

**SUBCHAPTER 1. GENERAL PROVISIONS****310:315-1-1. Purpose**

This chapter known as the Public Bathing Place Facility Standards (ODH Engineering Bulletin No. 0536), is to be used by engineers and other interested persons in the design and submission of plans to a public bathing place. The design criteria given are minimum design criteria and will be used as such by the State Department of Health. Nothing in these standard should be construed as preventing the consulting engineer from recommending, or the reviewing authority from approving, more effective treatment where local conditions dictate such action.

**310:315-1-2. Definitions**

**"Abrasion hazard"** means a sharp or rough surface that would scrape the skin upon chance or by normal use modes.

**"Adjustable inlet"** means a fitting mounted in the pool wall and connected to the return piping from the recirculation system that is directionally adjustable or a fitting mounted in the pool floor and connected to the return piping from the recirculation system that has a means of flow adjustment.

**"Air bump assist backwash"** means the compressing of a volume of air in the filter effluent chamber (by means of an air compressor or by the water pressure from the recirculating pump) which, when released, rapidly decompresses and forces water in the filter chamber through the elements in reverse, dislodging the filter aid and accumulated dirt, carrying it to waste.

**"Air induction system"** means a system whereby a volume of air (only) is induced into hollow ducting built into a spa floor, bench, or other location. The air induction system is activated by a separate air power unit (blower).

**"Attendant"** means any person capable of providing rescue who is responsible to the management.

**"Backwash"** means the process of thoroughly cleansing the filter media and/or elements by reverse flow.

**"Backwash cycle"** means the time required to thoroughly backwash the filter media and/or elements and the contents of the filter vessel.

**"Backwash rate"** means the rate of application of water through a filter during the cleaning cycle normally expressed in U. S. gallons per minute per square foot of effective filter area.

**"Bathing load"** means the maximum number of persons allowed in the pool enclosure at one time.

**"Booster pump system"** means a system whereby one or more hydrojets are activated by the use of a pump which is completely independent of the filtration and heating system of a spa.

**"Cartridge filter"** means a filter that utilizes a porous cartridge as its filter medium.

**"Collector tank"** means a tank receiving the gravity flow from the perimeter overflow gutter and main drain(s) from which the recirculation pump takes suction. It may be referred to as a balance tank.

**"Department"** means the Oklahoma State Department of Health and authorized representatives.

**"Diatomaceous earth filter"** means a filter that utilizes a thin layer of filter aid as its filter medium that periodically must be replaced.

**"Engineering nomenclature"** means the technical terms used through this chapter are understood to represent the currently accepted professional engineering definitions.

**"Filter"** means a device that separates solid particles from water by recirculating it through a porous substance (a filter medium or element).

**"Filter agitation"** means the mechanical or manual movement to dislodge the filter aid and dirt from the filter element.

**"Filter aid"** means a type of finely divided medium used to coat a septum type filter, usually diatomaceous earth, processed perlite, or similar material.

**"Filter cycle"** means the operating time between cleaning and/or backwash cycles.

**"Filter element"** means a device within a filter tank designed to entrap solids and conduct water to a manifold, collection header, pipe, or similar conduit. Filter elements usually consist of a septum and septum support.

**"Filter freeboard"** means the clear vertical distance between the top of the filter medium and the lowest outlet of the upper distribution system in a permanent media filter.

**"Filter media, permanent"** means a finely graded material (such as sand, anthracite, etc.) which removes filterable particles from the water.

**"Filter septum"** means that part of the filter element consisting of cloth, wire screen, or other porous material on which the filter medium or aid is deposited.

**"Filtration flow"** means the rate of flow, in volume per time (GPM, GPH), through the filter system installed per manufacturer's instructions with new clean media.

**"Filtration rate"** means 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.

**"Hydrojets"** means a fitting which blends air and water creating a high velocity, turbulent stream of air enriched water.

**"Hydrotherapy, whirlpool, or spa pool"** means a public pool used exclusively in conjunction with high velocity air and/or high velocity water recirculation systems, utilizing hot, cold, or ambient temperature water. These pools will be referred to as spas.

**"Individual therapy units"** means tanks which are designed for

the therapeutic treatment of one individual at one time and are drained and cleaned after each individual use. Individual therapy units are not considered public bathing places.

**"Ladders"** means a series of vertically separated treads or rungs either connected by vertical rail members or independently fastened to an adjacent vertical spa/pool wall.

**"Lower distribution system (underdrain)"** means those devices 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.

**"Open to the general public"** means not restricted to tenants or guests.

**"Overflow system"** means the term overflow system encompasses perimeter type overflows, surface skimmers, and surface water collection systems of various design and manufacture. The water line shall be established by the height of the overflow rim.

**"Perimeter overflow gutter"** means a trough or gutter around the inside perimeter of the pool walls with the overflow lip effecting a skimming action to clean the pool water surface.

**"Permanent media filter"** means a filter that utilizes a medium that can be regenerated and will not have to be replaced.

**"Plunge pool"** means the receiving body of water located at the terminus of a recreation water slide.

**"Pool deck"** means the unobstructed area around the outside of the pool curb, diving boards, diving towers, and/or pool slides.

**"Pool floor"** means the interior bottom pool/spa surface and consists of that surface from a horizontal plane up to a maximum of a 45° slope.

**"Pool turnover"** means the circulation of a quantity of water equal to the pool volume through the filter and treatment facilities.

**"Portable pool"** means a shallow pool, with depth not exceeding 4.5 feet, intended only for swimming instruction, which can be quickly erected, used for an instruction period then dismantled and moved to another location. Conditions governing authorization and operation are shown in the Public Bathing Place Regulations.

**"Precoat pot"** means a hopper with a valved connection to the suction side of the recirculation pump of pressure diatomaceous earth type filter systems that is used for coating the filter with filter medium prior to filtering water through the system.

**"Private pool"** means a pool maintained by an individual for the use of his family and friends, with no other formal admission requirement.

**"Public swimming pool or public pool"** means a structure of concrete, masonry, or other approved materials, located either indoors or outdoors, used for bathing or swimming, or for instructional purposes in swimming, diving, or other aquatic activities by humans, and filled with a filtered and disinfected water supply, together with buildings, appurtenances, and

equipment used in connection therewith. A public swimming pool or public pool shall mean a conventional pool, spa type pool, wading pool, special purpose pool, or water recreation attraction to which admission may be gained with or without payment of a fee and includes but is not limited to pools operated by or serving camps, churches, cities, clubs, counties, health spas, institutions, parks, state agencies, schools, subdivisions, or other cooperative living type projects such as apartments, boarding houses, condominiums, hotels, mobile home parks, motels, recreational vehicle parks, and mobile home parks.

**"Recessed steps"** means a riser/tread or series of risers/treads extending down from the deck with the bottom riser/tread terminating at the spa/pool wall, thus creating a "stairwell."

**"Recessed treads"** means a series of vertically spaced cavities in the spa/pool wall created treat areas for stepholes.

**"Recirculation system"** means the system traversed by the recirculated water from the pool until it is returned to the pool (from the through collector tank, recirculation pump, filter, chemical treatment heater, if provided, and returned to the pool).

**"Skimmer system"** means the water line shall fall in the midpoint of the operating range of the skimmers.

**"Special purpose pool"** means a public pool used exclusively for a particular purpose, including but not limited to springboard or platform diving training, scuba diving instruction, and aquatic programs for handicapped individuals and kindergarten children.

**"Spray pool"** means a recreation area intended for use by children, in which water is supplied by a system of sprays but is not allowed to accumulate.

**"Steps"** means a riser/tread or series of risers/treads extending down from the deck into the spa/pool area.

**"Toxic"** means the adverse physiological effect on man.

**"Tread contact surface"** means the foot contact surfaces of ladder, step, stair, or ramp.

**"Turnover rate"** means the period of time (usually in hours) required to circulate a volume of water equal to the pool capacity.

**"Upper distribution system"** means those devices designed to distribute the water entering a permanent media filter in a manner such as to prevent movement or migration of the filter medium. This system shall also properly collect water during filter backwashing unless other means are provided.

**"Vacuum (or suction) filter"** means a filter which operates under a reduced pressure from the suction of a pump.

**"Wading pool"** means a pool intended for recreative use by children and having a maximum depth not exceeding 18 inches.

**"Water line"** means the water line shall be defined in one of the following ways:

**"Water recreation attraction"** means a public bathing or swimming facility with design and operational features that

provide patrons recreational activity which is different from that associated with a conventional swimming pool and purposefully involves total or partial immersion in the water. Water recreation attractions include but are not limited to water slides, water amusement lagoons, and wave pools.

**SUBCHAPTER 3. PLAN DOCUMENTS****310:315-3-1. Plans and specifications**

(a) **Plans and specifications required.** Plans and specifications on new or major remodeling of existing public bathing places shall be prepared by a professional engineer licensed in the State of Oklahoma and submitted to the State Department of Health for approval and an approval permit issued prior to construction.

Permits for construction of public bathing place facilities are not transferable.

No permit to construct a public bathing place facility will be granted unless sufficient information has been presented to the Department to indicate a finding that such facility will be constructed and can be operated in accordance with this chapter and in accordance with good practices of public health and safety.

The purpose of this section is to point out the essential items and in general, the type of information that should be shown on the plans or included in the specifications or the engineer's report. The inclusion of complete information will expedite the review and approval of plans and specifications by the Water Facilities Engineering Service and will avoid the necessity of returning unapproved plans and specifications to the owner for additional information or clarification.

Plans submitted to the Department for approval for all future public bathing places, or for any major changes in existing public bathing places, must bear the seal of a registered professional engineer licensed to practice under the Oklahoma statutes. Plans shall be of sufficient size and legibility for microfilming.

It is unlawful for any person or persons to begin construction, alteration, or modification of any public pool without first having received written approval from the Department.

Any changes or additions to the recirculation system, treatment equipment, physical structure, or appurtenances that, in the opinion of the Department, are not equivalent in operating characteristics to those installed in accordance with the plans and related documents approved by the Department will be considered as an alteration or modification of an existing pool.

Upon completion of all new construction, approved alterations or modification of an existing pool, the owner shall provide written notification to the Department that the construction and/or equipment installation is ready for final inspection by the Department.

If construction of a pool (installation of the pool shell) has not commenced within one (1) year from the date of plan approval by the Department, the approval shall expire. However, upon written request by the owner, the project approval may be extended for a period of six (6) months provided significant changes have not been made in the project plans or have not occurred in local conditions affecting the pool or site, and the plans comply with

the standards.

(1) Number of sets of plans. Five (5) or more complete sets of plans and specifications, together with an application for permit on forms provided by the State Department of Health, signed by the owner, shall be submitted to the Department for review. If approved, all plans and specifications will be stamped, indicating the approval of the Department. One (1) set will be retained in the files of the Department; one (1) set forwarded to the local health department; two (2) sets returned to the owner, one (1) for the owner's file and the other to be provided the successful bidder for the pool construction and one set will be sent to the consulting engineer.

If not approved, one (1) complete set will be retained for record and the remainder will be returned to the applicant with recommendations for necessary changes or modifications that will be in compliance with lawful requirements.

(2) Plans Submitted for Review. Plans should be submitted for review at least thirty (30) days prior to advertising for bids or letting a contract for construction of the pool. From this it is not necessarily to be inferred that approval or recommendations by the Department will always be forthcoming within this time.

(b) **Minor changes.** Proposed changes or additions to existing public bathing places of a minor nature, and not of a sufficient magnitude or scope to involve engineering and the preparation and submission of plans, shall be reviewed informally by the Department in order that the owners may be assured that the proposed changes or additions are in compliance with lawful requirements.

(c) **Structural design not reviewed by State Department of Health.** The review of plans and specifications by the Water Facilities Engineering Service does not include structural design or structural stability of any section or part of a public bathing place. Certification of adequacy is the responsibility of the design engineer.

(d) **Information needed:** The engineer's report, specifications, or plans shall include all of the minimum design requirements outlined in this chapter; the pool capacity in gallons; estimated bathing load (male and female); capacity of all mechanical equipment; information of water supplies, pressure, etc., together with such other information as is requested throughout this chapter. When mechanical equipment, devices, plumbing fixtures, etc., are specified by use or trade name, catalog numbers, etc., then individual leaflets, catalogs, or other descriptive material shall be furnished.

(1) A plot plan is required showing the location of the pool and adjacent buildings, parking areas, sewers, water lines, fences, and contours. The finding location (legal description

or street address) shall be shown on the plot plan.

(e) **New equipment and methods.** The policy of the Department with reference to new types of equipment, new design features, etc., will not be such as to discourage or obstruct progress in design.

However, any newly developed equipment, materials, etc., proposed for use in connection with a public bathing place shall have been qualified by trial elsewhere to the satisfaction of the State Department of Health before plans and specifications will be approved or a permit issued. This requirement would not necessarily prohibit any occasional experimental or test installation with adequate impartial supervision, wherein a satisfactory written agreement with reference to replacement of equipment, materials, or changes in design is incorporated in the specifications in the event of failure. In the event public funds are involved, then any such agreement shall be backed by a satisfactory guarantee bond, sufficient in amount to provide for the replacement of unsatisfactory materials or equipment plus any and all additional costs occasioned by changes in design or construction, etc., arising from such replacement.

(f) **Special conditions.** Should special conditions exist or circumstances be such that in the opinion of the engineer certain items listed as minimum design requirements would not be applicable, then such items shall be submitted in writing to the State Department of Health and approved prior to preparation of the final plans and specifications, and shall be explained in detail in the engineer's report.

(g) **Deviations.** Deviations from this chapter may be allowed by the Department upon a finding by the Department that the operation, maintenance, safety, and sanitation of the pool will not be adversely affected by the deviation. No deviation will be allowed unless it is noted on the construction permit. No deviation from approved plans and specifications is permissible unless and until an amended permit has been granted.

**SUBCHAPTER 5. WATER AND SEWER FACILITIES****310:315-5-1. Water supply**

(a) **Potable water supply.** The water supply serving the bathhouse and all plumbing fixtures, including drinking fountains, lavatories, and showers, shall be treated in accordance with the requirements of the State Department of Health for drinking water.

(b) **Pool water supply.** The water supply for artificially constructed bathing places shall meet the requirements as set forth in 310:315-5-1, "Pool water quality."

(c) **Backflow preventers.** All portions of a public water distribution system serving the pool and ancillary facilities shall be protected against backflow. Water introduced into the pool either directly or through the recirculation system shall be introduced into the pool through an air gap providing two pipe diameters or six (6) inches vertical distance between the maximum flood level of the pool and the lowest point of the inlet pipe. The coping or deck constitutes the flood level, not a drain. In the case of other connections to a public distribution system, the supply shall be protected by an air gap whenever possible. When such connections are not possible, the supply shall be protected by a suitable backflow preventer installed on the discharge side of the last control valve to the fixture, device, or appurtenance. All hose bibs in the bathing facility area shall be so equipped. The requirements of the American National Standards Institute (ANSI) A40.6-1943; the American Society of Sanitary Engineering (ASSE) 1001-1970; ASSE 1011-1970, ASSE 1012-1972, ASSE 1013-1971, ASSE 1015-1972; or the American Water Works Association (AWWA) C-506-69, or latest revisions thereof, will be used in determining substantial compliance with this requirement.

(d) **Pool water quality.** Unless pool water is to be supplied from an approved and properly operated public water supply system routinely analyzed by the State Department of Health, an analysis of the proposed pool water supply shall be submitted with the plans and specifications or as part of a preliminary engineering report. The analysis shall include, as a minimum, the following parameters: pH, total alkalinity, dissolved solids, hardness both carbonate and non-carbonate, copper, iron, manganese and turbidity. Should any of the above parameters exceed the maximum limit set forth in the Public Bathing Place Regulations, design and specifications of necessary treatment units required to reduce the contaminant to an acceptable level must be made a part of the swimming pool plans.

(e) **Drinking fountains.** Approved type angle-jet fountains with approved water supply under adequate and regulated pressure must be provided in locations available to pool patrons. In the case of non-municipal pools, this requirement will be considered met by compliance with 310:315-7-7, "Bathing places not open to the general public."

**310:315-5-2. Sewer**

(a) **Adequate sanitary and storm sewer system required.** The sewer systems shall be adequate to serve the facility, include bathhouse, locker room, and related accommodations, and to provide for liquid waste disposal and surface drainage.

(b) **Pool wastewater.** Pool wastewater shall be discharged through an air gap to a sanitary sewer, used for pool makeup water after sedimentation and filtration, or the water may be used for irrigation after sedimentation. Proposals for a point discharge of the wastewater to a storm drain or receiving stream will be evaluated on a case-by-case basis and will require obtaining a National Pollutant Discharge Elimination System (NPDES) permit and compliance with all permit conditions. Disposal of wastewater from diatomaceous earth type filters shall be accomplished through adequately sized separation tanks acceptable to the Department, equipped with air bleed valves, bottom drain lines, and isolation valves, or through systems of a settling tank or tanks with final disposal being acceptable to local authorities. Waste lines shall be sized to handle the expected flow. There shall be an indirect connection between any drain from a pool or recirculation system and a sewer line.

(c) **Disposal of sanitary wastewater.** The sanitary sewer serving the bathhouse and ancillary facilities shall connect to the public sewer wherever possible. Where no such sewer is available, the sewer shall connect to a suitable treatment plant designed, constructed, and operated in accordance with the minimum requirements of the State Department of Health.

(d) **Stream pollution prevention.** The wastewater that results from the construction and operation of a swimming pool shall, prior to discharge, meet the water quality criteria that have been established for the area. In this regard, it will be necessary for the design engineer to refer to the Oklahoma Water Quality Standards, 1979, or the latest revision thereof, published by the Oklahoma Water Resources Board, for the stream standards to be met in the area in which the pool will be located. In addition, it will be necessary to supply information to the Department showing the measures to be provided to meet the standards.

**SUBCHAPTER 7. CONSTRUCTION AND OPERATION****310:315-7-1. Pool construction, materials, and finish****(a) Materials and finish.**

(1) Pools shall be constructed of concrete or other materials which are smooth, non-absorbent, durable, non-toxic to humans and which can withstand the design stresses. All side walls and bottom surfaces shall have a smooth, easily cleanable, and slip-resistant finish. Floors and walls shall be white or light (pastel) in color and shall have the characteristic of reflecting rather than absorbing any natural or artificial light that may be incident upon the floor and wall surfaces.

(2) Fiberglass panels or other approved panels shall not be installed so that a ledge is created at the junction with other materials except as permitted under 10:315-7-4, "Safety ledges."

(3) Wooden pools, spas, or hot tubs are prohibited.

(4) Plastic liners are prohibited.

(5) Sand or earth bottoms are not permitted in artificially constructed public bathing places.

**(b) Portable pools.**

(1) **Materials.** Because of its special use and supervised operation, the materials of construction of a portable pool shall be subject to individual appraisal and approval by the Department. It shall meet the objectives of conventional pools in matters of safety, sanitation, durability, water tightness, and ease of cleaning. It shall be easily erected and dismantled.

(2) **Equipment.** The equipment of a portable pool shall be subject to individual appraisal and approval by the State Department of Health. It shall include equipment for recirculation, filtration and disinfection, capable of meeting the water quality standards listed in the Public Bathing Place Regulations. Recirculation equipment shall provide a turnover rate not greater than four (4) hours, with a rate of three (3) hours recommended. Sanitary facilities required by this chapter shall be conveniently available to the pool. The needs for barriers, walkways, lighting, and other requirements of this chapter shall be met or shown to be non-applicable under the provisions of 310:315-3-1. The pool shall be equipped with a sturdy cover than can be locked in place. See Chapter 320 of this title for conditions governing the application and operation of portable pools.

**310:315-7-2. Pool layout**

(a) **Location.** In selecting the site for a proposed public

bathing place, the water supply, sanitary sewer, and other drainage facilities shall be given due consideration. Outside pools should not be located near unpaved highways where road dust and dirt would be carried into the pool by prevailing winds. The site of outdoor pools shall be elevated or otherwise protected by drainage ditches, curbs or retaining walls so that surface water will not flow into and contaminate the pool water.

(b) **Trees, shrubbery.** Trees and shrubbery overhanging or adjacent to the pool or walkway, or in the immediate vicinity on the windward side, are objectionable in that they are the source of dirt, leaves, and other contaminants which may fall into the water.

(c) **Exclusion of unauthorized persons.**

(1) Provision must be made to exclude unauthorized persons from the bathing facilities area. All bathing facilities must be surrounded by an effective barrier for this purpose.

(A) Outdoor pools open to general public such as municipal pools and pools used by organizations (YWCA, YMCA, etc.), shall be enclosed by a suitable barrier equal to a six (6) foot high woven wire fence. Within this pool area may then be established a semi-barrier which shall serve to separate the swimmers from the spectators. Enforcement of this section shall then be based on the observance of rules which shall be adopted so as to prevent the mingling of swimmers and spectators on the pool walk area.

(B) Indoor pools must be located in a room with doors that can be locked at all times when the pool is not in use (regardless of whether a fee is charged) or as in 7-2(c)(1)(C).

(C) Outdoor pools not open to the general public shall be enclosed with a suitable effective barrier to prevent unattended small children from entering the pool. The barrier may be any fence, wall or structure which prevents entry except through self-closing, self-latching gates and does not prevent visual observation of the pool and is not less than four (4) feet in height. Decorative type barriers shall not have open spaces greater than four (4) inches. See also 310:315-7-7. Where existing construction prohibits compliance with this rule, the owner shall file with the county or state health department, an operation procedure which will serve to ensure the exclusion of animals and unattended small children from the pool area.

(2) A suitable effective barrier shall be accomplished in one of the following manners:

(A) **Wood.**

(i) Wood posts shall be at least four (4) inches in diameter or four (4) inches x four (4) inches, shall be of pressure-treated wood and shall be spaced not more than ten (10) feet apart. Posts shall be embedded at least

eighteen (18) inches into the ground.

(ii) Wood railings, when used, shall be at least two (2) inches x four (4) inches in nominal dimension. There shall be at least two (2) railings. Railings shall provide no horizontal projections or recessions unless at four (4) feet. Railings shall not be used in such a way as to form a ladder.

(B) **Wire.**

(i) Wire posts shall be galvanized pipe at least two (2) inches in diameter and shall be spaced not more than ten (10) feet apart. Such posts shall be embedded to a depth of twelve (12) inches in a concrete jacket at least eighteen (18) inches deep and six (6) inches in diameter.

(ii) Chain link shall be at least eleven (11) gauge galvanized metal.

(iii) Wire supports shall be galvanized metal at least one and one-quarter (1-1/4) inches thick and shall provide no footholds.

(C) **Wrought iron.**

(i) Wrought iron posts shall consist of at least one-half (1/2) inch thick steel bars spaced not more than four (4) inches apart.

(ii) Wrought iron fence sections shall consist of at least one-half (1/2) inch thick steel bars spaced not more than four (4) inches apart.

(iii) Wrought iron horizontal rails shall not form a ladder.

(D) **Masonry.** Walls of brick, concrete or stone shall be constructed so as to provide no projections or recessions within four (4) feet of the ground's surface. Such walls shall meet the visual observation requirement of 310:315-7-2. Construction shall not be such as to form a ladder. There shall not be more than four (4) inches of space between the bottom of the enclosure and the ground's surface or the pool deck. Indoor bathing facilities not open to general public shall be enclosed so that access is only through self-closing, self-latching gates or doors, to control access by unattended small children. Enclosures shall have maximum openings of four (4) inches, and the enclosure design shall not form a ladder.

(E) **Alternate enclosure materials.** The Department may approve alternative enclosure materials and methods where the Department finds such materials and methods equivalent to those described.

(d) **Sand or grass plots.** The area within the pool enclosure of outdoor municipal and other pools open to the general public, and school pools, shall be free of all sand or grass plots used for sun-bathing or play areas. Sand and grass areas provided for sun-tanning or sun-bathing purposes in connection with swimming pools

open to the general public shall be separated from the pool and walk area by a fence or other barrier. The exits from the sand or grass sun-bathing area to the pool area shall be provided with continuous or automatic showers, with volume and pressure of water sufficient to remove gross particles of sand, grass, etc., from the bathers. In lieu of the above shower arrangement, sun-bathers may be routed from the sand or grass sun-bathing areas through the regular shower rooms.

(e) **Layout of filter plant and chemical storage facilities.**

(1) The filter plant and chemical storage areas shall be enclosed or shall otherwise limit access by the general public.

(2) The filter area shall be large enough to provide easy access to all equipment and appurtenances with sufficient room for adequate pipe run for the flow meter and for system maintenance.

(3) There must be at least eighteen (18) inches clearance about freestanding equipment.

(f) **Hose connections.** Ample hose connections shall be provided and suitably arranged in interior shower rooms, toilet rooms, and exterior walks, so that all floors, walks and drains may be flushed with water, using a fifty (50) foot section of flexible hose. Approved vacuum breakers shall be included at all hose connections (including any in equipment rooms).

(g) **Wall, floor, and ceiling material.** Walls, floors, and ceilings of new pool rooms and new filter rooms shall be of non-sorbent, smooth, cleanable material.

[Source: Amended at 22 Ok Reg 231, eff 10-31-2004 (Emergency); Amended at 22 Ok Reg 1131, eff 5-26-2005]

**310:315-7-3. Pool size and bathing load**

(a) **Pool size.** Generally, the size of the swimming pool shall be such as to accommodate the anticipated maximum swimming load that will frequently use the pool during the swimming season.

(b) **Diving and swimming areas.** Those portions of the pool from the breakpoint to the shallow end shall be designated as "swimming" area and the portion of the pool from the breakpoint to the deep end shall be designated as "diving" area.

(c) **Computing capacity requirements.** (See also Public Bathing Place Regulations.)

(1) Indoor public swimming pools and outdoor swimming pools with a minimum walk area (See 310:315-7-6) and no sun-bathing area:

$$\text{Number of person} = \frac{\text{Swimming Area}}{20} + \frac{\text{Diving Area}}{30}$$

(2) Other pools with average walk area, sun-bathing area, etc.:

$$\text{Number of persons} = \frac{\text{Swimming Area}}{20} + \frac{\text{Diving Area}}{30}$$

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(3) Deduct three hundred (300) square feet for each installed diving board from the diving area.

(4) The entire surface area shall be considered "Swimming Area" for non-diving pools having a uniform bottom slope (maximum slope: one (1) foot vertical to twelve (12) feet horizontal) from the shallow end to the deepest part of the pool.

(d) **Allowance for deck area.** The Department may make additional allowance in cases of pools with extensive deck areas used by patrons for lounging or sun-bathing. These allowances shall be based on studies of actual pool use.

### **310:315-7-4. Pool features**

#### **(a) Structural.**

(1) All pools shall be designed and constructed to withstand all anticipated structural loading, under both filled and empty conditions. A hydrostatic relief valve is required on all new below-grade pools.

(2) Facilities for the Handicapped. All pools open to the general public constructed after May 1, 1981 shall provide for the use of the entire facility by the handicapped as follows:

(A) Raised or cut out depth markings shall be used in the pool and on the deck.

(B) A ramp or lift shall be provided into the pool proper.

(C) Bathhouse construction shall be such that all facilities are readily available to wheelchair and ambulatory handicapped.

(b) **Pool shape.** The shape of any pool shall be such that the circulation of pool water and control of swimmers' safety are not impaired. For all free form, non-diving pools containing any swimming area where the pool perimeter is curved at a radius of less than six (6) feet and the sidewall depth is five (5) feet or less, the design engineer shall separately certify the design of the pool as to its safety.

#### **(c) Shallow depth.**

(1) The pools sixty (60) feet or more in length, such as school pools, municipal pools, institutional pools, and other pools where competitive use is a consideration, the minimum depth of three and one-half (3-1/2) feet at the shallow end.

(2) In the case of motel and hotel pools, and similar bathing places where recreative bathing is a primary function, minimum depths of three (3) feet are recommended. For pools designed for multiple functions, consideration may be given to the L, Z, or T-shaped pools where sufficient depth can be provided for competitive use in one section and shallower water provided in other areas for instruction use or recreational swimming.

(d) **Therapeutic pools.** In the case of special pools for water therapy where a design depth less than three (3) feet or other

special features are used, the engineer must include in his report a description of the intended use.

(e) **Slope of bottom.** The slope of the bottom of any portion of the pool having a water depth of less than five (5) feet shall not be more than one (1) foot in twelve (12) feet and said slope shall be uniform. An exception to this requirement will be made permitting a breakpoint to occur at a minimum water depth of four and one-half (4-1/2) feet for pools less than sixty (60) feet in length or special indoor pools used for instructional or therapeutic purposes. For pools without uniform bottom slope, without diving facilities, and with maximum depths of five (5) feet or more, the slope in the shallower section shall not exceed one (1) in twelve (12) and there shall be a life line at the change in slope. The slope of the transition section shall not exceed one (1) in three (3). See Public Bathing Place Regulations.

(f) **Side walls.**

(1) Walls of a pool shall be vertical for a water depth of at least five (5) feet below the water level, below which the wall may be curved to the bottom with a radius equal to the difference between the depth and five (5) feet, except that for water depths under four (4) feet, a radius of one (1) foot shall be permitted; for water depths between four (4) and five (5) feet, a radius of two (2) feet may be used. See also 310:315-7-4.

(2) Walls of pools without diving areas shall be vertical (constructed not more than eleven (11) degrees from plumb) for a water depth of at least three (3) feet in all areas where the side wall depth is five (5) feet or greater. The walls shall be vertical for a depth of at least two and one-half (2-1/2) feet in areas with less than five (5) feet side wall depth. The wall may then be curved to the bottom with a radius equal to or less than the difference between the minimum vertical wall depth and the side wall depth. Side wall depth shall be defined as the distance between the water surface and the point at which the side wall curvature intersects the constant slope of the bottom.

(g) **Diving area requirements.** Wherever diving facilities are provided in connection with public bathing places, the design shall be such as to provide adequate, clear head room and diving depths to assure the safety of the bathers. It is recommended that pools with diving facilities be designed in accordance with standards promulgated by FINA, NCAA, or U.S. Diving, Inc. The following are minimum requirements.

(1) There shall be a completely unobstructed clear vertical distance of sixteen (16) feet above any spring board measured from a point at the center of the end of the board over the water, and the clear area shall also extend horizontally at least eight (8) feet behind, eight (8) feet to each side, and

sixteen (16) feet ahead of that point.

(2) A schedule of depths and their locations is given in Figure I. These depths are to be interpreted as minimum requirements compatible with safety of design, and greater clearances are recommended.

(3) The area of deep water provided shall in all cases comply with the provisions of Figure I or the following requirements:

For pools utilizing deck level boards which will be not more than eighteen (18) inches above the normal operating level of the pool, and other small pools used for diving, the diving area shall have a minimum depth of eight (8) feet. The area where this minimum depth shall prevail shall be described as follows: at a point on the center line of the axis of the diving board eight (8) feet from the deep end wall, a circle shall be circumscribed with a six (6) foot radius: from a point eleven (11) feet from the deep end wall or three (3) feet in front of the first center, also on the diving board center line axis, a second circle shall be circumscribed with a five (5) foot radius extending from where the arc of the second circle intersects the arc of the first circle on one side to the point of intersection on the other side; all of that area within these two (2) circles shall have a normal operating depth of not less than eight (8) feet; all of this combined area shall be sloped to a point or points where main drains are located and where the depth is not less than eight (8) feet six (6) inches.

(4) In free form pool design (such as kidney-shaped), a deck level diving board may be accommodated in Figure II design, using a pool width of sixteen (16) feet at the tip of the diving board. The deck shall not encroach on the pool water surface inside a triangle whose base is sixteen (16) feet long and is centered at the tip of and is perpendicular to the center line of the diving board and whose apex is three (3) to four (4) feet back from the tip of the diving board. (This places the apex at the wall below the diving board.)

(A) **Slides, swings, and recreational equipment.** It is recommended that where slides, swings and similar recreational equipment are installed at pools, a lifeguard be on duty at the pool when it is in use.

(B) **Diving boards or platforms.**

(i) Because of the hazards involved, diving boards or platforms exceeding three (3) meters in height should not be available to the general public and will be approved only for instructional or competitive pools, supervised by capable instructors or coaches. Water depths below such platforms shall conform to NCAA, AAU, or FINA Standards. Preliminary plans for the pool construction shall be submitted for appraisal and concurrence prior to the submission of final construction plans. Preliminary plans

shall provide sufficient information on the operation of the pool to allow determination as to whether or not the high diving platforms can be used without hazard.

(ii) The design requirements are minimum to meet the needs for recreational swimming and diving. Where it is anticipated that pools with diving boards, for example one (1) meter and three (3) meter boards, will be used for competitive diving events or training for such events, greater water depths will be required. In such instances the water depths given in the listed standards shall be used in order to avoid safety hazards for this type of activity.

(h) **Safety ledges.**

(1) Safety ledges are acceptable for instructional pools where full-time lifeguards are on duty, provided the ledges are located not less than four (4) feet nor more than five (5) feet below the water surface. The corners shall be rounded.

(2) Ledges shall be painted or constructed with a material of contrasting color to be easily visible. Ledge surfaces shall have slip-resistant textures.

(3) Off-sets or protrusions from the pool wall resulting from design or construction variations shall fall within the area defined by an eleven (11) degree line from plumb and a plumb line starting at the junction of the pool wall and water surface.

(i) **Depth markings.**

(1) The depth of water shall be plainly marked at or above the water surface on the vertical wall of the swimming pool and on the edge of the deck or walk next to the swimming pool, at maximum and minimum points; at the points of break between the deep and shallow portions; and at intermediate one (1) foot increments of depth in the shallow end up to the breakpoint; and at two (2) foot increments of depth from the breakpoint to the deep end wall, spaced at not more than twenty-five (25) feet intervals measured peripherally; and at two (2) foot increments of depth (with at least three (3) markers per pool) throughout the length of non-diving pools with uniform bottom slope.

(2) Depth markers shall be in numerals of four (4) inches minimum height and a color contrasting with the background. Where depth markers cannot be placed on the vertical walls above the water level, other means shall be used, said markings to be plainly visible to persons in the pool area.

(3) It is strongly recommended that a six (6) inch black stripe be painted on the bottom of the pool at the breakpoint between the swimming and non-swimming areas, and that lengthwise stripes be painted on the pool bottom for better delineation of the bottom contour.

(j) **Coping.** Bullnosed coping is recommended. Other coping will

be approved on a case-by-case basis. None shall extend more than three (3) inches inside the pool wall nor have sharp corners, and the top surface shall not be more than nine (9) inches above the normal water level.

(k) **Isolation panels.** Where movable panels are used to separate pools, such as in a water channel connecting an indoor and outdoor pool, the design shall include a system of counterweights or springs, or other device, to prevent "guillotine" action. It is recommended that transparent panels include permanent striping in a contrasting color. Also, a minimum of one (1) additional inlet shall be positioned on each side of the panel to assure disinfectant distribution in the connecting water channel.

**310:315-7-5. Ladders, recessed treads, stairs, and decorative fountains**

(a) **Steps, ladders, stairs.**

(1) A minimum of one (1) ladder shall be provided for each seventy-five (75) feet of perimeter and not less than two (2) ladders shall be provided at any pool. Where stairs are provided in a pool, one (1) ladder may be deleted for each set of stairs provided. A side handrail extending up above and returning to the horizontal surface of the pool deck curve or coping shall be provided at each side of each ladder.

(2) All stairs entering a pool shall be recessed. An exception to this will permit the construction of steps extending completely across the shallow end of the pool, which will be construed as not projecting into the pool proper.

(3) Steps leading into the pool shall have a minimum tread length of twenty-four (24) inches, a minimum tread width of twelve (12) inches, and a maximum rise, or height, of ten (10) inches. Intermediate treads and risers between the top and bottom treads and risers shall be uniform in width and in height, respectively. The front edge (intersection of the tread and riser) of all steps shall have colored stripes contrasting with the interior color of the pool. These stripes shall be a minimum of two (2) inches in width on the tread and on the riser and shall extend the full length of the steps. Step treads shall be slip resistant.

(b) **Decorative fountains.** No fountains may be constructed within the swimming pool. They may be recessed around the periphery of a pool and may be equipped with benches and hand rails. Where water from a fountain is returned to the pool, the water supply to the fountain must be withdrawn from the pool recirculation system downstream from the filter and from the point of disinfectant injection. Fountains adjacent to the pool shall not include any structures which will invite patrons to climb and dive from them into the pool.

(c) **Recessed seats.** Underwater seats recessed from the pool wall may be approved provided they are surrounded by barriers to

discourage pool entry by way of the seats. The barriers shall not form a ladder, nor provide a platform for diving.

**310:315-7-6. Walkways or decks**

(a) **Width.** A walkway shall entirely surround the pool. It shall not be less than four (4) feet wide at indoor pools. The walk area about outdoor pools and within the fence shall be equivalent to that provided by a walk at least eight (8) feet wide around the pool. In no case shall the minimum width of the walk be less than four (4) feet. Where an outdoor pool is covered for cold weather use, the walkway requirements for indoor pools shall govern the size of cover.

(b) **Slope.** All walks, decks and terraces shall have a minimum slope of one-fourth (1/4) inch per foot to drains or points at which the water will have a free, unobstructed flow to points of disposal at all times. Drainage connections to the recirculation system, scum gutter or suitable waste are acceptable. Drainage into the pool is prohibited.

(c) **Finish.**

(1) It is recommended that decks adjoining the pool at public bathing places be constructed of concrete or other impervious material, have a slip-resistant finish, be easily cleanable, not allow standing water, and not cause discomfort to bare feet. Epoxyed gravel should not be used as deck material unless the interstices are filled with a stable, inert material.

(2) Wooden decks or walkways are prohibited adjoining the pool at public bathing places open to the general public but may be approved at public bathing places not open to the general public, indoors where such decks are sealed by a resin or other waterproof material, and outdoors where the design provides for adequate cleaning, sanitation, safety, and exposure to the drying action of the sun and wind.

(3) Indoor/outdoor carpets, absorbent or adsorbent coverings or similar deck materials are not recommended for use on the deck or walkways around outdoor public bathing places and prohibited at all indoor public bathing places. If carpeting or other porous materials are used as deck covering at outdoor pools, the substrate supporting the covering, and all ancillary features, shall comply with the recommendations of paragraph one of this chapter and with 310:315-7-6 (and see Public Bathing Place Regulations for disinfection).

(d) **Hose connections.** Ample hose connections shall be provided and suitable arranged about decks, walkways, and drains so that they may be flushed with water using a fifty (50) foot section of flexible hose. Approved vacuum breakers shall be included at all hose connections.

**310:315-7-7. Bathhouse**

(a) **General design requirements.** All public bathing places open to the general public shall be provided with adequate toilet facilities, hot water showers, lavatories, drinking fountains, and other required appurtenances. Since the number of each type of plumbing fixture required is based on the maximum number of persons likely to be in the pool area at one time, the engineer, in designing new public pools intended for swimming, should determine the number of such fixtures based on design load.

Shower controls, toilet facilities, and lavatories shall be provided at all bathing places open to the general public such that they can be easily reached by small children and the handicapped.

As a basis for determining the number of plumbing fixtures required on new and existing public bathing places open to the general public, and for the purpose of reviewing plans and specifications submitted to the Department for approval, the maximum probable number of persons likely to be in the pool at one time may be estimated by the formula shown in 310:315-7-3.

(b) **Separate facilities.** Bathhouses to be used simultaneously by both sexes shall be divided into two parts, each appropriately designated for men and women and separated by a tight partition. The entrances and exits shall be screened to break the line of sight.

If pools are to be used by one sex only, then all of the required plumbing facilities shall be provided for that sex.

(c) **Spectators excluded from bather facilities.** Spectators and non-bathers shall be excluded from the toilet rooms provided for the persons using the pool facilities. Should the management desire to accommodate spectators and non-bathers, then separate toilet facilities shall be provided. The requirements of this section shall not be mandatory for bathing places not open to the general public.

(d) **Minimum toilet facilities.**

(1) **Men.** A minimum of one (1) water-flush toilet and two (2) water-flush urinals shall be provided in the men's division of all bathing places open to the general public. This minimum number of toilet fixtures is considered sufficient for the first one hundred (100) males. In addition to the above, one (1) water closet and one (1) urinal shall be provided for each additional one hundred (100) males or major fraction thereof. A number less than twenty-five (25) will necessitate only one (1) additional urinal. For pools of less than sixteen hundred (1600) square feet surface area in size, used simultaneously by both sexes, this requirement may be reduced by one (1) urinal.

(2) **Women.** A minimum of three (3) water-flush toilets shall be provided in the women's division of all bathing places open to the general public. This minimum number of toilet fixtures is

considered sufficient for the first one hundred (100) females. In addition to the above, one (1) water closet shall be provided for each additional fifty (50) females or major fraction thereof. For pools of less than sixteen hundred (1600) square feet surface area in size, used simultaneously by both sexes, this requirement may be reduced by one (1) flush closet.

(e) **Showers and lavatories.**

(1) The minimum number of shower and lavatory fixtures shall be as follows:

(A) **Men.**

(i) One (1) lavatory for each one hundred (100) men

(ii) One (1) shower head for each forty (40) men

(B) **Women.**

(i) One (1) lavatory for each one hundred (100) men

(ii) One (1) shower head for each forty (40) women.

(2) At least three (3) shower heads for men and two (2) shower heads for women shall be provided. It is recommended that all shower stalls and dressing booths in the women's shower room be arranged so that privacy may be obtained while dressing and undressing and while under the shower, a minimum design recommendation being that one (1) such shower stall and dressing booth be provided.

(f) **Estimate of toilet facilities for institutional pools.** The number of toilet facilities necessary for indoor pools at schools, colleges, and similar institutions where it is intended that the swimmers be in groups or classes at regular intervals and where pools are not open to the general public shall be based on institutional needs and methods of operation; the number of persons permitted in each swimming class, time allowed for bather's preparation, and similar factors shall be used to determine facilities needed. As a general guide, it is recommended that one (1) water closet be provided for each ten (10) females and one (1) toilet and two (2) urinals for each twenty-five (25) males.

(g) **Bathing places not open to the general public.**

(1) Motels, apartment complexes, and similar establishments. Pool side bath or sanitary facilities are not required, providing the following conditions are met:

(A) All lodging units include bath and toilet facilities.

(B) Use of bathing facilities is restricted to tenants and their guests.

(C) Nothing in this section shall be construed to allow openings directly into the pool enclosure without a suitable effective barrier as per 310:315-7-2.

(2) Bathing places to serve other installations not open to the general public. Bathing places to serve special installations not open to the general public shall have a bathhouse located adjacent to the pool walkway with one (1) water-flush toilet,

one (1) lavatory, one (1) shower and one (1) drinking fountain separately provided for both men and for women. One (1) drinking fountain located so that it is available to both sexes is acceptable. The sanitation and safety requirements of 310:315-7-7 shall be complied with.

(h) **Wash water temperature.**

(1) An adequate supply of warm water within the temperature range of 95 to 100 degrees Fahrenheit is required for all showers and lavatories. On all new construction or the remodeling of present public bathing places, all shower heads shall be provided with fully automatic control valves to prevent scalding of persons under the shower. Either individual thermostatically-controlled mixing valves for each shower head or a master water blender for a gang of shower heads will be acceptable. In order to conserve hot water, each shower head shall be provided with a valve to control the quantity of blended water and to cut off the water when the shower is not being used. This valve shall be located within easy reach of all persons who use the pool facilities. The thermostatic mixing valves or water blending device shall be set to deliver water to the shower heads at a temperature of 95 to 100 degrees Fahrenheit.

(2) The temperature of water for the shower heads shall be regulated by thermostatically-controlled water blenders or mixing valves, provided that should the engineer prefer, a storage tank of ample capacity for storage of low temperature water (95 degrees to 100 degrees Fahrenheit temperature thermostatically-controlled) may be substituted for the combination of high temperature water storage and thermostatically-controlled shower blending devices. Control of shower water temperature by hand-operated mixing valves will not be considered as being in compliance with this safety requirement.

(i) **Bathhouse construction details.**

(1) **Walls and ceilings.** All interior walls and partitions shall be smooth, impervious, and of non-corrosive material, free of open cracks, kept in good repair, and painted a light color, with painted surfaces refinished when necessary. Walls and ceilings of showers shall be constructed of materials which are not adversely affected by water or heat. Partitions between dressing rooms shall terminate at least ten (10) inches above the floor or shall be placed on a continuous raised masonry or concrete base at least four (4) inches high. Lockers shall be set either on solid masonry bases at least four (4) inches high or on legs with bottom of locker at least ten (10) inches above the floor. Lockers shall be properly ventilated.

(2) **Floors.** All floors of showers, toilets, and dressing rooms of public bathing places constructed after passage of the Public Bathing Place Act shall be constructed with a proper

slope of one-fourth (1/4) inch per foot so that they can be readily flushed with a hose. Floors shall be of a smooth, non-slip finish, impervious to moisture, and without open cracks or joints. Walkways shall be so constructed that they will readily drain. Junctions between walls and floors shall be of coved, or equivalent sanitary construction.

(3) **Shower stalls.** The floor drains in shower rooms or stalls shall be so arranged, and of sufficient number, and with floors constructed and graded, so that wastewater from individual shower heads will not flow over the floor of another shower stall. Floors of the shower stalls shall be slightly depressed below surrounding floor areas. Raised curbs between shower stalls and walks are, however, not acceptable.

(4) **Baskets, lockers, furniture.** Baskets, lockers, and all furniture used in the bathhouse and the pool area shall be constructed of non-absorbent, easily cleanable material. The number of baskets or lockers in use at any time shall not exceed the design bathing load.

(5) **Soap.** Liquid soap with suitable dispensers shall be provided and be easily available to all persons using the showers and lavatories. Glass-type dispensers shall not be approved.

(6) **Foot-bath (not recommended).** Should the engineer or owner desire to include a foot-bath on plans of future public bathing places, it is recommended that the foot-bath be the flow-through type, with dimensions such as to discourage attempted jumping of the receptacle and to permit thorough wetting of both feet. Should the foot-bath be designed for use with a disinfecting solution, it is recommended that a bypass be provided for those who wish to avoid its use.

(7) **Emergency fire exit.** An emergency fire exit, other than the entrance, shall be provided in the bathhouse and in the fencing or structure enclosing the pool area, and such exit shall be plainly marked. No fire traps shall be established in the meaning of adequate exits as provided for in the current edition of the National Fire Prevention Association, National Fire Codes, Vol. 9, Section 101, Life Safety Code for Assembly Occupancies. Exits shall be plainly marked.

(8) **Fire extinguishers.** A fire extinguisher of a type suited to the structures, wiring, and equipment to be protected shall be provided and located where readily available. Carbon tetrachloride extinguishers are not acceptable.

### **310:315-7-8. Ventilation**

(a) **Indoor areas.** Indoor pools, shower rooms, dressing rooms, and toilets of all public bathing places shall be properly ventilated, with the further provision that the ventilating system for indoor pools be so designed as to prevent direct drafts on the bathers.

(b) **Interior rooms.** All interior rooms shall be ventilated so that they do not remain excessively damp.

(c) **Toilet rooms.** Toilet rooms shall be ventilated to the outside so that no odor nuisance may develop.

**310:315-7-9. Wading pools**

(a) **Wading pools used by children.** Since wading pools will be used by children, who are more susceptible to disease than adults, the standards of sanitation shall be equal, or superior, to those for swimming pools. The maximum depth of all wading pools shall be eighteen (18) inches. A reasonably non-slip surface shall be provided. Bottom slopes shall not exceed one (1) foot in twelve (12) feet. Bathing water shall meet all of the water quality requirements as specified for all artificially constructed bathing places.

(b) **Recirculation.** Wading pools shall have a minimum of one (1) turnover every four (4) hours (two (2) hours is strongly recommended). Unless a separate recirculation system is provided for the wading pool, the main pool recirculation system shall be designed for the additional flow. All recirculation piping to and from the wading pool shall be valved utilizing valves designed for proportioning flows. Rate of flow indicators shall be installed to indicate the flow rate to the wading pool. The piping, fittings, and hydraulic requirements shall be in accordance with 310:315-7-14, "Recirculation system."

(1) **Inlets, outlets.** Adjustable inlets shall be provided for wading pools based on a minimum of one (1) inlet for each twenty (20) feet, or fraction thereof, of pool perimeter except that wading pools with twenty (20) feet or less of perimeter shall have a minimum of two (2) equally spaced adjustable inlets. At least one (1) main drain meeting the requirements of 310:315-7-14 shall be provided.

(2) **Surface skimmers.** One (1) surface skimmer shall be provided for each four hundred (400) square feet of surface area or fraction thereof. Multiple skimmers shall be equally spaced and shall meet all the requirements of 310:315-7-14.

(3) **Emergency drainage.** All wading pools shall have drainage to waste (with indirect connection) through a quick opening valve to facilitate emptying the wading pools should accidental bowel or other discharge occur.

(b) **Wading pool integral with a swimming pool.** Where a wading pool is built integral with a swimming pool, provision must be made to prevent children falling into the deeper water. The two pools shall be separated by a wall extending to the surface of the water, topped by a barrier complying with 310:315-7-2.

(c) **Wading pool rules sign.** At all wading pools, a sign shall be displayed prominently using the following or equivalent language:

(1) Wading Pool

- (2) Supervisor Required for Use
- (3) Children over 12 Years of Age Prohibited.

**310:315-7-10. Spray pools**

All spray pools with recirculation systems shall comply with the water quality standards cited in Public Bathing Place Regulations.

Water supply and waste disposal shall comply with 310:315-5-1 and 310:315-5-2. Bottom slopes shall not exceed one (1) foot in twelve (12) feet. Spray orifices shall discharge at least six (6) inches above the overflow, and shall be designed and installed so as not to present an impalement or tripping hazard. Water shall be removed continuously through drains with anti-vortex covers, or through grates one hundred forty-four (144) square inches or more in area and limiting the maximum water velocity to one and one-half (1-1/2) feet/second.

**310:315-7-11. Public spas**

(a) **Spas.** Spas shall be made of concrete or other impervious materials with a finish adapted to the needs of the facility.

Spas shall be of such shape and size as to be operated and maintained in a safe and sanitary manner. In addition to the requirements of this section, compliance is required with all other applicable sections of this chapter.

(b) **Water depths and floor slopes.** Spas shall have a maximum water depth of four (4) feet. The spa floor shall slope to a main drain and the slope shall not exceed one (1) foot in twelve (12) feet (1:12) and the slope shall be uniform.

(c) **Steps.** Steps shall be provided and shall be located to provide adequate entrance to and exit from the spa. The number of sets of steps required shall be on the basis of one (1) for each fifty (50) feet, or major fraction thereof, of spa perimeter. They shall be constructed of an easily cleaned impervious materials having a slip resistant finish. Step sets for spas with more than two hundred (200) square feet of spa water surface area shall comply with 310:315-7-5. Step sets for spas with two hundred (200) square feet or less of spa water surface area shall comply with the following:

(1) Step treads shall have a minimum continuous tread length of twelve (12) inches and a minimum tread width of ten (10) inches.

(2) Step riser heights shall not exceed twelve (12) inches, except that when the bottom step is used for a bench or seat, the bottom riser may be a maximum of fourteen (14) inches.

(3) Intermediate treads and risers between the top and bottom treads and risers shall be uniform in width and height, respectively.

(d) **Handrails.** Handrails shall be provided for all sets of steps and shall be anchored in the bottom and shall extend over the coping and anchor in the deck. Where "figure 4" handrails are

used, they shall be anchored in the deck and shall extend laterally to a point vertically above the bottom step.

(e) **Decks.** Spa decks shall comply with the following requirements in addition to the applicable parts of 310:315-7-6.

(1) Decks shall slope a minimum of one-fourth (1/4) inch per foot away from the spa to drainage or to deck drains.

(2) Decks shall have a minimum four (4) foot unobstructed width around the entire spa perimeter except that small indoor spas of less than one hundred twenty (120) square feet of spa water surface area shall have a minimum four (4) foot unobstructed deck around a minimum of fifty (50) percent of the spa perimeter.

(3) Decks shall provide adequate access for cleaning and maintenance of the spa, and for assisting persons in distress.

(4) Decks shall not be more than ten (10) inches below the top of the curb.

(f) **Surface skimmers.** Surface skimmers or overflow gutters shall be provided. The minimum number of surface skimmers required shall be based on one (1) skimmer for each fifty (50) square feet or fraction thereof of spa water surface area. Multiple surface skimmers shall be equally spaced. All surface skimmers shall meet the requirements of 310:315-7-14 and the system shall be designed for thirty (30) gallons per minute per skimmer. Overflow gutters shall meet the requirements of 310:315-7-14.

(g) **Air or water jet systems.** Therapy or jet systems shall be independent of the recirculation-filtration and heating systems. In particular, therapy suction outlets shall be separated from filter system outlets sufficiently to ensure no interference with required filter system flow.

(h) **Suction openings.** All suction openings in spas shall have anti-vortex covers or grates one hundred forty-four (144) inches (minimum) with sufficient open area to prevent the flow velocity through the grate openings from exceeding one and one-half (1-1/2) feet per second. This same velocity restriction shall apply to suction intakes for water jets.

(i) **Chemical feeders.** Feeders for chlorine or bromine shall be specified, shall meet the requirements for the specific spa, and shall be in accordance with 310:315-7-16. (Note: chlorine is not recommended for disinfection in hot water facilities.)

(j) **Filtration system inlets.** Adjustable filtration system inlets shall be provided for spas based on a minimum of one (1) for each twenty (20) feet or fraction thereof of spa perimeter. Additional inlets shall be installed if needed to meet flow requirements. Spas with less than twenty (20) feet of perimeter shall have a minimum of two (2) equally spaced adjustable inlets.

(k) **Filtration recirculation.** Spas shall have a minimum of one (1) turnover every thirty (30) minutes. Note that minimum flow may be determined by the requirements of 310:315-7-11. The piping, fittings, and hydraulic requirements shall be in

accordance with 310:315-7-14 and 310:315-7-15. All recirculation lines to and from the spa shall be valved in order to control the recirculation flow. A main drain connected to the recirculation pump meeting the requirements of 310:315-7-11 shall be required. Strainers shall be sized at least twice the area required in 310:315-7-14. Spa water shall not be allowed to overflow or be piped into another bathing facility unless it is first disinfected and filtered.

(l) **Vacuuming.** Spas shall have provision for vacuuming.

(m) **Temperature.** The maximum water temperature for spas shall be 105°F (40.6°C) and this maximum temperature shall be posted at pool side. A thermostatic control for the water shall be provided.

(n) **Rental spas.** Facilities renting spas designed to provide privacy for users shall have louvered, non-locking doors in each spa enclosure, a help-call system using low voltage call switches to activate central station visual and sound signals, and a fire exit for the facility. An attendant certified in CPR shall be present at all times when any rental spa is in use.

(o) **Capacity.** The maximum capacity for public spas shall be one (1) person per three (3) feet of spa perimeter, or one (1) person per two hundred (200) gallons of water, whichever is less. For spas four hundred fifty (450) gallons or smaller, the capacity shall be one (1) person per one hundred fifty (150) gallons. The design capacity shall be posted prominently in the area adjacent to the spa.

(p) **Spa contiguous with pool.** Where a spa and a swimming pool share a wall in common, a barrier shall be mounted atop the common wall to discourage patrons from walking on the wall and falling into the spa, with its shallow seats. The barrier shall not form a ladder nor a diving platform and shall not include any impalement hazard.

### **310:315-7-12. Water recreation attractions**

(a) **General.** Water recreation attraction projects require special consultation with the Department in order that consideration can be given to concepts of design variations and to areas where potential problems may exist. In addition to the requirements of this section, compliance is required with all other applicable sections of this chapter. Plans for supervision, attendants, and lifeguards will be an important feature to be considered for water recreation attractions, and shall be presented in the engineering report accompanying plans and specifications.

(b) **Water slides.**

(1) **Recreational water slide.** A recreational water slide facility shall consist of one (1) or more flumes, plunge pool, a pump reservoir, filtration, disinfection, and chemical treatment facilities.

(2) **Water slide plunge pool.** Plunge pools are located at the base of slide flumes. They shall be constructed of concrete or other impervious materials with a smooth slip-resistant finish.

The plunge pool design shall be as follows:

(A) The minimum plunge pool operating water depth at the slide flume terminus shall be three (3) feet. This depth shall be maintained for a minimum distance of ten (10) feet in front of the slide terminus from which point the plunge pool floor may have constant upward slope to allow a minimum water depth of two (2) feet at the base of the steps. The floor slope shall not exceed one (1) foot in ten (10) feet. The plunge pool water depth shall be commensurate with safety and the ease of exit from the plunge pool.

(B) The plunge pool dimension between any slide flume exit or terminus and the opposite side of the plunge pool shall be a minimum of twenty (20) feet excluding steps.

(C) The slide flume terminus shall be at a minimum depth of six (6) inches below the plunge pool operating water surface level or it may be at the water surface level or up to a maximum of two (2) inches above the water surface level provided the terminal portion of the slide flume is parallel to the water surface for a minimum distance of ten (10) feet. The minimum distance between any plunge pool side wall and the outer edge of any slide flume terminus shall be four (4) feet. A minimum length of ten (10) feet of slide flume shall be perpendicular to the plunge pool wall at the exit end of the flume(s).

(D) The plunge pool shall have a minimum of one (1) main drain with separate piping and valve to the filtration system. The velocity through the openings of the main drain grate shall not exceed one and one-half (1-1/2) feet per second at the design flow rate of the recirculation pump. The main drain piping shall be sized to handle one hundred (100) percent of the design flow rate of the filtration system in accordance with 310:315-7-14.

(E) The plunge pool floor shall slope to the main drain(s) and the slope shall not exceed one (1) foot in ten (10) feet.

(F) Plunge pool decks shall meet the following requirements as follows:

(i) The minimum width of plunge pool decks along the exit side shall be ten (10) feet.

(ii) All plunge pool decks shall have a minimum six (6) inch high curb.

(iii) All plunge pool decks shall slope (drain) away from the plunge pool unless the curb is located at the outside perimeter of the deck. If the curb is located at the outside perimeter of the deck, the plunge pool deck shall slope to the plunge pool and/or pump reservoir or to deck drains which discharge to the same. All slopes shall be a

- minimum of three (3) inches in ten (10) feet.
- (3) **Bathhouse facilities.** Bathhouse facilities shall be provided in accordance with 310:315-7-7. For very large water recreation attractions, the number of bathhouse fixtures may be based on usage experience data.
- (4) **Pump reservoirs.** Pump reservoirs shall be made of concrete or other impervious material with a smooth slip-resistant finish and shall be connected to the plunge pool by a weir. Pump reservoirs shall be for the slide pump intakes. Pump reservoir designs shall be as follows:
- (A) The minimum reservoir volume shall be equal to two (2) minutes of the combined flow rate in gpm of all filter and slide pumps.
- (B) Pump reservoirs shall be isolated by a locking cover or enclosure and shall be accessible only to authorized individuals.
- (C) Access decks shall be provided for the reservoir such that all areas are accessible for vacuuming, skimming, and maintenance. The decks shall have a minimum width of three (3) feet and shall have a minimum slope of three (3) inches in ten (10) feet away from the reservoir. A minimum six (6) inch high curb shall protect the reservoir.
- (D) Pump reservoir slide pump intake(s) shall be located in the pump reservoir and shall be designed to allow cleaning without danger of operator entrapment.
- (E) The pump reservoir shall have a minimum of one (1) main drain with separate piping and valve to the filtration system and the velocity through the openings of the main drain grate(s) shall not exceed one and one-half (1-1/2) feet per second at the design flow rate of the filtration system in accordance with 310:315-7-14.
- (5) **Slide pump check valves.** Slide pumps shall have check valves on all discharge lines.
- (6) **Perimeter overflow gutters or skimmers.** Plunge pools and pump reservoirs shall have perimeter overflow gutter systems and/or skimmers which shall be an integral part of the filtration system.
- (A) Perimeter overflow gutter systems shall meet the requirements of 310:315-7-14 except the gutters are not required directly under slide flumes or along the weirs which separate plunge pools and pump reservoirs.
- (B) Surface skimmers may be used in lieu of perimeter overflow gutters and shall be appropriately spaced and located according to the structural design. Unless an overflow gutter system is used, a minimum of two (2) surface skimmers each shall be provided in the plunge pool. Skimmers shall meet the requirements of 310:315-7-14.
- (7) **Water slide recirculation-filtration equipment.**
- (A) The recirculation-filtration system of water slides

shall recirculate and filter a water volume equal to the total water volume of the facility in a period of one (1) hour or less.

(B) Minimum filter area requirements shall be twice the filter areas specified for the recirculation rate stipulated in 310:315-7-15.

(C) Any filtration system pump which takes suction directly from the plunge pool and reservoir shall have a minimum eight (8) inch diameter hair and lint strainer, meeting the requirements of 310:315-7-14 on the suction side of the pump.

(8) **Water slide chemical feed equipment.**

(A) Gas chlorination is recommended for disinfection for all water recreation facilities. Chlorinators must meet all the requirements of 310:315-7-16.

(B) Feeders for pH adjustment shall be provided, shall meet the requirements of 310:315-7-16, and shall be capable of meeting the feed rate necessary for the specific installation.

(C) When diatomaceous earth type filters are used, an acceptable diatomaceous earth type feeder meeting the minimum feeding requirements of 310:315-7-15 shall be provided regardless of the design filtration rate.

(c) **Water amusement lagoons.**

(1) **Submission of engineering plans.** The design engineer shall consult with the Department prior to preparation and submission of engineering plans and specifications for water amusement lagoons.

(2) **Water amusement lagoons.** Water amusement lagoons shall be constructed of concrete or other impervious materials with a smooth slip-resistant finish. These lagoons shall be of such shape and design as to be operated and maintained in a safe and sanitary manner.

(3) **Recirculation-filtration system.** The recirculation-filtration system of water amusement lagoons shall be capable of a minimum of one (1) turnover every thirty (30) minutes.

(d) **Wave pools and tube rides.**

(1) **Submission of engineering plans.** The design engineer shall consult with the Department prior to preparation and submission of engineering plans and specifications for wave pools.

(2) **Wave pool construction.** Wave pools shall be constructed of concrete or other impervious materials with a smooth slip-resistant finish. These pools shall be of such shape and design as to be operated and maintained in a safe and sanitary manner.

(3) **Recirculation-filtration system.** The recirculation-filtration system of wave pools and tube rides shall be capable of a minimum of one (1) turnover every four (4) hours.

**310:315-7-13. Chemicals and chemical storage**

(a) **Chemical storage and equipment.** For chemicals necessary in water treatment, for disinfection, and pH control, provision shall be made for dry storage of at least a two (2) weeks supply of chemicals. Equipment shall be provided for batch preparation of chemicals sufficient for twenty-four (24) hours feeding.

(b) **Storage room marking.** All rooms or areas used for storage of pool chemicals shall be plainly marked on the outside door. This may be done as follows:

(1) A sign stating "POOL CHEMICALS".

(2) A sign approved by the local fire officials which indicates that the contents are potentially dangerous. See Public Bathing Place Regulations.

**310:315-7-14. Recirculation system****(a) General considerations.**

(1) A circulation system shall be provided which will include pumps, hair-catcher, and filters, together with all necessary piping connections to the inlets and outlets of the pool. The water heater, chlorinator, and suction cleaner are also usually connected with the recirculation system and shall be considered as integral parts thereof. The entire system and all component parts of swimming pools shall be designed to provide a minimum of three (3) replacements of the bathing water volume every twenty-four (24) hours (four (4) turnovers are recommended), with maximum frictional resistance. The required turnover rate at spas and other facilities appears in the appropriate section; note that at pools and spas with skimmers, the required skimmer flow, rather than turnover, may determine the minimum flow. Design is to be based on provisions for main drain flow at thirty (30) percent of the total recirculation, and thirty (30) gpm through each skimmer. This is represented as  $0.3Q + 30n = Q = \text{total recirculation flow rate}$  and  $n = \text{number of skimmers}$ . (Main drain flow is  $0.3Q$ .) These criteria, plus the maximum allowable filter flux (15 gpm/ft<sup>2</sup> for rapid sand filters) and the maximum total dynamic head loss calculated assuming a "dirty" filter ready for backwash, comprise the basic design requirements for the most commonly designed pools and spas.

(2) Filtration and disinfection are discussed in subsequent subchapters. A collector tank or other means for accommodating surge capacity shall be provided for all pools using overflow gutters connected to the recirculation system.

**(b) Pumps.**

(1) Centrifugal pumps are preferable for swimming pool circulation. Electric drive is also preferable. When pipe lines from suction cleaner lead to pump suction, a pump which

will develop good vacuum must be used. The pump and piping at swimming pools shall be of such capacity as to provide for a turnover of pool water in at least eight (8) hours. Refer to the appropriate section for requirements at spas, water slides, and other facilities. When pressure filters are used, pumps must be designed to pass the required volume under the maximum head which may develop in the filters.

(2) The pump shall have adequate capacity to provide the design recirculation flow rate at maximum calculated head loss, and 15 gpm/ft<sup>2</sup> of sand filter area during backwash; the pump should be located below the water level of the pool when feasible, to avoid air-lock. Should it be necessary to locate the pump above the water level of the pool, a check valve shall be provided on the suction side of the pump unless a self-priming pump is furnished.

(3) If the filter is located above the water level of the pool, then valves shall be provided in the inlet and discharge lines which can be closed when the filter is not in use.

(c) **Strainers.** The recirculation system shall include a strainer to prevent hair, lint, and other solids from reaching the pump and filters. Strainers shall be corrosion-resistant with openings not more than one-eighth (1/8) inch in size and shall be readily accessible for frequent cleaning. Larger openings for strainers will be considered only on a trial basis. At least two (2) baskets, or screens, must be provided. The area of strainer openings shall be at least four (4) times the cross-sectional area of the connecting pipe. A compound pressure gauge shall be installed to measure the pressure between the pump and the hair and lint strainer. Where filter systems are located above the pool water level, a standard vacuum gauge is acceptable.

(d) **Vacuum cleaner.** Vacuum cleaner facilities, either portable or installed integrally in the pool piping system for the operation of a vacuum cleaner, shall be provided. Piping and hose shall be required to produce not more than fifteen (15) feet total head loss at the pump, while moving four (4) gallons per minute per linear inch of cleaner head. All pools shall be designed with pipes for vacuum cleaning facilities integrally with the pool piping or portable facilities will be provided. Vacuum cleaner heads with brushes are recommended.

The mixture of water and sediment from a suction cleaner may, in the case of outdoor pools subjected to heavy dust loads, be discharged to an approved waste treatment system. The discharge from suction cleaners used in cleaning indoor pools, which are not subjected to heavy dust loads or in which sedimentation is slight, may be returned to the pool through the filter system. Any point source discharge must comply with the requirements of 310:315-5-2.

(e) **Water heater.** Indoor pools operated during the colder months shall be provided with some method of heating the pool water. Introduction of steam directly into the pool or the use of heating

coils placed directly in the pool are prohibited. A heater designed to heat all or a part of the circulation water is preferable. Such a heater may be designed for use with steam or hot water and ample surface for heat interchange must be provided.

Automatic thermal control is desirable. Provision should be made for easy removal of the heater parts for cleaning. A check valve shall be installed between the filter and the inlet side of the heater.

On all heated pools, a fixed thermometer shall be placed on the recirculation line immediately downstream from the heater after blending and another on the return line from the pool. Thermometers shall be accessible and have a Fahrenheit scale.

(f) **Piping system.** The determination of sizes of pipe, fittings, and valves on the complete main pump suction line from the swimming pool shall be based upon a rate of friction losses for piping of not more than six (6) feet per one hundred (100) feet of pipe based upon the Hazen-Williams formula for fifteen (15) year old piping. All piping on the discharge side of the pump for filtration and to the point for discharge of backwash water from the filter plant shall have pipe sizes determined on a basis of friction losses which shall be not more than twelve (12) feet per one hundred (100) feet and the velocity in any pipe shall not exceed ten (10) feet per second. Pipe selection shall be made based upon the Hazen-Williams formula for fifteen (15) year old pipe. In the determination of pipe sizes required, the criterion which would call for the largest pipe size shall govern. All pool piping shall be supported by piers or other substantial means to preclude possible settlement which will either provide dirt traps or air pockets and a condition which might result in rupture of the lines.

The use of plastic pipe on suction lines and lines beneath the pool and bathhouse structure is not recommended. All plastic pipe used shall bear the approval seal of the National Sanitation Foundation.

All piping shall be labeled or color coded and all valves shall be labeled.

(g) **Rate-of-flow indicator.** Every public swimming pool distribution system including those for wading pools shall be provided with an accurate and durable rate-of-flow indicator, installed in accordance with the manufacturer's recommendations and with the required uniform distance upstream and downstream for accurate response.

In pressure sand filter installations, a rate indicator shall be provided and located on the filter inlet line so as to record both filtration and backwashing rates. It shall be calibrated for and provided with an easily readable scale reading in gallons per minute, and shall have a range at least ten (10) percent below the required filtration rate and ten (10) percent above the required backwash rate. It shall be accurate within ten (10) percent of

true flow.

In a diatomite type filter installation, a rate-of-flow indicator can be located wherever convenient to visibly indicate the flow rate, preferably in the filter effluent line.

(h) **Outlets.** All pools must be provided with an outlet at the deepest point to permit the pool to be completely and easily drained. Outlet openings of the grating in the floor of the pool shall be at least four (4) times the area of the discharge pipe. Outlets must be covered by a proper plate or grating which is not readily removed by bathers. The outlet shall be covered with a grate having a minimum area of one hundred forty-four (144) square inches equal to a twelve (12) inch x twelve (12) inch square or be covered with an anti-vortex plate to prevent the development of a suction in the outlet, dangerous to the safety of the bathers. Openings in the drain cover(s) shall be designed for a maximum velocity of one and one-half (1-1/2) feet per second. The maximum width of grate openings shall be one-half (1/2) inch. The outlet shall be marked by a dark colored stripe outlining the main drain, disk, or circle unless the plate or grating is of a contrasting color.

Multiple outlets to meet this requirement shall be provided where the width of the pool is more than thirty (30) feet. In such cases, outlets shall be spaced not more than twenty (20) feet apart and not more than fifteen (15) feet from the side walls.

A line shall run from the main drain(s) to a manifold connected to the inlet of the hair and lint strainer. A separate line shall run from each skimmer to the manifold. A valve that will permit adjustment of flow shall be installed in each line carrying water from the pool. Where thus provided, the vacuum line should connect to the manifold through a suitable valve.

(i) **Inlets.** Multiple inlets shall be provided and shall be so spaced that each inlet will serve a linear distance of not more than fifteen (15) feet, provided that the distance from side wall or corner to adjacent inlet in an end wall shall not exceed five (5) feet. At least four (4) inlets are required at pools of any size, and more may be required at recessed features (stairs, seats, etc.) or in pools with irregular shapes, to achieve satisfactory disinfectant distribution. On pools less than sixteen hundred (1600) square feet in area, only directional (eye-ball type) inlets are permitted.

In pools with surface area greater than sixteen hundred (1600) square feet or length in excess of sixty (60) feet, inlets shall be placed at fifteen (15) feet intervals around the entire perimeter. In any case, an adequate number of inlets shall be provided, properly spaced, and located to accomplish complete and uniform recirculation and maintenance of uniform disinfectant residual at all times. Inlets shall be a minimum of eighteen (18) inches below the water surface.

Each inlet shall be designed as an orifice subject to

adjustment or at least must be provided with an individual gate valve to permit adjustment of water volume and/or velocity to obtain a balanced circulation.

In the event recessed stairs are used, an inlet at the stairs must be provided to assure adequate circulation.

(j)**Overflow gutters.** Overflow gutters shall be required on all pools having a surface area or more than twenty-four hundred (2400) square feet. Pools having a surface area of twenty-four hundred (2400) square feet or less shall be provided either with overflow gutters or skimmers.

Overflow gutters shall extend completely around the pool except at steps or recessed ladders, and shall be designed to assure that water does not wash back into the pool from the gutter.

Guttered pools shall be designed for at least some water to be overflowing into the gutters or into surge weirs at all times, not just when the pool is at full bather capacity, for continuous removal of surface oils and debris.

The gutter, drains, and piping shall be designed to rapidly remove overflow water caused by recirculation displacement, wave action, or other causes produced from the maximum pool bathing load. The opening into the gutter beneath the coping shall be not less than four (4) inches, and the interior of the gutter shall be not less than four (4) inches wide with a depth of at least three (3) inches. Where large gutters are used, they shall be designed to prevent entrance or entrapment of bathers' arms or legs. The overflow edge shall be rounded and shall not be thicker than two and one-half (2-1/2) inches for the top two (2) inches. Prefabricated gutter and return systems will be evaluated on a case-by-case basis.

(k)**Gutter outlets.** Drainage outlets shall be provided at least every fifteen (15) feet and the gutter bottom may be level, or preferably pitched slightly, to these outlets. Outlet pipes shall have a minimum inside diameter of two (2) inches. Outlets shall be covered by gratings. Angle gutter drains, which are not as subject to stoppage, are recommended.

Drainage from overflow gutters may be discharged to sewers (without direct connection), or connected to the recirculation system through a properly designed surge tank or other acceptably designed provision for handling surge capacity, such as deep gutter channels. The gutter, drains, and return piping to the surge tank shall be designed to rapidly remove overflowing water caused by recirculation displacement, wave action, or other causes produced from the maximum pool bathing load.

The outlet fittings shall have a clear opening in the grating at least equal to one and one-half (1-1/2) times the cross-sectional area of the outlet pipe.

Open, roll-over, semi-recessed, or overflow gutters recessed in the side wall of the pool may be used, provided the design is such as to minimize accidents and to enable the gutter to be easily

cleaned.

(1) **Skimmers.** Skimming devices are permitted in lieu of gutters on swimming pools with not more than twenty-four hundred (2400) square feet of surface area, providing approved handholds are installed and sufficient motion to the pool water is induced by the pressure return inlets.

At least one (1) skimming device shall be provided for each six hundred (600) square feet or fraction thereof. The required surface skimmers shall be located at least thirty (30) feet apart, measured horizontally. One (1) skimmer shall be located on the leeward side.

Where used, skimming devices shall be built into the pool wall, shall develop sufficient velocity on the pool water surface to induce floating oils and wastes into the skimmers from the entire pool area, and shall meet the following general specifications:

(1) The piping and other pertinent components of the skimmers shall be designed for a total capacity of at least fifty (50) percent of the required filter flow of the recirculation system, and no skimmer shall be designed for a flow-through rate of less than thirty (30) gallons per minute.

(2) The skimmer weir shall be automatically adjustable and shall operate freely with continuous reaction action to variations in water level over a range of at least four (4) inches. The weir shall operate at all flow variations as described in the above paragraphs. The weir shall be of such buoyancy and design as to develop an effective velocity.

(3) An easily removable and cleanable basket or screen through which all overflow water must pass shall be provided to trap large solids.

(4) The skimmer shall be provided with a device to prevent air-lock in the suction line. If an equalizer pipe is used, it shall provide an adequate amount of water for pump suction should be water of the pool drop below the weir level. If any other device or arrangement is used, a sufficient amount of water for pump suction shall be assured. When the equalizer pipe is used, it shall be sized to meet the capacity requirements of the filter and pump and shall in no case be less than two (2) inches in diameter. This pipe shall be located at least one (1) foot below the lowest overflow level of the skimmer. It shall be provided with a valve or equivalent device that will remain tightly shut under normal operating conditions but will automatically open when the skimmer becomes starved.

(5) The skimmer shall be of sturdy corrosion-resistant materials.

(6) Where multiple skimmers are installed, valves shall be provided to isolate each skimmer and/or regulate the flow through each skimmer. See 310:315-7-14 for additional details.

(7) In addition to the above requirements, the skimmers must

be approved and listed as currently approved by the National Sanitation Foundation (NSF).

**310:315-7-15. Filters**

(a) **General.** The filter plant shall be provided with influent and effluent pressure gauges for each tank, backwash sight glass, air relief valves, and rate-of-flow indicator, as provided in this chapter. In vacuum filter installations where the circulating pump has a rating of two (2) horsepower or higher, an adjustable high vacuum automatic shutoff shall be provided to prevent damage to the pump by cavitation. A compound gauge shall be installed in the pump suction line, between the pump and hair catcher (see 310:315-7-14 for exception). The sight glass may be omitted if the backwash discharge can be clearly viewed from the backwash control valves.

The filter plant shall be provided with fixed piping and valving to permit the functions of filtering to pool or backwashing to approved waste disposal with the battery as a whole or any unit operated singly.

The filter plant shall be provided with means for draining all filter units and piping, so that all parts of the system may be completely drained to prevent damage from freezing.

Pressure tanks should be supported by jack legs or other supports to give a free movement of air under each tank and to permit access for painting.

Where dissimilar metals are used in the filters which may set up galvanic electric currents, provision shall be made to resist electrolytic corrosion.

The filters shall be designed in such a manner that they may be easily disassembled with allowances made for adequate working space above and around the filter to allow the removal and replacement of any part and for other maintenance.

(b) **Filters, sand, conventional low-rate.** This chapter shall apply where applicable to either gravity or pressure sand filters, designed for a filtration rate not to exceed three (3) gallons per square foot per minute. Filter tanks shall be designed with a factor of safety of four (4) in relation of working pressure to ultimate strength. The filter bed shall consist of suitable grades of filter sand and supporting bed of graded gravel or other porous material which shall serve to support the filter bed and distribute both filtered and backwash water uniformly. The supporting bed shall consist of graded gravel or other material and shall support not less than twenty (20) inches of filter media. The filter media shall consist of silica sand or other durable, inert material. The filter media shall be free of clay and limestone, with effective size between 0.35 and 0.65 millimeter and uniformity coefficient not exceeding 1.75.

The minimum freeboard to the draw-off point of backwash water shall be not less than twelve (12) inches above the normal level

of the top of the filter bed. The minimum backwash rate shall be not less than twelve (12) gallons per square foot of filter bed per minute.

Where anthracite coal or other filter media are employed, the freeboard shall be adequate to prevent the media being carried off to waste when the filter bed is backwashed at a rate adequate to carry off foreign material filtered from the water. The freeboard and the rate of backwash shall be the subject of individual design, based upon specific gravity of the media.

The under-drain system shall be constructed of material which is corrosion resistant and enduring and the design of the system shall be such that uniform collection of the filtered water and distribution of the backwash water is effected over the entire filter bed area. Unless other effective means are provided of distributing the water entering the unit above the filtering media, the filter shall be equipped with a baffle plate for this purpose.

Each conventional sand and gravel filter unit shall be provided with an access opening of not less than a standard eleven (11) x fifteen (15) inch manhole and cover.

(c) **Filters, sand, pressure high-rate.** High rate pressure sand filters are acceptable provided the filter-pump combination is designed and sized to limit the filtration rate to a maximum of fifteen (15) gallons per square foot per minute. High rate sand filters must be approved and listed by the National Sanitation Foundation. The filter media shall consist of silica sand or other durable, inert material, free from clay and limestone and with an effective size between 0.40 and 0.55 millimeters and an uniformity coefficient not exceeding 1.75. The minimum depth for filter sand shall be twenty (20) inches for rapid rate filters and twelve (12) inches for high-rate filters.

(d) **Filters, diatomite.** These may be of either pressure or vacuum type. The design filter rate shall not exceed two and one-half (2-1/2) gallons per minute per square foot of effective filter area. If an approved body feed is not used, the rate shall be reduced to two (2) gallons per minute per square foot of effective filter area. For pools with surface area of sixteen hundred (1600) square feet or more, an approved body feed is required. The determination of the filter area shall be made on the basis of a true and effective supported septum surface. In the case of fabric septums, the area computation will be made on the basis of measurements of the septum support in a reasonably constant plane. Area allowances shall not be granted for folds in the septum fabric or deviations in the septum surface which would easily bridge.

The filter cycle of the diatomite filter shall not be less than seventy-two (72) hours of continuous operation before cleaning. This shall not apply to the initial operation of a pool, but only to the operation where the pool water at least meets the

conditions of water quality given in the Public Bathing Place Regulations.

Provision shall be made to introduce a precoat of filter aid to evenly cover the filter elements upon placing the equipment into initial operation and after each cleaning. The amount of filter aid shall be selected to provide at least the same protection to the filter septum as that given by 0.1 pound of diatomaceous earth filter aid per square foot of filter area where body feed is employed, or 0.15 pound per square foot where no body feed is used. The equipment shall be so arranged that during the precoating the effluent shall be refiltered or discharged to an approved waste facility without passing into the pool until the effluent is clear of suspended matter. Slurry feeders shall include an agitator and positive feed pump.

Where provided, the body feeding equipment designed for feed of filter aid to the filter influent shall have a rate capacity to feed at a reasonably constant rate within a calibrated range. The equipment will have capacity to operate at the maximum feed rate of ten (10) parts per million at the design filter rate for a period of twenty-four (24) hours without refilling.

The tank containing the filter elements shall be constructed of steel, plastic, or other suitable material which will satisfactorily provide resistance to corrosion, with or without coating. Pressure filters shall be designed for a working pressure equal to the shutoff head of the pump, with a factor of safety of four (4). Vacuum filters shall be designed to withstand the pressure developed by the weight of the water contained therein and closed vacuum filters shall, in addition, be designed to withstand the crushing pressure developed under a vacuum of twenty-five (25) inches of mercury, both with a safety factor of three and one-half (3-1/2).

The septa or elements which support the filter aid shall be of corrosion resistant material and shall be provided with openings the minimum dimensions of which shall not be greater than 0.005 inches, or as specified in the National Sanitation Foundation Standards for Diatomite Filters. All diatomite filters shall be approved and listed by the National Sanitation Foundation.

The septa shall be constructed to be adequately resistant to rupture with the maximum differential pressure between influent and effluent of not less than the maximum pressure which can be developed by the circulating pump and of adequate strength to resist any additional stresses developed by the cleaning operation.

(e) **Surface skimmer filters.** Skimmer filters are acceptable on pools less than sixteen hundred (1600) square feet surface area, and on wading pools. The unit shall be designed to filter at a rate of two (2) gallons per minute per square foot and shall be equal to the design capacity of the skimmer. All requirements in 310:315-7-15, Filters, Diatomite, shall be applicable to skimmer

filters.

(f) **Cartridge filters.** Cartridge filters are acceptable if they conform to the following criteria:

(1) The filter is listed as approved by the National Sanitation Foundation.

(2) The maximum flow through the filter is not greater than 0.375 gpm/square foot.

(3) A sump or other means of collecting water and wastes drained from the filter, or from the filter elements during cleaning, is provided, and discharges into an approved wastewater collection system.

(g) **Filter operating instructions.** At the time of final inspection of the swimming pool construction, there shall be provided to the operator two (2) sets of filter operation instructions, for the operator and owner, which shall refer to valve operation by number. Each valve shall be equipped with a numbered metal, plastic, or other durable tag permanently attached by a chain or otherwise permanently secured.

#### **310:315-7-16. Disinfection and pH control**

(a) **Chlorinator or other disinfection feeder.** The pool shall be equipped with a chlorinator or other residual disinfectant feeder which meets the following requirements: All chemicals and chemical solutions shall be added to the pool water recirculation flow using a feeder that is acceptable to the Department.

(1) **Construction and materials.** It shall be of sturdy construction and materials which will withstand wear, corrosion, or attack by disinfectant solutions or vapors and which are not adversely affected by repeated regular adjustments or other conditions anticipated in the use of the device. Feeders requiring field maintenance or cleaning shall be capable of being easily disassembled. The design and construction shall be such as to preclude stoppage from chemicals used or foreign material. The feeder shall incorporate failure-proof features so that the disinfectant cannot feed directly into the pool, the pool piping or pool enclosure following any type of failure of the equipment or its maintenance. Super-chlorination shall be accomplished by the addition of calcium hypochlorite, sodium hypochlorite, or other approved chlorine compounds. Solution chemical feeders and flow through chemical feeders shall be listed as meeting the appropriate National Sanitation Foundation Standard and bear the NSF seal of approval.

(2) **Sizing of disinfection equipment.** Solution and gas feeders shall be capable of supplying the equivalent of 1.5 pounds of available chlorine in eight (8) hours, for each ten thousand (10,000) gallons of pool capacity. Feeders used with organic chlorine compounds or other stabilized chlorine shall be capable of supplying the equivalent of 0.5 pounds of

available chlorine in eight (8) hours, for each ten thousand (10,000) gallons of pool capacity and the cyanurate concentration in the pool shall be at least thirty (30) mg/l and shall not exceed one hundred (100) mg/l.

(3) **Erosion type feeders.** Erosion type chlorinators using stabilized chlorine compounds shall have a flow meter, calibrated valve, or other device acceptable to the reviewing authority to determine the rate of flow of water through the chlorinator. The device shall be either calibrated in pounds chlorine feed per unit of time or calibrated in gallons of flow per unit of time with an attached chart to convert the water flow rate to pounds of chlorine feed. The feeder shall be capable of continuous delivery within ten (10) percent of the dosage setting.

(4) **Solution type feed pumps.** The pump shall have a calibrated rate control and be adjustable from zero (0) to full range. The feeder shall have the capability of feeding the required dosage using a two and one-half (2-1/2) percent solution. (A diagram of a calcium hypochlorite system is shown in Figure III.)

(5) **Existing disinfection equipment.** Existing pools with disinfection equipment installed not meeting the requirements of 310:315-7-16 shall be upgraded to this chapter at such time that failure to meet the required water quality can be attributed to inadequate chemical feed equipment.

(6) **Chlorination for normal operation.** Chlorination for normal operation is recommended to be introduced before all sand filters. Where super-chlorination is accomplished by chemical feeders, the solution shall be introduced before the sand filter. When the disinfectant is introduced at the suction side of the pump, a device or method shall be provided to prevent air-locking of the pump or recirculation system.

(7) **Chlorination to prevent backflow.** The chlorinators shall be designed to prevent the backflow of water into the chlorine container.

(8) **Compressed chlorine gas.** When compressed chlorine gas is used, the following additional features shall be provided:

(A) The chlorine and chlorinating equipment shall be located either out-of-doors or in a separate well-ventilated room. Such rooms should preferably be above ground and shall be provided with vents near the floor which terminate outdoors. The door of the room shall have a viewport and shall not open to the pool enclosure and shall open outward.

When located out-of-doors, the cylinders shall be securely anchored to prevent them from falling over and shall be surrounded by a six (6) foot high, woven wire fence, or equivalent, and a locked gate.

(B) Where gaseous chlorine equipment is provided below grade in a filter room, or in any part of a building which

provides housing, the mechanical proportioning device and cylinders of chlorine shall be housed in a reasonably gas-tight, corrosion-resistant, and mechanically vented enclosure. Air-tight duct work from the bottom of the enclosure to atmosphere in an unrestricted area and a motor-driven exhaust fan capable of producing at least one (1) air change per minute shall be provided. Automatic louvers of good design near the top of the enclosure for admitting fresh air are required. An opening at least eighteen (18) inches square, glazed with clear glass, and artificial illumination shall be provided in an amount such that the essential performance of the equipment may be observed at all times without opening the enclosure. The floor area of the enclosure shall be of adequate size to house the chlorinator, fan, scales, and one (1) extra chlorine cylinder.

(C) Electrical switches for the control of artificial lighting and ventilation shall be on the outside of the enclosure adjacent to the door.

(D) The chlorine equipment shall be of rugged design capable of withstanding wear without developing leaks.

(E) Chlorine cylinders shall be anchored to prevent their falling over and shall be provided with platform scales having a capacity of at least one (1) cylinder of chlorine. An approved chlorine cylinder valve stem wrench shall be provided.

(F) The chlorine feeding device shall be designed so that during accidents or interruptions of the water or electric power supply, the chlorine feed will shut off automatically and leaking chlorine gas will be vented outdoors. The device shall be capable of delivering chlorine at its maximum rate without releasing chlorine gas to the atmosphere.

(G) A gas mask designed for use in a chlorine atmosphere and of a type approved by the U.S. Bureau of Mines shall be provided. A fresh replacement canister shall also be furnished.

(H) The gas mask shall be kept in a closed cabinet accessible without a key and located well away from the gas chlorinator or the room where the gas chlorinator is installed, such that it may easily and safely be reached and be put on out of range of possible gas fumes.

(I) Canister-type gas masks are suitable only with low concentrations of chlorine gas. In the event of a serious leak, the fire department shall be called.

(b) **Brominators or other disinfectant devices.** Where brominators or other disinfectant devices are proposed, the design with respect to equipment, maintenance, and safety shall be in accordance with the applicable provisions of 310:315-7-16.

(c) **Prohibitions and exceptions**

(1) **Hand feeding.** Hand feeding of disinfectants to maintain

normal disinfectant residuals is not acceptable; however, the addition of chlorine solution by hand may be used periodically to super-chlorinate for algal control. Super-chlorination shall be accomplished at times when the pool is closed and a safe range of chlorine disinfection shall be attained before patrons are permitted to return to the pool.

(2) **Local ordinances.** Where local ordinances exceed the requirements of this chapter, the local ordinances shall prevail.

(d) **Electrolytic chlorine generators.** The electrolytic chlorine generator shall be of sturdy construction and of materials which will withstand continual usage typical of public pools and the feed rate shall be adjustable from zero (0) to full range. The generator shall be capable of feeding a chlorine dosage of one and one-half (1-1/2) pounds of available chlorine in eight (8) hours for each ten thousand (10,000) gallons of pool capacity. The generator unit shall be UL approved and a failure-proof electrical interlock with the recirculation pump shall be incorporated into the system such that the generator operates only during recirculation pump operation. The generator units shall be installed according to the manufacturer's instructions and the saline content of the pool water shall be maintained in the required range specified by the manufacturer. Ventilation and housing shall meet the requirements of 310:315-7-16 for compressed chlorine gas.

(e) **Feeders for pH adjustment.** Feeders for pH adjustment shall be provided on all pools using gaseous chlorine for disinfection. They shall be adjustable from zero (0) to full range, and shall meet the requirements of 310:315-7-16. When soda ash is used for pH adjustment, the maximum concentration of soda ash solution to be fed shall not exceed one-half (1/2) pound soda ash per gallon of water. Feeders for soda ash shall be capable of feeding a minimum of three (3) gallons of the above soda ash solution per pound of gas chlorination capacity. The minimum size of the solution reservoir(s) shall not be less than fifty (50) percent of the maximum daily capacity of the feeder. The solution reservoir(s) shall be marked to indicate contents.

#### **310:315-7-17. Testing equipment**

(a) **Test kits.** Test kits are required at all pools to determine free active chlorine and total or combined available chlorine (using D.P.D. reagents), or bromine, total alkalinity, calcium hardness, and pH.

(b) **Cyanuric acid test kits.** Cyanuric acid test kits are required at all pools in which cyanurates or cyanuric acid stabilized chlorine products are used. The concentration of cyanuric acid in the pool water shall not exceed one hundred (100) ppm.

(c) **Sodium chloride test kits.** Sodium chloride test kits are

required at all pools which utilize accepted electrolytic chlorine generators which require sodium chloride concentrations in the pool water. The concentration of sodium chloride in the pool water shall be maintained in the range specified by the electrolytic chlorine generator manufacturer.

(d) **Thermometers.** All facilities heating the water to temperatures over 90°F shall maintain on the premises, in the pool or pool enclosure, a thermometer to take the temperature of the water. Those facilities requiring the ambient air temperature to be monitored shall maintain a suitable thermometer with a Fahrenheit scale at deck level in the pool room to monitor air temperature.

(e) **Test kits, spas.** In addition to fulfilling the foregoing requirements of this section, spa facilities shall be equipped to test for concentrations of total dissolved solids, copper, and iron.

### **310:315-7-18. Lighting**

(a) **Artificial lighting.** A complete system of artificial lighting shall be provided for all pools, rest rooms, toilet rooms, shower rooms, store rooms, and other areas of public bathing places.

(b) **Arrangement.** The arrangement and design of the lighting shall be such that attendants may clearly observe every part of the pool, spring boards, towers, floats, or other appurtenances. The lighting system of outdoor pools shall be designed with sources of illumination located so as to prevent insects attracted by the lights from falling into the water.

(c) **Underwater lights.** Where underwater lighting is used, it is recommended that the minimum illumination be eight (8) foot-candles at any point in the pool. Such lights shall be spaced to provide illumination so that all portions of the pool and pool bottom may be seen without glare. See 310:315-7-19, "Electrical requirements."

(d) **Area lighting.** Area lighting shall provide a minimum of ten (10) foot-candles at all points on the deck.

(e) **Interior rooms.** All rooms shall be provided with sufficient light so that all sections may be observed and are easily visible for cleaning purposes. A minimum of ten (10) foot-candles shall be provided in all interior rooms.

(f) **Emergency lighting.** Emergency lighting shall be provided at all indoor bathing facilities, in accordance with the requirements of the current edition of the NFPA 101 Life Safety Code, unless assurance can be provided that the facility will always be locked and not used at night.

**310:315-7-19. Electrical requirements**

(a) **Wiring standards.** All wiring in connection with requirements for a swimming pool for lighting or power shall conform with the National Electrical Code of the National Underwriters Laboratories.

(b) **Grounding.** In addition to the grounding requirements for electrical equipment and circuits by the National Electrical Code, all metal water and other metal piping to and from the public bathing place, including inlet and outlet pipes, shall be metallicly bonded together and adequately connected to the same grounding electrode used to ground the neutral conductor of the electrical system. Where metal fence is used, it shall be grounded at both sides of the entrance gate.

(c) **Electrical devices.** All electrical devices such as portable announcing systems, radios, and soft drink dispensers that might be used around the pool deck and immediate environment shall be prohibited within reach of bathers. Further special grounding of such fixtures must be provided.

(d) **Overhead conductors.** No electrical wiring shall pass overhead within twenty (20) feet of the pool enclosure.

(e) **Ground fault interrupter type circuit breakers.** Ground fault interrupter type circuit breakers shall be provided for all outlets within fifteen (15) feet of the pool and those located in the bathhouse and pump room.

(f) **Underwater light assemblies.** All underwater light assemblies shall comply with 310:315-7-19 and shall be connected in one of the following manners.

(1) Using a low-voltage twelve (12) volt system with three hundred (300) watt or less underwater light(s).

(2) New one hundred-ten (110) volt systems will have an approved junction box (deck box) in excess of eight (8) inches above the deck level and must have a ground fault interrupter installed at the main panel.

(3) All existing underwater lighting systems using one hundred-ten (110) volts shall have a ground fault interrupter installed at the main panel.

(4) Low water cutoffs are strongly recommended.