



# Standard Guide for Fences for Commercial and Public Outdoor Water Spray/ Play Areas<sup>1</sup>

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## 1. Scope

1.1 This guide provides the recommended minimum requirements for various types of fences for commercial and public outdoor water spray/play areas.

1.2 This guide provides for the safety of occupants in water spray/play areas or zones as it pertains to vehicular intrusion as well as other participant intrusion, and for children containment or entry/exit.

1.3 This guide does not choose the product components for the fence system, the choice of which should be made by the operators of the water spray/play area space and their specification writers or drafters based upon their determination of the merits of the products that could be used.

1.4 The values stated in inch-pound units are to be regarded as the standard. The SI values stated in parentheses are provided for information purposes only.

1.5 *This guide does not purport to address the aspect of safety within a water spray/play area or zone. It is the responsibility of the user of this guide to establish appropriate safety practices as related to the water spray/play area and determine the applicability of regulatory requirements prior to use.*

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

[A392](#) Specification for Zinc-Coated Steel Chain-Link Fence Fabric

[A491](#) Specification for Aluminum-Coated Steel Chain-Link Fence Fabric

[F537](#) Specification for Design, Fabrication, and Installation of Fences Constructed of Wood and Related Materials

[F552](#) Terminology Relating to Chain Link Fencing

<sup>1</sup> This guide is under the jurisdiction of ASTM Committee F14 on Fences and is the direct responsibility of Subcommittee F14.10 on Specific Applications.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[F668](#) Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric

[F900](#) Specification for Industrial and Commercial Steel Swing Gates

[F964](#) Specification for Rigid Poly (Vinyl Chloride) (PVC) Exterior Profiles Used for Fencing and Railing

[F1043](#) Specification for Strength and Protective Coatings on Steel Industrial Fence Framework

[F1083](#) Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

[F1345](#) Specification for Zinc-5 % Aluminum-Mischmetal Alloy-Coated Steel Chain-Link Fence Fabric

[F2049](#) Safety Performance Specification for Fences/Barriers for Public, Commercial, and Multi-Family Residential Use Outdoor Play Areas

[F2408](#) Specification for Ornamental Fences Employing Galvanized Steel Tubular Pickets

[F2453/F2453M](#) Specification for Welded Wire Mesh Fence Fabric (Metallic-Coated or Polymer Coated) for Meshes of 6 in.<sup>2</sup> [3871 mm<sup>2</sup>] or Less, in Panels or Rolls, with Uniform Meshes

[F2589](#) Specification for Ornamental Fences Employing Steel Tubular Pickets

### 2.2 NFPA Document:<sup>3</sup>

National Electrical Code, NFPA 70-1996 or current edition.

### 2.3 ANSI/IAF Documents related to water containments<sup>4</sup>

## 3. Terminology

3.1 See Terminology [F552](#) for definitions of terms relating to chain-link fencing.

### 3.2 Definitions of Terms Specific to This Standard:

3.2.1 *fence, n*—a type of barrier, which surrounds and obstructs access to the water area.

3.2.2 *grade, n*—the finished elevation at any specified point of the ground or pavement outside the water area, examples, chain link, wood, PVC, ornamental, welded wire.

<sup>3</sup> Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

<sup>4</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

3.2.3 *outdoor, adj*—located outside of a completely enclosed building or other structure.

3.2.4 *water spray/play area or zone, n*— a space for water activities that can be controlled by the user or participant with water that is sprayed, hosed, dumped from buckets, falls from overflow rims or other form of water sprays or that the user engages in without a control and that the egress or ingress should be contained or protected.

#### 4. Summary of Guide

4.1 This guide is based, in part, upon the premise that all water areas are a potential source in which drowning, near drowning and other injuries can occur. Such other man-made and natural water sources are protected by other fence standards; and that dry play areas are also protected by a fence standard for the safety of the users within the area or zone and outside of the area or zone that have intrusions, interferences, conflicts, no containment or other situations, which can cause life threatening or debilitating conditions.

#### 5. Significance and Use

5.1 This guide sets forth minimum standard requirements for use in local codes and ordinances relating to commercial and public water spray/play areas.

5.2 This guide does not have the effect of law, nor is it intended to supersede local codes and ordinances of a more restrictive nature.

5.3 This guide provides certain recommendations to assist those who intend to provide protection against injuries or fatalities associated with any possible vehicle passage into, or pedestrian passage to or from a water spray/play area environment by children. This would include, but not be limited to, state and local governments, model code organizations, building code groups, and consumers. It is understood that the format will vary depending upon the specific use and local conditions.

#### 6. Requirements

6.1 *Height*—The top of the interior fence shall be a minimum of 48 in. (1219 mm) above grade measured on the side of the fence that faces away from the water spray/play area. If the fence is mounted on top of a wall or berm, the top of the fence shall be a minimum of 36 in. (914 mm) above the top of the wall or berm, provided the top of the fence is a minimum of 48 in. (1219 mm) above grade. (See 3.2.2 for definition of “grade” specific to this guide). The top of the exterior perimeter fence shall be a minimum of 72 in. (1829 mm) from grade or wall.

6.2 *Visibility/Accessibility*—The fence shall be so designed and constructed that 50 % visibility and accessibility for emergencies from a designated supervising area outside the water spray/play area to inside the water spray/play area.

6.3 *Continuous Barriers*—That prevent vehicle intrusion into such areas or zones that are in proximity to highways, streets and parking lots should supplement fences and shall conform to F2049.

6.4 *Ground Clearance*—The maximum vertical clearance between grade and the bottom of the fence shall be 2 in. (51 mm) measured on the sides of the fence that faces away from the water spray/play area. Where the water spray/play area is above grade, the fence may be at ground level, or mounted on top of the peripheral berm or wall. Where the fence is mounted on top of the wall or berm, the space between the grade of the water spray/play area and the bottom of the fence shall be no greater than 2 in. (51 mm) in any direction.

6.5 *Chain-link Fences*—Mesh for exterior perimeter fence shall be 2 in. (50 mm) 9 gauge, interior fence mesh shall be 1¼ in. (32 mm) 11 gauge. Chain link fabric shall comply with Specifications A392, A491, F668, or F1345 having knuckle/knuckle selvage.

6.6 *Welded Wire Mesh (in accordance with F2453/F2453M)*—Exterior fencing mesh shall have maximum opening 2 in. by 2 in. (50 mm by 50 mm) minimum 9-gauge wire. Interior mesh shall have maximum spacing of 1½ in. by 1½ in. (38 mm by 38 mm), minimum 11 gauge wire.

6.7 *Decorative Fences*—Rigid PVC profile fence shall comply with Specification F964 and wood fence shall comply with Specification F537. Where the fence is composed of diagonal members, such as in a lattice fence, any opening created by the diagonal members located less than 48 in. (1219 mm) above grade shall be a maximum of 1¾ in. (44 mm) measured in its largest direction to prevent climbing. Fences greater than 48 in. (1219 mm) shall have a maximum opening of 2.9 in. (74 mm).

6.8 *Diagonal bracing members* extending from one corner to the opposite corner creating a ladder effect on all styles of fences and gates are not permitted where spacing of vertical members in any area between posts exceeds 1¾ in. (44 mm) to prevent climbing.

6.9 *Ornamental and Picket Fences*—Ornamental steel fence shall comply with Specification F2408 or Specification F2589, rigid PVC profile fence shall comply to Specification F964, and wood fence shall comply to Specification F537. The spacing between pickets shall not be greater than 4 in. (101 mm).

6.10 *Framework and Fittings*—The strength of the fence and its framework shall be structurally designed to provide the desired security, safety and strength to withstand area wind load forces. Chain link framework shall comply with Specification F1043, Table 3 Heavy Industrial Framework or Specification F1083.

##### 6.11 Access Gates:

6.11.1 Double leaf access gates shall comply with applicable ASTM specifications, the requirements of 6.1 through 6.6, and shall be equipped with a padlock or other key-operated locking device that is always locked when the gate is not in use. Chain link swing gates shall comply with Specification F900.

6.11.2 Single leaf access gates shall comply with applicable ASTM specifications, open outward away from the pool, shall be self-closing, and shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 in. (1372 mm) above grade, the release mechanism

shall be located on the spray/play side of the gate. Chain link swing gates shall comply with Specification **F900**.

6.12 *Building*—The fence shall completely surround the water spray/play area structure, if practical. Where a building or dwelling or portion thereof must be utilized as part of the pool enclosure and if the exterior wall or walls of that portion of the building contains doors, windows, or other openings, it shall comply with the following provisions:

6.12.1 *Doors*—Doors in the wall of a building or dwelling, which allow direct access through the wall to the water spray/play area shall be provided with one of the following:

6.12.1.1 A self-latching device on a self-closing door that is either:

(1) At least 54 in. (1372 mm) above floor level, or

(2) At any convenient height if the device uses a key, electronic opener, or integral combination lock, so long as it does not negate the function of the door.

6.12.2 *Windows*—Windows in the wall of a building or dwelling, which allow direct access through the wall to the water spray/play area and are located 48 in. (1219 mm) or higher above floor level, and where there is no foothold in the building or dwelling wall, shall be exempt and considered equivalent protection to the fence. Windows in the wall of a building or dwelling which allow direct access through the wall to the water spray/play area and where the lowest opening is at a height of less than 48 in. (102 mm) above floor level, shall comply with one of the following requirements:

6.12.2.1 Window guards or other means of equal protection shall limit access such that there are no openings exceeding 4 in. (102 mm); or

6.12.2.2 Windows shall be fixed in such a way that they will not open sufficiently far to create a gap exceeding 4 in. (102 mm); or

6.12.2.3 The lowest opening panel of a window shall be located not less than 48 in. (1219 mm) above the floor and

there shall be no footholds wider than 04. in. (10 mm) on the internal wall down to 42 in. (1067 mm) below the lowest opening panel.

6.13 *Grounding*—When required shall be ground in compliance with the requirements of local utilities and electrical codes.

## 7. Prohibited Location

7.1 Fences shall be located as to prohibit the use of permanent structures, equipment, landscaping or similar objects to aid in climbing the fence.

7.2 *Clear Zone*—There shall be a clear zone of at least 72 in. between the water spray/play area fence and any permanent structures, landscaping or equipment such as pumps, filters, heaters, etc., outside of area which can be used as an aid to climb the fence.

## 8. Maintenance and Inspection

8.1 It is the responsibility of the owner/operator, to maintain the integrity of the fence and to regularly inspect the gates, doors, etc., for proper closing and latching operation for correct operation.

8.2 It is the responsibility of the owner/operator to keep the area within and outside the fence free of toys, furniture, or other objects, which could be moved by a child and used to climb the fence.

8.3 It is the responsibility of the owner/operator to maintain proper Warning Signage and to establish and post rules for the use of the area contained by the fence.

## 9. Keywords

9.1 fence; fences; pools; swimming pools; water play devices; water sprays

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