

MARICOPA COUNTY ENVIRONMENTAL HEALTH CODE

CHAPTER VI

BATHING PLACES - PUBLIC AND SEMIPUBLIC SWIMMING POOLS

SECTION 3

GENERAL DESIGN STANDARDS AND SPECIFICATIONS

REGULATION 1. Materials

- a. A public or semipublic swimming pool or spa shall be constructed of concrete or other structurally rigid material that is equivalent in strength and durability to concrete, except that a public or semipublic spa may be constructed of fiberglass or acrylic.
- b. A surface within a public or semipublic swimming pool or spa intended to provide footing for users shall have a slip-resistant surface. The roughness or irregularity of the surface shall not cause injury or discomfort to users' feet during normal use.
- c. The materials and construction of a public or semipublic swimming pool shall be sound, durable and, where required, waterproof. The pool shall be constructed of materials that are rigid, nontoxic, smooth, free from cracks, easily cleanable and finished in white, pastel or other light colors. The color, pattern or finish of the interior of a public or semipublic swimming pool or spa shall not obscure objects, surfaces within the swimming pool or spa, debris, sediment or algae. Corners shall be rounded. Pool linings, specifically plastic and similar linings, and finishes not totally bonded to the pool sides and bottom are prohibited.

REGULATION 2. Shape

- a. A public or semipublic swimming pool or spa may be any shape except that the designer shall shape a public or semipublic swimming pool or spa to minimize hazards to users and provide adequate circulation of swimming pool or spa water.
- b. There shall be no protrusions, extensions, means of entanglement or other obstructions in a public or semipublic swimming pool or spa that may cause entrapment of or injury to the user. This subsection does not prohibit water features such as water fountains, slides, water play equipment or water volleyball and basketball nets.
- c. Where a racing lane terminates in a swimming pool, the wall shall be plumbed to a minimum depth of five (5) feet below the waterline. Below the five (5)-foot depth, the wall shall be radiused to join the floor.

- d. The minimum average width of a semipublic pool shall be 14 feet. The average width shall be calculated by dividing the surface area by the total length of the pool as noted in Appendix B.
- e. Coping or cantilevered deck may project from a swimming pool or spa wall to provide a handhold for users. The coping or deck shall be rounded, have a slip-resistant surface and shall not exceed three and one-half (3½) inches in thickness. The overhang of the coping or deck shall not exceed two (2) inches or be less than one (1) inch. All corners created by coping or cantilevered deck shall be rounded in both the vertical and horizontal dimensions to eliminate sharp corners.
- f. Floors:
 - 1. The slope of the floor of a public or semipublic swimming pool, from the end wall in the shallow area towards the deep area to the point of the first slope change, shall be uniform and shall not exceed one (1) foot of fall in ten (10) feet. The floor slope in a public or semipublic spa shall not exceed one (1) foot of fall in ten (10) feet.
 - 2. The floor slope of a public or semipublic swimming pool, from the point of the first slope change to the deepest part of the swimming pool, shall not exceed one (1) foot of fall in three (3) feet.
For public or semipublic swimming pools, the depth of the swimming pool at the point of the first slope change shall be a minimum of five (5) feet.
 - 3. All portions of a swimming pool or spa floor shall slope towards a main drain.
 - 4. The transitional radius where the floor of a public or semipublic swimming pool joins a wall shall comply with all the following:
 - (a) The center of the radius shall be no less than three (3) feet below the waterline in the deep area or two (2) feet below the waterline in the shallow area,
 - (b) The radius shall be tangent at the point where the radius meets the wall or floor, and
 - (c) The radius shall be equal to or greater than the depth of the swimming pool minus the vertical wall depth measured from the waterline minus three (3) inches.

REGULATION 3. Fill and Draw Pools

The construction and operation of fill and draw pools is prohibited.

REGULATION 4. Water Recirculation and Filtering System

General - The water recirculation system, consisting primarily of piping, pumps, filters, water conditioning and disinfecting equipment, together with other standard accessory equipment, shall be adequate to clarify and disinfect the entire contents of the pool within eight (8) hours or less. Water withdrawn shall not be returned to the pool unless it has been filtered and otherwise treated in an approved manner except that water may be withdrawn from a swimming pool for a water slide or a water feature without being filtered or disinfected as approved by the Department.

- a. The water recirculation system shall consist primarily of piping, pumps, filters, water conditioning and disinfecting equipment, together with other standard accessory equipment. Each bathing place shall be provided with a separate and distinct recirculation system.
- b. The water recirculation system shall be adequate to filter and disinfect the entire contents of the pool within eight (8) hours or less. Bypassing chemical feeders or other similar devices may be exempted from this requirement with the approval of the Department.
- c. The water recirculation system shall operate continuously.
- d. Seasonal closing of the pool shall be allowed when all of the following exist:
 1. A sign is posted that the pool/spa is closed;
 2. The gates are locked shut, and
 3. The Department is notified in writing of any such closure.

REGULATION 5. Piping

Piping systems shall be:

- a. Designed to carry the required quantity of water at a velocity of not more than ten (10) feet per second when located on the discharge side of a pump, except for copper discharge piping where the velocity shall not exceed eight (8) feet per second, and not more than six (6) feet per second when located on the suction side of a pump.
- b. Of sufficient strength to withstand 150 percent of normal operating pressures.
- c. Made of non-toxic materials.
- d. Reasonably resistant to corrosion under conditions of operation.
- e. Installed so that pipe and fittings, which pass through the pool structure, shall not project in a manner, which is hazardous to users of the facility.
- f. Comply with the sizes and flow rates shown in the following table unless accompanied by an approved hydraulic design.

Maximum Flow Rates (C=140) Schedule 40 PVC

PIPE SIZE	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
GPM PRESSURE SIDE	25	60	90	140	220	350	800
GPM PRESSURE SIDE, COPPER	20	48	72	96	176	280	640
GPM SUCTION SIDE	15	35	50	80	140	220	450

- g. Plastic water circulation piping shall comply with American National Standards Institute/NSF, International Standard Number 14, "Plastics Piping System Components and Related Materials," NSF International, 3475 Plymouth Road, P.O. Box 130140, Ann Arbor, Michigan which is incorporated by reference and on file with the office of the Secretary of State and the Department.
- h. A licensed Arizona contractor shall conduct an induced static hydraulic pressure test of the water circulation system piping at 25 pounds per square inch for at least 30 minutes. The pressure test shall be performed before the deck is poured. Pressure in the water circulation system piping shall be maintained during the deck pour.
- i. Piping systems shall be identified by nametags, labels or appropriate colors painted or located at conspicuous points.

REGULATION 6. Total Dynamic Head

The total dynamic head of the recirculation system shall be calculated. In lieu of calculating the total dynamic head, the Department may allow the following table to be used:

DISTANCE FROM THE MAIN DRAIN TO THE PUMP	TOTAL DYNAMIC HEAD (TDH)
1' – 25'	55
26' – 50'	60
51' – 75'	65
76' – 100'	70
101' – 125'	75
126' – 150'	80
BEYOND 150'	CALCULATIONS ARE REQUIRED

REGULATION 7. Pumps and Motors

- a. A pump and motor shall be provided for each water circulation system. The pump shall be sized to meet but not to exceed the flow rate required for filtering against the total head developed by the complete water circulation system. The pump shall be sized to comply with the turnover rates prescribed in Chapter VI, Section 3, Regulation 4 (Pools), Chapter VI, Section 9, Regulation 2 (Spas), and Chapter VI, Section 8, Regulation 4, (Wading Pools).
- b. Pumps and motors shall be readily and easily accessible for inspection, maintenance, and repair. When the pump is below the waterline, valves shall be installed on permanently connected suction and return lines. The valves shall be readily and easily accessible for maintenance and removal for any of the circulation components.
- c. Each motor shall have an open, drip-proof enclosure. Each motor shall be constructed electrically and mechanically to perform satisfactorily and safely under the conditions of load in the environment normally encountered in swimming pool or spa installations. Each motor shall be capable of operating the pump under full load with a voltage variation of plus or minus ten ($\pm 10\%$) percent from the nameplate rating. Each motor shall have thermal or current overload protection to provide locked rotor and running protection. Thermal or current overload protection may be built into the motor or in the line starter.
- d. The pump shall be equipped with an emergency shut-off switch that is located within the swimming pool or spa enclosure to cut off power to the water circulation system if someone is entrapped on a main drain or suction outlet.
- e. The emergency shut-off switch must be clearly labeled.

REGULATION 8. Hair Strainer

The recirculation system shall include a removable strainer located upstream from the pump to prevent solids, debris, hair, lint, etc. from reaching the pump and filters. Strainers shall be of corrosion-resistant material, with openings having a total area equal to four times the area of the recirculation pump suction pipe.

REGULATION 9. Pool Water Cleaning System

- a. A pool vacuum cleaning system shall be provided for public and semipublic swimming pools with the exception of hydrotherapy pools.
- b. Vacuum outlets shall be provided with covers, which automatically close and automatically latch and can only be opened with the use of a tool. The covers must be securely closed and latched when the pool is in use.
- c.

- d. The cleaning system provided shall not create a hazard or interfere with the operation or use of the pool. In integral systems, connections shall be provided in sufficient numbers and located in the pool walls at least ten (10) inches below the water line. In addition, automatic or self-cleaning systems may be installed as approved by the Department.

REGULATION 10. Inlets

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 (6) inlets, spaced not more than 15 feet apart as measured along the pool periphery. At least one (1) inlet shall be located within five (5) 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 30 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. Bottom returns will be considered to have an area of influence described by a radius of 15 feet. Public or semipublic spas with three (3) or more return inlets shall be on a closed loop piping system.

REGULATION 11. Drains

- a. Pools shall be equipped with at least two (2), main drains located in the deepest portion with centers at least three (3) feet apart and that are constructed to prevent suction entrapment under all operating conditions. Each drain shall be covered by an anti-vortex cover or an approved grate that has a minimum diagonal measurement of 24 inches, which is not readily removable by bathers and has safe openings of at least four (4) times the area of the drain pipe. Each drain pipe connection shall be under the center of the drain cover.
- b. Drains shall be spaced at intervals of not greater than one (1) each 20 feet of pool width in the deepest portion and not more than 15 feet from each side wall.
- c. A minimum of two (2) suction outlets shall be provided for each pump in a suction outlet system for a public or semipublic pool or spa. The suction outlets shall be separated by a minimum of three (3) feet or located on two (2) different planes (i.e. one suction outlet on the bottom and one (1) on a vertical wall or one (1) suction outlet each on two (2) separate vertical walls) as long as the three (3) foot separation is always maintained. The suction outlets shall be plumbed to draw water through them simultaneously through a common line to the pump. Suction outlets shall be plumbed to eliminate the possibility of entrapping suction, and be equipped with an approved anti-vortex cover.
- d. The total velocity of water through grate openings of the drain shall not exceed one and one-half (1 1/2) feet per second.
- e. No check valve may be installed between a suction outlet and a pump.

REGULATION 12. Flow Meter

A public swimming pool shall be equipped with a flow meter that indicates the rate of backwash through the filter. The flow meter shall be installed between the pump and the filter on a straight section of pipe in accordance with the manufacturer's specifications in a location where it can be read easily. The flow meter shall measure the rate of flow through the filter in gallons per minute and shall be accurate to within five (5) percent under all conditions of flow. The flow meter shall have an indicator with a range of at least 150 percent of the normal flow rate.

REGULATION 13. Sight Glass

Pressure filter systems shall be equipped with a sight glass installed on the waste discharge pipe.

REGULATION 14. Air Relief Valves

Pressure-type filters shall be equipped with a means to release internal pressure. Each pressure filter shall be equipped with an air relief piping system connected at an accessible point near the crown. Automatic air relief systems may be used instead of manual systems. The design of a filter with an automatic air relief system as its principal means of air release shall include lids that provide a slow and safe release of pressure. The design of a separation tank used in conjunction with any filter tank shall include a manual means of air release or a lid which provides a slow and safe release of pressure as it is opened.

REGULATION 15. Access to Equipment

Filters shall be designed, located and constructed to permit removal of filter manhole covers or heads for inspection purposes and replacement or repair of the filter elements or media. No filter or filtration system shall be installed beneath the surface of the ground or within any enclosure without adequate provision of access for inspection and maintenance.

REGULATION 16. Filtration Rate - Sand

The rate of filtration in high-rate sand filters shall not exceed an equivalent of 20 gallons per-minute per-square foot. Sufficient surface area of filter media shall be provided to achieve this rate.

REGULATION 17. Filtration Rate - Diatomaceous Earth

The rate of filtration of diatomaceous earth filters shall not exceed two (2) gallons per-minute per-square foot of effective surface area.

REGULATION 18. Filtration Rate - Cartridge Type

The rate of filtration of cartridge filters shall not exceed 0.375 gallons per-minute per-square foot.

REGULATION 19. Acceptable Filters

Swimming pool and spa filters shall comply with American National Standards Institute/NSF International Standard Number 50, "Circulation System Components and Related Materials for Swimming Pools, Spas / Hot Tubs," NSF International, 3475 Plymouth Road, P.O. Box 130140, Ann Arbor, Michigan. Filters shall be designed, located, and constructed to permit removal of filter manhole covers or heads for inspection, replacement or repair of filter elements or filter media. No filtration system shall be installed beneath the surface of the ground or within an enclosure without providing adequate access for inspection and maintenance. The maximum filtration rate shall not exceed the design flow rate prescribed by the ANSI/NSF Standard 50 for Commercial Filters. In no case shall the maximum filtration rate exceed the rates specified in this section.

REGULATION 20. Gauges

Pressure gauges shall be installed on the inlet side of the pump, and the inlet and outlet manifold of the filters. Such gauges shall read at one (1) pound pressure intervals or in inches of mercury/vacuum.

REGULATION 21. Cross Connection Control

- a. Cross-connections between potable water piping and the recirculation system or water reservoir of any pool are prohibited. Potable water for make up water purposes may only be introduced into the reservoir:
 1. Across an air gap of at least twice the diameter of the pipe, not less than six (6) inches above the overflow level. If an over-the-rim spout is used, it shall be located so that it does not present a tripping hazard; or
 2. Three (3) inches above the overflow rim of a float controlled make up water feed tank; or
 3. By a submerged inlet which is properly protected against back siphonage by a backflow prevention device meeting University of Southern California Foundation for Cross Connection Control and Hydraulic Research.
- b. All sewage from plumbing fixtures, including urinals, toilets, lavatories, showers, drinking fountains, floor drains and other sanitary facilities shall be disposed of in a sanitary manner. Filter backwash and wasted swimming pool or spa water shall be discharged into a sanitary sewer through an approved air gap, an approved subsurface disposal system or by other means that are approved by the Department. The method of disposal shall comply with applicable disposal requirements established by a municipal or other local authority. There shall be no direct physical connection between the sewer system and the water circulation system of a public or semipublic swimming pool or spa.

REGULATION 22. Signs

- a. Diving equipment is prohibited in a public or semipublic swimming pool that does not meet the minimum requirements for a diving board in Section 6, Regulation 6, of this code. If a public or semipublic swimming pool does not meet the dimensional requirements prescribed in Section 6, Regulation 6 of this code for diving, the owner shall prominently display at least one (1) sign that cautions users of the swimming pool that diving is prohibited. The warning sign shall state “CAUTION SHALLOW WATER NO DIVING” in letters that are four (4) inches or larger or display the international symbol for no diving. Diving from the deck of a public or semipublic swimming pool into water that is less than five (5) feet deep shall be prohibited. Warning markers indicating in words or symbols that diving is prohibited shall be placed on the deck, adjacent to each water depth marker, within 18 inches of the side of the shallow area of the swimming pool. A warning marker shall be positioned so that a person standing on the deck facing the water can read it.
- b. All persons shall be instructed before entering the pool, by means of suitable, clearly lettered signs properly located, to observe all safety regulations.
- c. The maximum bathing load for a public or semipublic swimming pool or spa shall be posted.
- d. When food preparation or food service equipment is allowed within the pool enclosure, a sign is required stating that no glass is allowed in the pool enclosure, that only paper and plastic service is allowed, and that no food or drink is allowed within four (4) feet of a semipublic pool or spa edge or ten (10) feet of a public pool or spa edge.

REGULATION 23. Roof Drain Water

Rain water draining from any structure must be diverted away from the swimming pool and pool deck to a suitable point of disposal.