

## Permit Procedure for Pool, Spa or Hot Tub Projects

**I.** The following information, where applicable, is required to be submitted when applying for a Building Permit for a Pool, Spa or Hot Tub:

- The permit application filled out in its entirety
- A certified copy of the property survey
- Specifications on grading (if more than 25 cubic yards)
- Storm water management plan if adding more than 400sqft of impervious surface (i.e. concrete skirting)
- Specifications on the pool, Spa or Hot Tub (size, shape, depth, cover etc.)
- Specifications on barriers and alarms to be installed
- Basement depth of the existing house which lies below grade
- Certificate of Insurance, Workers Comp. or Affidavit of exemption

**Ia.** A permit cannot be issued without 1<sup>st</sup> receiving storm water management approval if required

**Ib.** All swimming pools, spas or hot tubs shall comply with the 2015 International Swimming Pool and Spa Code (ISPSC)

**II.** The permit holder is required to schedule the following inspections, where applicable:

- Completion of the installation, electrical and any grading

**IIa.** All inspection requests shall be made 24 hrs. prior to the required inspection by calling the Department of Building Inspections between the hours of 8:30am – 5:00pm.

## CHAPTER 3

# GENERAL COMPLIANCE

### SECTION 301 GENERAL

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

**301.1.1 Application of Chapters 4 through 10.** Where differences occur between the provisions of this chapter and the provisions of Chapters 4 through 10, the provisions of Chapters 4 through 10 shall apply.

### SECTION 302 ELECTRICAL, PLUMBING, MECHANICAL AND FUEL GAS REQUIREMENTS

**302.1 Electrical.** Electrical requirements for aquatic facilities shall be in accordance with NFPA 70 or the *International Residential Code*, as applicable in accordance with Section 102.7.1.

**Exception:** Internal wiring for portable *residential* spas and portable *residential* exercise spas.

**302.2 Water service and drainage.** Piping and fittings used for water service, makeup and drainage piping for pools and spas shall comply with the *International Plumbing Code*. Fittings shall be *approved* for installation with the piping installed.

**302.3 Pipe, fittings and components.** Pipe, fittings and components shall be *listed* and *labeled* in accordance with NSF 50 or NSF 14. Plastic jets, fittings, and outlets used in public spas shall be *listed* and *labeled* in accordance with NSF 50.

#### Exceptions:

1. Portable *residential* spas and portable *residential* exercise spas *listed* and *labeled* in accordance with UL 1563 or CSA C22.2 No. 218.1.
2. *Onground storable pools* supplied by the pool manufacturer as a kit that includes all pipe, fittings and components.

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

**302.5 Backflow protection.** Water supplies for pools and spas shall be protected against backflow in accordance with the *International Plumbing Code* or the *International Residential Code*, as applicable in accordance with Section 102.7.1.

**302.6 Waste-water discharge.** Where waste water from pools and spas, backwash from filters and water from deck drains discharge to the building drainage system, such installation shall be in accordance with the *International Plumbing*

*Code* or the *International Residential Code*, as applicable in accordance with Section 102.7.1.

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

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

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

### SECTION 303 ENERGY

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

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

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

#### Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- or waste-heat recovery pool heating systems.

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

**Exception:** Where more than 70 percent of the energy for heating, computed over an operating season, is from site-recovered energy such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.

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

**303.3 Residential pools and permanent residential spas.** The energy consumption of *residential* swimming pools and

permanent *residential* spas shall be controlled in accordance with the requirements of APSP 15.

### SECTION 304 FLOOD HAZARD AREAS

**304.1 General.** The provisions of Section 304 shall control the design and construction of pools and spas installed in *flood hazard areas*.

**[BS] 304.2 Determination of impacts based on location.** Pools and spas located in *flood hazard areas* indicated within the *International Building Code* or the *International Residential Code* shall comply with Section 304.2.1 or 304.2.2.

**Exception:** Pools and spas located in riverine *flood hazard areas* that are outside of designated floodways and pools and spas located in *flood hazard areas* where the source of flooding is tides, storm surges or coastal storms.

**[BS] 304.2.1 Pools and spas located in designated floodways.** Where pools and spas are located in designated floodways, documentation shall be submitted to the code official that demonstrates that the construction of the pools and spas will not increase the design flood elevation at any point within the jurisdiction.

**[BS] 304.2.2 Pools and spas located where floodways have not been designated.** Where pools and spas are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool or spa and any associated grading and filling, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction.

**[BS] 304.3 Pools and spas in coastal high-hazard areas.** Pools and spas installed in coastal high-hazard areas shall be designed and constructed in accordance with ASCE 24.

**[BS] 304.4 Protection of equipment.** Equipment shall be elevated to or above the design flood elevation or be anchored to prevent flotation and protected to prevent water from entering or accumulating within the components during conditions of flooding.

**304.5 GFCI protection.** Electrical equipment installed below the design flood elevation shall be supplied by branch circuits that have ground-fault circuit interrupter protection for personnel.

### SECTION 305 BARRIER REQUIREMENTS

**305.1 General.** The provisions of this section shall apply to the design of barriers for pools and spas. These design controls are intended to provide protection against the potential drowning and near drowning by restricting access to such pools or spas. These requirements provide an integrated level of protection against potential drowning through the use of physical barriers and warning devices.

**Exceptions:**

1. Spas and hot tubs with a lockable *safety cover* that complies with ASTM F 1346.

2. Swimming pools with a powered *safety cover* that complies with ASTM F 1346.

**305.2 Outdoor swimming pools and spas.** Outdoor pools and spas and indoor swimming pools shall be surrounded by a barrier that complies with Sections 305.2.1 through 305.7.

**305.2.1 Barrier height and clearances.** Barrier heights and clearances shall be in accordance with all of the following:

1. The top of the barrier shall be not less than 48 inches (1219 mm) above grade where measured on the side of the barrier that faces away from the pool or spa. Such height shall exist around the entire perimeter of the barrier and for a distance of 3 feet (914 mm) measured horizontally from the outside of the required barrier.
2. The vertical clearance between grade and the bottom of the barrier shall not exceed 2 inches (51 mm) for grade surfaces that are not solid, such as grass or gravel, where measured on the side of the barrier that faces away from the pool or spa.
3. The vertical clearance between a surface below the barrier to a solid surface, such as concrete, and the bottom of the required barrier shall not exceed 4 inches (102 mm) where measured on the side of the required barrier that faces away from the pool or spa.
4. Where the top of the pool or spa structure is above grade, the barrier shall be installed on grade or shall be mounted on top of the pool or spa structure. Where the barrier is mounted on the top of the pool or spa, the vertical clearance between the top of the pool or spa and the bottom of the barrier shall not exceed 4 inches (102 mm).

**305.2.2 Openings.** Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.

**305.2.3 Solid barrier surfaces.** Solid barriers that do not have openings shall not contain indentations or protrusions that form handholds and footholds, except for normal construction tolerances and tooled masonry joints.

**305.2.4 Mesh fence as a barrier.** Mesh fences, other than chain link fences in accordance with Section 305.2.7, shall be installed in accordance with the manufacturer's instructions and shall comply with the following:

1. The bottom of the mesh fence shall be not more than 1 inch (25 mm) above the deck or installed surface or grade.
2. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not permit the fence to be lifted more than 4 inches (102 mm) from grade or decking.
3. The fence shall be designed and constructed so that it does not allow passage of a 4-inch (102 mm) sphere under any mesh panel. The maximum vertical clearance from the bottom of the mesh fence and the solid surface shall not be more than 4 inches (102 mm) from grade or decking.

4. An attachment device shall attach each barrier section at a height not lower than 45 inches (1143 mm) above grade. Common attachment devices 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 such as a safety gate hook.
5. Where a hinged gate is used with a mesh fence, the gate shall comply with Section 305.3.
6. Patio deck sleeves such as vertical post receptacles that are placed inside the patio surface shall be of a nonconductive material.
7. Mesh fences shall not be installed on top of onground *residential* pools.

**305.2.5 Closely spaced horizontal members.** 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 pool or spa side of the fence. Spacing between vertical members shall not exceed  $1\frac{3}{4}$  inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed  $1\frac{3}{4}$  inches (44 mm) in width.

**305.2.6 Widely spaced horizontal members.** 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, the interior width of the cutouts shall not exceed  $1\frac{3}{4}$  inches (44 mm).

**305.2.7 Chain link dimensions.** The maximum opening formed by a chain link fence shall be not more than  $1\frac{3}{4}$  inches (44 mm). Where the fence is provided with slats fastened at the top and bottom which reduce the openings, such openings shall be not more than  $1\frac{3}{4}$  inches (44 mm).

**305.2.8 Diagonal members.** Where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be not more than  $1\frac{3}{4}$  inches (44 mm). The angle of diagonal members shall be not greater than 45 degrees (0.79 rad) from vertical.

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

**305.2.10 Poolside barrier setbacks.** The pool or spa side of the required barrier shall be not less than 20 inches (508 mm) from the water's edge.

**305.3 Gates.** Access gates shall comply with the requirements of Sections 305.3.1 through 305.3.3 and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool or spa, shall be self-closing and shall have a self-latching device.

**305.3.1 Utility or service gates.** Gates not intended for pedestrian use, such as utility or service gates, shall remain locked when not in use.

**305.3.2 Double or multiple gates.** Double gates or multiple gates shall have at least one leaf secured in place and the adjacent leaf shall be secured with a self-latching device. The gate and barrier shall not have openings larger than  $\frac{1}{2}$  inch (12.7 mm) within 18 inches (457 mm) of the latch release mechanism. The self-latching device shall comply with the requirements of Section 305.3.3.

**305.3.3 Latches.** Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from grade, the release mechanism shall be located on the pool or spa side of the gate not less than 3 inches (76 mm) below the top of the gate, and the gate and barrier shall not have openings greater than  $\frac{1}{2}$  inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

**305.4 Structure wall as a barrier.** Where a wall of a dwelling or structure serves as part of the barrier and where doors or windows provide direct access to the pool or spa through that wall, one of the following shall be required:

1. Operable windows having a sill height of less than 48 inches (1219 mm) above the indoor finished floor and doors shall have an alarm that produces an audible warning when the window, door or their screens are opened. The alarm shall be *listed* and *labeled* as a water hazard entrance alarm in accordance with UL 2017. In dwellings or structures not required to be Accessible units, Type A units or Type B units, the operable parts of the alarm deactivation switches shall be located 54 inches (1372 mm) or more above the finished floor. In dwellings or structures required to be Accessible units, Type A units or Type B units, the operable parts of the alarm deactivation switches shall be located not greater than 54 inches (1372 mm) and not less than 48 inches (1219 mm) above the finished floor.
2. A *safety cover* that is *listed* and *labeled* in accordance with ASTM F 1346 is installed for the pools and spas.
3. An *approved* means of protection, such as self-closing doors with self-latching devices, is provided. Such means of protection shall provide a degree of protection that is not less than the protection afforded by Item 1 or 2.

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

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

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2. Where a barrier is mounted on top of the pool wall, the top of the barrier is not less than 48 inches (1219 mm) above grade for the entire perimeter of the pool, and the wall and the barrier on top of the wall comply with the requirements of Section 305.2.
3. Ladders or steps used as means of access to the pool are capable of being secured, locked or removed to prevent access except where the ladder or steps are surrounded by a barrier that meets the requirements of Section 305.
4. Openings created by the securing, locking or removal of ladders and steps do not allow the passage of a 4-inch (102 mm) diameter sphere.
5. Barriers that are mounted on top of onground *residential* pool walls are installed in accordance with the pool manufacturer's instructions.

**305.6 Natural barriers.** In the case where the pool or spa area abuts the edge of a lake or other natural body of water, public access is not permitted or allowed along the shoreline, and required barriers extend to and beyond the water's edge not less than 18 inches (457 mm), a barrier is not required between the natural body of water shoreline and the pool or spa.

**305.7 Natural topography.** Natural topography that prevents direct access to the pool or spa area shall include but not be limited to mountains and natural rock formations. A natural barrier approved by the governing body shall be acceptable provided that the degree of protection is not less than the protection afforded by the requirements of Sections 305.2 through 305.5.

## SECTION 306 DECKS

**306.1 General.** Decks shall be designed and installed in accordance with the *International Residential Code* or the *International Building Code*, as applicable in accordance with Section 102.7.1, except as provided in this section.

**306.2 Slip resistant.** Decks, ramps, coping, and similar step surfaces shall be slip resistant and cleanable. Special features in or on decks such as markers, brand insignias, and similar materials shall be slip resistant.

**306.3 Step risers and treads.** Step risers for decks of public pools and spas shall be uniform and have a height not less

than  $3\frac{3}{4}$  inches (95 mm) and not greater than  $7\frac{1}{2}$  inches (191 mm). The tread distance from front to back shall be not less than 11 inches (279 mm). Step risers for decks of *residential* pools and spas shall be uniform and shall have a height not exceeding  $7\frac{1}{2}$  inches (191 mm). The tread distance from front to back shall be not less than 10 inches (254 mm).

**306.4 Deck steps handrail required.** Public pool and spa deck steps having three or more risers shall be provided with a handrail.

**306.5 Slope.** The minimum slope of decks shall be in accordance with Table 306.5 except where an alternative drainage method is provided that prevents the accumulation or pooling of water. The slope for decks, other than wood decks, shall be not greater than  $\frac{1}{2}$  inch per foot (1 mm per 24 mm) except for ramps. The slope for wood and wood/plastic composite decks shall be not greater than  $\frac{1}{4}$  inch per 1 foot (1 mm per 48 mm). Decks shall be sloped so that standing water will not be deeper than  $\frac{1}{8}$  inch (3.2 mm), 20 minutes after the cessation of the addition of water to the deck.

**306.6 Gaps.** Gaps shall be provided between deck boards in wood and wood/plastic composite decks. Gaps shall be consistent with *approved* engineering methods with respect to the type of wood used and shall not cause a tripping hazard.

**306.6.1 Maximum gap.** The open gap between pool decks and adjoining decks or walkways, including joint material, shall be not greater than  $\frac{3}{4}$  inch (19.1 mm). The difference in vertical elevation between the pool deck and the adjoining sidewalk shall be not greater than  $\frac{1}{4}$  inch (6.4 mm).

**306.7 Concrete joints.** Isolation joints that occur where the pool coping meets the concrete deck shall be water tight.

**306.7.1 Joints at coping.** Joints that occur where the pool coping meets the concrete deck shall be installed to protect the coping and its mortar bed from damage as a result of the anticipated movement of adjoining deck.

**306.7.2 Crack control.** Joints in a deck shall be provided to minimize visible cracks outside of the control joints caused by imposed stresses or movement of the slab.

**306.7.3 Movement control.** Areas where decks join existing concrete work shall be provided with a joint to protect the pool from damage caused by relative movement.

**306.8 Deck edges.** The edges of decks shall be radiused, tapered, or otherwise designed to eliminate sharp corners.

TABLE 306.5  
MINIMUM DRAINAGE SLOPES FOR DECK SURFACES

SURFACE	MINIMUM DRAINAGE SLOPE (INCH PER FOOT)
Carpet	$\frac{1}{2}$
Exposed aggregate	$\frac{1}{4}$
Textured, hand-finished concrete	$\frac{1}{8}$
Travertine/brick-set pavers, public pools or spas	$\frac{3}{8}$
Travertine/brick-set pavers, residential pools or spas	$\frac{1}{8}$
Wood	$\frac{1}{8}$
Wood/plastic composite	$\frac{1}{8}$

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**306.9 Valves under decks.** Valves installed in or under decks shall be accessible for operation, service, and maintenance. Where access through the deck walking surface is required, an access cover shall be provided for the opening in the deck. Such access covers shall be slip resistant and secured.

**306.9.1 Hose bibbs.** Hose bibbs shall be provided for rinsing down the entire deck and shall be installed in accordance with the *International Plumbing Code* or *International Residential Code*, as applicable in accordance with Section 102.7.1, and shall be located not more than 150 feet (45 720 mm) apart. Water-powered devices, such as water-powered lifts, shall have a dedicated hose bibb water source.

**Exception:** *Residential* pools and spas shall not be required to have hose bibbs located at 150-foot (45 720 mm) intervals, or have a dedicated hose bibb for water-powered devices.

**SECTION 307  
GENERAL DESIGN**

**307.1 General.** The provisions of this section apply to all pools and spas.

**Exception:** The provisions of Sections 307.3 through 307.6 do not apply to *listed* and *labeled* portable *residential* spas and *listed* and *labeled* portable *residential* exercise spas.

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

**307.3 Materials.** Pools and spas and appurtenances thereto shall be constructed of materials that are nontoxic to humans and the environment; that are generally or commonly regarded to be impervious and enduring; that will withstand the design stresses; and that will provide a watertight structure with a smooth and easily cleanable surface without cracks or joints, excluding structural joints, or that will provide a watertight structure to which a smooth, easily cleaned surface/finish is applied or attached. Material surfaces that come in contact with the user shall be finished, so that they do not constitute a cutting, pinching, puncturing or abrasion hazard under casual contact and intended use.

**307.3.1 Beach pools.** Clean sand or similar material, where used in a beach pool environment, shall be used over an impervious surface. The sand area shall be designed and controlled so that the circulation system, maintenance, safety, sanitation, and operation of the pool are not adversely affected.

**307.3.2 Compatibility.** Assemblies of different materials shall be chemically and mechanically compatible for their intended use and environment.

**307.4 Materials and structural design.** Pools and spas shall conform to one or more of the standards indicated in Table 307.4. The structural design of pools and spas shall be in accordance with the *International Building Code* or the *International Residential Code*, as applicable in accordance with Section 102.7.1 of this code.

**TABLE 307.4  
RESERVOIRS AND SHELLS**

MATERIAL	STANDARD
Fiberglass reinforced plastic	IAPMO Z124.7
Plastic	IAPMO Z124.7
Stainless steel (Types 316, 316L, 304, 304L)	ASTM A 240
Tile	ANSI A108/A118/A136.1
Vinyl	ASTM D 1593

**307.4.1 Installation.** Equipment for pools and spas shall be supported to prevent damage from misalignment and settling and located so as to allow access for inspection, servicing, removal and repair of component parts.

**307.5 Freeze protection.** In climates subject to freezing temperatures, outdoor pool and spa shells and appurtenances, piping, filter systems, pumps and motors, and other components shall be designed and constructed to provide protection from damage from freezing.

**307.6 Surface condition.** The surfaces within public pools and spas intended to provide footing for users shall be slip resistant and shall not cause injury during normal use.

**307.7 Colors and finishes.** The colors, patterns, or finishes of the pool or spa interior shall not obscure objects or surfaces within the pool or spa.

**Exception:** *Residential* pools and spas.

**307.8 Roofs or canopies.** Roofs or canopies over pools and spas shall be in accordance with the *International Building Code* or *International Residential Code*, as applicable in accordance with Section 102.7.1 and shall be constructed so as to prevent water runoff into the pool or spa.

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

**SECTION 308  
DIMENSIONAL DESIGN**

**308.1 Floor slope.** The slope of the floor from the point of the first slope change to the deep area shall not exceed one unit vertical in three units horizontal (33-percent slope).

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

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**308.2 Walls.** Walls shall intersect with the floor at an angle or a transition profile. Where a transitional profile is provided at water depths of 3 feet (914 mm) or less, a transitional radius shall not exceed 6 inches (152 mm) and shall be tangent to the wall and is permitted to be tangent to or intersect the floor.

**Exceptions:**

1. Portable *residential* spas and portable *residential* exercise spas.
2. *Onground storable pools*.

**308.3 Shape.** This code is not intended to regulate the shape of a pool or spa other than to take into account the effect that a given shape will have on the safety of the occupants and to maintain the minimum required level of circulation to ensure sanitation.

**308.4 Waterline.** The *design waterline* shall have a maximum construction tolerance at the time of completion of the work of plus or minus 1/4 inch (6.4 mm) for pools and spas with adjustable weir surface skimming systems, and plus or minus 1/8 inch (3.2 mm) for pools and spas with nonadjustable surface skimming systems.

**SECTION 309  
EQUIPMENT**

**309.1 Electrically operated equipment.** Electrically operated equipment shall be *listed* and *labeled* in accordance with applicable product standards.

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

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

**SECTION 310  
SUCTION ENTRAPMENT AVOIDANCE**

**310.1 General.** Suction entrapment avoidance for pools and spas shall be provided in accordance with APSP 7.

**Exceptions:**

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

2. Suction entrapment avoidance for wading pools shall be provided in accordance with Section 405.

**SECTION 311  
CIRCULATION SYSTEMS**

**311.1 General.** The provisions of this section shall apply to circulation systems for pools and spas.

**Exceptions:**

1. Portable *residential* spas and portable *residential* exercise spas.
2. *Onground storable pools* supplied by the pool manufacturer as a kit that includes circulation system equipment that is in accordance with Section 704.

**311.2 System design.** A circulation system consisting of pumps, piping, return inlets and outlets, filters, and other necessary equipment shall be provided for the complete circulation of water. Wading pools and spas shall have separate dedicated filtering systems.

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

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

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

**311.2.3 Equipment anchorage.** Pool and spa equipment and related piping shall be designed and installed in accordance with the manufacturer's instructions.

**311.3 Water velocity.** The water velocity in return lines shall not exceed 8 feet (2.4 m) per second. The water velocity in suction piping shall be as required by Section 310.

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

**TABLE 311.4  
CIRCULATION SYSTEM PIPE MATERIAL STANDARD**

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

**311.4.1 Fittings.** Fittings used in circulation systems shall be *listed* and *labeled* as complying with one of the standards in Table 311.4.1.

**Exceptions:**

1. Suction outlet fitting assemblies and manufacturer-provided components certified in accordance with APSP 16.
2. Skimmers and manufacturer-provided components.
3. *Gutter* overflow grates and fittings installed above or outside of the overflow point of the pool or spa.

**311.4.2 Joints.** Joints shall be made in accordance with manufacturer’s instructions.

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

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

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

**311.6 Pressure or vacuum gauge.** Gauges shall be provided on the circulation system for public pools. Gauges shall be provided with ready access.

1. A pressure gauge shall be located downstream of the pump and between the pump and filter.
2. A vacuum gauge shall be located between the pump and filter and upstream of the pump.

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

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

**311.9 Hydrostatic pressure test.** Circulation system piping, other than that integrally included in the manufacture of the

pool or spa, shall be subjected to a hydrostatic pressure test of 25 pounds per square inch (psi) (172.4 kPa). This pressure shall be held for not less than 15 minutes.

**SECTION 312  
FILTERS**

**312.1 General.** The provisions of this section apply to filters for pools and spas.

**Exceptions:**

1. Portable *residential* spas and portable *residential* exercise spas.
2. *Onground storable pools* supplied by the pool manufacturer as a kit that includes a filter that is in accordance with Section 704.

**312.2 Design.** Filters shall have a flow rating equal to or greater than the design flow rate of the system. Filters shall be installed in accordance with the manufacturer’s instructions. Filters shall be designed so that filtration surfaces can be inspected and serviced.

**312.3 Internal pressure.** For pressure-type filters, a means shall be provided to allow the release of internal pressure.

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

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

**SECTION 313  
PUMPS AND MOTORS**

**313.1 General.** The provisions of this section apply to pumps and motors for pools and spas.

**Exceptions:**

1. Portable *residential* spas and portable *residential* exercise spas.
2. *Onground storable pools* supplied by the pool manufacturer as a kit that includes a pump and motor that is in accordance with Section 704.

**TABLE 311.4.1  
CIRCULATION SYSTEM FITTINGS**

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe	ASTM D 1527
Chlorinated polyvinyl chloride (CPVC) plastic pipe and tubing	ASTM D 2846; ASTM F 437; ASTM F 438; ASTM F 439; CSA B137.6
Copper or copper-alloy tubing	ASME B 16.15
Polyvinyl chloride (PVC) plastic pipe	ASTM D 2464; ASTM D 2466; ASTM D 2467; CSA B137.2; CSA B137.3
Stainless steel pipe, Types 304, 304L, 316, 316L	ASTM A 182; ASTM A 403



## GENERAL COMPLIANCE

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

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

**313.4 Location.** Pumps and motors shall be accessible for inspection and service in accordance with the manufacturer's specifications.

**313.5 Safety.** The design, construction, and installation of pumps and component parts shall be in accordance with the manufacturer's specifications.

**313.6 Isolation valves.** Shutoff valves shall be installed on the suction and discharge sides of pumps that are located below the waterline. Such valves shall be provided with access.

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

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

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

### SECTION 314 RETURN AND SUCTION FITTINGS

**314.1 General.** The provisions of this section apply to return and suction fittings for pools and spas

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

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

**314.3 Flow distribution.** The suction outlet fitting assemblies, where installed, and the skimming systems shall each be designed to accommodate 100 percent of the circulation turnover rate.

**314.3.1 Multiple systems.** Where multiple systems are used in a single pool to meet this requirement, each sub-system shall proportionately be designed such that the maximum design flow rates cannot be exceeded during normal operation.

**314.4 Return inlets.** One return inlet shall be provided for every 300 square feet (27.9 m<sup>2</sup>) of pool surface area, or fraction thereof.

**Exception:** *Onground storable pools*.

**314.4.1 Design.** Return and suction fittings for the circulation system shall be designed so as not to constitute a hazard to the bather.

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

### SECTION 315 SKIMMERS

**315.1 General.** The provisions of this section apply to skimmers for pools and spas.

#### Exceptions:

1. Portable residential spas and portable residential exercise spas.
2. *Onground storable pools* supplied by the pool manufacturer as a kit that includes a skimming system that is in accordance with Section 704.

**315.2 Required.** A surface skimming system shall be provided for public pools and spas. Surface skimming systems shall be *listed* and *labeled* in accordance with NSF 50. Either a surface skimming system or perimeter overflow system shall be provided for permanent inground residential pools and permanent residential spas. Where installed, surface skimming systems shall be designed and constructed to create a skimming action on the pool water surface when the water level in the pool is within operational parameters.

#### Exceptions:

1. Class D public pools designed in accordance with Chapter 6.
2. Skimmers that are an integral part of a spa that has been *listed* and *labeled* in accordance with UL1563 shall not be required to be *listed* and *labeled* in accordance with NSF 50.

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

**315.3 Skimmer sizing.** Where automatic surface skimmers are used as the sole overflow system, not less than one surface skimmer shall be provided for the square foot (square meter) areas, or fractions thereof, indicated in Table 315.3. Skimmers shall be located to maintain effective skimming action.

TABLE 315.3  
SKIMMER SIZING TABLE

POOL OR SPA	AREA PER SKIMMER (SQ. FT)
Public pool	500
Residential pool	800
Spas (all types)	150

For SI: 1 square foot = 0.0929 m<sup>2</sup>.

**315.4 Perimeter coverage.** Where a perimeter-type surface skimming system is used as the sole surface skimming system, the system shall extend around not less than 50 percent of the pool or spa perimeter.

**315.4.1 Surge capacity.** Where perimeter surface skimming systems are used, they shall be connected to a circulation system with a system surge capacity of not less than 1 gallon for each square foot (40.7 liters per square meter) of water surface. The capacity of the perimeter overflow system and related piping is permitted to be considered as a portion of the surge capacity.

**315.5 Equalizers.** Equalizers on skimmers shall be prohibited.

**315.6 Hazard.** Skimming devices shall be designed and installed so as not to create a hazard to the user.

**SECTION 316  
HEATERS**

**316.1 General.** The provisions of this section apply to heaters for pools and spas.

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

**316.2 Listed and labeled.** Heaters shall be *listed* and *labeled* in accordance with the applicable standard listed in Table 316.2.

**316.3 Sizing.** Heaters shall be sized in accordance with the manufacturer’s specifications.

**316.4 Installation.** Heaters shall be installed in accordance with the manufacturer’s specifications and the *International Fuel Gas Code*, *International Mechanical Code*, *International Energy Conservation Code*, NFPA 70 or *International Residential Code*, as applicable in accordance with Section 102.7.1.

**316.4.1 Temperature.** A means shall be provided to monitor water temperature.

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

**316.5 Heater circulation system.** Heater circulation systems shall comply with Sections 316.5.1 and 316.5.2.

**316.5.1 Water flow.** Water flow through the heater bypass piping, back-siphonage protection, and the use of heat sinks shall be in accordance with the heater manufacturer’s specifications.

**316.5.2 Pump delay.** Where required by the manufacturer, heaters shall be installed with an automatic device that will ensure that the pump continues to run after the

heater shuts off for the time period specified by the manufacturer.

**SECTION 317  
AIR BLOWER AND AIR INDUCTION SYSTEM**

**317.1 General.** This section applies to devices and systems that induce or allow air to enter pools and spas either by means of a powered pump or passive design.

**317.2 Backflow prevention.** Air blower systems shall be equipped with backflow protection as specified in UL 1563 or CSA C22.2 No. 218.1.

**317.3 Air intake source.** Air intake sources shall not induce water, dirt or contaminants.

**317.4 Sizing.** Air induction systems shall be sized in accordance with the manufacturer’s specifications.

**317.5 Inspection and service.** Air blowers shall be provided with access for inspection and service.

**SECTION 318  
WATER SUPPLY**

**318.1 Makeup water.** Makeup water to maintain the water level and water used as a vehicle for sanitizers or other chemicals, for pump priming, or for other such additions, shall be from a potable water source.

**318.2 Protection of potable water supply.** Potable water supply systems shall be designed, installed and maintained so as to prevent contamination from nonpotable liquids, solids or gases being introduced into the potable water supply through cross-connections or other piping connections to the system. Means of protection against backflow in the potable water supply shall be provided through an air gap complying with ASME A112.1.2 and the *International Residential Code* or the *International Plumbing Code*, as applicable in accordance with Section 102.7.1.

**318.3 Over-the-rim spouts.** Over-the-rim spouts shall be located under a diving board, adjacent to a ladder, or otherwise shielded so as not to create a hazard. The open end of such spouts shall not have sharp edges and shall not protrude more than 2 inches (51 mm) beyond the edge of the pool. The open end shall be separated from the water by an air gap of not less than 1.5 pipe diameters measured from the pipe outlet to the rim.

**TABLE 316.2  
WATER HEATERS**

DEVICE	STANDARD
Electric water heater	UL 1261, UL 1563 or CSA C22.2 No. 218.1
Gas-fired water heater	ANSI Z21.56/CSA 4.7a
Heat exchanger	NSF 50
Heat pump water heater	UL 1995, AHRI 1160, CSA C22.2 No. 236
Photovoltaic solar water heaters	NSF 50
Thermal radiant solar water heater	NSF 50

### SECTION 319 SANITIZING EQUIPMENT

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

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

### SECTION 320 WASTE WATER DISPOSAL

**320.1 Backwash water or draining water.** Backwash water and draining water shall be discharged to the sanitary or storm sewer, or into an *approved* disposal system on the premise, or shall be disposed of by other means *approved* by the state or local authority. Direct connections shall not be made between the end of the backwash line and the disposal system. Drains shall discharge through an air gap.

**320.2 Water salvage.** Filter backwash water shall not be returned to the vessel except where the backwash water has been filtered to remove particulates, treated to eliminate coli form bacteria and waterborne pathogens, and such return has been *approved* by the state or local authority.

**320.3 Waste post treatment.** Where necessary, filter backwash water and drainage water shall be treated chemically or through the use of settling tanks to eliminate or neutralize chemicals, diatomaceous earth, and contaminants in the water that exceed the limits set by the state or local effluent discharge requirements.

### SECTION 321 LIGHTING

**321.1 General.** The provisions of Sections 321.2 and 321.3 shall apply to lighting for public pools and spas. The provisions of Section 321.4 shall apply to lighting for residential pools and spas.

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

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

**321.2.1 Pool and deck illumination.** Overhead lighting, underwater lighting or both shall be provided to illuminate

the pool and adjacent deck areas. The lighting shall be *listed* and *labeled*. The lighting shall be installed in accordance with NFPA 70.

**321.2.2 Illumination intensity.** For outdoor pools, any combination of overhead and underwater lighting shall provide *maintained illumination* not less than 10 horizontal foot-candles (10 lumens per square foot) [108 lux] at the pool water surface. For indoor pools, any combination of overhead and underwater lighting shall provide *maintained illumination* of not less than 30 horizontal foot-candles (30 lumens per square foot) [323 lux] at the pool water surface. Deck area lighting for both indoor and outdoor pools shall provide *maintained illumination* of not less than 10 horizontal foot-candles (10 lumens per square foot) [108 lux] at the walking surface of the deck.

**321.2.3 Underwater lighting.** Underwater lighting shall provide not less than 8 horizontal foot-candles (8 lumens per square foot) [86 lux] at the pool water surface area, or not less than a total wattage of  $1/2$  watt/ft<sup>2</sup> (5.4 watts/m<sup>2</sup>) of pool water surface for incandescent underwater lighting where the fixtures and lamps are rated in watts.

**Exception:** The requirement of this section shall not apply where overhead lighting provides not less than 15 foot-candles (15 lumens per square foot) [161 lux] of *maintained illumination* at the pool water surface, the overhead lighting provides visibility, without glare, of all areas of the pool, and the requirements of Section 321.2.2 are met or exceeded.

**321.3 Emergency illumination.** Public pools and public pool areas that operate during periods of low illumination shall be provided with emergency lighting that will automatically turn on to permit evacuation of the pool and securing of the area in the event of power failure. Emergency lighting facilities shall be arranged to provide initial illumination that is not less than 0.1 foot-candle (0.1 lumen per square foot) [1 lux] measured at any point on the water surface and at any point on the walking surface of the deck, and not less than an average of 1 foot-candle (1 lumen per square foot) [11 lux]. At the end of the emergency lighting time duration, the illumination level shall be not less than 0.06 foot-candle (0.06 lumen per square foot) [0.65 lux] measured at any point on the water surface and at any point on the walking surface of the deck, and not less than an average of 0.6 foot-candle (0.6 lumen per square foot) [6.46 lux]. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

**321.4 Residential pool and deck illumination.** Where lighting is installed for, and in, *residential* pools and permanent *residential* spas, such lighting shall be installed in accordance with NFPA 70 or the *International Residential Code*, as applicable in accordance with Section 102.7.1.

### SECTION 322 LADDERS AND RECESSED TREADS

**322.1 General.** Ladders and recessed treads shall comply with the provisions of this section and the applicable provisions of Chapters 4 through 10 based on the type of pool or spa.

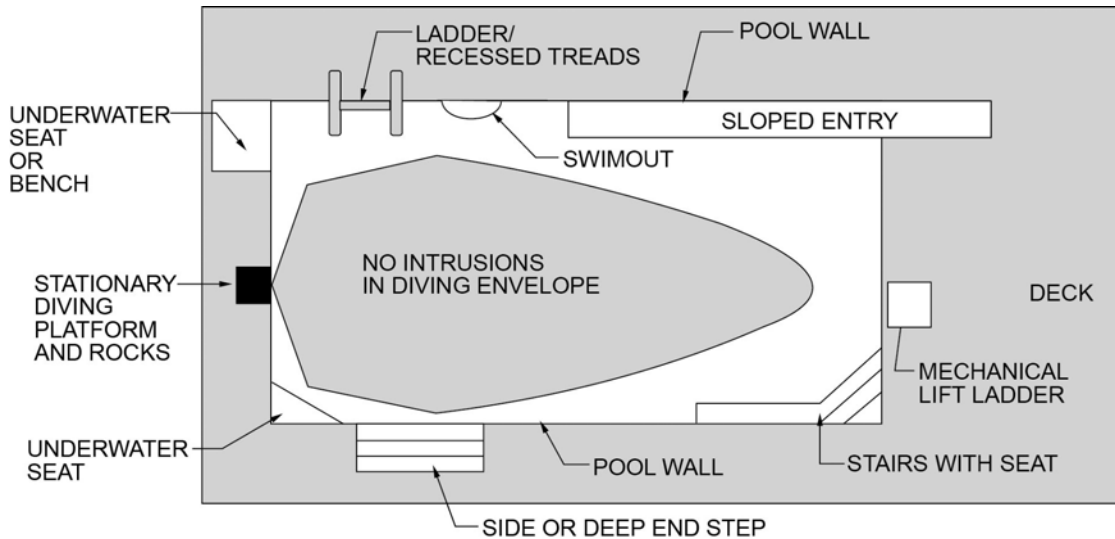


FIGURE 322.2  
MINIMUM WATER DIVING ENVELOPE

**322.2 Outside diving envelope.** Where installed, steps and ladders shall be located outside of the minimum diving water envelope as indicated in Figure 322.2.

**322.3 Ladders.** Ladder treads shall have a uniform horizontal depth of not less than 2 inches (51 mm). There shall be a uniform distance between ladder treads, with a distance of not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The top tread of a ladder shall be located not greater than 12 inches (305 mm) below the top of the deck or coping. Ladder treads shall have slip-resistant surfaces.

**322.3.1 Wall clearance.** There shall be a clearance of not less than 3 inches (76 mm) and not greater than 6 inches (152 mm) between the pool wall and the ladder.

**322.3.2 Handrails and handholds.** Ladders shall be provided with two handholds or two handrails. The clear distance between ladder handrails shall be not less than 17 inches (432 mm) and not greater than 24 inches (610 mm).

**322.4 Recessed treads.** Recessed treads shall have a minimum depth of not less than 5 inches (127 mm) and a width of not less than 12 inches (305 mm). The vertical distance between the pool coping edge, deck, or step surface and the uppermost recessed tread shall be not greater than 12 inches (305 mm). Recessed treads shall have slip-resistant surfaces.

**322.4.1 Vertical spacing.** Recessed treads at the center-line shall have a uniform vertical spacing of not less than 7 inches (178 mm) and not greater than 12 inches (305 mm).

**322.4.2 Drainage.** Recessed treads shall drain into the pool.

**322.4.3 Handrails and grab rails.** Recessed treads shall be provided with a handrail or grab rail on each side of the treads. The clear distance between handrails and grab rails shall be not less than 17 inches (432 mm) and not greater than 24 inches (610 mm).

**SECTION 323  
SAFETY**

**323.1 Handholds required.** Where the depth below the *design waterline* of a pool or spa exceeds 42 inches (1067 mm), handholds along the perimeter shall be provided. Handholds shall be located at the top of deck or coping.

**Exceptions:**

1. Handholds shall not be required where an underwater bench, seat or swimout is installed.
2. Handholds shall not be required for wave action pools and action rivers.

**323.1.1 Height above water.** Handholds shall be located not more than 12 inches (305 mm) above the *design waterline*.

**323.1.2 Handhold type.** Handholds shall be one or more of the following:

1. Top of pool deck or coping.
2. Secured rope.
3. Rail.
4. Rock.
5. Ledge.
6. Ladder.
7. Stair step.
8. Any design that allows holding on with one hand while at the side of the pool.

**323.1.3 Handhold spacing.** Handholds shall be horizontally spaced not greater than 4 feet (1219 mm) apart.

**323.2 Handrails.** Where handrails are installed, they shall conform to this section.

## GENERAL COMPLIANCE

**323.2.1 Height.** The top of the gripping surface of handrails for public pools and public spas shall be 34 inches (864 mm) to 38 inches (965 mm) above the ramp or step surface as measured at the nosing of the step or finished surface of the slope. The top of the gripping surface of handrails for *residential* pools and *residential* spas shall be 30 inches (762 mm) to 38 inches (965 mm) above the ramp or step surface as measured at the nosing of the step or finished surface of the slope.

**323.2.2 Material.** Handrails shall be made of corrosion-resistant materials.

**323.2.3 Nonremovable.** Handrails shall be installed so that they cannot be removed without the use of tools.

**323.2.4 Leading edge distance.** The leading edge of handrails for stairs, pool entries and exits shall be located not greater than 18 inches (457 mm) from the vertical face of the bottom riser.

**323.2.5 Diameter.** The outside diameter or width of *handrails* shall be not less than  $1\frac{1}{4}$  inches (32 mm) and not greater than 2 inches (51 mm).

**323.3 Obstructions and entrapment avoidance.** There shall not be obstructions that can cause the user to be entrapped or injured. Types of entrapment include, but are not limited to, wedge or pinch-type openings and rigid, nongiving cantilevered protrusions.

## CHAPTER 7

# ONGROUND STORABLE RESIDENTIAL SWIMMING POOLS

### SECTION 701 GENERAL

**701.1 Scope.** This chapter describes certain criteria for the design, manufacturing, and testing of *onground storable pools* intended for *residential* use. This includes portable pools with flexible or nonrigid side walls that achieve their structural integrity by means of uniform shape, support frame or a combination thereof, and that can be disassembled for storage or relocation. This chapter includes what has been commonly referred to in past standards or codes as onground or above-ground pools.

**701.1.1 Permanent inground residential swimming pool.** This chapter does not apply to permanent inground *residential* pools, as defined in Chapter 8.

**701.2 General.** In addition to the requirements of this chapter, onground storable *residential* swimming pools shall comply with the requirements of Chapter 3.

**701.3 Floor slopes.** Floor slopes shall be uniform and in accordance with Sections 701.3.1 through 701.3.4.

**701.3.1 Shallow end.** The slope of the floor from the shallow end wall towards the deep area shall not exceed 1 unit vertical in 7 units horizontal (14-percent slope) to the point of the first slope change.

**701.3.2 Transition.** The slope of the floor from the point of the first slope change towards the deepest point shall not exceed 1 unit vertical in 3 units horizontal (33-percent slope).

**701.3.3 Adjacent.** The slope adjacent to the shallow area shall not exceed 1 unit vertical in 3 units horizontal (33-percent slope) and the slope adjacent to the side walls shall not exceed 1 unit vertical in 1 unit horizontal (100-percent slope).

**701.3.4 Change point.** The point of the first slope change shall be defined as the point at which the shallow area slope exceeds 1 unit vertical in 7 units horizontal (14-percent slope) and is not less than 6 feet (1889 mm) from the shallow end wall of the pool.

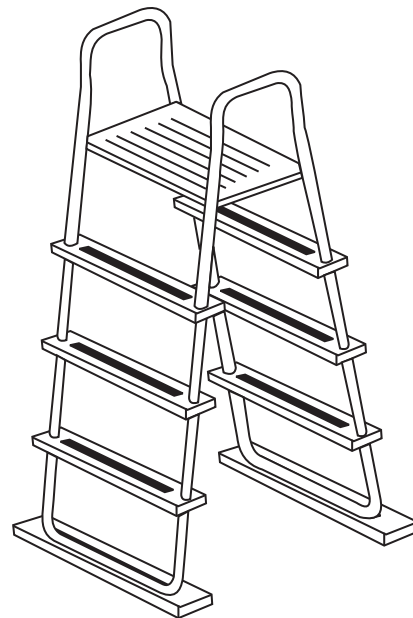
**701.4 Identification.** For onground storable *residential* pools with a vinyl liner, the manufacturer's name and the liner identification number shall be affixed to the liner. For onground storable *residential* pools without a liner, the manufacturer's name and identification number shall be affixed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

**701.5 Installation.** *Onground storable pools* shall be installed in accordance with the manufacturer's instructions.

### SECTION 702 LADDERS AND STAIRS

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

**702.2 Type A and Type B ladders.** Type A, double access, and Type B, limited access, A-frame ladders shall comply with Sections 702.2.1 through 702.2.7. See Figure 702.2.



**FIGURE 702.2**  
**TYPICAL A-FRAME LADDER, TYPES A AND B**

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

**Exception:** Barriers for ladders shall not be required where the ladder manufacturer provides a certification statement that the ladder complies with the ladder entrapment test requirements of APSP 4.

**702.2.2 Platform.** Where an A-frame ladder has a platform between the handrails, the platform shall have a width of not less than 12 inches (305 mm) and a length of not less than 12 inches (305 mm). The platform shall be at or above the highest ladder tread. The walking surface of the platform shall be slip resistant.

**702.2.3 Handrails or handholds.** A-frame ladders shall have two handrails or handholds that serve all treads. The height of the handrails and handholds shall be not less than 20 inches (508 mm) above the platform or uppermost tread, whichever is higher.

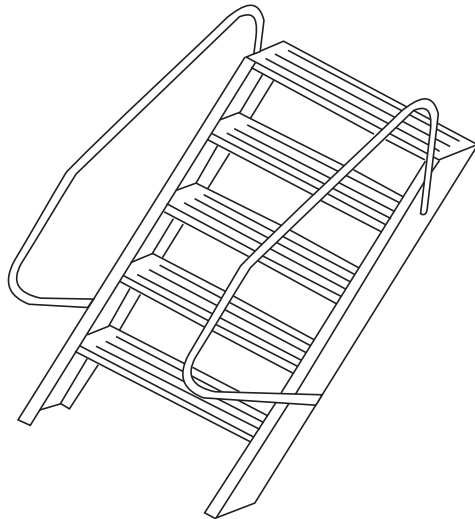
**702.2.4 Diameter.** The outside diameter of handrails and handholds shall be not less than 1 inch (25 mm) and not greater than 1.9 inches (48 mm).

**702.2.5 Clear distance.** The clear distance between ladder handrails shall be not less than a space of 12 inches (305 mm).

**702.2.6 Treads.** Ladder treads shall have a horizontal uniform depth of not less than 2 inches (51 mm).

**702.2.7 Riser height.** Risers, other than the bottom riser, shall be of uniform height that is not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The bottom riser height shall be not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The vertical distance from the platform or top of the pool structure to the uppermost tread shall be the same as the uniform riser heights.

**702.3 Type C staircase ladders (ground to deck).** Type C staircase ladders shall comply with Sections 702.3.1 through 702.3.6. See Figure 702.3.



**FIGURE 702.3**  
TYPICAL STAIRCASE LADDER, TYPE C

**702.3.1 Handrails or handholds.** Staircase ladders shall have not less than two handrails or handholds that serve all treads. The height of the handrails and handholds shall be not less than 20 inches (508 mm) above the platform or uppermost tread, whichever is higher.

**702.3.2 Diameter.** The outside diameter of handrails and handholds shall be not less than 1 inch (25 mm) and not greater than 1.9 inches (48 mm).

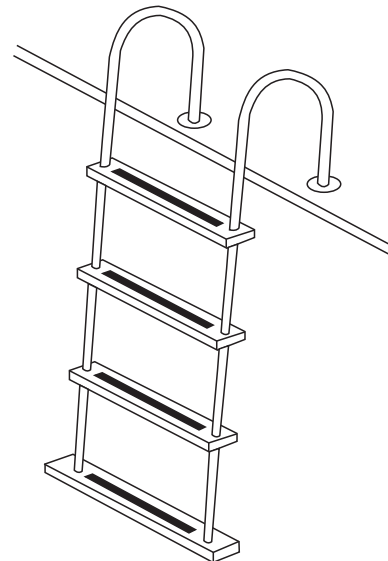
**702.3.3 Treads.** Ladder treads shall have a horizontal uniform depth of not less than 4 inches (102 mm).

**702.3.4 Riser height.** Risers, other than the bottom riser, shall be of uniform height that is not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The bottom riser height shall be not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The vertical distance from the platform or top of the pool structure to the uppermost tread shall be the same as the uniform riser heights.

**702.3.5 Top step.** The top step of a staircase ladder shall be flush with the deck or 7 inches (178 mm) to 12 inches (305 mm) below the deck level.

**702.3.6 Width.** Steps shall have a minimum unobstructed width of 19 inches (483 mm) between the side rails.

**702.4 Type D in-pool ladders.** Type D in-pool ladders shall be in accordance with Sections 702.4.1 through 702.4.7. See Figure 702.4.



**FIGURE 702.4**  
TYPICAL IN-POOL LADDER, TYPE D

**702.4.1 Clearance.** There shall be a clearance of not less than 3 inches (76 mm) and not greater than 6 inches (152 mm) between the pool wall and the ladder.

**702.4.2 Handrails or handholds.** Ladders shall be equipped with two handrails or handholds that extend above the platform or deck not less than 20 inches (508 mm).

**702.4.3 Clear distance.** The clear distance between ladder handrails shall be not less than 12 inches (305 mm).

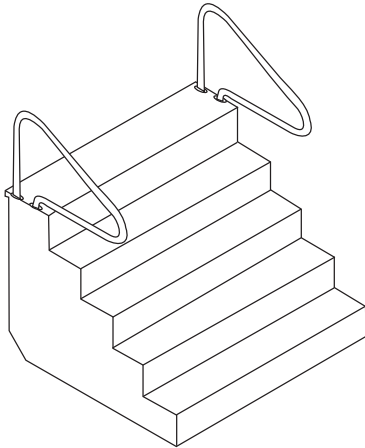
**702.4.4 Diameter.** The outside diameter of handrails and handholds shall be not less than 1 inch (25 mm) and not greater than 1.9 inches (48 mm).

**702.4.5 Riser height.** Risers, other than the bottom riser, shall be of uniform height that is not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The bottom riser height shall be not less than 7 inches (178 mm) and not greater than 12 inches (305 mm).

**702.4.6 Top tread.** The vertical distance from the pool coping, deck, or step surface to the uppermost tread shall be not less than 7 inches (178 mm) and not greater than 12 inches (305 mm) and uniform with other riser heights.

**702.4.7 Tread depth.** Ladder treads shall have a horizontal uniform depth of not less than 2 inches (51 mm).

**702.5 Type E protruding in-pool stairs.** Type E protruding in-pool stairs shall be in accordance with Sections 702.5.1 through 702.5.7. See Figure 702.5.



**FIGURE 702.5**  
**TYPICAL IN-POOL STAIRCASE TYPES, E AND F**

**702.5.1 Barrier required.** In-pool stairs shall have a physical barrier to prevent children from swimming through the riser openings or behind the in-pool stairs.

**702.5.2 Handrails or handholds.** In-pool stairs shall be equipped with not less than one handrail or handhold that serves all treads with a height of not less than 20 inches (508 mm) above the platform or uppermost tread, whichever is higher.

**702.5.3 Removable handrails.** Where handrails are removable, they shall be installed such that they cannot be removed without the use of tools.

**702.5.4 Leading edge distance.** The leading edge of handrails shall be 18 inches (457 mm)  $\pm$  3 inches ( $\pm$  76 mm), horizontally from the vertical plane of the bottom riser.

**702.5.5 Diameter.** The outside diameter of handrails and handholds shall be not less than 1 inch (25 mm) and not greater than 1.9 inches (48 mm).

**702.5.6 Tread width and depth.** Treads shall have an unobstructed horizontal depth of not less than 10 inches (254 mm) and an unobstructed surface area of not less than 240 square inches (0.15 m<sup>2</sup>).

**702.5.7 Uniform riser height.** Risers, other than the bottom riser, shall be of uniform height that is not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The bottom riser height shall be not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The verti-

cal distance from the pool coping, deck or step surface to the uppermost tread of the stairs shall be the same as the uniform riser heights.

**702.6 Type F recessed in-pool stairs.** Type F recessed in-pool stairs shall be in accordance with Sections 702.6.1 through 702.6.7. See Figure 702.5.

**702.6.1 Barrier required.** In-pool stairs shall have a physical barrier to prevent children from swimming through the riser openings or behind the in-pool stairs.

**702.6.2 Handrails or handholds.** In-pool stairs shall be equipped with not less than one handrail or handhold that serves all treads with a height of not less than 20 inches (508 mm) above the platform or uppermost tread, whichever is higher.

**702.6.3 Removable handrails.** Where handrails are removable, they shall be installed such that they cannot be removed without the use of tools.

**702.6.4 Leading edge distance.** The leading edge of handrails shall be 18 inches (457 mm)  $\pm$  3 inches ( $\pm$  76 mm), horizontally from the vertical plane of the bottom riser.

**702.6.5 Diameter.** The outside diameter of handrails and handholds shall be not less than 1 inch (25 mm) and not greater than 1.9 inches (48 mm).

**702.6.6 Tread width and depth.** Treads shall have an unobstructed horizontal depth of not less than 10 inches (254 mm) at all points and an unobstructed surface area of not less than 240 square inches (0.15 m<sup>2</sup>).

**702.6.7 Uniform riser height.** Risers, other than the bottom riser, shall be of uniform height that is not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The bottom riser height shall be not less than 7 inches (178 mm) and not greater than 12 inches (305 mm). The vertical distance from the pool coping, deck or step surface to the uppermost tread of the stairs shall be the same as the uniform riser heights.

## SECTION 703 DECKS

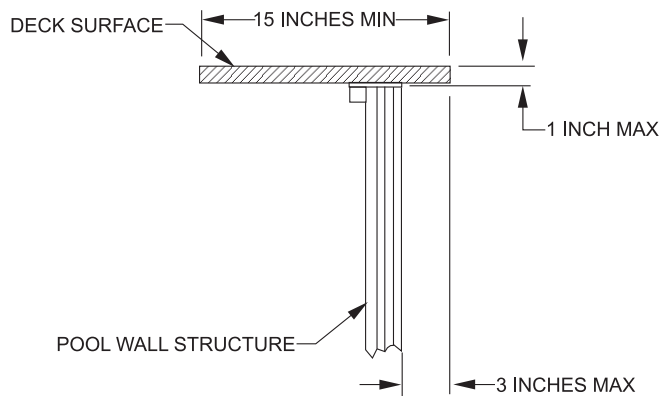
**703.1 General.** Decks provided by the pool manufacturer shall be installed in accordance with the manufacturer's instructions. Decks fabricated on-site shall be in accordance with the *International Residential Code*.

**703.2 Cantilevered.** The top surface of a cantilevered deck shall be not greater than 1 inch (25 mm) higher than the top of the pool wall. See Figure 703.4. The top surface of a noncantilevered deck shall be not higher than the top of the pool wall.

**703.3 No gaps.** Decks that are installed flush with the top rail of the pool shall have all gap openings between the deck and top rails closed-off or capped.

**703.4 Extension over pool.** Where a deck extends inside the top rail of the pool, it shall extend not more than 3 inches (76 mm) beyond the inside of the top rail of the pool in accordance with Figure 703.4 and shall have a smooth finish.



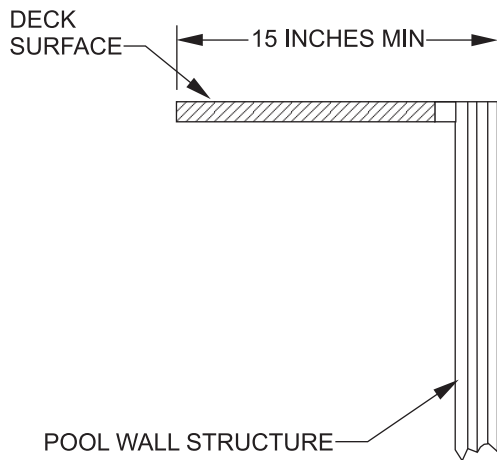


For SI: 1 inch = 25.4 mm.

**FIGURE 703.4**  
**TYPICAL CANTILEVERED DECK SUPPORT**

**703.5 Slip resistant.** The deck walking surface shall be slip resistant.

**703.6 Walk-around decks.** Walk-around decks shall have a level walking surface of not less than 15 inches (381 mm) in width, as measured from the inside edge of the pool top rail to the outside of the pool walk-around. See Figure 703.6.



For SI: 1 inch = 25.4 mm.

**FIGURE 703.6**  
**WALK-AROUND DECK WIDTH**

## SECTION 704 CIRCULATION SYSTEM

**704.1 General.** A circulation system consisting of pumps, hoses, tubing, piping, return inlets, suction outlets, filters and other related equipment that provides for the circulation of water throughout the pool shall be located so that such items cannot be used by young children as a means of access to the pool.

**704.2 Installation and support.** Circulation equipment shall be installed, mounted and supported in accordance with the manufacturer's instructions.

**704.3 Draining the system.** In climates subject to freezing, circulation system equipment shall be designed and fabricated to drain the pool water from the equipment and exposed piping, by removal of drain plugs and manipulating valves or by other methods in accordance with the manufacturer's instructions.

**704.4 Turnover.** A pump including a motor shall be provided for circulation of the pool water. The equipment shall be sized to provide a turnover of the pool water not less than once every 12 hours. The system shall be designed to provide the required turnover rate based on the manufacturer's specified maximum flow rate of the filter, with a clean media condition of the filter. The system flow shall not exceed the filter manufacturer's maximum filter flow rate.

**704.5 Piping and fittings.** The process piping of the circulation system, including but not limited to hoses, tubing, piping, and fittings, shall be made of nontoxic material and shall be capable of withstanding an internal pressure of not less than 1½ times the rated pressure of the pump. Piping on the suction side of the pump shall not collapse when flow into such piping is blocked.

**704.6 Filters.** Pressure-type filters shall have an automatic internal means or a manual external means to relieve accumulated air pressure inside the filter tank. Filter tanks composed of upper and lower tank lids that are held in place by a perimeter clamp shall have a perimeter clamp that provides for a slow and safe release of air pressure before the clamp disengages the lids.

**704.6.1 Automatic internal air relief.** Filter tanks incorporating an automatic internal air relief as the principal means of air release shall be designed with a means to provide for a slow and safe release of pressure.

**704.6.2 Separation tank.** A separation tank used in conjunction with a filter tank shall have a manual air release or the tank shall be designed to provide for a slow and safe release of pressure when the tank is opened.

**704.7 Pumps.** Pool pumps shall be tested and certified by a nationally recognized testing laboratory in accordance with UL 1081.

**704.7.1 Cleanable strainer.** Where a pressure-type filter is installed, a cleanable strainer or screen that captures materials such as solids, debris, hair and lint shall be provided upstream of the circulation pump.

**704.7.2 Accessible pumps and motors.** Pumps and motors shall be accessible for inspection and service in accordance with the pump and motor manufacturer's instructions.

**704.7.3 Pump shutoff valves.** An accessible means of shut off of the suction and discharge piping for the pump shall be provided for maintenance and removal of the pump.

**704.8 Outlets and return inlets.** Outlets or suction outlets and return inlets shall be provided and arranged to produce

uniform circulation of water so that sanitizer residual is maintained throughout the pool. Where installed, submerged suction outlets shall conform to APSP 16.

**704.9 Surface skimmer systems.** The surface skimming system provided shall be designed and constructed to skim the pool surface when the water level is maintained between the minimum and maximum fill level of the pool.

**704.9.1 Coverage where used as a sole outlet.** Where surface skimmers are used as the only pool water outlet system, not less than one skimmer shall be provided for each 800 square feet (74.3 m<sup>2</sup>), or fraction thereof, of the water surface area.

**704.9.2 Coverage where used in combination with other outlets.** Where surface skimmers are not the only outlet for pool water, they shall be considered to cover only that fraction of the 800 square feet (74.3 m<sup>2</sup>).

**704.9.3 Location and venting.** Skimmers shall be equipped with a vent that serves as a vacuum break.

## SECTION 705 SAFETY SIGNS

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

**705.2 Safety signs for ladders.** Safety signage for ladders shall be in accordance with Sections 705.2.1 through 705.2.3.2.

**705.2.1 A-frame ladders.** Safety signage for A-frame ladders shall be in accordance with Sections 705.2.1.1 through 705.2.1.4.1. The words on the signage shall be readable by persons standing in the pool and standing outside of the pool as applicable for the required location of each sign.

**705.2.1.1 No diving warning.** A-frame ladders shall have the following words posted on the in-pool side of the ladder and on the pool entry side of the ladder: “NO DIVING.” The location of the words shall be above the elevation of the design water level of the pool.

**705.2.1.2 Entrapment warning.** A-frame ladders shall have the following words posted on the pool side of the ladder: “TO PREVENT ENTRAPMENT OR DROWNING DO NOT SWIM THROUGH, BEHIND, OR AROUND LADDER.”

**705.2.1.3 Type A, A-frame ladders.** Type A double access A-frame ladders shall have the following words posted on the ladder: “REMOVE AND SECURE LADDER WHEN POOL IS NOT OCCUPIED.”

**705.2.1.4 Type B, A-frame ladders.** Type B limited access A-frame ladders shall have the following words posted on the ladder: “SECURE LADDER WHEN POOL IS NOT OCCUPIED.”

**705.2.1.4.1 Swing up or slide up secured ladders.** Type B limited access A-frame ladders that utilize

swing-up or slide-up sections for limiting access to the pool shall have the following words posted on the ladder as applicable for the type of securing method:

1. “WHEN POOL IS NOT OCCUPIED, SWING UP AND SECURE.”
2. “WHEN POOL IS NOT OCCUPIED, LIFT OFF.”
3. “WHEN POOL IS NOT OCCUPIED, SLIDE UP AND SECURE.”

**705.2.2 Type C staircase ladders.** Type C staircase ladders that swing up to limit access to the pool or that are removed to limit access to the pool shall have the following words posted on the ladder: “WHEN NOT IN USE SWING UP AND SECURE OR REMOVE.”

**705.2.3 Type D in-pool ladder.** Safety signage for Type D in-pool ladders shall be in accordance with Sections 705.2.3.1 and 705.2.3.2. The words on the signage shall be readable by persons standing in the pool or standing outside the pool as applicable for the required location of each sign.

**705.2.3.1 No diving warning.** Type D in-pool ladders shall have the following words posted on the in-pool side of the ladder and on the pool entry side of the ladder: “NO DIVING.” The location of the words shall be above the elevation of the design water level of the pool.

**705.2.3.2 Entrapment warning.** Type D in-pool ladders shall have the following words posted on the ladder: “WARNING: TO PREVENT ENTRAPMENT OR DROWNING, DO NOT SWIM THROUGH, BEHIND, OR AROUND LADDER.”

## CHAPTER 8

# PERMANENT INGROUND RESIDENTIAL SWIMMING POOLS

### SECTION 801 GENERAL

**801.1 Scope.** The provisions of this chapter shall govern permanent inground *residential* swimming pools. Permanent inground *residential* swimming pools shall include pools that are partially or entirely above grade. This chapter does not cover pools that are specifically manufactured for above-ground use and that are capable of being disassembled and stored. This chapter covers new construction, modification and repair of inground *residential* swimming pools.

**801.2 General.** Permanent inground *residential* pools shall comply with the requirements of Chapter 3.

### SECTION 802 DESIGN

**802.1 Materials of components and accessories.** The materials of components and accessories used for permanent inground *residential* swimming pools shall be suitable for the environment in which they are installed. The materials shall be capable of fulfilling the design, installation and the intended use requirements in the *International Residential Code*.

**802.2 Structural design.** The structural design and materials shall be in accordance with the *International Residential Code*.

### SECTION 803 CONSTRUCTION TOLERANCES

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

### SECTION 804 DIVING WATER ENVELOPES

**804.1 General.** The minimum diving water envelopes shall be in accordance with Table 804.1 and Figure 804.1. Negative construction tolerances shall not be applied to the dimensions of the minimum diving water envelopes given in Table 804.1.

### SECTION 805 WALLS

**805.1 General.** Walls in the shallow area and deep area of the pool shall have a wall-to-floor transition point that is not less than 33 inches (838 mm) below the *design waterline*. Above the transition point, the walls shall be within 11 degrees (0.19 rad) of vertical.

### SECTION 806 OFFSET LEDGES

**806.1 Maximum width.** Offset ledges shall be not greater than 8 inches (203 mm) in width.

**806.2 Reduced width required.** Where an offset ledge is located less than 42 inches (1067 mm) below the *design waterline*, the width of such ledge shall be proportionately less than 8 inches (203 mm) in width so as to fall within 11 degrees of vertical as measured from the top of the *design waterline*.

### SECTION 807 POOL FLOORS

**807.1 Floor slopes.** Floor slopes shall be in accordance with Sections 807.1.1 through 807.1.3.

**807.1.1 Shallow end.** The slope of the floor from the beginning of the shallow end to the deep area floor slope transition point, indicated in Figure 804.1 as Point E to

**TABLE 804.1  
MINIMUM DIVING WATER ENVELOPE FOR SWIMMING POOLS DESIGNATED TYPES I-V<sup>b</sup>**

POOL TYPE	MINIMUM DEPTHS AT POINT FEET-INCHES				MINIMUM WIDTHS AT POINT FEET-INCHES				MINIMUM LENGTHS BETWEEN POINTS FEET-INCHES					
	A	B	C	D	A	B	C	D	WA	AB	BC	CD	DE	WE
I	6-0	7-6	5-0	2-9	10-0	12-0	10-0	8-0	1-6	7-0	7-6	Note a	6-0	28-9
II	6-0	7-6	5-0	2-9	12-0	15-0	12-0	8-0	1-6	7-0	7-6	Note a	6-0	28-9
III	6-10	8-0	5-0	2-9	12-0	15-0	12-0	8-0	2-0	7-6	9-0	Note a	6-0	31-3
IV	7-8	8-0	5-0	2-9	15-0	18-0	15-0	9-0	2-6	8-0	10-6	Note a	6-0	31-3
V	8-6	9-0	5-0	2-9	15-0	18-0	15-0	9-0	3-0	9-0	12-0	Note a	6-0	36-9

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The minimum length between points C and D varies based on water depth at point D and the floor slope between points C and D.

b. See Figure 804.1 for location of points.

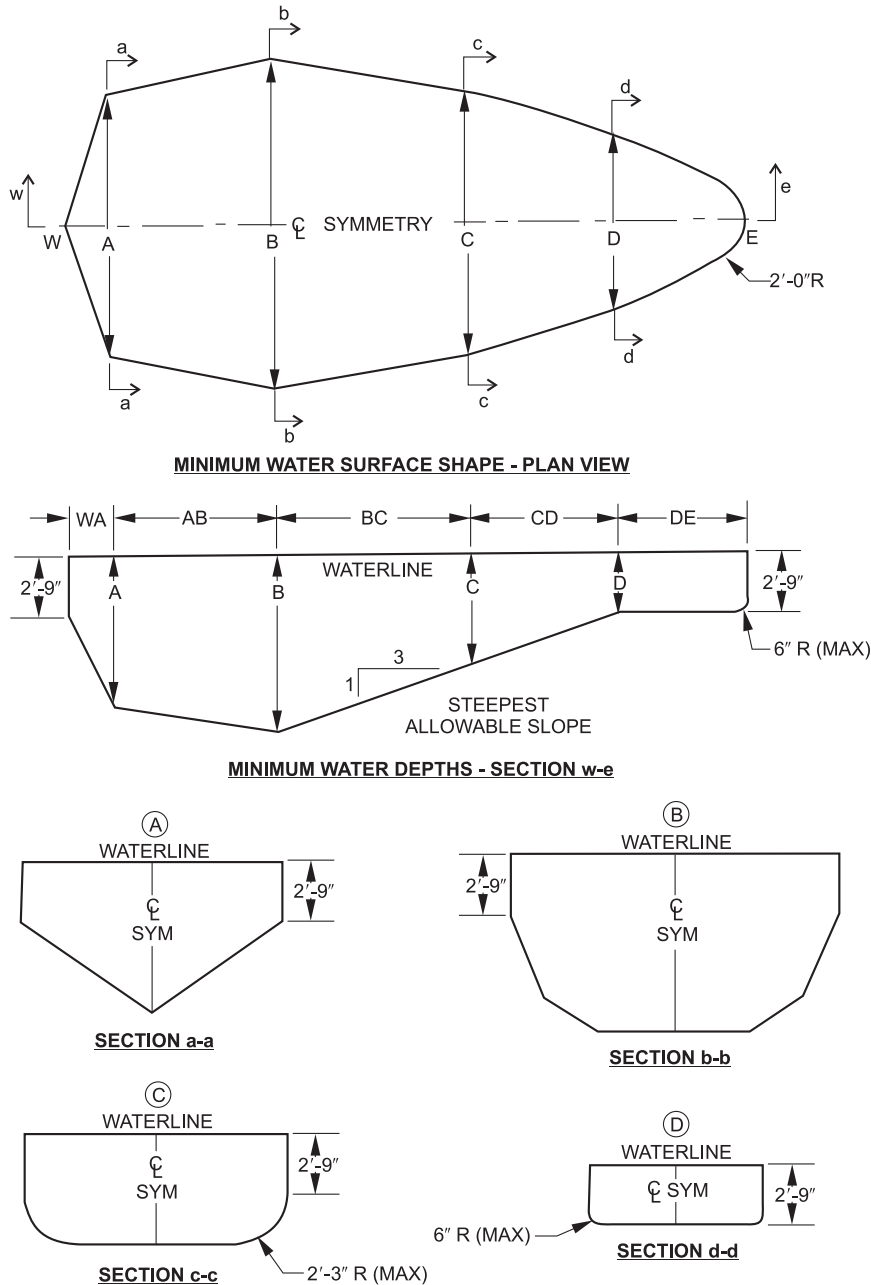
**PERMANENT INGROUND RESIDENTIAL SWIMMING POOLS**

Point D, shall not exceed 1 unit vertical in 7 units horizontal.

**807.1.2 Shallow to deep transition.** The shallow to deep area floor slope transition point, indicated in Figure 804.1 as Point D, shall occur at a depth not less than 33 inches (838 mm) below the *design waterline* and at a point not less than 6 feet (1829 mm) from the beginning of the shallow end, indicated in Figure 804.1 as Point E, except as specified in Section 809.7.

**807.1.3 Deep end.** The slope of the floor in the deep end, indicated in Figure 804.1 as Point B to Point D, shall not exceed a slope of 1 unit vertical in 3 units horizontal (33-percent slope).

**807.2 Shallow end water depths.** The design water depth as measured at the shallowest point in the shallow area shall be not less than 33 inches (838 mm) and not greater than 4 feet (1219 mm). Shallow areas designed in accordance with Sections 809.6, 809.7 and 809.8 shall be exempt from the minimum depth requirement.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

**FIGURE 804.1**  
**MINIMUM DIVING WATER ENVELOPE**

**SECTION 808  
DIVING EQUIPMENT**

**808.1 Manufactured and fabricated diving equipment.** Manufactured and fabricated diving equipment shall be in accordance with this section. Manufactured and fabricated diving equipment and appurtenances shall not be installed on a Type O pool.

**808.2 Manufactured diving equipment.** Manufactured diving equipment shall be designed for swimming pool use.

**808.3 Installation.** Where manufactured diving equipment is installed, the installation shall be located in the deep area of the pool so as to provide the minimum dimensions as shown in Table 804.1 and shall be installed in accordance with the manufacturer’s instructions.

**808.4 Labeling.** Manufactured diving equipment shall have a permanently affixed label indicating the manufacturer’s name and address, the date of manufacture, the minimum diving envelope and the maximum weight limitation.

**808.5 Slip resistant.** Diving equipment shall have slip-resistant walking surfaces.

**808.6 Point A.** For the application of Table 804.1, Point A shall be the point from which all dimensions of width, length and depth are established for the minimum diving water envelope. If the tip of the diving board or diving platform is located at a distance of WA or greater from the deep end wall and the water depth at that location is equal to or greater than the water depth requirement at Point A, then the point on the water surface directly below the center of the tip of the diving board or diving platform shall be identified as Point A.

**808.7 Location of pool features in a diving pool.** Where a pool is designed for use with diving equipment, the location of steps, pool stairs, ladders, underwater benches, special features and other accessory items shall be outside of the minimum diving water envelope as indicated in Figure 322.2.

**808.8 Stationary diving platforms and diving rocks.** Stationary diving platforms and diving rocks built on-site shall be permitted to be flush with the wall and shall be located in the diving area of the pool. Point A shall be in front of the wall at the platform or diving rock centerline.

**808.9 Location.** The forward tip of manufactured or fabricated diving equipment shall be located directly above Point A as defined by Section 808.6.

**808.10 Elevation.** The maximum elevation of a diving board above the *design waterline* shall be in accordance with the manufacturer’s instructions.

**808.11 Minimum water envelope.** Manufactured diving equipment installation and use instructions shall be provided by the diving equipment manufacturer and shall specify the minimum water dimensions required for each diving board and diving stand combination. The board manufacturer shall indicate the water envelope type by dimensionally relating their products to Point A on the water envelopes as shown in Figure 804.1 and Table 804.1. The board manufacturer shall specify which boards fit on the design pool geometry types as indicated in Table 804.1.

**808.12 Platform height above waterline.** The height of a stationary diving platform or a diving rock above the *design waterline* shall not exceed the dimensions in Table 808.12.

**TABLE 808.12  
DIVING PLATFORM OR APPURTENANCE  
HEIGHT ABOVE DESIGN WATERLINE**

POOL TYPE	HEIGHT INCHES
I	42
II	42
III	50
IV	60
V	69

For SI: 1 inch = 25.4 mm.

**808.13 Headroom above the board.** The diving equipment manufacturer shall specify the minimum headroom required above the board tip.

**SECTION 809  
SPECIAL FEATURES**

**809.1 Slides.** Slides shall be installed in accordance with the manufacturer’s instructions.

**809.2 Entry and exit.** Pools shall have a means of entry and exit in all shallow areas where the design water depth of the shallow area at the shallowest point exceeds 24 inches (610 mm). Entries and exits shall consist of one or a combination of the following: steps, stairs, ladders, treads, ramps, beach entries, underwater seats, benches, swimouts and other *approved* designs. The means of entry and exit shall be located on the shallow side of the first slope change.

**809.3 Secondary entries and exits.** Where water depth in the deep area of a pool exceeds 5 feet (1524 mm), a means of entry and exit shall be provided in the deep area of the pool.

**809.4 Over 30 feet in width.** Pools over 30 feet (9144 mm) in width at the deep area shall have an entry and exit on both sides of the deep area of the pool.

**809.5 Pool stairs.** The design and construction of stairs into the shallow end and recessed pool stairs shall conform to Sections 809.5.1 through 809.5.3.

**809.5.1 Tread dimension and area.** Treads shall have a minimum unobstructed horizontal depth of 10 inches (254 mm) and a minimum unobstructed surface area of 240 square inches (0.15 m<sup>2</sup>).

**809.5.2 Riser heights.** Risers, other than the top and bottom riser, shall have a uniform height of not greater than 12 inches (305 mm). The top riser height shall be any dimension not exceeding 12 inches (305 mm). The bottom riser height shall be any dimension not exceeding 12 inches (305 mm). The top and bottom riser heights shall not be required to be equal to each other or equal to the uniform riser height. Riser heights shall be measured at the horizontal centerline of the stairs.

**809.5.3 Additional steps.** In design water depths exceeding 48 inches (1219 mm), additional steps shall not be required.

## PERMANENT INGROUND RESIDENTIAL SWIMMING POOLS

**809.6 Beach and sloping entries.** The slope of beach and sloping entries used as a pool entrance shall not exceed 1 unit vertical in 7 units horizontal (14-percent slope).

**809.7 Steps and sloping entries.** Where steps and benches are used in conjunction with sloping entries, the vertical riser distance shall not exceed 12 inches (305 mm). For steps used in conjunction with sloping entries, the requirements of Section 809.6 shall apply.

**809.8 Architectural features.** Surfaces of architectural features shall not be required to comply with the 1 unit vertical in 7 units horizontal (14-percent slope) slope limitation.

**809.9 Maximum depth.** The horizontal surface of underwater seats, benches and swimouts shall be not greater than 20 inches (508 mm) below the design waterline.

### SECTION 810 CIRCULATION SYSTEMS

**810.1 Turnover rate.** The circulation system equipment shall be sized to provide a turnover of the pool water not less than once every 12 hours. The system shall be designed to provide the required turnover rate based on the manufacturer's specified maximum flow rate of the filter, with a clean media condition of the filter.

➔ **810.2 Strainer required.** Pressure filter systems shall be provided with a strainer located between the pool and the circulation pump.

### SECTION 811 SAFETY FEATURES

**811.1 Rope and float.** In pools where the point of first slope break occurs, a rope and float assembly shall be installed across the width of the pool. The rope assembly shall be located not less than 1 foot (305 mm) and not greater than 2 feet (610 mm) towards the shallow side of the slope break. Rope anchoring devices shall be permanently attached to the pool wall, coping or deck. Rope ends shall attach to the rope anchor devices so that the rope ends can be disconnected from the rope anchor device.

**CHAPTER 9**  
**PERMANENT RESIDENTIAL SPAS AND**  
**PERMANENT RESIDENTIAL EXERCISE SPAS**

**SECTION 901**  
**GENERAL**

**901.1 Scope.** This chapter shall govern the design, installation, construction and repair of permanently installed *residential* spas and exercise spas intended for *residential* use.

**901.2 General.** Permanent *residential* spas and permanent *residential* exercise spas shall comply with Chapter 5 except that Sections 504.1, 504.1.1, 508.1 and 509 shall not apply. Such spas shall comply with the requirements of Chapter 3.

**SECTION 902**  
**SAFETY FEATURES**

**902.1 Instructions and safety signage.** Instructions and safety signage shall comply with the manufacturer's recommendations and the requirements of the local jurisdiction.

**CHAPTER 10**

**PORTABLE RESIDENTIAL SPAS AND  
PORTABLE RESIDENTIAL EXERCISE SPAS**

**SECTION 1001  
GENERAL**

**1001.1 Scope.** This chapter shall govern the installation, alteration and repair of portable *residential* spas and portable exercise spas intended for *residential* use.

**1001.2 General.** In addition to the requirements of this chapter, portable *residential* spas and portable *residential* exercise spas shall also comply with the requirements of Chapter 3.

**1001.3 Listing.** Equipment and appliances shall be *listed* and *labeled*, and installed as required by the terms of their approval, in accordance with the conditions of the listing, the manufacturer's instructions and this code. Manufacturer's instructions shall be available on the job site at the time of inspection.

**1001.4 Certification.** Factory-built portable spas and portable exercise spas installed in *residential* applications shall be *listed* and *labeled* in compliance with UL 1563 or CSA C22.2 No. 218.1.

**1001.5 Installation.** Spa equipment shall be supported to prevent damage from misalignment and settling in accordance with the manufacturer's instructions.

➔ **1001.6 Access.** Electrical components that require placement or servicing shall be accessible.

■ **1001.7 Instructions and safety signage.** Instructions and safety signage shall comply with UL 1563 or CSA C22.2 No. 218.1, the manufacturer's recommendations, and the requirements of the local jurisdiction.