

## GENERAL POOL AND BARRIER REQUIREMENTS

(See Chapter 7 for additional requirements for storable swimming pools and Chapter 8 for permanent inground residential swimming pools)

Building permit and inspections are required on swimming pools where any of the following conditions are met (USBC 108.2)

- a. having a surface area greater than 150 square feet (13.95m<sup>2</sup>)
- b. more than 5000 gallons (19,000L)
- c. contain 24 inches or more in depth

Swimming pools, swimming pool enclosures and aquatic recreational facilities, as that term is defined in the International Swimming Pool and Spa Code, shall comply with the applicable provisions of the International Swimming Pool and Spa Code (USBC 3109.1)

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

**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.

**Exception:**

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 Wastewater discharge.** Where wastewater from pools and spas, such as backwash from filters and water from deck drains discharge to the building drainage system, the connection shall be through an air gap 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 General.** The energy consumption for pools and permanent spas shall be controlled by the requirements in 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.

**303.3 Time switches.** Time switches or other control methods that can automatically turn off and on heaters and pumps 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 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 a heat pump or solar source, covers or other vapor-retardant means shall not be required.

## **SECTION 305 BARRIER REQUIREMENTS**

**305.1 General.** The provisions of this section shall apply to the design of barriers for restricting entry into areas having pools and spas. Where spa and hot tubs are equipped with a lockable safety cover complying with ASTM F1346 and swimming pools are equipped with a powered safety cover that complies with ASTM F1346, the areas where those spas, hot tubs, or pools are located shall not be required to comply with Section 305.2 through 305.7.

**305.2 Outdoor swimming pools and spas.** All outdoor pools and spas and indoor swimming pools shall be surrounded by a barrier that complies with Section 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 (102 mm) diameter 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 restraining barrier/fence.** Mesh fences, other than chain link fences in accordance with Section 305.2.7, shall be installed in accordance with the manufacturer 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 which 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 widths of the cutouts shall not exceed 1.75 inches (44 mm) in width.

**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 reduces 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 not be greater than 45 degrees (0.79 rad) from vertical.

**305.2.9 (USBC 3109.1.1) Equipment clear zone.** There shall be a clear zone of not less than 36 inches (914mm) between the exterior of the barrier and any permanent structures or equipment such as pumps, filters and heaters that can be used to climb the barrier.

**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 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 not fewer than 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 and 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 a wall, one of the following shall be required

1. Operable windows have a sill height of less than 48" above the indoor finished floor and doors shall have an alarm that produces an audible warning when the window, door or its screen or window 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 threshold of 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 Items 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 (1219mm) above grade for the entire perimeter of the pool, the wall complies with the requirements of Section 305.2 and the pool manufacture allows the wall to serve as a barrier.
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 shall be 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.** The structural design and installation of decks around pools and spas must be in accordance with the International Residential Code or the International Building Code, as applicable in accordance with Section 102.7 and 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.

**306.5 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.

**TABLE 306.5 MINIMUM DRAINAGE SLOPES**

SURFACE	TYPICAL MINIMUM DRAINAGE SLOPE (INCH PER FOOT)
Travertine/brick-set pavers	1/8 inch
Carpet	1/2 inch
Exposed aggregate	1/4 inch
Textured, hand-finished concrete	1/8 inch
Wood	1/8 inch
Wood/plastic composite	1/8 inch

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

**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.

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

**306.6 Concrete joints.** Isolation joints that occur where the pool coping meets the concrete deck shall be watertight.

**306.6.1 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.

**306.6.2 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.

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

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

**306.8 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.

**306.8.1 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.** Section 307.1.1 through 307.1.4 shall apply to all pools and spas.

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

**307.1.1 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.

**307.1.3 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.

**307.2 Specific design and material requirements.** Section 307.2.1 through 307.2.4 shall apply to all pools and spas except for listed and labeled portable residential spas, and listed and labeled portable residential exercise spas.

**307.2.1 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.

**307.2.1.1 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.

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

**307.2.2 Materials and structural design.** Pools and spas shall conform to one or more of the standards indicated in Table 307.2.2 (Reservoirs & Shells). The structural design of 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.

**RESERVOIRS AND SHELLS**

<b>MATERIAL</b>	<b>STANDARD</b>
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

**307.2.2.1 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.

**307.2.3 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.

**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.

**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 (150 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 pools and spas 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 310 SUCTION ENTRAPMENT AVOIDANCE

### 310.1 General.

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

#### Exception:

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

## SECTION 321 LIGHTING

**321.4 Residential pool and deck illumination.** Where lighting is installed for, and in, residential pools and permanent residential spas, 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.

**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.

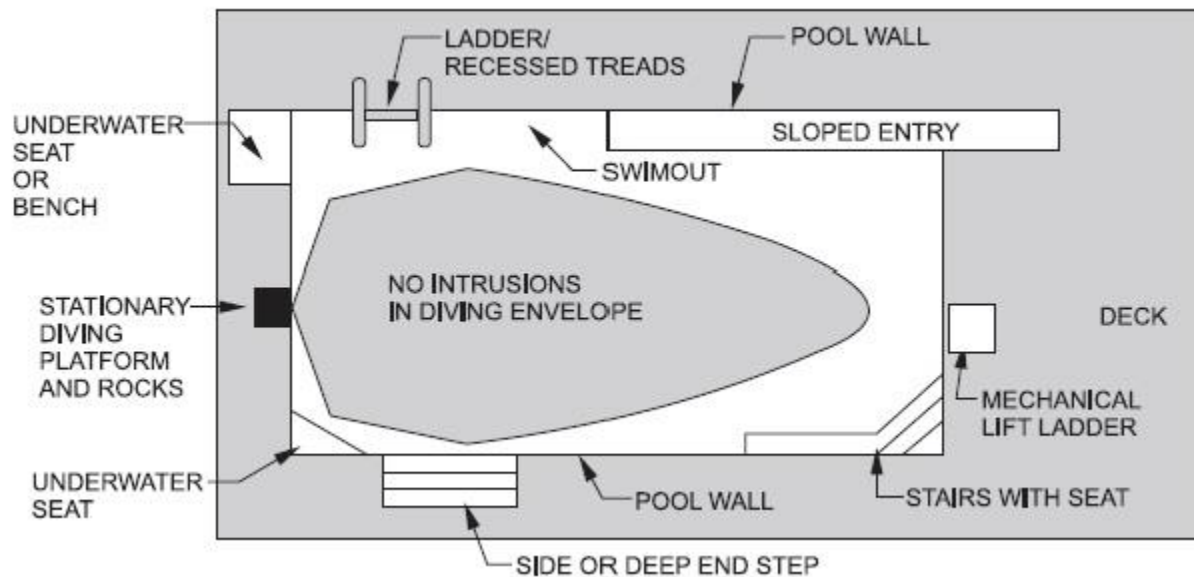


Figure 322.2 Minimum Water Diving Envelope

**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 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 centerline 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.

**323.2.1 Height.** The top of the gripping surface of handrails for *residential pools* and *residential spas* shall be between 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<sup>1</sup>/<sub>4</sub> 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, non-giving cantilevered protrusions.