

approved for compliance to the *Florida Building Code*. New units shall have foundation plans provided and secured, in the relocatable along with the local fire inspector report. Certification of such inspection shall remain on file with the district. Inventory/date of construction signage shall be affixed to the relocatable. Where FRTW is used, inspection access panels shall be provided and within easy reach to facilitate inspection for general condition assessment of FRTW and connectors.

SECTION 454 SWIMMING POOLS AND BATHING PLACES (PUBLIC AND PRIVATE)

454.1 Public swimming pools and bathing places. Public swimming pools and bathing places shall comply with the design and construction standards of this section.

454.1.1 Flood hazard areas. Public swimming pools installed in flood hazard areas established in Section 1612.3 shall comply with Section 1612.

NOTE: Other administrative and programmatic provisions apply. See Department of Health (DOH) Rule 64E-9, *Florida Administrative Code* and Chapter 514, *Florida Statutes*. The regulation and enforcement of the initial and annual operation permit for public pools are preempted to the DOH. The construction permit holder is responsible for obtaining an operation permit issued by DOH, as a public swimming pool shall not be put into operation without an inspection and operation permit issued from the DOH. DOH may grant variances from the provisions of the *Florida Building Code* specifically pertaining to public swimming pools and bathing places as authorized by Section 514.0115, *Florida Statutes*. Building officials shall recognize and enforce variance orders issued by the Department of Health pursuant to Section 514.0115(5), *Florida Statutes* including any conditions attached to the granting of the variance.

"Bathing load" means the maximum number of persons allowed in the pool or bathing place at one time.

"Collector tank" means a reservoir, with a minimum of 2.25-square feet water (0.2 m²) surface area open to the atmosphere, from which the recirculation or feature pump takes suction, which receives the gravity flow from the main drain line and surface overflow system or feature water source line, and that is cleanable.

"Department" means the permitting/inspection authority.

"Effective barrier." A barrier which consists of a building, or equivalent structure, plus a 48-inch (1219 mm) minimum height fence on the remaining sides or a continuous 48-inch (1219 mm) minimum height fence. All access through the barrier must have one or more of the following safety features: alarm, key lock or self-locking doors and gates. Safety covers that comply with the American Soci-

ety for Test Materials Standard F1346-91 (2003) may also be considered as an effective barrier.

"D.E." is the diatomaceous earth that is used as a filter aid in D.E.-type filters. For the purpose of this rule, it also includes alternative filter aids that have been approved under NSF/ANSI Standard 50-2007, and accepted by the filter manufacturer.

"Interactive water features" means a structure designed to allow for recreational activities with recirculated, filtered, and treated water; but having minimal standing water. Water from the interactive fountain type features is collected by gravity below grade in a collector tank or sump. The water is filtered, disinfected and then pumped to the feature spray discharge heads.

"Modification" means any act which changes or alters the original characteristics of the pool as approved. For example, changes in the recirculation systems, decking, treatment systems, disinfection system and pool shape are modifications.

"Marking" or "Markings" refers to the placement and installation of visual marking cues to help patrons identify step, bench and swimout outlines, slope break location, depth designations and NO ENTRY and NO DIVING warnings. When markings are specified by code to be dark, the term "dark" shall mean a Munsell color value from zero to four.

"Perimeter overflow gutter" means a level trough or ledge around the inside perimeter of the pool containing drains to clean the pool water surface.

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

"Pool Door" means the interior pool bottom surface which consists of that area from a horizontal plane up to a maximum of a 45-degree slope.

"Pool wall" means the interior pool side surfaces which consist of that area from a vertical plane to a 45-degree slope.

"Pool turnover" means the circulation of the entire pool volume through the filter system. Pool volume shall be determined from the design water level which is the normal operating water level; for gutter-type pools it is the horizontal plane of the upper lip of the gutter and for skimmer pools it is the centerline of the skimmer opening.

"Precoat pot" means a container with a valved connection to the suction side of the recirculation pump of a pressure diatomaceous earth-(D.E.) type filter system used for coating the filter with D. E. powder or NSF/ANSI Standard 50-2007 and manufacturer approved substitute filter aid.

A "public swimming pool" or "public pool" means a watertight structure of concrete, masonry, or other approved materials which is located either indoors or outdoors, used for bathing or swimming

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, counties, day care centers, group home facilities for eight or more clients, health spas, institutions, parks, state agencies, schools, subdivisions, or the cooperative living-type projects of five or more living units, such as apartments, boarding-houses, hotels, mobile home parks, motels, recreational vehicle parks, and townhouses. The term does not include a swimming pool located on the grounds of a private residence.

“Recirculation system” means the system of piping and mechanics designed to remove the water from the pool then filter, disinfect and return it to the pool.

“Slip resistant” means having a textured surface which is not conducive to slipping under contact of bare feet unlike glazed tile or masonry terrazzo and nontextured plastic materials. Manufactured surface products shall be designated by the manufacturer as suitable for walking surfaces in wet areas.

“Spa pool” means a pool used in conjunction with high-velocity air or water.

“Special purpose pool” means a public pool used exclusively for a specific, supervised purpose, including springboard or platform diving training, SCUBA diving instruction, and aquatic programs for persons with disabilities, preschool or kindergarten children.

“Swimming pool slide” is a slide designed by its manufacturer to discharge over the sidewall of a swimming pool.

“Swim spa” is a pool used in conjunction with a directional flow of water against which one swims.

“Wading pool” means a shallow pool designed to be used by children.

“Water recreation attraction” means a facility with design and operational features that provide patron recreational activity and purposefully involves immersion of the body partially or totally in the water. Water recreation attractions include water slides, river rides, water course rides, water activity pools, interactive water features, wave pools and any additional pool within the boundaries of the attraction.

“Water activity pool” means a water recreation attraction which has water-related activities such as

rope ladders, rope swings, cargo nets and other similar activities.

“Water slides” means a water recreation attraction ride which is characterized by having trough-like or tubular flumes or chutes.

“Water theme park” means a complex with controlled access, a fenced and gated attraction where guests enter through a limited number of entrances upon purchase of a ticket. These facilities are permanent and consist of multiple water recreation attractions. Lifeguards are present during all operating hours.

“Water therapy facilities,” as that term is used in Section 514.0115, Item 1, *Florida Statutes*, are pools used exclusively for water therapy to treat a diagnosed injury, illness or medical condition, wherein the therapy is provided under the direct supervision of a Florida licensed physical therapist, occupational therapist or athletic trainer; pursuant to prescription by a physician or a physician's assistant (PA) licensed pursuant to Chapters 458 or 459, *Florida Statutes*, a podiatrist licensed pursuant to Chapter 461, *Florida Statutes*, or an advanced registered nurse practitioner (ARNP) licensed pursuant to Chapter 464, *Florida Statutes*; and the prescribing physician, PA, podiatrist or ARNP authorizes a plan of treatment justifying use of the pool for health care purposes.

“Wade pool” means a water recreation attraction ride which is characterized by having trough-like or tubular flumes or chutes.

“Wave pool” means a water recreation attraction that is characterized by wave action.

“Wet deck area” means the 4-foot-wide (1219 mm) unobstructed pool deck area around the outside of the pool water perimeter, curb, ladders, handrails, diving boards, diving towers, or pool slides, waterfalls, water features, starting blocks, planters or life-guard chairs.

“Zero depth entry pool” means a pool where the pool floor continues to slope upward to a point where it meets the surface of the water and the pool deck.

454.1.1.1 Sizing. The bathing load for conventional swimming pools, wading pools, interactive water features, water activity pools less than 24 inches (610 mm) deep and special purpose pools shall be computed on the basis of one person per 5 gpm (.32 L/s) of recirculation flow. The bathing load for spa-type pools shall be based on one person per each 10 square feet (0.9 m²) of surface area. The filtration system for swimming pools shall be capable of meeting all other requirements of these rules while providing a flow rate of at least 1 gpm (0.06 L/s) for each living unit at transient facilities and $\frac{3}{4}$ gpm (0.04 L/s) at nontransient facilities. Recre-

ational vehicle sites, campsites and boat slips designated for live-aboards shall be considered a transient living unit. For properties with multiple pools, this requirement includes the cumulative total gpm of all swimming pools, excluding spas, wading pools and interactive water features. All other types of projects shall be sized according to the anticipated bathing load and proposed uses. For the purpose of determining minimum pool size only, the pool turnover period used cannot be less than 3 hours.

454.1.2 Swimming pool construction standards.

454.1.2.1 Pool structure. Pools shall be constructed of concrete or other impervious and structurally rigid material. All pools shall be watertight, free from structural cracks and shall have a nontoxic smooth and slip-resistant finish. All materials shall be installed in accordance with manufacturer's specifications unless such specifications violate Chapter 64E-9, *Florida Administrative Code*, rule requirements or the approval criteria of NSF/ANSI Standard 50 or NSF/ANSI Standard 60.

- (a) Floors and walls shall be white or pastel in color and shall have the characteristics of reflecting rather than absorbing light. Tile used in less than 5 feet (1524 mm) of water must be slip resistant. A minimum 4-inch (102 mm) tile line, each tile a minimum size of 1 inch (25 mm) on all sides, shall be installed at the water line, but shall not exceed 12 inches (305 mm) in height if a dark color is used. Gutter type pools may substitute 2-inch (51 mm) tile, each a minimum size of 1 inch (25 mm) on all sides, along the pool wall edge of the gutter lip.
- (b) One-inch (25 mm) square tile may be used if the manufacturer has specified the adhesive for use underwater to adhere the type of tile used [vitreous (glass) or ceramic]. Tiles shall not have sharp edges exposed that could cause bather injury.

454.1.2.2 Dimensions.

454.1.2.2.1 Dimensional standards. Dimensional standards for competition type pools shall be those published by the National Collegiate Athletic Association, 1990; Federation Internationale de Natation Amateur (FINA), 1998–2000 Handbook; 1998–1999 Official Rules of Diving & Code Regulation of United States Diving Inc.; 1998 United States Swimming Rules and Regulations, and National Federation of State High School Associations, 1997–1998, which are incorporated by reference in this code.

454.1.2.2.2 Walls and corners. All pool walls shall have a clearance of 15 feet (4572 mm) perpendicular to the wall (as measured at design water level from gutter lip to gutter lip, or on skimmer pools, from vertical wall to vertical wall). Offset steps spa coves, spa pools and wading pools are exempt from this clearance requirement. Where interior steps protrude into the pool resulting in less than 15 feet (4572

mm) of clearance from any wall, such protrusion shall not exceed 6 feet (1828 mm) on any perpendicular line from a tangent to any pool wall from which the steps emanate. The upper part of pool walls in areas 5 feet (1524 mm) deep or less shall be within 5 degrees (4572 mm) vertical for a minimum depth of 2½ feet (762 mm) from which point the wall may join the floor with a maximum radius equal to the difference between the pool depth and 2½ feet. The upper part of pool walls in areas over 5 feet deep shall be within 5 degrees vertical for a minimum depth equal to the pool water depth minus 2½ feet (762 mm) from which point the wall may join the floor with a maximum radius of 2½ feet (762 mm). Corners shall be a minimum 90-degree angle. The corner intersections of walls which protrude or angle into the pool water area shall be rounded with a minimum radius of 2 inches (51 mm). This radius shall be continued through the top of the gutter edge; chamfering is allowed, pool coping shall not overhang into the pool more than 1½ inches (38 mm).

454.1.2.2.3 Pool floor slope and slope transition. The radius of curvature between the floor and walls is excluded from these requirements. multiple floor levels in pools are prohibited.

454.1.2.2.3.1 Floor slope shall be uniform. The floor slope shall be a maximum 1 unit vertical in 10 units horizontal and a minimum of 1 unit vertical in 60 units horizontal in areas 5 feet (1524 mm) deep or less. The floor slope shall be a maximum 1 unit vertical in 3 units horizontal in areas more than 5 feet (1524 mm) deep.

454.1.2.2.3.2 Any transition in floor slope shall occur at a minimum of 5 feet (1524 mm) of water depth. A slope transition must have a 2 to 6 inch (51 to 152 mm) wide dark contrasting tile marking across the bottom and must extend up both sides of the pool at the transition point. The marking shall be continuous except for recessing grouting. A slope transition must have a safety line mounted by use of recessed cup anchors, 2 feet (610 mm) before the contrasting marking, towards the shallow end. The safety line shall have visible floats at maximum 7-foot (2134 mm) intervals.

454.1.2.2.4 Pool depths. The minimum water depth shall be 3 feet (914 mm) in shallow areas and 4 feet (1219 mm) in deep areas.

454.1.2.3 Markings.

454.1.2.3.1 Depth and markings. Depth and markings shall meet the following criteria.

1. The minimum water depth shall be 3 feet (914 mm) in shallow areas and 4 feet (1219 mm) in deep areas.
2. Permanent depth markings followed by the appropriate full or abbreviated words "FEET," "FT," or "INCHES," "IN," shall be installed

in minimum 4-inch-high (102 mm) numbers and letters on a contrasting background. Depth markers shall indicate the actual pool depth, within 3 inches (76 mm), at normal operating water level when measured 3 feet (914 mm) from the pool wall. Symmetrical pool designs with the deep point at the center may be allowed provided a dual marking system is used which indicates the depth at the wall and at the deep point.

3. At a minimum, the markings shall be located on both sides of the pool at the shallow end, slope break, deep end wall and deep point (if located more than 5 feet (1524 mm) from the deep end wall). Depth markings shall be legible from inside the pool and also from the pool deck. The maximum perimeter distance between depth markings is 25 feet (7620 mm). Pool size and geometry may necessitate additional depth marking placements about all sides of the pool to meet this requirement.
4. When a curb is provided, the depth markings shall be installed on the inside and outside or top of the pool curb. When a pool curb is not provided, the depth markings shall be located on the inside vertical wall at or above the water level and on the edge of the deck within 2 feet (610 mm) of the pool water. When open type gutter designs are utilized, depth markers shall be located on the back of the gutter wall.
5. When deck level perimeter overflow systems are utilized, additional depth marking signs shall be posted nearby or placed on adjacent fencing or walls and the size shall be increased so they are recognizable from inside the swimming pool. Alternatively, tile depth markers may be placed at the top of the pool wall just under the water level. Depth markers placed on the pool deck shall be within 3 feet (914 mm) of the water.
6. Those areas of the pool that are not part of an approved diving bowl shall have dark contrasting tile, 4-inch-high (102 mm) "NO DIVING" markings installed along the perimeter of the pool on the top of the pool curb or deck within 2 feet (610 mm) of the pool water with a maximum perimeter distance of 25 feet (7620 mm) between markings. A 6-inch (152 mm) tile with a 4-inch (102 mm) or larger red, international "NO DIVING" symbol may be substituted for the "NO DIVING" markings.
7. All markings shall be tile, except that pools constructed of fiberglass, thermoplastic or stainless steel may substitute other type markings when it can be shown that said markings are permanent and will not fade over time. This exemption does not extend to concrete pools that are coated with fiberglass. Tile

alternative examples include stone or manufactured plaques with engraved or sandblasted numbers and characters with permanent paint. Permanent appliques may be used for fiberglass, thermoplastics or stainless steel pools. All markings installed on horizontal surfaces shall have a slip-resistant finish. Markings shall be flush with the surrounding area where placed and recessed if necessary to provide a smooth finish that will avoid creation of an injury hazard to bathers. Pools that are not conducive to tile can employ other equivalent markings as stated above.

454.1.2.3.2 Designs or logos. Any design or logo on the pool floor or walls shall be such that it will not hinder the detection of a human in distress, algae, sediment, or other objects in the pool.

454.1.2.3.3 Lane markings. Pools that are not intended to be utilized for officially sanctioned competition may install lap lane markings provided they meet the following criteria: the markings must be 2 to 6 inches (51 to 152 mm) wide, they must terminate 5 feet (1524 mm) from the end wall in a "T" with the "T" bar at least 18 inches (1524 mm) long, they must be placed at 7-foot (2134 mm) intervals on center and be no closer than 4 feet (1219 mm) from any side wall, steps or other obstructions. Floating rope lines associated with lap lanes must not obstruct the entrance or exit from the pool and are prohibited when the pool is open for general use.

454.1.2.3.4 Targets. Pools that are not intended for officially sanctioned competition may have a 2 to 6 inch (51 to 152 mm) wide 18-inch by 18-inch (457 mm by 457 mm) targets (+) installed on the pool wall.

454.1.2.3.5 Rules and regulations signage. Rules and regulations for bathers shall be installed in minimum 1-inch (25.4 mm) letters which must be legible from the pool deck, and shall contain the following:

1. No food or beverages in pool or on pool wet deck.
2. No glass or animals in the fenced pool area (or 50 feet (15 240 mm) from unfenced pool).
3. Bathing load: ____ persons.
4. Pool hours: ____ a.m. to ____ p.m.
5. Shower before entering.
6. Pools of 200 square feet (18.58 m²) in area or greater without an approved diving well configuration shall have "NO DIVING", in 4-inch (102 mm) letters included with the above listed pool rules.
7. Do not swallow the pool water. This statement shall be added to signs at pools that conduct modifications as that term is defined.

454.1.2.4 Color. Pool floors and walls shall be white or light pastel in color and shall have the characteristic of reflecting rather than absorbing light.

Exception: A dark color may be used if (1) a tile line [minimum 4 inches (102 mm), maximum 12 inches (305 mm)] is installed at the water line or (2) if 2-inch (51 mm) tile is installed along the pool wall edge of the gutter lip for gutter type pools.

454.1.2.5 Access. All pools shall have a means of access every 75 feet (22 860 mm) of pool perimeter with a minimum of two, located so as to serve both ends of the pool. In addition, an access point shall be provided at the deep portion, if the deep portion is not at one end of the pool. When the deep portion of the pool is over 30 feet (9144 mm) wide, both sides of this area shall have a means of access. Access shall consist of ladders, stairs, recessed treads or swimouts and may be used in combination. All treads shall have a slip-resistant surface.

454.1.2.5.1 Ladders. Ladders shall be of the cross-braced type and shall be constructed of corrosion-resistant materials and be securely anchored into the pool deck. Clearance between the ladder and pool wall shall be between 3 to 6 inches (76 mm to 152 mm). Ladders shall extend at least 28 inches (711 mm) and no more than 40 inches (1016 mm) above the pool deck. Ladder bottom braces shall have intact end caps or bumpers that rest firmly against the pool wall. The top rung of the ladder shall be at or below the water level on open gutter pools and not more than 12 inches (305 mm) below the deck or curb top on all other type pools.

454.1.2.5.2 Recessed treads. Recessed treads shall be installed flush with the wall and shall be a minimum 5 inches (127 mm) wide, 10 inches (254 mm) long, with a maximum vertical distance of 12 inches (305 mm) between treads.

454.1.2.5.3 Stairs. Stairs shall have a minimum tread width of 10 inches (254 mm) and a maximum width of 48 inches (1219 mm) for a minimum tread length of 24 inches (610 mm) and a maximum riser height of 10 inches (254 mm). Treads and risers between the top and bottom treads shall be uniform to within $\frac{1}{2}$ inch (12.7 mm) in width and height. The riser heights shall be measured at the marked step edges and the differences in elevation shall be considered the riser heights. The front $\frac{3}{4}$ to 2 inches (19.1 to 51 mm) of the tread and the top 2 inches (51 mm) of the riser shall be tile, dark in color, contrasting with the interior of the pool. Tile shall be slip resistant. Bullnose tile that is slip resistant may be used when the $\frac{3}{4}$ -inch (19 mm) segment is placed on the tread or horizontal surface and the 2-inch (51 mm) segment is placed on the riser or vertical surface. Where the gutter is used as the top step, the tile on the gutter for the width of the steps shall be slip resistant. Vinyl liner and fiberglass pools may use other material for the step edge marking, provided

the material is permanent, permanently secured, dark in color, nonfading and slip resistant.

454.1.2.5.4 Swimouts. Swimouts shall extend 18 to 24 inches (457 mm to 610 mm) back from the pool wall, shall be 4 to 5 feet (1219 mm to 1524 mm) wide, shall be a maximum of 12 inches (305 mm) below the deck, unless stairs are provided in the swimout, and shall be located only in areas of the pool greater than 5 feet (1524 mm) deep. Pools that do not utilize a continuous perimeter overflow system must provide a wall return inlet in the swimout for circulation. A permanent dark contrasting colored band of tile shall be installed at the intersection of the pool wall and the swimout and must extend 2 inches (51 mm) on the horizontal and vertical surfaces. Tile must be slip resistant. Bullnose tile may be substituted and installed in accordance with Section 454.1.2.5.3.

454.1.2.5.5 Handrails and grabrails. Handrails shall be provided for all stairs, shall be anchored in the bottom step and the deck. Where "figure 4" deck-mounted-type handrails are used, they shall be anchored in the deck and extend laterally to any point vertically above the bottom step. Grabrails must be mounted in the pool deck at each side of recessed steps. Handrails and grabrails shall extend between 28 and 40 inches (711 mm and 1016 mm) above the step edge and deck.

454.1.2.5.6 Disabled access. Permanent or portable steps, ramps, handrails, lifts or other devices designed to accommodate handicapped individuals in swimming pools may be provided. Lifts mounted into the pool deck shall have a minimum 4-foot-wide (1219 mm) deck behind the lift mount.

454.1.2.6 Obstructions. The pool water area shall be unobstructed by any type structure unless justified by engineering design as a part of the recirculation system. Engineering design and material specifications shall show that such structures will not endanger the pool patron, can be maintained in a sanitary condition and will not create a problem for sanitary maintenance of any part of the pool, pool water, or pool facilities. Structures in accord with the above shall not be located in a diving bowl area or within 15 feet (4572 mm) of any pool wall.

Exceptions:

1. Stairs, ladders and ramps, necessary for entrance/exit from the pool are not considered obstructions.
2. Underwater seat benches may be installed in areas less than 5 feet (1524 mm) deep. Bench seats must be 14 to 18 inches (356 to 457 mm) wide and must have a dark contrasting tile marking on the seat edge extending two inches (51 mm) on the horizontal and vertical surface. Tile shall be slip resistant. Bullnose tile may be substituted and installed in accordance with Section 454.1.2.5.3. Vinyl liner, stainless

steel and fiberglass pools may use other material for the bench edge marking as detailed in Section 454.1.2.3.1, Item 7, provided the material is permanently secured, dark in color, nonfading and slip resistant. Benches shall not protrude into the 15-foot (4572 mm) clearance requirement of Section 454.1.2.6.

454.1.2.7 Diving areas. Diving facilities shall meet the minimum requirements of the FINA dimensions for diving facilities in accordance with the 2005-2009 FINA Handbook and include the following:

1. Diving boards or platforms with heights of less than the established standard shall meet the dimensional requirements of the next greater height.
2. Diving boards, platforms and ladders shall have a nonabsorbent, slip-resistant finish and be of sufficient strength to safely carry the anticipated loads. Diving equipment one meter and greater shall have guard rails which extend to the edge of the pool wall. All diving boards over 21 inches (533 mm) from the deck shall be provided with a ladder. Diving boards or platforms shall not be installed on curved walls where the wall enters into the defined rectangular diving area specified in this section. Adjacent platform and diving boards shall be parallel.
3. The location of pool ladders shall be such that the distance from the ladder to any point on a diving board or platform centerline is not less than the plummet to side wall dimension (b) indicated in the FINA standards. Trampoline-type diving facilities are prohibited.
4. Diving targets may be installed in accordance with FINA standards.

454.1.3 Pool appurtenances.

454.1.3.1 Decks and walkways.

454.1.3.1.1 Pool wet decks shall be constructed of concrete or other nonabsorbent material having a smooth slip-resistant finish. Wet deck area finishes shall be designed for such use and shall be installed in accordance with the manufacturer's specifications. Wooden decks and walkways are prohibited.

454.1.3.1.2 Pool wet decks shall be uniformly sloped at a minimum of 2 percent to a maximum of 4 percent away from the pool or to deck drains to prevent standing water. Textured deck finishes that provide pitting and crevices of more than $\frac{3}{16}$ inch (4.8 mm) deep that accumulate soil are prohibited. If settling or weathering occurs that would cause standing water, the original slopes shall be restored or corrective drains installed. When a curb is provided, the deck shall not be more than 10 inches (254 mm) below the top of the curb.

454.1.3.1.3 Pool wet decks shall have a minimum unobstructed width of 4 feet (1219 mm) around the

perimeter of the pool, pool curb, ladders, handrails, diving boards, diving towers and slides.

454.1.3.1.4 Traffic barriers shall be provided as needed so that parked vehicles do not extend over the deck area.

454.1.3.1.5 Walkways shall be provided between the pool and the sanitary facilities, and shall be constructed of concrete or other nonabsorbent material having a smooth slip-resistant finish for the first 15 feet (4572 mm) of the walkway measured from the nearest pool water's edge. A hose bibb with a vacuum breaker shall be provided to allow the deck to be washed down with potable water.

454.1.3.1.6 Twenty percent of the deck along the pool perimeter may be obstructed as long as any one obstruction does not exceed ten percent or ten feet (3048 mm), whichever is less, in any one area. Obstructions shall have a wet deck area behind or through them, with the near edge of the walk within 15 feet (4572 mm) of the water except approved slide obstructions shall have the near edge of the walk within 35 feet (10 668 mm) of the water. These obstructions must be protected by a barrier or must be designed to discourage patron access. Obstructions shall not include pool exit points. When an obstruction exists in multiple areas around the pool, the minimum distance between obstructions shall be 4 feet (1219 mm).

454.1.3.1.7 Food or drink service facilities shall not be located within 12 feet (3658 mm) of the water's edge.

454.1.3.1.8 The vertical clearance above the pool deck shall be at least 7 feet (2137 mm).

454.1.3.1.9 All public pools shall be surrounded by a minimum 48 inch (1219 mm) high fence or other approved substantial barrier. The fence shall be continuous around the perimeter of the pool area that is not otherwise blocked or obstructed by adjacent buildings or structures and shall adjoin with itself or abut to the adjacent members. Access through the barrier or fence from dwelling units, such as homes, apartments, motel rooms and hotel rooms, shall be through self-closing, self-latching lockable gates of 48 inch (1219 mm) minimal height from the floor or ground with the latch located a minimum of 54 inches (1372 mm) from the bottom of the gate or at least 3 inches (76 mm) below the top of the gate on the pool side. If the self-closing, self-latching gate is also self-locking and is operated by a key lock, electronic opener or integral combination lock, then the operable parts of such locks or openers shall be 34 inches minimum (864 mm) and 48 inches maximum (1219 mm) above the finished floor or ground. Doored access points from public rooms such as lobbies or club houses need not be through gates if the door(s) meet the same self-closing, self-latching requirements as a gate. Gates shall open outward away from the pool area. A latched, lockable gate

shall be placed in the fence within ten feet (3048 mm) of the closest point between the pool and the equipment area for service access.

Instead of a fence, permanent natural or man-made features such as bulkheads, canals, lakes, navigable waterways, etc., adjacent to a pool may be permitted as a barrier when approved. When evaluating such barrier features, the applicable governing body may perform on-site inspections, and review evidence, such as surveys, aerial photographs, water management agency standards and specifications, and any other similar documentation to verify at minimum, the following: the barrier feature is not subject to natural changes, deviations or alterations and is capable of providing an equivalent level of protection as that provided by a structure, and the barrier feature clearly impedes, prohibits or restricts access to the pool.

Screened pool enclosures must be hardened on the bottom 3 feet (914 mm). Fencing consideration shall be given to the U.S. Consumer Product Safety Commission (CPSC) Publication, No. 362, March 2005, guidelines available from CPSC.gov; or Sections 454.2.17.1.1 through 454.2.17.1.8. Safety covers that comply with ASTM F 1346-91 (Reapproved 2003), titled *Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs*, and available from ASTM.org, do not satisfy this requirement.

454.1.3.2 Bridges and overhead obstructions or river rides. Bridges and overhead obstructions over the pool shall be designed so they will not introduce any contamination to the pool water. The minimum height of the bridge or obstruction shall be at least 4 feet (1219 mm) above the surface of the pool in all cases except when the pool is a river ride where it shall be at least 5 feet above the surface of the pool. Minimum 42-inch-high (1067 mm) handrails shall be provided along each side of the bridge. The walking surfaces shall be constructed of concrete or other nonabsorbent material having a smooth slip-resistant finish. Pool coping shall not overhang into the pool more than 1 1/2 inches (38 mm).

454.1.3.3 Safety.

454.1.3.3.1 All swimming pools shall be installed with a shepherd's hook securely attached to a one piece pole not less than 16 feet (4877 mm) in length, and at least one 18-inch (5486 mm) diameter life-saving ring with sufficient rope attached to reach all parts of the pool from the pool deck. Safety equipment shall be mounted in a conspicuous place and be readily available for use. Pools greater than 50 feet (15 240 mm) in length shall have multiple units with at least one shepherd's hook and one lifesaving ring located along each of the longer sides of the pools. Spa pools under 200 square feet (18. 58 m²) of surface area, and interactive water features or wad-

ing pools with 2 feet (610 mm) or less of water depth are exempt from this requirement.

454.1.3.3.2 All pools with a slope transition shall have safety line anchors as required by Section 454.1.2.2.3.2.

454.1.3.3.3 If a pool cover or solar blanket is installed, it shall be secured around the entire perimeter and is designed to support a live load of an adult person, OR the pool area shall be inaccessible to unauthorized individuals during times of cover or blanket use.

454.1.3.3.4 A room or space shall be provided for chemicals to be stored in a cool, dry, and well-ventilated area under a roof and the area shall be inaccessible to the public.

454.1.3.3.5 Swimming pool slides shall be installed in accordance with manufacturer's specifications and sound engineering practice. Pools with slides designed for swimming pools are not required to satisfy those of slide plunge pools in Section 454.1.9.2.1.

454.1.3.3.6 Floating and climb-on devices, objects or toys that are not a part of the approved pool design shall not be tethered in the pool or installed without engineering modification application and department's approval.

454.1.4 Electrical systems.

454.1.4.1 Electrical equipment and wiring. Electrical equipment wiring and installation, including the grounding of pool components shall conform with Chapter 27 of this code.

454.1.4.2 Lighting. Artificial lighting shall be provided at all swimming pools which are to be used at night or which do not have adequate natural lighting so that all portions of the pool, including the bottom, may be readily seen without glare.

454.1.4.2.1 Outdoor pool lighting. Lighting shall provide a minimum of 3 footcandles (30 lux) of illumination at the pool water surface and the pool wet deck surface. Underwater lighting shall be a minimum of 1/2 watt per square foot of pool water surface area.

454.1.4.2.2 Indoor pool lighting. Lighting shall provide a minimum of 10 foot candles (100 lux) of illumination at the pool water surface and the pool wet deck surface. Underwater lighting shall be a minimum of 1/10 watt per square foot of pool surface area.

454.1.4.2.3 Underwater lighting. Underwater lighting shall utilize transformers and low-voltage circuits with each underwater light being grounded. The maximum voltage for each light shall be 15 volts and the maximum incandescent lamp size shall be 300 watts. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18

inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter. All underwater lights which depend upon submersion for safe operation shall have protection from overheating when not submerged. Underwater lighting requirements can be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface. Alternative lighting systems which use 15 volts or less, or use no electricity in the pool or on the pool deck, such as LED (light emitting diode) fiber-optic systems, may be utilized if the manufactures specifications provide for the equivalency in watt output.

454.1.4.2.4 Overhead wiring. Overhead service wiring shall not pass within an area extending a distance of 10 feet (3048 mm) horizontally away from the inside edge of the pool walls, diving structures, observation stands, towers or platforms. Allowances for overhead conductor clearances to pools that meet the safety standards in the *National Electrical Code* may be used instead. Electrical equipment wiring and installation, including the grounding of pool components, shall comply with Chapter 27 of this code.

454.1.5 Equipment area or rooms.

454.1.5.1 Equipment. Equipment designated by the manufacturer for outdoor use may be located in an equipment area, all other equipment must be located in an equipment room or enclosure. Plastic pipe subject to a period of prolonged sunlight exposure must be coated to protect it from ultraviolet light degradation. An equipment area shall be surrounded with a fence at least 4 feet (1219 mm) high on all sides not confined by a building or equivalent structure. A self-closing and self-latching gate with a permanent locking device shall be provided if necessary for access. An equipment room shall be protected on at least three sides and overhead. Any fence or gate installed shall use members spacing that shall not allow passage of a 4-inch (102 mm) diameter sphere. The fourth side may be a gate, fence, or open if otherwise protected from unauthorized entrance. An equipment enclosure shall be lockable or otherwise protected from unauthorized access.

454.1.5.2 Indoor equipment. Equipment not designated by the manufacturer for outdoor use shall be located in an equipment room. An equipment room shall be protected on at least three sides and overhead. The fourth side may be a gate, fence or open if otherwise protected from unauthorized entrance.

454.1.5.3 Materials. The equipment enclosure, area or room floor shall be of concrete or other nonabsorbent material having a smooth slip-resistant finish and shall have positive drainage, including a sump pump if necessary. Ancillary equipment, such as a heater, not contained in an equipment enclosure or room shall necessitate an equipment area as described above.

454.1.5.4 Ventilation. Equipment rooms shall have either forced draft or cross ventilation. All below-grade equipment rooms shall have a stairway access with forced draft ventilation or a fully louvered door and powered intake within 6 inches (152 mm) of the floor. Where stairway access is not necessary to carry heavy items into the below grade room or vault, a "ship's ladder" may be used if specified by the design engineer who must consider anticipated workload including equipment removal; and the ladder slope, tread height and width; and construction material of the ladder.

454.1.5.5 Access. The opening to an equipment room or area shall be a minimum 3 feet by 6 feet (914 mm by 1829 mm) and shall provide easy access to the equipment.

454.1.5.6 Size. The size of the equipment enclosure, room or area shall provide working space to perform routine operations. Clearance shall be provided for all equipment as prescribed by the manufacturer to allow normal maintenance operation and removal without disturbing other piping or equipment. In rooms with fixed ceilings, the minimum height shall be 7 feet (2137 mm).

454.1.5.7 Lighting. Equipment rooms or areas shall be lighted to provide 30 footcandles (300 lux) of illumination at floor level.

454.1.5.8 Storage. Equipment enclosures, rooms or areas shall not be used for storage of chemicals emitting corrosive fumes or for storage of other items to the extent that entrance to the room for inspection or operation of the equipment is impaired.

454.1.5.9 Hose bibbs. A hose bibb with vacuum breaker shall be located in the equipment room or area.

454.1.6 Plumbing systems.

454.1.6.1 Sanitary facilities. Swimming pools with a bathing load of 20 persons or less may utilize a unisex restroom. Pools with bathing loads of 40 persons or less may utilize two unisex restrooms or meet the requirements of Table 454.1.6.1. Unisex restrooms shall meet all the requirements for materials, drainage and signage as indicated in Sections 454.1.6.1.1 through 454.1.6.1.4. Each shall include a water closet, a diaper change table, a urinal and a lavatory. Pools with a bathing load larger than 40 persons shall provide separate sanitary facilities labeled for each sex. The entry doors of all restrooms shall be located within a 200-foot (60 960 mm) walking distance of the nearest water's edge of each pool served by the facilities.

Exception: Where a swimming pool serves only a designated group of residential dwelling units and not the general public, poolside sanitary facilities are not required if all living units are within a 200-foot (60 960 mm) horizontal radius of the nearest water's edge, are not over three stories in height unless serviced by an elevator, and are each equipped with private sanitary facilities.

454.1.6.1.1 Required fixtures. Fixtures shall be provided as indicated in Table 454.1.6.1. The fixture count in this chart is deemed to be adequate for the pool and pool deck area that is up to three times the area of the pool surface provided. When multiple fixture sets are required and separate facilities are provided for each sex, the fixtures used in ancillary family-style restrooms can be used to meet the requirements of this section.

One diaper changing table shall be provided at each restroom. Diaper changing tables are not required at restrooms where all pools served are restricted to adult use only. Swim diapers are recommended for use by children that are not toilet trained. Persons that are ill with diarrhea cannot enter the pool.

Exception: When a public swimming pool meets all of the following conditions, the following shall apply:

1. The pool serves only a designated group of dwelling units,
2. The pool is not for the use of the general public, and
3. A building provides sanitary facilities.

The fixture requirement for the building shall be determined and if it exceeds the requirement in Table 454.1.6.1, then the building requirement shall regulate the fixture count, otherwise the fixture count shall be based on the requirement for the pool. Under no circumstances shall the fixture counts be cumulative.

**TABLE 454.1.6.1
PUBLIC SWIMMING POOL—REQUIRED FIXTURE COUNT**

SIZE OF POOL (square feet)	MEN'S RESTROOM			WOMEN'S RESTROOM	
	Urinals	WC	Lavatory	WC	Lavatory
0 – 2,500	1	1	1	1	1
2,501 – 5,000	2	1	1	5	1
5,001 – 7,500	2	2	2	6	2
7,501 – 10,000	3	2	3	8	3

For SI: 1 square foot = 0.0929 m².

An additional set of fixtures shall be provided in the men's restroom for every 7,500 square feet (697 m²) or major fraction thereof for pools greater than 10,000 square feet (929 m²).

Women's restrooms shall have a ratio of three to two water closets provided for women as the combined total of water closets and urinals provided for men.

Lavatory counts shall be equal.

454.1.6.1.2 Outside access. Outside access to facilities shall be provided for bathers at outdoor pools. Where the restrooms are located within an adjacent building and the restroom doors do not open to the outside, the restroom doors shall be within 50 feet (15 240 mm) of the building's exterior door. If the

restrooms are not visible from any portion of the pool deck, signs shall be posted showing directions to the facilities. Directions shall be legible from any portion of the pool deck; letters shall be a minimum of 1 inch (25 mm) high.

454.1.6.1.3 Sanitary facility floors. Floors of sanitary facilities shall be constructed of concrete or other nonabsorbent materials, shall have a smooth, slip-resistant finish, and shall slope to floor drains. Carpets, duckboards and footbaths are prohibited. The intersection between the floor and walls shall be coved where either floor or wall is not made of waterproof materials such as tile or vinyl.

454.1.6.1.4 Hose bibb. A hose bibb with vacuum breaker shall be provided in or within 25 feet (7620 mm) of each restroom to allow for ease of cleaning.

454.1.6.2 Rinse shower. A minimum of one rinse shower shall be provided on the pool deck of all outdoor pools within the perimeter of the fence.

454.1.6.3 Cross-connection prevention. An atmospheric break or approved back flow prevention device shall be provided in each pool water supply line that is connected to a public water supply. Vacuum breakers shall be installed on all hose bibbs.

454.1.6.4 Plastic pipes. Plastic pipe subject to a period of prolonged sunlight exposure shall be coated to protect it from ultraviolet light degradation.

454.1.6.5 Recirculation and treatment systems.

454.1.6.5.1 Equipment testing. Recirculation and treatment equipment such as filters, recessed automatic surface skimmers, ionizers, ozone generators, disinfection feeders and chlorine generators shall be tested and approved using the NSF/ANSI Standard 50, *Circulation System Components and Related Materials for Swimming Pool, Spas/Hot Tubs*, dated April 2007, which is incorporated by reference.

454.1.6.5.2 Volume. The recirculation system shall be designed to provide a minimum of four turnovers of the pool volume per day. Pools that are less than 1,000 square feet (93 m²) at health clubs shall be required to provide eight turnovers per day.

454.1.6.5.3 System design. The design pattern of recirculation flow shall be 100 percent through the main drain piping and 100 percent through the perimeter overflow system or 60 percent through the skimmer system.

454.1.6.5.3.1 Perimeter overflow gutters. The lip of the gutter shall be uniformly level with a maximum tolerance of $\frac{1}{4}$ inch (6 mm) between the high and low areas. The bottom of the gutter shall be level or slope to the drains. The spacing between drains shall not exceed 10 feet (3048 mm) for 2-inch (51 mm) drains or 15 feet (4572 mm) for 2½-inch (64 mm) drains, unless hydraulically justified by the design engineer. Gutters may be eliminated along pool edges for no more than 15 feet (4572 mm) and this shall not exceed

10 percent of the perimeter (at least 90 percent of the perimeter shall be guttered). In areas where gutters are eliminated, handholds shall be provided within 9 inches (229 mm) of the water surface. Handhold design shall be approved by the jurisdictional building department prior to construction.

454.1.6.5.3.1.1 Either recessed-type or open-type gutters shall be used. Special designs can be approved provided they are within limits of sound engineering practice. Recessed-type gutters shall be at least 4 inches (102 mm) deep and 4 inches (102 mm) wide. No part of the recessed gutter shall be visible from a position directly above the gutter sighting vertically down the edge of the deck or curb. Open-type gutters shall be at least 6 inches (150 mm) deep and 12 inches (305 mm) wide. The gutter shall slope 2 inches (51 mm), $\pm 1/4$ inch (± 6 mm), from the lip to the drains. The gutter drains shall be located at the deepest part of the gutter.

454.1.6.5.3.1.2 All gutter systems shall discharge into a collector tank.

454.1.6.5.3.1.3 The gutter lip shall be tiled with a minimum of 2-inch (51 mm) tile on the pool wall, each a minimum size of 1 inch (25 mm) on all sides. The back vertical wall of the gutter shall be tiled with glazed tile.

Exception: Stainless steel gutter systems when it can be shown that the surfaces at the waterline and back of the gutter are easily cleanable.

454.1.6.5.3.2 Recessed automatic surface skimmers. Recessed automatic surface skimmers may be utilized when the pool water surface area is 1,000 square feet (93 m²) or less excluding offset stairs and swimouts and the width of the pool is not over 20 feet (6096 mm).

454.1.6.5.3.2.1 Volume. The recessed automatic surface skimmer piping system shall be designed to carry 60 percent of the pool total design flow rate with each skimmer carrying a minimum 30 gpm (2 L/s). One skimmer for every 400 square feet (37 m²) or fraction thereof of pool water surface area shall be provided.

454.1.6.5.3.2.2 Location. Prevailing wind direction and the pool outline shall be considered by the designer in the selection of skimmer locations. The location of skimmers shall be such that the interference of adjacent inlets and skimmers is minimized. Recessed automatic surface skimmers shall be installed so that there is no protrusion into the pool water area. The deck or curb shall provide for a handhold around the entire pool perimeter and shall not be located more than 9 inches (229

mm) above the midpoint of the opening of the skimmer.

454.1.6.5.3.2.3 Equalizers. Recessed automatic surface skimmers shall be installed with an equalizer valve and an equalizer line when the skimmer piping system is connected directly to pump suction. If installed, the equalizer valve shall be a spring-loaded vertical check valve which will not allow direct suction on the equalizer line. Float valves are prohibited. The equalizer line inlet shall be installed at least 1 foot (305 mm) below the normal pool water level and the equalizer line inlet shall be protected by an ASME/ANSI A112.19.8 compliant cover/grate. The equalizer line shall be sized to handle the expected flow with a 2-inch (51 mm) minimum line size.

454.1.6.5.3.2.4 Wall-inlet fitting. A wall-inlet fitting shall be provided directly across from each skimmer.

454.1.6.5.3.2.5 Waterline tile. A minimum 6-inch (152 mm) water line tile shall be provided on all pools with automatic skimmer systems, each a minimum size of 1 inch (25 mm) on all sides. Glazed tile that is smooth and easily cleanable shall be utilized.

454.1.6.5.4 Pumps. If the pump or suction piping is located above the water level of the pool, the pump shall be self-priming. Pumps that take suction prior to filtration shall be equipped with a hair and lint strainer. The recirculation pump shall be selected to provide the required recirculation flow against a minimum total dynamic head of 60 feet (18 288 mm) unless hydraulically justified by the design engineer. Vacuum D.E. filter system pumps shall provide at least 50 feet (15 240 mm) of total dynamic head. Should the total dynamic head required not be appropriate for a given project, the design engineer shall provide an alternative.

454.1.6.5.5 Filters. Filters sized to handle the required recirculation flow shall be provided.

454.1.6.5.5.1 Filter capacities. The maximum filtration rate in gallons per minute per square foot of filter area shall be: 15 [20 if so approved using the procedure stated in Section 454.1.6.5.1 for high rate sand filters, 3 for rapid sand filters, 0.375 for pleated cartridge filters and 2 for D.E.-type filters].

454.1.6.5.5.2 Filter appurtenances.

454.1.6.5.5.2.1 Pressure filter systems. Pressure filter systems shall be equipped with an air relief valve, influent and effluent pressure gauges with minimum face size of 2 inches (51 mm) reading 0–60 psi (0–414 kPa), and a sight glass when a backwash line is required.

454.1.6.5.5.2.2 Vacuum filter systems. Vacuum filter systems shall be equipped with a vacuum gauge which has a 2-inch (51 mm) face and reads from 0 to 30 inches of mercury.

454.1.6.5.5.2.3 D.E. systems. A precoat pot or collector tank shall be provided for D.E.-type systems.

454.1.6.5.5.3 Filter tanks and elements. The filter area shall be determined on the basis of effective filtering surfaces with no allowance given for areas of impaired filtration, such as broad supports, folds, or portions which may bridge. D.E.-type filter elements shall have a minimum 1-inch (25 mm) clear spacing between elements up to a 4 square foot (0.4 m²) effective area. The spacing between filter elements shall increase $\frac{1}{8}$ inch (3 mm) for each additional square foot of filter area or fraction thereof above an effective filter area of 4 square feet (0.4 m²). All cartridges used in public pool filters shall be permanently marked with the manufacturer's name, pore size and area in square feet of filter material. All cartridges with end caps shall have the permanent markings on one end cap. Vacuum filter tanks shall have covered intersections between the wall and the floor and the tank floor shall slope to the filter tank drain. The D.E.-type filter tank and elements shall be installed such that the recirculation flow draw down does not expose the elements to the atmosphere whenever only the main drain valve is open or only the surface overflow gutter system valve is open.

454.1.6.5.6 Piping. All plastic pipe used in the recirculation system shall be imprinted with the manufacturer's name and the NSF-pw logo for potable water applications. Size, schedule and type of pipe shall be included on the drawings. Plastic pipe subject to a period of prolonged sunlight exposure shall be coated to protect it from ultraviolet light degradation.

454.1.6.5.7 Valves. Return lines, main drain lines, and surface overflow system lines, shall each have proportioning valves.

454.1.6.5.8 Flow velocity. Pressure piping shall not exceed 10 feet per second (2038 mm/s), except that precoat lines with higher velocities may be used when necessary for agitation purposes. The flow velocity in suction piping shall not exceed 6 feet per second (1829 mm/s) except that flow velocities up to 10 feet per second (3048 mm/s) in filter assembly headers will be acceptable. Main drain systems and surface overflow systems which discharge to collector tanks shall be sized with a maximum flow velocity of 3 feet per second (914 mm/s). The filter and vacuuming system shall have the necessary valves and piping to allow filtering to pool, vacuuming to waste, vacuuming to filter, complete drainage of the filter tank, backwashing for sand and pressure D.E.-

type filters and precoat recirculation for D.E.-type filters.

454.1.6.5.9 Inlets. All inlets shall be adjustable with wall-type inlets being directionally adjustable and floor-type inlets having a means of flow adjustment. Floor inlets shall be designed and installed such that they do not protrude above the pool floor and all inlets shall be designed and installed so as not to constitute sharp edges or protrusions hazardous to pool bathers. Floor inlets, for vinyl liner and fiberglass pools, shall be smooth with no sharp edges, and shall not extend more than $\frac{3}{8}$ inches (9.5 mm) above the pool floor. Wall inlets shall be installed a minimum of 12 inches (305 mm) below the normal operating water level unless precluded by the pool depth or intended for a specific acceptable purpose.

454.1.6.5.9.1 Pools 30 feet (9144 mm) in width or less, with wall inlets only, shall have enough inlets such that the inlet spacing does not exceed 20 feet (6096 mm) based on the pool water perimeter.

454.1.6.5.9.2 Pools 30 feet (9144 mm) in width or less, with floor inlets only, shall have a number of inlets provided such that the spacing between adjacent inlets does not exceed 20 feet (6096 mm) and the spacing between inlets and adjacent walls does not exceed 10 feet (3048 mm).

454.1.6.5.9.3 A combination of wall and floor inlets may be used in pools 30 feet (9144 mm) in width or less only if requirements of Section 454.1.6.5.9.1 or 454.1.6.5.9.2 are fully met.

454.1.6.5.9.4 Pools greater than 30 feet (9144 mm) in width shall have either floor inlets only, or a combination of floor inlets and wall inlets. Pools with floor inlets only shall have a number of floor inlets provided such that the spacing between adjacent inlets does not exceed 20 feet (6096 mm) and the spacing between inlets and an adjacent wall does not exceed 10 feet (3048 mm).

454.1.6.5.9.5 Pools greater than 30 feet (9144 mm) in width with a combination of wall and floor inlets shall have the number of wall inlets such that the maximum spacing between the wall inlets is 20 feet (6096 mm) and floor inlets are provided for the pool water area beyond a 15-foot (4572 mm) perpendicular distance from all walls. The number of floor inlets shall be such that the spacing between adjacent inlets does not exceed 20 feet (6096 mm) and the distance from a floor inlet and an adjacent wall does not exceed 25 feet (7620 mm). Floor inlets shall be designed and installed such that they do not protrude more than $\frac{5}{8}$ inch (16 mm) above the pool floor and all inlets shall be designed and installed so as not to constitute sharp edges or protrusions hazardous to pool bathers.

454.1.6.5.9.6 The flow rate through each inlet shall not exceed 20 gpm (1 L/s).

454.1.6.5.10 Main drain outlets. All pools shall be provided with an outlet at the deepest point.

454.1.6.5.10.1 The depth at the outlet shall not deviate more than 3 inches (76 mm) from the side wall.

454.1.6.5.10.2 Outlets shall be covered by a secured grating which requires the use of a tool to remove and whose open area is such that the maximum velocity of water passing through the openings does not exceed $1\frac{1}{2}$ feet per second (457 mm/s) at 100 percent of the design recirculation flow. Main drain covers/grates shall comply with the requirements of ANSI/APSP 16, and the water velocity of this section.

454.1.6.5.10.3 Multiple outlets, equally spaced from the pool side walls and from each other, shall be installed in pools where the deep portion of the pool is greater than 30 feet (9144 mm) in width.

454.1.6.5.10.4 If the area is subject to high ground water, the pool shall be designed to withstand hydraulic uplift or shall be provided with hydrostatic relief devices.

454.1.6.5.10.5 The main drain outlet shall be connected to a collector tank. The capacity of the collector tank shall be at least 1 minute of the recirculated flow unless justified by the design engineer. Vacuum filter tanks are considered collector tanks.

454.1.6.5.11 Water makeup control. An automatic and manual water makeup control shall be provided to maintain the water level at the lip of the overflow gutter or at the mouth of the recessed automatic surface skimmers and shall discharge through an air gap into a fill pipe or collector tank. Over the rim fill spouts are prohibited.

454.1.6.5.12 Cleaning system. A portable or plumbed in vacuum cleaning system shall be provided. All vacuum pumps shall be equipped with hair and lint strainers. When the system is plumbed in, the vacuum fittings shall be located to allow cleaning the pool with a 50-foot (15 240 mm) maximum length of hose. Vacuum fittings shall be mounted no more than 15 inches (381 mm) below the water level, flush with the pool walls, and shall be provided with a spring-loaded safety cover which shall be in place at all times when the pool is not being vacuumed. Bag-type cleaners, which operate as ejectors on potable water supply pressure, shall be protected by a vacuum breaker. Cleaning devices shall not be used while the pool is open to bathers.

454.1.6.5.13 Rate of flow indicators. A rate of flow indicator, reading in gpm, shall be installed on the return line. The rate of flow indicator shall be properly sized for the design flow rate and shall be capable of measuring from one-half to at least one-and-one-half times the design flow rate. The clearances

upstream and downstream from the rate of flow indicator shall comply with manufacturer's installation specifications.

454.1.6.5.14 Heaters. Pool heaters shall comply with nationally recognized standards acceptable to the jurisdictional building department and to the design engineer. Pools equipped with heaters shall have a fixed thermometer mounted in the pool recirculation line downstream from the heater outlet. Thermometers mounted on heater outlets do not meet this requirement. A sketch of any proposed heater installation including valves, thermometer, pipe sizes, and material specifications shall be included in the application for permit prior to installation. Piping and influent, effluent and bypass valves which allow isolation or removal of the heater from the system shall be provided. Materials used in solar and other heaters shall be nontoxic and acceptable for use with potable water. Heaters shall not prevent the attainment of the required turnover rate.

454.1.6.5.15 Pool waste water disposal. Pool waste water shall be discharged through an air gap; disposal shall be to sanitary sewers, storm sewers, drainfields, or by other means, in accordance with local requirements including obtaining all necessary permits. Disposal of water from pools using D.E. powder shall be accomplished through separation tanks which are equipped with air bleed valves, bottom drain lines, and isolation valves, or through a settling tank with final disposal being acceptable to local authorities. D.E. separator tanks shall have a capacity as rated by the manufacturer, equal to the square footage of the filter system. All lines shall be sized to handle the expected flow. There shall not be a direct physical connection between any drain from a pool or recirculation system and a sewer line.

454.1.6.5.16 Addition of chemicals. Disinfection and ph adjustment shall be added to the pool recirculation flow using automatic feeders meeting the requirement of ANSI/NSF 50-2007. All chemicals shall be fed into the return line after the pump, heater and filters unless the feeder was designed by the manufacturer and approved by the NSF to feed to the collector tank or to the suction side of the pump.

454.1.6.5.16.1 Gas chlorination. When gas chlorination is utilized, the chlorinator shall be capable of continuously feeding a chlorine dosage of 6 mg/L to the recirculated flow of the filtration system. The application point for chlorine shall be located in the return line downstream of the filter, recirculation pump, heater, and flow meter, and as far as possible from the pool.

454.1.6.5.16.1.1 Gas chlorinators shall be located in above-grade rooms and in areas which are inaccessible to unauthorized persons.

454.1.6.5.16.1.1.1 Chlorine rooms shall have continuous forced draft ventilation capable of a minimum of one air change per minute with an exhaust at floor level to the outside, a minimum of 30 footcandles (300 lux) of illumination with the switch located outside and the door shall open out and shall not be located adjacent to the filter room entrance or the pool deck. A shatterproof gas-tight inspection window shall be provided.

454.1.6.5.16.1.1.2 Chlorine areas shall have a roof and shall be enclosed by a chain-link-type fence at least 6 feet (1829 mm) high to allow ventilation and prevent vandalism.

454.1.6.5.16.1.2 When booster pumps are used with the chlorinator, the pump shall use recirculated pool water supplied via the recirculation filtration system. The booster pump shall be electrically interlocked with the recirculation pump to prevent the feeding of chlorine when the recirculation pump is not operating.

454.1.6.5.16.1.3 A means of weighing chlorine containers shall be provided. When 150-pound (68 kg) cylinders are used, platform-type scales shall be provided and shall be capable of weighing a minimum of two full cylinders at one time. The elevation of the scale platform shall be within 2 inches (51 mm) of the adjacent floor level, and the facilities shall be constructed to allow easy placement of full cylinders on the scales.

454.1.6.5.16.2 Hypohalogenation and electrolytic chlorine generators. The hypohalogenation-type feeder and electrolytic chlorine generators shall be adjustable from 0 to full range. A rate of flow indicator is required on erosion-type feeders. The feeders shall be capable of continuously feeding a dosage of 6 mg/L to the minimum required turnover flow rate of the filtration systems. Solution feeders shall be capable of feeding the above dosage using a 10-percent sodium hypochlorite solution, or 5-percent calcium hypochlorite solution, whichever disinfectant is to be utilized at this facility. To prevent the disinfectant from siphoning or feeding directly into the pool or pool piping under any type failure of the recirculation equipment, an electrical interlock with the recirculation pump shall be incorporated into the system for electrically operated feeders. The minimum size of the solution reservoirs shall be at least 50 percent of the maximum daily capacity of the feeder. The solution reservoirs shall be marked to indicate contents.

454.1.6.5.16.3 Feeders for pH adjustment. Feeders for pH adjustment shall be provided on

all pools. pH adjustment feeders shall be positive displacement type, shall be adjustable from 0 to full range, and shall have an electrical interlock with the circulation pump to prevent discharge when the recirculation pump is not operating. When soda ash is used for pH adjustment, the maximum concentration of soda ash solution to be fed shall not exceed $\frac{1}{2}$ -pound (.2 kg) soda ash per gallon of water. Feeders for soda ash shall be capable of feeding a minimum of 3 gallons (11 L) of the above soda ash solution per pound of gas chlorination capacity. The minimum size of the solution reservoirs shall not be less than 50 percent of the maximum daily capacity of the feeder. The solution reservoirs shall be marked to indicate the type of contents.

454.1.6.5.16.4 Ozone generating equipment. Ozone generating equipment may be used for supplemental water treatment on public swimming pools subject to the conditions of this section.

454.1.6.5.16.4.1 Ozone generating equipment electrical components and wiring shall comply with the requirements of Chapter 27 of this code and the manufacturer shall provide a certificate of conformance. The process equipment shall be provided with an effective means to alert the user when a component of this equipment is not operating.

454.1.6.5.16.4.2 Ozone generating equipment shall meet NSF/ANSI Standard 50.

454.1.6.5.16.4.3 The concentration of ozone in the return line to the pool shall not exceed 0.1 mg/L.

454.1.6.5.16.4.4 The injection point for ozone generating equipment shall be located in the pool return line after the filtration and heating equipment, prior to the halogen injection point, and as far as possible from the nearest pool return inlet with a minimum distance of 4 feet (1219 mm). Injection methods shall include a mixer, contact chamber, or other means of efficiently mixing the ozone with the recirculated water. The injection and mixing equipment shall not prevent the attainment of the required turnover rate of the recirculation system. Ozone generating equipment shall be equipped with a check valve between the generator and the injection point. Ozone generating equipment shall be equipped with an air flow meter and a means to control the flow. The generator shall be electrically interlocked with the recirculation pump to prevent the feeding of ozone when the recirculation pump is not operating. A flow sensor controller can also be used to turn off the feeder when flow is sensed.

454.1.6.5.16.4.5 Ventilation requirements. Ozone generating equipment shall be installed in equipment rooms with either forced draft or cross draft ventilation. Below-grade equipment rooms with ozone generators shall have forced draft ventilation and all equipment rooms with forced draft ventilation shall have the fan control switch located outside the equipment room door. The exhaust fan intake for forced draft ventilation and at least one vent grille for cross draft ventilation shall be located at floor level.

454.1.6.5.16.4.6 A self-contained breathing apparatus designed and rated by its manufacturer for use in ozone contaminated air shall be provided when ozone generator installations are capable of exceeding the maximum pool water ozone contact concentration of 0.1 milligram per liter. The self-contained breathing apparatus shall be available at all times and shall be used at times when the maintenance or service personnel have determined that the equipment room ozone concentration exceeds 10 mg/L. Ozone generator installations which require the self-contained breathing apparatus shall also be provided with Draeger-type detector tube equipment which is capable of detecting ozone levels of 10 mg/L and greater.

Exception: In lieu of the self-contained breathing apparatus, an ozone detector capable of detecting 1 mg/L may be used. Said detector shall be capable of stopping the production of ozone, venting the room and sounding an alarm once ozone is detected.

454.1.6.5.16.5 Ionization units may be used as supplemental water treatment on public pools subject to the condition of this section.

454.1.6.5.16.5.1 Ionization equipment and electrical components and wiring shall comply with the requirements of Chapter 27 of this code and the manufacturer shall provide a certification of conformance.

454.1.6.5.16.5.2 Ionization equipment shall meet NSF/ANSI Standard 50, *Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs*, or equivalent, shall meet UL standards and shall be electrically interlocked with recirculation pump.

454.1.6.5.16.6 Ultraviolet (UV) light disinfectant equipment may be used as supplemental water treatment on public pools [and additional treatment on interactive water features (IWFs)] subject to the conditions of this paragraph and manufacturer's specifications. UV is encouraged to be used to eliminate or reduce chlorine-resis-

tant pathogens, especially the protozoan cryptosporidium.

1. UV equipment and electrical components and wiring shall comply with the requirements of the *National Electrical Code* and the manufacturer shall provide a certification of conformance to the jurisdictional building department.
2. UV equipment shall meet UL standards and shall be electrically interlocked with recirculation pump(s) on all pools and with feature pumps(s) on an IWF such that when the UV equipment fails to produce the required dosage as measured by an automated sensor, the feature pump(s) are disabled so the water features do not operate.
3. UV equipment shall be validated by a capable party that it delivers the required and predicted UV dose at the validated flow, lamp power and water UV transmittance conditions, and has complied with all professional practices summarized in the *USEPA Ultraviolet Disinfectant Guidance Manual* dated November 2006, which is publication number EPA 815-R-06-007 available from the department at <http://www.floridashealth.org/Environment/water/swim/index.html> or at http://www.epa.gov/safewater/disinfection/lt2/pdfs/guide_lt2_uvguidance.pdf.
4. UV equipment shall constantly produce a validated dosage of at least 40 mJ/cm² (millijoules per square centimeter) at the end of lamp life.
5. The UV equipment shall not be located in a side stream flow and shall be located to treat all water returning to the pool or water features.

454.1.6.5.17 Water features such as waterfalls or fountains in pools may use up to 20 percent of the return water from the filter system, however all waters used in the feature shall not be counted toward attaining the designed turnover rate. Return piping system shall be designed and capable of handling the additional feature flow when the feature is turned off. Features that require more than 20 percent of the flow rate shall be supplied by an additional pump that drafts from a suitable collector tank. All water features that utilize water from the pool shall be designed to return the water to the pool. Spray features mounted in the pool deck shall be flush with the pool deck and shall be designed with the safety of the pool patron in mind.

454.1.6.5.18 Chemical quality. Only NSF-60 approved chemicals shall be provided.

454.1.7 Wading pools.

454.1.7.1 General. Wading pools shall meet the requirements of Sections 454.1.1 through 454.1.6.5, unless otherwise indicated. Wading pools and associated piping shall not be physically connected to any other swimming pools and have no minimum width dimensions requirements.

454.1.7.2 Depths. Wading pools shall have a maximum depth of 2 feet (610 mm). The depth at the perimeter of the pool shall be uniform and shall not exceed 12 inches (305 mm). However, where jurisdictional building department-approved zero depth entry designs are used, this uniform depth requirement must be met only on the remainder of the pool outside the zero depth entry portion. The pool floor shall not be more than 12 inches (305 mm) below the deck unless steps and handrails are provided. Depth and "NO DIVING" markers are not required on wading pools.

454.1.7.3 Recirculation. Wading pools shall have a minimum of one turnover every hour. Lines from main drains shall discharge into a collector tank.

454.1.7.3.1 Skimmer equalizer lines when required shall be plumbed into the main drain installed in the pool floor with a grate covering.

454.1.7.3.2 The grate cover shall be sized so as not to allow the flow to exceed $1\frac{1}{2}$ feet per second (457 mm/s) when the equalizer line is operating.

454.1.7.4 Inlets. Wading pools with 20 feet (6096 mm) or less of perimeter shall have a minimum of two equally spaced adjustable inlets.

454.1.7.5 Emergency drainage. All wading pools shall have drainage to waste without a cross connection through a quick opening valve to facilitate emptying the wading pool should accidental bowel or other discharge occur.

454.1.7.6 Vacuuming. Wading pools with 200 square feet (19 m²) or more of pool water surface area shall have provisions for vacuuming through the skimmer, a portable vacuum system or an alternative approved method that does not involve a direct suction port in the pool.

454.1.7.7 Wading pool decks. When adjacent to swimming pools, wading pools shall be separated from the swimming pool by barrier or a fence of a minimum of 48 inches (1219 mm) in height with self-latching and self-closing gates. When adjacent to areas less than one foot (305 mm) deep of zero depth entry pools, the fence or effective barrier is required if the water edges are less than 40 feet (12 192 mm) apart. Wading pools shall have a minimum 10-foot (3048 mm) wide deck around at least 50 percent of their perimeter with the remainder of the perimeter deck being at least 4 feet (1219 mm) wide. There shall be at least 10 feet (3048 mm) between adjacent swimming pools and wading pools.

454.1.7.8 Lighting. Wading pools are exempt from underwater lighting requirements, but shall have lighting installed for night use of 10 footcandles (1000 lux) if indoors or 6 footcandles (60 lux) for outdoor night

use. Such illumination shall be provided over the pool water surface and the pool deck surface

454.1.7.9 Automated oxidation reduction potential (ORP) and pH controllers with sensing probes shall be provided to assist in maintaining proper disinfection and pH levels.

454.1.8 Spa pools.

454.1.8.1 General. Spa pools shall meet the requirements of Sections 454.1.1 through 454.1.6.5, unless specifically indicated otherwise.

454.1.8.2 Color, pattern, finish. The color, pattern or finish of the pool interior shall not obscure the existence or presence of objects or surfaces within the pool.

454.1.8.3 Water depths. Spa-type pools shall have a minimum water depth of $2\frac{1}{2}$ feet (762 mm) and a maximum water depth of 4 feet (1219 mm), except that swim spa pools may have a maximum water depth of 5 feet (1524 mm). Depth markers and "NO DIVING" markers are not required on spa-type pools with 200 square feet (19 m²) or less of water surface area.

454.1.8.4 Steps and handrails. Steps or ladders shall be provided and shall be located to provide adequate entrance to and exit from the pool. The number of sets of steps or ladders required shall be on the basis of one for each 75 feet (22 860 mm), or major fraction thereof, of pool perimeter. Step sets for spa-type pools with more than 200 square feet (19 m²) of pool water surface area shall comply with Section 454.1.2.5. Step sets for spa-type pools with 200 square feet (19 m²) or less of pool water surface area shall comply with the following: Step treads shall have a minimum width of 10 inches (254 mm) for a minimum continuous tread length of 12 inches (305 mm). Step riser heights shall not exceed 12 inches (305 mm). Intermediate treads and risers between the top and bottom treads and risers shall be uniform in width and height, respectively. Contrasting markings on the leading edges of the submerged benches and the intersections of the treads and risers are required to be installed in accordance with Section 454.1.2.5.

454.1.8.4.1 Handrails shall be provided for all sets of steps and shall be anchored in the bottom step and in the deck. Handrails shall be located to provide maximum access to the steps and handrails shall extend 28 inches (711 mm) above the pool deck.

454.1.8.4.2 Where "figure 4" handrails are used, they shall be anchored in the deck and shall extend laterally to any point vertically above the bottom step. Handrails shall be located to provide maximum access to the steps and handrails shall extend 28 inches (711 mm) above the pool deck.

454.1.8.5 Decks. Decks shall have a minimum 4-foot-wide (1219 mm) unobstructed width around the entire pool perimeter, except that pools of less than 120 square feet (11 m²) of pool water surface area shall have a minimum 4-foot-wide (1219 mm) unobstructed continuous deck around a minimum of 50 percent of

the pool perimeter. Decks less than 4 feet (1219 mm) wide shall have barriers to prevent their use. Decks shall not be more than 10 inches (254 mm) below the top of the pool. For pools of 120 square feet (11 m²) or greater, 10 percent of the deck along the pool perimeter may be obstructed.

454.1.8.6 Therapy or jet systems.

454.1.8.6.1 The return lines of spa-type therapy or jet systems shall be independent of the recirculation-filtration and heating systems.

454.1.8.6.2 Therapy or jet pumps shall take suction from the collector tank. Collector tank sizing shall take this additional gallonage into consideration.

454.1.8.7 Filtration system inlets. Spa-type pools with less than 20 feet (6096 mm) of perimeter shall have a minimum of two equally spaced adjustable inlets.

454.1.8.8 Filtration recirculation. Spa-type pools shall have a minimum of one turnover every 30 minutes. The piping, fittings, and hydraulic requirements shall be in accordance with Section 454.1.6.5. All recirculation lines to and from the pool shall be individually valved with proportional flow-type valves in order to control the recirculation flow.

454.1.8.9 Vacuuming. Spa-type pools of over 200 square feet (19 m²) of pool water surface area shall have provisions for vacuuming.

454.1.8.10 Combination spas/pools. When spa pools are part of a conventional swimming pool, the spa pool area shall be offset from the main pool area with the same water depth as the main pool area. The spa pool shall meet all the spa pool requirements of this chapter, and the deck area at the spa shall be protected by connected 30-inch-high (762 mm) stanchions. The deck perimeter at the offset spa area shall not exceed 15 percent of the entire swimming pool perimeter. All benches shall have contrasting markings on the leading edges of the intersection of the bench seats. If tile is used, it shall be slip resistant.

454.1.8.11 Portable and wooden spa pools. Portable and wooden-type spa pools are prohibited.

454.1.8.12 Automated controllers. Automated oxidation reduction potential (ORP) and pH controllers with sensing probes shall be installed on spa pools to assist in maintaining proper disinfection and pH levels.

454.1.8.13 In addition to the requirements of Section 424.1.2.3.5, spa pool signs installed shall include the following:

1. Maximum water temperature 104° F (40° C).
2. Children under twelve must have adult supervision.
3. Pregnant women, small children, people with health problems and people using alcohol, narcotics or other drugs that cause drowsiness should not use spa pools without first consulting a doctor.

4. Maximum use 15 minutes.

454.1.8.14 A clock shall be visible from the spa pool to assist the patron in meeting requirement 4 of Section 454.1.8.13 above.

454.1.8.15 If a spa is equipped with an emergency cut-off or kill switch, it shall include provisions for a minimum 80 decibel audible alarm near the spa to sound continuously until deactivated when such device is triggered. The following additional rule sign shall be installed to be visible by the spa which reads "ALARM INDICATES SPA PUMPS OFF. DO NOT USE SPA WHEN ALARM SOUNDS UNTIL ADVISED OTHERWISE."

454.1.9 Water recreation attractions and specialized pools.

454.1.9.1 General. Water recreation attraction projects shall be designed and constructed within the limits of sound engineering practice. In addition to the requirements of this section, compliance is required with Sections 454.1.1 through 454.1.6.5 of this chapter, depending upon the pool design and function. Additionally, all pools listed in this section shall have a 2-hour turnover rate unless otherwise noted.

454.1.9.2 Water slides.

454.1.9.2.1 Water slide plunge pool. Plunge pools shall be constructed of concrete or other structurally rigid impervious materials with a nontoxic, smooth and slip-resistant finish. The plunge pool design shall meet the criteria of Sections 454.1.9.2.1.1 through 454.1.9.2.1.6.

454.1.9.2.1.1 Plunge pool water depth. The minimum plunge pool operating water depth at the slide flume terminus shall be 3 feet (914 mm). This depth shall be maintained for a minimum distance of 10 feet (3048 mm) in front of the slide terminus from which point the plunge pool floor may have a constant upward slope to allow a minimum water depth of 2 feet (51 mm) at the base of the steps. The floor slope shall not exceed 1 in 10. The plunge pool water depth shall be commensurate with safety and the ease of exit from the plunge pool.

454.1.9.2.1.2 Plunge pool dimension. The plunge pool dimension between any slide flume exit or terminus and the opposite side of the plunge pool shall be a minimum of 20 feet (6096 mm) excluding steps.

454.1.9.2.1.3 Slide flume terminus.

454.1.9.2.1.3.1 The slide flume terminus shall be designed by the design engineer who can demonstrate to the jurisdictional building department's satisfaction that riders will be adequately slowed prior to discharge so as to prevent injury or harm to the rider upon impact with the plunge pool water. The slide terminus shall be flush with the pool wall and located at or below the pool water level.

454.1.9.2.1.3.2 The minimum distance between any plunge pool side wall and the outer edge of any slide terminus shall be 5 feet (1524 mm). The minimum distance between adjacent slide flumes shall be 6 feet (1828 mm).

454.1.9.2.1.3.3 A minimum length of slide flume of 10 feet (3048 mm) shall be perpendicular to the plunge pool wall at the exit end of the flumes.

454.1.9.2.1.4 Plunge pool main drains. The plunge pool shall have a minimum of one main drain with separate piping and valve to the filtration system collector tank. The velocity through the openings of the main drain grate shall not exceed $1\frac{1}{2}$ feet per second (457 mm/s) at the design flow rate of the recirculation pump. The main drain piping shall be sized to handle 100 percent of the design flow rate of the filtration system with a maximum flow velocity of 3 feet (914 mm) per second.

454.1.9.2.1.5 Plunge pool floor slope. The plunge pool floor shall slope to the main drains and the slope shall not exceed 1 in 10.

454.1.9.2.1.6 Plunge pool decks.

454.1.9.2.1.6.1 Width. The minimum width of plunge pool decks along the exit side shall be 10 feet (3048 mm).

454.1.9.2.1.6.2 Slopes. All plunge pool decks shall slope to the plunge pool or pump reservoir or to deck drains which discharge to waste, or other acceptable means. All slopes shall be between 2- and 4-percent grade.

454.1.9.2.2 Run out lanes.

454.1.9.2.2.1 Run out lanes may be utilized in lieu of a plunge pool system, provided they are constructed to the slide manufacturers specifications and are approved by the design engineer of record.

454.1.9.2.2.2 Five-foot-wide (1524 mm) walkways shall be provided adjacent to run out lanes.

454.1.9.2.2.3 Minimum water level indicator markings shall be provided on both sides of the run out trough to ensure adequate water for the safe slowing of pool patrons.

454.1.9.2.2.4 Water park personnel shall be provided at the top of the slides and at the run out.

454.1.9.2.3 Pump reservoirs. Pump reservoirs shall be made of concrete or other impervious material with a smooth slip-resistant finish. Pump reservoirs shall be for the slide pump intakes, but where properly sized may also be used as a collector tank for the filter system. Pump reservoir designs shall meet the criteria of Sections 454.1.9.2.3.1 through 454.1.9.2.3.5.

454.1.9.2.3.1 Pump reservoir volume. The minimum reservoir volume shall be equal to 3 minutes of the combined flow rate in gallons per minute of all filter and slide pumps.

454.1.9.2.3.2 Pump reservoir security. Pump reservoirs shall be accessible only to authorized individuals.

454.1.9.2.3.3 Pump reservoir maintenance accessibility. 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 3 feet (914 mm) and shall have a minimum slope of 3:10 away from the reservoir.

454.1.9.2.3.4 Pump reservoir slide pump intakes. The slide pump intakes shall be located in the pump reservoir and shall be designed to allow cleaning without danger of operator entrapment.

454.1.9.2.3.5 Pump reservoir main drains. The pump reservoir shall have a minimum of one main drain with separate piping and valve to the filtration system collector tank and the velocity through the openings of the main drain grates shall not exceed $1\frac{1}{2}$ feet per second (457 mm/s) at the design flow rate of the filtration system pump. The main drain piping shall be sized to handle 100 percent of design flow rate of the filtration system pump with a maximum flow velocity of 3 feet per second (914 mm/s).

454.1.9.2.3.6 The pump reservoir shall be fed by main drains within the plunge pool itself (either in the floor or side wall). They shall have the maximum flow velocity of $1\frac{1}{2}$ feet per second (457 mm/s) through the main drain grating and 3 feet per second (3962 mm/s) through the reservoir piping.

454.1.9.2.4 Slide pump check valves. Slide pumps shall have check valves on all discharge lines.

454.1.9.2.5 Perimeter overflow gutters or skimmers. Plunge pools and pump reservoirs shall have a perimeter overflow gutter system or skimmer which shall be an integral part of the filtration system.

454.1.9.2.5.1 Perimeter overflow gutter systems. Perimeter overflow gutter systems shall meet the requirements of Section 454.1.6.5.3.1 except that gutters are not required directly under slide flumes or along the weirs which separate plunge pools and pump reservoirs.

454.1.9.2.5.2 Surface skimmers. 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, surface skimmers shall be provided in the plunge pool and in the pump reservoir and the skimmer system shall be designed to carry 60 percent of the filtration

system design flow rate with each skimmer carrying a minimum 30 gpm (2 L/s). All surface skimmers shall meet the requirements for NSF commercial approval as set forth in NSF/ANSI Standard 50, *Circulation System Components and Related Materials for Swimming Pools, Spas/Hot Tubs*, which is incorporated by reference in these rules, including an equalizer valve in the skimmer and an equalizer line to the pool wall on systems with direct connection to pump suction.

454.1.9.2.6 Water slide recirculation-filtration equipment.

454.1.9.2.6.1 Recirculation rate. 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 2 hours or less.

454.1.9.2.6.2 Filter areas. Minimum filter area requirements shall be twice the filter areas specified for the recirculation rates stipulated in Section 454.1.6.5.5.1. The filtration system shall be capable of returning the pool water turbidity to 5/10 NTU within 8 hours or less after peak bather load.

454.1.9.2.6.3 Hair and lint strainer. Any filtration system pump which takes suction directly from the plunge pool and reservoir shall have a minimum 8-inch (208 mm) diameter hair and lint strainer on the suction side of the pump.

454.1.9.2.7 Disinfection. The disinfection equipment shall be capable of feeding 12 mg/L of halogen to the continuous recirculation flow of the filtration system.

454.1.9.2.8 Slide design and construction is the responsibility of a professional engineer licensed in Florida and the applicant.

454.1.9.2.9 A lockable gate shall be provided at the stair or ladder entrance to the slide.

454.1.9.2.10 Upon construction completion, a professional engineer licensed in Florida shall certify that the slide was constructed in accordance with the manufacturer's specifications and is structurally sound.

454.1.9.3 Water activity pools.

454.1.9.3.1 Water activity pools shall be designed and constructed within the limits of sound engineering practice.

454.1.9.3.2 Water activity pools shall be constructed of concrete or other structurally rigid impervious materials with a nontoxic, smooth and slip-resistant finish. These pools shall be of such shape and design as to be operated and maintained in a safe and sanitary manner.

454.1.9.3.3 The recirculation-filtration system of water activity pools shall achieve a minimum of one turnover every 2 hours for water activity pools over 2 feet (610 mm) deep, and in 1 hour for these pools that are 2 feet (610 mm) deep or less.

454.1.9.3.4 Those portions of the activity pool where the water depth will not allow for the proper installation of underwater lighting, shall be provided with 6 footcandles (60 lux) of lighting on the deck and water surface.

454.1.9.3.5 Fence requirements shall be in accordance with Section 454.1.7.7.

454.1.9.3.6 Play features with an overhead clearance of less than 4 feet (1219 mm) shall be blocked or barricaded to preclude children becoming entrapped.

454.1.9.3.7 In addition to the requirements of Section 454.1.2.3.5, all water activity pool signs installed shall have the following added in one inch letters:

"Do not swallow the pool water, it is recirculated."

"Do not use pool if you are ill with diarrhea."

454.1.9.4 Wave pools.

454.1.9.4.1 Wave pools shall be designed and constructed within the limits of sound engineering practice.

454.1.9.4.2 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.

454.1.9.4.3 The recirculation-filtration system of wave pools shall be capable of a minimum of one turnover every 3 hours.

454.1.9.4.4 Floors shall be sloped in accordance with the manufacturer's or design engineer's specifications; however, they shall not exceed the slope limits of Section 454.1.2.2.3.

454.1.9.5 River rides.

454.1.9.5.1 River rides shall be constructed within the limits of sound engineering practice.

454.1.9.5.2 River rides shall be constructed on concrete or other impervious materials with a nontoxic, smooth and slip-resistant finish. These rides shall be of such shape and design as to be operated in a safe and sanitary manner.

454.1.9.5.3 The recirculation-filtration system of the river ride shall be capable of a minimum of one turnover every 3 hours.

454.1.9.5.4 The maximum water depth of the river ride shall not exceed 3 feet (914 mm) unless justified to the jurisdictional building department's satisfaction by the design engineer.

454.1.9.5.5 Decking shall be provided at the entrance and exit points as necessary to provide safe patron access but shall not be smaller than 10 feet (3048 mm) in width and length. Additional decking along the ride course is not required except that decking shall be required at lifeguard locations and emergency exit points.

454.1.9.5.6 Access and exit shall be provided at the start and end of the ride and additional exit locations shall be located along the ride course as necessary to provide for the safety of the patrons.

Propulsion jets shall be installed in the walls of the river ride. In the alternative, propulsion jets may be installed in the floor if they are covered by a grate that will inhibit entrapment or injury of the pool patrons' feet or limbs.

454.1.9.6 Zero depth entry pools.

454.1.9.6.1 Zero depth entry pools shall have a continuous floor slope from the water edge to the deep end.

454.1.9.6.2 The deck level perimeter overflow system with grate shall be provided at the water's edge across the entire zero depth portion of the pool.

454.1.9.6.3 The pool deck may slope toward the pool for no more than 7 inches (2133 mm), as measured from the overflow system grate outward. Beyond this area the deck shall slope away from the pool in accordance with Section 454.1.2.2.3.

454.1.9.6.4 "No-Entry, Shallow Water" signs shall be provided along the pool wall edge where the water depth is less than 3 feet (914 mm) deep. No-entry signs shall be slip-resistant, shall have 4-inch-high (102 mm) letters, shall be located within 2 feet (610 mm) of the pool edge and shall be spaced no more than 15 feet (4572 mm) apart.

454.1.9.6.5 Additional inlets shall be provided in areas of less than 18 inches (457 mm) deep. The numbers and location shall be such as to double the flow rate into this area.

454.1.9.6.6 The recirculation-filtration system shall be of a minimum of one turnover every 2 hours in the area of the pool that is 3 feet (914 mm) deep or less. In the remainder of the pool where the depth is greater than 3 feet (914 mm), the system shall have a maximum 6 hour turnover rate. The design plans submitted by the applicant shall provide the volume of water in the pool area of 3 feet (914 mm) depth and less, the volume of water in the pool area greater than 3 feet (914 mm) in depth and the total volume in the pool for determination of minimum circulation flow. The volume calculations shall provide verification that the correct volume of water is used to determine the minimum flow at the 2-hour and the 6-hour flow requirements.

454.1.9.6.7 Those portions of the zero depth entry pool, where the water depth will not allow for the proper installation of underwater lighting, shall be

provided with 6 footcandles (60 lux) of lighting on the deck and the water.

454.1.9.6.8 Play structures in a zero depth entry area [in depth 0 to 3 feet (0 to 914 mm)] may be within 15 feet (4572 mm) of the pool walls, but shall comply with sound engineering requirements for the safety of pool patrons.

454.1.9.7 Special purpose pools.

454.1.9.7.1 General. Special purpose pool projects may deviate from the requirements of other sections of these rules provided the design and construction are within the limits of sound engineering practice. Only those deviations necessary to accommodate the special usage shall be allowed and all other aspects of the pool shall comply with the requirements of this section and with Section 454.1.2.

454.1.9.7.2 A special purpose pool may incorporate ledges which do not overhang into the pool.

454.1.9.8 Interactive water features (IWFs).

454.1.9.8.1 Waters discharged from all fountain or spray features shall not pond on the feature floor but shall flow by gravity through a main drain fitting to a below or collection system which discharges to a collector tank. The minimum size of the collector tank shall be equal to the volume of 3 minutes of the combined flow of all feature pumps and the filter pump. Smaller tanks may be utilized if hydraulically justified by the design engineer. Adequate access shall be provided to the sump or collector tank. Stairs or a ladder shall be provided as needed to ensure safe entry into the tank.

454.1.9.8.2 Reserved.

454.1.9.8.3 Chemical feeders shall be in accordance with Section 454.1.6.5; except that the disinfection feeder shall be capable of feeding 12 ppm of free chlorine to the pressure side of the recirculation system or the collector tank (based upon a hypothetical 30-minute turnover of the contained volume within the system). Automated oxidation reduction potential (ORP) and pH controllers with sensing probes shall be installed to assist in maintaining proper disinfection and pH levels.

454.1.9.8.4 If night operation is proposed, 6 footcandles (60 lux) of light shall be provided on the pool deck and the water feature area. Lighting that may be exposed to the feature pool water shall not exceed 15 volts, shall be installed in accordance with manufacturer's specifications and be approved for such use by UL or NSF.

454.1.9.8.5 All electrical work shall comply with Chapter 27 of this code.

454.1.9.8.6 Hydraulics.

454.1.9.8.6.1 The filter system shall filter and chemically treat all water that is returned to the spray features. The filter system shall draft from the collector tank and return filtered water

directly to the spray features. Excess water not required by the spray features shall be returned to the collector tank.

454.1.9.8.6.2 The water feature pump shall draft from the collector tank.

454.1.9.8.6.3 Alternatively, the contained volume of the system may be filtered and chemically treated based upon a 30-minute turnover of the contained volume with 100 percent returned to the collector tank by manifold piping. If this alternative is chosen, all water returned to the spray feature(s) must also be treated with UV light disinfection equipment to accomplish protozoan destruction in accordance with sound engineering and the requirements of Section 454.1.6.5.16.6. This alternative must have the ability to feed 6 mg/L free chlorine to the feature water as it is returned to the spray feature. The UV disinfection equipment shall be electrically interconnected such that whenever it fails to produce the required UV dosage, the water spray features pump(s) and flow will be immediately stopped.

454.1.9.8.6.4 The flow rate through the feature nozzles of the water features shall be such as not to harm the patrons and shall not exceed 20 feet per second (6096 mm/s) unless justified by the design engineer and by the fountain system manufacturer.

454.1.9.8.6.5 An automatic water level controller shall be provided.

454.1.9.8.6.6 An overflow waste line with air gap shall be provided.

454.1.9.8.6.7 A means of vacuuming and completely draining the tank(s) shall be provided.

454.1.9.8.6.8 Where the filter system described in Section 454.1.9.8.6.1 is utilized, a second filter system and disinfection system shall be provided to treat the water in the collector tank when the feature/filter pump is not in operation. Said system shall be capable of filtering the total volume of water in the collector tank in 30 minutes and the disinfection system shall be capable of providing 12 mg/L of disinfectant to this flow rate.

454.1.9.8.6.9 IWFs shall be fenced in the same fashion as wading pools, as noted in Section 454.1.7.7. Where the IWF is at least 50 feet (15 240 mm) from all other pools and is not designed to have any standing water, fencing requirements should be carefully considered by the applicant to control usage, but are not required by rule.

454.1.9.8.6.10 A minimum 4-foot-wide (1219 mm) wet deck area shall be provided around all IWFs. The wet deck shall meet the requirements of Section 454.1.2.2.3; however, up to 50 percent of the perimeter may be obstructed.

454.1.9.8.6.11 IWFs shall be constructed of concrete or other impervious and structurally rigid material.

454.1.9.8.6.12 Floor slopes of an IWF shall be a maximum 1 foot (305 mm) vertical in 10 feet (3048 mm) horizontal and a minimum of 1 foot (305 mm) vertical in 50 feet (15 240 mm) horizontal.

454.1.9.8.6.13 In addition to the requirements of Section 454.1.2.3.5, all IWF pool rule signs installed shall have the following added in one inch letters:

“Do not swallow the fountain water, it is recirculated.”

“Do not use fountain if you are ill with diarrhea.”

454.1.9.8.7 Water theme parks shall meet all other aspects of these rules for the features provided.

454.1.9.8.7.1 Rules and regulations for water theme parks shall be posted in minimum 1-inch (305 mm) letters at each entrance to the park and shall contain the following:

1. No food, drink, glass or animals in or on the pool decks.
2. Park operating hours __A.M. to __P.M.
3. Shower before entering.
4. Do not swallow the pool water.

454.1.9.8.7.2 Showers shall be provided at or near the entrance (queue line) to a water recreation attraction.

454.1.9.8.7.3 Water theme parks are exempt from the fencing requirements of Section 454.1.3.1.9, except that pools designed for small children shall be fenced when located within 50 feet (15 240 mm) of a pool with water depths of 3 feet (914 mm) or more.

454.1.9.8.7.4 Sanitary facilities within a water theme park shall be as near to the water recreation attractions as prudent to ensure patron use, but not over 200 feet (60 960 mm) walking distance from any exit of a water attraction.

454.1.10 Modifications.

454.1.10.1 Modifications. Modifications include non-equivalent changes or additions to the recirculation system, treatment equipment, physical structure or appurtenances. Replacement of the pool or spa shell is considered to be construction of a new facility and shall be processed as such. The installation of new decking is not considered a modification if it is installed in conformance with Section 454.1.3.1, and deck markings are upgraded in accordance with Section 454.1.2.3. Resurfacing the pool interior to original nontoxic, slip-resistant and smooth specifications or equivalent replacement of equipment are not considered modifications.

454.1.10.2 The painting of pools shall not be considered a modification provided the following conditions are met:

1. Only paints designated by the manufacturer as pool paints are used.
2. All step stripes, slope break markers and safety line, and depth and NO DIVING markings shall be provided to comply with the applicable provision(s) this section.

454.1.10.3 The installation of copper or copper/silver ionization units and ozone generators capable of producing less than a pool water ozone contact concentration of 0.1 milligrams per liter (mg/L) shall not be considered a pool modification provided compliance when the following is met:

1. The ionization or ozone generator unit complies with paragraph 64E-9.007(16)(e), *Florida Administrative Code*.
2. The manufacturer provides one set of signed and sealed engineering drawings indicating the following:
 - a. The unit does not interfere with the design flow rate.
 - b. The unit and the typical installation meet the requirements of the *National Electrical Code*.
 - c. A copper test kit and information regarding the maximum allowed copper and silver level and the minimum required chlorine level shall be available to the pool owner.
 - d. The unit shall meet the requirements of NSF/ANSI Standard 50.
3. At least 7 days before the time of installation, the installer will provide a photocopy of the above drawings and a letter of intent identifying the pool on which the unit is to be installed.
4. Upon completion of the installation, a professional engineer or electrician licensed in the state of Florida shall provide a letter to the county health department, indicating the unit was properly installed in accordance with the typical drawings, the *National Electrical Code* and local codes.

454.2 Private swimming pools.

454.2.1 Definitions—general.

454.2.1.1 Tense, gender and number. For the purpose of this code, certain abbreviations, terms, phrases, words, and their derivatives shall be construed as set forth in this section. Words used in the present tense include the future. Words in the masculine gender include the feminine and neuter. Words in the feminine and neuter gender include the masculine. The singular number includes the plural and the plural number includes the singular.

454.2.1.2 Words not defined. Words not defined herein shall have the meanings stated in the *Florida*

Building Code, Building; Florida Building Code, Mechanical; Florida Building Code, Plumbing; Florida Building Code, Fuel Gas; or Florida Fire Prevention Code. Words not defined in the *Florida Building Code* shall have the meanings stated in the Webster's *Ninth New Collegiate Dictionary*, as revised.

454.2.2 Definitions.

ABOVE-GROUND/ON-GROUND POOL. See "Swimming pool."

ADMINISTRATIVE AUTHORITY. The individual official, board, department or agency established and authorized by a state, county, city or other political subdivision created by law to administer and enforce the provisions of the swimming pool code as adopted or amended.

APPROVED. Accepted or acceptable under an applicable specification stated or cited in this code, or accepted as suitable for the proposed use under procedures and power of the administrative authority.

APPROVED SAFETY COVER. A manually or power-applied safety pool cover that meets all of the performance standards of ASTM International in compliance with ASTM F 1346.

APPROVED TESTING AGENCY. An organization primarily established for the purpose of testing to approved standards and approved by the administrative authority.

BACKWASH PIPING. See "Filter waste discharge piping."

BARRIER. A fence, dwelling wall or nondwelling wall or any combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool, especially access from the residence or from the yard outside the barrier.

BODY FEED. Filter aid fed into a diatomite-type filter throughout the filtering cycle.

CARTRIDGE FILTER. A filter using cartridge-type filter elements.

CHEMICAL PIPING. Piping which conveys concentrated chemical solutions from a feeding apparatus to the circulation piping.

CIRCULATION PIPING SYSTEM. Piping between the pool structure and the mechanical equipment. Usually includes suction piping, face piping and return piping.

COMBINATION VALVE. A multipart valve intended to perform more than one function.

DESIGN HEAD. Total head requirement of the circulation system at the design rate of flow.

DIATOMITE (DIATOAMCEOUS EARTH). A type of filter aid.

DIATOMITE-TYPE FILTER. A filter designed to be used with filter aid.

DIRECT ACCESS FROM THE HOME. Any opening which discharges into the "perimeter" of the pool or any opening in an exterior dwelling wall, or interior wall (for indoor pools) which faces the pool.

EXIT ALARM. A device that makes audible, continuous alarm sounds when any door or window which permits access from the residence to any pool that is without an intervening enclosure is opened or left ajar.

FACE PIPING. Piping, with all valves and fittings, which is used to connect the filter system together as a unit.

FILTER. Any apparatus by which water is clarified.

FILTER AID. A nonpermanent type of filter medium or aid such as diatomite, alum, etc.

FILTER CARTRIDGE. A disposable or renewable filter element which generally employs no filter aid.

FILTER ELEMENT. That part of a filter which retains the filter medium.

FILTER MEDIUM. Fine material which entraps the suspended particles and removes them from the water.

FILTER RATE. Average rate of flow per square foot of filter area.

FILTER ROCK. Specially graded rock and gravel used to support filter sand.

FILTER SAND. A specially graded type of permanent filter medium.

FILTER SEPTUM. That part of the filter element in a diatomite-type filter upon which a cake of diatomite or other nonpermanent filter aid may be deposited.

FILTER WASTE DISCHARGE PIPING. Piping that conducts waste water from a filter to a drainage system. Connection to drainage system is made through an air gap or other approved methods.

FRESH WATER. Those waters having a specific conductivity less than a solution containing 6,000 ppm of sodium chloride.

HIGH RATE SAND FILTER. A sand filter designed for flows in excess of 5 gpm (0.3 L/s) per square foot.

HOT TUB. See "Swimming pool."

INGROUND POOL. See "Swimming pool."

INLET FITTING. Fitting or fixture through which circulated water enters the pool.

MAIN SUCTION OUTLET. Outlet at the deep portion of the pool through which the main flow of water leaves the pool when being drained or circulated.

MESH SAFETY BARRIER. A combination of materials, including fabric, posts, and other hardware to form a barrier around a swimming pool.

MEDICALLY FRAIL ELDERLY PERSON. Means any person who is at least 65 years of age and has a medical problem that affects balance, vision, or judgment, including but not limited to a heart condition, diabetes, or Alzheimer's disease or any related disorder.

POOL. See "Swimming pool."

POOL DEPTHS. The distance between the floor of the pool and the maximum operating water level.

POOL PERIMETER. A pool perimeter is defined by the limits of the pool deck, its surrounding area including yard area on same property, and any dwelling or nondwelling wall or any combination thereof which completely surrounds the pool.

POOL PLUMBING. All chemical, circulation, filter waste discharge piping, deck drainage and water filling system.

PORTABLE POOL. A prefabricated pool which may be erected at the point of intended use and which may be subsequently disassembled and reerected at a new location. Generally installed on the surface of the ground and without excavation.

PRECOAT. In a diatomite-type filter, the initial coating or filter aid placed on the filter septum at the start of the filter cycle.

RAPID SAND FILTER. A filter designed to be used with sand as the filter medium and for flows not to exceed 5 gpm (0.3 L/s) per square foot.

RECEPTOR. An approved plumbing fixture or device of such material, shape and capacity as to adequately receive the discharge from indirect waste piping, so constructed and located as to be readily cleaned.

RESIDENTIAL. Situated on the premises of a detached one- or two-family dwelling or a one-family townhouse not more than three stories high.

RETURN PIPING. That portion of the circulation piping which extends from the outlet side of the filters to the pool.

SALINE WATER. Those waters having a specific conductivity in excess of a solution containing 6,000 ppm of sodium chloride.

SEPARATION TANK. A device used to clarify filter rinse or waste water; sometimes called a "reclamation tank."

SKIM FILTER. A surface skimmer combined with a vacuum diatomite filter.

SPA, NONPORTABLE. See "Swimming pool."

SPA, PORTABLE. Nonpermanent structure intended for recreational bathing, in which all controls and water heating and water circulating equipment are an integral part of the product and which is cord-connected and not permanently electrically wired.

SUCTION PIPING. That portion of the circulation piping located between the pool structure and the inlet side of the pump and usually includes main outlet piping, skimmer piping, vacuum piping and surge tank piping.

SURFACE SKIMMER. A device generally located in the pool wall which skims the pool surface by drawing pool water over a self-adjusting weir.

SWIMMING POOL, PRIVATE. Any structure, located in a residential area, that is intended for swimming or recreational bathing and contains water over 24 inches (610 mm) deep including but not limited to inground, above-

ground, and onground swimming pools, hot tubs, and non-portable spas.

SWIMMING POOL, INDOOR. A swimming pool which is totally contained within a structure and surrounded on all four sides by walls of said structure.

SWIMMING POOL, OUTDOOR. Any swimming pool which is not an indoor pool.

SWIMMING POOL, PUBLIC. A watertight structure of concrete, masonry, fiberglass, stainless steel or plastic which is located either indoors or outdoors, used for bathing or swimming 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, pools operated by or serving camps, churches, cities, counties, day care centers, group home facilities for eight or more clients, health spas, institutions, parks, state agencies, schools, subdivisions; or the cooperative living-type projects of five or more living units, such as apartments, boarding houses, hotels, mobile home parks, motels, recreational vehicle parks and townhouses.

SWIMMING POOL, RESIDENTIAL. See "Swimming pool, private."

TURNOVER TIME. The time in hours required for the circulation system to filter and recirculate a volume of water equal to the pool volume.

VACUUM FITTING. A fitting in the pool which is used as a convenient outlet for connecting the underwater suction cleaning equipment.

VACUUM PIPING. The piping from the suction side of a pump connected to a vacuum fitting located at the pool and below the water level.

WASTE PIPING. See "Filter waste discharge piping."

WIDTH AND/OR LENGTH. Actual water dimension taken from wall to wall at the maximum operating water level.

YOUNG CHILD. Any person under the age of 6 years.

454.2.3 Mechanical requirements. Unless otherwise specified in this code, all piping, equipment and materials used in the process piping system of swimming pools that are built in place shall conform to the *Florida Building Code, Plumbing*.

454.2.4 Approvals.

454.2.4.1 Compliance. All materials, piping, valves, equipment or appliances entering into the construction of swimming pools or portions thereof shall be of a type complying with this code or of a type recommended and approved by a nationally recognized testing agency or conforming to other recognized standards acceptable to the administrative authority.

454.2.4.2 Items not covered. For any items not specifically covered in these requirements, the administrative authority is hereby authorized to require that all equipment, materials, methods of construction and design features shall be proven to function adequately, effectively and without excessive maintenance and operational difficulties.

454.2.4.2.1 Flood hazard areas. Private swimming pools installed in flood hazard areas established in Section 1612.3 shall comply with Section 1612.

454.2.4.3 Applicant responsibility. It shall be the responsibility of the applicant to provide such data, tests or other adequate proof that the device, material or product will satisfactorily perform the function for which it is intended, before such item shall be approved or accepted for tests.

454.2.5 Alternate materials and methods of construction.

454.2.5.1 Approval and authorization. The provisions of this code are not intended to prevent the use of any alternate material, method of construction, appliance or equipment, provided any such alternate has been first approved and its use authorized by the administrative authority.

454.2.5.2 Required tests. When there is insufficient evidence to substantiate claims for alternates, the administrative authority may require tests, as proof of compliance, to be made by an approved agency at the expense of the applicant.

454.2.6 Private swimming pools.

454.2.6.1 Conformance standard. Design, construction and workmanship shall be in conformity with the requirements of ANSI/NSPI 3, ANSI/APSP/ICC 4, ANSI/APSP/ICC 5, ANSI/APSP/ICC 6, and ANSI/APSP 7.

454.2.6.2 Required equipment. Every swimming pool shall be equipped complete with approved mechanical equipment consisting of filter, pump, piping valves and component parts.

Exception: Pools with a supply of fresh water equivalent to the volume of the pool in the specified turnover time will be allowed.

454.2.6.3 Water velocity. Pool piping shall be designed so the water velocity will not exceed 10 feet per second (mm/s) for pressure piping and 8 feet per second (mm/s) for suction piping, except that the water velocity shall not exceed 8 feet per second (3048 mm/s) in copper tubing. Main suction outlet velocity must comply with ANSI/APSP 7.

Exception: Jet inlet fittings shall not be deemed subject to this requirement.

454.2.6.4 Piping to heater. Water flow through the heater, any bypass plumbing installed, any back-siphoning protection, and the use of heat sinks shall be