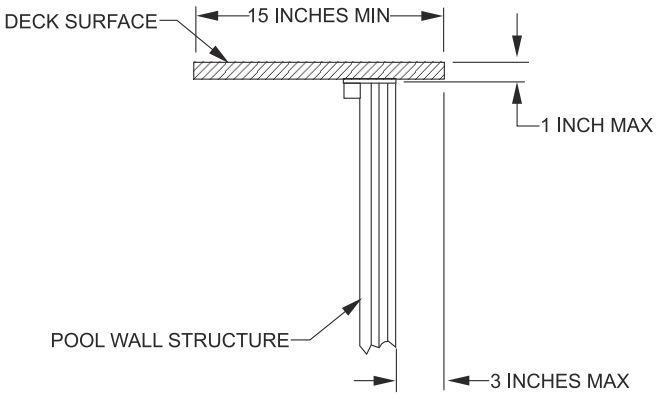
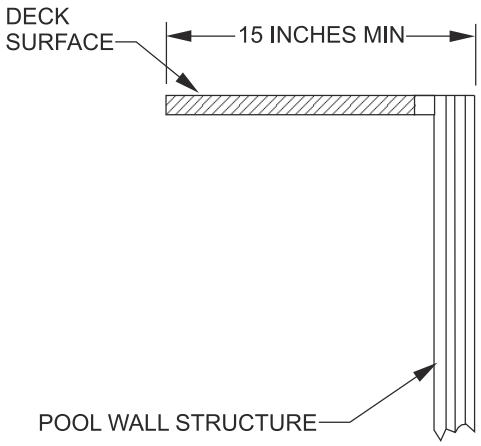
piping, by removal of drain plugs and manipulating valves or by other methods in accordance with the manufacturer's instructions.

704.2 Turnover. Where *circulation equipment* is required by the manufacturer, the equipment shall be sized to provide a turnover of the pool water at least 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.



For SI: 1 inch = 25.4 mm.

FIGURE 703.4
TYPICAL CANTILEVER DECK SUPPORT



For SI: 1 inch = 25.4 mm.

FIGURE 703.6
WALK-AROUND DECK WIDTH

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* that are installed for *residential* use. This chapter covers new construction, modification or *repair* and *residential aquatic vessels*.

801.2 General. Permanent inground *residential pools* shall also 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 ± 3 inches (76 mm). The construction tolerance for all other dimensions shall be ± 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 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

TABLE 804.1
MININUM DIVING WATER ENVELOPE FOR SWIMMING POOLS DESIGNATED TYPES I-V[b]

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 upon water depth at point D and the floor slope between points C and D.

b. See Figure 804.1 for location of points.

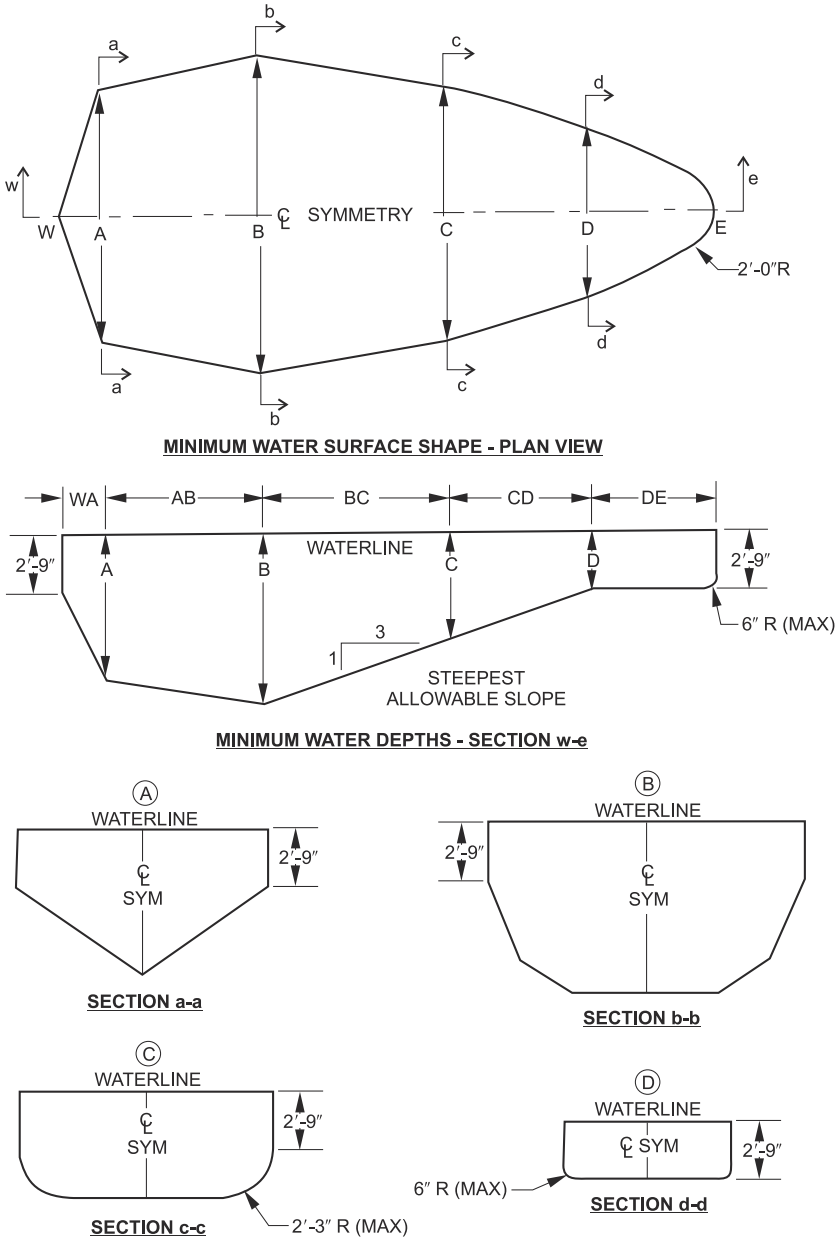
(838 mm) below the *design waterline* and at a point not less than 6 feet (1829 mm) from the beginning of the shallow end, indicated in Figure 804.1 as point E, except as specified in Section 809.7.

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.

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.

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.



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

FIGURE 804.1
MINIMUM WATER ENVELOPE

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.

808.13 Manufactured diving equipment height above waterline. 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 the shallow area if the design water depth exceeds 24 inches (610 mm) at the shallowest point. Entries and exits shall consist of one or a combination of the following: steps, stairs, ladders, treads, ramps, beach entries, *underwater seats*, benches, *swimouts*, mechanical lifts and other approved designs. The means of entry and exit shall be located on the shallow side of the first slope change. Pools having more than one *shallow area*, including but not limited to center deep, play or sports pools, shall use the same type of entry and exit in all *shallow areas*. *Ladders* shall not be installed in a *shallow area* of a pool.

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 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 809.5.4.

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 (0.17 m^2).

809.5.2 Bottom riser. On shallow end stairs, the bottom riser height is allowed to vary to the floor. The bottom riser must not exceed 12 inches (305 mm) to the floor for the width of the walking surface.

809.5.3 Riser height. Risers at the centerline shall have a uniform height not greater than 12 inches (305 mm), except the top riser, which shall be permitted to vary in height, but shall not exceed 12 inches (305 mm).

809.5.4 Additional steps. In design water depths exceeding 48 inches (1219 mm), no additional steps shall be required.

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.

TABLE 808.12
DIVING PLATFORM OR APPURTENANCE HEIGHT ABOVE DESIGN WATERLINE

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

For SI: 1 inch = 25.4 mm.

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 slope limitation.

809.9 Maximum depth. The horizontal surface of *underwater seats*, benches and *swimouts* shall not be 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 Pressure test. *Circulation system* piping, other than that integrally included in the manufacture of the pool, shall be subject to an induced static hydraulic pressure test (sealed system) at 25 pounds per square inch (psi) (172 kPa) for not less than 15 minutes.

> **Exception:** *Onground storable pools* and *portable residential spas*.

810.3 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 signs. Instructions and safety signage shall comply with the manufacturer's recommendation 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 installation instructions and this code. Manufacturer's installation 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 Suction fitting covers. Suction fitting covers shall be installed prior to final approval.

1001.6.1 Access. Electrical components that require placement or servicing shall be provided with access.

1001.7 Instructions and safety signs. 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.

CHAPTER 11
REFERENCED STANDARDS

This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section 102.7.

ACI

American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331

Standard reference number	Title	Referenced in code section number
304.2R—04	Placing Concrete by Pumping Methods	Table 502.1
305.1—06	Specification for Hot Weather Concreting	Table 502.1
306.1—90	Standard Specification for Cold Weather Concreting (Reapproved 2002)	Table 502.1
308.1—98	Standard Specification for Curing Concrete	Table 502.1
318—11	Building Code Requirements for Structural Concrete and Commentary	Table 502.1
506.2—95	Specification for Shotcrete	Table 502.1

AHRI

Air Conditioning, Heating and Refrigeration Institute
2111 Wilson Boulevard, Suite 500
Arlington, VA 22201

Standard reference number	Title	Referenced in code section number
AHRI 116—09	Performance Rating of Heat Pump Pool Heaters	Table 316.2

ANSI

American National Standards Institute
25 West 43rd Street, Fourth Floor
New York, NY 10036

Standard reference number	Title	Referenced in code section number
A108/A118/A136.1—2009	Specifications for Installation of Ceramic Tile	Table 502.1
Z21.56a—2008	Gas Fired Pool Heaters	Table 316.2
Z124.7—1997	Prefabricated Plastic Spa Shells	Table 502.1

APSP

The Association of Pool & Spa Professionals
2111 Eisenhower Avenue
Alexandria, VA 22314

Standard reference number	Title	Referenced in code section number
APSP 7—06	American National Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins	310.1
APSP 14—11	American National Standard for Portable Electric Spa Energy Efficiency	303.1
APSP 15—11	American National Standard for Residential Swimming Pool and Spa Energy Efficiency	303.1
APSP 16—11	American National Standard for Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs	202, 311.4.1, 505.2.1

ASCE/SEI

American Society of Civil Engineers
Structural Engineering Institute
1801 Alexander Bell Drive
Reston, VA 20191-4400

Standard reference number	Title	Referenced in code section number
ASCE 24—05	Flood Resistant Design & Construction	304.3

ASME

American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Standard reference number	Title	Referenced in code section number
A112.1.2—2004	Air Gaps in Plumbing Systems (For Plumbing Fixtures and Water-Connected Receptors)	318.2
ASME B16.15—2006	Cast Bronze Threaded Fittings	Table 311.4.1

ASTM

ASTM International
100 Barr Harbor
West Conshohocken, PA 19428-2959

Standard reference number	Title	Referenced in code section number
A 182-10a	Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service	Table 311.4.1
A 240—09	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications	Table 502.1
A 312—09	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes	Table 311.4.
A 403—10a	Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings	Table 311.4.1
B 88—03	Standard Specification for Seamless Copper Water Tube	Table 311.4
B 447—07	Specification for Welded Copper Tube	Table 311.4
D 1527—99(2005)	Specifications for Acrylonitrile Butadiene Styrene (ABS) Plastic Pipe, Schedules 40 and 80	Table 311.4.1
D 1593—09	Non-rigid vinyl chloride plastic sheeting	Table 502.1
D 1785—06	Specification for Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120	Table 311.4
D 2241—09	Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).	
D 2464—06	Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	Table 311.4.1
D 2466—06	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	Table 311.4.1
D 2467—06	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80	Table 313.4.1
D 2672—96a(2009)	Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement	Table 311.4
D 2846/D2846M—09b	Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems	Table 311.4, Table 311.4.1
F 437—09	Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	Table 311.4.1
F 438—09	Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40	Table 311.4.1
F 439—09	Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80	Table 311.4.1
F 1346—91(2003)	Standard Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs	305.1, 305.4