# Town of Marana POOL and SPA CODE

# Chapter 1

#### **ADMINISTRATION**

#### Title

**Sec. 101.** These regulations shall be known as the "Pool and Spa code", may be cited as such, and will be referred to herein as "this code".

## **Purpose**

**Sec. 102.** The purpose of this code is to provide minimum standards to protect the public health, safety and welfare by regulating and controlling the design, access, construction and maintenance of spas and swimming pools in this jurisdiction.

# Scope

- **Sec. 103.**(a) The provisions of this code shall apply to the erection, installation, alteration, addition, repair, relocation, replacement, access and paths of travel, maintenance or use of any spa/swimming pool system except as otherwise provided for in this code.
- (b) Where this code is in conflict with any other code, ordinance, or law, the most restrictive shall govern.
- (c) Wherever in this code reference is made to the appendix, the provisions in Appendix A, Diagrams and Tables shall be part of this code. All other appendices are for reference only and do not apply unless specifically adopted.

#### **Existing Installations**

- **Sec. 104.**(a) Any spa/swimming pool system lawfully installed prior to the effective date of this code may have its existing use, maintenance or repair continued if the use, maintenance or repair is in accordance with the original design and location and no hazard to the public health, safety or welfare has been created by such system.
- (b) The owner or his designated agent shall be responsible for the maintenance of the spa/swimming pool system in a safe and sanitary condition.
- (c) All spas and swimming pools, whether usable or not, existing on the effective date of this subsection (c) shall be and remain enclosed in accordance with the enclosure provisions of this code applicable to all other spas and swimming pools of the same type of use, either private, semi-public or public.

## **Authority to Abate**

- **Sec. 105.**(a) **Nuisance.** Any portion of a spa/swimming pool found by the Administrative Authority to be unsafe and/or insanitary as defined herein is hereby declared to be a nuisance.
- (b) **Abatement.** Where a nuisance exists or a system is maintained in violation of this code or any notice issued pursuant to this section, the Administrative Authority shall require the nuisance or violation to be abated and where necessary, shall seek such abatement in the manner provided by law.

# **Administrative Authority**

**Sec. 106**. **General**. Whenever the term or title "administrative authority," "responsible official," "building official," "chief inspector," "code enforcement officer," or other similar designation is used herein or in any of the technical codes, it shall be construed to mean the building official designated by the appointing authority of this jurisdiction.

## **Powers and Duties of Building Official**

- **Sec. 107.**(a) **General.** The building official is hereby authorized and directed to enforce all the provision of this code and the referenced technical codes. For such purposes, he shall have the powers of a law enforcement officer.
- (b) **Deputies** In accordance with prescribed procedures and with the approval of the appointing authority, the building official may appoint such number of technical officers and inspectors and other employees as shall be authorized from time to time. He may deputize such inspectors or employees as may be necessary to carry out the functions of the code enforcement agency.
- (c) **Right of Entry.** Whenever necessary to make an inspection to enforce any of the provisions of this code and the technical codes, or whenever the building official or his authorized representative has reasonable cause to believe that there exists in premises an unsafe, dangerous or hazardous swimming pool or spa, or appurtenances thereto, the building official or his authorized representative may enter such premises at all reasonable times to inspect the same or to perform any duty imposed upon the building official by such codes, provided that if such premises be occupied, he shall first present proper credentials and demand entry; and if such building or premises be unoccupied, he shall first make a reasonable effort to locate the owner or other persons having charge or control of the premises and demand entry. Should entry be refused, the building official or his authorized representative shall have recourse to every remedy provided by law to secure entry.
- (d) **Stop Orders.** Whenever any work is being done contrary to the provisions of this code and the technical codes, the building official may order the work stopped by notice in writing served on any persons engaged in the doing or causing such work to be done, and any such persons shall forthwith stop such work until authorized by the building official to proceed with the work.

- (e) **Occupancy Violations.** Whenever any spa/swimming pool or spa/swimming pool service equipment therein regulated by this code and the technical codes is being used contrary to the provisions of such codes, the building official may order such use discontinued by written notice served on any person causing such use to be continued. Such person shall discontinue the use within the time prescribed by the building official after receipt of such notice to make the spa/swimming pool, or portion thereof, comply with the requirements of such codes.
- (f) **Authority to Disconnect Utilities.** The building official or his authorized representative shall have the authority to disconnect any utility service or energy supplied to the spa/swimming pool or spa/swimming pool equipment therein regulated by this code or the technical codes in case of emergency where necessary to eliminate an immediate hazard to life or property. The building official shall whenever possible notify the serving utility, the owner and occupant of the spa/swimming pool or spa/swimming pool equipment of the decision to disconnect prior to taking such action, and shall notify such serving utility, owner and occupant of the spa/swimming pool or spa/swimming pool service equipment, in writing, of such disconnection immediately thereafter.
- (g) **Authority to Condemn Service Equipment.** Whenever the building official ascertains that any spa/swimming pool service equipment regulated in the technical codes has become hazardous to life, health, property, or becomes insanitary, he shall order in writing that such equipment either be removed or restored to a safe or sanitary condition, whichever is appropriate. The written notice itself shall fix a time limit for compliance with such order. No person shall use or maintain defective service equipment after receiving such notice.

When such equipment or installation is to be disconnected, a written notice of such disconnection and causes therefor shall be given within 24 hours to the serving utility, the owner or occupant of such spa/swimming pool or premises.

When any service equipment is maintained in violation of the technical codes and in violation of any notice issued pursuant to the provisions of this section, the building official shall institute any appropriate action to prevent, restrain, correct or abate the violation.

- (h) Connection after Order to Disconnect. No person shall make connections from any energy, fuel or power supply nor supply energy or fuel to any equipment which has been disconnected or ordered to be disconnected by the building official or the use of which has been ordered to be disconnected by the building official until the building official authorizes the reconnection and use of such equipment.
- (i) **Liability.** The building official, or his authorized representative charged with the enforcement of this code and the technical codes, acting in good faith and without malice in the discharge of his duties, shall not thereby render himself personally liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of his duties. Any suit brought against the building official or employee because of such act or omission performed by him in the enforcement of any provision of such codes shall be defended by this jurisdiction until final termination of such proceedings, and any judgment resulting therefrom shall be assumed by this jurisdiction.

Such codes shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any spa/swimming pool structure or spa/swimming pool service equipment therein for any damages to persons or property caused by defects, nor shall the code enforcement agency or its parent jurisdiction be held as assuming any such liability by reason of the inspections authorized by such codes or approvals issued under such codes.

- (j) **Cooperation of Other Officials and Officers.** The building official may request, and shall receive so far as is required in the discharge of his duties, the assistance and cooperation of other officials of this jurisdiction.
- (k) **Review and Update of this Code.** The Administrative Authority shall periodically review and update the code, or parts thereof, as required to maintain compatibility with the National Spa and Pool Institute Standards.

#### **Violation and Penalties**

**Sec. 108.** It shall be a civil infraction for any person, firm or corporation to erect, construct, enlarge, alter, repair, move, improve, remove, convert or demolish, equip, use, occupy or maintain any spa/swimming pool or spa/swimming pool service equipment or cause or permit the same to be done in violation of this code and the technical codes.

## **Permits Required**

- **Sec. 109.**(a) **General.** It shall be a civil infraction for any person to install, remove, alter, repair or replace or cause to be installed, removed, altered, repaired, or replaced any spa/swimming pool, or part thereof, in a building or premises without first obtaining a permit to do such work from the Administrative Authority.
  - (b) **Separate Permits.** A separate permit shall be obtained for each spa/swimming pool.

**EXCEPTION:** Repairs and remodeling which involve only the replacement of component parts of existing work with similar materials and which do not affect any structural, electrical, mechanical or plumbing installations.

#### **Application for Permit**

- **Sec. 110.**(a) **General.** Any person legally entitled to apply for and receive a permit shall make such application on forms provided for that purpose. He shall give a description of the character of the work proposed to be done and the location, ownership, occupancy and use of the premises in connection therewith. The Administrative Authority may require plans, specifications or drawings and such other information as he may deem necessary before issuance of a permit per Section 109 of this code.
- (b) **Plans Required.** Application for permits for new construction shall be accompanied by plans as required by the Administrative Authority, and in sufficient detail including the following:

- 1. <u>Plot plans</u> dimensioned and drawn to a reasonable scale and showing at least the following:
- A. Property lines, easements, right-of-way of record, and overhead utilities adjacent to spa/pool area or over the property.
- B. Existing structures, fencing, retaining walls, irregular grades, and other relevant characteristics adjacent to spa/pool area. All paths of travel via sidewalks, stairs, lighting shall be indicated on the plan.
- C. The proposed spa/pool shape and type, dimensioned and located to show setbacks, side yards, and clearances from existing structures adjacent to spa/pool area.
- D. The proposed mechanical equipment pad location as to setbacks and side yards.
- E. All diving and deck equipment items, if included.
- F. The proposed deckwork configuration, showing its anticipated drainage.
- G. The anticipated overall drainage of the spa/pool site and the location of backwash water disposal if any.
- H. The proposed or existing spa/pool barrier/enclosure.
- 2. <u>Structural plan</u> showing at least the following:
- A. The type of construction.
- B. The spa/pool dimensions, including the depth, surface area, and adequate cross-sections drawn to scale.
- C. Computations, stress diagrams, and other data sufficient to show the correctness of the plans; including the reinforcing steel schedule and detail, and design to handle any surcharge from buildings, water features or other structure, if applicable.
- D. The interior finish details.
- E. The spa/pool edge details.
- 3. <u>Mechanical plan</u> showing at least the following:
- A. The volume, system flow rate in gallons per minute, and turnover in hours.
- B. The type and size of filtration system and means of waste disposal.

- C. The type and size of spa/pool heater, including the method of venting and provisions for combustion air, if applicable.
- D. The spa/pool piping layout with all sizes shown and types of material to be used, and showing the location of the main outlet, surface skimmers, and inlets.
- E. The rated capacity of the spa/pool pump in G.P.M. (L.P.M.) at the design head with the size and type of motor indicated and identified as to type of pump.
- F. The means of adding makeup water and back flow provisions.
- G. The size, length from source to heater and routing of the gas line, if applicable.
- H. Size and location of existing electrical service.
- 4. All plans and documents submitted shall be on substantial paper and shall show the name and address of the person under whose supervision the documents were prepared.

If the Administrative Authority determines that the plans, specifications, drawings, descriptions, or information furnished by the applicant is in compliance with this code, he shall issue the permit applied for upon payment of the required fee as hereinafter fixed. The Administrative Authority shall further require that permits be obtained by the persons responsible for all of the electrical, plumbing, related utility connections and heating work in conjunction with issuance of the building permit for the spa/swimming pool structure.

The above requirements shall not void any requirements by any other department having jurisdiction.

#### **Cost of Permit**

**Sec. 111.** Every applicant for a permit to install, alter or repair a spa/swimming pool system or part thereof, shall state in writing on the application form provided for that purpose, the character of work proposed to be done and the amount and kind in connection therewith, together with such information pertinent thereto as may be required. The cost shall be as set forth in the fee schedule adopted by this jurisdiction.

## Work to be Inspected

**Sec. 112.** All spa/swimming pool installations or alterations thereto including walls and barriers, paths of travel, equipment, piping and appliances related thereto shall be inspected by the Administrative Authority before said work is covered to insure compliance with the requirements of this code.

# **Inspection Requests.**

**Sec. 113.** It shall be the duty of the person doing the work authorized by the permit to notify the Administrative Authority that said work is ready for inspection. Such notification shall be given not less than twenty-four hours before the work is to be inspected.

It shall be the duty of the person doing the work authorized by the permit, to make sure that the work will stand the test prescribed elsewhere in this code, before giving the above notification.

## Reinspections

**Sec. 114.** A reinspection fee may be assessed for each inspection or reinspection when such portion of work for which inspection is called is not complete or when corrections called for are not made.

This section is not to be interpreted as requiring reinspection fees the first time a job is rejected for failure to comply with the requirements of this code or the technical codes, but as controlling the practice of calling for inspections before the job is ready for such inspection or reinspection.

Reinspection fees may be assessed when the permit card is not properly posted on the work site, the approved plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, or for deviating from plans requiring the approval of the building official.

To obtain a reinspection, the applicant shall file an application therefor in writing upon a form furnished for that purpose, and pay the reinspection fee in accordance with the fee schedule adopted by this jurisdiction.

In instances where reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

## Suspension or Revocation.

**Sec. 115.** The building official may, in writing, suspend or revoke a permit issued under the provisions of this code and the technical codes whenever the permit is issued in error or on the basis of incorrect information supplied, or in violation of any ordinance or regulation or any of the provisions of these codes.

# Unconstitutionality.

**Sec. 116.** If any section, subsection, sentence, clause or phrase of this code is, for any reasons, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code. The legislative body hereby declares that it would have adopted this code, and each section, subsection, clause or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases be declared unconstitutional.

# **Board of Appeals/Advisory Board**

**Sec. 117.** The Board of Appeals/Advisory Board of this jurisdiction is authorized to determine the suitability of alternate materials and methods of construction and to provide for reasonable interpretations of this code.

# Chapter 2

#### **DEFINITIONS**

**Sec. 201. General.** For the purpose of this code, certain terms, phrases, words and their derivatives shall be construed as specified in this chapter. Words used in the singular include the plural and the plural the singular. Words used in the masculine gender include the feminine and the feminine the masculine.

Where terms are not defined, they shall have their ordinary accepted meanings within the context with which they are used. Webster's Third New International Dictionary of the English Language, Unabridged, copyright 1981, shall be considered as providing ordinarily accepted meanings.

#### Sec. 202. A

**ABRASION HAZARD** is a sharp or rough surface that would scrape the skin upon chance or by normal use modes.

**ACCESSIBLE** is easily exposed for inspection and the replacement of materials and/or parts with the use of simple tools, i.e., screwdriver, pliers or wrench.

**AIR INDUCTION SYSTEM** is a system activated by a separate air power unit whereby air is induced into hollow ducting built into or affixed on a spa/swimming pool floor, bench or other location.

**ALLEY** is any public way or thoroughfare, not designated as a street, which has been dedicated or deeded to the public for public use.

**APPURTENANCE** is a subordinate part or adjunct; accessory object.

**APPROVED** is acceptable by the appropriate jurisdiction.

#### Sec. 203. B

**BACKWASH** is the process of thoroughly cleaning the filter medium and/or elements by the reverse flow of water.

**Backwash Cycle** is the time required to thoroughly backwash the filter medium and/or elements and the contents of the filter vessel.

**Backwash Piping** is the pipe or hose going from the backwash outlet of filter system to a disposal point.

**Backwash Rate** is the rate of flow of water through a filter during the backwash cycle, normally expressed in U.S. gallons per minute per square foot of effective filter area.

**BARRIER** is an object or structure which separates a swimming pool or spa from a building.

**BATHER/SWIMMER** is any person using a spa/pool and adjoining deck area for the purpose of water sports, recreation or related activities.

**BEGINNERS AREA** is that water area in pools which is three feet (3') or less in water depth.

**BROMINATOR** is a device to apply or to deliver a bromine disinfectant to water at a controlled rate.

**BROMINE** is a chemical element that exists as a liquid in its elemental form or as a part of a chemical compound which is an oxidant and a biocidal agent used to disinfect pool water.

## Sec. 204. C

**CARTRIDGE** is a replaceable porous element, used in one type of filtering system.

**Depth-Type Cartridge** is a filter cartridge with a medium relying on penetration of particles into the medium for removal and providing adequate holding capacity of such particles.

**Surface-type Cartridge** is a filter cartridge with a medium relying on retention of particles on the surface of the cartridge for removal.

**CASUAL CONTACT** is contact of any body part occurring by normal use modes.

**CHEMICAL FEEDER** is a device for applying chemicals to spa/pool water.

**CHLORINATOR** is a device to apply or to deliver a chlorine disinfectant to water at a controlled rate.

**CHLORINE** is a chemical element that exists as a gas in its elemental form or as a part of a chemical compound which is an oxidant and a biocidal agent used in pool water disinfection.

**CHLORINE GENERATOR** is equipment that generates chlorine, hypochlorous acid, or hypochlorite on site for disinfection and oxidation of water contaminants.

**CPSC** is the Consumers Product Safety Commission Washington, D.C. 20207

**COVE** is the radius between the wall and the floor.

**COVER, POOL/SPA SAFETY** is a cover that uses an electric motor to open and close a retractable barrier over the entire pool surface.

**COVER, SECURABLE SPA** is a cover that completely covers the spa, and is equipped with hardware which requires special tools, i.e., keys, allen wrenches, etc. for removal.

#### Sec. 205. D

**DECK** is that area immediately adjacent to a spa/pool that is specifically constructed or installed for use by bathers.

**DECK - ABOVE GROUND** is any structure that is on top of or adjacent to the outer edges of the spa/pool that is specifically constructed or installed for the use of bathers.

**DEEP AREA** is the portion of a pool having water depths in excess of five feet (5').

**DISINFECTANT** is the application of energy or chemicals to kill undesirable or pathogenic (disease-causing) organisms.

**DIVING EQUIPMENT, COMPETITIVE** is competitive diving equipment that shall include diving boards and fulcrum-setting diving stands intended to provide adjustment for competitive diving.

**DIVING UNIT** is any permanently installed natural or man made object used for the purpose of diving or jumping into the water and further defined as follows:

**Diving Board** is a recreational mechanism for entering a swimming pool, consisting of a semirigid board that derives its elasticity through the use of a fulcrum mounted below the board.

**Diving Equipment, Manufactured** is manufactured diving equipment that shall include diving boards, jump boards, spring boards and starting platforms. Architectural features such as decorative rocks and elevated bond beams are not considered to be manufactured diving equipment.

**Jump Board** is a recreational mechanism that has a coil spring, leaf spring or comparable device located beneath the board which is activated by the force exerted by jumping on the board.

**Starting Platform** is a device installed on a swimming pool, designed for competitive swimming events.

#### Sec. 206. E

**EDGE GUARDS** are shields designed to cover sharp edges in above-ground swimming pools.

**EFFECTIVE FILTER AREA** is a total surface area through which designed flow rate will be maintained during filtration.

**Permanent Medium Type** is the filter surface that is perpendicular to the flow direction.

**Cartridge Type** is the cartridge area exposed to the direct flow of water. This excludes cartridge ends, seals, supports and other areas where flow is impaired.

**ENCLOSURE** is an object or structure which surrounds a swimming pool. An enclosure may also serve as a barrier.

**EXISTING POOL/SPA** is a spa or pool in existence or for which a permit to construct has been obtained and construction commenced on or before the effective date of this code.

#### Sec. 207. F

**FACTOR OF SAFETY** is the ultimate load divided by the safe load or the ultimate strength divided by the allowable stress.

**FILTER** is a device that removes undissolved particles from water by recirculating the water through a porous substance (a filter medium or element).

**Filter Aid** is a type of finely divided medium used to coat a septum type filter; usually diatomaceous earth, processed perlite or similar material.

**Permanent Medium Filter** is a filter that utilizes a medium, e.g. sand, that under normal use will not have to be replaced.

**Diatomaceous Earth Filter** is a filter that utilizes a thin coating of diatomaceous earth over a porous fabric as its filter medium that periodically must be replaced.

**Cartridge Filter** is a filter that utilizes a porous element that acts as a filter medium.

**FILTER CYCLE** is the operating time between cleaning and/or backwash cycles.

**FILTER ELEMENT** is a device within a filter tank designed to entrap solids and conduct water to a manifold, collection header, pipe, or similar conduit and return it to the pool. A filter element usually consists of a septum and septum support, or a cartridge.

**Filter Medium** is a finely graded material (such as sand, diatomaceous earth, polyester fabric, anthracite, etc.) that removes filterable particles from the suction of a pump.

**FILTER, PRESSURE-TYPE** is a filter that operates under pressure generated by a pump.

**FILTER, VACUUM (or SUCTION)** is a filter that operates under a vacuum from the suction of a pump.

**FILTRATION FLOW** is the design rate of flow, in gallons per minute (GPM) or gallons per hour (GPH) through the filter system with a new, clean filter medium.

**FILTRATION RATE** is the rate of filtration of water through a filter during the filter cycle expressed in U.S. gallons per minute per square foot of effective filter area.

**FLOOR** is the bottom surface of a spa/pool ranging from a horizontal plane up to a maximum of a 45 degree slope.

**FOOTHOLD/HANDHOLD** is any protrusion or indention with any portion greater than one and one-half inches from the exterior vertical surface; or

For picket, wrought iron or other type of barrier or enclosure having openings where a sphere of one and one-half inch diameter can penetrate to depth greater than one and one-half inches from the exterior vertical surface.

#### Sec. 208. G

**GATE** is a removable framework or solid structure that swings on hinges or slides horizontally to control exit or entrance through a fence or wall.

#### Sec. 209. H

**HANDHOLD/HANDRAIL** is a device that can be gripped by a bather for the purpose of resting and/or steadying him/herself. It is not limited to but may be located within or without the spa/pool or as part of a set of steps or deck-installed equipment.

## HANDHOLD/FOOTHOLD see FOOTHOLD/HANDHOLD, Sec. 207

# **HEALTH DEPARTMENT - Pima County or Arizona State Department of Health**

**HOT TUB** is a spa constructed of wood with sides and bottom formed separately; and the whole tub joins together by pressure from the surrounding hoops, bands or rods; as distinct from spa units formed of plastic, concrete, metal or other materials.

**HYDROJET is** a fitting that blends air and water creating a high velocity, turbulent stream of air-enriched water.

HYDROTHERAPY SPA or HOT TUB is a unit that may have a therapeutic use which is not drained, cleaned or refilled for each individual. It may include, but not be limited to, hydrojet circulation, hot water, cold water mineral baths, air induction bubbles, or any combination thereof. Industry terminology for a spa includes, but is not limited to, "therapeutic pool," "hydrotherapy pool," "whirlpool," "hot spa," etc. NSPI standards exclude facilities used or under the direct supervision and control of licensed medical personnel.

# Sec. 210. I

**INLET, RETURN** is the aperture or fitting through which the water under positive pressure return into the pool.

#### Sec. 211. J

**JUMP BOARD** is a recreational mechanism that has a coil spring, leaf spring, or comparable device located beneath the board which is activated by the force exerted in jumping on the board.

Sec. 212. K No definitions

Sec. 213. L

**LADDERS** are a series of generally vertically separated treads or rungs connected by vertical rail members or independently fastened to an adjacent vertical pool wall.

**Deck Ladder** is a ladder for deck access from outside the pool.

**In-Pool Ladder** is a ladder located in a pool to provide ingress and egress from the deck.

**Limited Access Ladder** is any ladder with provision for making entry inaccessible when a pool is not in use, i.e., swing-up, slide-up or equivalent.

**Portable Ladder** is a ladder that is intended to be removed easily when a pool is not in use.

**LIFEGUARD** is a person expert in rescue and resuscitation and properly certified by a duly authorized agency of the appropriate jurisdiction.

**LINER** is a membrane that acts as a container for the water.

**LOWER DISTRIBUTION SYSTEM (UNDERDRAIN)** is used in the bottom of a permanent media filter to collect the water uniformly during the filtering and to distribute the backwash uniformly during the backwashing.

#### Sec. 214. M

**MAKE-UP WATER** is fresh water used to fill or refill the pool. (See also SOURCE WATER).

#### Sec. 215. N

**NEW POOL CONSTRUCTION** is the activity of building or installing a pool structure, and its component parts, where no such structure has previously existed.

**NONSWIMMING AREA** is any portion of a pool where water depth, offset ledges, or similar irregularities would prevent normal swimming activities.

**NSPI** is the National Spa & Pool Institute

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### Sec. 216. O

**OUTLET, SUCTION** is the aperture or fitting through which the water under negative pressure is drawn from the spa/pool. Measures to prevent entrapment shall be incorporated into the pool design or devices installed to break suction.

**OVERFLOW SYSTEM** refers to removal of pool surface water through the use of overflows, surface skimmers, and surface water collection systems of various design and manufacture.

**OZONE, LOW OUTPUT GENERATING EQUIPMENT** refers to units which will produce ozone in air at a concentration less than 500 ppm.

#### Sec. 217. P

**PATH OF TRAVEL** is any sidewalk, stair or path leading from the home or from a public way. Changes in elevation, stairs, handrails and guards shall conform to the current Building Code. Paths adjacent on elevated areas must be provided with guards when within two feet of the drop or slope exceeding 1 in 2.

**PINCHING HAZARD** is any configuration of components that would pinch or entrap the fingers or toes of a child or adult.

**POOL, PERMANENTLY INSTALLED,** is a pool that is constructed in the ground or in a building in such a manner that it cannot be readily disassembled for storage.

**Aboveground Pool** is a pool of any shape that has a constant depth of more than twenty four (24") inches, or holds more than 2,500 gallons of water or has a water surface area in excess of 150 square feet, installed entirely above ground. For the purpose of the National Electrical Code, see also NEC Article 680 and the definition of storable swimming or wading pools.

**Inground Swimming Pool** is any pool whose sides rest in partial or full contact with the earth.

**On-Ground Swimming Pool** is an aboveground pool whose sides rest fully above the surrounding earth and that has a deep area below the ground level where diving equipment is prohibited.

**Public Pool** is any pool, other than a residential pool, which is intended to be used for swimming or bathing and is operated by an owner, lessee, operator, licensee or concessionaire, regardless of whether a fee is charged for use. References within the standard to various types of public pools are defined by the following categories:

Class A: Competition Pool is any pool intended for use for accredited competitive aquatic events such as Federation International De Natation Amateur (FINA), U.S. Swimming,

U.S. Diving, National Collegiate Athletic Association (NCAA), National Federation of State High School Associations (NFSHSA), etc. The pool may also be used for recreation.

**Class B: Public Pool** is any pool intended for public recreational use.

Class C: Semi-Public Pool is any pool operated solely for and in conjunction with lodgings such as, but not limited to, hotels, motels, apartments, condominiums, mobile home parks.

Class D: Other Pool is any pool operated for medical treatment, therapy, exercise, lap swimming, recreational play, and other special purposes, including, but not limited to, wave or surf action pools, activity pools, splash pools, kiddie pools and play areas.

Public pools may be diving or nondiving. If diving, they shall be further classified into types as an indication of the suitability of a pool for use with diving equipment.

**Type VI through Type IX** are semi-public/public pools suitable for the installation of diving equipment by type.

 $\mathbf{Type}\ \mathbf{N}$  is a semi-public/public pool where the installation of diving equipment is prohibited.

Wading Pool is a pool that has a shallow depth used for wading.

**Residential Pool** is any constructed pool, permanent or non-portable which is intended for non-commercial use as a swimming pool by not more than one owner family and their guests, and which is over twenty-four inches (24") in depth and (a) has a surface area exceeding 80 square feet, or (b) a volume over 2,500 gallons.

Residential pools shall be further classified into types as an indication of the suitability of a pool for use with diving equipment.

**Type O** is any residential pool where the installation of diving equipment is prohibited.

Type I through Type V is any residential pool suitable for the installation of diving equipment.

**Semi-Artificial** is an outdoor bathing place which is partly artificial and partly natural in character.

**Other pools** such as those operated for medical treatment, therapy, exercise, lap swimming, recreational play, and other special purposes are intended to be covered within the scope of this code.

**PSI** is an abbreviation for POUNDS PER SQUARE INCH.

**PUMP** is a mechanical device, usually powered by an electric motor, which causes hydraulic flow and pressure for the purpose of filtration, heating, and circulation of pool water.

**PUNCTURE HAZARD** is any surface or protrusion that would puncture a bather's skin under casual contact.

Sec. 218. Q No Definitions

Sec. 219. R

**REHABILITATION** is the activity of restoring all or part of a pool structure, and its component parts, back into good condition, including the rebuilding and/or replacing of worn and broken parts of components.

**REMOVABLE** is the capability of being disassembled with the use of only simple tools such as a screwdriver, pliers or wrench.

**RETURN PIPING** is that piping which carriers water from the filter to the spa/pool.

**ROPE AND FLOAT LINE** is a continuous line not less than one-fourth inch (1/4") in diameter, which is supported by buoys and attached to opposite sides of a pool to separate the deep and shallow ends.

Sec. 220. S

**SAFETY COVER** is a dome cover placed over the suction inlet so as to prevent entrapment.

**SHALLOW AREA** is a portion of a pool with water depths less than five feet (5').

**SKIMMING SYSTEM** is overflow system which encompasses perimeter type overflows, surface skimmers and surface water collection systems of various design and manufacturer.

**SLIP RESISTING** is a surface that has been so treated or constructed as to significantly reduce the chance of slipping. The surface should not be an abrasion hazard.

**SLOPE** is an inclined surface.

**SOURCE WATER** is fresh water used to fill or refill the pool (see also MAKE-UP WATER).

**SPA** (see HYDROTHERAPY SPA or HOT TUB) is a hydrotherapy unit of irregular or geometric shell design.

**Portable Spa, Residential** is a spa in which all control, water-heating, and water-circulating equipment is an integral part of the product. Portable residential spas may be permanently wired or cord-connected. The spa shall be movable and above ground.

**Permanent Spa** is a spa in which the water-heating and water-circulating equipment is not an integral part of the product. Permanent spas may employ separate components such as an individual filter, pump, heater, and controls, or they may employ assembled combinations of various components.

**Public Spa** is any spa, other than an residential spa, which is operated by an owner, lessee, operator, licensee or concessionaire, regardless of whether a fee is charged for use.

**Semi-public Spa** is any spa operated solely for and in conjunction with lodgings such as, but not limited to, hotels, motels, apartments, condominiums, mobile home parks.

**STATIONARY DIVING PLATFORM** is used for diving and is constructed or located on site. It may be natural or artificial rocks, pedestals, or other items constructed on site. Architectural features such as decorative rocks and elevated bond beams are not considered to be manufactured diving equipment.

**STEPS, RECESSED STEPS, AND RECESSED TREADS** is a means of pool ingress and egress that may be used in conjunction with one another.

**Steps** are riser/tread or series of risers/treads extending down from the deck and terminating at the pool wall. They may be recessed so that all risers are located outside of swimming areas.

**Recessed Treads** are a series of vertically spaced cavities in the pool wall creating tread areas for stepholes.

**SUCTION PIPING** is that piping which moves water from the spa/pool to the filter.

**SURFACE SKIMMING SYSTEM** is the term that encompasses perimeter-type overflows, surface skimmers, and surface water collection systems of various design and manufacture.

**SWIMMER/BATHER** is any person using a spa/pool and adjoining deck area for the purpose of water sports, recreation or related activities.

#### Sec. 221. T

**TAMPERPROOF** is a term that means tools are required to alter or remove portions of the equipment.

**TOXIC** is a term meaning that a given substance has an adverse physiological effect on man or other living organisms.

**TREAD CONTACT SURFACE** means an area that comes in contact with surfaces of a ladder, step, stair or ramp.

**TURNOVER** is the period of time (usually in hours) required to circulate a volume of water equal to the spa/pool capacity.

Sec. 222. U

**UNDERWATER LIGHT** is a fixture designed to illuminate a pool beneath the water surface.

Wet Niche Light is a watertight and water cooled light unit placed in a submerged, wet niche in the pool wall and accessible only from the pool.

**Dry Niche Light** is a light unit placed behind a watertight window in the spa/pool wall.

Sec. 223. V

**VERTICAL** is a wall up to a positive 11 degree angle towards the spa/pool's interior from plumb.

**VINYL LINER** is that membrane that acts as a container for the water.

Sec. 224. W

**WALL** is the interior spa/pool wall surface consisting of surfaces from the plumb to a 45 degree slope.

**WASTE WATER DISPOSAL SYSTEM** is the system, approved by the building official, such as a storm sewer, open pit, leach field, irrigation system or to a wash or street when the clorine is neutralized.

**WATERLINE** is a term defined in one of the following ways:

**Skimmer System** - The waterline shall be at midpoint of the operating range of the skimmers.

**Overflow System** - The waterline shall be at the top of the overflow rim.

**WINTERIZING** is the procedure for preparing spa/pools from freezing weather. Includes chemical treatment of the standard water, plus physical and chemical protection of the pool and its equipment against freezing.

Sec. 225. X No Definitions

Sec. 226. Y No Definitions

Sec. 227. Z No Definitions

# Chapter 3

#### RESIDENTIAL SWIMMING POOLS

## Scope

- **Sec. 301**.(a) This chapter is intended to cover permanent in-ground pools intended to be used for swimming.
- 1. This chapter is intended to cover certain aspects of the design, equipment, operation, installation, new construction and rehabilitation of swimming pools. This code may be met notwithstanding certain variations in equipment, materials, and design.
  - (b) This chapter is not meant to cover semi-public, public pools, or above-ground pools
  - (c) Other chapters are referenced in this chapter for items not covered.

## **Materials of Construction**

**Sec. 302.** Swimming pools and all appurtenances thereto shall be constructed of materials which are nontoxic to man and the environment; which are impervious and enduring; which can withstand the design stresses; and which will provide a watertight structure with a smooth and easily cleaned surface without cracks or joints, excluding structural joints, or to which a smooth, easily cleaned surface finish is applied or attached.

#### **Structural Design**

- **Sec. 303.**(a) Prior to construction, rehabilitation, or alteration of a permanently installed residential pool, plans and specifications shall be submitted to the administrative authority for review, approval, and issuance of a permit to construct or rehabilitate, as may be required.
- (b) The structural design and materials used shall be in accordance with generally accepted good structural engineering practices.
  - (c) Sand or earth shall not be permitted as an interior finish in a swimming pool.
- (d) In climates subject to freezing temperatures, the pool shell and appurtenances, piping, filter system, pump and motor, and other components shall be so designed and constructed to facilitate protection from damage due to freezing.
- (e) The surfaces within the pool intended to provide footing for bathers shall be designed to provide a slip-resisting surface. The roughness or irregularity of such surfaces shall not cause injury or discomfort to the feet during normal use.
- (f) The colors, patterns, or finishes of the pool interior shall not be such as to obscure the existence or presence of objects or surfaces within the pool.

## **Dimensional Design**

- **Sec. 304.**(a) No limits are specified for shape of swimming pools except that consideration shall be given from the standpoint of safety and circulation of the swimming pool water.
- 1. There shall be no protrusions, extensions, means of entanglement, or other obstructions in the swimming area which can cause the entrapment or injury of the bather.
- 2. There shall be construction tolerances allowed on all dimensional designs. Overall length, width, and depth in the deep end may vary plus or minus three inches. All other overall dimensions may vary plus or minus two inches unless otherwise specified.
- (b). Walls shall not be greater than 11 inches from plumb, as shown in Appendix A, Figure 2, for a minimum depth of two feet, nine inches (2'-9") from the waterline in deep areas or two feet, three inches (2'-3") in shallow areas. Below these depths the wall may be radiused to join the floor. Type I pools shall have plumb walls as shown in Appendix A, Figure 6.
  - (c). Floor slopes shall, as a minimum, comply with the following:
  - 1. All slopes shall be uniform.
- 2. The slope of the floor from the shallow end wall towards the deep end shall not exceed one foot in seven feet (1':7') to the point of the first slope change.
- 3. The point of the first slope change shall be defined as the point at which the floor slope exceeds one foot in seven foot (1':7') and is at least six feet (6') from the shallow end wall.
- 4. The slope of the floor from the point of the first slope change to the deep end wall shall not exceed one foot in three feet (1':3').
- (d). Water depths at the shallow end of the swimming area shall be a minimum of two feet, nine inches (2'-9") and a maximum of three feet, six inches (3'-6") except for special purpose pools.
- 1. No minimum water depth shall be specified in a nonswimming area. The nonswimming area shall be visually set apart from swimming areas of the pool.
- (e). Pools of the type where manufactured diving units are permitted shall have the area and depth of water in compliance with the drawings for Type I through Type V pools, shown in Appendix A.
- 1. Where a manufactured diving unit is installed, it shall conform to the specifications set forth in Section 305(g) and shall be so located in the diving area of the pool so as to provide the minimum dimensions shown in Appendix A for Types I through V pools.
- 2. The tip of the manufactured diving unit shall be located at Point "A", which is the reference point for all other dimensions.

3. Minimum unobstructed head room from the top of the manufactured diving unit shall be provided for diving in accordance with the following table unless greater dimensions are called for by the manufacturer.

Pool Type	Head Room
I	Not Permitted
II	12 feet
III	12 feet
IV	13 feet
V	14 feet

- 4. The minimum allowable underwater cross sections at B, C, and D shall be as shown on drawings of Types I through V pools in Appendix A.
- 5. Constant depth swimming pools on which manufactured diving units are prohibited (Type O) with water depths not exceeding four feet (4') shall not be limited in dimensional design as provided in Sections 304(a) through 304(d).
- 6. Stationary diving platform(s) built on site shall be located in the diving area of the pool so as to provide the minimum dimension as shown in Appendix A, Figure 6 at a maximum height of three feet (3'). Point "A" shall be eighteen inches (18") in front of the wall at the platform centerline. The stationary diving platform(s) sgach unit.
- 2. A label shall be permanently affixed to the manufactured diving equipment or jump board and shall include:
  - A. Manufacturer's name and address.
  - B. Board equipment length.
  - C. Fulcrum setting specifications (if applicable).
  - D. Reference to the current year of the applicable section and NSPI standard.
- 3. Manufactured diving equipment suitable for installation on a lower pool type may be installed on any higher pool type providing no less a water envelope is provided from the tip of the board than called for in the lower type. Manufactured diving equipment of a greater type, e.g., Type III, shall not be installed on a pool of lesser type, e.g., Type II. Should manufactured diving equipment be installed at any greater height than specified for the lower type pool, water surface area and geometry shall be provided for the type pool which permits board installation at that height.
  - 4. Manufactured diving equipment shall have slip-resisting tread surfaces.
- 5. Manufactured diving equipment shall be permanently anchored to the pool deck. The edge of the board at the tip end shall be level with the water surface. The tip end of the board over the pool water surface may be higher than the butt end of the board. Refer to manufacturer's recommendations.

(f). Swimming Pool Slides - The requirements of the U.S. Consumer Product Safety Commission (CPSC) Standard for Swimming Pool Slides as published in the Code of Federal Regulations 16CFR, Part 1207, shall be used for standards relating to swimming pool slides. Installation and use instructions shall be provided with each unit by the manufacturer.

## **Circulation Systems**

- **Sec. 306**.(a) A circulation system consisting of pumps, piping, return inlets and suction outlets, filters, and other necessary equipment shall be provided for complete circulation of water through all parts of the pool.
- 1. The equipment shall be of adequate size to turn over the entire pool water capacity at least once every twelve (12) hours. Water clarity shall be maintained.
- 2. Circulation system components which require replacement or servicing shall be accessible for inspection, repair, or replacement, and shall be installed according to the manufacturer's instructions.
- 3. Pool equipment shall be properly supported to prevent damage from misalignment, settlement, etc. The equipment shall be mounted so as to minimize the potential for the accumulation of debris and moisture, following manufacturer's instructions.
- (b) The water velocity in the pool piping shall not exceed ten feet (10') per second for discharge piping and eight feet (8') per second for suction piping, unless calculations are provided to show that the greater flow is possible with the pump and piping provided.
- (c) The circulation system piping and fittings shall be nontoxic, shall be considered to be process piping, and shall be of material able to withstand operating pressures and operating conditions.
- 1. Equipment shall be designed and fabricated to drain the pool water from the equipment, by removal of drain plugs and manipulating valves, or by other methods. Refer to manufacturer's recommendations for specific information on draining the system.
- (d) A pressure or vacuum gauge or other means of indicating system condition shall be provided in the circulation system in an easily readable location.
- (e) The circulation system shall be capable of maintaining water clarity and water chemistry requirements. Time clocks may be used to set the operating period. When time clock are used, they shall also govern the operating time of appurtenant devices such as chemical/disinfectant feeders, slurry feeders, heaters, etc., that are dependent upon circulation pump flow.
- (f). Written operation and maintenance instructions shall be provided for the circulation system.

#### **Filters**

- **Sec. 307.**(a) Filters shall be designed so that after cleaning per manufacturer's instructions the system can provide the water clarity noted in Section 306(e).
  - 1. Filters shall be designed so that filtration surfaces can be inspected and serviced.
- (b). On pressure-type filters, a means shall be provided to permit the release of internal pressure.
- 1. Any filter incorporating an automatic internal air release as its principal means of air release shall have lids which provide a slow and safe release of pressure as a part of its design.
- 2. Any separation tank used in conjunction with any filter tank shall have a manual means of air release or a lid which provides a slow and safe release of pressure as it is opened as a part of its design.
- (c) Pressure filters and separation tanks shall have operation and maintenance instructions permanently installed on the filter or separation tank and shall include a precautionary statement warning not to start up the system after maintenance without first opening the air release and proper reassembly of the filter and separation tank. The statement shall be visible and noticeable within the area of the air release.

# **Pumps and Motors**

- **Sec. 308.**(a) A pump and motor shall be provided for circulation of the pool water. Performance of all pumps shall meet or exceed the conditions of flow required for filtering and cleaning (if applicable) the filters against the total dynamic head developed by the complete system.
- (b) With the pressure filter systems a cleanable strainer or screen shall be provided upstream of the circulation pump(s) to remove solids, debris, hair, lint, etc.
  - (c) Pump(s) and motor(s) shall be accessible for inspection and service.
- (d) The design and construction of the pump(s) and component parts shall provide safe operation that is not hazardous to the operator or maintenance personnel.
- (e) Where a mechanical pump seal is provided, components of the seal shall be corrosion-resisting and capable of operating under conditions normally encountered in pool operation.
- (f) All motors shall have as minimum a open drip-proof enclosure and be constructed electrically and mechanically to perform satisfactorily and safely under the conditions of load environment normally encountered in swimming pool installations.

- (g) Motor(s) shall be capable of operating the pump(s) under full load with a voltage variation of plus or minus ten percent from the nameplate rating. If the maximum service factor of the motor is exceeded (at full voltage), the manufacturer shall indicate this on the pump curve.
- (h) All motors shall have thermal or current overload protection, either built in or in line starter, to provide locked rotor and running protection.
- (i) Where the pump is below the waterline, valves shall be installed on permanently connected suction and discharge lines, located in an accessible place outside the walls of the pool, where they shall be readily and easily accessible for maintenance and removal of the pump.

#### **Return Inlets and Suction Outlets**

- **Sec. 309.**(a) Return inlet(s) and suction outlet(s) shall be provided and arranged to produce a uniform disinfectant residual throughout the entire pool. Where skimmers are used, the return inlet(s) shall be located so as to help bring floating particles within range of the skimmers.
- (b) The number of return inlet(s) shall be based on a minimum of one (1) return inlet per six hundred (600) square feet of pool surface area, or fraction thereof. Return inlet fittings shall be installed of sufficient pipe size or quantity to allow a full design turnover rate of the circulation system in accordance with the manufacturer's recommendations for return inlets.
- 1. Return inlet(s) from the circulation system shall be designed so as not to constitute a hazard to the bather.
- (c) The pool shall not be operated if the suction outlet grate is missing broken, or secured in such a way that it can be removed without the use of tools.
- (d) If the suction outlet system, such as a filtration system, automatic cleaning system, solar system etc., has a single suction outlet, or multiple suction outlets which can be isolated by valves, each suction outlet shall conform to International Association of Plumbing and Mechanical Officials Standard ANSI/ASME A112.19 8M-1987 to protect against bather entrapment by either:
  - 1. An approved antivortex cover.
  - 2. A twelve inch by twelve inch (12" x 12") or larger grate.
  - 3. Other approved means such as venting or VRS.
- 4. A minimum of two (2) suction outlets provided for each pump in the suction outlet system, separated by a minimum of three feet (3') or located on two (2) different planes; i.e. one (1) on the bottom and one (1) on the vertical wall, or two (2) separate vertical walls. These suction outlets shall be plumbed such that water is drawn through them simultaneously through a common line to the pump.

## **Surface Skimmer Systems.**

- **Sec. 310**.(a) A surface skimming system shall be provided on all residential swimming pools, and shall be designed and constructed to skim the pool surface when the water level is maintained within the operational parameters of the system's rim or weir device.
- (b) Skimming devices shall be designed and installed so as not to constitute a hazard to the bather.
- (c) Where automatic surface skimmers are used as the sole overflow system, at least one (1) surface skimmer shall be provided for each eight hundred (800) square feet or fraction thereof of the water surface area. Nominal recessed areas such as stairs, swimouts, spas, etc., shall not be considered in the calculation. Where skimmers are used, they shall be located to maintain effective skimming action over the entire surface of the pool.

## **Electrical Requirements.**

**Sec. 311**. The requirements of the National Electrical Code (NEC), as published by the National Fire Protection Association, amended and adopted by the jurisdiction, shall be followed.

#### Heaters

- **Sec. 312.**(a) Swimming pool heaters shall be tested by a nationally recognized testing agency and comply with the appropriate current nationally recognized standards.
- (b) The heater(s) shall be installed according to the manufacturer's recommendations. Heaters shall not be installed in narrow side yards or those areas providing emergency escape routes. Heaters shall be installed no closer to property lines than 4 feet.
- 1. The heater shall be installed on a concrete (or equivalent) base unless it is specifically designed for installation on a combustible surface.
- 2. Adequate clearances shall be maintained on all sides and over the top of the heater as shown in the manufacturer's instructions.
  - 3. The heater shall have adequate ventilation in order to assure proper combustion.
- 4. When installing a heater indoors, the heater shall be installed in accordance with the Mechanical Code as amended and adopted by the Administrative Authority, and the manufacturer's recommendation for properly sized air openings to the enclosure.
- A. Draft or venting devices shall be installed according to the manufacturer's recommendations and shall not be modified.
- B. A heater using propane gas shall not be installed in a pit or basement. Whenever installing a heater using propane gas, the manufacturer's instructions shall be followed.

#### (d). Heater Piping System:

- 1. The heater gas supply piping shall comply with the Plumbing Code as amended and approved by the administrative authority. When installing a gas-fired heater, the gas line shall be run from the gas meter as directly as practical.
- 2. The heater circulation system shall comply with the manufacturer's recommendations.
- 3. The water piping system shall be installed according to the manufacturer's recommendations.
- A. When installing a heater and a filter system, adequate provisions shall be made so that the heater does not cause excessive pressure drop to the filter system. Refer to manufacturer's requirements and/or recommendations for installation of bypass valves.

## Water Supply.

- **Sec. 313.**(a) No direct mechanical connection shall be made between the potable water supply and the swimming pool, chlorinating equipment, or the system of piping for the pool, unless it is protected against backflow and backsiphonage in a manner approved by the building official or through an air gap, or other equivalent means approved by the building official.
- (b) An over-the-rim spout, if used, shall be located under a diving board, adjacent to a ladder, or otherwise properly shielded so as not to create a hazard. Its open end shall have no sharp edges and shall not protrude more than two inches (2") beyond the edge of the pool.

## Waste Water Disposal.

**Sec. 314.** Backwash water shall be disposed of and contained on site. All discharges of backwash water shall comply with applicable Town ordinances and Arizona Department of Environmental Quality (ADEQ) Engineering bulletins. Backwash water shall be contained in such a manner that the soil conditions will allow the water to percolate into the soil without migrating to adjacent properties, affecting the pool shell or decks or the foundation of the home or other structures. Sites where adjacent properties are lower must assess placement of backwash water area to ensure subsurface water will not affect those properties.

Pools may be drained to the street when the the water being discharged is chlorine free, at a Ph of 7 plus or minus.5, and no known biological hazards are present. Any stain or residue resulting from water disposal shall be removed by rinsing with potable water or other approved means. Water may be discharged to a wash when the above criteria are met and with measures to prevent erosion of the wash bank or channel.

#### Disinfectant Equipment, Oxidation Equipment, and Chemical Feeders

**Sec. 315.**(a) Disinfectant equipment, oxidation equipment, and chemical feeders, hereafter referred to jointly as "equipment" shall comply with nationally recognized standards.

The equipment and the chemical feeders shall be capable of precisely introducing a sufficient quantity of a disinfecting agent.

- (b) Chemical Feeders. Good engineering practices and manufacturer's instructions shall be used in installing chemical feeders.
- (c) Low Ozone Output Generating Equipment. The installation of ozone generating equipment shall be limited to low ozone output generating equipment. The installation and use of ozone generating equipment shall conform to the following:
- 1. Installation of ozone generating equipment shall allow for indications of operation or malfunction to be easily observed. The equipment shall be installed in a manner such that a malfunction will not endanger operators or pool users.
- 2. Ozone generating equipment shall be used in conjunction with other chemical treatments. Normal maintenance and monitoring of water chemistry shall be followed.
- 3. Good engineering practices and manufacturer's recommendations shall be used to determine where and how ozone shall be injected.

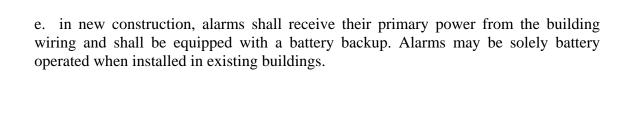
# Safety, Path of Travel

- **Sec. 316.** A residential pool shall be provided with a suitable handhold around its perimeter in areas where depths exceed three feet six inches (3'6"). Handholds shall be provided no further apart than four feet (4') and shall consist of any one (1) or a combination of items listed in the following:
- 1. Coping, ledge, or deck along the immediate top edge of the pool which provides a slip-resisting surface of at least four inches (4") minimum horizontal width and located at or not more than twelve inches (12") above the waterline; or
  - 2. Ladders, stairs, or seat ledges; or
- 3. A secured rope or railing placed at or not more than twelve inches (12") above the waterline.
- (a) Rope anchor devices shall be installed at a minimum of one foot (1') and a maximum of two feet (2') on the shallow end side of a point of change in floor slope. In pools where the slope change occurs in water depths less than four feet six inches (4'6"), a rope, supported by buoys, shall be installed.
- **PATH OF TRAVEL** is any sidewalk, stair or path leading from the home to the pool or spa. Changes in elevation, stairs, handrails and guards shall conform to the Residential Building Code. Paths adjacent on elevated areas must be provided with guards when within two feet of the drop or slope exceeding 1 in 2. Stairs or steps leading to the pool area or leading to raised areas around pools and spas shall be provided with a handrail when there is more than one riser unless the tread is more than 24 inches between risers. Stairs and handrails must meet the provisions of the Residential Building Code. Hand rails in this section are in addition to those required for exiting the pool. Walking surfaces shall be non skid.

### **Barriers and Enclosures/Residential Pools**

- **Sec. 317**. Outdoor residential swimming pools shall be provided with an enclosure and barrier meeting the following requirements:
- 1. Barriers and enclosures shall be a minimum of 5 feet in height above finished grade or other walking surface, measured on the side opposite the swimming pool.
- 2. No opening in a barrier or enclosure shall allow passage of a sphere larger than 4 inches.
- 3. The vertical distance between the bottom of a barrier or enclosure and the finished grade or walking surface shall not exceed 4 inches.
- 4. The barrier or enclosure shall be constructed so as not to provide opportunity for climbing on the side opposite the pool and the interior when common walls are present. Where a protrusion, indention, or top surface is at a continuous angle of inclination towards the barrier or enclosure equal to 45 degrees above the horizontal and otherwise does not provide a handhold or foothold, it shall be deemed not to provide an opportunity for climbing, for purposes of this code. Openings in chain-link fences, exceeding 1 inch, shall be slatted.
- A. A non-climable protion of the enclosure or barrier of 48 continious inches shall be provided as a part of the 5 foot height. The 48" may be provided anywhere in the 60 height.
- B. Wrought iron or wood barriers or enclosures shall be constructed with at least 48 inches between the top surface of the horizontal members.
- C. Any space which falls within the area within a 48 inch radius, centered at the top of the barrier/enclosure, must be maintained free of objects that provide a means to climb.
- D. Any pool equipment or pool related structures shall be installed so that the 48 inch radius will be maintained for any common wall that separates properties.
- 5. Gates placed in an enclosure or barrier shall comply with the above. All gates shall be not less than 60" in height and be self-closing and self-latching. Where the latch is less than 54" above the walking surface or 50" above a foothold, the latch shall be installed on the pool side of the gate not less than 42" above the walking surface, and the gate and barrier shall have no opening greater than 1 inch within 18 inches of the latch. Gates in a barrier shall be installed to swing in a direction opposite the pool.
- 6. The Building Official may grant an exception to the requirements of enclosing a swimming pool when he finds that there is a barrier or enclosure existing on the premises by reason of landscaping, or topography suitable to prevent access to the pool area.
  - 7. A pool safety cover may be used for a barrier if all the following conditions are met:

- a. When in the closed position, a sphere 4 inches in diameter is prevented from reaching the water surface.
  - b. The cover is designed to support a static load of 485 pounds.
- c. The electric motor switch shall be key-operated or locked and there shall be an additional power disconnect located not less than 54" above the finished grade, deck or other walking surfaces.
- 8. Any wall of a dwelling or other building may be used as part of an enclosure or barrier if all the following conditions are met:
- a. Windows leading to the swimming pool area shall be provided with a latching device located not less than 54 inches above the floor. Bedroom egress windows shall not enter into a pool area and shall not be modified to comply with this code.
- b. Hinged doors leading to the swimming pool area shall be self-closing/self-latching with the latch located not less than 54 inches above the finished grade or other walking surface, measured on the side opposite the swimming pool. Hinged screen doors when used as a barrier shall be self-closing/self-latching and protected with a substantial grill on the pool side to a minimum height of 48" above the walking surface.
- c. A sliding door leading to the swimming pool area shall be provided with a self-closing and self-latching device on the door or the screen not less than 54 inches above the finished grade or other walking surface, measured on the side opposite the swimming pool. Screen doors shall comply with the closing requirements and be protected with a substantial grill on the pool side to a minimum height of 48" above the walking surface.
  - 9. Alarms may be used on doors being used as part of a barrier in lieu of the self-closing door when the following conditions are met:
  - a. doors may be equipped with an alarm which produces an audible warning when the door and its screen, if present, are opened.
  - b. the alarm shall sound continuously immediately after the door is opened, and be capable of being heard through the house during normal household activities. The alarm shall not automatically reset after operation but shall be manually reset at the touch pad or switch.
  - c. the sound shall be distinctively different from the sounds made by any smoke detector or other alarm installed in the house.
  - d. the alarm may be equipped with a manual means, such as a touch-pad or switch, to temporarily deactivate the alarm for not more than 15 seconds to accommodate a single opening of the door. The deactivation means shall be located at least 54 inches above the floor or installed in a panelboard or control panel which is inaccessible to children.



# Chapter 4

#### PERMANENTLY INSTALLED RESIDENTIAL SPAS

## Scope

- **Sec. 401.**(a) This chapter is intended to cover spas, hydrotherapy units of irregular or geometric shell design, which are permanent residential spas intended to be used for bathing.
- 1. This chapter is intended to cover certain aspects of the design, equipment, operation, installation, new construction and rehabilitation of spas. This chapter may be met notwithstanding certain variations in equipment, materials, and design.
- (b) This chapter is not meant to cover public spas, public/commercial spas, portable spas, and other spas such as those operated for medical treatment, physical therapy, or other special purposes.
  - (c) Other chapters are referenced in this chapter for items not covered.

#### **Materials of Construction**

- **Sec. 402.(a)** The materials of components and accessories used in permanently installed residential spas shall comply with the Standards in Appendix A, Table 1. These materials shall be capable of fulfilling the design, installation and intended use requirements in this standard.
- (b) The materials for components and accessories to be used in and around spas shall be such that the operational strength of the entire assembly shall not be adversely affected by exposure to rain, snow, ice, sunlight, local normal temperature extremes, local normal wind variations, expected local air pollution products, and the mechanical, electrical, and chemical environment in and around spas. "Local normal" temperature extremes and wind variations are defined as the average annual recorded limits for the past ten (10) years at any spa installation point in the U.S.A., where such statistical information exists in the latest "Statistical Abstract of the United States", U.S. Department of Commerce, Bureau of the Census, Section 7, Geography and Environment.
- (c) The selection of all materials for components and accessories to be used in and around spas shall be such that all parts with external surfaces and edges that may come in contact with the user are assembled, arranged, and/or finished (deburred, polished, etc.) so that they will not constitute a cutting, pinching, puncturing, or abrasion hazard under casual contact and intended use.
- (d) The selection of materials used in components and accessories to be used in and around spas shall be such that the assembled and installed product shall not be harmful to man or to the environment under intended used, and reasonably foreseeable abuse or disposal.

(e) The selection of materials for components and accessories to be used in and around spas shall be such that the assembled and installed product shall be chemically compatible with the materials and environment contacted under intended use and reasonably foreseeable abuse.

# **Structural Design**

- **Sec. 403.(a)** Prior to construction, rehabilitation, or alteration of a permanently installed residential spa, plans and specifications shall be submitted to the administrative authority for review, approval, and issuance of a permit to construct, rehabilitate or alter, as may be required.
- (b) The structural design and materials used shall be in accordance with generally accepted good structural engineering practices.
  - (c) Sand or earth shall not be permitted as an interior finish in a residential spa.
- (d) In climates subject to freezing temperatures, a means shall be provided to protect the spa shell and appurtenances, piping, filter system, pump and motor, and other components from damage due to freezing.
- (e) The surfaces within the spa intended to provide footing for users shall be designed to provide a slip-resisting surface. The roughness or irregularity of such surfaces shall not cause injury or discomfort during normal use.
- (f) The colors, patterns, or finishes of the spa interior shall not be such as to obscure the existence or presence of objects or surfaces within the spa.
- (g) Roofs or canopies over spas shall be constructed so that water run-off does not drain into the spa.

## **Dimensional Design**

- **Sec. 404.(a)** No limits are specified for the shape of spas except that consideration shall be given to shape from the standpoint of safety and circulation of the spa water.
- 1. There shall be no protrusions, extensions, means of entanglement, or other obstructions in the bathing area which can cause the entrapment or injury of the user.
- 2. The designed waterline shall have a maximum construction tolerance at the time of completion of the work of a plus or minus one-fourth inch for spas with adjustable weir surface skimming systems, and a plus or minus one-eighth inch for spas with nonadjustable surface skimming system.
- 3. There shall be a construction tolerance on all other dimensional designs. Overall dimensions may vary plus or minus two inches, unless otherwise specified.
  - (b) The maximum water depth shall be four feet (4') measured from the waterline.

- (c) Multi-level seating may be provided, but the maximum water depth of any seat or sitting bench shall be thirty inches (30") measured from the waterline.
- (d) The spa shall be provided with a suitable handhold around its perimeter in areas where water depths exceed three feet six inches (3'6"). Perimeters rims of spas may serve as a suitable handhold. Handholds shall be provided no further apart than four feet (4') and may consist of any one or a combination of the options listed in the following:
- 1. Coping, ledges, radiused flanges, or decks along the immediate top edge of the spa shall provide a suitable slip-resisting handhold located not more than twelve inches (12") above the waterline; or
  - 2. A secured rope or railing at or not more than twelve inches (12") above the waterline.
- (e) The slope of the floor shall not exceed one foot in twelve feet (1:12) vertical to horizontal.
- (f) Steps, seats, ladders or recessed treads shall be provided for entry and exit where water depths are greater than twenty-four inches (24").
  - (g) The design and construction of ladders, where used, shall conform to the following:
  - 1. Spa ladder(s) shall be made entirely of corrosion-resisting materials.
  - 2. Ladder treads shall have slip-resisting surfaces.
  - 3. Ladder(s) shall provide two (2) handholds/handrails.
- 4. The outside diameter of a ladder rail shall be between one inch (1") and two and one quarter inches (2.25").
- 5. Below the water level, there shall be a clearance of not more than six inches (6") nor less than three inches (3") between any ladder tread edge, measured from the spa wall side of the tread, and the spa wall.
- 6. The clear distance between ladder handrails shall be a minimum of seventeen inches (17") and a maximum of twenty-four inches (24").
- (h) The design and construction of recessed treads, where provided, shall conform to the following:
- 1. Recessed treads at the centerline shall have a uniform vertical spacing of twelve inches (12") maximum and seven inches (7") minimum.
- 2. The vertical distance between the spa coping edge, deck, or step surface and the uppermost recessed tread shall not exceed twelve inches (12").

- 3. Recessed treads shall have a minimum depth of five inches (5") and a minimum width of twelve inches (12").
- 4. Recessed treads shall drain into the spa to prevent the accumulation of dirt, and shall be slip-resisting.
- 5. Each set of recessed treads shall be provided with a set of handrails/handholds to serve all treads and risers.

#### **Decks**

- **Sec. 405.(a)** These requirements shall apply to new construction areas immediately around the spa.
- 1. Deck(s) shall be designed and installed in accordance with the engineering practices required in the area of installation. Concrete decks must comply with the appropriate standards in Table 1. Decks elevated more than 30 inches above adjacent grade shall have guards designed in accordance with the Building code.
- (b) Decks, ramps, coping and similar step surfaces shall be slip-resisting and easily cleanable.
- (c) Special features in or on decks such as markers, brand insignias, or similar items shall conform to this article.
- (d) Risers for steps for a deck shall be uniform and have a maximum height of eight (8"). The minimum tread depth shall be nine inches (9").
- (e) The subgrade for decks shall be prepared and/or installed in accordance with engineering and construction practices required in the area of installation to adequately support the decks.
- (f) The minimum slope of deck(s) shall be one-eighth inch per one foot (1/8":1') for textured, hand-finished concrete decks; one-fourth inch per one foot (":1) for exposed aggregate concrete decks; and one-half per one foot (":1') for resilient artificial deck surfaces, unless an alternate drainage method is provided.
- 1. The maximum slope for all decks other than wood decks shall be one inch per foot (1":1') except for ramps. The maximum slope for wood decks shall be one-eighth inch per foot (1/8":1'). Gaps shall be based on good engineering practices with respect to the type of wood used.
- (g) The maximum voids between adjoining concrete slabs and/or between concrete slabs and expansion joint material shall be one-sixteenth inch (1/16") of horizontal clearance with a maximum difference in vertical elevation of one-fourth (1/4").
- 1. Construction joints where concrete deck(s) meet the spa coping shall be watertight and shall not allow water to pass to the ground beneath.

- 2. The areas where the deck(s) join the spa coping shall be designed and installed so as to protect the coping and its mortar bed from damage as a result of reasonable movement of adjoining deck(s).
- 3. Joints in deck(s) shall be provided to minimize the potential for cracks due to a change in elevations, separation of surfaces or movement of the slab.
- 4. The areas where deck(s) join concrete work shall be protected by expansion joints if necessary, to protect the spa adequately from the pressures of relative movements.
- (i) Decks shall be edged, have a radius, or be otherwise relieved to eliminate sharp corners.
- (j) Site drainage shall be provided so as to direct all deck drainage as well as general site and roof drainage away from the spa.
- (k) If used, an open pit or leaching design for backwash sump purposes shall be located so that it falls completely below adjacent deck(s) and fully outside a line projected 45 degrees downward and away from such deck(s), or shall be designed to accommodate local soil conditions and the volume of backwash.
- (1). Circulation system piping, other than that integrally included in the manufacture of the spa, shall be subject to an induced static hydraulic pressure test (sealed system) at twenty-five (25) pounds per square inch (psi) for thirty (30) minutes. This test shall be performed before the deck is poured, and the pressure shall be maintained through the deck pour.
- 1. For premolded spas, a normal operational running test may be provided in lieu of a pressure test.
- 2. Valves installed in or under any deck(s) shall be provided with a minimum ten inches (10") diameter access cover and valve pit to facilitate servicing.

## **Circulation Systems**

- **Sec. 406.**(a) A circulation system consisting of pumps, piping, return inlets and suction outlets, filters, and other necessary equipment shall be provided for complete circulation of water through all parts of the spa.
- 1. The circulation system equipment shall be designed to turn over the entire spa water capacity at a minimum of once every hour.
- 2. Circulation system components which require replacement or servicing shall be accessible for inspection, repair, or replacement and shall be installed according to the manufacturer's instructions.

- 3. Where equipment sizing falls within the scope of National Sanitation Foundation (NSF) testing, materials, and equipment used in the circulation system shall comply with the Standards in Table 1, Appendix A.
- 4. Spa equipment shall be properly supported to prevent damage from misalignment, settlement, and operational movement, etc. The equipment shall be mounted so as to minimize the potential for the accumulation of debris and moisture, following manufacturer's instructions.
- (b) The water velocity in the piping shall not exceed ten feet (10') per second for discharge piping, except for copper pipe where the velocity for piping shall not exceed eight feet (8') per second, and six feet (6') per second for suction piping, unless summary calculations are provided to show that the greater flow is possible with the pump and piping provided.
- 1. The pump shall be sized to deliver the required flow rate against the total system head involved.
- (c) The circulation system piping and fittings shall be of material able to withstand operating pressures and operating conditions.
- 1. Equipment shall be designed and fabricated to drain the spa water from the equipment, by removal of drain plugs and manipulating valves, or by other methods. Refer to manufacturer's recommendations for specific information on draining the system.
- (d) A pressure gauge (located downstream from the pump on a pressure system), or vacuum gauge (located before the pump on the vacuum system), or other means of indicating system condition shall be provided in the circulation system in an easily readable location.
- (e) The circulation system shall be capable of maintaining water clarity. Time clocks may be used to set the operating period. When time clocks are used, they shall also govern the operating time of appurtenant devices such as chemical disinfectant feeders, heaters, etc. that are dependent upon circulation pump flow.
- (f) Written operation and maintenance instructions shall be provided for the circulation system.

#### **Filters**

- **Sec. 407.**(a) Filters shall be designed so that after cleaning per manufacturer's instructions, the system can provide the minimum turnover noted in Sec. 405.(a).1.
  - 1. Filters shall be designed so that filtration surfaces can be inspected and serviced.
- (b) On pressure-type filters, a means shall be provided to permit release of internal pressure.

- 1. Any filter incorporating an automatic internal air release as its principal means of air release shall have lids which provide a slow and safe release of pressure as a part of its design.
- 2. Any separation tank used in conjunction with any filter tank shall have a manual means of air release or a lid which provides a slow and safe release of pressure as it is opened as a part of its design.
- (c) Pressure filters and separation tanks shall have operation and maintenance instructions permanently installed on the filter or separation tank and shall include a precautionary warning statement not to start the system after maintenance without first opening the air release and proper reassembly of the filter and separation tank. The statement shall be visible and noticeable within the area of the air release.
- (d) Piping furnished with the filter shall be of suitable material capable of withstanding one and one-half (1) times the working pressure. The suction piping shall not collapse when there is a complete shut off of flow on the suction side of the pump.

# **Pumps and Motors**

- **Sec. 408.**(a) With all pressure filter systems, a cleanable strainer or screen shall be provided upstream of the circulation pump(s) to remove solids, debris, hair, lint, etc.
- (b) The design and construction of the pump and component parts shall provide safe operation that is not hazardous to the operator or maintenance personnel.
- (c) Where a mechanical pump seal is provided, components of the seal shall be corrosion-resisting and capable of operating under conditions normally encountered in spa operation.
- (d) All motors shall have as a minimum an open, drip-proof enclosure (as defined by the latest National Electrical Manufacturers Association [NEMA] Standard MGI-1978) and be constructed electrically and mechanically to perform satisfactorily and safely under the conditions of load and environment normally encountered in spa installations.
- (e) A pump and motor shall be provided for circulation of the spa water. Performance of all pumps shall meet or exceed the conditions of flow required for filtering and cleaning (if applicable) the filters against the total dynamic head developed by the complete system.
- (f) All motors shall have thermal or current overload protection, either built in or in the line starter, to provide lock rotor and running protection.
- (g) Where the pump is below the waterline, valves shall be installed on suction and discharge lines. Valves shall be readily accessible for maintenance.

#### **Return Inlets and Suction Outlets**

- **Sec. 409.**(a) Return inlet(s) and suction outlet(s) shall be provided and arranged to produce circulation throughout the spa.
- (b) If the suction outlet system, such as a filtration system, automatic cleaning system, solar system etc., has a single suction outlet, or multiple suction outlets which can be isolated by valves, each suction outlet shall conform to American National Standards Institute (ANSI) ASME A112.19 8M-1987 to protect against bather entrapment by either:
  - 1. An approved safety cover.
  - 2. A twelve inch by twelve inch (12" x 12") or larger grate.
  - 3. Other approved means.
- (c) A minimum of two (2) suction outlets shall be provided for each pump in the suction outlet system, separated by a minimum of three feet (3') or located on two (2) different planes; i.e. one (1) on the bottom and one (1) on the vertical wall, or two (2) separate vertical walls. These suction outlets shall be plumbed such that water is drawn through them simultaneously through a common line to the pump.
- (d) Where provided, the vacuum cleaner fitting(s) with safety covers, shall be located in an accessible position(s) at least three inches (3") and no greater than eighteen inches (18") below the minimum operating water level or as an attachment to the skimmer(s). Wall fitting and safety covers shall be approved by a nationally recognized testing agency.

# **Surface Skimmer Systems**

- **Sec. 410.**(a) A surface skimming system shall be provided on all residential spas, and shall be designed and constructed to skim the spa surface when the water level is maintained within the operational parameters of the system's rim or weir device.
- (b) Skimming devices shall be designed and installed so as not to constitute a hazard to the user.
- (c) Where automatic surface skimmers are used as the sole overflow system, one (1) surface skimmer shall be provided for each one hundred fifty (150) square feet, or fraction thereof, of water surface area. Nominal recessed areas such as stairs shall not be considered in the calculation.
- (d) Where perimeter surface skimming systems are used, they shall be connected to the circulation system with a system surge capacity of not less than one (1) gallon for each square foot of spa surface.
- (e) The hydraulic capacity of the overflow system shall be capable of handling one hundred percent (100%) of the circulation flow.

## **Electrical Requirements**

**Sec. 411.** The requirements of the National Electrical Code (NEC), as published by the National Fire Protection Association, amended and adopted by the jurisdiction, shall be followed.

# **Air Induction System**

- **Sec. 412.**(a) Any air induction system shall prevent water back-up that could cause electrical shock hazards.
  - (b) Air intake sources shall not induce water, dirt, or contaminants into the spa.
- (c) Integral air passages shall be pressure tested at time of manufacture to provide structural integrity for a valve of one and one-half (1) times the intended working pressure.
- (d) Air induction systems shall be installed in accordance with manufacturer's instructions.

#### Heaters

- **Sec. 413.**(a) Spa heaters shall be tested by a nationally recognized testing agency and comply with the appropriate current nationally recognized standards.
  - (b) The heater(s) shall be installed according to the manufacturer's recommendations.
- 1. The heater shall be installed on a concrete (or equivalent) base unless it is specifically designed for installation on a combustible surface.
- 2. Adequate clearances shall be maintained on all sides and over the top of the heater, as shown in the manufacturer's instructions for proper clearances.
  - 3. The heater shall have adequate ventilation in order to assure proper combustion.
- 4. When installing a heater indoors, the heater shall be installed in accordance with the Mechanical Code as amended and adopted by the Administrative Authority, and the manufacturer's recommendation for properly sized air openings to the enclosure.
- A. Draft or venting devices shall be installed according to the manufacturer's recommendations and shall not be modified.
- B. A heater using propane gas shall not be installed in a pit or basement. Whenever installing a heater using propane gas, the manufacturer's ventilation instructions shall be followed.
  - (c) Heater Piping System:

- 1. The heater gas supply piping shall comply with the Plumbing Code as amended and approved by the administrative authority. When installing a gas-fired heater, the gas line shall be run from the gas meter as directly as practical.
  - 2. The heater circulation system shall comply with the manufacturer's recommendations.
- 3. The water piping system shall be installed according to the manufacturer's recommendations.
- A. When installing a heater and a filter system, adequate provisions shall be made so that the heater does not cause excessive pressure drop to the filter system. Refer to manufacturer's requirements and/or recommendations for installation of bypass valves.

# Water Supply.

- **Sec. 414.** (a) No direct mechanical connection shall be made between the potable water supply and the spa, chlorinating equipment, or the system of piping for the spa, unless it is protected against backflow and backsiphonage in a manner approved by the building official or through an air gap, or other equivalent means approved by the building official.
- (b) An over-the-rim spout, if used, shall be properly shielded so as not to create a hazard. Its open end shall have no sharp edges and shall not protrude more than two inches (2") beyond the edge of the spa.

# Waste Water Disposal.

**Sec. 415.** Backwash water shall be disposed of and contained on site. All discharges of backwash water shall comply with applicable Town ordinances and Arizona Department of Environmental Quality (ADEQ) Engineering bulletins. Spas may be drained to the street when the the water being discharged is chlorine free, at a Ph of 7 plus or minus.5, and no known biological hazards are present. Any stain or residue resulting from water disposal shall be removed by rinsing with potable water or other approved means. Water may be discharged to a wash when the above criteria are met and with measures to prevent erosion of the wash bank or channel.

## Disinfectant Equipment, Oxidation Equipment, and Chemical Feeders

- **Sec. 416.**(a) Disinfectant equipment, oxidation equipment, and chemical feeders, hereafter referred to jointly as "equipment" shall comply with nationally recognized standards. The equipment and the chemical feeders shall be capable of precisely introducing a sufficient quantity of an approved disinfecting agent.
- (b) Chemical Feeders. Good engineering practices and manufacturer's instructions shall be used in installing chemical feeders.
- (c) Low Ozone Output Generating Equipment. The installation of ozone generating equipment shall be limited to low ozone output generating equipment. The installation and use of ozone generating equipment shall conform to the following:

- 1. Installation of ozone generating equipment shall allow for indications of operation or malfunction to be easily observed. The equipment shall be installed in a manner such that a malfunction will not endanger operators or spa users.
- 2. Ozone generating equipment shall be used in conjunction with other chemical treatments. Normal maintenance and monitoring of water chemistry shall be followed.
- 3. Good engineering practices and manufacturer's recommendations shall be used to determine where and how ozone shall be injected.

### **Barriers and Enclosures**

- **Sec. 417.**(a) Outdoor residential spas shall be provided with an enclosure and barrier meeting the following the same requirements found in Section 317 of this code, or
- 1. A <u>securable spa cover</u> may be used for a barrier and enclosure if all the following conditions are met:
- a. When in the closed position, a sphere 4 inches in diameter is prevented from reaching the water surface.
  - b. The cover is designed to support a static load of 100 pounds.
  - c. The spa width or diameter does not exceed eight feet (8').
- 2. A <u>spa safety cover</u> may be used for a barrier or enclosure if all the following conditions are met:
- a. When in the closed position, a sphere 4 inches in diameter is prevented from reaching the water surface.
  - b. The cover is designed to support a static load of 100 pounds.
- c. The electric motor switch shall be key-operated or locked and there shall be an additional power disconnect located not less than 54" above the finished grade, deck or other walking surfaces.

## Chapter 5

#### RESIDENTIAL PORTABLE SPAS

## Scope

- **Sec. 501.**(a) This chapter is intended to cover portable residential spas, and hydrotherapy units of irregular or geometric shell design, which are intended to be used for bathing.
- 1. This chapter is intended to cover certain aspects of the design, equipment, operation, installation, new construction and rehabilitation of spas. This standard may be met notwithstanding certain variations in equipment, materials and design.
- (b) This chapter is not meant to cover public/commercial spas, permanently installed residential spas, and other spas such as those operated for medical treatment, physical therapy, or other special purposes.
  - (c) Other standards may be referenced in this chapter for items not covered.

### **Materials of Manufacture**

- **Sec. 502.(a)** The materials of components and accessories used in portable spas shall comply with the Standards in Table 1. These materials shall be capable of fulfilling the design, installation and intended use requirements in this standard.
- (b) All 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.
  - 1. Product shall be maintained in accordance with manufacturer's instructions.
- (c) Assemblies of different materials shall be chemically and mechanically compatible for their intended use and environment.

# **Structural Design**

- **Sec. 503.(a)** The structural design and materials used shall be in accordance with generally accepted structural engineering practices.
- (b) A means shall be provided to protect the spa shell and appurtenances, piping, filter system, pump and motor, and other components from damage due to freezing.
- (c) The surfaces within the spa intended to provide footing for users shall be designed to provide a slip-resisting surface.
- (d) Spa equipment shall be properly supported to prevent damage from misalignment, settling, etc. The equipment shall be mounted so as to minimize the potential for the accumulation of debris and moisture.

# **Dimensional Design**

- **Sec. 504.(a)** The shape of spas shall not be limited except from the standpoint of safety and/or circulation of the spa water.
- 1. There shall be no protrusions, extensions, means of entanglement, or other obstructions in the bathing area which can cause the entrapment or injury of the user.
- 2. The maximum water depth shall be four feet (4') measured from the waterline. Exceptions may be made for spas designed for a special purpose.
- 3. Multi-level seating may be provided, but the maximum water depth of any seat or sitting bench shall be thirty inches (30") measured from the waterline.
- (b) The slope of the floor shall not exceed one foot in twelve feet (1:12) vertical to horizontal.
- (c) Steps, seats, ladders or recessed treads shall be provided for entry and exit where water depths are greater than twenty-four inches (24").
- (d) The design and construction of spa steps, recessed steps, and seat benches, where used, shall conform to sections 403.(g).1. through 5.
- 1. Step treads shall have a minimum unobstructed horizontal depth of ten inches (10") for a minimum continuous width of twelve inches (12").
- 2. Riser heights shall not be less than seven inches (7") nor greater than twelve inches (12"). Where the bottom tread serves as a bench or seat, the bottom riser may be a maximum of fourteen inches (14") above the spa floor.
- 3. Handrails, if used, shall be installed in such a way that they shall be removable only with tools.
- 4. Portable spas are intended for entry and exit from the surface supporting the spa. If the spa rim of a portable spa is intended for use as a step, a handrail shall be provided.

## **Circulation Systems**

- **Sec. 505.**(a) A circulation system consisting of piping, inlets, suction outlets, and circulation equipment (pump, heater, filter and connecting piping) shall be provided for complete circulation of water through all parts of the spa.
- 1. The circulation system equipment shall be designed to turn over the entire spa water capacity at a minimum of once every hour.
- 2. Circulation system components which require replacement or servicing shall be accessible for inspection, repair, or replacement and shall be installed according to the manufacturer's instructions.

- (b) The circulation system shall be designed and fabricated to provide drainage from the spa and circulation equipment. Refer to manufacturer's recommendations for specific information on draining.
- (c) Time clocks may be used to set the operating period. When time clocks are used, they shall also govern the operating time of appurtenant devices such as chemical/disinfectant feeders, etc. that are dependent upon circulation pump flow.

#### Heaters

- **Sec. 506.**(a) Spa heaters shall be tested and approved by a nationally recognized testing agency and comply with the appropriate current nationally recognized standards such as the American National Standards Institute (ANSI-Z-21.56) or Underwriters Laboratories (UL1261).
  - (b) The heater(s) shall be installed according to the manufacturer's recommendations.
- 1. The heater shall be installed on a concrete (or equivalent) base unless it is specifically designed for installation on a combustible surface.
- 2. When installing the heater, adequate clearances shall be maintained on all sides and over the top of the unit. Consult manufacturer's instructions for proper clearances.
  - 3. The heater shall have adequate ventilation in order to assure proper combustion.
- 4. When installing a heater indoors, proper openings to the room are a necessity. The heater shall be installed in accordance with (state or local authority) codes and the manufacturer's recommendation for properly sized air openings to the enclosure.
- A. All fossil fuel heaters are supplied with some type of venting system, either for indoor or outdoor installation. These draft or venting devices shall be installed according to the manufacturer's recommendations and shall not be modified.
- B. When installing a heater that will be using propane gas, special precautions shall be noted. Propane gas is heavier than air and shall not be installed in a pit or in an enclosed area. Whenever installing a heater with propane gas, the manufacturer's ventilation recommendations shall be followed.
  - (c) Heater Piping System:
- 1. The heater gas supply piping shall comply with the Uniform Plumbing Code as amended and approved by the administrative authority. When installing a gas-fired heater, the gas line shall be run from the gas meter as directly as practical.
  - 2. The heater circulation system shall comply with the manufacturer's recommendations.

- 3. The water piping system shall be installed according to the manufacturer's recommendations.
- A. When installing a heater and a filter system, adequate provisions shall be made so that the heater does not cause excessive pressure drop to the filter system. Refer to manufacturer's requirements and/or recommendations for installation of bypass valves.
- (d) The maximum temperature of the spa shall be 104 degrees. A thermostatic control for the water temperature shall be required.

# Water Supply.

**Sec. 507.** No direct mechanical connection shall be made between the potable water supply and the spa, chlorinating equipment, or the system of piping for the spa, unless it is protected against backflow and backsiphonage in a manner approved by the building official or through an air gap, or other equivalent means approved by the building official.

# Waste Water Disposal.

**Sec. 508.** Backwash water shall be disposed of and contained on site. All discharges of backwash water shall comply with applicable Town ordinances and Arizona Department of Environmental Quality (ADEQ) Engineering bulletins. Spas may be drained to the street when the the water being discharged is chlorine free, at a Ph of 7 plus or minus.5, and no known biological hazards are present. Any stain or srsudue resulting from water disposal shall be removed by rinsing with potable water or other approved means. Water may be discharged to a wash when the above criteria are met and with measures to prevent erosion of the wash bank or channel.

# Disinfectant Equipment, Oxidation Equipment, and Chemical Feeders

- **Sec. 509.**(a) Disinfectant equipment, oxidation equipment, and chemical feeders, hereafter referred to jointly as "equipment" shall comply with nationally recognized standards. The equipment and the chemical feeders shall be capable of precisely introducing a sufficient quantity of an approved disinfecting agent.
- (b) Chemical Feeders. Good engineering practices and manufacturer's instructions shall be used in installing chemical feeders.
- (c) Low Ozone Output Generating Equipment. The installation of ozone generating equipment shall be limited to low ozone output generating equipment. The installation and use of ozone generating equipment shall conform to the following:
- 1. Installation of ozone generating equipment shall allow for indications of operation or malfunction to be easily observed. The equipment shall be installed in a manner such that a malfunction will not endanger operators or spa users.

- 2. Ozone generating equipment shall be used in conjunction with other chemical treatments. Normal maintenance and monitoring of water chemistry shall be followed.
- 3. Good engineering practices and manufacturer's recommendations shall be used to determine where and how ozone shall be injected.

## **Barriers and Enclosures**

- **Sec. 510**.(a) Residential portable spas shall be provided with an enclosure and barrier meeting the following requirements:
- 1. Barriers and enclosures shall be a minimum of 4 feet in height above finished grade or other walking surface, measured on the side opposite the spa.

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- 2. No opening in a barrier or enclosure shall allow passage of a sphere larger than 4 inches.
- 3. The vertical distance between the bottom of a barrier or enclosure and the finished grade or walking surface shall not exceed 4 inches.
- 4. The barrier or enclosure shall be constructed so as not to provide opportunity for climbing on the side opposite the spa.
- A. Footholds or handholds shall be not less than 48 inches from the top of the enclosure or 48 inches from the finished grade, or other walking surface measured on the side opposite the spa. Openings in chain-link fences, exceeding 1 inches, shall be slatted.
- B. Wrought iron or wood barriers or enclosures shall be constructed with at least 48 inches between the top surface of the horizontal members.
- C. Where the protrusion, indention, or top surface is at a continuous angle of inclination towards the barrier or enclosure equal to 45 degrees above the horizontal and otherwise does not provide a handhold or foothold, it shall be deemed not to provide an opportunity for climbing, for purposes of this code.
- D. Any space which falls within the area described by a 48 inch radius, centered at the top of the barrier/enclosure, must be maintained free of all natural or man made objects.
- 5. Gates placed in an enclosure or barrier shall comply with the above. All gates shall be not less than 48" in height and be self-closing and self-latching. Where the latch is less than 54" above the walking surface or 50" above a foothold, the latch shall be installed on the spa side of the gate not less than 42" above the walking surface, and the gate and barrier shall have no opening greater than 1 inch within 18 inches of the latch. Gates in a barrier shall be installed to swing in a direction opposite the spa.

- 6. The Building Official may grant an exception to the requirements of enclosing a spa when he finds that there is a barrier or enclosure existing on the premises by reason of thorny/spiny vegetation, landscaping, or topography suitable to prevent access to the spa area.
- (b) A securable space cover may be used for a barrier and enclosure if all the following conditions are met:
- 1. When in the closed position, a sphere 4 inches in diameter is prevented from reaching the water surface.
  - 2. The cover is designed to support a static load of 100 pounds.
  - 3. The spa width or diameter does not exceed eight feet (8').
- (c) A spa safety cover may be used for a barrier or enclosure if all the following conditions are met:
- 1. When in the closed position, a sphere 4 inches in diameter is prevented from reaching the water surface.
  - 2. The cover is designed to support a static load of 100 pounds.
- 3. The electric motor switch shall be key-operated or locked and there shall be an additional power disconnect located not less than 48" above the finished grade, deck or other walking surfaces.
- (d)(County Only) Any wall of a dwelling or other building may be used as part of an enclosure or barrier if all the following conditions are met:
- 1. Windows leading to the spa area shall be provided with a latching device located not less than 42 inches above the floor.
- 2. Hinged doors leading to the spa area shall be self-closing/self-latching with the latch located not less than 42 inches above the finished grade or other walking surface, measured on the side opposite the spa. Hinged screen doors when used as a barrier shall be self-closing/self-latching and protected with a substantial grill on the spa side to a minimum height of 36" above the walking surface.
- 3. A sliding door leading to the spa area shall be provided with a self-closing and self-latching device on the door or the screen not less than 42 inches above the finished grade or other walking surface, measured on the side opposite the spa. Screen doors shall be protected with a substantial grill on the spa side to a minimum height of 36" above the walking surface.

**Exception:** In lieu of the self- closing doors required by (c) 1 and 2 above, said doors may be equipped with an alarm which produces an audible warning when the door and its screen, if present, are opened. The alarm shall sound continuously for a minimum off 30 seconds immediately after the door is opened, and be capable of being heard through the house during normal household activities. The sound shall be distinctively different from the sounds made by any smoke detector or other alarm installed in the house. The

alarm shall automatically reset after operation. The alarm may be equipped with a manual means, such as a touch-pad or switch, to temporarily deactivate the alarm for not more than 15 seconds to accommodate a single opening of the door. The deactivation means shall be located at least 554 inches above the floor or installed in a panelboard or control panel which is inaccessible to children.

In new construction, alarms shall receive their primary power from the building wiring and shall be equipped with a battery backup. Alarms may be solely battery operated when installed in existing buildings.

- (e)In the City of Tucson any wall of a dwelling or other building may be used as part of an enclosure or barrier if all of the following conditions are met:
  - (1) No door may be in the section of wall used for the enclosure of barrier.
  - (2) Any window must be fixed (non-operable) or have a sill height of at least sixty (60") inches above the interior floor or be permanently secured to allow the window to open less than four (4") inches in the least dimension.
- (f) In the city of Tucson, sub-section (c) may be used only for the retrofitting of the enclosures/barriers of those pools constructed outside the city limits and subsequently annexed and which are found not to be in compliance with the enclosure/barrier requirements of this code as mandated by Section 104(c), and any spa/pool found not to be in compliance with the code under which it was originally constructed.

# Chapter 6

### ABOVEGROUND SWIMMING POOLS

## Scope

- **Sec. 601.**(a) This chapter is intended to cover aboveground residential pools intended to be used for swimming. This chapter is intended to cover certain aspects of the design, equipment, operation, installation, new construction and rehabilitation of swimming pools. This code may be met notwithstanding certain variations in equipment, materials, and design.
- (b) This chapter is not meant to cover semi-public, public pools, or in-ground residential pools.
  - (c) Other chapters are referenced in this chapter for items not covered.

### **Materials of Construction**

- **Sec. 602.**(a) The materials of components and accessories used in and around aboveground pools shall be compatible with man and the environment in which they are installed. These materials shall be capable of fulfilling the design, installation, and intended use requirements in this chapter.
- (b) The selection of all materials for components and accessories to be used in and around aboveground pools shall be such that all parts with external surfaces and edges that may come in contact with the user are assembled, arranged, and/or finished (deburred, polished, etc.) so that they will not constitute a cutting, pinching, puncturing or abrasion hazard under casual contact and intended use.
  - (c) All paints and finishes shall be free of lead compounds.

### **Structural Design**

- **Sec. 603.**(a) The structural design and materials used shall be in accordance with generally accepted good structural engineering practices.
- 1. The primary structure shall be designed for a factor of safety that conforms to accepted engineering structural standards based on the total static water pressure of the pool.
- A. Steel shall have a factor of safety of at least 1.7, and aluminum shall have a factor of safety of at least 1.85.
- 2. The secondary structure(s) shall be designed for a factor of safety of 1.5, based on the static load without permanent deformation.
- 3. In climates subject to freezing temperatures, the pool shell and appurtenances, piping, hoses, filter system, pump and motor, and other components shall be so designed and constructed to facilitate protection from damage due to freezing.

- 4. The surfaces intended to provide footing for users shall be designed to provide a slip-resisting surface. The roughness or irregularity of such surfaces shall not cause injury or discomfort to the feet during normal use.
- 5. Onground Pools The slope adjacent to the shallow area shall have a maximum slope of 3:1, and the slope adjacent to the side walls shall have a maximum slope of 1:1.

### **Dimensional Design**

- **Sec. 604.**(a) No limits are specified for shape of aboveground swimming pools except that consideration shall be given to shape from the stand-point of safety and circulation of the swimming pool water.
- 1. There shall be construction tolerances allowed on all dimensional designs. Overall length, width, and depth may vary plus of minus two inches unless otherwise specified.
  - (b) Aboveground pool liners shall conform to the following:
- 1. Liners shall be sealed to produce a membrane to contain the water in a watertight envelope.
- 2. A winterized liner shall not physically crack when tested at (-) 20 degrees Fahrenheit per ASTM test method (D-1790).
- 3. A standard grade liner shall not physically crack when tested at zero degrees Fahrenheit per ASTM test method (D-1790).
- 4. Nominal liner thickness shall be plus or minus 10 percent of the thickness given by the manufacturer per ASTM Test D-374 Method "C".
- 5. Liners shall be so installed that a method is provided to prevent the liner from slipping from the retainer and the sidewalls.
  - (c) Aboveground pool walls shall conform to the following:
- 1. Closure of walls shall be accomplished by mechanical joining which is capable of withstanding the maximum stress applied to the wall. The means of closure shall be described in easy-to-understand diagrams and/or language in the assembly instructions.
  - 2. Maintenance of the wall shall be described in the instruction manual.

## **Assembly, Safety and Maintenance**

**Sec. 605.**(a) Each new swimming pool shall be supplied with a clearly self-explanatory, illustrated set of instructions for installation, assembly and operation.

- (b) All caution warnings shall be written in bold type, a minimum of twice the size of the normal type used in the instructions and shall be contained in a bordered area.
- (c) A prominently displayed, permanent and tamper-proof warning label with lettering not less than 1/4" (0.6 cm) in height shall warn bathers that there will be "No Diving".
- (d) A notice shall be included advising that the swimming pool, like any other item of equipment is subject to wear and deterioration and that certain types of excessive deterioration can lead to failure of the swimming pool structure, which might release large quantities of water that could cause bodily harm and property damage.
- (e) The instructions shall clearly list the manufacturer's name and address or that of an agent.
- (f) The instructions shall advise the initial owner of a residential aboveground swimming pool of some of the more important features related to safety concerning its ownership, operation and maintenance.

#### Ladders/Stairs

- **Sec. 606.**(a) All pools shall have a means of entry/exit consisting of at least one ladder or stairs. Ladders/stairs shall conform to the following:
  - 1. All ladder/stair treads shall have slip-resisting surfaces which are integral to or permanently attached to the tread surface.
  - 2. Ladders/stairs shall provide two (2) handrails/handholds that serve all treads.
  - 3. Written instructions for proper assembly and use of all ladders shall include the following:
    - A. "Locate ladder on a solid base"
    - B. "One person on the ladder at a time"
    - C. "The ladder shall be installed per manufacturer's instructions:
    - D. "Warning: No Diving No Jumping". Follow manufacturer's instructions.
    - E. Manufacturer shall provide instructions on which way to face when using ladder and advise of same in instructions.

### **Decks and Deck Equipment**

**Sec. 607.**(a) if deck structure relies on the pool for support, (cantilever style) it must be ascertained from the pool manufacturer that the pool structure is capable of supporting the deck.

- 1. The deck shall be designed to support a static load of 40 lbs. per square foot of Dead Weight at point of 250 lbs. on the span of the deck both horizontal and vertical.
- (b) The deck walking surface shall be:
- 1. Maximum of six inches (6") above the pool top rail.
- 2. Extend no more than three inches (3") beyond the inside of the top rail of the pool, and be parallel to the top rail of the pool.
- 3. Decks that are installed flush with the top rail shall have the gaps filled in or coped.
- (c) The top rail of the pool fence, deck fence, patio fence and walk-around fence shall be a minimum of thirty six inches (36") from the deck surface.
  - 1. Where provided, the height of the fence from the top horizontal bar to the top of the rail of the pool shall be a minimum of thirty six inches (36").
  - 2. Open-air spacing between pickets shall be a maximum of four inches (4") between all vertical pickets and support posts.
  - 3. Where a picket-type fence is provided, maximum openings between the top rail of the pool and the lower horizontal bottom rail of the fence shall not exceed a maximum four inches (4").
- (d) The deck surface shall be manufactured from materials that will provide a slip-resisting surfaces. The deck owners instruction manual shall provide any finishing instructions necessary to meet this requirement.
- (e) The deck package shall have affixed at point of entry a permanent weather resistant load capacity decal or plate containing the following information:
  - 1. Warning
  - 2. Maximum load capacity (person and equipment)
- (f) The deck package shall have affixed at point of entry "Danger Do Not Dive or Jump" safety signs in accordance with the standard specifications.
- (g) Walk-around (patio) decks shall be a minimum of fifteen inches (15") wide, measured from the inside of the pool to the outside of the pool walk-around.

## **Circulation Systems**

**Section 608.**(a.) A circulation system consisting of pumps, hoses, tubing, piping, return inlets and suction outlets, skimmers, filters and other necessary equipment shall be provided for complete and continuous circulation of water through all parts of the pool

- 1. The equipment shall be of adequate size to turn over the entire pool water capacity at least once every eight (8) hours.
- 2. Circulation system components which require replacement or servicing shall be accessible for inspection, repair, or replacement, and shall be installed according to the manufacturer's instructions.
- 3. Pool equipment shall be properly supported to prevent damage from misalignment, settlement, etc. The equipment shall be mounted so as to minimize the potential for the accumulation of debris and moisture, following manufacturer's instructions.
- (b) The water velocity in the pool pressure and suction lines shall not exceed ten feet (10') per second for pressure lines, and eight feet (8') per second for suction lines. Pool recirculation systems shall be sized to permit the rated flows for filtering and cleaning without exceeding the maximum head of the pump.
- (c) The circulation system and fittings shall be of nontoxic material able to withstand operating pressures and operating conditions.
- (d) A pressure or vacuum gauge or other means of indicating system condition shall be provided in the circulation system in an easily readable location.
- (e) The circulation system piping and fittings shall be nontoxic, shall be considered to be process piping, and shall be of material able to withstand operating pressures and operating conditions.
  - 1. Equipment shall be designed and fabricated to drain the pool water from the equipment, by removal of drain plugs and manipulating valves, or by other methods. Refer to manufacturer's recommendations for specific information on draining the system.
- (f) Written operation and maintenance instructions shall be provided for the circulation system.

# **Filters**

- **Sec. 609**.(a) Filters shall be designed so that after cleaning per manufacturer's instructions, the system can provide the water clarity noted in Section 306(a).
  - 1. Filters shall be designed so that filtration surfaces can be inspected and serviced.
- 2. On pressure-type filters, a means shall be provided to permit the release of internal pressure.
- A. Any filter incorporating an automatic internal air release as its principal means of air release shall have a manual means to provide a slow and safe release of pressure as a part of its design.

- B. Any separation tank used in conjunction with any filter tank shall have a manual means of air release or a means to provide a slow and safe release of pressure as it is opened as a part of its design.
- (b) Pressure filters shall have operation instructions permanently installed on the filter. Filters with manual air release reliefs shall include a precautionary statement warning not to start up the system without first opening the air release. The statement shall be visible and noticeable within the area of the air release.
- (c) Hoses, tubing, and piping furnished with the filter shall be of suitable material capable of withstanding one and one-half (1-1/2) times the shut-off head of the pump. The hoses, tubing, and piping shall not collapse when there is a complete shut-off of flow on the suction side of the pump.

# **Pumps and Motors**

- **Sec. 610.**(a) A pump and motor shall be provided for circulation of the pool water. Performance of all pumps shall meet or exceed the conditions of flow required for filtering and cleaning (if applicable) the filters against the total dynamic head developed by the complete system.
- (b) With all pressure filter systems a cleanable strainer or screen shall be provided upstream of the circulation pump(s) to remove solids, debris, hair, lint, etc.
  - (c) Pump(s) and motor(s) shall be accessible for inspection and service.
- (d) The design and construction of the pump(s) and component parts shall provide safe operation that is not hazardous to the operator or maintenance personnel.
- (e) Where a mechanical pump seal is provided, components of the seal shall be corrosion-resisting and capable of operating under conditions normally encountered in pool operation.
- (f) All motors shall be installed in accordance with the National Electric Code and be constructed electrically and mechanically to perform satisfactorily and safely under the conditions of load and environment normally encountered in swimming pool installations.
- (g) Motor(s) shall be capable of operating the pump(s) under full load with a voltage variation of plus or minus ten percent (± 10%) from the nameplate rating. If the maximum service factor of the motor is exceeded (at full voltage), the manufacturer shall indicate this on the pump curve.
- (h) All motors shall have thermal or current overload protection, either built in or in the line starter, to provide locked rotor and running protection.

### **Return Inlets and Suction Outlets**

- **Sec. 611.**(a) Return inlet(s) and suction outlet(s) shall be provided and arranged to produce a uniform disinfectant residual throughout the entire pool. Where skimmers are used, the return inlet(s) shall be located so as to help bring floating particles within range of the skimmers.
- (b) Return inlet(s) from the circulation system shall be designed so as not to constitute a hazard to the user.
- (c) The pool shall not be operated if the suction outlet grate is missing, broken, or secured in such a way that it can be removed without the use of tools.
- (d) If the suction outlet system, such as a filtration system, automatic cleaning system, solar system etc., has a single suction outlet, or multiple suction outlets which can be isolated by valves, each suction outlet shall conform to International Association of Plumbing and Mechanical Officials Standard ANSI/ASME A112.19 8M-1987 to protect against bather entrapment by either:
  - 1. An approved safety cover.
  - 2. A twelve inch by twelve inch (12" x 12") or larger grate.
  - 3. Other approved means.
- (e) Where provided, the vacuum cleaner fittings(s) with safety covers, shall be located in an accessible position(s) at least three inches (3"), and no greater than eighteen inches (18"), below the minimum operating water level or as an attachment to the skimmer(s). Wall fitting and safety covers shall be approved by a nationally recognized testing agency.

# **Surface Skimmer Systems**

- **Sec. 612**.(a) A surface skimming system shall be provided on all aboveground swimming pools, and shall be designed and constructed to skim the pool surface when the water level is maintained within the operational parameters of the system's rim or weir device.
- (b) Skimming devices shall be designed and installed so as not to constitute a hazard to the user.
- (c) Where automatic surface skimmers are used as the sole overflow system, at least one (1) surface skimmer shall be provided for each eight hundred (800) square feet, or fraction thereof, of the water surface area.

### **Electrical Requirements**

**Sec. 613.** The requirements of the National Electrical Code (NEC), as published by the National Fire Protection Association, amended and adopted by the jurisdiction, shall be followed.

### **Heaters**

- **Sec. 614.**(a) Swimming pool heaters shall be tested by a nationally recognized testing agency and comply with the appropriate current nationally recognized standards.
  - (b) The heater(s) shall be installed according to the manufacturer's recommendations.
- 1. The heater shall be installed on a concrete (or equivalent) base unless it is specifically designed for installation on a combustible surface.
- 2. Adequate clearances shall be maintained on all sides and over the top of the heater. As shown in the manufacturer's instructions.
  - 3. The heater shall have adequate ventilation in order to assure proper combustion.
- 4. When installing a heater indoors, the heater shall be installed in accordance with the Uniform Mechanical Code as amended and adopted by the Administrative Authority, and the manufacturer's recommendation for properly sized air openings to the enclosure.
- A. Draft or venting devices shall be installed according to the manufacturer's recommendations and shall not be modified.
- B. A heater using propane gas shall not be installed in a pit or basement. Whenever installing a heater using propane gas, the manufacturer's instructions shall be followed.

### (d) Heater Piping System:

- 1. The heater gas supply piping shall comply with the Uniform Plumbing Code as amended and approved by the administrative authority. When installing a gas-fired heater, the gas line shall be run from the gas meter as directly as practical.
- 2. The heater circulation system shall comply with the manufacturer's recommendations.
- 3. The water piping system shall be installed according to the manufacturer's recommendations.
- A. When installing a heater and a filter system, adequate provisions shall be made so that the heater does not cause excessive pressure drop to the filter system. Refer to manufacturer's requirements and/or recommendations for installation of bypass valves.

## **Water Supply**

- **Sec. 615**.(a). No direct mechanical connection shall be made between the potable water supply and the swimming pool, chlorinating equipment, or the system of piping for the pool, unless it is protected against backflow and back-siphonage in a manner approved by the building official or through an air gap, or other equivalent means approved by the building official.
- (c) An over-the-rim spout, if used, shall be properly shielded so as not to create a hazard. Its open end shall have no sharp edges and shall not protrude more than two inches (2") beyond the edge of the pool.

### **Waste Water Disposal**

**Sec. 616.** Backwash water shall be disposed of and contained on site. All discharges of backwash water shall comply with applicable Town ordinances and Arizona Department of Environmental Quality (ADEQ) Engineering bulletins. Spas may be drained to the street when the the water being discharged is chlorine free, at a Ph of 7 plus or minus.5, and no known biological hazards are present. Any stain or residue resulting from water disposal shall be removed by rinsing with potable water or other approved means. Water may be discharged to a wash when the above criteria are met and with measures to prevent erosion of the wash bank or channel.

# Disinfectant Equipment, Oxidation Equipment, and Chemical Feeders

- **Sec. 617**.(a) Disinfectant equipment, oxidation equipment, and chemical feeders, hereafter referred to jointly as "equipment" shall comply with nationally recognized standards. The disinfection equipment and the chemical feeders shall be capable of precisely introducing a sufficient quantity of a disinfecting agent.
- (b) Chemical Feeders. Good engineering practices and manufacturer's instructions shall be used in installing chemical feeders.
- (c) Low Ozone Output Generating Equipment. The installation of ozone generating equipment shall be limited to low ozone output generating equipment. The installation and use of ozone generating equipment shall conform to the following:
- 1. Installation of ozone generating equipment shall allow for indications of operation or malfunction to be easily observed. The equipment shall be installed in a manner such that a malfunction will not endanger operators or pool users.
- 2. Ozone generating equipment shall be used in conjunction with other chemical treatments. Normal maintenance and monitoring of water chemistry shall be followed.
- 3. Good engineering practices and manufacturer's recommendations shall be used to determine where and how ozone shall be injected.

### **Barriers and Enclosures**

- **Sec. 618.** Outdoor aboveground swimming pools shall be provided with an enclosure and barrier meeting the requirements of Section317 of this code, or :
  - 1 A pool safety cover may be used for a barrier if all the following conditions are met:
- a. When in the closed position, a sphere 4 inches in diameter is prevented from reaching the water surface.

- b. The cover is designed to support a static load of 485 pounds.
- c. The electric motor switch shall be key-operated or locked or there shall be an additional power disconnect located not less than 54" above the finished grade, deck or other walking surfaces.
- 2. The walls of a typical portable pool do not provide the required 5 foot high enclosure. Provisions must be made to surround the pool with an enclosure that meet all the requirements of Section 317 of this code.

# Chapter 7

#### PUBLIC AND SEMI-PUBLIC SWIMMING POOLS

## Scope

- **Sec. 701.**(a) This chapter is intended to cover public and semi-public pools to be used for bathing and operated by an owner, licensee, or concessionaire, regardless of whether a fee is charged for use.
- 1. This chapter is intended to cover certain aspects of the design, equipment, operation, installation, new construction and rehabilitation of pools. This code may be met notwithstanding certain variations in equipment, materials, and design.
- (b) This chapter is not meant to cover hot tubs, permanently installed residential pools, portable spas, aboveground pools, or other pools or spas, such as those operated for medical treatment, physical therapy, or other special purposes.
  - (c) other standards are referenced in this chapter for items not covered.

### **Materials of Construction**

**Sec. 702.** Swimming pools and all appurtenances thereto shall be constructed of materials which are nontoxic to man and the environment; which are impervious and enduring; which can withstand the design stresses; and which will provide a watertight structure with a smooth and easily cleaned surface without cracks or joints, excluding structural joints, or to which a smooth easily cleaned surface finish is applied or attached.

### **Structural Design**

- **Sec. 703.(a)** Prior to construction, rehabilitation, or alteration of a permanently installed public or semi-public swimming pool, plans and specifications, as required by Section 110 of this code, shall be submitted to the building official for review, approval, and issuance of a permit to construct or rehabilitate or alter. All plans and specifications shall have first been reviewed and approved by the Health Department.
- (b) The structural design and materials used shall be in accordance with generally accepted good structural engineering practices.
  - (c) Sand or earth shall not be permitted as an interior finish in a swimming pool.
- (d) In climates subject to freezing temperatures, the pool shell and appurtenances, piping, filter system, pump and motor, and other components shall be so designed and constructed to facilitate protection from damage due to freezing.
- (e) The surfaces within the pool intended to provide footing for users shall be designed to provide a slip-resisting surface. The roughness or irregularity of such surfaces shall not cause injury or discomfort to the feet during normal use.

- (f) The colors, patterns, or finishes of the pool interior shall not be such as to obscure the existence or presence of objects or surfaces within the pool.
- (g) The swimming pool shall be built in compliance with the plans as approved unless subsequent written approval of changes has been given by the building official.
- (h) The swimming pool owner or agent shall notify the building official at specific, predetermined stages of construction, and at the time of completion of the pool, to permit inspections.

# **Dimensional Design**

- **Sec. 704.(a)** No limits are specified for the shape of swimming pools except that consideration shall be given to shape from the standpoint of safety and circulation of the swimming pool water.
- 1. There shall be no protrusions, extensions, means of entanglement, or other obstructions in the swimming area which can cause the entrapment or injury of the user.
- 2. There shall be construction tolerances allowed on all dimensional designs. Overall length, width, and depth in the deep end may vary plus or minus three inches ( $\pm 3$ "). All other overall dimensions may vary plus or minus two inches ( $\pm 2$ "), unless otherwise specified (such as in a Class A pool). The designed waterline shall have a maximum construction tolerance at the time of completion of the work of plus or minus one-fourth inch ( $\pm 1/4$ ") for pools with adjustable weir surface skimming systems, and of plus or minus one-eighth inch ( $\pm 1/8$ ") for pools with nonadjustable surface skimming systems.
- 3. The size of Class A or D pools shall be governed by the requirements of the activities for which the installation is intended.
- (b) Walls in Class B and C pools shall not be greater than 11\_ from plumb (see Appendix, figure 2) for a minimum depth of two feet nine inches (2'9") from the waterline in deep areas, or two feet three inches (2'3") in the shallow areas. Below these depths, the wall may be radiused to join the floor. Class A pools, where racing lanes terminate, shall have plumb walls.
  - (c) Floor slopes shall, as a minimum, be in compliance with Section 704.(c)1 through 5.
  - 1. All slopes shall be uniform.
- 2. The slope of the floor from the shallow end wall towards the deep end shall not exceed one foot in twelve feet (1':12') to the point of the first slope change for Class A and B pools, or one foot in ten feet (1':10') for Class C pools.
- 3. The point of the first slope change shall be defined as the point at which the floor slope exceeds one foot in twelve feet (1':12') for Class A and B pools, or one foot in ten feet (1':10') for Class C pools.

- 4. The slope of the floor from the point of the first slope change to the deep end shall not exceed one foot in three feet (1':3'). Such slopes are not intended to provide any less water depth than those specified if the pool is intended for diving.
- 5. Transitional radius from wall to floor where floor slopes join the wall shall comply with the following:
- A. The radius shall have its center no less than two feet nine inches (2'9") below the waterline in deep areas or two feet six inches (2'6") in the shallow area.
- B. The radius shall be tangent at the points where the radius meets the wall and the floor.
- C. The radius shall be at least equal to, or greater than, the depth of the pool minus the vertical wall depth measured from the waterline (or tolerance allowed in Section 704(a)2), minus three inches (3") to allow draining to the main drain. (R minimum Pool depth Vertical wall depth 3")
- (d) Water depths at the shallow end of the swimming area shall be three feet (3') minimum, with a three feet six inches (3'6") minimum for racing pools. Exceptions may be made in a recessed area of the main swimming pool, outside of the competitive and/or swimming course, when the pool is an irregular shape with the permission of the building official.
- 1. The beginners' area of a pool shall be visually set apart from, but may be adjoined to, the shallow area and shall not adjoin the deep area.
- 2. The transition point of the pool from the beginners' area to the shallow area and from the shallow area to the deep area shall be visually set apart with a rope and float line; depth markers; and a four inch (4") minimum width row of floor tile, pointed line, or similar means of a color contrasting with the bottom. In diving pools with a constant slope, the shallow area shall be visually set apart from the deep area with a rope and float line, depth markers; and a four inch (4") minimum width row of floor tile, painted line, or similar means of a color contrasting with the bottom.
- 3. Class A pools intended for competitive diving and swimming shall be designed and constructed so as to provide the water depths specified by Federation International de National Amateur (FINA) U. S. Swimming, and U. S. Diving.
- (e) Class B and C pools intended for diving shall conform to the minimum water depths, areas, slopes, and other dimensions shown in Appendix A, Figure 11. If a wall exists, then it shall conform with the 3:1 slope in the Point D dimension and the L1-2-3-4 dimensions.
- 1. When diving equipment is installed, it shall conform to the specifications set forth in Section 705.(a) and shall be located in the diving area of the pool so as to provide the minimum dimensions as shown in Appendix A, Figure 11. Competitive diving equipment shall not be installed on Class B and C pools.

- 2. The tip of the diving equipment shall be located at Point "A," which is the reference point of all other dimensions.
- 3. There shall be a completely unobstructed clear vertical distance of thirteen feet (13') above any diving board measured from the center of the front end of the board. This area shall extend horizontally at least eight feet (8') behind, eight feet (8') to each side, and sixteen feet (16;) ahead of Point A.
- 4. Public pools with diving facilities in excess of three (3) meters in height, or pools designed for platform diving, shall comply with the dimensional design requirements of FINA, U. S. Diving, National Federation of State High School Associations (NFSHSA), etc.
- (f) Offset ledges, as shown in Appendix A, figure 10, when provided, shall fall within 11 degrees from plumb starting at the junction of the pool wall and waterline, and shall have a slip-resisting surface. Maximum width shall be eight inches (8"). The typical allowable dimensions are based on the depths shown below:
- (g) Underwater seat benches, when provided, shall have a maximum horizontal seat bench depth of twenty inches (20") below the waterline, be visually set apart, have a slip-resisting surface, and shall be located fully outside of the required minimum diving water envelope if the pool is intended for use with diving equipment.
- 1. Underwater seat benches shall be permitted in the deep end of the pool only if they are either completely recessed, shaped to be compatible with the contour of the pool wall, or in a corner of the pool.
- (h) Maximum user load at Class B or C pools shall be in accordance with the following table:

	Shallow Instructional or	Deep Area (not including the diving	Diving Area ( per each diving board)
	Wading Area	area)	
Pools with	15 square feet per	20 square feet per	300 square feet per
minimum deck	swimmer	swimmer	swimmer
area			
Pools with deck	12 square feet per	15 square feet per	300 square feet per
area at least	swimmer	swimmer	swimmer
equal to water			
surface area			
Pools with deck	8 square feet per	10 square feet per	300 square feet per
area at least	swimmer	swimmer	swimmer
twice the water			
surface area			

- 1. Where there is an anticipated maximum load in the swimming pool, there shall not be less than fifteen (15) square feet per user. Consideration shall be taken by the designer/operator to make certain that there is adequate room for the users.
- (i) Wading pools shall be separated from public and semi-public swimming pools by minimum four foot height fence or partition with self-closing, self-latching gate to prevent the direct entrance of waders into the swimming pool areas.
- 1. Wading pools shall have a maximum water depth of twenty inches (20"). The water depth at the perimeter shall not exceed eighteen inches (18"). Water depths may be reduced from the above maximums and brought to zero at the most shallow point.
- 2. Walls in wading pools shall be vertical or within 11\_ of vertical except for the lower six inches (6") which shall be radiused to the floor. Walls shall not extend more than six inches (6") above the waterline at each point.
- 3. Floors of wading pools shall be uniform, sloped to drain with a maximum slope of 1 foot in 12 feet (1':12').

# **Decks and Deck Equipment**

- **Sec. 705**.(a) These requirements shall be for decks and deck equipment used by users and shall apply at the time of construction.
- 1. Deck(s) shall be designed and installed in accordance with the engineering practices required in the area of installation. This includes the design and quality of subbase when required, concrete mix design, reinforcing, joints, etc.
- 2. Decks, ramps, coping, and similar step surfaces shall be slip-resisting and easily cleanable.
- 3. Special features in or on deck(s) such as markers, brand insignias or similar shall conform to this article.
- 4. Risers for steps for the deck shall be uniform and have a minimum height of three and three-fourths inches (3-3/4") and a maximum height of seven (7"). The minimum tread depth shall be eleven inches (11).
  - 5. Excavation areas shall be adequately compacted when they support the deck(s).
- 6. The minimum continuous, unobstructed deck width, including the coping, shall conform to the following, as appropriate.
- A. Class A pool As recommended by the appropriate activity (FINA, U. S. Swimming, U. S. Diving.)
  - B. Class B pool Ten feet (10') minimum.
  - C. Class C pool Four feet (4') minimum.

- D. Class D pool Three feet (3') minimum where provided.
- E. A minimum four feet (4') deck width shall be provided on the sides and rear of any diving equipment. A deck clearance of twenty-four inches (24") shall be provided around any other deck equipment that is thirty-six inches (36") or less in height above the deck. A deck clearance of thirty-six inches (36") shall be provided around all other deck equipment.
- 7. The minimum slope of the deck(s) shall be one-eighth inch per one foot (1/8::1') for textured, hand-finished concrete decks; one-fourth inch per one foot (1/4":1') for exposed aggregate concrete decks; and one-half inch per one foot (1/2":1') for indoor/outdoor carpeting decks, unless an alternate drainage method is provided.
- 8. The maximum slope of all decks other than wood decks shall be one inch per foot (1":1') except for ramps. The maximum slope for wood decks shall be one-eighth inch per foot (1/8":2'). Gaps shall be based on good engineering practices with respect to the type of wood used.
- 9. The maximum voids between adjoining concrete slabs, and/or between concrete slabs and expansion joint material, shall be three-sixteenths inch (3/16") of horizontal clearance with a maximum difference in vertical elevation of one-fourth inch (1/4").
- A. Construction joints where pool coping meets concrete deck(s) shall be watertight and shall not allow water to pass to the ground beneath.
- B. The areas where the deck(s) join pool coping shall be designed and installed so as to protect the coping and its mortar bed from damage as a result of reasonable movement of adjoining deck(s).
- C. Joints in deck(s) shall be provided to minimize the potential for cracks due to a change in elevations, separation of surfaces, or movement of the slab.
- D. The areas where deck(s) join concrete work shall be protected by expansion joints to protect the pool adequately from the pressures of relative movements.
- E. Deck(s) shall be edged, have a radius, or be otherwise relieved to eliminate sharp corners.
- F. Deck(s) shall be sloped to effectively drain either to perimeter areas or to deck drains. Drainage shall remove pool splash water, deck cleaning water, and rain water without leaving standing water.
- G. Site drainage shall be provided so as to direct all perimeter deck drainage as well as general site and roof drainage away from the pool. When required, yard drains shall be installed to prevent the accumulation or puddling of site water in the general area of the deck(s) and related improvements.
- 10. If used, an open pit or leaching design for backwash sump purposes shall be located so that it falls completely below adjacent deck(s) and fully outside a line projected 45 degrees

downward, refer to drawing shown in Figure 305, and away from such deck(s), or shall be designed to accommodate local soil conditions and the volume of backwash.

- 11. 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 twenty-five (25) pounds per square inch (psi) for thirty (30) minutes. This test shall be performed before the deck is poured, and the pressure shall be maintained through the deck pour.
- 12. Valves installed in or under any deck(s) shall be provided with a minimum ten inches (10") diameter access cover and valve pit to facilitate servicing.
- 13. A hose bibb with a vacuum breaker shall be provided for washing down the entire deck area.
- 14. All pools shall have at least two (2) means of entry/exit located so as to serve both ends of the pool. These shall consist of ladders, stairs, or recessed treads and may be used in combination. All treads shall have slip-resisting surfaces.
- a. Where water depths are twenty-four inches (24") or less at the pool wall, such areas shall be considered as providing their own natural mode for entry/exit.
- b. For pools or water areas over thirty feet (30') in width, both sides of the deep portions of the pool shall have a entries/exits provided.
- c. A means of entry/exits for the shallow end shall be located between the shallow end wall and the cross section at point "D", while a means of entry/exit for the deep end shall be between the deep end wall and the cross section at point "B". As shown in Appendix A, Figure 11.
- d. A means of entry/exit shall be provided at a minimum of every seventy-five (75) linear feet of pool wall or fraction thereof.
- e. Stairs, ladders and recessed treads shall be located so as not to interfere with racing lanes if applicable.
- 15. The design and construction of protruding and recessed pool stairs shall conform to the following:
- a. Step treads shall have a minimum unobstructed horizontal depth of ten inches (10") and a minimum unobstructed surface area of two hundred forty (240) square inches.
- b. Risers at the centerline of the treads shall have a maximum uniform height of twelve inches (12"), with the bottom riser height allowed to vary plus or minus two inches ( $\pm$ ") from the uniform riser height.
- 16. Each set of stairs shall be provided with at least one (1) handrail to serve all treads and risers. Handrails shall conform to the following:

- a. Handrails if removable, shall be installed in such a way that they cannot be removed without the use of tools.
- b. The leading edge of handrails facilitating stairs and pool entry/exit shall be no more than eighteen inches (18") plus or minus three inches ( $\pm$ 3"), horizontally from the vertical plane of the bottom riser (where applicable).
- c. The outside diameter of handrails shall be between one inch (1") and two and one quarter inches (2.25").
- d. Underwater seats, benches or swimouts may be provided as part of the stairs or recessed treads.
  - 17. The design and construction of pool ladder(s) shall conform to the following:
  - a. Pool ladders shall be made entirely of corrosion-resisting materials.
  - b. Ladders shall be provided with two (2) handholds or two (2) handrails.
- c. Below the water level, there shall be a clearance of not more than six inches (6") nor less than three (3") inches between any ladder tread edge, measured from the pool wall side of the tread and the pool wall.
- d. The clear distance between ladder handrails shall be a minimum of seventeen inches (17") and a maximum of twenty-four inches (24").
- e. There shall be a uniform height between ladder treads, with a seven inch (7") minimum distance and a twelve inch (12") maximum distance.
- f. Ladder treads shall have a minimum horizontal depth of one and one-half inches (1 ").
- 18. The design and construction of recessed treads in the pool shall conform to the following:
- a. Recessed treads at the centerline shall have a uniform vertical spacing of twelve inches (12") maximum and seven inches (7") minimum.
- b. The vertical distance between the pool coping edge, deck, or step surface and the uppermost recessed tread shall be a maximum of twelve inches (12").
- c. Recessed treads shall have a minimum depth of five inches (5") and a minimum width of twelve inches (12").
  - d. Recessed treads shall drain into the pool to prevent the accumulation of dirt.
- e. Each set of recessed treads shall be provided with a set of handrails/guardrails/handholds to serve all treads and risers.

- 19. Supports, platforms, stairs, and ladders for diving equipment shall be designed to carry the anticipated loads. Stairs and ladder shall be of corrosion-resisting material, easily cleanable and with slip-resisting tread. All diving stands higher than twenty-one inches (21") measured from the deck to the top butt end of the board shall be provided with stairs and/or a ladder. Step treads shall be self-draining.
- a. Platforms and diving equipment of one (1) meter or higher shall be protected with guard rails which shall be at least thirty inches (30") above the diving board and extend to the edge of the pool wall. All platforms or diving equipment high than one (1) meter shall have guard rails which are at least thirty six (36") inches above the diving board and extend to the edge of the pool wall.
- 20. Diving equipment shall be designed for swimming pool use and shall be installed in accordance with the manufacturer's recommendations. Diving equipment manufacturers shall provide installation instructions and specifications with each unit. A label shall be permanently affixed to the diving equipment or jump board and shall include:
  - A. Manufacturer's name and address.
  - B. Board equipment length.
  - C. Identification as to diving or jump board.
  - D. Fulcrum setting specifications (if applicable).
  - E. Reference to the current year and sections of the applicable NSPI standard.
- 3. Diving equipment suitable for installation on a lower pool type may be installed on any higher pool type providing no less a water envelope is provided from the tip of the board than called for in the lower type. Diving equipment of a greater type, e.g., Type VIII, shall not be installed on a pool of lesser type, e.g. Type VII. Should diving equipment be installed at any greater height than specified for the lower type pool, water surface area and geometry shall be provided for the type pool which permits board installation at that height.
  - 4. Diving equipment shall have slip-resisting tread surfaces.
- 5. Diving equipment shall be permanently anchored to the pool deck. The edge of the board at the tip end shall be level with the water surface. The tip end of the board over the pool water surface may be higher than the butt end of the board. Refer to manufacturer's recommendations.
- 6. Maximum board height over the water shall have plus three inches (+3") tolerance to allow for construction variances only on Class B and C pools.
- 7. The maximum construction tolerance of the tip of the board from Point "A" shall be plus or minus three inches (+3") on Class B and C pools. The diving equipment shall be in compliance with Section 704.(e)2.

(h) The requirements of the U.S. Consumer Product Safety Commission (CPSC) Standard for Swimming Pool Slides as published in the Code of Federal Regulations, 16 CFR, Part 1207, shall be used for standards relating to swimming pool slides. Installation and use instructions shall be provided with each unit by the manufacturer.

### **Circulation Systems**

- **Sec. 706**.(a) A circulation system consisting of pumps, piping, return inlets and suction outlets, filters, and other necessary equipment shall be provided for complete circulation of water through all parts of the pool.
- 1. The equipment shall be of adequate size to turn over the entire pool water capacity at least once every eight (8) hours. The system shall be designed to give the proper turnover rate based on the manufacturer's recommended maximum pressure flow of the filter, in clean media condition of the filter. Water clarity shall be maintained as required by the health department.
- 2. Circulation system components which require replacement or servicing shall be accessible for inspection, repair, or replacement and shall be installed according to the manufacturer's instructions.
- 3. Materials and equipment used in the circulation system shall comply with the Nationally recognized standards.
- 4. Pool equipment shall be properly supported to prevent damage from misalignment, settlement, etc. The equipment shall be mounted so as to minimize the potential for the accumulation of debris and moisture, following manufacturer's instructions.
- (b) The water velocity in the pool piping shall not exceed ten feet (10') per second for discharge piping (except for copper pipe where the velocity should not exceed eight feet (8') per second), and six feet (6') per second for suction piping, unless summary calculations are provided to show that the greater flow is possible with the pump and piping provided. Pool piping shall be sized to permit the rated flows for filtering and cleaning without exceeding the maximum head of the pump.
- 1. A wading pool shall have a separate circulation system of adequate size to turn over the entire pool water capacity at least once every two (2) hours.
- (c) The circulation system piping and fittings shall be nontoxic, shall be considered to be process piping, and shall be of material able to withstand operating pressures and operating conditions.
- 1. Pool piping subject to damage by freezing shall have a uniform slope in one direction equipped with valves for adequate drainage. Pool piping shall be supported at sufficient intervals to prevent entrapment of air, water, or dirt. Provisions shall be made for expansion or contraction of pipes.
- 2. Equipment shall be designed and fabricated to drain the pool water from the equipment, together with exposed face piping, by removal of drain plugs and manipulating

valves, or by other means. Refer to manufacturer's recommendations for specific information on draining the system.

- (d) A pressure or vacuum gauge or other means of indicating system condition shall be provided in the circulation system in an easily readable location, as required in section 708(j).
- 1. Class A, B and C public pools shall be provided with an indicator measuring the rate of flow through the filter system with an appropriate range readable in gallons per minute and accurate within ten (10) percent actual flow.
- (e) The circulation system shall be capable of maintaining water clarity and water chemistry requirements. Time clocks may be used to set the operating period. When time clocks are used, they shall also govern the operating time of appurtenant devices such as chemical/disinfectant feeders, slurry feeders, heaters, etc. that are dependent upon circulation pump flow.
  - (f) Operation and maintenance instructions shall be provided for the circulation system.

### **Filters**

**Sec. 707**.(a) Filters shall be designed so that after cleaning per manufacturer's instructions the system can provide the water clarity noted in Section 706.(a)1.

- 1. Filters shall be designed so that filtration surfaces can be inspected and services.
- (b) On pressure-type filters, a means shall be provided to permit the release of internal pressure.
- 1. Any filter incorporation an automatic internal air release as its principal means of air release shall have lids which provide a slow and safe release of pressure as a part of its design.
- 2. Any separation tank used in conjunction with any filter tank shall have a manual means of air release or a lid which provides a slow and safe release of pressure as it is opened as a part of its design.
- (c) Pressure filters and separation tanks shall have operation and maintenance instructions permanently installed on the filter or separation tank and shall include a precautionary statement warning not to start up the system after maintenance without first opening the air release and proper reassembly of the filter and separation tank. The statement shall be visible and noticeable within the area of the air release.
- (d) Piping furnished with the filter shall be of suitable material capable of withstanding one and one-half (1) times the working pressure. The suction piping shall not collapse when there is a complete shutoff of flow on the suction side of the pump.

## **Pumps and Motors**

- **Sec. 708.**(a) A pump and motor shall be provided for circulation of the pool water. Performance of all pumps shall meet or exceed the conditions of flow required for filtering and cleaning (if applicable) the filters against the total dynamic head developed by the complete system.
- (b) With all pressure filter systems, a cleanable strainer or screen shall be provided upstream of the circulation pump(s) to remove solids, debris, hair, lint, etc.
  - (c) Pump(s) and motor(s) shall be accessible for inspection and service.
- (d) The design and construction of the pump(s) and components parts shall provide safe operation.
- (e) Where a mechanical pump seal is provided, components of the seal shall be corrosion-resisting and capable of operating under conditions normally encountered in pool operation.
- (f) All motors shall have as a minimum an open, drip-proof enclosure and be constructed electrically and mechanically to perform satisfactorily and safely under the conditions of load and environment normally encountered in swimming pool installations.
- (g) Motor(s) shall be capable of operating the pump under full load with a voltage variation of plus or minus ten (+10) percent from the nameplate rating. If the maximum service factor of the motor is exceeded (at full voltage) the manufacturer shall indicate this on the pump curve.
- (h) All motors shall have thermal or current overload protection, either built in or in the line starter to provide locked rotor and running protection.
- (i) When the pump is below the waterline valves shall be installed on permanently connected suction and discharge lines, located in an accessible place outside the walls of the pool, where they shall be readily and easily accessible for maintenance and removal of the pump.
  - (j) Pressure and vacuum gauges shall be installed on all public pools.
- 1. The vacuum gauge shall be installed as close to the pump return inlet as possible and still maintain an accurate reading.
- 2. The pressure gauge shall be installed on the face piping ahead of the filter or on top of the filter in the area of greatest filter pressure.

#### **Return Inlets and Suction Outlets**

**Sec. 709**.(a) Return inlet(s) and suction outlet(s) shall be provided and arranged to produce a uniform circulation of water and maintain a uniform disinfectant residual throughout the pool. Where skimmers are used, the return inlet(s) shall be located so as to help bring floating particles within range of the skimmers.

- (b) Adjustable pool wall inlets shall be provided on all pools. Inlets shall be of sufficient number, properly designed, sized and installed to produce uniform circulation throughout the pool. There shall be a minimum of six inlets. At least one inlet shall be located within five feet of each corner and in each step alcove. Inlets shall be on a closed loop piping system. Where the width of the pool exceeds thirty feet, bottom returns will also be required. Bottom returns shall be flush with the pool bottom or of such design as to prevent injury to bathers. Returns will be considered to have an area of influence described by a radius of fifteen feet.
- (c) Pools shall be equipped with at least one main drain located in the deepest portion. Drains shall be covered by grating, which are not readily removable by bathers and which have safe openings at least four times the area of the drain pipe. Drains shall be spaced at intervals of not greater than one each twenty feet of pool width in the deepest portion. All drains must have plumbing provisions so as to relieve any possibility of entrapping suction.
- (d) If the suction outlet system, such as a filtration system, automatic cleaning system, solar system etc., has a single suction outlet, or multiple suction outlets which can be isolated by valves, each suction outlet shall conform to International Association of Plumbing and Mechanical Officials Standard ANSI/ASME A112.19 8M-1987 to protect against bather entrapment by either:
  - 1. An approved safety cover.
  - 2. A twelve inch by twelve inch (12" x 12") or larger grate.
  - 3. Other approved means.
- (e) A pool vacuum cleaning system shall be provided. In integral systems, connections shall be provided in sufficient number and location in the pool walls and is recommended to be at least ten inches below the water line. In addition, automatic or self-cleaning systems may be installed if they are approved by the department. Vacuum systems are to be installed with positive type shut off valves in the equipment area. Vacuum system shall be operational only when the vacuum lines are attached during the cleaning process. Vacuum inlets are to be installed with I.A.P.M.O. approved safety covers.

## **Surface Skimmer System**

- **Sec. 710**.(a) A surface skimming system shall be provided on all public swimming pools, and shall be designed and constructed to skim the pool surface when the water level is maintained within the operational parameters of the system's rim or weir device.
- (b) Skimming devices shall be designed and installed so as not to constitute a hazard to the bather.
- (c) Where an automatic surface skimming system is used as the sole overflow system, at least one (1) surface skimmer shall be provided for each five hundred (500) square feet or

fraction thereof of the water surface area. Nominal recessed areas such as stairs, swimouts, spas, etc., shall not be considered in the calculation. When skimmers are used, they shall be located to maintain effective skimming action over the entire surface of the pool.

- (d) Where a perimeter-type surface skimming system is used as the sole surface skimming system, this system shall extend around a minimum fifty (50) percent of the perimeter of the pool.
- 1. Where perimeter surface skimming systems are used, they shall be calculated to the circulation system with a system surge capacity of not less than one (1) gallon for each square foot of pool surface.
- (e) The hydraulic capacity of the overflow system shall be capable of handling one hundred (100) percent of the circulation flow.

# **Electrical Requirements**

**Sec. 711**. The requirements of the National Electrical Code (NEC), as published by the National Fire Protection Association, amended and adopted by the jurisdiction, shall be used.

#### **Heaters**

- **Sec. 712**.(a) Swimming pool heaters shall be tested by a nationally recognized testing agency and comply with the appropriate current nationally recognized standards.
- (b). The heater(s) shall be installed according to the manufacturer's recommendations and the following:
- 1. The heater shall be installed on a concrete (or equivalent) base unless it is specifically designed for installation on a combustible surface.
- 2. Adequate clearances shall be maintained on all sides and over the top of the heater, as shown in the manufacturer's instructions.
  - 3. The heater shall have adequate ventilation in order to assure proper combustion.
- 4. When installing a heater indoors, the heater shall be installed in accordance with the Mechanical Code as amended and adopted by the jurisdiction, and the manufacturer's recommendation for properly sized air openings to the enclosure.
- A. Draft or venting devices shall be installed according to the manufacturer's recommendations and shall not be modified.
- B. A heater using propane gas shall not be installed in a pit or basement. Whenever installing a heater using propane gas, the manufacturer's instructions shall be followed.
  - (d) Heater Piping System:

- 1. The heater gas supply piping shall comply with the Plumbing Code as amended and adopted by the administrative authority. When installing a gas-fired heater, the gas line shall be run from the gas meter as directly as practical.
- 2. The heater circulation system shall comply with the manufacturer's recommendations.
- 3. The water piping system shall be installed according to the manufacturer's recommendations.
- A. When installing a heater and a filter system, adequate provisions shall be made so that the heater does not cause excessive pressure drop to the filter system. Refer to manufacturer's requirements and/or recommendations for installation of bypass valves.

# **Water Supply**

- **Sec. 713**.(a) The water supply serving the pool, which may come from a variety of sources, shall meet the requirements of the Health Department (See Appendix B included for reference only) before the using the pool.
- (b) No direct mechanical connection shall be made between the potable water supply and the swimming pool, chlorinating equipment, or the system of piping for the pool, unless it is protected against backflow and back-siphonage in a manner approved by the building official, or through an air gap approved, or other equivalent means approved by the building official.
- (c) An over-the-rim spout, if used, shall be located under a diving board, adjacent to a ladder, or otherwise properly shielded so as not to create a hazard. Its open end shall have no sharp edges and shall not protrude more than two inches (2") beyond the edge of the pool.

### **Waste Water Disposal**

**Sec. 714.** Backwash water shall be disposed of and contained on site. All discharges of backwash water shall comply with applicable Town ordinances and Arizona Department of Environmental Quality (ADEQ) Engineering bulletins. Spas may be drained to the street when the the water being discharged is chlorine free, at a Ph of 7 plus or minus.5, and no known biological hazards are present. Any stain or residue resulting from water disposal shall be removed by rinsing with potable water or other approved means. Water may be discharged to a wash when the above criteria are met and with measures to prevent erosion of the wash bank or channel.

### **Disinfectant Equipment and Chemical Feeders**

**Sec. 715**.(a) Disinfectant equipment and chemical feeders, hereafter referred to jointly as "equipment" shall comply with the requirements of nationally recognized standards. The disinfecting equipment shall be capable of precisely introducing a sufficient quantity of an approved disinfecting agent.

- 1. Every pool shall be required to have disinfectant agent equipment in compliance with the requirements of the Health Department.
  - (b) The installation and use of chemical feeders shall conform to the following:
- 1. Chemical feeders shall be installed downstream from the filter and heater. Erosion-type feeders shall be allowed to feed their solution to the suction side of the pump.
- 2. A Chemical feeder shall be installed so it introduces the gas or solution downstream from the heater and, if possible, at a position lower than the heater outlet fitting.
- 3. Chemical feeders and pumps shall be wired so they cannot operate unless the filter pump is running. If the chlorinator has an independent timer, the filter and chemical feed pump timers shall be interlocked.
- (c) Low Ozone Output Generating Equipment. The installation of ozone generating equipment shall be limited to low ozone output generating equipment. The installation and use of ozone generating equipment shall conform to the following:
- 1. Installation of ozone generating equipment shall allow for indications of operation or malfunction to be easily observed. The equipment shall be installed in a manner such that a malfunction will not endanger operators or pool users.
- 2. Ozone generating equipment shall be used in conjunction with other chemical treatments. Normal maintenance and monitoring of water chemistry shall be followed.
- 3. Good engineering practices and manufacturer's recommendations shall be used to determine where and how ozone shall be injected.
- (d) Every public and semi-public pool shall be supplied with a chemical test kit for the determination of pH, chlorine or bromine residuals, cyanuric acid (if used), total alkalinity, and calcium hardness.

### **Safety**

#### **Sec. 716.**(a) Handholds shall conform to the following:

- 1. A public pool shall be provided with a suitable handhold around its perimeter in areas where depths exceed three feet six inches (3'6"). Handholds shall consist of any one (1) or a combination of the items listed below:
- A. Coping, ledge, or deck along the immediate top edge of the pool which proivdes a slip-resisting surface of at least four inches (4") minimum horizontal width and located at or not more than twelve inches (12") above the waterline; or
  - B. Ladders, stairs, or seat ledges; or

- C. A rope or railing placed not more than twelve inches (12") above the waterline and secured at not more than four foot intervals to the wall of the pool.
  - (b) Depth markers shall conform to the following:
- 1. The depth of water in feet shall be plainly and conspicuously marked at or above the waterline on the vertical pool wall and on the top of the coping or edge of the deck or walk next to the pool.
- A. Depth markers on the vertical pool wall shall be positioned to be read from the water side.
- B. Depth markers on the deck shall be within eighteen inches (18") of the water edge and positioned to be read while standing on the deck facing the water.
  - 4. Depth markers in or on the deck surfaces shall be slip-resisting.
- 5. There shall be a minimum of two (2) depth markers per pool, regardless of pool size or shape, spaced at not more than twenty-five (25) foot intervals uniformly located around the perimeter of the pool.
- 6. Depth markers shall be installed at intermediate increments of water depth not to exceed two feet (2') nor spaced at distances greater than twenty-five foot (25') intervals.
- 7. Depth markers shall have a four inch (4") minimum height. Numbers shall be of contrasting color to the background on which they are applied, and the color shall be of a permanent nature.

#### **Barriers and Enclosures**

- **Sec. 717.**(a) Outdoor public and semi-public swimming pools shall be provided with an enclosure and barrier meeting the following requirements:
- 1. Enclosure and barrier means a fence, wall or barrier of durable material of which the pool itself may be constructed, or any combination thereof.
- 2 Barriers and enclosures shall be not less than six feet in height for Class A and B pools and five feet in height for Class C and D pools.
- 3. No opening in a barrier or enclosure shall allow passage of a sphere larger than 4 inches.
- 4. The vertical distance between the bottom of a barrier or enclosure and the finished grade or walking surface shall not exceed 4 inches.
- 5. The barrier or enclosure shall be constructed so as not to provide opportunity for climbing on the side opposite the swimming pool.

- 6. The space on the outside of the enclosure which falls within the area described by a radius equal in length to the height of the enclosure and centered at the top of the enclosure, must be maintained free of all natural or man made objects which could be used to gain access into the enclosure.
- 7. All Gates shall have the same height as required in 717(a)2 for the type of pool and be self-closing and self-latching, with the latch at least 54" above the walking surface. Gates in a barrier and enclosure shall be installed to swing in a direction opposite the pool.
- 8. The enclosure may be limited to the pool area alone, or the area enclosed may also include the pool's ancillary facilities as part of the enclosure, provided that any doors or gates entering these ancillary facilities from outside the enclosure are equipped and sized as described above. General offices, recreation rooms, laundry facilities, etc., are not considered as ancillary facilities to the pool.

### **Dressing Facilities for Class A and B Swimming Pools**

**Sec. 718**. Dressing and sanitary facilities shall be provided and be approved by the Health Department, prior to the issuance of a permit.

### **Visitor and Spectator Area**

- **Sec. 719.(a)** There shall be separation between the spaces used by visitors and spectators in street clothes and those spaces used by users. The visitor and spectator area may be within the pool perimeter enclosure if it is in a separate area segregated from the space used by users.
  - 2. Separate toilets shall be provided for spectators.

#### **Operation and Management**

- **Sec. 720.**(a) Public pools shall be maintained under the supervision and direction of a properly trained operator who shall be responsible for the sanitation, safety, and proper maintenance of the pool, and all physical and mechanical equipment and records as required by the Health Department.
- (b) Rules and regulations for users shall be posted in a conspicuous place to inform pool patrons.
  - (c) The user load limit shall be conspicuously posted.

### **Operating Permits**

**Sec. 721.** A public pool shall not operate until such time as the appropriate application has been submitted to the Health Department on the prescribed forms and a valid operating permit has been issued by the Health Department. The permit shall be renewed annually.

### Chapter 8

#### PUBLIC AND SEMI-PUBLIC SPAS

### Scope

**Sec. 801.**(a) This chapter is intended to cover public and semi-public spas to be used for bathing and operated by an owner, licensee, or concessionaire, regardless of whether a fee is charged for use.

- 1. This chapter is intended to cover certain aspects of the design, equipment, operation, installation, new construction and rehabilitation of spas. This code may be met notwithstanding certain variations in equipment, materials, and design.
- (b) This chapter is not meant to cover hot tubs, permanently installed residential spas, portable spas, or other spas, such as those operated for medical treatment, physical therapy, or other special purposes.
  - (c) other standards are referenced in this chapter for items not covered.

#### **Materials of Construction**

**Sec. 802**. Spas and all appurtenances thereto shall be constructed of materials which are nontoxic to man and the environment; which are impervious and enduring; which can withstand the design stresses; and which will provide a watertight structure with a smooth and easily cleaned surface without cracks or joints, excluding structural joints, or to which a smooth easily cleaned surface finish is applied or attached.

#### **Structural Design**

- **Sec. 803.(a)** Prior to construction, rehabilitation, or alteration of a permanently installed public or semi-public spa, plans and specifications, as required by Section 110 of this code, shall be submitted to the building official for review, approval, and issuance of a permit to construct or rehabilitate or alter. All plans and specifications shall have first been reviewed and approved by the Health Department.
- (b) The structural design and materials used shall be in accordance with generally accepted good structural engineering practices.
  - (c) Sand or earth shall not be permitted as an interior finish in a spa.
- (d) In climates subject to freezing temperatures, the spa shell and appurtenances, piping, filter system, pump and motor, and other components shall be so designed and constructed to facilitate protection from damage due to freezing.
- (e) The surfaces within the spa intended to provide footing for users shall be designed to provide a slip-resisting surface. The roughness or irregularity of such surfaces shall not cause injury or discomfort to the feet during normal use.

- (f) The colors, patterns, or finishes of the spa interior shall not be such as to obscure the existence or presence of objects or surfaces within the spa.
- (g) The spa shall be built in compliance with the plans as approved unless subsequent written approval of changes has been given by the building official.
- (h) The spa owner or agent shall notify the building official at specific, predetermined stages of construction, and at the time of completion of the spa, to permit inspections.

# **Dimensional Design**

- **Sec. 804.(a)** No limits are specified for the shape of spas except that consideration shall be given to shape from the standpoint of safety and circulation of the spa water.
- 1. There shall be no protrusions, extensions, means of entanglement, or other obstructions in the bathing area which can cause the entrapment or injury of the user.
- 2. The designed waterline shall have a maximum construction tolerance at the time of completion of the work of a plus or minus one-fourth inch ( $\pm$  ") for spas with adjustable weir surface skimming systems, and a plus or minus one-eighth inch ( $\pm$  1/8") for spas with nonadjustable surface skimming systems.
- 3. There shall be a construction tolerance on all other dimensional designs. Overall dimensions may vary plus or minus two inches  $(\pm 2)$  unless otherwise specified.
- (b) The maximum water depth shall be four feet (4') measured from the waterline. Exceptions may be made for spas designed for a special purpose.
- (c) Multi-level seating may be provided, but the maximum water depth of any seat or sitting bench shall be thirty inches (30") measured from the waterline.
- (d) The slope of the floor shall not exceed one foot in twelve feet (1:12) vertical to horizontal.
- (f) Steps, seats, ladders or recessed treads shall be provided for entry and exit where water depths are greater than twenty-four inches (24").
- 1. Spas shall be equipped with at least one handrail (or ladder equivalent) for each fifty feet (50') of perimeter, or portion thereof, to designate the point of entry and exit.
- (g) The design and construction of spa steps, recessed steps, and seat benches, where used, shall conform to the following:
- 1. Step treads shall have a minimum unobstructed horizontal depth of ten inches (10") for a minimum continuous width of twelve inches (12"). Step treads shall have slip-resisting surfaces.

- 2. Riser heights shall not be less than seven inches (7") nor greater than twelve inches (12"). Where the bottom tread serves as a bench or seat, the bottom riser may be a maximum of fourteen inches (14") above the spa floor.
- 3. The first and last risers need not be uniform but shall comply with riser height requirements as noted above. The first (top) riser is measured from the finished deck.
  - 4. Intermediate risers, those between the first and last risers, shall be uniform in height.
- 5. Each set of steps shall be provided with at least one (1) handrail to serve all treads and risers.
  - A. Handrails shall be installed in such a way that they shall be removed only with tools.
- B. The leading edge of a handrail in the spa shall be no more than eighteen inches (18") plus or minus three inches ( $\pm$  3") horizontally from the vertical plans of the bottom riser (where applicable).
  - 6. Seats or benches may be provided as part of the steps.
- (h) The design and construction of spa ladder(s), where used, shall conform to the following:
  - 1. Spa ladder(s) shall be made entirely of corrosion-resisting materials.
  - 2. Ladder treads shall have slip-resisting surfaces.
  - 3. Ladder(s) shall provide two (2) handholds/handrails.
- 4. The outside diameter of a ladder rail shall be between one inch (1") and two and a quarter inches (2.25").
- 5. Below the water level, there shall be a clearance of not more than six inches (6") nor less than three inches (3") between any ladder, tread edge, measured from the spa wall side of the tread, and the spa wall.
- 6. The clear distance between ladder handrails shall be a minimum of seventeen inches (17") and a maximum of twenty-four inches (24").
- (i) The design and construction of recessed treads, where provided, shall conform to the following:
- 1. Recessed treads at the centerline shall have a uniform vertical spacing of twelve inches (12") maximum and seven inches (7") minimum.
- 2. The vertical distance between the spa coping edge, deck, or step surface and the uppermost recessed tread shall be a maximum of twelve inches (12").

- 3. Recessed treads shall have a minimum depth of five inches (5") and a minimum width of twelve inches (12').
- 4. Recessed treads shall drain into the spa to prevent the accumulation of dirt and shall be slip-resisting.
- 5. Each set of recessed treads shall be provided with a set of handrails/grabrails/handholds to serve all treads and risers.

# **Decks and Deck Equipment**

- **Sec. 805**.(a) These requirements shall be for decks and deck equipment used by users and shall apply at the time of construction.
- 1. Deck(s) shall be designed and installed in accordance with the engineering practices required in the area of installation. This includes the design and quality of subbase when required, concrete mix design, reinforcing, joints, etc.
- 2. Decks, ramps, coping, and similar step surfaces shall be slip-resisting and easily cleanable.
- 3. Special features in or on deck(s) such as markers, brand insignias or similar shall conform to this article.
- 4 Risers for steps for the deck shall be uniform and have a minimum height of three and three-fourths inches (3-3/4") and a maximum height of seven (7"). The minimum tread depth shall be eleven inches (11").
- 5. The minimum slope of the deck(s) shall be one-eighth inch per one foot (1/8:1') for textured, hand-finished concrete decks; one-fourth inch per one foot (1/4":1') for exposed aggregate concrete decks; and one-half inch per one foot (1/2":1') for indoor/outdoor carpeting decks, unless an alternate drainage method is provided.
- 6. The maximum slope of all decks other than wood decks shall be one inch per foot (1":1') except for ramps. The maximum slope for wood decks shall be one-eighth inch per foot (1/8":2'). Gaps shall be based on good engineering practices with respect to the type of wood used.
- 7. The maximum voids between adjoining concrete slabs, and/or between concrete slabs and expansion joint material, shall be three-sixteenths inch (3/16") of horizontal clearance with a maximum difference in vertical elevation of one-fourth inch (1/4").
- A. Construction joints where spa coping meets concrete deck(s) shall be watertight and shall not allow water to pass to the ground beneath.
- B. The areas where the deck(s) join spa coping shall be designed and installed so as to protect the coping and its mortar bed from damage as a result of reasonable movement of adjoining deck(s).

- C. Joints in deck(s) shall be provided to minimize the potential for cracks due to a change in elevations, separation of surfaces, or movement of the slab.
- D. The areas where deck(s) join concrete work shall be protected by expansion joints to protect the spa adequately from the pressures of relative movements.
- E. Deck(s) shall be edged, have a radius, or be otherwise relieved to eliminate sharp corners.
- F. Deck(s) shall be sloped to effectively drain either to perimeter areas or to deck drains. Drainage shall remove spa splash water, deck cleaning water, and rain water without leaving standing water.
- G. Site drainage shall be provided so as to direct all perimeter deck drainage as well as general site and roof drainage away from the spa. When required, yard drains shall be installed to prevent the accumulation or puddling of site water in the general area of the deck(s) and related improvements.
- 8. If used, an open pit or leaching design for backwash sump purposes shall be located so that it falls completely below adjacent deck(s) and fully outside a line projected 45\_ downward and away from such deck(s), or shall be designed to accommodate local soil conditions and the volume of backwash.
- 9. Circulation system piping, other than that integrally included in the manufacture of the spa, shall be subject to an induced static hydraulic pressure test (sealed system) at twenty-five (25) pounds per square inch (psi) for thirty (30) minutes. This test shall be performed before the deck is poured, and the pressure shall be maintained through the deck pour. For premolded spas, a normal operational running test may be provided in lieu of a pressure test.
- 10. Valves installed in or under any deck(s) shall provided with a minimum ten inches (10") diameter access cover and valve pit to facilitate servicing.
- 11. A hose bibb with a vacuum breaker shall be provided for washing down the entire deck area.

### **Circulation Systems**

- **Sec. 806**.(a) A circulation system consisting of pumps, piping, return inlets and suction outlets, filters, and other necessary equipment shall be provided for complete circulation of water through all parts of the spa.
- 1. The equipment shall be of adequate size to turn over the entire spa water capacity at least once every thirty (30) minutes. The system shall be designed to give the proper turnover rate based on the manufacturer's recommended maximum pressure flow of the filter, in clean media condition of the filter. Water clarity shall be maintained as required by the health department.

- 2. Circulation system components which require replacement or servicing shall be accessible for inspection, repair, or replacement and shall be installed according to the manufacturer's instructions.
- 3. Materials and equipment used in the circulation system shall comply with the Nationally recognized standards.
- 4. Spa equipment shall be properly supported to prevent damage from misalignment, settlement, etc. The equipment shall be mounted so as to minimize the potential for the accumulation of debris and moisture, following manufacturer's instructions.
- (b) The water velocity in the spa piping shall not exceed ten feet (10') per second for discharge piping (except for copper pipe where the velocity should not exceed eight feet (8') per second), and six feet (6') per second for suction piping, unless summary calculations are provided to show that the greater flow is possible with the pump and piping provided. Spa piping shall be sized to permit the rated flows for filtering and cleaning without exceeding the maximum head of the pump.
- (c) The circulation system piping and fittings shall be nontoxic, shall be considered to be process piping, and shall be of material able to withstand operating pressures and operating conditions.
- 1. Spa piping subject to damage by freezing shall have a uniform slope in one direction equipped with valves for adequate drainage. Spa piping shall be supported at sufficient intervals to prevent entrapment of air, water, or dirt. Provisions shall be made for expansion or contraction of pipes.
- 2. Equipment shall be designed and fabricated to drain the spa water from the equipment, together with exposed face piping, by removal of drain plugs and manipulating valves, or by other means. Refer to manufacturer's recommendations for specific information on draining the system.
- (d) A pressure or vacuum gauge or other means of indicating system condition shall be provided in the circulation system in an easily readable location. As required in section 708(j).
- 1. Public spas shall be provided with an indicator measuring the rate of flow through the filter system with an appropriate range readable in gallons per minute and accurate within ten (10) percent actual flow.
- (e) The circulation system shall be capable of maintaining water clarity and water chemistry requirements. Time clocks may be used to set the operating period. When time clocks are used, they shall also govern the operating time of appurtenant devices such as chemical/disinfectant feeders, slurry feeders, heaters, etc. that are dependent upon circulation pump flow.
  - (f). Operation and maintenance instructions shall be provided for the circulation system.

#### **Filters**

- **Sec. 807**.(a) Filters shall be designed so that after cleaning per manufacturer's instructions the system can provide the water clarity noted in Section 806.(a)1.
  - 1. Filters shall be designed so that filtration surfaces can be inspected and services.
- (b) On pressure-type filters, a means shall be provided to permit the release of internal pressure.
- 1. Any filter incorporating an automatic internal air release as its principal means of air release shall have lids which provide a slow and safe release of pressure as a part of its design.
- 2. Any separation tank used in conjunction with any filter tank shall have a manual means of air release or a lid which provides a slow and safe release of pressure as it is opened as a part of its design.
- (c) Pressure filters and separation tanks shall have operation and maintenance instructions permanently installed on the filter or separation tank and shall include a precautionary statement warning not to start up the system after maintenance without first opening the air release and proper reassembly of the filter and separation tank. The statement shall be visible and noticeable within the area of the air release.
- (d) Piping furnished with the filter shall be of suitable material capable of withstanding one and one-half (1) times the working pressure. The suction piping shall not collapse when there is a complete shutoff of flow on the suction side of the pump.

# **Pumps and Motors**

- **Sec. 808**.(a) A pump and motor shall be provided for circulation of the spa water. Performance of all pumps shall meet or exceed the conditions of flow required for filtering and cleaning (if applicable) the filters against the total dynamic head developed by the complete system.
- (b) With all pressure filter systems, a cleanable strainer or screen shall be provided upstream of the circulation pump(s) to remove solids, debris, hair, lint, etc.
  - (c) Pump(s) and motor(s) shall be accessible for inspection and service.
- (d) The design and construction of the pump(s) and components parts shall provide safe operation.
- (e) Where a mechanical pump seal is provided, components of the seal shall be corrosion-resisting and capable of operating under conditions normally encountered in spa operation.
- (f) All motors shall have as a minimum an open, drip-proof enclosure and be constructed electrically and mechanically to perform satisfactorily and safely under the conditions of load and environment normally encountered in swimming spa installations.

- (g) Motor(s) shall be capable of operating the pump under full load with a voltage variation of plus or minus ten (+10) percent from the nameplate rating. If the maximum service factor of the motor is exceeded (at full voltage) the manufacturer shall indicate this on the pump curve.
- (h) All motors shall have thermal or current overload protection, either built in or in the line starter to provide locked rotor and running protection.
- (i) When the pump is below the waterline valves shall be installed on permanently connected suction and discharge lines, located in an accessible place outside the walls of the spa, where they shall be readily and easily accessible for maintenance and removal of the pump.
  - (j) Pressure and vacuum gauges shall be installed on all public spas.
- 1. The vacuum gauge shall be installed as close to the pump return inlet as possible and still maintain an accurate reading.
- 2. The pressure gauge shall be installed on the face piping ahead of the filter or on top of the filter in the area of greatest filter pressure.

#### **Return Inlets and Suction Outlets**

- **Sec. 809**.(a) Return inlet(s) and suction outlet(s) shall be provided and arranged to produce a uniform circulation of water and maintain a uniform disinfectant residual throughout the spa. Where skimmers are used, the return inlet(s) shall be located so as to help bring floating particles within range of the skimmers.
- 1. Return inlet(s) from the circulation system shall be designed so as not to constitute a hazard to the bather.
- (b) The spa shall not be operated if the outlet grate is missing, broken or secured in such a way that it can be removed without the use of tools.
- (c) If the suction outlet system, such as a filtration system, automatic cleaning system, solar system etc., has a single suction outlet, or multiple suction outlets which can be isolated by valves, each suction outlet shall conform to International Association of Plumbing and Mechanical Officials Standard ANSI/ASME A112.19 8M-1987 to protect against bather entrapment by either:
  - 1. An approved safety cover.
  - 2. A twelve inch by twelve inch (12" x 12") or larger grate.
  - 3. Other approved means.
- (d). A minimum of two (2) suction outlets shall be provided for each pump in the suction outlet system, separated by a minimum of three feet (3') or located on two (2) different planes; i.e. one (1) on the bottom and one (1) on the vertical wall, or two (2) separate vertical walls.

These suction outlets shall be plumbed such that water is drawn through them simultaneously through a common line to the pump.

# **Surface Skimmer System**

- **Sec. 810**.(a) A surface skimming system shall be provided on all public spas, and shall be designed and constructed to skim the spa surface when the water level is maintained within the operational parameters of the system's rim or weir device.
- (b) Skimming devices shall be designed and installed so as not to constitute a hazard to the user.
- (c) Where automatic surface skimmers system are used as the sole overflow system, at least one (1) surface skimmer shall be provided for each one hundred fifty (150) square feet, or fraction thereof, of water surface area. Nominal recessed areas such as stairs shall not be considered in the calculation.
- (d) Where perimeter surface skimming systems are used, they shall be connected to the circulation system with a system surge capacity of not less than two and one half (2) gallons for each square foot of spa surface.
- 1. Where perimeter surface skimming systems are used, they shall be calculated to the circulation system with a system surge capacity of not less than one (1) gallon for each square foot of spa surface.
- (e) The hydraulic capacity of the overflow system shall be capable of handling one hundred (100) percent of the circulation flow.

### **Air Induction System**

- **Sec. 811.(a)** Any air induction system shall prevent water back-up that could cause electrical shock hazards.
  - (b) Air intake sources shall not induce water, dirt or contaminants into the spa.
- (c) Air induction systems shall be installed in accordance with manufacturer's instructions.

### **Electrical Requirements**

**Sec. 812**. The requirements of the National Electrical Code (NEC), as published by the National Fire Protection Association, amended and adopted by the jurisdiction, shall be used.

#### **Heaters**

**Sec. 813**.(a) Spas heaters shall be tested by a nationally recognized testing agency and comply with the appropriate current nationally recognized standards.

- (b) The heater(s) shall be installed according to the manufacturer's recommendations and the following:
- 1. The heater shall be installed on a concrete (or equivalent) base unless it is specifically designed for installation on a combustible surface.
- 2. Adequate clearances shall be maintained on all sides and over the top of the heater, as shown in the manufacturer's instructions.
  - 3. The heater shall have adequate ventilation in order to assure proper combustion.
- 4. When installing a heater indoors, the heater shall be installed in accordance with the Mechanical Code as amended and adopted by the jurisdiction, and the manufacturer's recommendation for properly sized air openings to the enclosure.
- A. Draft or venting devices shall be installed according to the manufacturer's recommendations and shall not be modified.
- B. A heater using propane gas shall not be installed in a pit or basement. Whenever installing a heater using propane gas, the manufacturer's instructions shall be followed.
  - (c) Heater Piping System:
- 1. The heater gas supply piping shall comply with the Plumbing Code as amended and adopted by the administrative authority. When installing a gas-fired heater, the gas line shall be run from the gas meter as directly as practical.
  - 2. The heater circulation system shall comply with the manufacturer's recommendations.
- 3. The water piping system shall be installed according to the manufacturer's recommendations.
- A. When installing a heater and a filter system, adequate provisions shall be made so that the heater does not cause excessive pressure drop to the filter system. Refer to manufacturer's requirements and/or recommendations for installation of bypass valves.

### **Water Supply**

- **Sec. 814**.(a) The water supply serving the spa, which may come from a variety of sources, shall meet the requirements of the Health Department (see Appendix B included for reference only) before the user uses the spa.
- (b) No direct mechanical connection shall be made between the potable water supply and the spa, chlorinating equipment, or the system of piping for the spa, unless it is protected against backflow and back-siphonage in a manner approved by the building official, or through an air gap approved, or other equivalent means approved by the building official.

(c) An over-the-rim spout, if used, shall be properly shielded so as not to create a hazard. Its open end shall have no sharp edges and shall not protrude more than two inches (2") beyond the edge of the spa.

# **Waste Water Disposal**

**Sec. 815.** . Backwash water shall be disposed of and contained on site. All discharges of backwash water shall comply with applicable Town ordinances and Arizona Department of Environmental Quality (ADEQ) Engineering bulletins. Pools/Spas may be drained to the street when the the water being discharged is chlorine free, at a Ph of 7 plus or minus.5, and no known biological hazards are present. Any stain or residue resulting from water disposal shall be removed by rinsing with potable water or other approved means. Water may be discharged to a wash when the above criteria are met and with measures to prevent erosion of the wash bank or channel.

### **Disinfectant Equipment and Chemical Feeders**

- **Sec. 816**.(a) Disinfectant equipment and chemical feeders, hereafter referred to jointly as "equipment" shall comply with the requirements of nationally recognized standards. The disinfecting equipment shall be capable of precisely introducing a sufficient quantity of an approved disinfecting agent to maintain the appropriate levels as required by the Health Department (see Appendix B included for reference only).
- 1. Every spa shall be required to have disinfectant agent equipment in compliance with the requirements of the Health Department.
  - (b) The installation and use of chemical feeders shall conform to the following:
- 1. Chemical feeders shall be installed downstream from the filter and heater. Erosion-type feeders shall be allowed to feed their solution to the suction side of the pump.
- 2. A Chemical feeder shall be installed so it introduces the gas or solution downstream from the heater and, if possible, at a position lower than the heater outlet fitting.
- 3. Chemical feeders and pumps shall be wired so they cannot operate unless the filter pump is running. If the chlorinator has an independent timer, the filter and chemical feed pump timers shall be interlocked.
- (c) Low Ozone Output Generating Equipment. The installation of ozone generating equipment shall be limited to low ozone output generating equipment. The installation and use of ozone generating equipment shall conform to the following:
- 1. Installation of ozone generating equipment shall allow for indications of operation or malfunction to be easily observed. The equipment shall be installed in a manner such that a malfunction will not endanger operators or spa users.
- 2. Ozone generating equipment shall be used in conjunction with other chemical treatments. Normal maintenance and monitoring of water chemistry shall be followed.

3. Good engineering practices and manufacturer's recommendations shall be used to determine where and how ozone shall be injected.

# **Safety**

### **Sec. 817.**(a) Handholds shall conform to the following:

- 1. A public spa shall be provided with a suitable handhold around its perimeter in areas where depths exceed three feet six inches (3'6"). Handholds shall consist of any one (1) or a combination of the items listed below:
- A. Coping, ledge, or deck along the immediate top edge of the spa which provides a slip-resisting surface of at lest four inches (4") minimum horizontal width and located at or not more than twelve inches (12") above the waterline; or
  - B. Ladders, stairs, or seat ledges; or
- C. A rope or railing placed not more than twelve inches (12") above the waterline and secured at not more than four foot intervals to the wall of the spa.
  - (b) Depth markers shall conform to the following:
- 1. The depth of water in feet shall be plainly and conspicuously marked at or above the waterline on the vertical spa wall and on the top of the coping or edge of the deck or walk next to the spa.
- A. Depth markers on the vertical spa wall shall be positioned to be read from the water side.
- B. Depth markers on the deck shall be within eighteen inches (18") of the water edge and positioned to be read while standing on the deck facing the water.
  - 2. Depth markers in or on the deck surfaces shall be slip-resisting.
- 3. There shall be a minimum of two (2) depth markers per spa, regardless of spa size or shape, spaced at nor more than twenty-five (25) foot intervals uniformly located around the perimeter of the spa.
- 4. Depth markers shall have a four inch (4") minimum height. Numbers shall be of contrasting color to the background on which they are applied, and the color shall be of a permanent nature.

#### **Barriers and Enclosures**

**Sec. 818**.(a) Outdoor public and semi-public spas shall be provided with an enclosure and barrier meeting the following requirements:

- 1. Enclosure and barrier means a fence, wall or barrier of durable material of which the pool itself may be constructed, or any combination thereof.
- 2 Barriers and enclosures shall be not less than six feet in height for public spas and five feet in height for semi-public spas.
- 3. No opening in a barrier or enclosure shall allow passage of a sphere larger than 4 inches.
- 4. The vertical distance between the bottom of a barrier or enclosure and the finished grade or walking surface shall not exceed 4 inches.
- 5. The barrier or enclosure shall be constructed so as not to provide opportunity for climbing on the side opposite the spa.
- A. Footholds or handholds shall be not less than 48 inches from the top of the enclosure or 48 inches from the finished grade, or other walking surface measured on the side opposite the spa. Openings in chain-link fences, exceeding 1 inches, shall be slatted.
- B. Wrought iron or wood barriers or enclosures shall be constructed with at least 48 inches between the top surface of the horizontal members.
- C. Where a protrusion, indention, or top surface is at a continuous angle of inclination towards the barrier or enclosure equal to 45 degrees above the horizontal and otherwise does not provide a handhold or foothold, it shall be deemed not to provide an opportunity for climbing, for purposes of this code.
- D. The space on the outside of the enclosure which falls within the area described by a radius equal in length to the height of the enclosure and centered at the top of the enclosure, must be maintained free of all natural or man made objects which could be used to gain access into the enclosure.
- 6. Gates placed in an enclosure or barrier shall comply with the above. All gates shall be not less than five feet in height and be self-closing and self-latching, with the latch at least 54" above the walking surface. Gates in a barrier and enclosure shall be installed to swing in a direction opposite the spa.
- 7. The enclosure may be limited to the spa area alone, or the area enclosed may also include the spa's ancillary facilities as part of the enclosure, provided that any doors or gates entering these ancillary facilities from outside the enclosure are equipped and sized as described above. General offices, recreation rooms, laundry facilities, etc. are not considered as ancillary facilities to the spa.

#### **Dressing Facilities**

**Sec. 819**. Dressing and sanitary facilities shall be provided and be approved by the Health Department, prior to the issuance of a permit.

# **Operation and Management**

- **Sec. 820.**(a) Public spas shall be maintained under the supervision and direction of a properly trained operator who shall be responsible for the sanitation, safety, and proper maintenance of the spa, and all physical and mechanical equipment and records as required by the Health Department.
- (b) Rules and regulations for users shall be posted in a conspicuous place to inform spa patrons.
  - (c) The user load limit shall be conspicuously posted.

# **Operating Permits**

**Sec. 821.** A public spa shall not operate until such time as the appropriate application has been submitted to the Health Department on the prescribed forms and a valid operating permit has been issued by the Health Department. The permit shall be renewed annually.