OREGON HEALTH AUTHORITY

Oregon Public Aquatic Facility Rules

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OAR 333-060-1000 – Aquatic Facility Design Standards and Construction

Public Pool Program
Food, Pool & Lodging Health and Safety Program

Oregon Public Aquatic Facility Rules
OAR 333-060

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1.0 Glossary of Abbreviations [Deleted]

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2.0 Glossary of Terms

“Accessible Route” means access/egress standards as defined by 2010 ADA Standards for Accessible Design.

“Activity Pool” *See “Pool.”*

"Approved" means approved in writing by the Oregon Health Authority (Authority).

“Aquatic Facility” means a physical place that contains one or more aquatic venues and support infrastructure.

“Aquatic Feature” means an individual component within an aquatic venue. Examples include slides, structures designed to be climbed or walked across, and structures that create falling or shooting water

“Aquatic Venue” means an artificially constructed structure or modified natural structure where the public is exposed to water intended for recreational or therapeutic purpose and where the primary intended use is not watering livestock, irrigation, water storage, fishing, or habitat for aquatic life. Such structures do not necessarily contain standing water, so water exposure may occur via contact, ingestion, or aerosolization.

Examples include swimming pools, wave pools, lazy rivers, surf pools, spas *(including spa pools and hot tubs)*, waterslide landing pools, spray pads, and other interactive water venues.

- **"General-Use"** means any aquatic venue other than a limited-use aquatic venue. Aquatic venues operated in conjunction with a companion facility but not limited to use of the residents, patrons or members of the companion facility are general-use aquatic venues.
- **“Increased Risk Aquatic Venue”** means an aquatic venue which due to its intrinsic characteristics and intended users has a greater likelihood of affecting the health of the bathers of that venue by being at increased risk for microbial contamination *(e.g., by children ages less than 5 years)* or being used by people that may be more susceptible to infection *(e.g., therapy patients with open wounds)*. Examples of increased-risk aquatic venues include spray pads, wading pools and other aquatic venues designed for children ages less than 5 years as well as therapy pools.
- **“Lazy River”** means a channeled flow of water of near−constant depth in which the water is moved by pumps or other means of propulsion to provide a river−like flow that transports bathers over a defined path. A lazy river may include play features and devices. A lazy river may also be referred to as a tubing pool, leisure river, leisure pool or a current channel.
- **“Limited-Use"** means any aquatic venue located at and operated in connection with a companion facility such as a residential housing facility having five or more living units, travelers' accommodations, mobile home park, recreation park, boarding school, organizational camp, dude ranch, club or association where use of the aquatic venue is limited to residents, patrons or members of the companion facility.
- **“Spa”** means a structure intended for either warm or cold water where prolonged exposure is not intended. Spa structures are intended to be used for bathing or other recreational uses and are not usually drained and refilled after each use. It may include, but is not limited to, hydrotherapy, air induction bubbles, and recirculation.
- **“Special Use Aquatic Venue”** means aquatic venues that do not meet the intended use and design features of any other aquatic venue or pool listed/identified in these rules and is designed specifically for sporting or recreational purposes. **“Aquatic Venue”** does not include:
    - A basin that is drained and refilled with potable water between each use and does not have a recirculation system with filtration and sanitizing equipment,
    - A private aquatic venue onboard a watercraft,
    - A floatation tank, or
    - A therapy pool.

"Athletic club" means a facility constructed to provide athletic or physical conditioning for its members, guests or patrons. It includes but is not limited to racquetball clubs, health spas and fitness facilities.

“Authority” means the Oregon Health Authority or Authority Having Jurisdiction.

“Authority Having Jurisdiction” *(AHJ)* means the Oregon Health Authority, Local Public Health Authority, or an agency, organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, installations, or procedures.

"Automated Controller" means a system of at least one chemical probe, a controller, and auxiliary or integrated component that senses the level of one or more water parameters and provides a signal to other equipment to maintain the parameters within a user-established range.
"Available Chlorine" *See "Chlorine."*
"Backflow" means a hydraulic condition caused by a difference in water pressure that causes an undesirable reversal of the flow as the result of a higher pressure in the system than in its supply.
"Barrier" means an obstacle intended to deter direct access from one point to another.
"Bather" means a person at an aquatic venue who has contact with water either through spray or partial or total immersion. The term bather as defined, also includes staff members, and refers to those users who can be exposed to contaminated water as well as potentially contaminate the water.
"Bather Count" means the number of bathers in an aquatic venue at any given time.
"Bather Load Capacity", *see Maximum Bather Load*
"Bathhouse", *see Hygiene Facility*
"Best Practice" means a technique or methodology that, through experience and research, has been proven to reliably lead to a desired result.
"Body of Water" *(per NEC, q.v.)* means any aquatic venue holding standing water, whether permanent or storable.
"Breakpoint Chlorination" means the conversion of inorganic chloramine compounds to nitrogen gas by reaction with Free Available Chlorine. When chlorine is added to water containing ammonia *(from urine, sweat, or the environment, for example)*, it initially reacts with the ammonia to form monochloramine. If more chlorine is added, monochloramine is converted into dichloramine, which decomposes into nitrogen gas, hydrochloric acid, and chlorine. The apparent residual chlorine decreases since it is partially reduced to hydrochloric acid. The point at which the drop occurs is referred to as the "breakpoint". The amount of free chlorine that must be added to the water to achieve breakpoint chlorination is approximately 10 times the amount of combined chlorine in the water. As additional chlorine is added, all inorganic combined chlorine compounds disappear, resulting in a decrease in eye irritation potential and "chlorine odors."
"Builder" means a person who, in the pursuit of an independent business, undertakes, or offers to undertake, or submits a bid, to construct, alter, repair, or improve any aquatic venue and its appurtenances.
"Bulkhead" means a movable partition that physically separates a pool into multiple sections.
"Certified, Listed, and Labeled" means equipment, materials, products, or services included in a list published by an ANSI—accredited certification organization where said equipment, material, product, or service is evaluated against specific criteria and whose listing either states that it meets identified standards or has been tested and found suitable for a specified purpose. In sections of this code where equipment, materials, products, or services are referred to with terms such as "approved", "verified", or similar terms to a referenced standard, these terms also mean "certified, listed, and labeled.
"Chemical Storage Space" means a space in an aquatic facility used for the storage of pool chemicals such as acids, salt, or corrosive or oxidizing chemicals.
"Chlorine" means an element that at room temperature and pressure is a heavy greenish yellow gas with a characteristic penetrating and irritating smell; it is extremely toxic. It can be compressed in liquid form and stored in heavy steel tanks. When mixed with water, chlorine gas forms hypochlorous acid *(HOCl)*, the primary chlorine-based disinfecting agent, hypochlorite ion, and hydrochloric acid. HOCl dissociation to hypochlorite ion is highly pH dependent. Chlorine is a general term used which refers to HOCl and hypochlorite ion in aqueous solution derived from chlorine gas or a variety of chlorine-based disinfecting agents.

- **"Available Chlorine"** means the amount of chlorine in the +1 oxidation state, which is the reactive, oxidized form. In contrast, chloride ion *(Cl_-)* is in the -1 oxidation state, which is the inert, reduced state. Available Chlorine is subdivided into Free Available Chlorine and Combined Available Chlorine. Pool chemicals containing Available Chlorine are both oxidizers and disinfectants. Elemental chlorine *(Cl_2)* is defined as containing 100% available chlorine. The concentration of Available Chlorine in water is normally reported as ppm (*mg/L*) "as Cl_2", that is, the concentration is measured on a Cl_2 basis, regardless of the source of the Available Chlorine.
- **"Combined Available Chlorine" or "Combined Chlorine" or "CAC" or "CC"** means the concentration of available chlorine present in the form of inorganic or organic chloramines.

Combined available chlorine is less reactive than free available chlorine and organic chloramines are generally less reactive oxidizers than the inorganic chloramines. Combined chlorine is determined by taking the difference between the Total Chlorine *(TC)* and DPD-FC concentrations. CC = TC – DPD-FC.

- "**Cyanurate-bound available chlorine**" or "**CBC**" means the concentration of available chlorine that is bound to cyanurate.
- **"DPD Free Chlorine" or "DPD-FC"** means the FC *("free chlorine")* concentration from DPD-based test methods. The DPD-based test result for FC includes cyanurate-bound available chlorine as well as HOCl and OCl^-, that is, DPD-FC = FAC CBC. The terms DPD-FC and FAC would be interchangeable only in the absence of cyanuric acid.
- **"Free Available Chlorine" or "FAC" or "Free Chlorine Residual"** means the portion of the total available chlorine that is not "combined chlorine" or "cyanurate-bound available chlorine" and is primarily present as hypochlorous acid *(HOCl)* or hypochlorite ion *(OCl^-)*. Molecular chlorine *(Cl_2)*, trichloride *(Cl_3^-)*, and chlorine monoxide *(Cl_2O)* are also present at very low concentrations, depending on chlorine ion concentration, and these compounds are also counted as free available chlorine. The pH of the water determines the relative amounts of HOCl and OCl^-. HOCl is a very effective biocide and is the active biocide in pool water. OCl^- is also a biocide but acts more slowly than HOCl. Thus, chlorine is a more effective biocide at low pH than at high pH. A free chlorine residual must be maintained for adequate disinfection.
- **"Total Available Chlorine"** means the "TC" concentration from DPD-based test methods with iodide reagent added. All forms of available chlorine which react with iodide are measured as Total Available Chlorine *(TC)*.

"Circulation Path" means an exterior or interior way of passage from one part of an aquatic facility to another for pedestrians, including, but not limited to walkways, pathways, decks, and stairways.
"Cleansing Shower" *See "Shower."*
"Code" means a systematic statement of a body of law, especially one given statutory force.
"Combustion Device" means any appliance or equipment using fire. These include, but may not be limited to, gas or oil furnaces, boilers, pool heaters, domestic water heaters, etc.
"Construction Joint" means a watertight joint provided to facilitate stopping places in the construction process. Construction joints also serve as contraction joints which control cracking.
"Contaminant" means a substance that soils, stains, corrupts, or infects another substance by contact or association.
"Contamination Response Plan" means a plan for handling contamination from formed-stool, diarrheal-stool, vomit, and blood.
"Corrosive Material" means pool chemicals, fertilizers, cleaning chemicals, oxidizing cleaning materials, salt, de-icing chemicals, other corrosive or oxidizing materials, pesticides, and such other materials which may cause injury to people or damage to the building, air-handling equipment, electrical equipment, safety equipment, or fire-suppression equipment, whether by direct contact or by contact via fumes or vapors, whether in original form or in a foreseeably likely decomposition, pyrolysis, or polymerization form. Refer to labels and SDSs.
"Crack" means any and all breaks in the structural shell of a pool vessel or deck.
"Cross-Connection" means a connection or arrangement, physical or otherwise, between a potable water supply system and a plumbing fixture, tank, receptor, equipment, or device, through which it may be possible for non- potable, used, unclean, polluted, and contaminated water, or other substances to enter into a part of such potable water system under any condition.
"CT Inactivation Value" means a representation of the concentration of the disinfectant *(C)* multiplied by time in minutes *(T)* needed for inactivation of a particular contaminant. The concentration and time are inversely proportional; therefore, the higher the concentration of the disinfectant, the shorter the contact time required for inactivation. The CT inactivation value can vary with pH or temperature change so these values must also be supplied to allow comparison between values.
"Deck" means surface areas serving the aquatic venue, including the dry deck, perimeter deck, and pool deck.

(A) **"Dry Deck"** means all pedestrian surface areas within the enclosure not subject to frequent splashing or constant wet foot traffic. The dry deck is not perimeter deck or pool deck, which

connects the pool to adjacent amenities, entrances, and exits. Landscape areas are not included in this definition.

(B) **"Perimeter Deck"** means the hardscape surface area immediately adjacent to and within 4 feet *(1.2 m)* of the water's edge.

(C) **Pool Deck"** means surface areas serving the aquatic venue, beyond perimeter deck, which is expected to be regularly trafficked and made wet by bathers.

"Design Professional" means a person who is registered or licensed to practice their respective design profession as defined by the local, state, territorial, federal, and tribal laws governing professional practice within the jurisdiction where the project is to be constructed.

"Diaper-Changing Station" means a hygiene station that includes a diaper-changing unit, handwashing sink, soap and dispenser, a means for drying hands, trash receptacle, and disinfectant products to clean after use.

"Diaper-Changing Unit" means a diaper-changing surface that is part of a diaper-changing station.

"Dichloramine" means a disinfection byproduct formed when chlorine binds to nitrogenous waste in pool water to form an amine-containing compound with two chlorine atoms *($NHCl_2$)*. It is a known acute respiratory and ocular irritant.

"Disinfection" means a treatment that kills or irreversibly inactivates microorganisms *(e.g., bacteria, viruses, and parasites)*; in water treatment, a chemical *(commonly chlorine, chloramine, or ozone)* or physical process *(e.g., ultraviolet radiation)* can be used.

"Disinfection Byproduct" *(DBP)* means a chemical compound formed by the reaction of a disinfectant *(e.g., chlorine)* with a precursor *(e.g., natural organic matter, nitrogenous waste from bathers)* in a water system *(pool, water supply)*.

"Diving Pool" *See "Pool."*

"Drop Slide" *See "Slide."*

"Dry Deck" *See "Deck."*

"Electrical Interlock System" means a control mechanism that automatically disables pool equipment operation components like pumps, heaters and chemical feeders during pump failure, inadequate flow, or electrical faults to ensure safety.

"Emergency Action Plan" *(EAP)* means a plan that identifies the objectives that need to be met for a specific type of emergency, who will respond, what each person's role will be during the response and what equipment is required as part of the response.

"Enclosure" means an uninterrupted constructed feature or obstacle used to surround and secure an area that is intended to effectively prevent unpermitted, uncontrolled, and unfettered access. It is designed to resist climbing and to prevent passage through it and under it. Enclosure can apply to aquatic facilities or aquatic venues.

"EPA Registered" means all products regulated and registered under the Federal Insecticide, Fungicide, and Rodenticide Act *(FIFRA)* by the EPA.

"Equipment Room or Area" means a space intended for the operation of pool pumps, filters, heaters, and controllers. This space is not intended for the storage of hazardous pool chemicals.

"Exit Gate" means an emergency exit, which is a gate or door allowing free exit at all times.

"Expansion Joint" means a watertight joint provided in a pool vessel used to relieve flexural stresses due to movement caused by thermal expansion/contraction.

"Fixture" *See "Plumbing Fixture"* or *"Hygiene Fixture."*

"Floatation Tank" *(a.k.a. Float Tank, Float Room/Pod/Spa/Chamber, Isolation Tank, or Sensory Deprivation Tank)* means a tub that contains a saturated solution of magnesium sulfate having a specific gravity of 1.23 to 1.3, provides a light and sound reduced environment, and is maintained at a temperature of approximately 92–96°F /33.3–35.6°C.

"Floatation Tank Solution" means a saturated solution of magnesium sulfate having a specific gravity of 1.23 to 1.3.

"Flume" means the riding channels of a waterslide which accommodate riders using or not using mats, tubes, rafts, and other transport vehicles as they slide along a path lubricated by a water flow.

"Foot Bath" means standing water in which bathers or aquatics staff rinse their feet.

"Free Chlorine Residual" or "Free Available Chlorine" *See "Chlorine.*

"Ground-Fault Circuit Interrupter" *(GFCI)* means a device for protection of personnel that de-energizes an electrical circuit or portion thereof in the event of excessive ground current.

"Handwashing Station" means a location which has a handwashing sink, adjacent soap with dispenser, hand drying device or paper towels and dispenser, and trash receptacle.
"Hygiene Facility" means an enclosed structure that may contain a toilet, shower, diaper-changing unit, handwashing station, and dressing capabilities serving bathers and patrons at an aquatic facility. Also referred to as a bathhouse.
"Hygiene Fixtures" means all components necessary for hygiene facilities including plumbing fixtures, diaper- changing stations, handwashing stations, trashcans, soap dispensers, paper towel dispensers or hand dryers, and toilet paper dispensers.
"Hyperchlorination" means the intentional and specific raising of chlorine levels for a prolonged period of time to inactivate pathogens following a fecal or vomit release in an aquatic venue.
"Imminent Health Hazard" means a substantial threat or danger to health that is considered to exist when there is evidence sufficient to show that a product, practice, circumstance, or event creates a situation that requires immediate correction or cessation of operation to prevent injury based on the number of potential injuries and the nature, severity, and duration of the anticipated injury or illness.
"Increased Risk Aquatic Venue" *See "Aquatic Venue."*
"Indoor Aquatic Facility" means a physical place that contains one or more aquatic venues and the surrounding bather and spectator/stadium seating areas within a structure that meets the definition of "Building" per the Oregon Structural Specialty Code (OSSC). Indoor Aquatic Facility does not include equipment, chemical storage, or bather hygiene rooms or any other rooms with a direct opening to the aquatic facility. Otherwise known as a natatorium.
"Infinity Edge" means a pool wall structure and adjacent perimeter deck that is designed in such a way where the top of the pool wall and adjacent deck are not visible from certain vantage points in the pool or from the opposite side of the pool. Water from the pool flows over the edge and is captured and treated for reuse through the normal pool filtration system. They are often also referred to as "vanishing edges," "negative edges," or "zero edges."
"Inlet" means wall or floor fittings where treated water is returned to the pool.
"Interactive Water Play Aquatic Venue" means any indoor or outdoor installation that includes sprayed, jetted, or other water sources contacting bathers and not incorporating standing or captured water as part of the bather activity area. These aquatic venues are also known as splash pads and spray pads. For the purposes of these rules, only those designed to recirculate water and intended for public use and recreation shall be regulated.
"Interior Space" means any substantially enclosed space having a roof and having a wall or walls which might reduce the free flow of outdoor air. Ventilation openings, fans, blowers, windows, doors, etc., shall not be construed as allowing free flow of outdoor air.
"Island" means a structure inside a pool where the perimeter is completely surrounded by the pool water and the top is above the surface of the pool.
"**Landing Pool**" *See "Pool."*
"Lazy River" *See "Aquatic Venue."*
"Lifeguard Supervisor" means an individual responsible for the oversight of lifeguard performance and emergency response at an aquatic facility, who has successfully completed a lifeguard supervisor training course that meets the requirements of this code, and who holds a valid certificate for such training.
"mg/L" means milligrams per liter and is the equivalent metric measure to parts per million *(ppm)*.
"Maximum Bather Load" means the maximum number of bathers allowed in the pool at any given time, as determined by the available pool space, water circulation, and safety standards. It is calculated based on the size of the pool and applicable code requirements to ensure safe usage, proper water quality, and effective emergency response capabilities.
"Monitoring" means the regular and purposeful observation and checking of systems or facilities and recording of data, including system alerts, excursions from acceptable ranges, and other facility issues. Monitoring includes human or electronic means.
"Moveable Floors" means a pool floor whose depth varies through the use of controls.
"No Diving Marker" means a sign with the words "No Diving" and the universal international symbol for "No Diving" pictured as an image of a diver with a red circle with a slash through it.
"Noise Criterion" means the single number rating that is somewhat sensitive to the relative loudness and speech interference properties of a given noise spectrum. The method consists of a family of criterion

curves extending from 63 to 8,000 Hz and a tangency rating procedure. The criterion curves define the limits of octave band spectra that must not be exceeded to meet occupant acceptance in certain spaces.
"Non-Substantial Alteration" means any minor modification, repair, or maintenance work that does not significantly change the aquatic venue's core structure, operational systems, or capacity.
"Oocyst" means the thick-walled, environmentally resistant structure released in the feces of infected animals that serves to transfer the infectious stages of sporozoan parasites *(e.g., Cryptosporidium)* to new hosts.
"Oxidation" means the process of changing the chemical structure of water contaminants by either increasing the number of oxygen atoms or reducing the number of electrons of the contaminant or other chemical reaction, which allows the contaminant to be more readily removed from the water or made more soluble in the water.
"Oxidation Reduction Potential" *(ORP)* means a measure of the tendency for a solution to either gain or lose electrons; higher *(more positive)* oxidation reduction potential indicates a more oxidative solution.
"Patron" means a bather or other person or occupant at an aquatic facility who may or may not have contact with aquatic venue water either through partial or total immersion. Patrons may not have contact with aquatic venue water but could still be exposed to potential contamination from the aquatic facility air, surfaces, or aerosols.
"Peninsula / Wing Wall" means a structural projection into a pool intended to provide separation within the body of water.
"**Perimeter Deck**" *See "Deck."*
"Perimeter Gutter System" means a weir or trough around the perimeter of a pool that is used to skim the surface of the water and return the water to the treatment system.
"Person" includes, in addition to the definition of "person" in ORS 174.100, municipalities, recreation districts, counties and state agencies, instrumentalities, or builder.
"pH" means the negative log of the concentration of hydrogen ions. When water ionizes, it produces hydrogen ions *(H+)* and hydroxide ions *(OH-)*. If there is an excess of hydrogen ions the water is acidic. If there is an excess of hydroxide ions the water is basic. pH ranges from 0 to 14. Pure water has a pH of 7.0. If pH is higher than 7.0, the water is said to be basic, or alkaline. If the water's pH is lower than 7.0, the water is acidic. As pH is raised, more hypochlorous acid *(HOCl)* ionization occurs and chlorine disinfectants decrease in effectiveness.
"Plumbing Fixture" means a receptacle, fixture, or device that is connected to a water supply system or discharges to a drainage system or both and may be used for the distribution and use of water; for example: toilets, urinals, showers, and hose bibs.
"Pool" means a subset of aquatic venues designed to have recirculated standing water that is chemically treated for total or partial bather immersion. This does not include spas.

- **"Activity Pool"** means a water attraction designed primarily for play activity that uses constructed features and devices including pad walks, flotation devices, and similar attractions.
- **"Diving Pool"** means a pool used exclusively for diving.
- **"Landing Pool"** means an aquatic venue or designated section of an aquatic venue located at the exit of one or more waterslide flumes. The body of water is intended and designed to receive a bather emerging from the flume for the purpose of terminating the slide action and providing a means of exit to a deck or walkway area.
- **"Skimmer Pool"** means a pool using a skimmer system.
- **"Surf Pool"** means any pool designed to generate waves dedicated to the activity of surfing on a surfboard or analogous surfing device commonly used in the ocean and intended for sport as opposed to general play intent for wave pools.
- **"Therapy Pool"** means a pool used exclusively for aquatic therapy, physical therapy, or rehabilitation to treat a diagnosed injury, illness, or medical condition, wherein the therapy is provided under the direct supervision of a licensed physical therapist, occupational therapist, or athletic trainer. This could include wound patients or immunocompromised patients whose health could be impacted if there is not additional water quality protection.
- "**Wading Pool"** means any pool used exclusively for wading and intended for use by young children where the depth does not exceed 2 feet (0.6 m).

- **“Wave Pool”** means any pool designed to simulate breaking or cyclic waves for purposes of general play. A wave pool is not the same as a surf pool, which generates waves dedicated to the activity of surfing on a surfboard or analogous surfing device commonly used in the ocean and intended for sport as opposed to general play intent for wave pools.

“Pool Deck” See “Deck.”
“Pool Slide” *See “Slide.”*
"Private Swimming Pool" means any aquatic venue owned by no more than four individuals, either jointly, individually or through association, incorporation or otherwise, and operated and maintained in conjunction with a companion residential housing facility having no more than four living units, for the use of the occupants thereof and their personal friends only. Private swimming pools shall not be subject to the provisions of these rules.
“Public Water Systems” means water systems including community water systems, non-transient/non-community water systems, or transient non-community water systems with exceptions as noted by AHJ and EPA.
“Qualified Lifeguard” means an individual who has successfully completed a Council for Model Aquatic Health Code-certified lifeguard training program or equivalent approved by the Authority, holds a current certificate for such training, has met the pre-service requirements, and is participating in continuing in-service training requirements of the aquatic facility.
“Qualified Operator” means a person performing the duties of the responsible supervisor, and responsible for providing direction and training to non-certified responsible supervisors and other pool personnel in regard to pool maintenance and operation. This person shall be certified by an organization providing training in pool safety, maintenance and operation recognized by the Division. Such courses and organizations include the Certified Pool Operator Program, by the Pool and Hot Tub Alliance, and the Aquatic Facility Operator Program, by the National Recreation and Parks Association, or equivalent, as determined by the Authority.
“Recessed Steps” means a way of ingress/egress for a pool, similar to a ladder but the individual treads are recessed into the pool wall.
“Recirculation System” means the combination of the main drain, gutter or skimmer, inlets, piping, pumps, controls, surge tank or balance tank to provide pool water recirculation to and from the pool and the treatment systems.
“Reduction Equivalent Dose *(RED)* Bias” means a variable used in UV system validation to account for differences in UV sensitivity between the UV system challenge microbe *(e.g., MS2 virus)* and the actual microbe to be inactivated *(e.g., Cryptosporidium)*.
“Responsible Supervisor” means an individual onsite that is responsible for water treatment operations when a “qualified operator” is not onsite at an aquatic facility.
“Rinse Shower” *See “Shower.”*
“Robotic Cleaner” means a modular vacuum system consisting of a motor-driven, in-pool suction device, either self-powered or powered through a low voltage cable, which is connected to a deck-side power supply.
"Rope and Float Line" means a continuous line not less than 1/4" *(6 mm)* in diameter and that is supported by buoys spaced no more than 5 feet apart to provide a visual and physical separation of the pool areas.
“Runout” means that part of a waterslide where riders are intended to decelerate and/or come to a stop. The runout is a continuation of the waterslide flume surface.
“Safety” *(as it relates to construction items)* means a design standard intended to prevent inadvertent or hazardous operation or use *(i.e., a passive engineering strategy)*.
“Safety Plan” means a written document that has procedures, requirements and/or standards related to safety which the aquatic facility staff shall follow. These plans include training, emergency response, and operations procedures.
“Safety Team” means any employee of the aquatic facility with job responsibilities related to the aquatic facility’s emergency action plan.
“Safety Vacuum Release System” *(SVRS)* means as defined in 15 USC 8002 (5) “a vacuum release system capable of providing vacuum release at a suction outlet caused by a high vacuum occurrence due to a suction outlet flow blockage.” A SVRS may be a mechanical device installed on the exposed single main suction pipe before a filtration or feature pump or an electrical device located as an attachment to

the filtration or feature pump control system or is integral with the filtration or feature pump or motor itself.

"Sanitize" means reducing the level of microbes to that considered safe by public health standards.

"Saturation Index" means a mathematical representation or scale representing the ability of water to deposit calcium carbonate, or dissolve metal, concrete, or grout.

"Secondary Treatment" means those disinfection processes or systems installed in addition to the standard systems required on all aquatic venues, which are required to be used for increased risk aquatic venues.

"Shower" means a device that sprays water on the body.

- **"Cleansing Shower"** means a shower located within a hygiene facility using warm water and soap. The purpose of these showers is to remove contaminants including perianal fecal material, sweat, skin cells, personal care products, and dirt before bathers enter the aquatic venue.
- **"Rinse Shower"** means a shower typically located in the pool deck area with ambient temperature water. The main purpose is to remove dirt, sand, or organic material prior to entering the aquatic venue to reduce the introduction of contaminants and the formation of disinfection byproducts.

"Skimmer" means a device installed in the pool wall whose purpose is to remove floating debris and surface water to the filter. They shall include a weir to allow for the automatic adjustment to small changes in water level, maintaining skimming of the surface water.

"Skimmer Pool" *See "Pool."*

"Skimmer System" means periodic locations along the top of the pool wall for removal of water from the pool's surface for treatment.

"Slide" means an aquatic feature where users slide down from an elevated height into water.

- **"Drop Slide"** means a slide that drops bathers into the water from a height above the water versus delivering the bather to the water entry point.
- **"Pool Slide"** means a slide having a configuration as defined in 16 CFR Part 1207 or is similar in construction to a playground slide used to allow users to slide from an elevated height to a pool. They shall include children's slides and all other non- flume slides that are mounted on the pool deck or within the basin of a pool.
- **"Waterslide"** means a slide that runs into a landing pool or runout through a fabricated channel with flowing water.
- "**Waterpark slide**" means a slide at an aquatic venue, which has a length of at least 20 feet (6.1m), not including the platform.

"Slip Resistant" means surfaces shall have a minimum dynamic coefficient of friction at least equal to the requirements of ANSI A137.1 and A326.3 for that installation as measured by the DCOF AcuTest.

"Spa" *See "Aquatic Venue."*

"Special Use Aquatic Venue" *See "Aquatic Venue."*

"Stadium Seating" means an area of high-occupancy seating provided above the pool level for observation.

"Standard" means something established by authority, custom, or general consent as a model or example.

"Storage" means the condition of remaining in one space for 1 hour or more. Materials in a closed pipe or tube awaiting transfer to another location shall not be considered to be stored.

"Structural Crack" means a break or split in the pool surface that weakens the structural integrity of the vessel.

"Substantial Alteration" means any major renovation, construction, or modification that significantly impacts the pool's structural, mechanical, or operational systems.

"Superchlorination" means the addition of large quantities of chlorine-based chemicals to kill algae, destroy odors, or improve the ability to maintain a disinfectant residual.

"Supplemental Treatment" means those disinfection processes or systems which are not required on an aquatic venue for health and safety reasons. They may be used to enhance overall system performance and improve water quality.

"Surf Pool" *See "Pool."*

"SVRS" *See "Safety Vacuum Release System."*

*"***Swimming Pool" See** *"Pool."*
"Therapy Pool" *See "Pool."*
"Toe Ledge" See "*Underwater Ledge*."
"Total Bromine" means the amount of bromine in the 1 oxidation state, which is the reactive, oxidized form. Commercially available test kits are not capable of distinguishing free bromine *(Br_2, HOBr, OBr^-)* from combined bromine *(bromamines)*. The bromine value specified in test results is the concentration of total bromine.
"Trichloramine" means a disinfection byproduct formed when chlorine binds to nitrogenous waste in pool water to form an amine-containing compound with three chlorine atoms *(NCl_3)*. It is a known acute respiratory and ocular irritant. It has low solubility in water and is rapidly released into the air above pools where it can accumulate, particularly in indoor settings.
"Trihalomethanes" *(THM)* means chemical compounds in which three of the four hydrogen atoms of methane *(CH_4)* are replaced by halogen atoms. Trihalomethanes are environmental pollutants, and many are considered carcinogenic.
"Tripping Hazard" means any condition or object within or around the aquatic venue that poses a risk of causing a person to lose their balance, stumble, or fall. This includes, but is not limited to, uneven surfaces, protruding objects, and improperly secured or misplaced pool equipment.
"Turnover" or "Turnover Rate" or "Turnover Time" means the period of time, usually expressed in hours, required to circulate a volume of water equal to the capacity of the aquatic venue.
"Underwater Bench" means a submerged seat with or without hydrotherapy jets.
"Underwater Ledge" or "Underwater Toe Ledge" means a continuous step in the pool wall that allows swimmers to rest by standing without treading water.
"Underwater Shelf" means a shallow, flat area within a pool that extends horizontally from the pool wall. It is designed to be submerged in water, typically with a depth of 8 to 24 inches, providing a shallow space for lounging, play, or easy entry into the pool. Also referred to as a tanning ledge, sun shelf, or Baja shelf.
"UV Transmissivity" means the percentage measurement of ultraviolet light able to pass through a solution.
"Variance" means written permission from the Authority for an aquatic venue to be operated when it does not comply with all the applicable rules for aquatic venues.
"Wading Pool" *See "Pool."*
"Waterslide" *See "Slide."*
"Water Quality Testing Device" *(WQTD)* means a product designed to measure the level of a parameter in water. A WQTD includes a device or method to provide a visual indication of a parameter level and may include one or more reagents and accessory items.
"Water Replenishment System" means a way to remove water from the pool as needed and replace with make- up water to maintain water quality.
"Wave Pools" *See "Pool."*
"Wing Wall / Peninsula" *See "Peninsula / Wing Wall."*
"Zero Depth Entry" means a sloped entry into a pool from deck level into the interior of the pool as a means of access and egress.

3.0 Cited Standards and Laws [Deleted]

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4.0[A] Aquatic Facility Design Standards and Construction

The provisions of Chapter 4 *(Aquatic Facility Design Standards and Construction)* apply to construction of a new AQUATIC FACILITY or AQUATIC VENUE or SUBSTANTIAL ALTERATION to an existing AQUATIC FACILITY or AQUATIC VENUE, unless otherwise noted.

Note: Section numbers with superscript "A" (e.g., 4.0A) denote a corresponding discussion in the Annex to the Model Aquatic Health Code.

4.1 Plan Submittal

4.1.1 Plan Submittal

4.1.1.1 Purpose AQUATIC FACILITY construction plans shall be designed to provide sufficient clarity to indicate the location, nature, and extent of the work proposed.

4.1.1.2 Conform AQUATIC FACILITY construction plans shall show in detail that the AQUATIC FACILITY will conform to the provisions of this CODE and all applicable local, state, territorial, federal, and tribal laws, as determined by the AHJ and to protect the health and SAFETY of the facility's BATHERS and PATRONS.

4.1.1.3 Approved Plans No person shall begin to construct a new AQUATIC FACILITY or shall SUBSTANTIALLY ALTER an existing AQUATIC FACILITY without first having the construction plans detailing the construction or SUBSTANTIAL ALTERATION submitted to and approved by the AHJ.

4.1.1.4 Plan Preparation All plans shall be prepared by a DESIGN PROFESSIONAL proficient in the application of this CODE and all applicable local, state, territorial, federal, and tribal laws relevant to the project and who shall apply this CODE and all applicable laws when preparing project plans.

4.1.1.5 Required Statements All construction plans shall include the following statements:

1) "The proposed aquatic facility and all equipment shall be constructed and installed in conformity with the approved plans and specifications or approved amendments," and

2) "No substantial alteration, changes, additions, or equipment not specified in the approved plans can be made or added until the plans for such substantial alteration, changes, additions, or equipment are submitted to and approved by the AHJ."

4.1.2 Content of Design Report

4.1.2.1 Basis of Design Report

4.1.2.1.1[A] Names / Addresses AQUATIC FACILITY plans shall include the name, address, and contact information for the owner, designer, and builder if available at the time of submission.

4.1.2.1.2 Site Information AQUATIC FACILITY plans shall include site information indicating at a minimum the location of all utilities, wells, topography, natural water features, and potential sources of surface drainage and pollution which have the potential to affect the proposed AQUATIC FACILITY.

4.1.2.1.3 Plot Plan AQUATIC FACILITY plans shall include a site plot plan including:

1) A general map and detailed scaled drawings of the AQUATIC FACILITY site plan or floor plan with detailed locations of the AQUATIC VENUES and AQUATIC FEATURES; and

2) The locations of all water supply facilities, sources of drinking water, public or private sewers, and relative elevations of paved or other walkways and the EQUIPMENT ROOM floor shall be shown on the plans with the elevations of storm and sanitary sewer inverts and street grade.

4.1.2.2 Plans and Specifications

4.1.2.2.1 Drawings Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall include an AQUATIC VENUE area plan and layout plan along with dimensioned longitudinal and transverse cross sections of the AQUATIC VENUE.

4.1.2.2.1.1 Operating Conditions The design documents shall include a record of operating conditions *and* intended use for each type of VENUE accepted by both the design engineer and owner/operator.

4.1.2.2.2 Aquatic Venue Attributes Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall include location and type of:

1) INLETS;
2) Overflows;
3) Drains;
4) Suction outlets;
5) Overflow gutters or devices;
6) Piping;
7) Designed POOL water elevation;
8) AQUATIC FEATURES such as ladders, stairs, diving boards, SLIDES, and play features;
9) Lighting;
10) POOL markings; and
11) Surface materials

4.1.2.2.3 Area Design Detailed scaled and dimensional drawings of the AQUATIC FACILITY and for each individual AQUATIC VENUE, as appropriate, shall include location and type of:

1) Design of ENCLOSURE including walls, fencing, entry and exit doors and gates, self- closing and latching hardware, and locks;
2) Design of DECK, including paving materials, DECK slope, and DECK drains;
3) Paved walkways and other hardscape features;
4) SLIP-RESISTANT flooring;
5) AQUATIC VENUE area finishes;
6) Drinking fountains or other sources of drinking water;
7) Entries and exits;
8) Hose bibs;
9) Fences;
10) Telephones; and
11) Area lighting.

4.1.2.2.4 Aquatic Venue Recirculation and Treatment Design Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall contain a flow diagram showing the location, plan, elevation, and schematics of:

1) Filters;
2) Pumps;
3) Chemical feeders and interlocks;
4) Chemical controllers and interlocks;
5) SECONDARY TREATMENT, if required;
6) Supplemental disinfection systems, if installed;
7) Ventilation devices or AIR HANDLING SYSTEMS;
8) Heaters;
9) Surge tanks, including operating levels;
10) BACKFLOW prevention assemblies and air gaps;
11) Valves;
12) Piping;
13) Flow meters;
14) Gauges;
15) Thermometers; and
16) Drainage system for the disposal of AQUATIC VENUE water and filter wastewater.

4.1.2.2.5 Equipment Room Design Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall contain a schematic layout of the AQUATIC VENUE EQUIPMENT ROOM OR AREA showing accessibility for installation and maintenance.

4.1.2.2.6 Chemical Storage Space Design Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall contain a schematic layout of the AQUATIC FACILITY CHEMICAL STORAGE SPACE(S).

4.1.2.2.7 Hygiene Facility Design Detailed scaled and dimensional drawings for each AQUATIC FACILITY shall show the location and number of all available HYGIENE FACILITIES provided including

dressing rooms, lockers and basket STORAGE, SHOWERS, lavatory, toilet FIXTURES, and DIAPER-CHANGING STATIONS.

4.1.2.3 Technical Specifications

4.1.2.3.1[A] Accompanying Drawings Technical specifications for the construction of each AQUATIC VENUE and all appurtenances shall accompany the drawings for the AQUATIC FACILITY plans.

4.1.2.3.2[A] Technical Details [Deleted]

4.1.2.3.3 Water Sources The technical specifications for each AQUATIC FACILITY shall include the sources of all water supplies.

4.1.2.3.4 Area and Volume Technical specifications shall include the water surface area and volume of each AQUATIC VENUE and associated water features, if applicable.

4.1.2.3.5[A] Maximum Bather Load The technical specifications for each AQUATIC FACILITY and each AQUATIC VENUE shall include MAXIMUM BATHER LOAD, respectively.

4.1.2.3.5.1 Used for Designing Systems [Deleted]

4.1.2.3.5.2 Incorporate Non-Water Related Areas The MAXIMUM BATHER LOAD for an AQUATIC FACILITY shall be used for designing systems that serve BATHERS and PATRONS and shall incorporate non-water related areas such as DECKS and other adjacent portions of the AQUATIC FACILITY not associated with the AQUATIC VENUE.

4.1.2.3.5.3 Calculating Maximum Bather Load The MAXIMUM BATHER LOAD shall be calculated by dividing the surface area in square feet of the AQUATIC VENUE by the density factor *(D)* that fits the specific AQUATIC VENUE being considered.

MAXIMUM BATHER LOAD = AQUATIC VENUE Surface Area / D

The density factors *(D)* are Water/BATHER-related:

1) Indoor or outdoor swimming pools with a surface area of less than 2,000 square feet = 24 ft^2 per BATHER.
2) Outdoor swimming pools with a surface area of more than 2,000 square feet, where "F" equals the surface area of the pool greater than five feet (1.5m) and "S" equals the surface area of the pool less than five feet (1.5m) deep. (F / 27 ft^2 per BATHER) + (S / 15 ft^2 per BATHER).
3) Diving Area = 300 ft^2 per diving board or platform
4) Spas = 10 ft^2 per BATHER
5) WATERSLIDE LANDING POOL density factor = manufacturer-established capacity at any given time.
6) INTERACTIVE WATER PLAY water density factor = 10 ft_2 *(0.9 m_2)* per BATHER on surface.
7) SURF POOL density factor = manufacturer-established capacity at any given time.

4.1.2.3.5.3.1 Density Factor Modification The density factors in 4.1.2.3.5.3 may be modified for higher BATHER or PATRON density, but they shall not be modified to result in less BATHERS per square feet than listed for the factors in 4.1.2.3.5.3.

4.1.2.3.5.3.2 Aquatic Facility Maximum Bather Load The MAXIMUM BATHER LOAD for an AQUATIC FACILITY shall be determined by adding the calculations for each AQUATIC VENUE in the AQUATIC FACILITY.

4.1.2.3.6 Equipment Characteristics and Rating The technical specifications and supplemental engineering data for each AQUATIC FACILITY and each AQUATIC VENUE shall include:

1) Detailed information on the type, size, operating characteristics, and rating of all mechanical and electrical equipment;
2) Hydraulic computations for head loss in all piping and recirculation equipment;
3) Pump curves that demonstrate that the selected recirculation pump*(s)* are adequate for the calculated required flows; and
4) Demonstrate that the selected disinfectant feeders/equipment are of sufficient size and capacity.

4.1.2.3.7 Recirculation Rate and Turnover The technical specifications for each AQUATIC VENUE shall include the recirculation rate and TURNOVER TIME.

4.1.2.3.8 Filter Media The technical specifications for each AQUATIC VENUE shall include information on the filter media such as diatomaceous earth, sand, gravel, or other approved material.

4.1.2.3.9 Equipment Specifications [Deleted]

4.1.2.3.10 Safety Equipment Specifications The technical specifications for each AQUATIC FACILITY shall include information on all aquatic safety equipment.

4.1.2.3.11 Design for Risk Management The layout for zones of PATRON surveillance as specified in 6.3.3.1.1 shall be included and must show features or design configurations that can impact PATRON surveillance.
4.1.2.3.12 Other Specifications The technical specifications for each AQUATIC FACILITY and each AQUATIC VENUE shall include additional information related to the project requested by the AHJ for the purposes of the construction of the AQUATIC FACILITY and each AQUATIC VENUE and all appurtenances.
4.1.2.3.13 Air Filter Media [Deleted]

4.1.3[A] Plan Approval

4.1.3.1 New Construction

4.1.3.1.1 Approval Limitations The AHJ shall clearly state in its construction approval documents the limitations of their approval.
4.1.3.1.2 Other Approvals The approval shall also state that it is independent of all other required approvals such as Building, Zoning, Fire, Electrical, Structural, and any other approvals as required by all applicable local, state, territorial, federal, and tribal laws and the applicant must separately obtain all other required approvals and permits.
4.1.3.1.3 Plan Review Coordination The AHJ shall coordinate their AQUATIC FACILITY plan review and communicate their approval with the owner's representative and DESIGN PROFESSIONALS associated with an AQUATIC FACILITY construction.
4.1.3.1.4 Plan Review Report The AHJ shall provide a plan submission compliance review list to the AQUATIC FACILITY owner with the following information:

1) A comment section, keyed to the compliance review list, shall detail unsatisfactory and insufficient findings;
2) Indication of the AHJ approval or disapproval of the AQUATIC FACILITY construction plans;
3) In the case of a disapproval, specific reasons for disapproval, and procedure for resubmittal; and
4) Reviewer's name, signature, and date of review.

4.1.3.1.5 Plans Maintained The AQUATIC FACILITY owner shall maintain at least one set of their own approved plans made available to AHJ on file for as long as the AQUATIC FACILITY is in operation.

4.1.3.2 Non-Substantial Alterations

4.1.3.2.1 Alteration Review The AQUATIC FACILITY owner planning a NON-SUBSTANTIAL ALTERATION shall contact the AHJ to review proposed changes prior to starting the NON-SUBSTANTIAL ALTERATION.
4.1.3.2.2 Alteration Scope The AQUATIC FACILITY operator shall consult with the AHJ to determine if new or modified plans must be submitted for plan review and approval for other NON- SUBSTANTIAL ALTERATIONS proposed.

4.1.3.3 [A] Replacements

4.1.3.3.1 Replacement Approval Prior to replacing equipment, the AQUATIC FACILITY owner shall submit technical verification to the AHJ that all replacement equipment is equal to that which was originally approved and installed.
4.1.3.3.2 Replacement Equipment Equivalency The replacement of, filters, feeders, controllers, flowmeters, valves, or other similar equipment with identical or substantially similar equipment may be done without submission to the AHJ for approval of new or altered AQUATIC FACILITY plans.
4.1.3.3.3 Emergency Replacement In emergencies, the replacement may be made prior to receiving the AHJ's approval, with the owner accepting responsibility for proper immediate replacement,
4.1.3.3.3.1 Documentation Where emergency replacements are installed as per 4.1.3.3.3, the owner shall submit documentation for review and approval of the replacement to the AHJ within 45 days. if the equipment is not deemed equivalent by the AHJ.
4.1.3.3.4 Replacement Record Maintenance The AHJ shall provide the AQUATIC FACILITY owner written approval or disapproval of the proposed replacement equipment's equivalency.
4.1.3.3.5 Documentation Documentation of proposed, approved, and disapproved replacements shall be maintained in the AHJ's AQUATIC FACILITY files.

4.1.4[A] Compliance Certificate [Deleted]

4.1.5 Construction Permits [Deleted]

4.2 Materials

4.2.1 Aquatic Venues

4.2.1.1 Construction Material AQUATIC VENUES shall be constructed of reinforced concrete or impervious and structurally sound material(s), which provide a smooth, easily cleaned, watertight structure capable of withstanding the anticipated stresses/loads for full and empty conditions taking into consideration climatic, hydrostatic, seismic, and the integration of the AQUATIC VENUE with other structural conditions and as required by applicable CODES. Prefabricated basins with a water temperature above 60F with integral filtration and sanitizing equipment are not allowed**.**

4.2.1.2 Durability All materials shall be inert, non-toxic, resistant to corrosion, impervious, enduring, and resistant to damages related to environmental conditions of the installation region.

4.2.1.3 Areas Subject to Freezing Where located in areas subject to freezing, AQUATIC VENUES and appurtenances shall be designed to protect against damage due to freezing.

4.2.1.4 Competitive Pools Competitive or lap POOLS may have lane markings and end wall targets installed in accordance with FINA, NCAA, USA Swimming, NFHS, or other recognized STANDARD.

4.2.1.5 A Design Parameters Any graphics, color, or finish incorporated into the construction of a POOL or painted on the floor or walls shall not prevent the detection of a BATHER in distress, algae, sediment, or other objects in the AQUATIC VENUE.

4.2.1.6 Watertight POOLS shall be designed in such a way to maintain their ability to retain the designed amount of water.

4.2.1.7A Smooth Finish All vertical walls shall have a durable finish suitable for regular scrubbing and cleaning at the waterline.

4.2.1.7.1 Daily Cleaning The finish shall be able to withstand daily brushing, scrubbing, and cleaning of the surface in accordance with the manufacturer's recommendations.

4.2.1.7.2 Skimmer Pools SKIMMER POOLS shall have a 6 inch *(152 mm)* to 12 inch *(305 mm)* high waterline finish that meets the requirements of 4.2.1.7 and 4.2.1.7.1.

4.2.1.7.3 Gutter / Perimeter Overflow Systems Gutter or perimeter overflow systems shall have a minimum finish height of 2 inches (*51 mm)* that meets the requirements of 4.2.1.7 and 4.2.1.7.1.

4.2.1.7.4 Dark Colors [Deleted]

4.2.1.8A Slip Resistant POOL floors in areas less than 5 feet *(1.5 m)* deep shall have a SLIP-RESISTANT finish.

4.2.1.9 Stainless Steel, Vinyl, PVC-P or PVC Pools Stainless steel, vinyl, PVC-P, or PVC panel and liner POOL finish systems shall be acceptable provided that the system is installed on top of approved materials and design requirements as listed within this section.

4.2.1.9.1 Damaged If at any time the liner system is damaged or cut in such a way that its integrity is compromised, the POOL shall be shut down until the system is fully repaired.

4.2.1.10 Not Permitted Wood, sand, or earth shall not be permitted as an interior finish.

4.2.2 Indoor Aquatic Facility [Deleted]

4.3 Equipment Standards

4.3.1 Accredited Standards Where applicable, all equipment used or proposed for use in AQUATIC FACILITIES governed under this CODE shall be:

1) Of a proven design and construction and
2) CERTIFIED, LISTED, AND LABELED to a specific STANDARD for the specified equipment use by an ANSI- accredited certification organization.

4.3.2 No Standards Where STANDARDS do not exist, technical documentation shall be submitted to the AHJ to demonstrate acceptability for use in AQUATIC FACILITIES.

4.3.3 Suitable for Intent All equipment and materials used or proposed for use in AQUATIC FACILITIES shall be suitable for their intended use and be installed in accordance with this CODE, as

CERTIFIED, LISTED, AND LABELED to a specific STANDARD by an ANSI-accredited certification organization where applicable, and as specified by the manufacturer.
4.3.3.1 Proof of Acceptability The AHJ shall have the authority to require tests, as proof of acceptability.

4.4 Aquatic Facility and Venue Operation and Maintenance [N/A]

4.5 Aquatic Venue Structure

4.5.1[A] Design for Risk Management Design of AQUATIC FACILITIES and/or AQUATIC VENUE*(s)* shall include consultation with and input by the owner and/or an aquatic risk management consultant and address operational considerations such as the layout of zones of PATRON surveillance.
4.5.1.1 Basic Requirements The AQUATIC VENUE shape shall provide for the SAFETY of swimmers, the thorough and complete circulation of the water, the ability to clean and maintain the AQUATIC VENUE, and be considered when planning for effective supervision and surveillance of BATHERS and PATRONS using the AQUATIC VENUE.
4.5.1.2 Water Clarity Main suction outlets or a permanent tile used as a reference to test for or observe water clarity shall be installed according to 4.5.1.2.1 through 4.5.1.2.4.
4.5.1.2.1 Pools Ten Feet Deep or Less For POOLS 10 feet deep (*3.0 m*) or less, a 4 inch x 4 inch square *(10.2 cm x 10.2 cm)* reference tile in a contrasting color to the POOL floor or main suction outlet shall be located at the deepest part of the POOL.
4.5.1.2.2 Pools Over Ten Feet Deep For POOLS over 10 feet deep *(3.0 m)* an 8 inch by 8 inch square *(20.3 cm x 20.3 cm)* reference tile in a contrasting color to the POOL floor or main suction outlet shall be located at the deepest part of the POOL.
4.5.1.2.3 Visible This reference tile shall be visible at all times at any point on the DECK up to 30 feet *(9.1 m)* away in a direct line of sight from the tile or main drain.
4.5.1.2.4 Spas For SPAS, this test shall be performed when the water is in a non-turbulent state and bubbles have been allowed to dissipate.
4.5.1.2.5 Reference Tile Alternative Where main suction outlets are not provided for or where finish materials do not allow for the installation of a water clarity reference tile, an alternate means of achieving the goal of observing water clarity shall be provided.

4.5.2 Bottom Slope

4.5.2.1[A] Under Five Feet In water depths under 5 feet *(1.5 m)*, the slope of the floor of all POOLS shall not exceed 1 foot *(30.5 cm)* vertical drop for every 12 feet *(3.7 m)* horizontal.
4.5.2.2 Five Feet or Over In water depths 5 foot *(1.5 m)* and greater, the slope of the floors of all POOLS shall not exceed 1 foot *(30.5 cm)* vertical to 3 feet *(0.9 m)* horizontal. ***Exception:*** POOLS designed and used for competitive diving shall be designed to meet the STANDARDS of the sanctioning organization *(such as NFHS, NCAA, USA Diving, or FINA)*.
4.5.2.3[A] Drain POOLS shall be designed so that they drain without leaving puddles or trapped standing water.

4.5.3 Pool Access / Egress

4.5.3[A] Accessibility Each POOL shall have a minimum of two means of access and egress, with one located within 10 feet *(3.0 m)* of the shallowest end, and one located within 10 feet of the deepest end of the POOL, where applicable, with the exception of:
1) Waterslide landing pools,
2) Waterslide runouts, and
3) Wave pools.

4.5.3.2 Acceptable Means Acceptable means of access / egress shall include stairs / handrails, grab rails / RECESSED STEPS, ladders, ramps, and zero-depth entries.
4.5.3.3 Large Venues For POOLS wider than 30 feet *(9.1 m)*, such means of access / egress shall be provided on each side of the POOL.

4.5.3.3.1 Distance Apart For POOLS wider than 30 feet *(9.1 m)*, such means of access / egress shall not be more than 75 feet *(22.9 m)* apart.

4.5.4 Stairs

4.5.4.1 Slip Resistant Where provided, stairs shall be constructed with SLIP-RESISTANT materials.

4.5.4.2 Outlined Edges The leading horizontal and vertical edges of stair treads shall be outlined with a continuous SLIP-RESISTANT, contrasting tile or other permanent marking of not less than 1 inch *(25.4 mm)* and not greater than 2 inches *(50.8 mm)*.

4.5.4.3 [A] Deep Water Where stairs are provided in POOL water depths greater than 5 feet *(1.5 m)*, they shall be recessed and not protrude into the swimming area of the POOL.

4.5.4.3.1 Lowest Tread Where stairs are provided in POOL water depths greater than 5 feet *(1.5 m)*, the lowest tread shall be not less than 4 feet *(1.2 m)* below normal water elevation.

4.5.4.4 Stairs Stairs shall have a minimum uniform horizontal tread depth of 12 10 inches *(25 cm)*, and a minimum unobstructed tread width of 24 inches *(61.0 cm)*.

4.5.4.5 Dimensions Dimensions of stair treads for other types of stairs shall conform to requirements of:

1) Table 4.5.4.5,
2) Figure 4.5.4.5.1, and
3) Figure 4.5.4.5.2

Table 4.5.4.5: Required Dimensions for Stair Treads and Risers

Dimensions	T-1 Standard	T-2	W-1	H-1
Minimum	10 inches *(25 cm)*	T-1	24 inches *(61.0 cm)*	6 inches *(15.2 cm)*
Maximum	18 inches *(45.7 cm)*	T-1	N/A	12 inches *(30.5 cm)*

Figure 4.5.4.5.1: Stair Treads and Risers: Side View

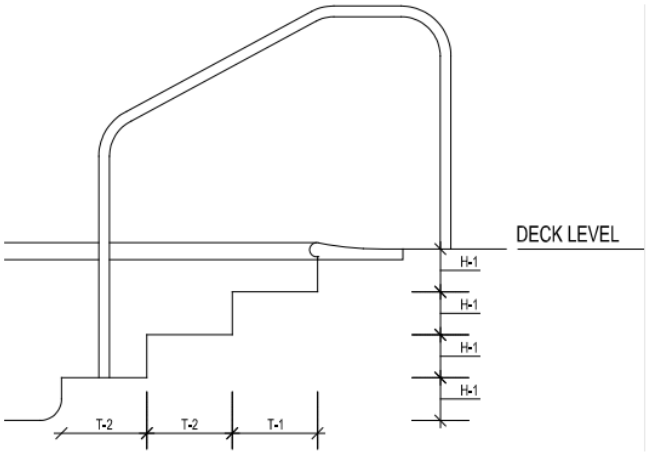
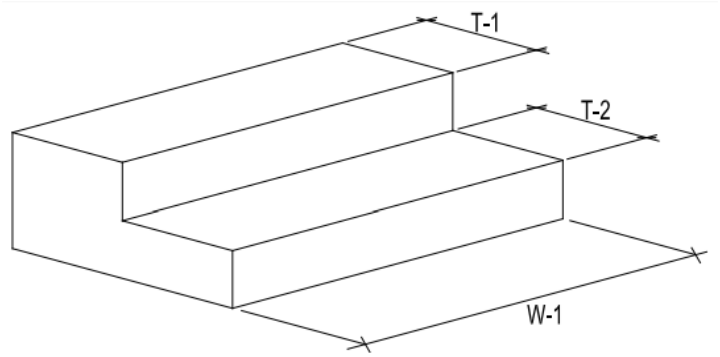


Figure 4.5.4.5.2: Stair Treads and Risers: Front View



4.5.4.6 Stair Risers Stair risers shall have a minimum uniform height of 6 inches *(15.2 cm)* and a maximum height of 12 inches *(30.5 cm)*, with a tolerance of ½ inches *(12.7 mm)* between adjacent risers.
4.5.4.6.1 Transitional Areas Stairs shall not be used underwater to transition between two sections of POOL of different depths. The bottom riser may vary due to potential cross slopes with the POOL floor; however, the bottom step riser may not exceed the maximum allowable height required by this section.
4.5.4.7 Top Surface The top surface of the uppermost stair tread shall be located not more than 12 inches *(30.5 cm)* below the POOL coping or DECK.
4.5.4.8 [A] Perimeter Gutter Systems For POOLS with PERIMETER GUTTER SYSTEMS, the gutter may serve as a step, provided that the gutter is provided with a grating or cover and conforms to all construction and dimensional requirements herein specified.
4.5.4.9 Approach Steps Approach steps on the exterior of a raised wall extending above the DECK are required unless the raised wall is 19 inches (48.3 cm) or less in height above the DECK and serves as a transfer tier or pivot-seated entry. If no other entry points are provided and the water depth exceeds 24 inches, approach steps must be installed to ensure safe and accessible entry into the AQUATIC VENUE.

Exterior Steps:

1) Steps located on the outside of the wall must meet the standards for the Building Codes Division;
2) A handrail shall be provided along both sides of the stairs having one or more risers, including the riser to the deck;
3) Handrails shall be located at the outside edge of the stairs or spaced apart a minimum distance of 36 inches;
4) Dimensions of handrails shall conform to requirements of Table 4.5.5.7 and Figure 4.5.5.7.1; and
5) Handrails shall return to the AQUATIC VENUE wall, guard or deck or shall be continuous to the handrail of an adjacent stair.

Interior Steps:

1) Stairway treads shall have a minimum unobstructed horizontal tread depth of 10" and a minimum unobstructed surface area of 240 square inches;
2) Stair risers must conform to the requirements of 4.5.4.6;
3) Handrails shall be located at the outside edge of the stairs or spaced apart a minimum distance of 36 inches;
4) Dimensions of handrails shall conform to requirements of Table 4.5.5.7 and Figure 4.5.5.7.1;
5) Handrails shall return to the spa pool wall, guard or deck or shall be continuous to the handrail of an adjacent stair; and
6) The leading horizontal edge or vertical edge (if applicable) of the interior spa steps shall be outlined with a continuous slip-resistant color contrasting tile or other permanent marking of not less than ¾ inch and not greater than 2 inches.

4.5.5 Handrails

4.5.5.1 Provided Handrail*(s)* shall be provided for each set of stairs.

4.5.5.2 Corrosion Resistant Handrails shall be constructed of corrosion-resistant materials and anchored securely.

4.5.5.3 [A] Upper Railing The upper railing surface of handrails shall extend above the POOL coping or DECK a minimum of 28 inches *(71.1 cm)*.

4.5.5.4. Wider Than Five Feet Stairs wider than 5 feet *(1.5 m)* shall have handrails at either side and spaced not more than every 12 feet *(3.7 m)* apart across the entire stair width, or as approved by the AHJ

4.5.5.4 [A] ADAAG Accessibility [Deleted]

4.5.5.5 Support Handrails shall be designed to resist a load of 50 pounds *(22.7 kg)* per linear foot applied in any direction and independently a single concentrated load of 200 pounds *(90.7 kg)* applied in any direction at any location.

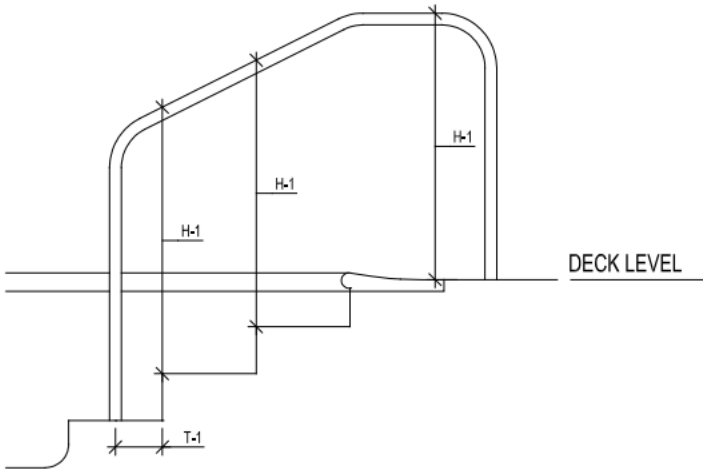
4.5.5.5.1 Transfer Loads Handrails shall be designed to transfer these loads through the supports to the POOL or DECK structure.

4.5.5.6 [A] Dimensions Dimensions of handrails shall conform to requirements of Table 4.5.5.7 and Figure 4.5.5.7.1.

Table 4.5.5.7: Stair Handrail Dimensions

Dimensions	T-1	H-1
Minimum	3 inches *(7.6 cm)*	34 inches *(86.4 cm)*
Maximum	N/A	38 inches *(96.5 cm)*

Figure 4.5.5.7.1: Stair Handrails: Side View



4.5.6 Grab Rails

4.5.6.1 Corrosion Resistant Where grab rails are provided, they shall be constructed of corrosion-resistant materials.

4.5.6.2 Anchored Grab rails shall be anchored securely.

4.5.6.3 Provided Grab rails shall be provided at both sides of RECESSED STEPS.

4.5.6.4 Clear Space The horizontal clear space between grab rails shall be not less than 18 inches *(45.7 cm)* and not more than 24 inches *(61.0 cm)*.

4.5.6.5 Upper Railing The upper railing surface of grab rails shall extend above the POOL coping or DECK a minimum of 28 inches *(71.1 cm)*.

4.5.6.6 Support Grab rails shall be designed to resist a load of 50 pounds *(22.7 kg)* per linear foot applied in any direction and independently a single concentrated load of 200 pounds *(90.7 kg)* applied in any direction at any location.

4.5.6.6.1 Transfer Loads Grab rails shall be designed to transfer these loads through the supports to the POOL or DECK structure.

4.5.7 Recessed Steps

4.5.7.1 Slip Resistant Recessed steps shall be SLIP RESISTANT.
4.5.7.2 Easily Cleaned RECESSED STEPS shall be designed to be easily cleaned.
4.5.7.3 Drain RECESSED STEPS shall drain into the POOL.
4.5.7.4 Dimensions Dimensions of RECESSED STEPS shall conform to requirements of:

1) Table 4.5.7.4,
2) Figure 4.5.7.4.1, and
3) Figure 4.5.7.4.2

Table 4.5.7.4: Recessed Step Dimensions

Dimensions	H-1	H-2	W-1	D-1	D-2
Minimum	6 inches *(15.2 cm)*	5 inches *(12.7 cm)*	12 inches *(30.5 cm)*	5 inches *(12.7 cm)*	N/A
Maximum	12 inches *(30.5 cm)*	N/A	N/A	N/A	2.5 inches *(6.5 cm)*

Figure 4.5.7.4.1: Recessed Step Dimensions: Side View

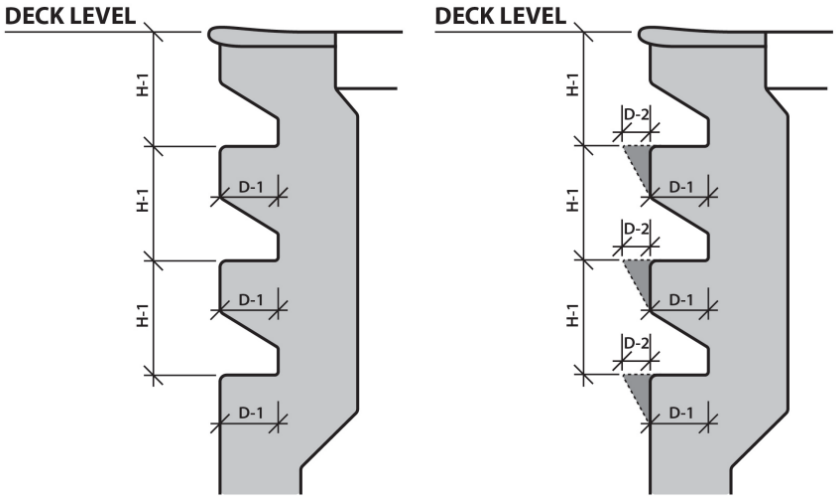
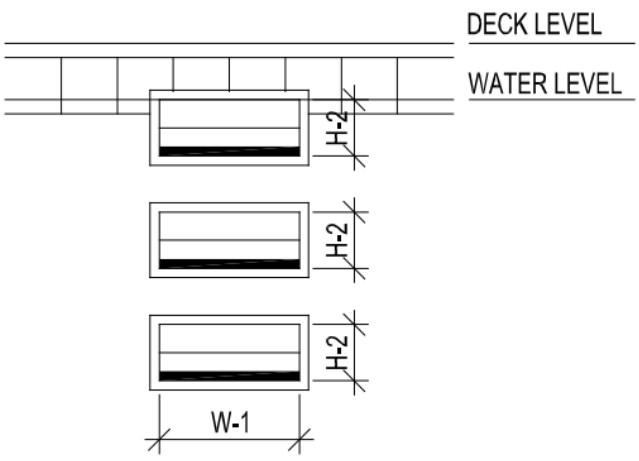


Figure 4.5.7.4.2: Recessed Step Dimensions: Front View



4.5.7.5 Uniformly Spaced RECESSED STEPS shall be uniformly spaced not less than 6 inches *(15.2 cm)* and not more than 12 inches *(30.5 cm)* vertically along the POOL wall.
4.5.7.6 Uppermost Step The top surface of the uppermost RECESSED STEP shall be located not more than 12 inches *(30.5 cm)* below the POOL coping or DECK.

4.5.7.7 Perimeter Gutter Systems For POOLS with PERIMETER GUTTER SYSTEMS, the gutter may serve as a step, provided that the gutter is provided with a grating or cover and conforms to all construction and dimensional requirements herein specified.

4.5.8 Ladders

4.5.8.1 General Guidance for Ladders

4.5.8.1.1 Corrosion Resistant Where provided, ladders shall be constructed of corrosion- resistant materials.

4.5.8.1.2 Anchored Ladders shall be anchored securely to the DECK.

4.5.8.2 [A] Ladder Handrails

4.5.8.2.1 Two Handrails Provided Ladders shall have two handrails.

4.5.8.2.2 Clear Space The horizontal clear space between handrails shall be not less than 17 inches *(43.2 cm)* and not more than 24 inches *(61.0 cm)*.

4.5.8.2.3 Upper Railing The upper railing surface of handrails shall extend above the POOL coping or DECK a minimum of 28 inches *(71.7 cm)*.

4.5.8.2.4[A] Pool Wall The clear space between handrails and the POOL wall shall be not less than 3 inches *(7.6 cm)* and not more than 4 inches *(10.2 cm)* between the POOL wall and the ladder.

4.5.8.2.5[A] Support Ladders shall be designed to resist a load of 50 pounds *(22.7 kg)* per linear foot applied in any direction and independently a single concentrated load of 200 pounds *(90.7 kg)* applied in any direction at any location.

4.5.8.2.5.1 Transfer Loads Ladders shall be designed to transfer these loads through the supports to the POOL or DECK structure.

4.5.8.3 Ladder Treads

4.5.8.3.1 Slip Resistant Ladder treads shall be SLIP RESISTANT.

4.5.8.3.2 Tread Depth Ladder treads shall have a minimum horizontal tread depth of 1.5 inches *(3.8 cm)*.

4.5.8.3.2.1 Distance Between Tread and Pool Wall The distance between the horizontal tread and the POOL wall shall not be greater than 4 inches *(10.2 cm)*.

4.5.8.3.3 Uniformly Spaced Ladder treads shall be uniformly spaced not less than 7 inches *(17.8 cm)* and not more than 12 inches *(30.5 cm)* vertically at the handrails.

4.5.8.3.4 Upmost Ladder Tread The top surface of the upmost ladder tread shall be located not more than 12 inches *(30.5 cm)* below the POOL coping, gutter, or DECK.

4.5.9 Zero Depth (Sloped) Entries

4.5.9.1 Slip Resistant Where ZERO DEPTH ENTRIES are provided, they shall be constructed with SLIP-RESISTANT materials.

4.5.9.2 Maximum Floor Slope ZERO DEPTH ENTRIES shall have a maximum floor slope of 1:12, consistent with the requirements of 4.5.2.1.

4.5.9.2.1 Slope Changes Changes in floor slope shall be permitted.

4.5.9.3 Trench Drains Trench drains shall be used along ZERO DEPTH ENTRIES at the waterline to facilitate surface skimming.

4.5.9.3.1 Flat or Follow Slope The trenches may be flat or follow the slope of the ZERO DEPTH ENTRY.

4.5.9.3.2 Handholds Any handholds that present a trip hazard shall not be continuous along the ZERO DEPTH ENTRY.

4.5.9.4 Rope and Float Line [Deleted]

4.5.10 Disabled Access [Deleted]

4.5.11 Color and Finish

4.5.11.1[A] White or Light Pastel Floors and walls below the water line shall be white or light pastel in color such that from the POOL DECK a BATHER is visible on the POOL floor and the following items can be identified:

1) Algae growth, debris, or dirt within the POOL;
2) CRACKS in the surface finish of the POOL; and

3) Reference tiles defined in 4.5.1.2.

4.5.11.1.1 A Munsell Color Value The finish shall be at least 6.5 on the Munsell color value scale.

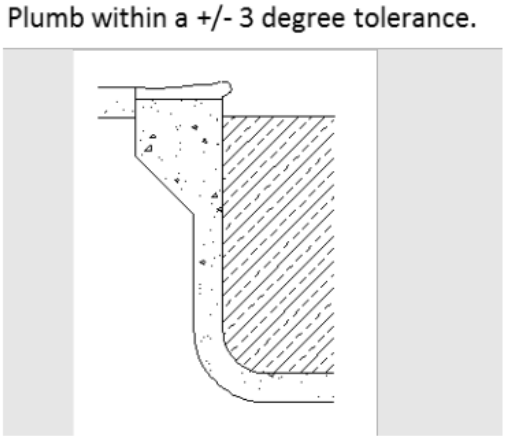
4.5.11.1.2 Exceptions An exception shall be made for the following AQUATIC VENUE components.

1) Competitive lane markings,
2) Dedicated competitive diving well floors,
3) Step or bench edge markings,
4) POOLS shallower than 24 inches *(61.0 cm)*,
5) Water line tiles, or
6) WAVE POOL and SURF POOL depth change indicator tiles.

4.5.12 Walls

4.5.12.1 Plumb POOL walls shall be plumb within a +/- 3 degree tolerance to a water depth of at least 5 feet *(1.5 m)* unless the wall design requires structural support ledges and slopes below to support the upper wall. Refer to Figure 4.5.12.1.

Figure 4.5.12.1: Plumb Pool Walls: Cross-Section



4.5.12.2 Contrasting Color A contrasting color shall be provided on the edges of any support ledge to draw attention to the ledge for BATHER SAFETY.

4.5.12.3 Rounded Corners All corners created by adjoining walls shall be rounded or have a radius in both the vertical and horizontal dimensions to eliminate sharp corners.

4.5.12.4[A] No Protrusions, Extensions, Means of Entanglement, or Obstructions There shall be no protrusions, extension, means of entanglement, or other obstructions in the AQUATIC VENUE that may cause the entrapment or injury of the user or interfere with proper POOL operation.

4.5.12.5 Transitional Point Where walls join the floor, the transitional point or profile shall comply with the following:

4.5.12.5.1 Intersect Walls may intersect with the floor at an angle or a transition profile.

4.5.12.5.2 Depths 3–5 Feet At water depths 3–5 ft *(91–152 cm)*, the maximum radius shall be 2 ft 3 in *(69 cm)*.

4.5.12.5.3 Depths Less Than Three Feet At water depths 3 ft *(91 cm)* or less, a transitional radius shall not exceed 6 in *(15 cm)* and shall be tangent to the wall and may be tangent to or intersecting the floor.

4.5.12.5.4 Depths Greater Than Three Feet At water depths greater than 3 ft *(91 cm)*, a transitional radius shall be tangent to the wall at a point no less than 2 ft 6 in *(76 cm)* below the water surface and may progressively increase from 6 in *(15 cm)* to a value capable of being tangent to or intersecting the floor.

4.5.13A Structural Stability

4.5.13.1 Withstand Loads The AQUATIC VENUE shall be watertight, constructed of waterproof and enduring materials compatible with the swimming pool environment and shall be designed to withstand all anticipated loading for both pool-empty and pool-full conditions.

4.5.13.2 Hydrostatic Relief Valve A hydrostatic relief valve and/or suitable under drain system shall be provided where the water table exerts hydrostatic pressure to uplift the AQUATIC VENUE when empty or drained.

4.5.13.3 Freezing [Deleted]

4.5.14[A] Handholds

4.5.14.1 Handholds Provided Where not otherwise exempted, every POOL shall be provided with handholds *(PERIMETER GUTTER SYSTEM, coping, horizontal bars, recessed handholds, cantilevered DECKING)* around the perimeter of the POOL where the water depth at the wall exceeds 24 inches *(61.0 cm)*.

4.5.14.1.1 Installed These handholds shall be installed not greater than 9 inches *(22.9 cm)* above, or 3 inches *(7.6 cm)* below static water level.

4.5.14.2 Horizontal Recesses Horizontal recesses may be used for handholds provided they are a minimum of 24 inches *(61.0 cm)* long, a minimum of 4 inches *(10.2 cm)* high and between 2 inches *(5.1 cm)* and 3 inches *(7.6 cm)* deep.

4.5.14.2.1 Drain Horizontal recesses shall drain into the POOL.

4.5.14.2.2 Consecutive Recesses Horizontal recesses need not be continuous, but consecutive recesses shall be separated by no more than 12 inches *(30.5 cm)* of wall.

4.5.14.3 Decking Where PERIMETER GUTTER SYSTEMS are not provided, a coping or cantilevered DECKING of reinforced concrete or material equivalent in strength and durability, with rounded, SLIP-RESISTANT edges shall be provided.

4.5.14.4 Coping Dimensions The horizontal overhang for coping or cantilevered DECKING shall not be greater than 2 inches *(5.1 cm)* from the vertical plane of the POOL wall, nor less than 1 inch *(2.5 cm)*.

4.5.14.5 Coping Thickness The vertical thickness of the coping or cantilevered DECKING shall not exceed 2.5 inches *(6.4 cm)* for the horizontal overhang.

4.5.15 Infinity Edges

4.5.15.1[A] Perimeter Restrictions [Deleted]

4.5.15.2 Length The length of an INFINITY EDGE shall be no more than 30 feet *(9.1 m)* long when in water depths greater than 5 feet *(1.5 m)*.

4.5.15.2.1 Shallow Water No maximum distance is enforced for the length of INFINITY EDGES in shallow water 5 feet *(1.5 m)* and less.

4.5.15.3 [A] Handholds Handholds conforming to the requirements of 4.5.14 shall be provided for INFINITY EDGES, which may be separate from, or incorporated as part of the INFINITY EDGE detail.

4.5.15.4 Construction Guidance Where INFINITY EDGES are provided, they shall be constructed of reinforced concrete or other impervious and structurally rigid material*(s)* and designed to withstand the loads imposed by POOL water, BATHERS, and adjacent soils or structures.

4.5.15.5 Overflow Basins Troughs, basins, or capture drains designed to receive the overflow from INFINITY EDGES shall be watertight and free from STRUCTURAL CRACKS.

4.5.15.5.1 Finish Troughs, basins, or capture drains designed to receive the overflow from INFINITY EDGES shall have a non-toxic, smooth, and SLIP-RESISTANT finish.

4.5.15.6 [A] Maximum Height The maximum height of the wall outside of the INFINITY EDGE shall not exceed 30 inches *(76.2 cm)* to the adjacent grade and capture drain.

4.5.16[A] Underwater Benches

4.5.16.1 [A] Slip Resistant Where provided, UNDERWATER BENCHES shall be constructed with SLIP-RESISTANT materials.

4.5.16.2 Outlined Edges The leading horizontal edge of UNDERWATER BENCHES shall be outlined with a continuous slip-resistant, color-contrasting tile or other permanent marking of not less than three-quarter inch *(1.9 cm)* and not greater than 3 inches *(7.6 cm)*. If diamond markers are used in place of continuous markings, each marker must be at least 2 inches by 2 inches in size, spaced no more than 10 inches apart center-to-center, positioned on the leading horizontal edge, slip-resistant, and in a contrasting color to the background.

4.5.16.3 [A] Maximum Water Depth UNDERWATER BENCHES may be installed in areas of varying depths, but the maximum POOL water depth in that area shall not exceed 5 feet *(1.5 m)*.

4.5.16.4 Maximum Seat Depth The maximum submerged depth of any seat or sitting bench shall be 24 inches *(61 cm)* measured from the water line.

4.5.16.5 Additional Requirements UNDERWATER BENCHES in a POOL must:

1) Be positioned to avoid interference with lap swimming
2) Have the ROPE AND FLOAT LINE positioned at least 6 inches away from the vertical face of the UNDERWATER BENCH, if applicable.
3) Have QUALIFIED LIFEGUARDS on duty during all operating hours unless located within a senior living facility.
4) Have "No Diving" markers installed in accordance with 4.5.19.4.1 on the deck adjacent to the UNDERWATER BENCH.

4.5.17 Underwater Ledges

4.5.17.1 [A] Slip Resistant Where UNDERWATER TOE LEDGES are provided to enable swimmers to rest or to provide structural support for an upper wall, they shall be constructed with SLIP-RESISTANT materials.

4.5.17.2 Protrude UNDERWATER TOE LEDGES for resting that are recessed or protrude beyond the vertical plane of the POOL wall shall meet the criteria for SLIP RESISTANT and tread depth outlined in this section.

4.5.17.2 [A] Five Feet or Greater UNDERWATER TOE LEDGES for resting shall only be provided within areas of a POOL with water depths of 5 feet *(1.5 m)* or greater.

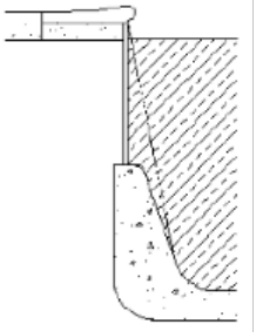
4.5.17.2.1 Underwater Toe Ledge UNDERWATER TOE LEDGES shall start no earlier than 4 lineal feet *(1.2 m)* to the deep side of the 5 foot *(1.5 m)* slope break.

4.5.17.2.2 Below Water Level UNDERWATER TOE LEDGES shall be at least 4 feet *(1.2 m)* below static water level.

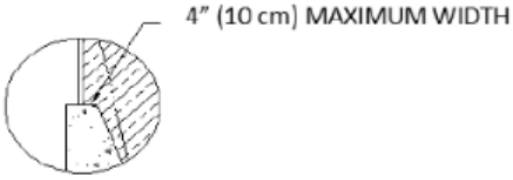
4.5.17.3 [A] Structural Support UNDERWATER LEDGES for structural support of upper walls shall be allowed.

Figure 4.5.17.4: Structural Support Ledges

(A) Structural support ledge all within 1 in 5 slope.



(B) Underwater ledge for support of upper wall.



4.5.17.3.1 Ledge Slope All structural support ledges and slopes of the wall below shall fall within a plane sloped at a maximum of 1 horizontally in 5 vertically or 11 degrees from the water line down to a water depth of 5 feet *(1.5 m)*. Refer to Figure 4.5.17.4.

4.5.17.3.2 Ledge Depth A structural support ledge shall be installed at a water depth of 3 feet *(0.9 m)* or deeper.

4.5.17.4 Outlined The edges of UNDERWATER TOE LEDGES and underwater structural support ledges shall be outlined with a continuous SLIP-RESISTANT, color-contrasting tile or other permanent marking of not less than 1 inch *(2.5 cm)* and not greater than 2 inches *(5.1 cm)*.

4.5.17.4.1 Visible If they project past the plane of the POOL wall, the edges of UNDERWATER TOE LEDGES and underwater structural support ledges shall be clearly visible from the DECK.

4.5.17.5 Tread Depths UNDERWATER TOE LEDGES and underwater structural support ledges shall have a maximum uniform horizontal tread depth of 4 inches *(10.2 cm)*. See Figure 4.5.17.4.

4.5.18[A] Underwater Shelves

4.5.18.1 Immediately Adjacent UNDERWATER SHELVES may be constructed immediately adjacent to water 3 feet 6 inches *(1.1 m)* or shallower.

4.5.18.2 Nosing UNDERWATER SHELVES shall have SLIP-RESISTANT, color-contrasting nosing at the leading horizontal edges and should be clearly visible from the DECK or from underwater.

4.5.18.3 Maximum Depth UNDERWATER SHELVES shall have a maximum depth of 12 inches *(30.5 cm)*.

4.5.18.4 Depth Markings Depth markings required at the same spacing as required by 4.5.19 and are in addition to the depth marking locations on the deck as required by 4.5.19.

4.5.18.5 Other Standards:

1) Must have steps leading into water depths no greater than 3 feet, 6 inches.
2) Must provide a turnover rate of 60 minutes or less.
3) Skimmers must be placed in locations to provide effective skimming or have a perimeter overflow system (gutter).
4) Floor inlets must be provided (1 per 400 sq. ft.).
5) Include signage "All children must be supervised by an adult" in letters at least 2 inches high. Signs must be placed within 10 feet of the underwater shelf.

4.5.19 Depth Markers and Markings

4.5.19.1 Location

4.5.19.1.1 Markings POOL water depths shall be clearly and permanently marked at the following locations:

1) Minimum depth,
2) Maximum depth,
3) On both sides and at each end of the POOL, and
4) At the break in the floor slope between the shallow and deep portions of the POOL.

4.5.19.1.2[A] Depth Measurements Depth markers shall be located on the vertical POOL wall and positioned to be read from within the POOL.

4.5.19.1.3[A] Below Handhold Where depth markings cannot be placed on the vertical wall above the water level, other means shall be used so that the markings will be plainly visible to persons in the POOL.

4.5.19.1.4 Coping or Deck Depth markers shall also be located on the POOL coping or DECK within 18 inches *(45.7 cm)* of the POOL structural wall or perimeter gutter.

4.5.19.1.5 Read on Deck Depth markers shall be positioned to be read while standing on the DECK facing the POOL.

4.5.19.1.6 Twenty-Five Foot Intervals Depth markers shall be installed at not more than 25 *(7.6 m)*-foot intervals around the POOL perimeter edge and according to the requirements of this section.

4.5.19.1.6.1 Five Feet or Less For water less than 5 feet *(1.5 m)* in depth, the depth shall be marked at 1 foot *(30.5 cm)* depth intervals.

4.5.19.2 Construction / Size

4.5.19.2.1 Durable Depth markers shall be constructed of a durable material resistant to local weather conditions.

4.5.19.2.2 Slip Resistant Depth markers shall be SLIP RESISTANT when they are located on horizontal surfaces.

4.5.19.2.3[A] Color and Height Depth markers shall have letters and numbers with a minimum height of 4 inches *(10.2 cm)* of a color contrasting with background.

4.5.19.2.4[A] Feet and Inches Depth markers shall be marked in units of feet and inches.

4.5.19.2.4.1 Abbreviations Abbreviations of “FT” and “IN” may be used in lieu of “FEET” and “INCHES.”

4.5.19.2.4.1.1 Abbreviations Symbols for feet *(‘)* and inches *(“)* shall not be permitted on water depth signs.

4.5.19.2.4.2 Metric Metric units may be provided in addition to—but not in lieu of—units of feet and inches.

4.5.19.3 Tolerance Depth markers shall be located to indicate water depth to the nearest 3 inches *(7.6 cm)*, as measured from the POOL floor 3 feet *(0.9 m)* out from the POOL wall to the gutter lip, mid-point of surface SKIMMER*(S)*, or surge weir*(s)*.

4.5.19.4 No Diving Markers

4.5.19.4.1 [A] ***Depths*** For POOL water depths 5 feet *(1.5 m)* or shallower, all DECK depth markers required by 4.5.19 shall be provided with "NO DIVING" warning signs along with the universal international symbol for "NO DIVING."

4.5.19.4.1.1 Spacing "NO DIVING" warning signs and symbols shall be spaced at no more than 25 foot *(7.6 m)* intervals around the POOL perimeter edge.

4.5.19.4.2 Durable "NO DIVING" MARKERS shall be constructed of a durable material resistant to local weather conditions.

4.5.19.4.3 Slip Resistant "NO DIVING" MARKERS shall be SLIP RESISTANT when they are located on horizontal surfaces.

4.5.19.4.4 At Least Four Inches All lettering and symbols shall be at least 4 inches *(10.2 cm)* in height.

4.5.19.5[A] **Depth Marking At Break in Floor Slope**

4.5.19.5.1 Over Five Feet For POOLS deeper than 5 feet *(1.5 m)*, a line of contrasting color, not less than 2 inches *(5.1 cm)* and not more than 6 inches *(15.2 cm)* in width, shall be clearly and permanently installed on the POOL floor at the shallow side of the break in the floor slope, and extend up the POOL walls to the waterline.

4.5.19.5.2 Durable Depth marking at break in floor slope shall be constructed of a durable material resistant to local weather conditions and be SLIP RESISTANT.

4.5.19.5.3 Rope and Float Line One foot *(30.5 cm)* to the shallower side of the break in floor slope and contrasting band, a ROPE AND FLOAT LINE shall extend across the POOL surface with the exception of WAVE POOLS, SURF POOLS, and WATERSLIDE LANDING POOLS.

4.5.19.6[A] **Dual Marking System** Symmetrical AQUATIC VENUE designs with the deep point at the center may be allowed by providing a dual depth marking system which indicates the depth at the wall as measured in 4.5.19.3 and at the deep point.

4.5.19.7 Non-Traditional Aquatic Venues [Deleted]

4.5.19.8 [A] **Wading Pool Depth Markers** AQUATIC VENUES where the maximum water depth is 6 inches *(15.2 cm)* of water or less *(such as WADING POOLS and ACTIVITY POOL areas)* shall not be required to have depth markings or "NO DIVING" signage.

4.5.19.9 Movable Floor Depth Markers For AQUATIC VENUES with movable floors, a sign indicating movable floor and/or varied water depth shall be provided and clearly visible from the DECK.

4.5.19.9.1 Vertical Measurement The posted water depth shall be the water level to the floor of the AQUATIC VENUE according to a vertical measurement taken 3 feet *(0.9 m)* from the AQUATIC VENUE wall.

4.5.19.9.2 Signage A sign shall be posted to inform the public that the AQUATIC VENUE has a varied depth and refer to the sign showing the current depth.

4.5.19.10 Spas A minimum of two depth markers shall be provided regardless of the shape or size of the SPA as per 4.12.1.6.

4.5.20 Aquatic Venue Shell Maintenance [N/A]

4.5.21[A] Special Use Aquatic Venues

4.5.21.1 Adequately Support The DESIGN PROFESSIONAL shall provide information to adequately support why the SPECIAL USE AQUATIC VENUE does not meet the definition and use characteristics of other categories of AQUATIC VENUES or POOLS listed in the CODE.

4.5.21.2 Justification The DESIGN PROFESSIONAL shall provide justification to support variance requests in accordance with 5.2.3 for design parameters that do not meet the design STANDARDS and construction requirements listed in Chapter 4.0.

4.6 Indoor / Outdoor Environment

4.6.1 Lighting

4.6.1.1 General Requirements

4.6.1.1.1 Outdoor Aquatic Venues Lighting as described in this subsection shall be provided for all outdoor AQUATIC VENUES open for use from 30 minutes before sunset to 30 minutes after sunrise, or during periods of natural illumination below the levels required in .6.1.3.1.

4.6.1.1.2 Accessible No lighting controls shall be accessible to PATRONS or BATHERS.

4.6.1.2 [A] Windows / Natural Light Where natural lighting methods are used to meet the light level requirements of 4.6.1.3 during portions of the day when adequate natural lighting is available, one of the following methods shall be used to ensure that lights are turned on when natural lighting no longer meets these requirements:

1) Automatic lighting controls based on light levels or time of day or
2) Written operations procedures where manual controls are used.

4.6.1.3 [A] Light Levels POOL water surface and DECK light levels shall meet the following minimum maintained light levels:

1) Indoor Water Surface: 30 horizontal footcandles *(323 lux).*
2) Outdoor Water Surface: 10 horizontal footcandles *(108 lux).*
3) DECK: 10 horizontal footcandles *(108 lux).*

4.6.1.3.1 Minimum Light Levels Maintained Where overhead lighting is adjustable to accommodate higher lighting levels for different activities, the minimum lighting level setting must ensure the minimum lighting levels are maintained as required at the POOL water surface and DECK whenever the lighting is on.

4.6.1.4 [A] Overhead Lighting

4.6.1.4.1[A] Artificial Lighting Artificial lighting shall be provided at all AQUATIC VENUES which are to be used at night or which do not have adequate natural lighting.

4.6.1.4.2 Aquatic Venue Floor Lighting shall illuminate all parts of the floor of the AQUATIC VENUE to enable a QUALIFIED LIFEGUARD or other person to determine whether a BATHER is on the floor of the AQUATIC VENUE.

4.6.1.4.3 Aquatic Venue Illumination Lighting shall illuminate all parts of the AQUATIC VENUE including the water, the depth markers, signs, entrances, restrooms, safety equipment, and the required DECK area and walkways.

4.6.1.5 [A] Underwater Lighting

4.6.1.5.1[A] Minimum Requirements Underwater lighting, where provided, shall be not less than eight initial rated lumens per square foot of POOL water surface area.

4.6.1.5.1.1 Location Such underwater lights, in conjunction with overhead or equivalent DECK lighting, shall be located to provide illumination so that all portions of the AQUATIC VENUE, including the AQUATIC VENUE bottom and drain*(s)*, may be readily seen.

4.6.1.5.1.2 Higher Light Levels Higher underwater light levels shall be considered for deeper water to achieve this outcome.

4.6.1.5.2 Dimmable Lighting Dimmable lighting shall not be used for underwater lighting.

4.6.1.6 [A] Night Swimming with No Underwater Lighting

4.6.1.6.1 Minimum Requirements Where outdoor POOLS are open for use from 30 minutes before sunset to 30 minutes after sunrise, or during periods of low illumination, underwater lighting may be excluded where:

1) Maintained POOL surface lighting levels are a minimum of 15 horizontal footcandles *(161 lux),* and
2) All portions of the POOL, including the bottom and drain*(s)*, are readily visible as required in 5.7.6.1.

4.6.1.7 [A] Emergency Lighting [Deleted]

4.6.1.8 [A] Glare Windows and any other features providing natural light into the POOL space and overhead or equivalent DECK lighting shall be designed or arranged to inhibit or reduce glare on the POOL water surface that would prevent seeing objects on the POOL bottom.

4.6.2[A] Indoor Aquatic Facility Ventilation

4.6.2.1 [A] Purpose An AQUATIC VENUE license holder must ensure that there is sufficient ventilation to prevent build-up of harmful amounts of moisture or chemical byproducts in the air of buildings enclosing AQUATIC VENUES.

4.6.2.2 [A] Exemptions Indoor aquatic facility ventilation requirements do not apply to AQUATIC VENUES or AQUATIC FACILITIES built or renovated prior to September 1, 2014.

4.6.3[A] Indoor/Outdoor Aquatic Facility Electrical Systems and Components [Deleted]

4.6.4[A] Pool Water Heating

4.6.4.1[A] High Temperature When designing POOL heating equipment, measures shall be taken to prevent BATHER exposure to water temperatures in excess of 104°F *(40°C)*.

4.6.4.2 Pressure Relief Device A listed pressure-relief device shall be installed to limit the pressure on the heating equipment to 50 psig or no more than the maximum value specified by the heating-equipment manufacturer and applicable CODES.

4.6.4.3 Code Compliance POOL-water heating equipment shall be selected and installed to preserve compliance with the applicable CODES, the terms of listing and labeling of equipment, and with the equipment manufacturer's installation instructions and applicable CODES.

4.6.4.4[A] Equipment Room Requirements Where POOL water heaters use COMBUSTION and are located inside a building, the space in which the heater is located shall be considered to be an EQUIPMENT ROOM, and the requirements of 4.9.1 shall apply.

4.6.4.4.1 Carbon Monoxide Detector A carbon monoxide detector with local alarming, CERTIFIED, LISTED, AND LABELED in accordance with UL 2075, shall be installed in all such EQUIPMENT ROOMS.

4.6.4.4.2 Adjacent Rooms All rooms that are immediately adjacent to spaces containing fuel burning equipment or vents carrying the products of combustion shall also be provided with locally alarming carbon monoxide detectors.

4.6.4.5 Exception Heaters CERTIFIED, LISTED, AND LABELED for the atmosphere shall be acceptable without isolation from chemical fumes and vapors.

4.6.5 First Aid Area

4.6.5.1[A] Station Design Design and construction of new AQUATIC FACILITIES shall include an area designated for first aid equipment and/or treatment.

4.6.6 Emergency Exit [Deleted]

4.6.7 Drinking Fountains

4.6.7.1[A] Provided A drinking fountain shall be provided inside a GENERAL USE AQUATIC FACILITY and shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 61-2020 and, if electric, UL 399.

4.6.7.1.1 Alternative Alternate locations or the use of bottled water shall be evaluated by the AHJ.

4.6.7.1.2 Common Use Area If the drinking fountain cannot be provided inside the AQUATIC FACILITY, it shall be provided in a common use building or area adjacent to the AQUATIC FACILITY entrance and on the normal path of BATHERS going to the AQUATIC FACILITY entrance.

4.6.7.2 Readily Accessible The drinking fountain shall be located where it is readily accessible and not a hazard to BATHERS per 4.10.2.

4.6.7.2.1 Not Located The drinking fountain shall not be located in a SHOWER area or toilet area.

4.6.7.3 Single Fountain A single drinking fountain shall be allowed for one or more AQUATIC VENUES within an AQUATIC FACILITY.

4.6.7.4 Angle Jet Type The drinking fountain shall be an angle jet type installed according to applicable plumbing CODES.

4.6.7.5 Potable Water Supply The drinking fountain shall be supplied with water from an approved potable water supply that complies with OAR chapter 333, division 061.

4.6.7.6 Wastewater The wastewater discharged from a drinking fountain shall be routed to an approved sanitary sewer system or other approved disposal area according to applicable plumbing CODES.

4.6.8 Garbage Receptacles

4.6.8.1 Sufficient Number Receptacles shall be provided within an AQUATIC FACILITY to ensure that garbage and refuse can be disposed of properly to maintain safe and sanitary conditions.

4.6.8.2 Number and Location The number and location of receptacles shall be at the discretion of the AQUATIC FACILITY manager.
4.6.8.3 Closable Receptacles shall be designed to be closed with a lid or other cover so they remain closed until intentionally opened.

4.6.9 Food and Drink Concessions

4.6.9.1 Meet AHJ Requirements Concessions for food and drink in an AQUATIC FACILITY shall meet all AHJ requirements and be located outside the PERIMETER DECK.

4.6.10 Spectator Areas

4.6.10.1 Within Aquatic Facility Enclosure An area designed for use by spectators may be located within an AQUATIC FACILITY ENCLOSURE. Spectators must be outside the PERIMETER DECK AREA.

4.6.11 Indoor Aquatic Facility Acoustics [Deleted]

4.7 Recirculation and Water Treatment

4.7.1 Recirculation Systems and Equipment

4.7.1.1 [A] General
4.7.1.1.1 Equipped and Operated Each AQUATIC VENUE shall be equipped and operated with an individual recirculation and filtration system capable of meeting the provisions outlined in Part 4.7, except for an ACTIVITY POOL as outlined in 4.7.1.2.
4.7.1.1.2 Component Installation The installation of the recirculation and the filtration system components shall be performed in accordance with the designer's and manufacturer's instructions.
4.7.1.1.3 Recirculation System A water RECIRCULATION SYSTEM consisting of one or more pumps, pipes, return INLETS, suction outlets, tanks, filters, and other necessary equipment shall be provided.
4.7.1.2 [A] Combined Aquatic Venue Treatment
4.7.1.2.1 Maintain and Measure When treatment systems of multiple AQUATIC VENUES are combined as part of an ACTIVITY POOL, the design shall include all appurtenances to maintain and measure the required water characteristics including but not limited to flow rate, pH, and disinfectant concentration in each AQUATIC VENUE or AQUATIC FEATURE.
4.7.1.2.2 Secondary Treatment If SECONDARY TREATMENT is required for an INCREASED RISK AQUATIC VENUE as per 4.7.3.3.1.2, then SECONDARY TREATMENT shall be required for all treatment systems that are combined with the INCREASED RISK AQUATIC VENUE.
4.7.1.2.3 Isolate When multiple AQUATIC VENUES are combined in one treatment system, each AQUATIC VENUE shall be capable of being isolated for maintenance purposes.
4.7.1.3 Inlets
4.7.1.3.1 [A] General
4.7.1.3.1.1 Hydraulically Balanced The RECIRCULATION SYSTEM shall be designed with sufficient flexibility to achieve a hydraulic apportionment that will ensure the following:
1) Effective distribution of treated water and 2) Maintenance of a uniform disinfectant residual and pH throughout the AQUATIC VENUE.
4.7.1.3.1.1.1 [A] Alternative Design Justification Alternative designs shall be allowed based on adequate engineering justification which may include utilizing a computation fluid dynamics (CFD) model of the POOL design that documents in-POOL circulation without any dead zones.
4.7.1.3.1.2 Inlets Effective distribution of treated water shall be accomplished by either a continuous perimeter overflow system with integral INLETS or by means of directionally adjustable INLETS adequate in design, number, and location.
4.7.1.3.1.3 Adequate Mixing POOLS shall use wall and/or floor INLETS to provide adequate mixing.
4.7.1.3.1.3.1 Greater Than Fifty Feet Wide For POOLS greater than 50 feet wide *(15.2 m)*, floor INLETS shall be required.
4.7.1.3.1.4 Other Inlet Types All other types of INLET systems not covered in this section shall be subject to approval by the AHJ with proper engineering justification to support a variance request under 5.2.3.

4.7.1.3.1.5 Hydraulically Sized INLETS shall be hydraulically sized to provide the design flow rates for each POOL area of multi-zone POOLS based on the required design TURNOVER RATE for each zone.

4.7.1.3.2[A] Floor Inlets

4.7.1.3.2.1 Uniformly Spaced Floor INLETS shall be spaced to effectively distribute the treated water throughout the POOL.

4.7.1.3.2.2 Flush with Bottom Floor INLETS shall be flush with the bottom of the POOL.

4.7.1.3.2.2.1 Distance Distance between floor INLETS shall be no greater than 20 feet *(6.1 m)*.

4.7.1.3.2.2.2 Row A row of floor INLETS shall be located within 15 feet *(4.6 m)* of each side wall.

4.7.1.3.2.3 Spaced Floor INLETS, used in combination with wall INLETS, shall be spaced no greater than 25 feet *(7.6 m)* from nearest side walls.

4.7.1.3.3 Wall Inlets

4.7.1.3.3.1[A] Effective Mixing Wall INLET velocity shall mix the water effectively.

4.7.1.3.3.2 Adjustable INLETS shall be directionally adjustable to provide effective distribution of water.

4.7.1.3.3.3[A] Inlet Spacing Wall INLETS shall be spaced no greater than 20 feet *(6.1 m)* apart.

4.7.1.3.3.3.1 Corner INLETS shall be placed within 5 feet *(1.5 m)* of each corner of the POOL.

4.7.1.3.3.3.2 Skimmers INLETS shall be placed at least 5 feet *(1.5 m)* from a SKIMMER.

4.7.1.3.3.3.3 Isolated INLETS shall be placed in each recessed or isolated area of the POOL.

4.7.1.3.3.4 Directional Flow Wall INLETS shall not require design to provide directional flow if part of a manufactured gutter system in which the filtered return water conduit is contained within the gutter structure.

4.7.1.3.3.5[A] Dye Testing The AHJ may require dye testing to evaluate the mixing characteristics of the RECIRCULATION SYSTEM.

4.7.1.3.3.5.1 Failed Test If dye test reveals inadequate mixing in the POOL after 20 minutes, the RECIRCULATION SYSTEM shall be adjusted or modified to assure adequate mixing.

4.7.1.4 Perimeter Overflow Systems/Gutters

4.7.1.4.1 General

4.7.1.4.1.1[A] Skimming All POOLS shall be designed to provide SKIMMING for the entire POOL surface area with engineering rationale provided by the DESIGN PROFESSIONAL.

(1) A perimeter-type overflow system shall be used for AQUATIC VENUES which are greater than 30 feet (9.1m) in width or have more than 2,500 square feet of surface area.

(2) A skimmer-type overflow system may be used for AQUATIC VENUES less than 30 feet (9.1m) in width or with less than 2,500 square feet of surface area.

4.7.1.4.1.1.1 Around Entire Pool For POOLS that require a perimeter overflow system, the perimeter overflow system shall extend around the entire POOL perimeter except where noted in this CODE.

4.7.1.4.1.1.2[A] Novel Perimeter Overflow Systems Novel perimeter overflow system designs that do not extend around the entire POOL perimeter shall be permitted with proper engineering justification.

4.7.1.4.1.2 Zero Depth Entry ZERO DEPTH ENTRY POOLS shall have a continuous overflow trench that terminates as close to the side walls as practical including any zero-depth portion of the POOL perimeter.

4.7.1.4.1.2.1 Ends Where a perimeter overflow system cannot be continuous, the ends of each section shall terminate as close as practical to each other.

4.7.1.4.2[A] Perimeter Overflow System Size and Shape

4.7.1.4.2.1 Continuous Water Removal The gutter system shall be designed to allow continuous removal of water from the POOL'S upper surface at a rate of at least 125 percent of the total design recirculation flow rate.

4.7.1.4.2.2 Inspection Gutters shall permit ready inspection, cleaning, and repair.

4.7.1.4.3[A] Gutter Outlets Drop boxes, converters, return piping, or FLUMES used to convey water from the gutter shall be designed to:

1) Prevent flooding and BACKFLOW of skimmed water into the POOL and

2) Handle at least 125 percent of the total design recirculation flow rate.

4.7.1.4.4 Surge Tank Capacity

4.7.1.4.4.1[A] Net Surge Capacity All perimeter overflow systems shall be designed with an effective net surge capacity of not less than one gallon for each square foot *(40.7 L/m2)* of POOL surface area.

4.7.1.4.4.1.1 Surge Components Surge shall be provided within a surge tank, or the gutter or filter above the normal operating level, or elsewhere in the system.

4.7.1.4.4.2 Tank Capacity The tank capacity specified shall be the net capacity.
4.7.1.4.4.3.1 Marked The surge tank's minimum, maximum, and normal POOL operating water levels shall be marked on the tank so as to be readily visible for inspection.
4.7.1.4.4.3 Tank Levels The DESIGN PROFESSIONAL shall define the minimum, maximum, and normal POOL operating water levels in the surge tank.
4.7.1.4.4.4 Overflow Pipes Surge tanks shall have overflow pipes to convey excess water to waste via an air gap or other approved BACKFLOW prevention device.
4.7.1.4.5[A] Tolerances Gutters shall be level within a tolerance of plus or minus 1/16 inch *(1.6 mm)* around the perimeter of the AQUATIC VENUE.
4.7.1.4.6[A] Makeup Water System
4.7.1.4.6.1 Automatic Makeup Automatic makeup water supply equipment shall be provided to maintain continuous skimming of AQUATIC VENUES with Perimeter Overflow Systems.
4.7.1.4.6.2 Air Gap Makeup water shall be supplied through an air gap or other approved BACKFLOW prevention device.
4.7.1.5 Skimmers and Alternative Gutter Technologies Using In-Pool Surge Capacity
4.7.1.5.1 General
4.7.1.5.1.1 Manufactured The use of manufactured direct suction SKIMMERS shall be in accordance with the manufacturer's recommendations.
4.7.1.5.1.2[A] Provided Where SKIMMERS are used, at least one surface SKIMMER shall be provided for each 400 square feet *(37 m2)* of surface area or fraction thereof. Skimmer equalizer lines accessible to the public are prohibited.
4.7.1.5.1.2.1 Conditions Additional SKIMMERS may be required to achieve effective skimming under site-specific conditions such as outdoor POOLS affected by winds or heavy CONTAMINANT loading.
4.7.1.5.1.3[A] Hybrid Systems Hybrid systems that incorporate surge weirs in the overflow gutters to provide for in-POOL surge shall meet all of the requirements specified for overflow gutters—with the exception of the requirements under 4.7.1.4.4 when the net surge capacity required by 4.7.1.4.4.1 is alternatively met by the in-POOL surge capacity.
4.7.1.5.1.3.1 [A] Surge Weirs The number of surge weirs shall be based on the individual surge weir capacity and the operational apportionment of the total design recirculation flow rate.
4.7.1.5.1.3.1.1 Locations The location of the required number of surge weirs shall be uniformly spaced in the gutter sections.
4.7.1.5.2 Skimmer Location
4.7.1.5.2.1 Effective SKIMMERS shall be so located as to provide effective skimming of the entire water surface. Skimmer equalizer lines accessible to the public are prohibited.
4.7.1.5.3 [A] Skimmer Flow Rate The flow rate for the SKIMMERS shall comply with manufacturer data plates or NSF/ANSI 50 including Annex K.
4.7.1.5.4 Control
4.7.1.5.4.1 Weir Each SKIMMER shall have a weir that adjusts automatically to variations in water level over a minimum range of 4 inches *(10.2 cm)*.
4.7.1.5.5 Tolerances
4.7.1.5.5.1 Skimmer Base The base of each SKIMMER shall be level with all other SKIMMERS in the POOL within a tolerance of plus or minus ¼ inch *(6.4 mm)*.
4.7.1.6[A] Submerged Suction Outlet
4.7.1.6.1 General Submerged suction outlet fitting assemblies (SOFAs), shall be CERTIFIED, LISTED, AND LABELED to the requirements of ANSI/APSP/ICC-16 2017 and shall be installed in accordance with the SOFA specific installation instructions, including minimum sump depth, pipe size*(s)*, adapters frames, structural supports, and fasteners.
4.7.1.6.2 Number and Location POOLS must have at least two outlets. Except for:

1) Reverse Flow POOLS, where the drain is not connected to the recirculation system but is provided for drainage of the pool through an air-gap connection to the sanitary sewer.
2) Other suction-fitting arrangement that allows the drainage of the POOL through an air-gap connection to the sanitary sewer, or other approved location, while also providing entrapment protection.

3) POOLS with no drain system, with provisions to completely drain the pool to the sanitary sewer or other approved location, by other means that have entrapment protection.
4) WADING POOLS shall not have main drains installed.
5) Facilities licensed with a single main drain and in continuous operation prior to the adoption of this code, shall be equipped with either a secondary anti-entrapment device or a single unblockable drain, in compliance with the requirements of the Virginia Graeme Baker Pool and Spa Safety Act (VGBA). These upgrades must be completed within three years from the adoption of this code to ensure compliance with federal pool safety standards.

4.7.1.6.2.1 Flow Ratings SOFA system flow ratings shall be calculated as follows:

1) Blockable SOFA systems: the sum of the installation specific SOFA flow ratings minus the flow rating of a SOFA with the highest installed flow rating;
2) Unblockable SOFA systems: the sump of the installation specific flow rating*(s)*.

4.7.1.6.2.1.1 Location SOFAs or outlets may be located on the bottom or side wall. Maintenance drains and SOFAs used to drain the POOL shall be located on the bottom and at the deepest point to achieve the objective of 4.5.2.3. POOLS with SOFAS or outlets on the side wall must have provisions to completely drain the pool to the sanitary sewer or other approved location, by other means that have entrapment protection.

4.7.1.6.2.1.2 Connected Multiple outlets shall be connected to a single main suction pipe by branch line pipe that is not valved so as to be capable of operating independently.

4.7.1.6.2.2 Spaced Outlets shall be separated by at least 3 feet (915mm) between the furthest fittings or be on separate planes and measured from the main drain connector pipe centerline. They shall be placed so the floor and wall suction fittings cannot be easily blocked at the same time. Maximum separation distances shall be specified by SOFA-specific installation instructions.

4.7.1.6.3 Tank Connection Where gravity outlets are used, the main drain outlet shall be connected to a surge tank, collection tank, or balance tank/pipe.

4.7.1.6.4[A] Flow Distribution and Control

4.7.1.6.4.1 Design Capacity The submerged suction outlet system piping shall be designed at a minimum to handle the total design recirculation flow rate.

4.7.1.6.4.1.1 Two Main Drain Outlets Where there are two main drain outlets, the branch pipe from each main drain outlet shall be designed to carry 100% of the total design recirculation flow rate.

4.7.1.6.4.1.2 Three or More Drains Where three or more main drain outlets are connected by branch piping in accordance with 4.7.1.6.2.1.1 through 4.7.1.6.2.1.3, the design flow through each branch pipe from each main drain outlet may be as follows:

1) Q_{max} for each drain= Q *(total design recirculation flow rate)* / *(number of drains less one)* and
2) $Q_{max}=Q_{total}$ / *(N-1)*.

4.7.1.6.4.2 Proportioning Valve The single main drain suction pipe to the pump shall be equipped with a proportioning valve*(s)* to adjust the flow distribution between the main drain piping and the surface overflow system piping.

4.7.1.6.5 Flow Velocities

4.7.1.6.5.1 Standards Flow velocities shall meet ANSI/APSP-16 20171 based on 100% design flow through each main drain cover.

4.7.1.7 Piping

4.7.1.7.1 Design

4.7.1.7.1.1 Materials Piping system components in contact with POOL water shall be of non-toxic material, resistant to corrosion, able to withstand operating pressures, chemicals, and temperatures.

4.7.1.7.1.2 Standards Piping and piping system component materials shall be suitable for potable water contact.

4.7.1.7.1.2.1 Certified, Listed, and Labeled Piping and piping system component materials shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 14, NSF/ANSI 50, and NSF/ANSI 61, as applicable.

4.7.1.7.1.2.2 Certified Piping and piping system component materials shall be CERTIFIED, LISTED, AND LABELED to a specific STANDARD by an ANSI-accredited certification organization.

4.7.1.7.2 Velocity in Pipes

4.7.1.7.2.1[A] Discharge Piping RECIRCULATION SYSTEM piping shall be designed so that water velocities do not exceed 8 feet *(2.4 m)* per second on the discharge side of the recirculation pump unless alternative values have proper engineering justification.
4.7.1.7.2.2 [A] Suction Piping Suction piping shall be sized so that the water velocity does not exceed 6 feet per second *(1.8 m/s)* unless alternative values have proper engineering justification.
4.7.1.7.2.3 [A] Additional Considerations Gravity piping shall be sized with consideration of available system head or as demonstrated by detailed hydraulic calculations at the total design recirculation flow rate.

4.7.1.7.3[A] Drainage and Installation

4.7.1.7.3.1 Temperature Variations Provisions shall be made for expansion and contraction of pipes due to temperature variations.
4.7.1.7.3.2 Drainage Provisions shall be made for complete drainage of all AQUATIC VENUE piping.
4.7.1.7.3.3 Supported All piping shall be supported continuously or at sufficiently close intervals to prevent sagging and settlement.

4.7.1.7.4 Piping and Component Identification

4.7.1.7.4.1 [A] Clearly Marked All exposed piping shall be clearly marked to indicate function.
4.7.1.7.4.2 Flow Direction and Source All piping shall be clearly marked to indicate type or source of water and direction of flow with clear labeling and/or color coding.
4.7.1.7.4.3 Valves All valves shall be clearly marked to indicate function with clear labeling and/or color coding.
4.7.1.7.4.4 Schematic Displayed A complete, easily readable schematic of the entire AQUATIC VENUE RECIRCULATION SYSTEM shall be openly displayed in the mechanical room or available to maintenance and inspection personnel.

4.7.1.7.5 Testing [Deleted]

4.7.1.8 Strainers and Pumps

4.7.1.8.1 Strainers

4.7.1.8.1.1 Strainer / Screen All filter recirculation pumps, except those for vacuum filter installations, shall have a strainer/screen device on the suction side to protect the filtration and pumping equipment.
4.7.1.8.1.2 Materials [Deleted].

4.7.1.8.2 Pumping Equipment

4.7.1.8.2.1 [A] Variable Frequency Drives VFDs *may* be installed to control all recirculation and feature pumps.
4.7.1.8.2.2 [A] Total Dynamic Head The recirculation pump*(s)* shall have adequate capacity to meet the total design recirculation flow rate at the maximum TDH required by the entire RECIRCULATION SYSTEM under the most extreme operating conditions *(e.g., clogged filters in need of backwashing)*.
4.7.1.8.2.3 Required Flow Rate The pump shall be designed to maintain total design recirculation flow rate under all conditions.
4.7.1.8.2.4 Vacuum Limit Switches Where vacuum filters are used, a vacuum limit switch shall be provided on the pump suction line.
4.7.1.8.2.5 Maximum The vacuum limit switch shall be set for a maximum vacuum of 18 inches *(45.7 cm)* of mercury.
4.7.1.8.2.6 Pump Priming All recirculation pumps shall be self-priming or flooded-suction.
4.7.1.8.2.7 Net Positive Suction Head Requirement All recirculation pumps shall meet the minimum NPSH requirement for the system.
4.7.1.8.2.8 Materials Pumps shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 50.

4.7.1.8.3[A] Operating Gauges

4.7.1.8.3.1 Vacuum Gauge A compound vacuum-pressure gauge shall be installed on the pump suction line as close to the pump as possible.
4.7.1.8.3.2 Suction Lift A vacuum gauge shall be used for pumps with suction lift.
4.7.1.8.3.3 Installed A pressure gauge shall be installed on the pump discharge line adjacent to the pump.
4.7.1.8.3.4 Easily Read Gauges shall be installed so they can be easily read.
4.7.1.8.3.5 Valves All gauges shall be equipped with valves to allow for servicing under operating conditions.

4.7.1.9 Flow Measurement and Control

4.7.1.9.1[A] Flow Meters A flow meter accurate to within +/- 5% of the actual design flow shall be provided for each filtration system.

4.7.1.9.1.1 Certified, Listed, and Labeled Flow meters shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 50 by an ANSI-accredited certification organization.

4.7.1.9.2 Valves All pumps shall be installed with a manual adjustable discharge valve to provide a backup means of flow control as well as for system isolation.

4.7.1.10[A] Flow Rates / Turnover Times

Table 4.7.1.10: Aquatic Venue Maximum Allowable Turnover Times

Type of Pools	Turnover Maximum
Activity Pools	2-6 hours or less
Diving Pools	8 hours or less
Interactive Water Play*	0.5 hours or less
Lazy River	2 hours or less-
Plunge Pools	1 hour or less
Runout Slide	1 hour or less
Wading Pools*	1 hour or less
Wave Pools	2 hours or less
All Other Pools	6 hours or less
Surf Pools	Submit engineering justification from equipment manufacturer

*Shall have secondary treatment

Aquatic Venue Maximum Allowable Turnover Times for Spa, Therapy*, and Exercise Pools

Temperatures	Load	Turnover Maximum
≤ 72º–93ºF (22º–34ºC)	> 2,500 gals/person (9.46 m3)	4 hours or less
≤ 72º–93ºF (22º–34ºC)	> 450 gals/person (1.7 m3)	2 hours or less
≤ 72º–93ºF (22º–34ºC)	≤ 450 gals/person (1.7 m3)	1 hour or less
≥ 93°–104ºF (34º–40ºC)	All	0.5 hours or less

*Shall have secondary treatment

4.7.1.10.1 Maximum Allowable All AQUATIC VENUES shall comply with the above maximum allowable TURNOVER TIMES shown in Table 4.7.1.10.

4.7.1.10.2[A] Calculated The TURNOVER TIME shall be calculated based on the total volume of water divided by the total design recirculation flow rate through the filtration process.

4.7.1.10.2.1 [A] Unfiltered Water Unfiltered water such as water that may be withdrawn from and returned to the AQUATIC VENUE for such AQUATIC FEATURES as SLIDES by a pump separate from the filtration system, shall not factor into TURNOVER TIME.

4.7.1.10.3 [A] Turnover Times TURNOVER TIMES shall be calculated based solely on the flow rate through the filtration system.

4.7.1.10.3.1 Required The required TURNOVER TIME shall be the lesser of the following options:

1) The specified time in Table 4.7.1.10, or

2) The time required for individual components *(e.g., three SKIMMERS with flow rates set by the manufacturer and an additional 20% for the main drains could exceed the minimum value in the table)*.

4.7.1.10.3.2 Total Volume The total volume of the AQUATIC VENUE system shall include the AQUATIC VENUE and any surge/balance tank.

4.7.1.10.3.3 Supply Water Where water is drawn from the AQUATIC VENUE to supply water to AQUATIC FEATURES *(e.g., SLIDES, tube rides)*, the water may be reused prior to filtration provided the disinfectant concentration and pH of the supply water are maintained at required levels.

4.7.1.10.4[A] Reuse Ratio The ratio of INTERACTIVE WATER PLAY AQUATIC VENUE FEATURE water to filtered water shall be no greater than 3:1 in order to maintain the efficiency of the FILTRATION SYSTEM.

4.7.1.10.5[A] Flow Turndown System For AQUATIC FACILITIES that intend to reduce the recirculation flow rate below the minimum required design values when the POOL is unoccupied, the flow turndown system shall be designed as follows in 4.7.1.10.5.1 through 4.7.1.10.5.2.

4.7.1.10.5.1 Flowrate The system flowrate shall not be reduced more than 25% lower than the minimum design requirements and only reduced when the AQUATIC VENUE is unoccupied.

4.7.1.10.5.1.1 Clarity The system flowrate shall only be reduced if the minimum water clarity required under 5.7.6 is met and the turbidity level in the POOL is less than 0.5 NTU.

4.7.1.10.5.1.2 Disinfectant Concentration The turndown system shall be required to maintain required disinfectant concentration and pH at all times.

4.7.1.10.5.2 Increase When the turndown system is also used to intelligently increase the recirculation flow rate above the minimum requirement *(e.g., in times of peak use to maintain water quality goals more effectively)*, the following requirements shall be met at all times:

1) Velocity requirements inside of pipes *(per 4.7.1.7.2)* and
2) Maximum filtration system flows.

4.7.2[A] Filtration

4.7.2.1 All Filters

4.7.2.1.1 Required Filtration shall be required for all AQUATIC VENUES that recirculate water.

4.7.2.1.2[A] Certified, Listed, and Labeled Filters All filters shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 50 by an ANSI-accredited certification organization or approved by the AHJ with proper engineering justification.

4.7.2.1.3 Appropriate Filter Media Filters shall use the appropriate filter media as recommended by the filter manufacturer for maximum clarity and cycle length for AQUATIC VENUE use.

4.7.2.1.4 Certified, Listed, and Labeled Filter Media All filter media, including alternative filter media, shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 50 by an ANSI-accredited certification organization and within the size specifications provided by the filter manufacturer and NSF/ANSI 50 or approved by the AHJ with proper engineering justification.

4.7.2.2 Granular Media Filters

4.7.2.2.1[A] General

4.7.2.2.1.1 Valves and Piping The granular media filter system shall have valves and piping to allow isolation, venting, complete drainage *(for maintenance or inspections)*, and backwashing of individual filters.

4.7.2.2.1.2 Filtration Accessories Filtration accessories shall include the following items:

1) Influent pressure gauge, and
2) Manual air relief system.

4.7.2.2.2[A] Filter Location and Spacing

4.7.2.2.2.1 Installed Filters shall be installed with adequate clearance and facilities for ready and safe inspection, maintenance, disassembly, and repair.

4.7.2.2.2.2 Media Removal A means and access for easy removal of filter media shall be required.

4.7.2.2.3 Filtration and Backwashing Rates

4.7.2.2.3.1[A] Operate High-rate granular media filters shall be designed to operate at 18 GPM per square foot of filter media or that rate approved by the manufacturer for that particular filter, whichever is less. Pools constructed prior to May1, 1986, may continue to use filters sized at 20 GPM per square foot of filter media until replaced.er.

4.7.2.2.3.1.1 Less than Fifteen Inch Bed Depth When a bed depth is less than 15 inches *(38.1 cm)*, filters shall be designed to operate at no more than 12 GPM per square foot *(29 m/h)*.

4.7.2.2.3.2[A] Backwash System Design The granular media filter system shall be designed to backwash each filter at a rate of at least 15 GPM per square foot *(37 m/h)* of filter bed surface area, unless explicitly

prohibited by the filter manufacturer and approved at an alternate rate as specified in their NSF/ANSI 50 listing.

4.7.2.2.[A] Coagulant Injection Equipment Installation If coagulant feed systems are used, they shall be installed with the injection point located before the filters as far ahead as possible, with electrical interlocks in accordance with 4.7.3.2.1.3.

4.7.2.3 Precoat Filters

4.7.2.3.1[A] Filtration Rates

4.7.2.3.1.1 Vacuum Precoat The design filtration rate for vacuum precoat filters shall not be greater than either:

1) 2 GPM per square foot *(4.9 m/h)* or
2) 2.5 GPM per square foot *(6.1 m/h)* when used with a continuous precoat media feed *(commonly referred to as "body-feed")*.

4.7.2.3.1.2 Pressure Precoat The design filtration rate for pressure precoat filters shall not be greater than two GPM per square foot *(4.9 m/h)* of effective filter surface area.

4.7.2.3.1.3 Calculate The filtration surface area shall be based on the outside surface area of the media with the manufacturer's recommended thickness of precoat media and consistent with their NSF/ANSI 50 listing and labeling.

4.7.2.3.2[A] Precoat Media Introduction System Process The precoat process shall follow the manufacturer's recommendations and requirements of NSF/ANSI 50.

4.7.2.3.3[A] Continuous Filter Media Feed Equipment

4.7.2.3.3.1 Manufacturer Specification If equipment is provided for the continuous feeding of filter media to the filter influent, the equipment shall be used in accordance with the manufacturer's specifications.

4.7.2.3.3.2 Filter Media Discharge All discharged filter media shall be handled in accordance with all applicable local, state, territorial, federal, and tribal laws.

4.7.2.4[A] Cartridge Filters

4.7.2.4.1[A] Filtration Rates The design filtration rate for surface-type cartridge filter shall not exceed 0.375 GPM per square foot.

4.7.2.4.2[A] Supplied and Sized Filter cartridges shall be supplied and sized in accordance with the filter manufacturer's recommendation for AQUATIC VENUE use.

4.7.3[A] Disinfection and pH Control

4.7.3.1 Chemical Addition Methods

4.7.3.1.1 Disinfection and pH DISINFECTION and pH control chemicals shall be automatically introduced through the RECIRCULATION SYSTEM for new construction or SUBSTANTIAL ALTERATION to an existing AQUATIC FACILITY

4.7.3.1.1.1 Controller Used A chemical controller, as specified in 4.7.3.2.8 shall be provided and used for MONITORING and control of disinfectant and pH feed equipment for new construction or SUBSTANTIAL ALTERATION to an existing AQUATIC FACILITY.

4.7.3.1.1.2 Feeder DISINFECTION and pH control chemicals shall be added using a feeder that meets the requirements outlined in 4.7.3.2.

4.7.3.2 Feed Equipment

4.7.3.2.1[A] General

4.7.3.2.1.1 Required Chemical feeders shall be required in new or SUBSTANTIALLY ALTERED AQUATIC VENUES upon adoption of this CODE.

4.7.3.2.1.2 Feeders & Devices The AQUATIC VENUE shall be equipped with chemical feed equipment such as flow-through chemical feeders, electrolytic chemical generators, mechanical chemical feeders, chemical feed pumps, and AUTOMATED CONTROLLERS that are CERTIFIED, LISTED, AND LABELED to NSF-ANSI 50 by an ANSI-accredited certification organization.

4.7.3.2.1.2.1 Specified by Manufacturer Flow-through chemical feeders shall only be used with the chemical *(formulation, brand, size, and shape)* specified by the chemical feeder manufacturer.

4.7.3.2.1.3 Interlock Controls and No or Low Flow Deactivation For all new or SUBSTANTIALLY ALTERED AQUATIC VENUES, all chemical control and feed systems shall be provided with an automatic means to disable all chemical feeders for each VENUE or portion of a VENUE in the event of a low flow or

no flow condition. This shall be accomplished through an electrical interlock consisting of at least two of the following:

1) Recirculation pump power monitor,
2) Flow meter/flow switch in the return line, or
3) Flow meter/flow switch at the chemical controller.

4.7.3.2.1.3.1 Installed The electrical interlock system shall be installed per manufacturer's instructions and shall never be altered.

4.7.3.2.1.3.2 Visual Alarm For new installations and replacement equipment, if the feeder is disabled through the electrical interlock, a visual alarm or other indication shall be initiated that will alert staff onsite for BATHER evacuation.

4.7.3.2.1.4 Installation The chemical control and feed systems shall be installed according to the manufacturer's instructions.

4.7.3.2.1.4.1 Protective Cover A protective cover shall be installed between chemical feed pumps supplying acid or liquid hypochlorite solution and other POOL components to shield staff and equipment from chemical sprays from leaking connections.

4.7.3.2.2[A] Sizing of Disinfection Equipment

4.7.3.2.2.1 Sizing Feeders shall be capable of supplying disinfectant and pH control chemicals to the AQUATIC VENUE to maintain the DISINFECTION levels and pH at all times in accordance with these rules.

4.7.3.2.2.2 Chlorine Dosing All CHLORINE dosing and generating equipment including erosion feeders, or in line electrolytic and brine/batch generators, shall be designed with a capacity to meet the demand necessary to maintain the minimum required DPD-FC CONCENTRATIONS specified in 5.7.3.1.1.2 during all times of operation.

4.7.3.2.2.2.1 Chlorine Demand Factors [Deleted]

4.7.3.2.2.3 Documentation [Deleted]

4.7.3.2.2.4 Upon Operation If upon operation it is determined that feeders/equipment are not capable of meeting the demand necessary to maintain minimum required DISINFECTION levels at all times, additional capacity shall be provided.

4.7.3.2.3 Introduction of Chemicals

4.7.3.2.3.1 Separation The injection point of DISINFECTION chemicals shall be located before any pH control chemical injection point with sufficient physical separation of the injection points to reduce the likelihood of mixing of these chemicals in the piping during periods of interruption of RECIRCULATION SYSTEM flow.

4.7.3.2.3.2 Backflow Means of injection shall not allow BACKFLOW into the chemical system from the POOL system.

4.7.3.2.3.3 Coagulants shall be metered and injected through a pump system prior to the filters per the manufacturer's recommended rate.

4.7.3.2.4 Compressed Chlorine Gas

4.7.3.2.4.1 Prohibited for New Construction Use of compressed CHLORINE gas shall be prohibited for new construction and after SUBSTANTIAL ALTERATION to existing AQUATIC FACILITIES.

4.7.3.2.5[A] Types of Feeders

4.7.3.2.5.1 Liquid Solution Feeders Liquid solution feeders shall include positive displacement pumps such as peristaltic pumps, diaphragm pumps, and piston pumps.

4.7.3.2.5.1.1 Feed Rates Feed rates shall be locally adjusted on the pumps and also on/off controlled using an AUTOMATED CONTROLLER.

4.7.3.2.5.1.2 Routed All chemical tubing that runs through areas where staff work shall be routed in PVC piping to support the tubing and/or otherwise supported and protected to prevent leaks.

4.7.3.2.5.1.3 Size The double containment PVC pipe shall be of sufficient size to allow for easy replacement of tubing.

4.7.3.2.5.1.4 Turns Any necessary turns in the piping shall be designed so as to prevent kinking of the tubing.

4.7.3.2.5.2 Erosion Erosion feeders may be pressure, pressure differential, or spray erosion types.

4.7.3.2.5.2.1 Dry Chemical Feeders Dry chemicals shall be granules or tablets.

4.7.3.2.5.2.2 Located Feeders shall have isolation valves on each side of the feeder to be closed before opening the unit.

4.7.3.2.5.2.3 Source Water Erosion feeders shall use AQUATIC VENUE water post- filtration as the source water unless approved by the feeder manufacturer.
4.7.3.2.5.3 Gas Feed Systems Carbon dioxide and ozone are the only gas feed systems permitted in AQUATIC FACILITIES.
4.7.3.2.5.4 Ventilation Proper ventilation shall be required for all gas systems.
4.7.3.2.5.5 Alarms Where CO_2 cylinders are located indoors, a monitor and alarm shall be provided to alert PATRONS/operator of high CO_2 and/or low O_2 levels.
4.7.3.2.5.6 UV Systems Where used, UV systems shall be installed in the RECIRCULATION SYSTEM after the filters.
4.7.3.2.5.6.1 Bypass A bypass pipe that is valved on both ends shall be installed to allow maintenance on the UV unit while the POOL is in operation.
4.7.3.2.5.6.2 Interlock UV system operation shall be interlocked with the recirculation pump so that power to the UV system is interrupted when there is no water flow to the UV unit per 4.7.3.2.1.3.
4.7.3.2.6 Salt Electrolytic Chlorine Generators, Brine Electrolytic Chlorine, or Bromine Generators Halogen generator equipment shall be marked with an EPA establishment number.
4.7.3.2.6.1 Salt Electrolytic Chlorine Generators In-line generator*(s)* or brine *(batch)* generator*(s)* shall be permitted on AQUATIC VENUES.
4.7.3.2.6.2 In-line Method In-line generators shall use POOL-grade salt dosed into the AQUATIC VENUE to produce and introduce CHLORINE into the AQUATIC VENUE treatment loop through an electrolytic chamber.
4.7.3.2.6.3 Batch Method Brine *(Batch)* generators shall produce CHLORINE through an electrolytic cell.
4.7.3.2.6.3.1 Chlorine Production CHLORINE shall be produced from brines composed of POOL-grade salt.
4.7.3.2.6.4 TDS Readout Electrolytic generators shall have a TDS or salt (NaCl) readout and a low salt indicator.
4.7.3.2.6.5 Feed Rate The feed rate shall be adjustable from zero *(0)* to full range.
4.7.3.2.6.6 UL Standard The generator unit shall be CERTIFIED, LISTED, AND LABELED to UL 1081 *(for electrical/fire/shock SAFETY)* by an ANSI-accredited certification organization.
4.7.3.2.6.7 Interlock The generator*(s)* shall be interlocked for all new or SUBSTANTIALLY ALTERED AQUATIC VENUES per 4.7.3.2.1.3.
4.7.3.2.6.8 Installed The generator units shall be installed according to the manufacturer's instructions.
4.7.3.2.6.8.1 Saline Content The saline content of the POOL water shall be maintained in the required range specified by the manufacturer.
4.7.3.2.7 A Feeders for pH Adjustment
4.7.3.2.7.1 Provided Feeders for pH adjustment shall be provided on all new and SUBSTANTIALLY ALTERED AQUATIC VENUES as in 4.7.3.2.1.2.
4.7.3.2.7.2 Approved Substances Approved substances for pH adjustment shall include but not be limited to muriatic *(hydrochloric)* acid, sodium bisulfate, carbon dioxide, sulfuric acid, sodium bicarbonate, and soda ash.
4.7.3.2.7.3 Adjustable pH adjustment feeders shall be adjustable from zero *(0)* to full range.
4.7.3.2.7.4 Marked Reservoirs shall be clearly marked and labeled with contents.
4.7.3.2.8[A] Automated Controllers
4.7.3.2.8.1 Required AUTOMATED CONTROLLERS shall be installed for MONITORING and turning on or off chemical feeders used for pH and disinfectants at all new AQUATIC VENUES.
4.7.3.2.8.1.1 Existing Aquatic Venues For existing AQUATIC VENUES, AUTOMATED CONTROLLERS shall be required at the time of a SUBSTANTIAL ALTERATION of the disinfection system.
4.7.3.2.8.2 NSF Standard All automated chemical controllers for pH and disinfectant MONITORING/control shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 50 by an ANSI-accredited certification organization.
4.7.3.2.8.3 Operation Manuals Operation manuals or other instructions that give clear directions for cleaning and calibrating AUTOMATED CONTROLLER probes and sensors shall be provided in close proximity to the AUTOMATED CONTROLLER.
4.7.3.2.8.4 Set Point A set point shall be used to target the disinfectant concentration and the pH.
4.7.3.3 Secondary Treatment

4.7.3.3.1 General Requirements

4.7.3.3.1.1[A] ANSI Listing and Labeling SECONDARY TREATMENT shall be CERTIFIED, LISTED, AND LABELED to ANSI/NSF 50 by an ANSI-accredited certification organization or approved by the AHJ with proper engineering justification.

4.7.3.3.1.1.1 Marked SECONDARY TREATMENT equipment shall be marked with an EPA establishment number.

4.7.3.3.1.2 [A] Required Facilities The new construction or SUBSTANTIAL ALTERATION of INCREASED RISK AQUATIC VENUES, such as AQUATIC VENUES designed primarily for children under five years old shall be required to use a SECONDARY TREATMENT after adoption of this CODE:

4.7.3.3.1.3 Other Aquatic Venues Optional SECONDARY TREATMENT may be installed on other AQUATIC VENUES not specified in 4.7.3.3.1.2.

4.7.3.3.1.4 Labeled If installed and labeled as SECONDARY TREATMENT, then they shall conform to all requirements specified under 4.7.3.3.

4.7.3.3.1.5 Conform If not labeled as SECONDARY TREATMENT, then they shall be labeled as SUPPLEMENTAL TREATMENT systems and conform to requirements listed under 4.7.3.4.

4.7.3.3.2[A] Log Inactivation and Oocyst Reduction

4.7.3.3.2.1[A] Log Inactivation [Deleted]

4.7.3.3.2.2[A] Installation The SECONDARY TREATMENT shall be located in the treatment loop *(post filtration)* and treat a portion *(up to 100%)* of the filtration flow prior to return of the water to the AQUATIC VENUE or AQUATIC FEATURE, except on INTERACTIVE WATER PLAY AQUATIC VENUES. For INTERACTIVE WATER PLAY AQUATIC VENUES; the SECONDARY TREATMENT shall be located after the feature pump to treat 100% of the water prior to reaching the BATHERS.

4.7.3.3.2.3 Manufacturer's Instructions The SECONDARY TREATMENT shall be installed according to the manufacturer's directions.

4.7.3.3.3[A] Ultraviolet Light Systems To prevent mercury exposure, UV systems shall be installed to avoid lamp breakage according to the guidelines in EPA 815-R-06-007 Appendix E.

4.7.3.3.3.1[A] Third Party Validation UV equipment shall be third party validated in accordance with the practices outlined in the *EPA Ultraviolet Disinfectant Guidance Manual* dated November, 2006, publication number EPA 815-R-06-007 or, alternatively for UV equipment designed for INTERACTIVE WATER PLAY AQUATIC VENUES, in accordance with the practices for wastewater treatment equipment outlined in the Water Environment Federation/International Ultraviolet Association (WEF/IUVA) WEF/IUVA publication "Ultraviolet Disinfection for Wastewater" dated April 2015, ISBN: 978-1-57278-312-6.

4.7.3.3.3.1.1 Validation Standard The *EPA Ultraviolet Disinfectant Guidance Manual* shall be considered a recognized national STANDARD in these rules.

4.7.3.3.3.2 Suitable for Intended Use UV systems and all materials used therein shall be suitable for their intended use and be installed:

1) In accordance with these rules;2) As CERTIFIED, LISTED, AND LABELED to a specific STANDARD by an ANSI-accredited certification organization; and 3) As specified by the manufacturer.

4.**7.3.3.3.3 Installation** The UV equipment shall be installed after the filtration and before addition of primary disinfectant except on INTERACTIVE WATER PLAY AQUATIC VENUES. For INTERACTIVE WATER PLAY AQUATIC VENUES, the UV system shall be located after the feature pump to treat 100% of the water prior to reaching the BATHERS. When the features are off, the UV shall continue to circulate a minimum amount of water back through the tank, if required by the manufacturer for warm-up and cool-down purposes.

4.7.3.3.3.3.1 Labeled UV equipment shall be labeled with the following design specifications: maximum flow rate, minimum transmissivity, minimum intensity, and minimum dosage.

4.7.3.3.3.3.2 Strainer Installation An inline strainer shall be installed after the UV unit to capture broken lamp glass or sleeves.

4.7.3.3.3.4 Electrically Interlocked For new AQUATIC VENUES, SUBSTANTIAL ALTERATIONS or replacements, the equipment shall be electrically interlocked with feature pump*(s)* or automated feature supply valves, such that when the UV equipment fails to produce the required dosage as measured by automated sensor, the water features do not operate.

4.7.3.3.3.4.1[A] Alarm/Interlock Setpoint The UV alarm/interlock setpoint shall be such that it ensures that the minimum required dose is delivered under all possible conditions of water UV transmittance and lamp output at the actual flow rate.
4.7.3.3.3.4.2 Operation UV systems shall not operate if the RECIRCULATION SYSTEM is not operating.
4.7.3.3.3.5 Calibrated UV Sensors The UV equipment shall be complete with calibrated UV sensors, which record the output of all the UV lamps installed in a system.
4.7.3.3.3.5.1 Multiple Lamps [Deleted]
4.7.3.3.3.5.2 Fewer Sensors [Deleted]
4.7.3.3.3.6 Automated Shut Down The automated shut down of the UV equipment for any reason shall initiate a visual alarm or other indication which will alert staff onsite or remotely.
4.7.3.3.3.6.1 Signage Signage instructing staff or PATRONS to notify facility management shall be posted adjacent to the visual indication.
4.7.3.3.3.6.2 Not Staffed If the AQUATIC FACILITY is not staffed, the sign shall include a means to contact management whenever the AQUATIC FACILITY is in use.
4.7.3.3.3.7 Reports and Documentation The UV equipment shall be supplied with the appropriate validation reports and documentation for that equipment model.

4.7.3.3.4 Ozone Disinfection

4.7.3.3.4.1[A] Log Inactivation [Deleted]
4.7.3.3.4.2[A] Onsite Measurement [Deleted]
4.7.3.3.4.3 [A] Suitable for Use Ozone systems and all materials used therein shall be suitable for their intended use and be installed:

1) In accordance with all applicable requirements;
2) As CERTIFIED, LISTED, AND LABELED to a specific STANDARD by an ANSI-accredited certification organization; and
3) As specified by the manufacturer.

4.7.3.3.4.4 Ozone System Components An ozone system shall be a complete system consisting of the following *(either skid-mounted or components)*:

1) Ozone generator;
2) Injector / injector manifold;
3) Reaction tank *(contact tank)* / mixing tank / degas tower;
4) Degas valve *(if applicable, to vent un-dissolved gaseous ozone)*;
5) Ozone destruct *(to destroy un-dissolved gaseous ozone)*;
6) ORP monitor / controller;
7) Ambient ozone monitor / controller;
8) Air flow meter / controller; and
9) Water BACKFLOW prevention device in gas delivery system.

4.7.3.3.4.5 Appropriate Installation These components *(or skid)* shall be installed as specified by the manufacturer to maintain the required system validation as noted above.
4.7.3.3.4.6 ORP Monitor The ozone generating equipment shall be designed, sized, and controlled utilizing an ORP monitor / controller *(independent of and in addition to any halogen ORP monitor/controller)*.
4.7.3.3.4.6.1 Placed Downstream The device shall be placed in the AQUATIC VENUE and AQUATIC FEATURE recirculation water downstream of the ozone side-stream loop and before the halogen feed location.
4.7.3.3.4.6.2 Minimum ORP Reading The minimum ORP reading shall be no less than 600 mV measured directly after *[one to 5 feet (30.5 cm to 1.5 m)]* the ozone side-stream remixes into the full flow of the RECIRCULATION SYSTEM.
4.7.3.3.4.6.3 Maximum ORP Reading The maximum ORP reading shall be no greater than 900 mV.
4.7.3.3.4.7 Installation and Injection Point The ozone system injection point shall be located in the AQUATIC VENUE return line after the filtration and heating equipment, prior to the primary disinfectant injection point.
4.7.3.3.4.7.1 Injection and Mixing The injection and mixing system shall not prevent the attainment of the recirculation rate required elsewhere in this CODE.
4.7.3.3.4.7.2[A] Gas Monitor / Controller An ambient ozone gas monitor/controller located adjacent to the ozone reactor/contact tank shall be utilized to disable the ozone system in the event of an ozone gas leak.

4.7.3.3.4.8 Comply with Fire Code Ozone system installations shall comply with the NFPA 1 Fire Code or the International Fire Code and any other CODES, STANDARDS, or requirements as mandated by the AHJ.

4.7.3.3.4.9 Air Space Testing At the time the ozone generating equipment is installed, again after 24 hours of operation, and annually thereafter, the air space within 6 inches of the AQUATIC VENUE water shall be tested to determine compliance of less than 0.1 ppm *(mg/L)* gaseous ozone.

4.7.3.3.4.9.1 Results Results of the test shall be maintained onsite for review by the AHJ.

4.7.3.3.4.10 Automatic Shut Down Automatic shutdown shall occur under any condition that would result in the ozone system not operating within the established parameters needed to achieve the required log inactivation of *Cryptosporidium (i.e., low feed gas supply, loss of vacuum or pressure, high dew point in feed air, water in ozone gas delivery line)*.

4.7.3.3.4.10.1 Electrically Interlocked The equipment shall be electrically interlocked with AQUATIC VENUE pump*(s)* or automated feature supply valves, such that when the ozone equipment fails to produce the required dosage as measured by ORP, the AQUATIC VENUES do not operate.

4.7.3.3.4.11 ORP Reading Alarm or Visual Indication If the ORP reading for the ozone system drops below 600 mV *(regardless of the cause)* a visual alarm or other indication shall be initiated that will alert staff onsite or remotely.

4.7.3.3.4.11.1 Signage Signage to notify facility management shall be present adjacent to the visual alarm.

4.7.3.3.4.12 Regular Audits In order to ensure that the supplied ozone system meets all the requirements of the STANDARD, the manufacturer shall maintain a quality system audited on a regular basis to a recognized quality STANDARD.

4.7.3.3.4.12.1 Listed Ozone equipment shall be listed to NSF/ANSI 50.

4.7.3.3.4.13 Reports and Documentation The ozone system shall be supplied with the appropriate validation reports and documentation for that equipment model.

4.7.3.3.4.13.1 Log Inactivation Chart Ozone validation reports shall include a graph, chart, or other documentation which clearly indicates the required operating parameters for which the required log inactivation is guaranteed for the system in question.

4.7.3.3.4.13.2 Inclusive This dose shall be inclusive of validation factors.

4.7.3.3.4.13.3 System Performance Curves System performance curves that do not include such factors are not considered validated systems.

4.7.3.3.5 Filtration Removal of Cryptosporidium oocysts Filtration systems to be used in SECONDARY TREATMENT for *Cryptosporidium* reduction in INCREASED RISK AQUATIC VENUES shall be certified by at least one of the following methods:

1) NSF Certified to confirm that they provide the specified log reduction of *Cryptosporidium* OOCYSTS or a conservative surrogate using realistic AQUATIC VENUE water quality values and operating conditions.

2) ANSI-accredited third-party testing and certification organization confirmation that they provide the specified log reduction of *Cryptosporidium* OOCYSTS or a conservative surrogate using realistic AQUATIC VENUE water quality values and operating conditions.

3) Peer-reviewed literature values with specified log reduction of *Cryptosporidium* OOCYSTS or a conservative surrogate using realistic AQUATIC VENUE water quality values and operating conditions.

4.7.3.4 Supplemental Treatment Systems

4.7.3.4.1 General Requirements

4.7.3.4.1.1[A] Optional AQUATIC VENUES that do not require SECONDARY TREATMENT may install SUPPLEMENTAL TREATMENT systems for the purpose of enhancing overall system performance and improving water quality.

4.7.3.4.1.2 Clearly Noted The AQUATIC FACILITY operating instructions shall clearly note that these SUPPLEMENTAL TREATMENT SYSTEMS do not meet the requirements of a SECONDARY TREATMENT, and as such, are only considered SUPPLEMENTAL TREATMENT SYSTEMS.

4.7.3.4.1.3 No Log Inactivation Required SUPPLEMENTAL TREATMENT SYSTEMS shall meet all of the requirements of this CODE, except:

1) They do not need to achieve the minimum log inactivation of *Cryptosporidium parvum* as required in 4.7.3.3;

2) They do not need to be able to reduce the total number of infective OOCYSTS to one OOCYST per 100 mL as required in 4.7.3.3; and
3) Except as noted in 4.7.3.4.2 and 4.7.3.4.3 below.

4.7.3.4.1.4 Clearly Labeled Each system shall be clearly labeled, "Supplemental Water Treatment System—Does Not meet the requirements for Secondary Disinfection."

4.7.3.4.2[A] Ultraviolet Light

4.7.3.4.2.1 UV as Supplemental Treatment Requirement When UV is used as a SUPPLEMENTAL TREATMENT system, all requirements of 4.7.3.3.3.2 through 4.7.3.3.3.4 shall be met.

4.7.3.4.2.3 Water Features Water features shall not require shut off if the supplemental UV system does not produce the required dosage.

4.7.3.4.2.4 Exempt The equipment is exempt from the validation requirements of 4.7.3.3.3.1.

4.7.3.4.3[A] Ozone

4.7.3.4.3.1 Ozone as Supplemental Treatment Requirement When ozone is used as a SUPPLEMENTAL TREATMENT system, all requirements of 4.7.3.3.4.3 thru 4.7.3.3.4.9 shall be met.

4.7.3.4.3.2 Maximum ORP Reading The maximum ORP reading shall be no greater than 900 mV.

4.7.3.4.4[A] Copper / Silver Ion Systems

4.7.3.4.4.1 Only EPA–REGISTERED Disinfectants Only those systems that are EPA REGISTERED for use as disinfectants in AQUATIC VENUES or SPAS in the United States shall be permitted.

4.7.3.4.4.2 Suitable Copper/silver systems, and all materials used therein, shall be suitable for their intended use.

4.7.3.4.4.3 Installed Copper/silver systems, and all materials used therein, shall be installed in accordance with all applicable requirements and manufacturer's instructions.

4.7.3.4.5[A] Ultraviolet Light/Hydrogen Peroxide Systems UV light/hydrogen peroxide combination systems shall be prohibited for use in aquatic facilities.

4.7.3.5[A] Water Quality Testing Devices and Kits

4.7.3.5.1 Compliance WQTDs and kits shall be CERTIFIED, LISTED, AND LABELED to NSF/ANSI 50 by an ANSI-accredited certification organization or as approved by the Authority.

4.7.3.5.2 Water Clarity Device *Refer to 5.7.6 for guidance on water clarity devices.*

4.7.3.6[A] Microbiological Testing Equipment

4.7.3.6.1 EPA Approved Microbiological testing equipment and methods shall be:

1) EPA Approved, EPA Accepted, EPA Equivalent;
2) Conforming to the latest edition of Standard Methods for the Examination of Water and Wastewater; or
3) CERTIFIED, LISTED, AND LABELED to NSF/ANSI 50 by an ANSI-accredited certification organization.

4.7.4[A] Water Replenishment System

4.7.4.1[A] Discharge and Measure A WATER REPLENISHMENT SYSTEM consisting of a means to intentionally discharge and measure or calculate the volume of both discharged AQUATIC VENUE water and filter backwash wastewater (or alternate means of achieving the same result) shall be provided.

4.7.4.1.1[A] Alternate System An alternate system capable of removing an equivalent amount of turbidity, total dissolved organic carbon (TOC), and total nitrogen (TN) containing compounds shall also be acceptable in lieu of discharging AQUATIC VENUE water.

4.7.4.1.1.1 Product Water When an alternate system is used, the return water from the alternate system shall maintain turbidity, total organic carbon, and total nitrogen concentrations that are less than or equal to the AQUATIC VENUE water supply.

4.7.4.1.2 Discharge The WATER REPLENISHMENT SYSTEM shall be designed to discharge *(or treat and reuse via a separate treatment system capable of removing compounds specified in 4.7.4.1.1)* AQUATIC VENUE water at a rate of at least 4 gallons *(15 L)* per BATHER per day per AQUATIC VENUE.

4.7.5 Spas

4.7.5.1[A] General

4.7.5.1.1 Requirements SPAS shall conform to the design, operation, and maintenance requirement of AQUATIC VENUES except as required below.

4.7.5.2 Flow Rates/Turnover Times

4.7.5.2.1 Maximum Allowable All SPAS shall be designed to have a maximum allowable TURNOVER TIME of 0.5 hour or less.

4.7.5.2.2 Turnover Times TURNOVER TIMES shall be calculated based solely on the flow rate through the filtration system.

4.7.5.3 Filtration System Inlets SPAS shall have a minimum of two adjustable filter system INLETS located below the surface of the UNDERWATER BENCH and spaced at least 3 feet *(0.9 m)* apart and designed to distribute flow evenly.

4.7.5.4 Hydrotherapy Jet System Inlets

4.7.5.4.1 Air Flow Air flow shall be permitted through the hydrotherapy jet system and/or when injected post-filtration.

4.7.5.4.2 Skimmer Submerged suction SKIMMERS shall be allowed provided that the manufacturer's recommendations for use are followed.

4.7.5.4.3 Independent The hydrotherapy jet system shall be independent of the recirculation, filtration, and heating systems.

4.8 Decks and Equipment

4.8.1 Decks

4.8.1.1 General Standards for All Decks

4.8.1.1.1[A] Lifeguard Placement and Safety Considerations DECKS shall be designed to allow for QUALIFIED LIFEGUARD placement per the zone of BATHER surveillance in 6.3.3.1.1 and safety areas and equipment in 4.8.5.

4.8.1.1.1.1[A] Deck Clearance DECKS shall have a minimum of 4 feet *(1.2 m)* of clearance from AQUATIC VENUE edge to fencing or other obstruction to allow for QUALIFIED LIFEGUARD transit, roaming, or change of positioning to maximize viewing of the zone of BATHER surveillance as well as execution of water extrication.

4.8.1.1.1.2[A] Access Points Access points shall be provided to QUALIFIED LIFEGUARDS to transit to QUALIFIED LIFEGUARDS positions.

4.8.1.1.1.3[A] Bather Zone Surveillance The designer and owner shall consider impact on BATHER zone surveillance when determining placement of structural, operational, and theming elements.

4.8.1.1.1.3.1 Elements for Deck Placement These elements shall include but are not limited to chairs, fencing, ADA access equipment, and AQUATIC FEATURES.

4.8.1.1.2 Joints or Gaps Conditions between adjacent DECK materials, components, and concrete pours shall not have horizontal open joints or gaps larger than 3/16 inches wide (4.8 *mm)*.

4.8.1.1.2.1 Vertical Elevation Any change in vertical elevation between adjacent DECK materials, components, and concrete pours exceedi¼1/4 inches *(6.4 mm)* shall be considered an edge condition and shall be treated according to 4.8.1.1.2.2 or 4.8.1.1.3.

4.8.1.1.2.2 Fillers Open joints or gaps larger than 3/16 inches *(4.8 mm)* wide or with vertical elevations exceeding ¼ inches *(6.4 mm)* shall be rectified using appropriate fillers.

4.8.1.1.2.3 Sealants The use of fillers such as caulk or sealant in joints or gaps shall be permitted for expansion and contraction.

4.8.1.1.2.4 No Violation The use of fillers such as caulk or sealant in joints or gaps shall not be in violation of 4.8.1.1.3.

4.8.1.1.3 Rounded Edges All DECK edges shall be beveled, rounded, or otherwise relieved to eliminate sharp corners.

4.8.1.1.4 Minimize Cracks Joints in DECKING shall be provided to minimize the potential for CRACKS due to a change in elevation, for movement of the slab and for shrinkage control.

4.8.1.1.5[A] Concrete Decking Where concrete is used as a DECK material, it shall be installed in accordance with the latest edition of the American Concrete Institute *(ACI)* Standards and in accordance with applicable local, state, territorial, federal, and tribal building CODES.

4.8.1.1.6 Access Hatches Any access hatches located within the surface of the DECK shall be lockable, SLIP RESISTANT, and designed to maintain acceptable surface temperatures to allow barefoot traffic.

4.8.1.2[A] Standards for Perimeter Decks

4.8.1.2.1 Impervious Finish materials for the PERIMETER DECK shall be suitable for the POOL environment, non-toxic, and substantially impervious.
4.8.1.2.2 Watertight Expansion Continuous watertight EXPANSION JOINT material shall be provided between PERIMETER DECKS and POOL coping.
4.8.1.2.2.1 Expansion Joint Where applicable, the EXPANSION JOINT shall be designed and constructed so as to protect the coping and its mortar bed from damage as a result of movement of adjoining DECK.
4.8.1.2.3 Watertight Expansion All conditions between adjacent concrete PERIMETER DECK pours shall be constructed with watertight EXPANSION JOINTS.
4.8.1.2.3.1 Joint Measurements Joints shall be at least 3/16 inches *(5 mm)* in continuous width.
4.8.1.2.3.2 Vertical Differential The maximum allowable vertical differential across a joint shall be ¼ inches *(6.5 mm)*.
4.8.1.3 Drains *Refer to 4.11.4 for additional guidance on drains.* ***4.8.1.3.1 A Slope*** DECKS shall be sloped away from the AQUATIC VENUE and in accordance with Table 4.8.1.3 below.

Table 4.8.1.3 Minimum Slopes for Drainage

Surface	Minimum Slope
Smooth finishes; such as tile, hand-finished concrete & lightly-broomed concrete	1/8 inch per foot *(3.2 mm/30.5 cm)*
Moderately textured finishes; such as exposed aggregate or medium-broomed concrete	1/4 inch per foot *(6.4 mm/30.5 cm)*
Heavily textured finishes; such as brick (where permitted)	3/8 inch per foot *(9.5 mm/30.5 cm)*

4.8.1.3.1.1 Accessible Routes Where DECK areas or portions thereof serve as ACCESSIBLE ROUTES, slopes in any direction shall not exceed ADA requirements.
4.8.1.3.1.2 All Water All water that touches areas defined as DECK, including water originating in the AQUATIC VENUE, shall drain effectively to either perimeter areas or to DECK drains.
4.8.1.3.1.3 Remove Wastewater Drainage shall remove AQUATIC VENUE water that splashes outside of the AQUATIC VENUE and beyond a POOL gutter system, DECK cleaning water, and rainwater without leaving standing water.
4.8.1.3.2 Placement The placement of DECK drains, where provided, shall effectively carry water away from the AQUATIC VENUE and off the DECK without ponding.
4.8.1.3.3[A] Cross-Connection Control There shall be no direct connection between the DECK drains and the sanitary or storm sewer system.
4.8.1.3.3.1 Discharge to Sewer or Other Ground Water If the AHJ requires an outdoor POOL to have DECK drains that discharge to a storm sewer system, ground surface, or holding pond, the POOL shall be plumbed through an air-gap, BACKFLOW preventer, or other approved device as allowed by the AHJ.
4.8.1.3.3.2[A] No Drain DECK drains shall not drain to the POOL, POOL gutter, or RECIRCULATION SYSTEMS.
4.8.1.3.4 Drain Bodies Drain receptacles shall consist of non-corrosive or corrosion-resistant materials.
4.8.1.3.5 Drain Covers Drain covers shall be suitable for bare foot traffic with openings no greater than ½ inch *(1.3 cm)* and easily removable with a simple tool to facilitate regular cleaning.
4.8.1.4 Materials / Slip Resistant
4.8.1.4.1 General PERIMETER DECK and POOL DECK shall be constructed with a uniform and easily cleaned surface such as concrete, tile, manufactured or acrylic surfaces.
4.8.1.4.2[A] Slip Resistant All DECKS shall have SLIP-RESISTANT, textured finishes, which are not conducive to slipping under contact of bare feet in wet or dry conditions.
4.8.1.4.3[A] Carpet Carpet and artificial turf shall be prohibited materials for PERIMETER DECK and POOL DECK.
4.8.1.4.4[A] Wood Wood shall be a prohibited material for use as PERIMETER DECK.

4.8.1.4.5[A] Dry Deck [Deleted]

4.8.1.4.6[A] Landscaping Loose plant material or bedding shall not be permitted within PERIMETER DECKS.

4.8.1.5 [A] Deck Size / Width

4.8.1.5.1 Perimeter Deck

4.8.1.5.1.1[A] Width PERIMETER DECKS shall be 4 feet *(1.2 m)* minimum in unobstructed width around the POOL perimeter as prescribed in this section.

4.8.1.5.1.1.1 Circulation Path [Deleted]

4.8.1.5.1.1.2 Flush with Pool Wall PERIMETER DECK areas shall be flush with POOL walls/copings except where special conditions exist, such as elevated beam or parapet, raised transfer walls, or as permitted by other sections of this CODE.

4.8.1.5.1.2[A] Perimeter Decking PERIMETER DECKS shall be provided around 100% of the AQUATIC VENUE perimeter except where special conditions exist as permitted by other sections of this CODE.

4.8.1.5.1.3[A] Unguarded Aquatic Venues For unguarded POOLS, PERIMETER DECKS shall be provided in compliance with at least one of two options:

1) Provide PERIMETER DECK around 100% of the of the POOL perimeter or

2) Provide PERIMETER DECK such that the entire perimeter and depth of the POOL is readily reachable by a pole and hook from the PERIMETER DECK.

4.8.1.5.1.4 Spectator Seating *Refer to 4.6.10 for more information on spectator areas.*

4.8.1.5.2 Fixed Equipment

4.8.1.5.2.1 Unobstructed Deck Unobstructed DECK area 4 feet *(1.2 m)* minimum in width shall be provided for access around:

1) Diving equipment,
2) Special feature stairways *(such as a WATERSLIDE)*,
3) Lifeguard stands,
4) Diving boards,
5) Similar DECK equipment,
6) ADA access equipment, and
7) Structural columns.

4.8.1.5.2.2 Circulation Path [Deleted]

4.8.1.5.2.3 Queuing Space [Deleted]

4.8.1.5.2.4 Free Space [Deleted]

4.8.1.5.3 Circulation Path [Deleted]

4.8.1.6 Wing Walls or Peninsulas

4.8.1.6.1[A] No Perimeter Deck WING WALLS or PENINSULAS less than 18 inches *(45.7 cm)* in width shall not be considered a part of the PERIMETER DECK.

4.8.1.6.1.1 Use by Lifeguards A WING WALL or PENINSULA greater than 18 inches *(45.7 cm)* wide but less than 48 inches *(1.2 m)* wide may be used by QUALIFIED LIFEGUARD personnel but shall not be considered as part of the PERIMETER DECK.

4.8.1.6.1.2 Slip Resistant Any WING WALL or PENINSULA shall be constructed of SLIP- RESISTANT materials.

4.8.1.6.2[A] Perimeter Overflow System If it is impractical to design a perimeter overflow system into the WING WALL or PENINSULA due to width or height, then the overflow system may bypass the WING WALL or PENINSULA.

4.8.1.6.3[A] Pool Perimeter WINGWALLS and PENINSULAS shall be considered part of the POOL.

4.8.1.6.3.1 Calculating WINGWALLS and PENINSULAS shall not be accounted for in calculating the POOL perimeter.

4.8.1.6.4 Normal Operating Water Level WINGWALLS and PENINSULAS shall be at or above the normal operating water level of the POOL.

4.8.1.6.5[A] Deck Drainage DECK drainage shall not be required for WINGWALLS or PENINSULAS as they are considered part of the POOL.

4.8.1.6.5.1 Crowned The tops shall be crowned to prevent standing water and sloped to the POOL or overflow system.

4.8.1.6.6 Vertical Depth Markers Vertical depth markers shall be provided around WINGWALLS and PENINSULAS in accordance with 4.5.19.

4.8.1.7[A] Islands

4.8.1.7.1 Minimum Width An ISLAND not more than 18 inches *(45.7 cm)* in width shall be designed to discourage a person from walking on the ISLAND by not providing stairs, ladders, or bridges to the ISLAND.

4.8.1.7.2 Slip Resistant The surface of ISLANDS shall be SLIP RESISTANT.

4.8.1.7.3 Lifeguards An ISLAND 18 inches*(45.7cm)* to 48 inches *(1.2m)* wide may be allowed for use only by QUALIFIED LIFEGUARDS.

4.8.1.7.4 Vertical Depth Markers Vertical depth markers shall be provided around ISLANDS in accordance with 4.5.19 and visible from all sides.

4.8.1.7.5 Horizontal Depth Markers Horizontal depth markings and warning signs shall also be required per 4.5.19 if the ISLAND is designed for BATHER use.

4.8.1.7.5.1 Island Not Intended for Bather Use If the ISLAND is not designed for BATHER use, warning signs stating "No Entry" shall be required.

4.8.1.7.6 Bridge or Stairway An ISLAND designed for BATHER traffic shall be accessible by bridge, ramp, ladder, or stairway from the POOL.

4.8.1.7.7 Minimum Clearance All bridges spanning a POOL or any other structures not intended for INTERACTIVE PLAY shall have a minimum clearance of 7 feet *(2.1 m)* from the bottom of the POOL to any structure overhead.

4.8.1.7.8 Guard Rails Any bridge shall have a minimum 42 inch *(1.1m)* high BARRIER on both sides.

4.8.1.8[A] Heated Decks [Deleted]

4.8.1.9 Hose Bibbs

4.8.1.9.1 General Domestic water hose bibbs shall be provided insufficient quantity, spacing, and type to wash down PERIMETER DECK and POOL DECK areas using a hose of no longer than 100 feet *(30.5 m)*.

4.8.1.9.2 Backflow Prevention All hose bibbs shall be equipped with BACKFLOW prevention devices.

4.8.2 Diving Boards and Platforms

4.8.2.1[A] Diving Envelope

4.8.2.1.1[A] Competitive Diving Diving boards shall be permitted only when the diving envelope conforms to the most current version of STANDARDS referenced in the 2023 4th Ed. Model Aquatic Health Code, Chapter 3 for the certifying agency that regulates competitive diving at the AQUATIC FACILITY. Such certifying agencies include:

1) NCAA,
2) NFHS,
3) FINA, or
4) U.S.A. Diving, Inc.

4.8.2.1.2[A] Non-Competitive Diving If the AQUATIC VENUE does not have competitive diving, then the diving envelope shall conform to the diving envelope STANDARDS of:

1) Table 4.8.2.2,
2) Table 4.8.2.3,
3) Figure 4.8.2.2.1, and
4) Figure 4.8.2.2.2.

4.8.2.2[A] Steps and Guardrails

4.8.2.2.1 Higher than Twenty-One Inches Diving stands higher than 21 inches *(53.3 cm)* measured from the DECK to the top of the butt end of the board or platform shall have steps or a ladder and handrails.

4.8.2.2.2 Self-Draining Treads Steps or ladder treads shall be self-draining, corrosion resistant, SLIP RESISTANT, and designed to support the maximum expected load.

4.8.2.2.3 Short Platforms Diving stands or platforms that are 1 meter *(3.4 ft)* or higher shall be protected with guard rails at least 30 inches *(76.2 cm)* above the board, extending at least to the edge of the water along with intermediate rails.

4.8.2.2.4[A] Tall Platforms Diving stands or platforms that are 2 meters *(6.6 ft)* or higher shall have guard rails with the top rail at least 36 inches *(0.9 m)* above the board and a second rail approximately half the distance from the platform to the upper rail.

Table 4.8.2.2 Diving Board Height and Dimensions

Diving Board Height	1.64 ft. *(0.5 m)*	2.46 ft. *(0.75 m)*	3.28 ft. *(1.0 m)*	3.84 ft. *(3.0 m)*
Diving Board Length	10.0 ft. *(3.05 m)*	12.0 ft. *(3.66 m)*	16.0 ft. *(4.88 m)*	16.0 ft. *(4.88 m)*
Diving Board Width	20.0 in. *(50.8 cm)*	20.0 in. *(50.8 cm)*	20.0 in. *(50.8 cm)*	20.0 in. *(50.8 cm)*

Table 4.8.2.3 Minimum Dimensions of Components Related to Diving Wells By Diving Board Height

Note: Letters below refer to Figures 4.8.2.2.1 & 4.8.2.2.2

		Minimum Dimensions			
	Diving Board Height	0.5 Meter	0.75 Meter	1.0 Meter	3.0 Meter
A	**Distance from plummet back to pool wall**	3.0 ft. *(0.91 m)*	4.5 ft. *(1.37 m)*	6.0 ft. *(1.83 m)*	6.0 ft. *(1.83 m)*
B	**Distance from plummet to pool wall at side**	10.0 ft. *(3.05 m)*	10.0 ft. *(3.05 m)*	10.0 ft. *(3.05 m)*	11.5 ft. *(3.51 m)*
C	**Distance from plummet to adjacent plummet**	8.83 ft. *(2.69 m)*	8.83 ft. *(2.69 m)*	8.83 ft. *(2.69 m)*	8.54 ft. *(2.60 m)*
D	**Distance from plummet to pool wall ahead**	26.0 ft. *(7.92 m)*	27.83 ft. *(8.48 m)*	29.58 ft. *(9.02 m)*	33.67 ft. *(10.26 m)*
E	**Height, diving board to ceiling at plummet & distances F and G**	16.0 ft. *(4.88 m)*	16.0 ft. *(4.88 m)*	16.0 ft. *(4.88 m)*	16.0 ft. *(4.88 m)*
F	**Clear overhead distance behind and each side of plummet**	8.0 ft. *(2.34 m)*	8.0 ft. *(2.34 m)*	8.0 ft. *(2.34 m)*	8.0 ft. *(2.34 m)*
G	**Clear overhead distance ahead of plummet**	16.0 ft. *(4.88 m)*	16.0 ft. *(4.88 m)*	16.0 ft. *(4.88 m)*	16.0 ft. *(4.88 m)*
H	**Depth of water at plummet**	9.5 ft. *(2.90 m)*	10.75 ft. *(3.28 m)*	12.0 ft. *(3.66 m)*	12.5 ft. *(3.81 m)*
J	**Distance ahead of plummet to depth K**	12.0 ft. *(3.66 m)*	14.25 ft. *(4.34 m)*	16.5 ft. *(5.03 m)*	19.75 ft. *(6.02 m)*
K	**Depth at distance J ahead of plummet**	8.75 ft. *(2.67 m)*	10.0 ft. *(3.05 m)*	11.28 ft. *(3.44 m)*	12.17 ft. *(3.71 m)*
L	**Distance at each side of plummet to depth M**	8.0 ft. *(2.34 m)*	8.13 ft. *(2.48 m)*	8.25 ft. *(2.51 m)*	9.92 ft. *(3.02 m)*
M	**Depth at distance L on each side of plummet**	9.08 ft. *(2.77 m)*	10.33 ft. *(3.15 m)*	11.63 ft. *(3.54 m)*	12.17 ft. *(3.71 m)*
N	**Maximum slope to reduce height E**	30°	30°	30°	30°
P	**Maximum floor slope to reduce depth ahead of K, to the sides of M, or back to pool wall behind H**	3:1	3:1	3:1	3:1

Figure 4.8.2.2.1: Diving Platform Longitudinal Section: Side View

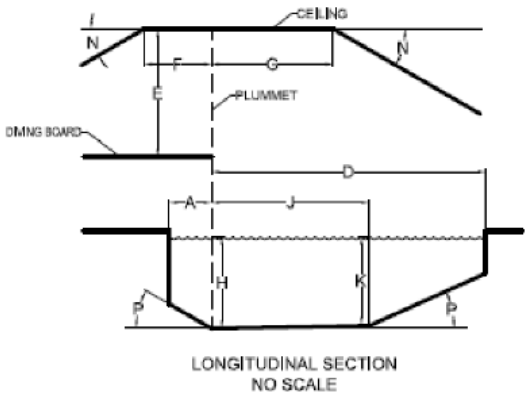
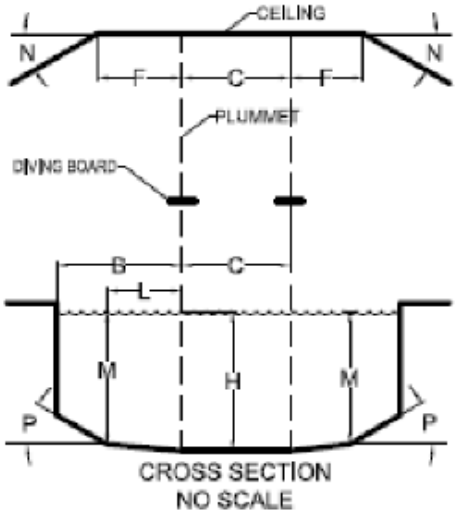


Figure 4.8.2.2.2: Diving Platform Cross Section: Front View



4.8.3 Starting Platforms

4.8.3.1[A] Conform to Standard Codes Starting platforms shall be installed and conform to applicable SAFETY STANDARDS established by:

1) FINA,
2) U.S.A. Swimming,
3) NCAA,
4) NFHS,
5) YMCA, or
6) Other sanctioning body.

4.8.3.2 Minimum Water Depth Starting platforms shall be installed in a minimum water depth of 4 feet *(1.25 m)*, except for new construction, where starting platforms shall be installed in a minimum water depth of 6 feet *(1.8 m)*.

4.8.3.3 Leading Edge The leading edge of starting platforms shall have a maximum height of 30 inches *(76.2 cm)* above the water surface.

4.8.3.4 Slip Resistant Starting platforms shall have SLIP-RESISTANT tread surfaces.

4.8.3.5 Secure and Stable Starting platforms shall be installed and secured per manufacturer's recommendations at all times when in use.

4.8.4 Pool Slides [N/A]

4.8.5 Lifeguard & Safety-Related Equipment

4.8.5.1 Equipment Inspection and Maintenance [N/A]

4.8.5.2 Safety Equipment Required at all Aquatic Facilities

4.8.5.2.1[A] Emergency Communication Equipment The AQUATIC FACILITY or each AQUATIC VENUE, as necessary, shall have a functional telephone or other communication device that is hard wired and capable of directly dialing 911 or function as the emergency notification system.

4.8.5.2.1.1 Conspicuous and Accessible The telephone or communication system or device shall be conspicuously provided and accessible to AQUATIC VENUE users such that it can be reached immediately.

4.8.5.2.1.2 Alternate Communication Systems Alternate systems, devices, or communication processes are allowed with approval of the AHJ in situations when a telephone is not logistically sound, and an alternate means of communication is available, which meet the requirements of 5.8.5.2.1.2.

4.8.5.2.1.3 Internal Communication The AQUATIC FACILITY design shall include a method for staff to communicate in cases of emergency.

4.8.5.2.1.4 Signage A sign shall be posted at the telephone providing dialing instructions, address and location of the AQUATIC VENUE location, and the telephone number.

4.8.5.3 Safety Equipment Required at Facilities with Lifeguards

4.8.5.3.1[A] Lifeguard Chair and Stand Placement The designer shall coordinate with the owner and/or an aquatic consultant to consider the impact on BATHER surveillance zones for placement of chairs and stands designed to be permanently installed so as to provide an unobstructed view of the BATHER surveillance zones.

4.8.5.3.2[A] Lifeguard Chair and Stand Design The chairs/stands shall be designed:

1) With no sharp edges or protrusions;
2) With sturdy, durable, and UV–resistant materials;
3) To provide enough height to elevate the lifeguard to an eye level above the heads of the BATHERS; and
4) To provide safe access and egress for the lifeguard.

4.8.5.3.3[A] UV Protection for Chairs and Stands Where provided, permanently installed chairs/stands, where QUALIFIED LIFEGUARDS can be exposed to UV radiation, shall include protection from such UV radiation exposure.

4.8.5.3.4 Automatic External Defibrillators (AED) All general-use pools, and pools at health clubs serving 100 patrons or more a day, must provide an AED on-site and accessible for use.

1) The AED must be maintained, inspected and serviced, including the battery and electrodes according to the guidelines set forth by the manufacturer.
2) There must be a sufficient number of employees, including all lifeguards, trained in the use of the AED so that there is one on-site whenever the pool is open.
3) The AED must be stored in a location from which the AED is accessible and can be quickly retrieved.
4) Signage must be provided that indicates the location of the AED.
5) A policy must be developed for the use of the AED, including the need to contact 911 as soon as possible after identifying the incident. This policy should be made available to facility staff and must be posted with the AED.

4.8.6 Barriers and Enclosures

4.8.6.1[A] General Requirements

4.8.6.1.1 Enclosure All AQUATIC FACILITIES, CHEMICAL STORAGE SPACES, and AQUATIC VENUE mechanical spaces shall be located in an ENCLOSURE to prevent unauthorized entry.

4.8.6.1.1.1 Enclosures The ENCLOSURE may consist of any combination of building envelopes, site walls, or fencing as provided for in this section.

4.8.6.1.1.2 Patron Accessibility An ENCLOSURE shall be provided between CHEMICAL STORAGE SPACES, POOL, mechanical spaces, and areas accessible to the public, in accordance with applicable local, state, territorial, federal, and tribal building CODES.

4.8.6.2 Construction Requirements

4.8.6.2.1[A] Discourage Climbing ENCLOSURES shall be designed to discourage climbing from outside the enclosure and be located at an AQUATIC VENUE or an AQUATIC FACILITY to prevent access to nearby

structures to simplify climbing over it, such as light poles, site furnishings, overhanging tree limbs or other obvious footholds or handholds.

4.8.6.2.1.1 Horizontal Mid-Rails Horizontal mid-rails shall have a minimum separation distance of 42 inches (1.07 m) from either the top or bottom of the fence.

4.8.6.2.1.2 Mesh Fencing Chain-link fencing constructed of a maximum opening of 1¾ inches *(44.4 mm)* mesh shall be permitted. Mesh openings greater than 1¾ inches may have vertical slats installed.

4.8.6.2.1.3 Footholds and Handholds All exterior projections or recessions must have a minimum separation distance of 42 inches (1.07 m) from either the top or bottom of the fence.

4.8.6.2.1.4 Objects and Furnishings Items such as electrical/cable boxes, speakers, BBQ grills, tables, chairs, planters, trash bins, parked vehicles, shall not be within 42" of the enclosure.

4.8.6.2.2[A] Emergency Exit Paths [Deleted]

4.8.6.2.2.1 Pathways [Deleted]

4.8.6.2.2.2 Exit Pathways [Deleted]

4.8.6.2.2.3 Seasonal Separation Seasonal separation may be employed at seasonally operated AQUATIC VENUES, but shall be subject to the same physical requirements of permanent ENCLOSURES for AQUATIC VENUES in 4.8.6, except the minimum height of the enclosure must be 4 feet.

4.8.6.2.3 Windows Windows on a building that forms part of an ENCLOSURE around an AQUATIC VENUE shall have a maximum opening width not to exceed 4 inches *(10.2 cm)*.

4.8.6.2.3.1 Opened [Deleted]

4.8.6.2.4[A] Height ENCLOSURES shall be no less than 6 feet *(1.83 m)* in height.

4.8.6.2.4.1 Change in Grade Where a change in grade occurs at an ENCLOSURE, height shall be measured from the uppermost grade to the top of the ENCLOSURE.

4.8.6.2.4.2 Fencing Requirements Height shall be measured from the finished grade to the top of the ENCLOSURE on the side outside of the ENCLOSURE surrounding an AQUATIC VENUE.

4.8.6.2.4.3[A] Other Barriers Not Serving as Part of an Enclosure Except where otherwise noted, all other BARRIERS not serving as part of an ENCLOSURE shall not be less than 42 inches *(1.1 m)* in height.

4.8.6.2.5 Clearance Above Grade The maximum vertical clearance at the bottom of the ENCLOSURE when measured on the side of the ENCLOSURE facing away from the enclosed space, shall not exceed:

1) 2 inches *(5.1 cm)* above grade when the ENCLOSURE rests on a non-solid surface, including grass or gravel or
2) 4 inches *(10.2 cm)* above grade when the ENCLOSURE rests on a solid surface.

4.8.6.2.6 Spacing Separation between vertical sections and bars shall be a maximum of 4 inches (100 mm).

4.8.6.3[A] Gates and Doors

4.8.6.3.1 Self-Closing and Latching All primary public access gates or doors serving as part of an AQUATIC FACILITY ENCLOSURE or required ENCLOSURE shall be self-closing and self- latching from any open position.

4.8.6.3.1.1[A] Self-latching Device Height Operable parts of the release latch on self-latching devices shall be located 42 inches (1.07 m) above finished grade. Latching devices located on the inside of the enclosure may not be accessible from outside the enclosure.

4.8.6.3.1.2 Operable by Children Self-latching devices shall not be operable by small children on the outside of the ENCLOSURE around the AQUATIC VENUE.

4.8.6.3.1.3 Locked All gates or doors shall be capable of being locked from the exterior.

4.8.6.3.1.4 Emergency Egress [Deleted]

4.8.6.3.1.5 Unauthorized Entry EXIT GATES or doors shall be constructed so as to prevent unauthorized entry from outside of the ENCLOSURE around the AQUATIC VENUE.

4.8.6.3.1.6[A] Exceptions [Deleted]

4.8.6.3.2 Gates [Deleted]

4.8.6.3.3 Turnstiles Turnstiles shall not form a part of an ENCLOSURE.

4.8.6.3.4 Exit Gates EXIT GATES shall be conspicuously marked on the inside of the AQUATIC VENUE or AQUATIC FACILITY.

4.8.6.3.4.1 Quantity, Location, and Width Quantity, location, and width*(s)* for ENCLOSURE GATES shall be provided consistent with all applicable local, state, territorial, federal, and tribal building and fire CODES and applicable accessibility guidelines.

4.8.6.3.5 Swing Outward All ENCLOSURE gates, doors and EXIT GATES shall swing away from the AQUATIC VENUE. Fire exiting from other parts of a facility through the pool is not allowed.

4.8.6.3.6 Absence of Building Codes [Deleted]

4.8.6.3.7 Separate Activity Areas All non-pool activity areas, including but not limited to, BBQ areas, playgrounds, game areas, and similar spaces not directly related to pool activities, must be located outside of the ENCLOSURE.

4.8.6.4 Indoor Aquatic Venues

4.8.6.4.1 Enclosure Building walls enclosing an INDOOR AQUATIC FACILITY may be designated as the AQUATIC FACILITY ENCLOSURE.

4.8.6.4.2 Securable Indoor AQUATIC VENUES shall be securable from unauthorized entry from other building areas or the exterior.

4.8.6.4.3[A] Indoor and Outdoor Aquatic Venues Where separate indoor and outdoor AQUATIC VENUES are located on the same site, an ENCLOSURE shall be provided between them.

4.8.6.4.3.1 Year-Round Operation ***Exception:*** Where all AQUATIC VENUES are operated continuously 12 months a year on the same schedule.

4.8.6.4.4[A] Wall Separating [Deleted]

4.8.6.5[A] Multiple Aquatic Venues

4.8.6.5.1 One Enclosure Except as otherwise required in this CODE, one ENCLOSURE may surround multiple AQUATIC VENUES at one facility.

4.8.6.5.2 Wading Pools WADING POOLS shall not require separation from other WADING POOLS by a BARRIER. Refer to 4.12.9 for additional guidance about WADING POOLS.

4.8.7[A] Aquatic Venue Cleaning Systems

4.8.7.1[A] No Hazard The cleaning system provided shall not create an entanglement or suction entrapment hazard or interfere with the operation or use of the AQUATIC VENUE.

4.8.7.2 Common Cleaning Equipment If there are multiple AQUATIC VENUES at one AQUATIC FACILITY, the AQUATIC FACILITY may use common cleaning equipment.

4.8.7.3 Integral Vacuum Systems Use of integral vacuum systems, meaning a vacuum system that uses the main circulating pump or a dedicated vacuum pump connect to the POOL with PVC piping and terminating at the POOL with a flush-mounted vacuum port fitting, shall be prohibited.

4.8.7.4 GFCI Power Where used, PORTABLE VACUUM cleaning equipment shall be powered by circuits having GROUND-FAULT CIRCUIT INTERRUPTERS.

4.8.7.5 Low Voltage Any ROBOTIC CLEANERS shall utilize low voltage for all components that are immersed in the POOL water.

4.8.7.6[A] GFCI Connection Any ROBOTIC CLEANER power supply shall be connected to a circuit equipped with a ground fault interrupter, and shall not be operated using an extension cord.

4.9 Filter/Equipment Room

4.9.1 Equipment Room

4.9.1.1[A] General Requirements

4.9.1.1.1 Nonabsorbent Material The EQUIPMENT ROOM OR AREA floor shall be of concrete or other suitable material having a smooth SLIP-RESISTANT finish.

4.9.1.1.1.1 Positive Drainage The EQUIPMENT ROOM OR AREA floor shall have positive drainage, including a sump drain pump if necessary.

4.9.1.1.2 Floor Slope Floors shall have a slope toward the floor drain and/or sump drain pump adequate to prevent standing water at all times.

4.9.1.1.3 Opening The opening to the EQUIPMENT ROOM OR AREA shall be designed to provide access for all anticipated equipment.

4.9.1.1.4 Hose Bibb At least one hose bibb with BACKFLOW preventer shall be located in the EQUIPMENT ROOM or be accessible within an adequate distance of the EQUIPMENT ROOM so that a hose can service the entire EQUIPMENT ROOM.

4.9.1.2[A] Construction

4.9.1.2.1 Size The size of the EQUIPMENT ROOM OR AREA shall provide working space to perform routine operations and equipment service.

4.9.1.2.1.1 Adequate Storage Space EQUIPMENT ROOMS also intended for STORAGE shall have adequate space provided for such STORAGE, without reducing the working spaces.

4.9.1.2.2 Lighting EQUIPMENT ROOMS or areas shall be lighted to provide 30 foot candles *(323 lux)* of illumination at floor level in accordance with IESNA guidelines.

4.9.1.3 Electrical

4.9.1.3.1 Conform to NEC All electrical wiring shall conform to the edition of NEC adopted by the AHJ.

4.9.1.3.2 Conform to NRTL Equipment, components, and their application and installation shall conform to the NRTL listing.

4.9.1.4[A] Ventilation

4.9.1.4.1 Code Conformance EQUIPMENT ROOM ventilation shall address:

1) COMBUSTION requirements,
2) Heat dissipation from equipment,
3) Humidity from surge or balance tanks,
4) Ventilation to the outside, and
5) Air quality.

4.9.1.5[A] Markings

4.9.1.5.1 Piping Identified All piping in the EQUIPMENT ROOM shall be permanently identified by its use and the AQUATIC VENUE and AQUATIC FEATURE it serves.

4.9.1.5.1.1 Components to Identify Identification shall be provided for:

1) Main drains and SKIMMERS,
2) Filtered water,
3) Make-up water,
4) Backwash water,
5) Chlorine *(or DISINFECTION)* feeds,
6) Acid *(or pH)* feeds,
7) Compressed air lines,
8) Gutters,
9) Chemical sample piping, and
10) POOL heating lines.

4.9.1.5.2 Piping Marked All piping shall be marked with directional arrows as necessary to determine flow direction.

4.9.1.5.3 Valves Identified All valves shall be clearly identified by number with a brass tag, plastic laminate tags, or permanently affixed alternate.

4.9.1.5.3.1 Valves Described Valves shall be described as to their function and referenced in the operating instruction manual.

4.9.1.5.3.2 Piping Diagram A water-resistant, easily read, wall-mounted piping diagram shall be furnished and installed inside the EQUIPMENT ROOM.

4.9.1.6[A] Equipment Rooms Containing Combustion Equipment [N/A]

4.9.1.7[A] Separation from Chemical Storage Spaces [Deleted]

4.9.1.8 Other Equipment Room Guidance

4.9.1.8.1[A] Access Space Where ventilation, air filtration, or space dehumidification, heating, or cooling for an INDOOR AQUATIC FACILITY is by mechanical equipment located in an EQUIPMENT ROOM, adequate access space shall be provided to allow for inspection and service.

4.9.1.8.1.1[A] Size Requirements The access spaces shall be the greater of:

1) Those required by OSHA, NEC, National Fuel Gas Code, or other official requirements or

2) The equipment manufacturers' recommendations.

4.9.1.8.2[A] Adequate Space Where ventilation, air filtration, or space heating or cooling for an INDOOR AQUATIC FACILITY is beside mechanical equipment located in an EQUIPMENT ROOM, adequate space for required straight lengths of duct shall be provided as the greater of those described in AMCA 201, SMACNA Duct Manual, ACCA Manual SPS Sec. 13, or the equipment manufacturer's recommendations.

4.9.1.8.3[A] Minimize Hazards Where an EQUIPMENT ROOM contains equipment requiring regular service or maintenance, the room shall be so designed and constructed as to minimize the hazards of such maintenance and service.

4.9.1.8.3.1 Ladder Installed Where a ladder will be required for service or maintenance of equipment, other permanently installed equipment shall not be so located as to interfere with the use of the ladder.

4.9.1.8.3.2 Alternative Access Where a ladder cannot be safely or practically used to service equipment where any serviceable component is more than 6.5 feet *(2.0 m)* above the floor, a mezzanine floor, platform, or other arrangement for safe access shall be provided.

4.9.1.8.3.2.1 Exception ***Exception:*** Where otherwise specifically allowed by OSHA.

4.9.1.8.3.2.2 Stricter Requirements ***Exception:*** Where OSHA or other applicable CODES or STANDARDS have stricter requirements, those stricter requirements shall prevail.

4.9.1.8.4[A] Refrigeration Equipment Where refrigeration equipment such as an air-conditioner or dehumidifier is located indoors in a building intended for occupation, arrangements for refrigerant relief *(if any)* shall be according to the applicable mechanical CODE or other applicable CODE.

4.9.1.8.5[A] Chemical Separation All chemicals and chemical equipment must be properly stored and installed to reduce or prevent injury.

4.9.1.8.5.1 Elevation of Chemicals All stored chemicals and equipment containing chemicals must be elevated above the floor level in equipment rooms or any areas prone to water accumulation.

4.9.1.8.5.2 Non-Combustible Support Materials Materials used to elevate stored chemicals must be non-combustible.

4.9.1.8.5.3 Separation Stored chemicals and equipment that contain combustible materials must be separated by a method approved by the Oregon Fire Code (OFC) or Building Codes Division (BCD).

4.9.1.8.5.4 Storage of Incompatible Chemicals Whenever incompatible chemicals are stored in the same area, they must, at a minimum, be stored on separate spill-proof pallets to prevent cross-contamination or reaction.

4.9.2[A] Chemical Storage Spaces [Deleted]

4.9.2.10 Ozone Rooms

4.9.2.10.1 Only Ozone Equipment An ozone EQUIPMENT ROOM shall not be used for STORAGE of chemicals, solvents, or any combustible materials, other than those required for the operation of the recirculation and ozone generating equipment.

4.9.2.10.2 Emergency Ventilation Rooms which are designed to include ozone equipment shall be equipped with an emergency ventilation system capable of six air changes per hour.

4.9.2.1.1.1 Exhaust Intake The exhaust intake shall be located approximately 6 inches *(15.2 cm)* from the floor, on the opposite side of the room from the make-up air intake.

4.9.2.1.1.2 On Command The emergency ventilation system shall be so arranged as to run on command of an ozone-leak alarm or on command of a manual switch.

4.9.2.1.1.3 Manual Switch The manual emergency ventilation switch shall be located outside the room and near the door to the ozone room.

4.9.2.10.3 Below Grade [Deleted]

4.9.2.10.4 Signage In addition to the signs required on all CHEMICAL STORAGE SPACES, a sign shall be posted on the exterior of the entry door, stating "DANGER-GASEOUS OXIDIZER OZONE" in lettering not less than 4inches *(10.2 cm)* high.

4.9.2.10.5 Alarm System Rooms containing ozone generation equipment shall be equipped with an audible and visible ozone detection and alarm system.

4.9.2.10.5.1 Requirements The alarm system shall consist of both an audible alarm capable of producing at least 85 decibels at 10 feet distance *(3.0 m)*, and a visible alarm consisting of a flashing light mounted in plain view of the entrance to the ozone-EQUIPMENT ROOM.

4.9.2.10.5.2 Sensor Theozonesensorshallbelocatedataheightof18–24inches *(45.7–61.0cm)* above floor level.

4.9.2.10.5.2.1 Measuring The ozone sensor shall be capable of measuring ozone in the range of 0–2 ppm *(mg/L)*.

4.9.2.10.5.3 Ozone Concentration The alarm system shall alarm when the ozone concentration equals or exceeds 0.1 ppm *(mg/L)* in the room.

4.9.2.10.5.4 Activation Activation of the alarm system shall shut off the ozone generating equipment and turn on the emergency ventilation system.

4.9.2.11[A] Gaseous Chlorination Space As per 4.7.3.2.4.1, use of compressed CHLORINE gas shall be prohibited for new construction and after SUBSTANTIAL ALTERATION to existing AQUATIC FACILITIES.

4.9.2.11.1 Existing Facilities 4.9.2.11 shall apply to existing facilities using compressed CHLORINE gas.

4.9.2.11.2 Adequate Size A gaseous-chlorination space shall be large enough to house the chlorinator, CHLORINE STORAGE tanks, and associated equipment as required.

4.9.2.11.3 Secure Tanks A gaseous-chlorination space shall be equipped with facilities for securing tanks.

4.9.2.11.4 Not Below Grade A gaseous-chlorination space shall not be located in a basement or otherwise be below grade.

4.9.2.11.5 Compressed-Chlorine Gas Where installed indoors, compressed-CHLORINE gas STORAGE containers and associated chlorinating equipment shall be in a separate room constructed to have a fire rating of not less than 1-hour.

4.9.2.11.6 Entry Door The entry door to an indoor gaseous-CHLORINE space shall open to the exterior of the building or structure.

4.9.2.11.6.1 Pool or Deck The entry door to an indoor gaseous-CHLORINE space shall not open directly towards a POOL or DECK.

4.9.2.11.7 Inspection Window An indoor gaseous-CHLORINE space shall be provided with a shatterproof gas-tight inspection window.

4.9.2.11.8 Ventilation Indoor gaseous-chlorination spaces shall be provided with a spark-proof ventilation system capable of 60 air changes per hour.

4.9.2.11.8.1 Exhaust-Air Intake The exhaust-air intake of the ventilation system shall be taken at a point within 6 inches *(15.2 cm)* of the floor, and on the opposite side of the room from the makeup-air intake.

4.9.2.11.8.2 Discharge Point The exhaust-air discharge point shall be:

1) Outdoors,

2) Above adjoining grade level,
3) At least 20 feet *(6.1 m)* from any operable window, and
4) At least 20 feet *(6.1 m)* from any adjacent building.

4.9.2.11.8.3 Make-Up Intake The make-up air intake shall be within 6 inches *(15.2 cm)* of the ceiling of the space.

4.9.2.11.8.3.1 Open Outdoors The make-up air intake shall open directly to the outdoors.

4.9.2.11.8.4 Personal Protective Equipment Available PPE, consisting of at least a gas mask approved by NIOSH for use with CHLORINE atmospheres, shall be stored directly outside one entrance to an indoor gaseous-chlorination space.

4.9.2.11.8.5 SCBA Systems A minimum of two SCBA systems shall be on hand at all times and two QUALIFIED OPERATORS are to be involved in the changing of the tanks.

4.9.2.11.8.6 Stationed Outside One of the QUALIFIED OPERATORS should be stationed outside of the chemical room where the QUALIFIED OPERATOR inside can be seen at all times.

4.9.2.11.8.7 Emergency Telephone An emergency direct line telephone shall be located by the door.

4.9.2.12 Windows in Chemical Storage Spaces

4.9.2.12.1[A] Not Required Windows in CHEMICAL STORAGE SPACES shall not be required by this CODE.

4.9.2.12.2[A] Requirements Where a window is to be installed in an interior wall, ceiling, or door of a CHEMICAL STORAGE SPACE, such window shall have the following components:

1) Tempered or plasticized glass,
2) A corrosion-resistant frame, and
3) Incapable of being opened or operated.

4.9.2.12.3 Exterior Window Any CHEMICAL STORAGE SPACE window in an exterior wall or ceiling shall:

1) Be mounted in a corrosion-resistant frame and
2) Be so protected by a roof, eave or permanent awning as to minimize the entry of rain or snow in the event of window breakage.

4.9.2.13 Sealing and Blocking Materials

4.9.2.13.1 Minimize Leakage Materials used for sealing and blocking openings in an interior CHEMICAL STORAGE SPACE shall minimize the leakage of air, vapors, or fumes from the CHEMICAL STORAGE SPACE.

4.9.2.13.2 Compatible Materials used for sealing and blocking openings in an interior CHEMICAL STORAGE SPACE shall be compatible for use in the environment.

4.9.2.13.3 Fire Rating Materials used for sealing and blocking openings in an interior CHEMICAL STORAGE SPACE shall be commensurate with the fire rating of the assembly in which they are installed.

4.10 Hygiene Facilities

4.10.1[A] General

4.10.1.1 New Construction or Substantial Alteration All design provisions shall be required for new construction or SUBSTANTIAL ALTERATION to an existing AQUATIC FACILITY.

4.10.1.1.1 At Time of Adoption ***Exception:*** the following sections shall be required for all new or SUBSTANTIALLY ALTERED AQUATIC FACILITIES at time of adoption:

1) 4.10.4.5: Diaper-changing stations,
2) 4.10.4.6.5: Soap Dispensers, and
3) 4.10.4.6.9: Trash Can

4.10.1.2[A] Minimum to Provide AQUATIC FACILITIES shall provide HYGIENE FACILITIES that include, at a minimum, toilets, urinals, SHOWERS, DIAPER-CHANGING STATIONS, and other HYGIENE FIXTURES, as specified herein.

4.10.1.3 Construction HYGIENE facilities shall be constructed in accordance with all applicable local, state, territorial, federal, and tribal laws or as modified herein.

4.10.1.4 Minimum Toilets, Urinals, and Other Fixtures The minimum number of toilets, urinals, and other HYGIENE FIXTURES provided, excluding SHOWERS, shall be the greater of the following two options:

1) In accordance with all applicable local, state, territorial, federal, and tribal laws or
2) Based upon MAXIMUM BATHER LOAD of each aquatic venue. Women, one per 40 pool users or fraction thereof; Men, one per 60 pool user or fraction thereof (urinals shall be an acceptable substitute for no more than one-half of the toilets).

4.10.1.5[A] Theoretical Peak Occupancy [Deleted]

4.10.2 Location

4.10.2.1[A] Distance A drinking fountain, toilet, HANDWASHING STATION, and DIAPER-CHANGING STATION shall be located no greater than 200 feet *(91 m)* walking distance from each AQUATIC VENUE.

4.10.3[A] Design and Construction

4.10.3.1 Floors The floors of HYGIENE FACILITIES and dressing areas serving AQUATIC FACILITIES shall have a smooth, easily cleaned, impervious-to-water, SLIP-RESISTANT surface.

4.10.3.2[A] Floor Base A hard, smooth, impervious-to-water, easily cleaned base shall provide a sealed, coved juncture between the wall and floor and extend upward on the wall at least 6 inches *(15.2 cm)*.

4.10.3.3 Floor Drains Floor drains shall be installed in HYGIENE FACILITIES and dressing areas where PLUMBING FIXTURES are located.

4.10.3.3.1[A] Opening Grill Covers Floor drain opening grill covers shall be ½-inch *(1.3 cm)* or less in width or diameter.

4.10.3.3.2[A] Sloped to Drain Floors shall be sloped to drain water or other liquids.

4.10.3.3.2.1 Accessible Routes [Deleted]

4.10.3.4 Partitions and Enclosures Partitions and ENCLOSURES adjacent to HYGIENE FACILITIES shall have a smooth, easy-to-clean, impervious surface.

4.10.3.5[A] Hose Bibb At least one hose bibb or other potable water source capable of connecting a hose shall be located in each HYGIENE FACILITY to facilitate cleaning.

4.10.4[A] Plumbing Fixture Requirements

4.10.4.1 General

4.10.4.1.1[A] Protected PLUMBING FIXTURES shall be installed and operated in a manner to adequately protect the potable water supply from back siphonage or BACKFLOW in accordance with all applicable local, state, territorial, federal, and tribal laws.

4.10.4.1.2 Easily Cleaned PLUMBING FIXTURES shall be designed so that they may be readily and frequently cleaned, SANITIZED, and disinfected.

4.10.4.1.3[A] Toilet Counts One unisex restroom must be provided. Total toilet or urinal counts shall be in accordance with 4.10.1.4.

4.10.4.1.4 Hand Wash Sink Handwashing sink counts shall be in accordance with all applicable local, state, territorial, federal, and tribal laws or as modified herein.

4.10.4.2[A] Cleansing Showers

4.10.4.2.1[A] Count The number of required CLEANSING SHOWERS shall be determined based on the maximum bather load, with one shower required for every 40 users, or a fraction thereof. A minimum of two showers must be provided, ensuring one is available per sex. For spa pools, only one CLEANSING SHOWER is required for every 40 users or a fraction thereof if unisex showers are provided. If unisex showers are not available, a minimum of two showers must be provided, with one designated for each sex.

4.10.4.2.1.1 Additional Cleansing Showers [Deleted]

4.10.4.2.2 Distributed CLEANSING SHOWERS shall be evenly distributed between sexes, as applicable.

4.10.4.2.3[A] Location CLEANSING SHOWERS shall be located in a HYGIENE FACILITY that is near the entrance and within clear view of the AQUATIC VENUE.

4.10.4.2.4[A] Enclosed Entryways to private or group CLEANSING SHOWER areas shall be enclosed by a door or curtain.

4.10.4.2.4.1 Doors SHOWER doors shall be of a smooth, hard, easy-to-clean material.

4.10.4.2.4.2 Curtains SHOWER curtains shall be of a smooth, easy-to-clean material.

4.10.4.2.5 Soap Dispenser CLEANSING SHOWERS shall be supplied with soap and a soap dispenser adjacent to the SHOWER.

4.10.4.2.6[A] Exemption AQUATIC VENUES located in lodging and residential settings shall be exempt from 4.10.4.2.

4.10.4.3[A] Rinse Showers

4.10.4.3.1 Minimum and Location A minimum of one RINSE SHOWER shall be provided on the DECK near an entry point to the AQUATIC VENUE. Additional RINSE SHOWERS may be required at the discretion of the AHJ.

4.10.4.3.2 Temperature Water used for RINSE SHOWERS may be at ambient temperature.

4.10.4.3.3[A] Floor Sloped Floors of RINSE SHOWERS shall be sloped to drain wastewater away from the AQUATIC VENUE and meet applicable local, state, territorial, federal, and tribal laws.

4.10.4.3.4[A] Large Aquatic Facilities [Deleted].

4.10.4.3.5[A] Beach Entry [Deleted]

4.10.4.3.6[A] Lazy River [Deleted]

4.10.4.3.7[A] Waterslide [Deleted]

4.10.4.4[A] All Showers AQUATIC FACILITIES with 7500 square feet *(697 m2)* of water area or more may be flexible in the number of CLEANSING SHOWERS they provide based on the MAXIMUM BATHER LOAD in 4.1.2.3.5:

1) 25% of the required SHOWERS shall be CLEANSING SHOWERS,
2) 25% of the required SHOWERS shall be RINSE SHOWERS, and
3) the remaining 50% may be either cleansing or RINSE SHOWERS.

4.10.4.5[A] Diaper-Changing Stations

4.10.4.5.1 Each Facility All new or SUBSTANTIALLY ALTERED AQUATIC FACILITIES allowing use by diaper-aged BATHERS shall have at least one DIAPER-CHANGING STATION in each male and female HYGIENE FACILITY or make available a unisex DIAPER-CHANGING STATION.

4.10.4.5.1.1[A] Hand Wash Sink All new or SUBSTANTIALLY ALTERED AQUATIC FACILITIES, shall install an adjacent plumbed handwashing sink.

4.10.4.5.1.2[A] Portable [Deleted]

4.10.4.5.2[A] Conform DIAPER-CHANGING UNITS shall conform to either of the following STANDARDS:

1) ASTM Standard F2285-04: *Consumer Performance Standards for Commercial Diaper-Changing Stations* or
2) The STANDARDS for diaper-changing surfaces in the most current version of *Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs*.

4.10.4.5.3[A] Unisex If only a unisex HYGIENE FACILITY is provided, it shall have a DIAPER- CHANGING STATION that conforms to 4.10.4.5.

4.10.4.5.4[A] Trash Can A covered, hands-free, plastic-lined trash receptacle or diaper pail shall be located directly adjacent to the DIAPER-CHANGING UNIT.

4.10.4.5.5 Disinfecting Surface An EPA–REGISTERED disinfectant shall be provided for maintaining a clean and disinfected DIAPER-CHANGING UNIT surface before and after each use.

4.10.4.6 Non-Plumbing Fixture Requirements

4.10.4.6.1 Easy to Clean All HYGIENE FIXTURES and appurtenances in the dressing area shall have a smooth, hard, easy-to-clean, impervious-to-water surface and be installed to permit thorough cleaning.

4.10.4.6.2 Glass Glass, excluding mirrors, shall not be permitted in HYGIENE FACILITIES.

4.10.4.6.3 Mirrors Mirrors shall be shatter resistant.

4.10.4.6.4[A] Lockers If lockers are provided, they shall be installed at least 3.5 inches *(8.9 cm)* above the finished floor or on legs or a base at least 3.5 inches *(8.9 cm)* high and far enough apart to allow for cleaning and drying underneath the locker.

4.10.4.6.5 Soap Dispensers Soap dispensers shall be securely attached adjacent to handwashing sinks and at each CLEANSING SHOWER.

4.10.4.6.5.1 Dispenser Materials The dispensers shall be of all metal, plastic, or other shatterproof materials that can be readily and frequently cleaned.

4.10.4.6.6[A] Dryers / Paper Towels Hand dryers or paper towel dispensers shall be provided and securely attached adjacent to handwashing sinks.

4.10.4.6.6.1 Materials Hand dryers and paper towel dispensers shall be of all metal, plastic or other shatterproof materials that can be readily and frequently cleaned.

4.10.4.6.7 Toilet Paper Dispensers Toilet paper dispensers shall be securely attached to wall or partition adjacent to each toilet.

4.10.4.6.8 Female Facilities In female HYGIENE FACILITIES, covered receptacles shall be provided for disposal of used feminine hygiene products.
4.10.4.6.9 Trash Can A minimum of one hands-free trash receptacle shall be provided in areas adjacent to handwashing sinks.

4.10.5[A] Provision of Suits, Towels, and Shared Equipment

4.10.5.1 Adequate Space AQUATIC FACILITIES supplying reusable suits, towels, and/or shared equipment shall provide adequate equipment and space for cleaning, sanitizing, drying, and storing of these materials.

4.10.6[A] Foot Baths

4.10.6.1 Prohibited FOOT BATHS shall be prohibited.

4.10.7[A] Sharps [Deleted]

4.11 Water Supply/ Wastewater Disposal

4.11.1 Water Supply

4.11.1.1[A] Public Water System Water serving an AQUATIC FACILITY shall be supplied from a potable water source in compliance with OAR chapter 333 division 061.
4.11.1.1.1[A] Other Sources Other water sources such as lakes or springs may be approved to serve an AQUATIC FACILITY by the AHJ.
4.11.1.2.2[A] Condensate / Reclaimed Water Use of condensate water, collected rain water, or other reclaimed water for water serving an AQUATIC VENUE is prohibited.
4.11.1.11.2.1 Condensate Use Condensate water may be used for irrigation or other non-potable uses.
4.11.1.11.2.2 Exceptions Exceptions to 4.11.1.1.2 may be made by the AHJ with evidence that such water has met all EPA potable water quality STANDARDS.
4.11.1.2[A] Sufficient Capacity The water supply shall have sufficient capacity to simultaneously serve all PLUMBING FIXTURES.
4.11.1.2.1 Refill Pool The water supply shall have sufficient capacity and pressure to refill the AQUATIC VENUE to the operating water level after backwashing filters and after any splashing or evaporative losses within 1 hour if the AQUATIC VENUE is operational at the time of the backwash.

4.11.2[A] Fill Spout

4.11.2.1 Hazard If a fill spout is used at an AQUATIC VENUE, the fill spout shall be located so that it is not a SAFETY hazard to BATHERS.
4.11.2.2 Shielded A fill spout shall be located so the possibility of it becoming a trip hazard is minimized.
4.11.2.3 Open End The open end of fill spouts shall not have sharp edges or protrude more than 2 inches *(50.8 mm)* beyond the edge of the POOL.
4.11.2.4 Air Gap The discharge end shall be separated from the water by a vertical air gap of at least 2 pipe diameters measured from the pipe outlet to the edge of the POOL.

4.11.3[A] Cross-Connection Control

4.11.3.1 Protected The potable water supply serving an AQUATIC VENUE shall be protected against BACKFLOW consisting of either of the following:

1) An acceptable air gap consisting of a vertical distance of not less than two pipe diameters of the water supply pipe or 6 inches *(15.2 cm)*, whichever is greater, over the lowest free-flowing discharge point of the receiving pipe, tank, or vessel. Splash guards that are open to the atmosphere may be used around the air gap, or
2) Where permitted, an approved RPZ BACKFLOW preventer installed according to the plumbing CODE and the AHJ.

4.11.4 Deck Drains and Rinse Showers

4.11.4.1 Sloped Walkway The walkway or DECK around an AQUATIC VENUE shall be properly sloped to DECK drains or to the edge of the DECK to prevent the accumulation of standing water.

4.11.4.2 Discharge If DECK drains are provided, the drains shall discharge to the sanitary or storm sewer or as otherwise allowed by the AHJ and according to applicable plumbing CODES.

4.11.4.3 Area or Linear DECK drains may be either area drains or linear drains. Refer to 4.8.1.3 for DECK drain area and other requirements.

4.11.4.4 Rinse Showers RINSE SHOWER drains shall discharge to the sanitary or storm sewer as allowed by the AHJ and according to applicable plumbing CODES.

4.11.5 Sanitary Wastes

4.11.5.1 Discharged Wastewater from all PLUMBING FIXTURES in the entire AQUATIC FACILITY shall be discharged to a municipal sanitary sewer system, if available.

4.11.5.2 Onsite Sewer System If a municipal sanitary sewer system is not available, all wastewater shall be disposed to an onsite sewer system that is properly designed to receive the entire wastewater capacity.

4.11.6[A] Pool Wastewater

4.11.6.1 Discharged Wastewater from an AQUATIC VENUE, including filter backwash water, shall be discharged to a sanitary sewer system having sufficient capacity to collect and treat wastewater or to an onsite sewage disposal system designed for this purpose.

4.11.6.1.1 Storm Water Systems and Surface Waters Wastewater shall not be directed to storm water systems or surface waters without appropriate permits from the AHJ or the EPA.

4.11.6.1.2 Recovery and Reuse A water recovery and reuse system may be submitted to the AHJ for review and approval.

4.11.6.2.[A] Separation Tank for Precoat Media Filters A separation tank shall be provided prior to discharge for backwash water from precoat filters using diatomaceous earth *(DE)* as a filter medium.

4.11.6.2.1 Discharged For precoat filters using perlite or cellulose as a filter medium, the backwash may be discharged to the sanitary sewer, unless directed otherwise by the AHJ.

4.12 Specific Aquatic Venues

4.12.1 Spas

4.12.1.1 Additional Provisions In addition to the general AQUATIC VENUE requirements stated in this CODE, SPAS shall comply with the additional provisions or reliefs of this section.

4.12.1.2[A] Maximum Water Depth The maximum water depth in SPAS shall be 4 feet *(1.2 m)* measured from the designed static water line except for SPAS that are designed for SPECIAL USE and purposes and approved by the AHJ.

4.12.1.2.1 Exercise Spas [Deleted]

4.12.1.2.2 Seating The maximum submerged depth of any seat or sitting bench shall be 28 inches *(71.1 cm)* measured from the water line.

4.12.1.3[A] Handholds A SPA shall have one or more suitable, SLIP-RESISTANT handhold*(s)* around the perimeter and not over 12 inches *(30.5 cm)* above the water line.

4.12.1.3.1 Options The handhold*(s)* may consist of bull-nosed coping, ledges, or DECKS along the immediate top edge of the SPA; ladders, steps, or seat ledges; or railings.

4.12.1.4 Stairs Interior steps or stairs shall be provided where SPA depths are greater than 24 inches *(61.0 cm)*.

4.12.1.4.1 Handrail Each set of steps shall be provided with at least one handrail to serve all treads and risers.

4.12.1.4.2 Seating Seats or benches may be provided as part of these steps.

4.12.1.4.3 Approach Steps Approach steps on the exterior of a SPA wall extending above the DECK shall also be required unless the raised SPA wall is 19 inches *(48.3 cm)* or less in height above the DECK and it is used as a transfer tier or pivot-seated entry. If no other entry points are provided, approach steps must be installed to ensure safe and accessible entry into the SPA per 4.5.4.9.

4.12.1.5[A] Perimeter Deck A 4 foot *(1.2 m)* wide, continuous, unobstructed PERIMETER DECK shall be provided on two consecutive or adjacent sides or fifty percent or more of the SPA perimeter.

4.12.1.5.1 Lower Ratio [Deleted]

4.12. 1.5.2 Coping The PERIMETER DECK may include the coping.

4.12. 1.5.3 Recessed SPAS may be located adjacent to other AQUATIC VENUES as long as they are recessed in the DECK.

4.12. 1.5.4[A] Elevated Spas Elevated SPAS may be located adjacent to another AQUATIC VENUE as long as there is an effective BARRIER between the SPA and the adjacent AQUATIC VENUE.

4.12.1.5.5 Minimum Distance If an effective BARRIER is not provided, a minimum distance of 4 feet *(1.2 m)* between the AQUATIC VENUE and SPA is required.

4.12.1.6 Depth Markers A minimum of two depth markers shall be provided regardless of the shape or size of the SPA.

4.12.1.7[A] Temperature Water temperatures shall not exceed 104°F *(40°C)*.

4.12.1.8 Drain A means to drain the SPA shall be provided to allow frequent draining and cleaning.

4.12.1.9 Air Induction System An air induction system, when provided, shall prevent water back up that could cause electrical shock hazards.

4.12.1.9.1 Intake Air intake sources shall not permit the introduction of toxic fumes or other CONTAMINANTS.

4.12.1.10[A] Timers The hydrotherapy jet system shall be connected to a minute timer that does not exceed 15 minutes to limit the period of agitation.

4.12.1.101 Out of Bather Reach The hydrotherapy jet system shall be connected to a minute timer located out of reach of a BATHER in the SPA.

4.12.1.11[A] Emergency Shutoff All SPAS shall have a clearly labeled emergency shutoff or control switch for the purpose of stopping the motor*(s)* that provide power to the RECIRCULATION SYSTEM and hydrotherapy or hydrotherapy jet system.

4.12.1.11.1 Readily Accessible All SPAS shall have a clearly labeled emergency shutoff or control switch that shall be installed and be readily accessible to the BATHERS, in accordance with the NEC.

4.12.2 Waterslides and Landing Pools

4.12.2.1[A] Design and Construction

4.12.2.1.1 Additional Provisions In addition to the general AQUATIC FACILITY requirements stated in this CODE, WATERSLIDES and LANDING POOLS shall comply with the additional provisions or reliefs of this section.

4.12.2.1.2 Recognized Standards The following recognized design and construction STANDARDS for WATERSLIDES shall be adhered to.

4.12.2.1.2.1 Engineer Compliance The DESIGN PROFESSIONAL shall provide documentation and/or certification that the WATERSLIDE design is in conformance with these STANDARDS:

1) ASTM F2376-17a *Standard Practice for Classification, Design, Manufacture, Construction, and Operation of Water Slide Systems* and
2) ASTM F2461-16e1. *Standard Practice for Manufacturer, Construction, Operation, and Maintenance of Aquatic Play Equipment.*

4.12.2.1.2.2 Required Signage Signs indicating riding instructions, warnings, and requirements in accordance with the manufacturer recommendations shall be posted at the WATERSLIDE entry.

4.12.2.2 Flumes

4.12.2.2.1 Surfaces FLUME surfaces shall be inert, nontoxic, smooth, and easily cleaned.

4.12.2.2.2 Dips All FLUME VALLEYS and DIPS shall have proper drainage, SAFETY measures that ensure a rider cannot fall from the FLUME, and a means of egress in the event the ride malfunctions or a rider stops on the ride.

4.12.2.3 Flume Exits

4.12.2.3.1 Landing Pool The exit of any FLUME shall be designed to ensure that BATHERS enter the LANDING POOL or SLIDE RUNOUT at a safe speed and angle of entry.

4.12.2.3.2 Intersection If a WATERSLIDE has two or more FLUMES and there is a point of intersection between the centerlines of any two FLUMES, the distance between that point and the point of exit for each intersecting FLUME shall not be less than the SLIDE manufacturer's recommendations and ASTM F2376.

4.12.2.4[A] Exit into Landing Pools

4.12.2.4.1 Water Level WATERSLIDES shall be designed to terminate at or below water level, except for DROP SLIDES or unless otherwise permitted by the WATERSLIDE manufacturer and ASTM F2376.

4.12.2.4.2 Perpendicular WATERSLIDES shall be perpendicular to the wall of the AQUATIC VENUE at the point of exit unless otherwise permitted by the WATERSLIDE manufacturer.

4.12.2.4.3 Exit System WATERSLIDES shall be designed with an exit system which shall be in accordance with the WATERSLIDE manufacturer's recommendations and ASTM F2376.

4.122.4.3.1 Safe Entry WATERSLIDES shall be designed with an exit system which shall provide safe entry into the LANDING POOL or WATERSLIDE RUNOUT.

4.12.2.4.4 Flume Exits The FLUME exits shall be in accordance with the WATERSLIDE manufacturer's recommendations and ASTM F2376.

4.12.2.4.5 Point of Exit The distance between the point of exit and the side of the AQUATIC VENUE opposite the BATHERS as they exit, excluding any steps, shall not be less than the WATERSLIDE manufacturer's recommendations and in accordance with ASTM F2376.

4.12.2.5 Landing Pools

4.12.2.5.1 Steps If steps are provided instead of exit ladders or RECESSED STEPS with grab rails, they shall be installed at the opposite end of the LANDING POOL from the FLUME exit with a handrail.

4.12.2.5.2 Landing Area If the WATERSLIDE FLUME ends in a POOL, the landing area shall be divided from the rest of the AQUATIC VENUE by a ROPE AND FLOAT LINE, WING WALL, PENINSULA, or other similar feature to prevent collisions with other BATHERS.

4.12.2.6 Decks A PERIMETER DECK shall be provided along the exit side of the LANDING POOL.

4.12.2.7 Means of Access A walkway, steps, stairway, or ramp shall be provided between the LANDING POOL and the top of the FLUME. Refer to 4.8.1 for more guidance on DECK spaces.

4.12.2.8 Slide Runouts

4.12.2.8.1 Egress WATERSLIDE RUNOUTS, if used, shall have a planned means of egress, unless one of the walls of the RUNOUT is not more than 19 inches *(48.3 cm)* in height.

4.12.2.8.2 Designed WATERSLIDE RUNOUTS shall be designed in accordance with the SLIDE manufacturer's recommendations and ASTM F2376.

4.12.2.9[A] Drop Slides

4.12.2.9.1 Landing Area There shall be a SLIDE landing area in accordance with the SLIDE manufacturer's recommendations and ASTM F2376.
4.12.2.9.2 Area Clearance This area shall not infringe on the landing area for any other SLIDES, diving equipment, or any other minimum AQUATIC VENUE clearance requirements.
4.12.2.9.3 Steps Steps shall not infringe on this area.
4.12.2.9.4 Water Depth The minimum required water depth shall be a function of the vertical distance between the terminus of the SLIDE surface and the water surface of the LANDING POOL.
4.12.2.9.5 Manufacturer's Recommendation The minimum required water depth shall be in accordance with the SLIDE manufacturer's recommendations and ASTM F2376.
4.12.2.10 Pool Slides
4.12.2.10.1 Designed for Safety All SLIDES installed as an appurtenance to an AQUATIC VENUE shall be designed, constructed, and installed to provide a safe environment for all BATHERS utilizing the AQUATIC VENUE in accordance with applicable ASTM and CPSC STANDARDS.
4.12.2.10.2 Non-Toxic Components used to construct a POOL SLIDE shall be non-toxic and compatible with the environment contacted under normal use.
4.12.2.10.3 Water Depth Water depth at the SLIDE terminus shall be determined by the SLIDE manufacturer.
4.12.2.10.4 Pool Edge Clear space shall be maintained to the POOL edge and other features per manufacturer requirements.
4.12.2.10.4.1 Landing Area The landing area of the SLIDE shall be protected through the use of a ROPE AND FLOAT LINE, WING WALL, PENINSULA, or other similar impediment to prevent collisions with other BATHERS.
4.12.2.10.4.2 Prevent Bather Access Netting or other BARRIERS shall be provided to prevent BATHER access underneath POOL SLIDES where sufficient clearance is not provided.
4.12.2.10.4.3 Netting or Barrier Such netting or other BARRIER shall be designed such that any underwater opening does not allow for the passage of a 4 inch *(10.2 cm)* ball and no opening can create a finger entrapment.
4.12.2.11 Signage Warning signs in accordance with manufacturer's recommendations shall be provided.

4.12.3[A] Wave Pools
4.12.3.1 General
4.12.3.1.1 Additional Provisions In addition to the general POOL requirements stated in this CODE, WAVE POOLS shall comply with the additional provisions or reliefs of this section.
4.12.3.2 Access
4.12.3.2.1 Access Point BATHERS shall gain access to the WAVE POOL at the shallow or beach end with the exception of an allowable ADA designated entry point.
4.12.3.2.1.1 Sides The sides of the WAVE POOL shall be protected from unauthorized entry into the WAVE POOL by the use of a BARRIER.
4.12.3.2.1.2 Handrails If provided, shall be designed in such a way that they do not present a potential for injury or entrapment with WAVE POOL BATHERS.
4.12.3.2.2 Perimeter Decks A PERIMETER DECK shall not be required around 100% of the WAVE POOL perimeter.
4.12.3.2.2.1 Wave Pool Access A PERIMETER DECK shall be provided where BATHERS gain access to the WAVE POOL at the shallow or beach end and in locations where access is required for lifeguards.
4.12.3.2.3 Handholds WAVE POOLS shall be provided with handholds at the static water level or not more than 6 inches *(15.2 cm)* above the static water level.
4.12.3.2.3.1 Continuous These handholds shall be continuous around the WAVE POOL'S perimeter with the exception of at the ZERO DEPTH ENTRY, water depths less than 24 inches *(61.0 cm) if* this area is roped off not allowed for BATHER access.
4.12.3.2.3.2 Self-Draining These handholds shall be self-draining.
4.12.3.2.3.3 Flush Handholds shall be installed so that their outer edge is flush with the WAVE POOL wall.
4.12.3.2.3.4 Entangled The design of the handholds shall ensure that body extremities will not become entangled during wave action.

4.12.3.2.4 Steps and Handrails RECESSED STEPS shall not be allowed along the walls of the WAVE POOL due to the entrapment potential.
4.12.3.2.5 Ladders Side wall ladders shall be utilized for egress only.
4.12.3.2.5.1 Placement Side wall ladders shall be placed so they do not project beyond the plane of the wall surface.
4.12.3.2.6 Rope and Float Line WAVE POOLS shall be fitted with a ROPE AND FLOAT LINE located to restrict access to the caisson wall if required by the WAVE POOL equipment manufacturer.
4.12.3.2.6.1 Exception ROPE AND FLOAT LINE shall not apply to WAVE POOLS as indicated in provisions of 4.5.19.5.3.
4.12.3.3 Safety
4.12.3.3.1 Life Jackets Proper STORAGE shall be provided for life jackets and all other equipment used in the WAVE POOL that will allow for thorough drying to prevent mold and other biological growth.
4.12.3.3.2 Shut-Off Switch A minimum of two emergency shut-off switches to disable the wave action shall be provided, one on each side of the WAVE POOL.
4.12.3.3.2.1 Labeled and Accessible These switches shall be clearly labeled and readily accessible to QUALIFIED LIFEGUARDS.
4.12.3.3.3 Caisson Enclosure Caisson ENCLOSURES that prevent the passage of a 4-inch *(10.2 cm)* ball shall be provided for all WAVE POOLS.

4.12.4 Therapy Pools [Deleted]

4.12.5 Lazy Rivers
4.12.5.1 General
4.12.5.1.1 Additional Provisions In addition to the general swimming AQUATIC VENUE requirements stated in this CODE, LAZY RIVERS shall comply with the additional provisions or reliefs of this section.
4.12.5.1.2 Protrusions Handrails, steps, stairs, and propulsion jets for LAZY RIVERS shall not protrude into the river.
4.12.5.2 Access and Egress
4.12.5.2.1[A] Means Means of access/egress shall be provided at 150 foot *(45.7 m)* intervals around the LAZY RIVER.
4.12.5.2.2[A] Handhold A handhold in compliance with 4.5.14 shall be required on at least one side of the LAZY RIVER but shall not include horizontal bars and/or recessed handholds.
4.12.5.2.2.1 Bathers In or On Tubes *Exception:* Handholds shall not be required where BATHERS are required to be in or on a tube while in the LAZY RIVER.
4.12.5.2.3[A] Deck A DECK shall be provided along the entire length of the LAZY RIVER.
4.12.5.2.3.1 Alternate Sides The DECK shall be allowed to alternate sides of the LAZY RIVER.
4.125.2.3.2 Obstructions Obstructions around the perimeter of the LAZY RIVER, such as bridges or landscaping, shall be allowed provided they do not impact lifeguarding, sight lines, or rescue operations.
4.12.5.2.4[A] Bridges All bridges spanning a LAZY RIVER shall have a minimum clearance of both 7 feet *(2.1 m)* from the bottom of the LAZY RIVER and 4 feet *(1.2 m)* above the water surface to any structure overhead.

4.12.6 Moveable Floors
4.12.6.1 General
4.12.6.1.1 Additional Provisions In addition to the general swimming AQUATIC VENUE requirements stated in this CODE, MOVEABLE FLOORS shall comply with the additional provisions or reliefs of this section.
4.12.6.1.2 Water Treatment The MOVEABLE FLOOR design shall not impede the effectiveness of the water treatment system.
4.12.6.1.3 Underneath MOVEABLE FLOORS shall allow inspection, cleaning, and maintenance of the area underneath.
4.12.6.2 Slip Resistant The surface of the MOVEABLE FLOOR shall be SLIP RESISTANT if it is intended for installation in water depths less than 5 feet *(1.5 m)*.

4.12.6.3 Safety

4.12.6.3.1[A] Not Continuous A strategy for preventing BATHERS from transitioning to deeper water when a MOVEABLE FLOOR is not continuous over the entire surface area of the AQUATIC VENUE shall be provided.

4.12.6.3.2[A] Underside The underside of the MOVEABLE FLOOR shall not be accessible to BATHERS.

4.12.6.3.3 Entrapment The design of a MOVEABLE FLOOR shall protect against BATHER entrapment between the MOVEABLE FLOOR and the POOL walls and floor.

4.12.6.3.4 Hydraulic Fluid If the MOVEABLE FLOOR is operated using hydraulics, the hydraulic compounds shall be listed as safe for use in POOL water in case there is a hydraulic leak.

4.12.6.4[A] Movement

4.12.6.4.1 Speed The speed of a MOVEABLE FLOOR shall be less than or equal to 1.5 feet per minute *(45.7 cm/min)*.

4.12.6.4.2 Use Use of the MOVEABLE FLOOR portion of the POOL shall not be open to BATHERS when the floor is being raised or lowered.

4.12.6.4.2.1 Accessibility *Exception:* The MOVEABLE FLOOR shall only be used for accessibility purposes under direct supervision.

4.12.6.5 Water Depth and Markings

4.12.6.5.1 Displayed A floor depth indicator shall be provided that displays the current POOL water depth.

4.12.6.5.2 Warning Markings Warning markings stating "Moveable Floor" shall be provided at 25 foot *(7.6 m)* intervals around the perimeter of the MOVEABLE FLOOR.

4.12.7 Bulkheads

4.12.7.1 Additional Provisions In addition to the general AQUATIC VENUE requirements stated in this CODE, BULKHEADS shall comply with the additional provisions or reliefs of this section.

4.12.7.2[A] Entrapment The bottom of the BULKHEAD shall be designed so that a BATHER cannot be entrapped underneath or inside of the BULKHEAD.

4.12.7.3 Placement The BULKHEAD placement shall not interfere with the required water circulation in the POOL.

4.12.7.4 Fixed BULKHEADS shall be fixed to their operational position*(s)* by a tamper-proof system.

4.12.7.5[A] Gap The gap between the BULKHEAD and the POOL wall shall be no greater than 1.5 inches *(3.8 cm)*.

4.12.7.6[A] Handhold The BULKHEAD shall be designed to afford an acceptable handhold as required in 4.5.14.

4.12.7.7 Entrances and Exits The proper number of entrances/exits to the POOL as required by 4.5.3 shall be provided when the BULKHEAD is in place.

4.12.7.8 Guard Railings Guard railings at least 34 inches *(86.4 cm)* tall shall be provided on both ends of the BULKHEAD.

4.12.7.9[A] Width The width of the walkable area *(total BULKHEAD width)* of a BULKHEAD shall be greater than or equal to 3 feet and 3 inches *(1.0 m)*.

4.12.7.9.1[A] Starting Platforms If starting platforms are installed, the width of the walkable area *(total BULKHEAD width)* of a BULKHEAD shall be greater than or equal to 3 feet and 9 inches *(1.1 m)*.

4.12.7.9.1.1 Side Mount Style Starting platforms shall be "side mount" style if BULKHEAD is less than 4 feet 6 inches *(1.4 m)* wide.

4.12.7.10 Bulkhead Travel The travel of a BULKHEAD shall be in accordance with one of the following:

1) Limited such that it cannot encroach on any required clearances of other features, such as diving boards, or
2) Designed with modifications incorporated that prevent use of other features when the required clearances have been compromised by the position of the BULKHEAD.

4.12.7.11 Bulkhead Installation BULKHEADS shall not be installed, unless designed, and operated in accordance with all manufacturer's installation and operations recommendations.

4.12.8[A] Interactive Water Play Venues

4.12.8.1 Additional Provisions In addition to the general AQUATIC VENUE requirements stated in this CODE, INTERACTIVE WATER PLAY VENUES shall comply with the additional provisions or reliefs of this section.

4.12.8.2 Surface INTERACTIVE WATER PLAY VENUES shall have a SLIP-RESISTANT and easily cleaned surface.

4.12.8.2.1 Manufactured Surfacing Any manufactured surfacing shall be deemed suitable by the manufacturer for aquatic and chlorinated environments.

4.12.8.3 [A] Sloped The INTERACTIVE WATER PLAY VENUE shall be properly sloped so that only water from the AQUATIC FEATURES flows back to the INTERACTIVE WATER PLAY VENUE collection tank.

4.12.8.3.1 Adjacent Areas Areas adjacent to the INTERACTIVE WATER PLAY VENUE shall be sloped away from the collection drains.

4.12.8.3.2 Water Collection The slope of the INTERACTIVE WATER PLAY VENUE shall be sufficient to prevent standing water from collecting on the pad.

4.12.8.4 Drains The size, number and locations of the INTERACTIVE WATER PLAY VENUE drains shall be determined and specified so as to assure water does not accumulate on the INTERACTIVE WATER PLAY VENUES.

4.12.8.4.1 Gravity Flow through the drains to the INTERACTIVE WATER PLAY VENUE COLLECTION TANK shall be under gravity.

4.12.8.4.2 Direct Suction Outlets Direct suction outlets from the INTERACTIVE WATER PLAY VENUE shall be prohibited.

4.12.8.4.3 Valving Valves shall be provided in the drain system to allow for discharging water to an approved means for wastewater disposal prior to returning to the collection tank when INTERACTIVE WATER PLAY AQUATIC VENUE is not operational.

4.12.8.5 Grate Openings Openings in the grates covering the drains shall not exceed ½ inches *(12.7 mm)* wide.

4.12.8.5.1 Tools Gratings shall not be removable without the use of tools.

4.12.8.6 Treatment Tank The INTERACTIVE WATER PLAY VENUE COLLECTION TANK shall be designed to provide ready access for cleaning and inspections, and

4.12.8.6.1 Completely Drain The INTERACTIVE WATER PLAY VENUE collection tank shall be capable of complete draining.

4.12.8.6.2 Access Hatch The access hatch or lid shall be locked or require a tool to open.

4.12.8.6.3 Capacity The collection tank shall have a minimum operational volume of 3,000 gallons of water.

4.12.8.6.3.1 Volume The volume of water in the collection tank shall be sufficient to assure continuous operation of the filtration system.

4.12.8.6.4 Overflow Pipe A means to convey excess water in the tank to an AHJ approved waste disposal system shall be provided.

4.12.8.6.5[A] Inlets RECIRCULATION SYSTEM INLETS shall be sized and positioned to provide for complete mixing in the tank.

4.12.8.7 Deck Area INTERACTIVE WATER PLAY VENUES shall be kept free of landscape debris by either:

1) Eight feet *(2.4 m)* of DECK area, or
2) Raised curbs.

4.12.8.7.1 Deck Surface The DECK shall be of a uniform, easily cleaned, impervious material.

4.12.8.7.2 Protected From Runoff The DECK shall be protected from surface runoff.

4.12.8.8 Barrier, Separation by Distance The INTERACTIVE WATER PLAY VENUE must be separated by a distance of at least 15 feet (4.6 m) from other BODIES OF WATER and located at the shallow end of all pools.

4.12.8.8.1 Exception: Separated by Distance [Deleted]

4.12.8.9 Enclosures If a facility only consists of an INTERACTIVE WATER PLAY VENUE, then the requirements for an ENCLOSURE shall not apply.

4.12.8.10 [A] Hazard Spray features shall be designed and installed to be seen clearly, so as not to be a hazard to BATHERS due to water velocity from the spray feature discharge, or other SAFETY hazards.

4.12.8.11 Maximum Velocity Maximum velocity at the orifice of the spray feature nozzle shall not exceed 20 feet (6.1 m) per second.

4.12.8.12[A] Signage Depth markings shall not be required for INTERACTIVE WATER PLAY VENUES and warning signs shall have the following information or text complying with the intent of the information below. If the venue is without an enclosure, the warning signs must be placed on four sides or not more than 50 feet apart, whichever is less.

1) "WARNING: NO LIFEGUARD" in letters at least four inches (100 mm) high
2) Do not use the pool if you have had diarrhea in the last two weeks.
3) All persons, who are not toilet trained, must wear swim diapers.
4) Do not poop or pee in the water.
5) Do not swallow or spit water.
6) Do not leave children unsupervised.
7) If the operator does not provide direct supervision, add: "For emergency assistance please (insert contact 911, or other emergency assistance site staffed during all hours the wading pool is open)" and "Please contact (insert contact person or agency and phone number) with any concerns about this pool".

4.12.8.13 NEC Requirements NEC swimming POOL requirements shall apply to INTERACTIVE WATER PLAY VENUES.

4.12.9 Wading Pools

4.12.9.1 Additional Provisions In addition to the general AQUATIC VENUE requirements stated in this CODE, WADING POOLS shall comply with the additional provisions or reliefs of this section.

4.12.9.2[A] Separation For new and SUBSTANTIALLY ALTERED WADING POOLS, a WADING POOL shall be separated by 15 feet (4.6 m) from other BODIES OF WATER and located at the shallow end of a pool.

4.12.9.2.1 Barrier The BARRIER between a a WADING POOL and other BODIES OF WATER is not required.

4.12.9.2.2[A] Shallow Water WADING POOLS near other WADING POOLS shall not be required to be separated by 15 feet (4.6m).

4.12.10[A] Other Aquatic Features

Other AQUATIC FEATURES not otherwise addressed in the CODE, including but not limited to climbing walls, inflatables, and play structures, shall not be installed unless designed and operated in accordance with all manufacturer's installation and operations recommendations.

OAR 333-060-0000 AQUATIC FACILITIES – DESIGN STANDARDS AND CONSTRUCTION

333-060-1005 Plan Review

(1) A person may not construct or perform a major alteration or reconstruction of an AQUATIC FACILITY OR AQUATIC VENUE without plan approval to do so from the AUTHORITY.
(2) Any person desiring to construct any AQUATIC FACILITY OR AQUATIC VENUE shall file an application for plan approval with the AUTHORITY.
(3) The application must be accompanied by a description of the sources of water supply, amount and quality of water available and intended to be used, method and manner of water purification, treatment, disinfection, heating, regulating and cleaning, lifesaving apparatus, and measures to ensure safety of bathers, measures to ensure personal cleanliness of bathers, methods and manner of washing, disinfecting, drying and storing bathing apparel and towels, and all other information and statistics that may be required by the AUTHORITY. The AUTHORITY shall either approve or deny the application based upon the plans submitted.
(4) After construction, the AUTHORITY shall cause an inspection to be made of the proposed AQUATIC FACILITY OR AQUATIC VENUE. If the AUTHORITY determines that the AQUATIC FACILITY AND AQUATIC VENUE complies with the rules of the AUTHORITY as constructed, it shall issue a final approval authorizing the issuance of a license under ORS 448.035.
(5) If an AQUATIC VENUE is to be owned, operated or maintained by a person for profit, or in conjunction with a travelers' accommodation or recreation park, the applicant shall pay the AUTHORITY a plan review fee of $600. Payment of the plan review fee entitles the applicant to two inspections toward final approval. The AUTHORITY may not impose any new standards after a second or any subsequent inspection. For any subsequent construction inspection necessary, the applicant shall pay $100 for each inspection.

333-060-1010 Permission to Construct

(1) No person shall construct an AQUATIC FACILITY OR AQUATIC VENUE, or alter any such structures without:
(a) Submitting complete plans and specifications to the AUTHORITY);
(b) Paying the stipulated plan review fee to the AUTHORITY;
(c) Receiving a written plan approval or conditional approval from the AUTHORITY;
(2) No person shall deviate from the approved or conditionally approved plans and specifications during the construction or alteration of a facility described in section (1) of this rule without the written approval of the AUTHORITY.

333-060-1015 Variance

(1) The AUTHORITY may grant a variance from requirements of these rules as follows:
(a) Where it is demonstrated to the satisfaction of the AUTHORITY that strict compliance with the rule would be highly burdensome or impractical due to special conditions or cause;
(b) Where the public or private interest in the granting of the variance is found by the AUTHORITY to clearly outweigh the interest of the application of uniform rules; and
(c) Where such alternative measures are provided which in the opinion of the AUTHORITY will provide adequate public health and safety protection.
(2) Such variance authority is not conferred upon any county notwithstanding delegated or contractual authority in administration and enforcement of these rules.

333-060-1020 Maintenance and Modification

(1) All equipment of AQUATIC FACILITIES AND AQUATIC VENUES shall be operational and shall be kept in good repair. Such equipment shall be maintained in conformance with the original design or better.
(2) The structural components of all AQUATIC FACILITIES AND AQUATIC VENUES shall be maintained in good repair.

333-060-1025 Exemptions

The exemptions of sections (1) through (11) of this rule apply, provided the exemption does not present a health or safety hazard. Exemptions do not apply to any alteration or replacement of affected component part.
(1) Pre-May 13, 1959, Pools and Wading Pools: POOLS and WADING POOLS which were in public use before May 13, 1959, shall not be required to comply with Structural Stability, 4.5.13.2; and Walls, 4.5.12.5, provided they are operated in compliance with all other rules of the AUTHORITY relating to AQUATIC VENUES.
(2) Pre-March 1, 1979, Pool Lifelines: POOLS built prior to March 1, 1979, shall provide a lifeline two feet on the shallow side of the break in grade between the shallow and deep portion of the POOL when the interior finish is repaired, if applicable. Where there is a uniform slope, a lifeline is not required.
(3) Pre-March 1, 1979, Pool Markings: POOLS built prior to March 1, 1979, shall comply with Depth Markers and Markings, 4.5.19, pertaining to vertical wall markings when the interior finish is repaired or resurfaced.
(4) Pre-September 1, 2014, Ventilation Systems: POOL or WADING POOL built or renovated after September 1, 2014, and enclosed in a building must have a ventilation system that complies with the requirements of the Oregon Structural Specialty Code, and the Oregon Mechanical Specialty Code.
(5) Pre-June 10, 1959, Pool and Wading Pool Plans Required: All POOLS and WADING POOLS which were constructed and in use but were not in public use and were not licensed by the AUTHORITY before June 10, 1959, shall submit complete and detailed plans to the AUTHORITY for approval before being operated for any public use. A license to operate as a POOL shall not be issued until the POOL complies with the requirements of these rules.
(6) Pre-July 2006, Wading Pool Recirculation and Entrapment: Any WADING POOL built prior to July 1, 2006, but not licensed by the AUTHORITY before that date, must obtain a license to operate:
(a) All WADING POOLS without water recirculation shall be renovated or phased out of use and removed before December 31, 2009. or must cease operation.
(b) All existing WADING POOLS must provide protection against entrapment, hair entanglement and evisceration or cease operation by December 31, 2008.
(7) Pre-February 25, 1971, Limited Use Pools: Any LIMITED USE POOL operated in conjunction with a companion residential housing facility having five or more living units and which was operated and maintained for the use of the occupants thereof and their personal friends only, but which was not required to be licensed prior to February 25, 1971, shall not be required to comply with Structural Stability, 4.5.13.2; Walls 4.5.12.5; Piping, 4.7.1.7, 4.7.1.7.2, 4.7.1.7.3.1; and Overflow Systems, 4.7.1.4; provided such POOLS are operated in compliance with all other requirements of these rules.
(8) Pre-March 1, 1979, Aquatic Venue Construction: AQUATIC VENUES built prior to March 1, 1979, are exempt from the following requirements of these rules provided such AQUATIC VENUES are operated in continuous compliance with the rules in effect at the time they were constructed:
(a) Dimensions, 4.5.12.5.
(b) Finishes, Markings and Lifelines, 4.5.19.5.
(c) Ladders, Recessed Steps and Stairways, 4.5.4.4 and 4.5.4.6.
(d) Decks, 4.8.1.5.2.1, 4.8.1.2.3, 4.8.1.1.2.
(e) Overflow Systems, 4.7.1.4.
(f) Recirculation Systems, 4.7.1.10 (Turnover rate for WADING POOL only).

(g) Inlets and Outlets, 4.7.1.3.
(h) Piping, 4.7.1.7.2, 4.7.1.7.3.2.
(i) Pumps, 4.7.1.8.1.1, 4.7.1.8.2.
(j) Filters, 4.7.2.2.3.1, 4.7.2.2.3.1.1, 4.7.2.3.1, 4.7.2.4.1, 4.7.2.1.2, 4.11.6.4.
(k) Disinfectant and Chemical Feeders, 4.7.3.2.1.2.
(l) Equipment Room, 4.9.1.
(m) Hygiene Facility, 4.10.2.1.
(9) Pre-June 23, 1981, Spas: SPAS built prior to June 23, 1981, are exempt from the following requirements, provided they are constructed and maintained in accordance with the plans approved by the AHJ for the construction of the SPA, and the exemption does not present a health or safety hazard:
(a) Underwater Lighting, 4.6.1.5.
(b) Deck, 4.12.1.5, 4.8.1.4.2, 4.8.1.4.4.
(c) Overflow System, 4.7.1.5.2.1, 5.7.1.1.3, 4.7.1.5.1.2.
(d) Recirculation, 4.7.5.4.3.
(e) Inlets, 4.7.1.3.
(f) Filters, 4.7.2.2.3.1, 4.7.2.2.3.1.1, 4.7.2.3.1, 4.7.2.4.1.
(g) Equipment Room, 4.9.1.
(10) Pre-September 1, 2014, Spa Enclosure: Buildings enclosing SPAS built after September 1, 2014, and buildings enclosing SPAS that are remodeled or renovated on or after September 1, 2014, shall be constructed in accordance with the requirements of the Oregon Structural Specialty Code.
(11) Pre-May 1, 1986, Spa Piping: For all SPAS built after May 1, 1986, the backwash or drain line shall be permanently piped with an air break to discharge into an approved sewerage system.