIPTION

CHANGE NO.	ZONE/REV	DESCRIPTION	DATE	APPROVED



SECTION A-A
SCALE: 0.500

		177 U.S. HIGHWAY 1 SUITE 201 TOLONESTA, FL 32469 USA (981) 744-0510	
ENGINEER	DATE	DESIGN ENGINEER	DATE
F.A. FORE, P.E.	04-03-21	F.A. FORE, P.E.	04-03-21
STRUCTURES ENGINEER		STRUCTURES ENGINEER	
F.A. FORE, P.E.		F.A. FORE, P.E.	
DRAFTSMAN		DRAFTSMAN	
APPROVED BY:		APPROVED BY:	
JOB NO.: 21ENG022		JOB NO.: 21ENG022	
CAD FILE NAME: /fence.asm		CAD FILE NAME: /fence.asm	
THIRD ANGLE PROJECTION 		PREPARED UNDER CONTRACT FURNISHED UNDER CONTRACT	
P.E. CERTIFICATION FRANK A. FORE, P.E. 042561		DATE SEAL	
Pool Barrier Corp IN-GROUND POLE MOUNT OPTION		CAGE CODE: L21ENG022 DWG NO.: L21ENG022 SHEET: 1 of 1 REVISION: SCALE: 0.125	

8 7 6 5 4 3 2 1

D C B A

ADDENDUM B

2020 Florida Building Code, Residential, 7th Edition

R4501.17 Residential swimming barrier requirement.

Residential swimming pools shall comply with **Sections R4501.17.1 through R4501.17.3.**

Exception: A swimming pool with an approved safety pool cover complying with ASTM F1346.

R4502.17.1 Outdoor swimming pools.

Outdoor swimming pools shall be provided with a barrier complying with **R4501.17.1.1 through R4501.17.1.14.**

R4501.17.1.1

The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade the barrier may be at ground level or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).

R4501.17.1.2

The barrier may not have any gaps, openings, indentations, protrusions, or structural components that could allow a young child to crawl under, squeeze through, or climb over the barrier as herein described below. One end of a removable child barrier shall not be removable without the aid of tools. Openings in any barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.

R4501.17.1.3

Solid barriers which do not have openings shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

R4501.17.1.4

Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 1-3/4 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1-3/4 inches (44 mm) in width.

R4501.17.1.5

Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1-3/4 inches (44 mm) in width.

R4501.17.1.6

Maximum mesh size for chain link fences shall be a 2-1/4-inch square (57 mm) unless the fence is provided with slats fastened at the top or bottom which reduce the openings to no more than 1-3/4 inches (44 mm).

R4501.17.1.7

Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be no more than 1-3/4 inches (44 mm).

R4501.17.1.8

Access gates, when provided, shall be self-closing and shall comply with the requirements of **Sections R4501.17.1.1 through R4501.17.1.7** and shall be equipped with a self-latching locking device located on the pool side of the gate. Where the device release is located no less than 54 inches (1372 mm) from the bottom of the gate, the device release mechanism may be located on either side of the gate and so placed that it cannot be reached by a young child over the top or through any opening or gap from the outside. Gates that provide access to the swimming pool must open outward away from the pool. The gates and barrier shall have no opening greater than 1/2 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

R4501.17.1.9

Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. All doors and windows providing direct access from the home to the pool shall be equipped with an exit alarm complying with UL 2017 that has a minimum sound pressure rating of 85 dBA at 10 feet (3048 mm). Any deactivation switch shall be located at least 54 inches (1372 mm) above the threshold of the access. Separate alarms are not required for each door or window if sensors wired to a central alarm sound when contact is broken at any opening.

Exceptions:

- a. Screened or protected windows having a bottom sill height of 48 inches (1219 mm) or more measured from the interior finished floor at the pool access level.
- b. Windows facing the pool on floor above the first story.
- c. Screened or protected pass-through kitchen windows 42 inches (1067 mm) or higher with a counter beneath.

2. All doors providing direct access from the home to the pool must be equipped with a self-closing, self-latching device with positive mechanical latching/locking installed a minimum of 54 inches (1372 mm) above the threshold, which is approved by the authority having jurisdiction.
3. A swimming pool alarm that, when placed in a pool, sounds an alarm upon detection of an accidental or unauthorized entrance into the water. Such pool alarm must meet and be independently certified to ASTM Standard F2208, titled "Standard Safety Specification for Residential Pool Alarms," which includes surface motion, pressure, sonar, laser, and infrared alarms. For purposes of this paragraph, the term "swimming pool alarm" does not include any swimming protection alarm device designed for individual use, such as an alarm attached to a child that sounds when the child exceeds a certain distance or becomes submerged in water.

R4501.17.1.10

Where an aboveground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, the ladder or steps either shall be capable of being secured, locked or removed to prevent access, or the ladder or steps shall be surrounded by a barrier which meets the requirements of **Sections R4501.17.1.1 through R4501.17.1.9** and **Sections R4501.17.1.12 through R4501.17.1.14**. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

R4501.17.1.11

Standard screen enclosures which meet the requirements of **Section R4501.17** may be utilized as part of or all of the "barrier" and shall be considered a "non-dwelling" wall. Removable child barriers shall have one end of the barrier non-removable without the aid of tools.

R4501.17.1.12

The barrier must be placed around the perimeter of the pool and must be separate from any fence, wall, or other enclosure surrounding the yard unless the fence, wall, or other enclosure or portion thereof is situated on the perimeter of the pool, is being used as part of the barrier, and meets the barrier requirements of this section.

R4501.17.1.13

Removable child barriers must be placed sufficiently away from the water's edge to prevent a young child or medically frail elderly person who may manage to penetrate the barrier from immediately falling into the water. Sufficiently away from the water's edge shall mean no less than 20 inches (508 mm) from the barrier to the water's edge. Dwelling or non-dwelling walls including screen enclosures, when used as part or all of the "barrier" and meeting the other barrier requirements, may be as close to the water's edge as permitted by this code.

R4501.17.1.14

A wall of a dwelling may serve as part of the barrier if it does not contain any door or window that opens to provide direct access from the home to the swimming pool.

R4501.17.1.14.1 Adjacent waterways.

Permanent natural or permanent man-made features such as bulkheads, canals, lakes, navigable waterways, etc., adjacent to a public or private swimming pool or spa may be permitted as a barrier when approved by the authority having jurisdiction. When evaluating such barrier features, the authority may perform on-site inspections and review evidence such as surveys, aerial photographs, water management agency standards and specifications, and any other similar documentation to verify, at a minimum, the following:

1. The barrier feature is not subject to natural changes, deviations, or alterations and is capable of providing an equivalent level of protection as that provided by the code.
2. The barrier feature clearly impedes, prohibits or restricts access to the swimming pool or spa.

R4501.17.1.15

A mesh safety barrier meeting the requirements of **Section R4501.17** and the following minimum requirements shall be considered a barrier as defined in this section:

1. Individual component vertical support posts shall be capable of resisting a minimum of 52 pounds (229 N) of horizontal force prior to breakage when measured at a 36-inch (914 mm) height above grade. Vertical posts of the child mesh safety barrier shall extend a minimum of 3 inches (76 mm) below deck level and shall be spaced no greater than 36 inches (914 mm) apart.
2. The mesh utilized in the barrier shall have a minimum tensile strength according to ASTM D5034 of 100 pounds per foot, and a minimum ball burst strength according to ASTM D3787 of 150 pounds per foot. The mesh shall not be capable of deformation such that a 1/4-inch (6.4 mm) round object could pass through the mesh.

The mesh shall receive a descriptive performance rating of no less than “trace discoloration” or “slight discoloration” when tested according to ASTM G53 (Weatherability, 1,200 hours).

3. When using a molding strip to attach the mesh to the vertical posts, this strip shall contain, at a minimum, #8 by 1/2-inch (12.7 mm) screws with a minimum of two screws at the top and two at the bottom with the remaining screws spaced a maximum of 6 inches (152 mm) apart on center.
4. Patio deck sleeves (vertical post receptacles) placed inside the patio surface shall be of a nonconductive material.
5. A latching device shall attach each barrier section at a height no lower than 45 inches (1161 mm) above grade. Common latching devices that include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring actuated retaining lever (commonly referred to as a safety gate hook).
6. The bottom of the child mesh safety barrier shall not be more than 1 inch (25 mm) above the deck or installed surface (grade).

R4501.17.2 Indoor swimming pools.

All walls surrounding indoor swimming pools shall comply with **Section R4501.17.1.9.**

R4501.17.3 Prohibited locations.

A barrier may not be located in a way that allows any permanent structure, equipment, or window that opens to provide access from the home to the swimming pool.

ADDENDUM C

2020 Florida Building Code, Building, 7th Edition

454.2.17 Residential swimming barrier requirement.

Residential swimming pools shall comply with **Sections 454.2.17.1** through **454.2.17.3**.

Exception: A swimming pool with an approved safety pool cover complying with ASTM F1346.

454.2.17.1 Outdoor swimming pools.

Outdoor swimming pools shall be provided with a barrier complying with **Sections 454.2.17.1.1** through **454.2.17.1.14**.

454.2.17.1.1

The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade the barrier may be at ground level or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).

454.2.17.1.2

The barrier may not have any gaps, openings, indentations, protrusions, or structural components that could allow a young child to crawl under, squeeze through, or climb over the barrier as herein described below. One end of a removable child barrier shall not be removable without the aid of tools. Openings in any barrier shall not allow passage of a 4-inch diameter (102 mm) sphere.

454.2.17.1.3

Solid barriers which do not have openings shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

454.2.17.1.4

Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 1-3/4 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1-3/4 inches (44 mm) in width.

454.2.17.1.5

Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1-3/4 inches (44 mm) in width.

454.2.17.1.6

Maximum mesh size for chain link fences shall be a 2-1/4 inch (57 mm) square unless the fence is provided with slats fastened at the top or bottom which reduce the openings to no more than 1-3/4 inches (44 mm).

454.2.17.1.7

Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be no more than 1-3/4 inches (44 mm).

454.2.17.1.8

Access gates, when provided, shall be self-closing and shall comply with the requirements of **Sections 454.2.17.1.1 through 454.2.17.1.7** and shall be equipped with a self-latching locking device located on the pool side of the gate. Where the device release is located no less than 54 inches (1372 mm) from the bottom of the gate, the device release mechanism may be located on either side of the gate and so placed that it cannot be reached by a young child over the top or through any opening or gap from the outside. Gates that provide access to the swimming pool must open outward away from the pool. The gates and barrier shall have no opening greater than 1/2 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

454.2.17.1.9

Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. All doors and windows providing direct access from the home to the pool shall be equipped with an exit alarm complying with UL 2017 that has a minimum sound pressure rating of 85 dBA at 10 feet (3048 mm). Any deactivation switch shall be located at least 54 inches (1372 mm) above the threshold of the access. Separate alarms are not required for each door or window if sensors wired to a central alarm sound when contact is broken at any opening.

Exceptions:

1. Screened or protected windows having a bottom sill height of 48 inches (1219 mm) or more measured from the interior finished floor at the pool access level.
2. Windows facing the pool on the floor above the first story.
3. Screened or protected pass-through kitchen windows 42 inches (1067 mm) or higher with a counter beneath.

2. All doors providing direct access from the home to the pool must be equipped with a self-closing, self-latching device with positive mechanical latching/locking installed a minimum of 54 inches (1372 mm) above the threshold, which is approved by the authority having jurisdiction.
3. A swimming pool alarm that, when placed in a pool, sounds an alarm upon detection of an accidental or unauthorized entrance into the water. Such pool alarm must meet and be independently certified to ASTM F2208, titled “Standard Safety Specification for Residential Pool Alarms,” which includes surface motion, pressure, sonar, laser, and infrared alarms. For purposes of this paragraph, the term “swimming pool alarm” does not include any swimming protection alarm device designed for individual use, such as an alarm attached to a child that sounds when the child exceeds a certain distance or becomes submerged in water.

454.2.17.1.10

Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps, the ladder or steps either shall be capable of being secured, locked or removed to prevent access, or the ladder or steps shall be surrounded by a barrier which meets the requirements of **Sections 454.2.17.1.1** through **454.2.17.1.9** and **Sections 454.2.17.1.12** through **454.2.17.1.14**. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

454.2.17.1.11

Standard screen enclosures which meet the requirements of **Section 454.2.17** may be utilized as part of or all of the “barrier” and shall be considered a “non-dwelling” wall. Removable child barriers shall have one end of the barrier non-removable without the aid of tools.

454.2.17.1.12

The barrier must be placed around the perimeter of the pool and must be separate from any fence, wall, or other enclosure surrounding the yard unless the fence, wall, or other enclosure or portion thereof is situated on the perimeter of the pool, is being used as part of the barrier, and meets the barrier requirements of this section.

454.2.17.1.13

Removable child barriers must be placed sufficiently away from the water’s edge to prevent a young child or medically frail elderly person who may manage to penetrate the barrier from immediately falling into the water. Sufficiently away from the water’s edge shall mean no less than 20 inches (508 mm) from the barrier to the water’s edge. Dwelling or non-dwelling walls including screen enclosures, when used as part or all of the barrier and meeting the other barrier requirements, may be as close to the water’s edge as permitted by this code.

454.2.17.1.14

A wall of a dwelling may serve as part of the barrier if it does not contain any door or window that opens to provide direct access from the home to the swimming pool.

454.2.17.1.15

A mesh safety barrier meeting the requirements of **Section 454.2.17** and the following minimum requirements shall be considered a barrier as defined in this section:

1. Individual component vertical support posts shall be capable of resisting a minimum of 52 pounds (24 kg) of horizontal force prior to breakage when measured at a 36 inch (914 mm) height above grade. Vertical posts of the child safety barrier shall extend a minimum of 3 inches (76 mm) below deck level and shall be spaced no greater than 36 inches (914 mm) apart.
2. The mesh utilized in the barrier shall have a minimum tensile strength according to ASTM D5034 of 100 pounds per foot, and a minimum ball burst strength according to ASTM D3787 of 150 pounds per foot. The mesh shall not be capable of deformation such that a 1/4-inch (6.4 mm) round object could not pass through the mesh. The mesh shall receive a descriptive performance rating of no less than “trace discoloration” or “slight discoloration” when tested according to ASTM G53, Weatherability, 1,200 hours.
3. When using a molding strip to attach the mesh to the vertical posts, this strip shall contain, at a minimum, #8 by 1/2 inch (12.7 mm) screws with a minimum of two screws at the top and two at the bottom with the remaining screws spaced a maximum of 6 inches (152 mm) apart on center.
4. Patio deck sleeves (vertical post receptacles) placed inside the patio surface shall be of a nonconductive material.
5. A latching device shall attach each barrier section at a height no lower than 45 inches (1143 mm) above grade. Common latching devices that include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring actuated retaining lever (commonly referred to as a safety gate hook).
6. The bottom of the mesh safety barrier shall not be more than 1 inch (25 mm) above the deck or installed surface (grade).

454.2.17.1.16 Adjacent waterways.

Permanent natural or permanent man-made features such as bulkheads, canals, lakes, navigable waterways, etc., adjacent to a public or private swimming pool or spa may be permitted as a barrier when approved by the authority having jurisdiction. When evaluating such barrier features, the authority may perform on-site inspections and review evidence such as surveys, aerial photographs, water management agency standards and specifications, and any other similar documentation to verify, at a minimum, the following:

1. The barrier feature is not subject to natural changes, deviations, or alterations and is capable of providing an equivalent level of protection as that provided by the code.
2. The barrier feature clearly impedes, prohibits or restricts access to the swimming pool or spa.

454.2.17.2 Indoor swimming pools.

All walls surrounding indoor swimming pools shall comply with **Section 454.2.17.1.9.**

454.2.17.3 Prohibited locations.

A barrier may not be located in a way that allows any permanent structure, equipment, or window that opens to provide access from the home to the swimming pool.

Title XXXIII

REGULATION OF TRADE, COMMERCE, INVESTMENTS,
AND SOLICITATIONS

Chapter 515

RESIDENTIAL SWIMMING POOL SAFETY ACT

CHAPTER 515
RESIDENTIAL SWIMMING POOL SAFETY ACT

- 515.21 Short title.
- 515.23 Legislative findings and intent.
- 515.25 Definitions.
- 515.27 Residential swimming pool safety feature options; penalties.
- 515.29 Residential swimming pool barrier requirements.
- 515.31 Drowning prevention education program; public information publication.
- 515.33 Information required to be furnished to buyers.
- 515.35 Rulemaking authority.
- 515.37 Exemptions.

515.21 Short title.— This chapter may be cited as the “Preston de Ibern/McKenzie Merriam Residential Swimming Pool Safety Act.”

History.—s. 1, ch. 2000-143.

515.23 Legislative findings and intent.— The Legislature finds that drowning is the leading cause of death of young children in this state and is also a significant cause of death for medically frail elderly persons in this state, that constant adult supervision is the key to accomplishing the objective of reducing the number of submersion incidents, and that when lapses in supervision occur a pool safety feature designed to deny, delay, or detect unsupervised entry to the swimming pool, spa, or hot tub will reduce drowning and near-drowning incidents. In addition to the incalculable human cost of these submersion incidents, the health care costs, loss of lifetime productivity, and legal and administrative expenses associated with drownings of young children and medically frail elderly persons in this state each year and the lifetime costs for the care and treatment of young children who have suffered brain disability due to near-drowning incidents each year are enormous. Therefore, it is the intent of the Legislature that all new residential swimming pools, spas, and hot tubs be equipped with at least one pool safety feature as specified in this chapter. It is also the intent of the Legislature that the Department of Health be responsible for producing its own or adopting a nationally recognized publication that provides the public with information on drowning prevention and the responsibilities of pool ownership and also for developing its own or adopting a nationally recognized drowning prevention education program for the public and for persons violating the pool safety requirements of this chapter.

History.—s. 1, ch. 2000-143.

515.25 Definitions.— As used in this chapter, the term:

- (1) “Approved safety pool cover” means a manually or power-operated safety pool cover that meets all of the performance standards of the American Society for Testing and Materials (ASTM) in compliance with standard F1346-91.
- (2) “Barrier” means a fence, dwelling wall, or nondwelling wall, or any combination thereof, which completely surrounds the swimming pool and obstructs access to the swimming pool, especially access from the residence or from the yard outside the barrier.
- (3) “Department” means the Department of Health.
- (4) “Exit alarm” means a device that makes audible, continuous alarm sounds when any door or window which permits access from the residence to any pool area that is without an intervening enclosure is opened or left ajar.
- (5) “Indoor swimming pool” means a swimming pool that is totally contained within a building and surrounded on all four sides by walls of or within the building.
- (6) “Medically frail elderly person” means any person who is at least 65 years of age and has a medical problem that affects balance, vision, or judgment, including, but not limited to, a heart condition, diabetes, or Alzheimer’s disease or any related disorder.
- (7) “Outdoor swimming pool” means any swimming pool that is not an indoor swimming pool.
- (8) “Portable spa” means a nonpermanent structure intended for recreational bathing, in which all controls and water-heating and water-circulating equipment are an integral part of the product and which is cord-connected and not permanently electrically wired.
- (9) “Public swimming pool” means a swimming pool, as defined in s. 514.011(2), which is operated, with or without charge, for the use of the general public; however, the term does not include a swimming pool located on the grounds of a private residence.
- (10) “Residential” means situated on the premises of a detached one-family or two-family dwelling or a one-family townhouse not more than three stories high.

(11) "Swimming pool" means any structure, located in a residential area, that is intended for swimming or recreational bathing and contains water over 24 inches deep, including, but not limited to, in-ground, aboveground, and on-ground swimming pools; hot tubs; and nonportable spas.

(12) "Young child" means any person under the age of 6 years.

History.—s. 1, ch. 2000-143.

515.27 Residential swimming pool safety feature options; penalties. —

(1) In order to pass final inspection and receive a certificate of completion, a residential swimming pool must meet at least one of the following requirements relating to pool safety features:

(a) The pool must be isolated from access to a home by an enclosure that meets the pool barrier requirements of s. 515.29;

(b) The pool must be equipped with an approved safety pool cover;

(c) All doors and windows providing direct access from the home to the pool must be equipped with an exit alarm that has a minimum sound pressure rating of 85 dB A at 10 feet;

(d) All doors providing direct access from the home to the pool must be equipped with a self-closing, self-latching device with a release mechanism placed no lower than 54 inches above the floor; or

(e) A swimming pool alarm that, when placed in a pool, sounds an alarm upon detection of an accidental or unauthorized entrance into the water. Such pool alarm must meet and be independently certified to ASTM Standard F2208, titled "Standard Safety Specification for Residential Pool Alarms," which includes surface motion, pressure, sonar, laser, and infrared alarms. For purposes of this paragraph, the term "swimming pool alarm" does not include any swimming protection alarm device designed for individual use, such as an alarm attached to a child that sounds when the child exceeds a certain distance or becomes submerged in water.

(2) A person who fails to equip a new residential swimming pool with at least one pool safety feature as required in subsection (1) commits a misdemeanor of the second degree, punishable as provided in s. 775.082 or s. 775.083, except that no penalty shall be imposed if the person, within 45 days after arrest or issuance of a summons or a notice to appear, has equipped the pool with at least one safety feature as required in subsection (1) and has attended a drowning prevention education program established by s. 515.31. However, the requirement of attending a drowning prevention education program is waived if such program is not offered within 45 days after issuance of the citation.

History.—s. 1, ch. 2000-143; s. 14, ch. 2016-129.

515.29 Residential swimming pool barrier requirements. —

(1) A residential swimming pool barrier must have all of the following characteristics:

(a) The barrier must be at least 4 feet high on the outside.

(b) The barrier may not have any gaps, openings, indentations, protrusions, or structural components that could allow a young child to crawl under, squeeze through, or climb over the barrier.

(c) The barrier must be placed around the perimeter of the pool and must be separate from any fence, wall, or other enclosure surrounding the yard unless the fence, wall, or other enclosure or portion thereof is situated on the perimeter of the pool, is being used as part of the barrier, and meets the barrier requirements of this section.

(d) The barrier must be placed sufficiently away from the water's edge to prevent a young child or medically frail elderly person who may have managed to penetrate the barrier from immediately falling into the water.

(2) The structure of an aboveground swimming pool may be used as its barrier or the barrier for such a pool may be mounted on top of its structure; however, such structure or separately mounted barrier must meet all barrier requirements of this section. In addition, any ladder or steps that are the means of access to an aboveground pool must be capable of being secured, locked, or removed to prevent access or must be surrounded by a barrier that meets the requirements of this section.

(3) Gates that provide access to swimming pools must open outward away from the pool and be self-closing and equipped with a self-latching locking device, the release mechanism of which must be located on the pool side of the gate and so placed that it cannot be reached by a young child over the top or through any opening or gap.

(4) A wall of a dwelling may serve as part of the barrier if it does not contain any door or window that opens to provide access to the swimming pool.

(5) A barrier may not be located in a way that allows any permanent structure, equipment, or similar object to be used for climbing the barrier.

History.—s. 1, ch. 2000-143.

515.31 Drowning prevention education program; public information publication. —

(1) The department shall develop a drowning prevention education program, which shall be made available to the public at the state and local levels and which shall be required as set forth in s. 515.27(2) for persons in violation of the pool safety requirements of this chapter. The department may charge a fee, not to exceed \$100, for attendance at such a program. The drowning prevention education program shall be funded using fee proceeds, state funds appropriated for such purpose, and grants. The department, in lieu of developing its own program, may adopt a nationally recognized drowning prevention education program to be approved for use in local safety education programs, as provided in rule of the department.

(2) The department shall also produce, for distribution to the public at no charge, a publication that provides information on drowning prevention and the responsibilities of pool ownership. The department, in lieu of

developing its own publication, may adopt a nationally recognized drowning prevention and responsibilities of pool ownership publication, as provided in rule of the department.

History.—s. 1, ch. 2000-143.

515.33 Information required to be furnished to buyers.—A licensed pool contractor, on entering into an agreement with a buyer to build a residential swimming pool, or a licensed home builder or developer, on entering into an agreement with a buyer to build a house that includes a residential swimming pool, must give the buyer a document containing the requirements of this chapter and a copy of the publication produced by the department under s. 515.31 that provides information on drowning prevention and the responsibilities of pool ownership.

History.—s. 1, ch. 2000-143.

515.35 Rulemaking authority.—The department shall adopt rules pursuant to the Administrative Procedure Act establishing the fees required to attend drowning prevention education programs and setting forth the information required under this chapter to be provided by licensed pool contractors and licensed home builders or developers.

History.—s. 1, ch. 2000-143.

515.37 Exemptions.—This chapter does not apply to:

- (1) Any system of sumps, irrigation canals, or irrigation flood control or drainage works constructed or operated for the purpose of storing, delivering, distributing, or conveying water.
- (2) Stock ponds, storage tanks, livestock operations, livestock watering troughs, or other structures used in normal agricultural practices.
- (3) Public swimming pools.
- (4) Any political subdivision that has adopted or adopts a residential pool safety ordinance, provided the ordinance is equal to or more stringent than the provisions of this chapter.
- (5) Any portable spa with a safety cover that complies with ASTM F1346-91 (Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs).
- (6) Small, temporary pools without motors, which are commonly referred to or known as “kiddie pools.”

History.—s. 1, ch. 2000-143.

Disclaimer: The information on this system is unverified. The journals or printed bills of the respective chambers should be consulted for official purposes.



Designation: F2286 – 16

Standard Design and Performance Specification for Removable Mesh Fencing for Swimming Pools, Hot Tubs, and Spas¹

This standard is issued under the fixed designation F2286; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification outlines the performance and design requirements for removable mesh safety barriers used for barriers for swimming pools, hot tubs, and spas to reduce the incidence of injuries or death for infants and children up to and including five years of age.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

[D3787 Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traverse \(CRT\) Ball Burst Test](#)

[D5034 Test Method for Breaking Strength and Elongation of Textile Fabrics \(Grab Test\)](#)

[F1908 Guide for Fences for Residential Outdoor Swimming Pools, Hot Tubs, and Spas](#)

[G154 Practice for Operating Fluorescent Ultraviolet \(UV\) Lamp Apparatus for Exposure of Nonmetallic Materials](#)

2.2 ANSI Standards:³

[ANSI Z97.1 Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test](#)

[ANSI Z535.4 Product Safety Signs and Labels](#)

¹ This specification is under the jurisdiction of ASTM Committee F15 on Consumer Products and is the direct responsibility of Subcommittee F15.49 on Pool Safety Standards.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

2.3 ANSI/NSPI Standard:³

[ANSI/NSPI-8 Standard for Model Barrier Code for Residential Swimming Pools](#)

3. Terminology

3.1 Definitions:

3.1.1 See ANSI/NSPI-8 and Guide F1908 for specific terms.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *grade, n*—surfaces including concrete, brick, tile, wood, metal, or similar rigid surface used as foundation for mesh safety barriers.

3.2.2 *mesh safety barrier, n*—barrier composed of fabric mesh, support posts, hardware, and other assembly components.

4. Design and Performance Requirements

4.1 The top of a fence or wall used as a barrier shall be a minimum of 48 in. (1.2 m) above the grade adjacent to the exterior side of the barrier.

4.2 Distance between vertical support poles and attached mesh, along with other manufactured factors, shall be so designed and fabricated to hinder children's ability to climb.

4.3 Decorative details, if provided or added, shall not afford the ability of children to climb the mesh safety barrier.

4.4 When a hinged gate is used in addition to, or as part of the mesh safety barrier, the gate shall be self-closing, self-latching, accommodate a locking device and open outward from the pool, spa, or hot tub. The self-latching and lockable devices for gates shall be located at a minimum height of 54 in. (1.37 m) above grade and be mounted on the outside of the gate. An additional support or plate may be necessary to raise the device to 54 in. (1.37 m).

NOTE 1—Hinged gates in accordance with 4.4 are recommended for use with removable mesh fencing for swimming pools, hot tubs, and spas.

4.5 There shall be a clear zone of at least 20 in. (50 cm) between the barrier and pool/spa/hot tub.

4.6 The fence shall have at least 40 % open space to allow visibility from outside to inside of the pool area.

NOTE 2—The "open space" is calculated by using total area and subtracting the area of opaque supports and mesh.

4.7 The mesh safety barrier shall be removable when desired.

4.8 The removable mesh safety barrier, when properly installed, shall provide continuous and constant protection of the pool/hot tub/spa. When used on an outdoor or unenclosed pool, the mesh safety barrier may provide complete 360° protection or may be attached to another existing property or perimeter fence in such a manner as to prevent unsupervised access to the pool. When used in a screen enclosure, the terminus of the mesh safety barrier shall be fastened to an upright or vertical member of the enclosure and installed in such a location that the barrier prevents unsupervised access to the pool.

4.9 Vertical posts of the mesh safety barrier shall extend a minimum of 3 in. (7.5 cm) below grade level and shall be spaced no greater than 40 in. (1.016 m) apart.

4.10 The mesh used in the barrier shall have a minimum tensile strength according to Test Method **D5034** of 100 lbf (449 N) and a minimum burst strength in accordance with Test Method **D3787** of 150 lbf (667 N).

4.11 The mesh shall receive a descriptive performance rating of no less than “trace discoloration” or no greater than “slight discoloration” or a numerical rating of 4 or 5 on a scale of 1 to 5 (1 indicating a severe color change and 5 indicating no color change) when tested in accordance with Practice **G154** (weatherability, 1000 h).

4.12 When using a molding strip to attach the mesh to the vertical posts, this strip shall contain, at a minimum, #8 × ½-in. screws with a minimum of two screws at the top and two at the bottom with the remaining screws spaced a maximum of 6 in. (15 cm) apart on center.

4.13 Patio deck sleeves (vertical post receptacles) placed inside the patio surface shall be of a nonconductive material.

4.14 A latching device shall attach each barrier section at a height no lower than 45 in. (1.14 m) above grade. Common latching devices may include, but are not limited to, devices that provide the security equal to or greater than that of a hook-and-eye-type latch incorporating a spring-actuated retaining lever (commonly referred to as a safety gate hook).

4.15 The bottom of the mesh safety barrier shall not be more than 1 in. (25 mm) above the deck or installed surface (grade).

4.16 The mesh safety barrier shall be constructed to prohibit the free passage of a 4.0-in. (102-mm) diameter rigid sphere^{4,5} at any point, after testing in accordance with Section 5 when the fence is installed in accordance with the manufacturer’s instructions.

5. Performance Tests

5.1 Vertical Load Test:

⁴ CPSC Publication 362, “Safety Barrier Guidelines for Home Pools,” U.S. Consumer Product Safety Commission, Washington, DC 20207-0001 and New Jersey Community Affairs Division of Codes and Standards Cite 27.

⁵ N.M.R. 3150, Subchapter 2, “Child-Protection Window Guards, 5:10, 27:4, Specifications for Window Guards.”

5.1.1 A ⅛-in. (0.3-cm) diameter steel wire is looped through the mesh at a height of 36 in. (0.91 m) from grade.

5.1.2 A steady vertical force of 20 lb (9.07 kg) (as measured by any force gauge, that is, fish weight scale) shall be exerted steadily upward on the wire.

5.1.3 The force shall be maintained for 1 min.

5.1.4 The mesh safety barrier shall be tested at each 5-ft (1.5-m) increment of the perimeter, including any gate.

5.1.5 Once the load is removed, the mesh safety barrier shall be inspected to determine that no opening exists that would allow passage of a 4.0-in. (102-mm) diameter rigid sphere.

5.1.6 The latching and locking device shall remain engaged after testing.

5.2 Impact Test:

5.2.1 The impactor (52 lb (23.58 kg)), such as in Figs. 2 and 3 from ANSI Z97.1 (see Appendix XI), is prepared and mounted to a 12-in. (30.48-cm) fixture cable so that when at rest it is no farther than 2 in. (50 mm) away from the fence at a height of 36 in. (0.91 m) from grade.

5.2.2 The impactor is swung sideways and upward from the mesh safety barrier until the bottom of the impactor is extended sideways and at a vertical distance of 6 in. (150 mm) above the “at rest” position. The bottom of the impactor will be at 42 in. (1.066 m) above grade for this test.

5.2.3 When all motion has stopped, the impactor is released and allowed to impact once into the mesh safety barrier.

5.2.4 The impactor test shall be used to test the fence at each 5-ft (1.5-m) increment of the perimeter of the fence including any gate.

5.2.5 Once the impact is completed and the test weight is withdrawn, the tested mesh safety barrier shall prohibit the free passage of a 4.00-in. (102-mm) diameter rigid sphere through or around it at any point.

5.2.6 The latching device shall remain engaged after testing.

6. Instructions

6.1 Instructions shall specify all requirements for proper assembly, installation, and use of the mesh safety barrier.

6.2 Instructions shall address all warning signs and safe use. Use ANSI Z535.4 for guide to details.

6.3 Instructions shall include name, address, and phone number of manufacturer.

7. Product Marking

7.1 Mesh safety barrier, meeting all requirements of this specification shall be labeled “Meets ASTM Standard F2286.”

7.2 Instructions shall include where the label of compliance is to be placed.

7.3 Manufacturer’s name.

NOTE 3—Suggested location is poolside on first pole of panel (on left side of completed panel facing pool).

8. Keywords

8.1 children safety; fences; hot tubs; mesh safety barriers; portable fences; spas; swimming pools

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Safety Barrier Guidelines for Residential Pools

Preventing Child Drownings

U.S. Consumer Product
Safety Commission





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CPSC is charged with protecting the public from unreasonable risks of injury or death associated with the use of the thousands of consumer products under the agency's jurisdiction.

Many communities have enacted safety regulations for barriers at residential swimming pools—in ground and above ground. In addition to following these laws, parents who own pools can take their own precautions to reduce the chances of their youngsters accessing the family or neighbors' pools or spas without supervision. This booklet provides tips for creating and maintaining effective barriers to pools and spas.



Each year, thousands of American families suffer swimming pool tragedies—drownings and near-drownings of young children. The majority of deaths and injuries in pools and spas involve young children ages 1 to 3 and occur in residential settings. These tragedies are preventable.

This U.S. Consumer Product Safety Commission (CPSC) booklet offers guidelines for pool barriers that can help prevent most submersion incidents involving young children. This handbook is designed for use by owners, purchasers, and builders of residential pools, spas, and hot tubs.

The swimming pool barrier guidelines are not a CPSC standard, nor are they mandatory requirements. CPSC believes that the safety features recommended in this booklet will help make pools safer, promote pool safety awareness, and save lives. Barriers are not the sole method to prevent pool drowning of young children and cannot replace adult supervision.

Some states and localities have incorporated these guidelines into their building codes. Check with your local authorities to see what is required in your area's building code or in other regulations.



Swimming Pool Barrier Guidelines

Many of the nearly 300 children under 5 who drown each year in backyard pools could be saved if homeowners completely fenced in pools and installed self-closing and self-latching devices on gates.

Anyone who has cared for a toddler knows how fast young children can move. Toddlers are inquisitive and impulsive and lack a realistic sense of danger. These behaviors make swimming pools particularly hazardous for households with young children.

CPSC reports that child drownings are the second leading cause of accidental death around the home for children under 5 years of age. In some southern or warm weather states, drowning is the leading cause of accidental death in the home for children under 5.

CPSC staff has reviewed a great deal of data on drownings and child behavior, as well as information on pool and pool barrier construction. The staff concluded that the best way to reduce child drownings in residential pools is for pool owners to construct and maintain barriers that will help to prevent young children from gaining access to pools and spas.

The guidelines provide information for pool and spa owners to use to prevent children from entering the pool area unaccompanied by a supervising adult. They take into consideration the variety of barriers (fences) available and where each might be vulnerable to a child wanting to get on the other side.

The swimming pool barrier guidelines are presented with illustrated descriptions of pool barriers. The definition of pool includes spas and hot tubs. The swimming pool barrier guidelines therefore apply to these structures as well as to above ground pools, and may include larger portable pools.

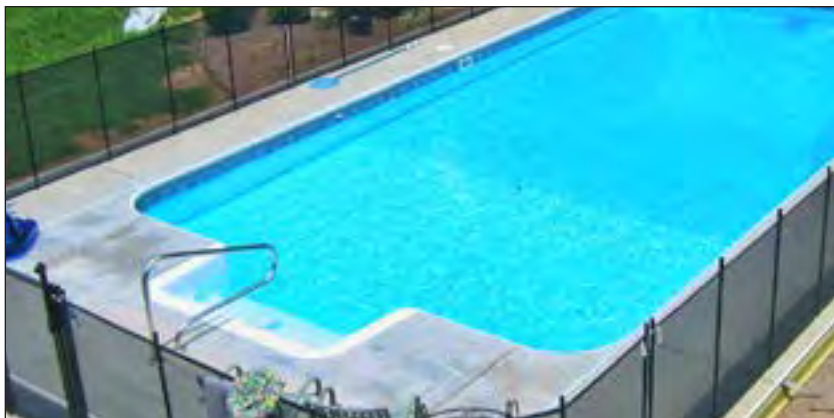
**Pool and Spa Submersions:
Estimated Injuries and Reported
Fatalities***

CPSC publishes an annual report on submersion incidents. Key findings from the 2012 report include:

- Nearly 300 children younger than 5 drown in swimming pools and spas each year representing 75 percent of the 390 fatalities reported for children younger than 15.
- Children aged 1 to 3 years (12 months through 47 months) represented 67 percent of the reported fatalities and 66 percent of reported injuries in pools and spas.
- Over 4,100 children younger than 5 suffer submersion injuries and require emergency room treatment; about half are seriously injured and are admitted to the hospital for further treatment.
- The majority of drownings and submersion injuries involving victims younger than 5 occur in pools owned by the family, friends or relatives.
- The majority of estimated emergency department-treated submersion injuries and reported fatalities were associated with pools.
- Portable pools accounted for 10 percent of the total fatalities (annual average of 40) for children younger than 15.

**The report presents average annual estimates for emergency department-treated injuries for 2009 through 2011 and average annual estimates for fatal submersions for 2007 through 2009, as reported to CPSC staff. The years for reported injury and fatality statistics differ due to a lag in fatality reporting.*





Barriers

Barriers are not child proof, but they provide layers of protection for a child when there is a lapse in adult supervision. Barriers give parents additional time to find a child before the unexpected can occur.

Barriers include a fence or wall, door alarms for the house, and a power safety cover over the pool. Use the following recommendations as a guide.

Barrier Locations

Barriers should be located so as to prohibit permanent structures, equipment or similar objects from being used to climb the barriers.

Fences

A fence completely surrounding the pool is better than one with the house serving as the fourth side. Fences should be a minimum of 4 feet high, although fences 5 feet or higher are preferable.

If the home serves as one side of the barrier install **door alarms** on all doors leading to the pool area. Make sure the doors have self-closing and self-latching devices or locks beyond the reach of children to prevent them from opening the door and gaining access to the pool.

Pool covers add another layer of protection and there are a wide variety of styles on the market. Keep pool covers well-maintained and make sure the control devices are kept out of the reach of children.

A successful pool barrier prevents a child from getting **OVER**, **UNDER**, or **THROUGH** and keeps the child from gaining access to the pool except when supervising adults are present.

How To Prevent a Child from Getting OVER a Pool Barrier

A young child can get over a pool barrier if the barrier is too low or if the barrier has handholds or footholds to use when climbing. The top of a pool barrier should be at least 48 inches above grade, measured on the side of the barrier which faces away from the swimming pool. Some states, counties or municipalities require pool barriers of 60 inches.

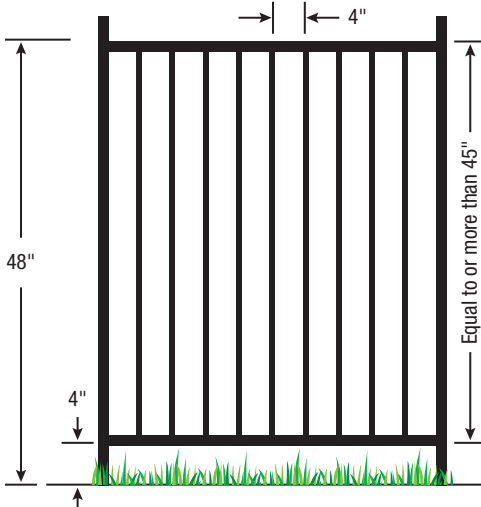


Figure 1

Eliminate handholds and footholds and minimize the size of openings in a barrier's construction.

For a Solid Barrier

No indentations or protrusions should be present, other than normal construction tolerances and masonry joints.

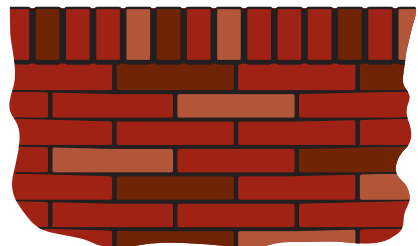


Figure 2

For a Barrier (Fence) Made Up of Horizontal and Vertical Members

If the distance between the top side of the horizontal members is less than 45 inches, the horizontal members should be on the swimming pool side of the fence.

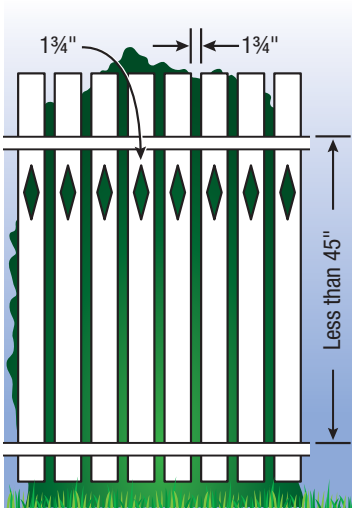


Figure 3

The spacing between vertical members and within decorative cutouts should not exceed 1 3/4 inches. This size is based on the foot width of a young child and is intended to reduce the potential for a child to gain a foothold and attempt to climb the fence.

If the distance between the tops of the horizontal members is more than 45 inches, the horizontal members can be on the side of the fence facing away from the pool. The spacing between vertical members should not exceed 4 inches. This size is based on the head breadth and chest depth of a young child and is intended to prevent a child from passing through an opening. If there are any decorative cutouts in the fence, the space within the cutouts should not exceed 1 3/4 inches.

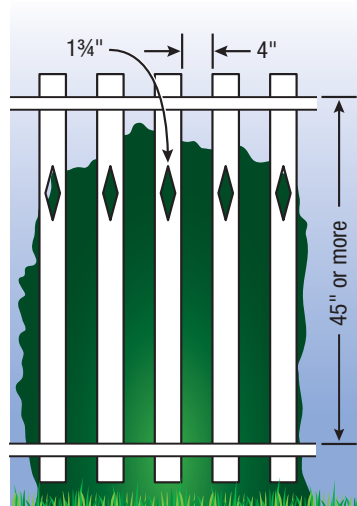


Figure 4

For a Chain Link Fence

The mesh size should not exceed 1¼ inches square unless slats, fastened at the top or bottom of the fence, are used to reduce mesh openings to no more than 1¾ inches.

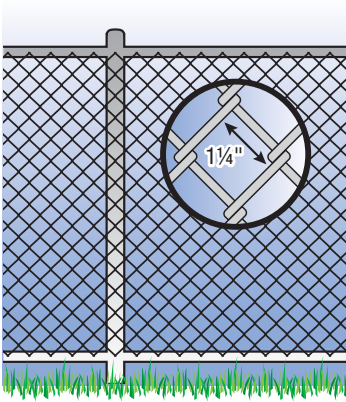


Figure 5

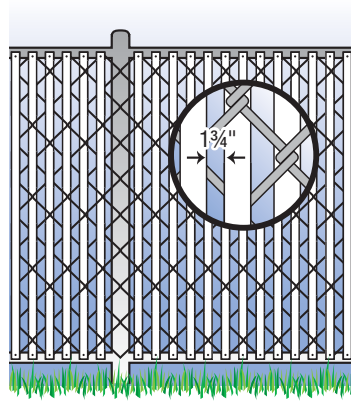


Figure 6

For a Fence Made Up of Diagonal Members or Latticework

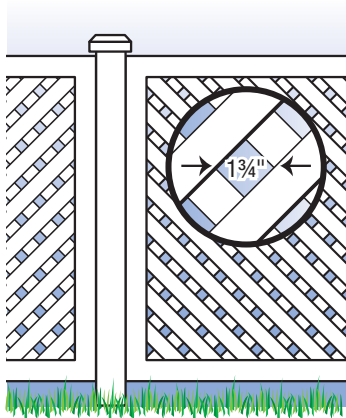


Figure 7

The maximum opening in the lattice should not exceed 1¾ inches.

For Above Ground Pools

Above ground pools should have barriers. The pool structure itself serves as a barrier or a barrier is mounted on top of the pool structure.

There are two possible ways to prevent young children from climbing up into an above ground pool. The steps or ladder can be designed to be secured, locked or removed to prevent access, or the steps or ladder can be surrounded by a barrier such as those described in these guidelines

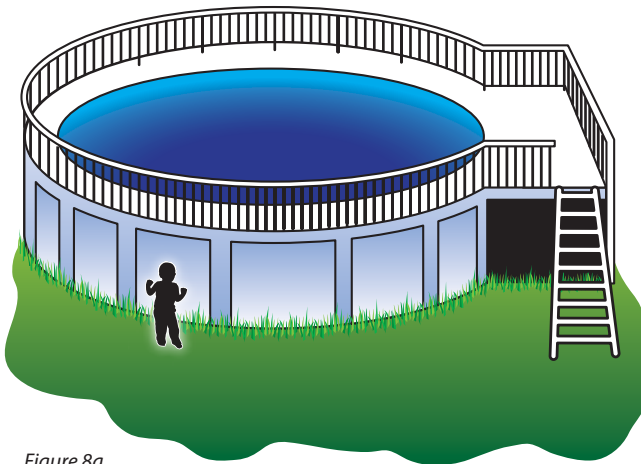


Figure 8a

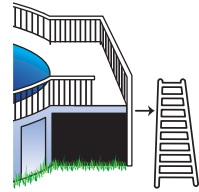


Figure 8b

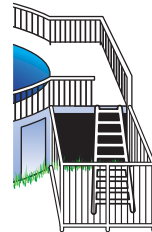


Figure 8c

Above Ground Pool with Barrier on Top of Pool

If an above ground pool has a barrier on the top of the pool, the maximum vertical clearance between the top of the pool and the bottom of the barrier should not exceed 4 inches.

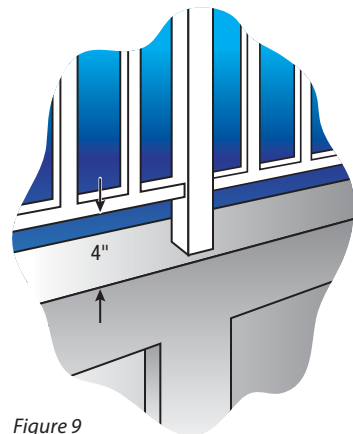


Figure 9

How to Prevent a Child from Getting UNDER a Pool Barrier

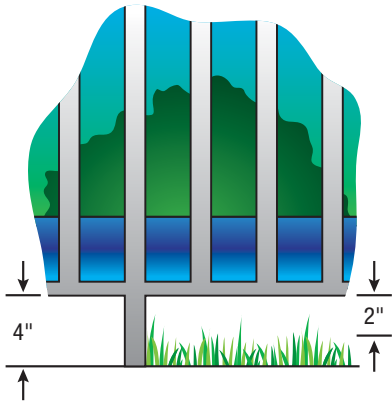


Figure 10

For any pool barrier, the maximum clearance at the bottom of the barrier should not exceed 4 inches above the surface or ground when the measurement is done on the side of the barrier facing away from the pool. Industry recommends that if the bottom of the gate or fence rests on a non-solid surface like grass or gravel, that measurement should not exceed 2 inches.

How to Prevent a Child from Getting THROUGH a Pool Barrier

Preventing a child from getting through a pool barrier can be done by restricting the sizes of openings in a barrier and by using self-closing and self-latching gates.

To prevent a young child from getting through a fence or other barrier, all openings should be small enough so that a 4-inch diameter sphere cannot pass through. This size is based on the head breadth and chest depth of a young child.

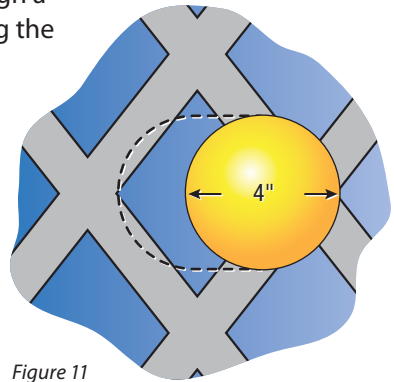


Figure 11

Portable Pools



Portable pools are becoming more popular. They vary in size and height, from tiny blow-up pools to larger thousands-of-gallons designs. Portable pools present a real danger to young children.

Never leave children unsupervised around portable pools. It is recommended that portable pools be fenced, covered or emptied and stored away. Instruct neighbors, friends and caregivers about their presence and the potential dangers of a portable pool in your yard.

Removable Mesh Fences

Mesh fences are specifically made for swimming pools or other small bodies of water. Although mesh fences are meant to be removable, the safest mesh pool fences are locked into the deck so that they cannot be removed without the extensive use of tools.



Like other pool fences, mesh fences should be a minimum of 48" in height. The distance between vertical support poles and the attached mesh, along with other manufactured factors, should be designed to hinder a child's ability to climb the fence. The removable vertical support posts should extend a minimum of 3 inches below grade and they should be spaced no greater than 40 inches apart. The bottom of the mesh barrier should not be more than 1 inch above the deck or installed surface.

For more information on Removable Mesh Fencing see ASTM standard F 2286 – 05.

Gates

There are two kinds of gates which might be found on a residential property: pedestrian gates and vehicle or other types of gates. Both can play a part in the design of a swimming pool barrier. All gates should be designed with a locking device.



Pedestrian Gates

These are the gates people walk through. Swimming pool barriers should be equipped with a gate or gates which restrict access to the pool.

Gates should open out from the pool and should be self-closing and self-latching. If a gate is properly designed and not completely latched, a young child pushing on the gate in order to enter the pool area will at least close the gate and may actually engage the latch.



Figure 12

The weak link in the strongest and highest fence is a gate that fails to close and latch completely. For a gate to close completely every time, it must be in proper working order.

When the release mechanism of the self-latching device on the gate is less than 54 inches from the bottom of the gate, the release mechanism for the gate should be at least 3 inches below the top of the gate on the side facing the pool. Placing the release mechanism at this height prevents a young child from reaching over the top of a gate and releasing the latch.

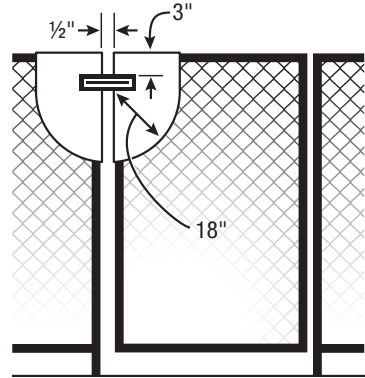


Figure 13

Also, the gate and barrier should have no opening greater than 1/2 inch within 18 inches of the latch release mechanism. This prevents a young child from reaching through the gate and releasing the latch.

All Other Gates (Vehicle Entrances, Etc.)

Other gates should be equipped with self-latching devices. The self-latching devices should be installed as described for pedestrian gates.



When the House Forms Part of the Pool Barrier

In many homes, doors open directly from the house onto the pool area or onto a patio leading to the pool. In such cases, the side of the house leading to the pool is an important part of the pool barrier. Passage through any door from the house to the pool should be controlled by security measures.

The importance of controlling a young child's movement from the house to pool is demonstrated by the statistics obtained in CPSC's submersion reports. Residential locations dominate in incidents involving children younger than 5 accounting for 85% of fatalities and 54 percent of injuries (from *CPSC's 2012 Pool and Spa Submersion Report*, see page 3).



Figure 14

Door Alarms

All doors that allow access to a swimming pool should be equipped with an audible alarm which sounds when the door and/or screen are opened. Alarms should meet the requirements of *UL 2017 General-Purpose Signaling Devices and Systems, Section 77* with the following features:

- Sound lasting for 30 seconds or more within 7 seconds after the door is opened.
- The alarm should be loud: at least 85 dBA (decibels) when measured 10 feet away from the alarm mechanism.
- The alarm sound should be distinct from other sounds in the house, such as the telephone, doorbell and smoke alarm.
- The alarm should have an automatic reset feature to temporarily deactivate the alarm for up to 15 seconds to allow adults to pass through house doors without setting off the alarm. The deactivation switch could be a touchpad (keypad) or a manual switch, and should be located at least 54 inches above the threshold and out of the reach of children.

Self-closing doors with self-latching devices could be used in conjunction with door alarms to safeguard doors which give access to a swimming pool.

Pet or Doggy Doors

Never have a pet or doggy door if the door leads directly to a pool or other backyard water. An isolation barrier or fence is the best defense when pet doors are installed. Remember, pet door openings, often overlooked by adults, provide curious children with an outlet to backyard adventure. Locking these doors is not sufficient and could lead to accidents and tragedies. Children regularly drown in backyard pools, which they were able to access through pet doors. Some municipalities have building codes that prohibit doggy doors in homes with pools unless there is an isolation fence around the pool.

Power Safety Covers

Power safety covers can be installed on pools to serve as security barriers, especially when the house serves as the fourth wall or side of a barrier. Power safety covers should conform to the specifications in the *ASTM F 1346-91 standard*, which specifies safety performance requirements for pool covers to protect young children from drowning.

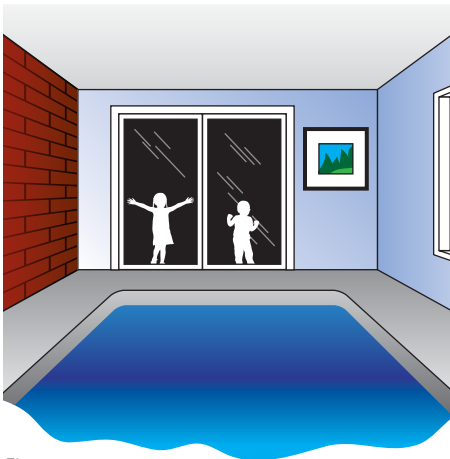


Figure 15

Indoor Pools

When a pool is located completely within a house, the walls that surround the pool should be equipped to serve as pool safety barriers. Measures recommended for using door alarms, pool alarms and covers where a house wall serves as part of a safety barrier also apply for all the walls surrounding an indoor pool.

Barriers for Residential Swimming Pool, Spas, and Hot Tubs

The preceding explanations of CPSC’s pool barrier guidelines were provided to make it easier for pool owners, purchasers, builders, technicians, and others to understand and apply the guidelines to their particular properties or situations. Reading the following guidelines in conjunction with the diagrams or figures previously provided may be helpful. For further information, consult your local building department or code authority.

Outdoor Swimming Pools

All outdoor swimming pools, including inground, above ground, or onground pools, hot tubs, or spas, should have a barrier which complies with the following:

1. The **top of the barrier** should be at least 48 inches above the surface measured on the side of the barrier which faces away from the swimming pool (figure 1).
2. The maximum **vertical clearance between the surface and the bottom of the barrier** should be 4 inches measured on the side of the barrier which faces away from the swimming pool. In the case of a non-solid surface, grass or pebbles, the distance should be reduced to 2 inches, and 1 inch for removable mesh fences (figures 1 and 10).
3. Where the top of the **pool structure is above grade or surface**, such as an above ground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier should be 4 inches (figure 9).
4. **Openings in the barrier** should not allow passage of a 4-inch diameter sphere (figure 11).
5. **Solid barriers**, which do not have openings, such as a masonry or stone wall, should not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints (figure 2).
6. Where the barrier is composed of **horizontal and vertical members** and the distance between the bottom and top horizontal members is less than 45 inches, the horizontal members should be located on the swimming pool side of the fence (figure 3).
7. **Spacing between vertical members** should not exceed 1¾ inches in width. Where there are decorative cutouts, spacing within the cutouts should not exceed 1¾ inches in width (figure 4).
8. **Maximum mesh size for chain link fences** should not exceed 1¼ inch square unless the fence is provided with slats fastened at the top or the bottom which reduce the openings to no more than 1¾ inches (figures 5 and 6).
9. Where the barrier is composed of **diagonal members**, such as a lattice fence, the maximum opening formed by the diagonal members should be no more than 1¾ inches (figure 7).
10. **Access gates** to the pool should be equipped with a locking device. Pedestrian access gates should open outward, away from the pool, and should be self-closing and have a self-latching device (figure 12). Gates other than pedestrian access

- gates should have a self-latching device. Where the release mechanism of the **self-latching device** is located less than 54 inches from the bottom of the gate,
- (a) the release mechanism should be located on the pool side of the gate at least 3 inches below the top of the gate and
 - (b) the gate and barrier should have no opening greater than ½ inch within 18 inches of the release mechanism (figure 13).
11. Where a **wall of a dwelling** serves as part of the barrier, one of the following should apply:
- (a) **All doors with direct access to the pool** through that wall should be equipped with an **alarm** which produces an audible warning when the door and its screen, if present, are opened. Alarms should meet the requirements of *UL 2017 General-Purpose Signaling Devices and Systems, Section 77*. For more details on alarms, see page 13.
 - (b) The pool should be equipped with a **power safety cover** which complies with ASTM F1346-91 listed below.
 - (c) Other means of protection, such as **self-closing doors with self-latching devices**, are acceptable so long as the degree of protection afforded is not less than the protection afforded by (a) or (b) described above.
12. Where an **above ground pool structure is used as a barrier** or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps (figure 8a), then
- (a) **the ladder** to the pool or steps should be capable of being secured, locked or removed to prevent access (figure 8b), or
 - (b) **the ladder or steps should be surrounded by a barrier** (figure 8c). When the ladder or steps are secured, locked, or removed, any opening created should not allow the passage of a 4 inch diameter sphere.

For more information on

Fencing:

- **ASTM F 1908-08** *Standard Guide for Fences for Residential Outdoor Swimming Pools, Hot Tubs, and Spas*: <http://www.astm.org/Standards/F1908.htm>
- **ASTM F 2286-05** *Standard Design and Performance Specifications for Removable Mesh Fencing for Swimming Pools, Hot Tubs, and Spas*: <http://www.astm.org/Standards/F2286.htm>

Covers:

- **ASTM F 1346-91** *Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs*: <http://www.astm.org/Standards/F1346.htm>

Note: ASTM Standards are available for a fee. You may want to contact a pool contractor.

And:

- **ASTM Standards**, contact ASTM online at: <http://www.astm.org/CONTACT/index.html>
- **UL** (Underwriters Laboratories) Relevant Pool and Spa Standards <http://www.ul.com/global/eng/pages/>, look for Life Safety and Security Product



CPSC's **Pool Safely: Simple Steps Save Lives campaign** provides advice and tips on drowning and entrapment prevention. Installing barriers is just one of the *Pool Safely* Simple Steps for keeping children safe around all pools and spas. Here are others:

Rule # 1: Never leave a child unattended around a pool, spa, bath tub, or any body of water.

At pools, spas, and other recreational waters:

- Teach children basic water safety skills.
- Learn how to swim and ensure your children know how to swim as well.
- Avoid entrapment by keeping children away from pool drains, pipes, and other openings.
- Have a phone close by at all times when visiting a pool or spa.
- If a child is missing, look for them in the pool or spa first, including neighbors' pools or spas.
- Share safety instructions with family, friends, babysitters, and neighbors.

If you have a pool:

- Install a 4-foot fence around the perimeter of the pool and spa, including portable pools.
- Use self-closing and self-latching gates; ask neighbors to do the same if they have pools or spas.
- If your house serves as the fourth side of a fence around a pool, install and use a door or pool alarm and/or a pool or spa cover.
- Maintain pool and spa covers in good working order.
- Ensure any pool or spa you use has anti-entrapment safety drain covers; ask your pool service representative if you do not know.*
- Have life saving equipment such as life rings, floats or a reaching pole available and easily accessible.

**The Virginia Graeme Baker Pool & Spa Safety Act, a federal law, requires all public pools and spas to have anti-entrapment drain covers and other devices, where needed. Residential pools are not required to install these but it is recommended that they do so.*

Visit **www.PoolSafely.gov** for more information. See CPSC's latest submersion reports: *Submersions Related to Non-pool and Non-spa Products, 2012* and *Pool and Spa Submersion Report, 2012*.

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