Industry Training for 2018 Aquatic Health Regulations

Chapter 2– Facility Design and Construction

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Training Materials

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Training Materials- Table of Contents –

Note: links take you to the start of the section so be sure to review all associated slides!

New Regulations- General Information

The Nevada Administrative Code Sections 444.010 - 444.546 is being replaced with a 117-page document which is based on the CDC's Model Aquatic Health Code (MAHC). The contents of the MAHC were modified in some places to accommodate the unique needs of aquatic health venues in Clark County.

New Regulations – Implementation and Orientation

The complete set of Aquatic Health Regulations can be found on the SNHD website at www.southernnevadahealthdistrict.org.

Implementation for **new** facilities under construction and orientation for **existing** facilities will begin August, 2018.

After the one-year orientation period, enforcement of new regulations will begin July 1, 2019.

New Regulations -History

The Nevada Administrative Code Sections 444.010 - 444.546 served as SNHD's governing document to regulate the operation of public bathing places. Due to changes to industry and safety standards, SNHD developed and proposed regulations based on the CDC's Model Aquatic Health Code.

Following more than 3 years of collaboration with industry groups including HOAs, resort representatives, pool companies and other interested parties, the 2018 Aquatic Facility Regulations were approved by the Board of Health in April 2018 and approved by the Nevada State Board of Health on
June 8, 2018.

New Regulations - Overview

Chapter 1: Glossary, Acronyms and Initialisms, Definitions
Chapter 2: Facility Design and Construction
Chapter 3: Facility Operation and Maintenance
Chapter 4: Policies and Management
Chapter 5: Compliance and Enforcement
Appendix A: Residential Facility Self-Management Program

This presentation only covers Chapter 2 revisions.

Scope of Training Materials

- This presentation covers major changes from the NAC. **Regulations that have not changed may not be mentioned, but are still required. Not all language revisions are included. The complete set of regulations can be found here:** www.southernnevadahealthdistrict.org

- Your management has the right to be more strict than the regulations. If the information in this presentation contradicts your operational practices, please see your management for guidance.

Scope of Training Materials

- Words in CAPITAL LETTERS in the regulations (and items copied from the regulations) have definitions specified in Chapter 1.
- Where possible, links to sections in other chapters are provided.
- Meanings of acronyms used in this presentation are provided on the next slide.

Acronyms use in this presentation

ANSI	American National Standards Institute	NSF	National Sanitation Foundation
ASTM	American Society for Testing and Materials	ÖNORM	Osterreichisches Normungsinstitut (Austrian Standards Institute)
DCoF	Dynamic Coefficient of Friction	ORP	Oxidation Reduction Potential
DVGW	Deutscher Verein des Gas-und Wasserfaches e.V. – Technisch Wissenshaftlicher Verein (German Technical and Scientific Association for Gas and Water)	PPM	Parts per Million
EPA	Environmental Protection Agency	RED	Reduction Equivalent Dose Bias
FINA	Federation Internationale de Natation	RWI	Recreational Water Illness
GPM	Gallons per Minute	UV	Ultra-violet
MAHC	Model Aquatic Health Code	YMCA	Young Men's Christian Association
Ml	Milliliter		
mV	Millivolts		
NCAA	National Collegiate Athletic Association		
NEC	National Electrical Code		
NFSHSA	National Federation Of State High School Associations		

2-1 Plan Submittal

- Most application materials must be submitted electronically

- Hard copies required:
  - One complete set of plans
  - One copy of the HEALTH AUTHORITY's Construction Application, signed and stamped by the DESIGN PROFESSIONAL or licensed contractor
  - One copy of the hydraulic calculations.

2-1 New Construction and Substantial Alteration

2-101.1 AQUATIC FACILITY construction plans shall be designed to provide sufficient clarity to indicate the location, nature, and extent of the work proposed.

2-101.2 AQUATIC FACILITY construction plans shall show in detail that it will conform to the provisions of these Regulations and relevant laws to protect the health and SAFETY of the facility's BATHERS and PATRONS.

2-101.4 An OWNER who allows new construction or a SUBSTANTIAL ALTERATION of an AQUATIC FACILITY to begin prior to obtaining approval from the HEALTH AUTHORITY will be subject to applicable fees. Any contractor who begins new construction or a SUBSTANTIAL ALTERATION of an AQUATIC FACILITY prior to obtaining APPROVED plans may be reported to the Nevada State Contractors Board.

2-1 New Construction and Substantial Alteration

2-101.6 All construction plans shall include the following statements:

A. The proposed aquatic facility and all equipment shall be constructed and installed in conformity with the approved plans and specifications or approved amendments and

B. No substantial alteration, changes, additions, or equipment not specified in the approved plans or allowed in these Regulations can be made or added until the plans for such substantial alteration, changes, additions, or equipment are submitted to and approved by the health authority.

2-1 New Construction and Substantial Alteration

2-102.3 Technical Specifications

A. Technical specifications for the construction of each AQUATIC VENUE and all appurtenances shall accompany the drawings for the AQUATIC FACILITY plans.

B. The technical specifications for each AQUATIC FACILITY and each AQUATIC VENUE shall include all construction details not shown on the plans that relate to the AQUATIC FACILITY.

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

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

Cont'd…

2-1 New Construction and Substantial Alteration

2-102.3 Technical Specifications

E. The technical specifications for each AQUATIC FACILITY and each AQUATIC VENUE shall include the THEORETICAL PEAK OCCUPANCY, respectively.

1. The THEORETICAL PEAK OCCUPANCY 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.

2-1 New Construction and Substantial Alteration

2-102.3 Technical Specifications

2. The THEORETICAL PEAK OCCUPANCY 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.

   a. The overall density of the AQUATIC FACILITY may be adjusted as deemed appropriate by the HEALTH AUTHORITY with respect to health and SAFETY concerns related to the intended use.

   b. The THEORETICAL PEAK OCCUPANCY for an AQUATIC FACILITY shall be determined by adding the calculations for each AQUATIC VENUE in the AQUATIC FACILITY.

Cont'd...

2-1 New Construction and Substantial Alteration

2-102.3 Technical Specifications

F. 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; and

3. Pump curves that demonstrate that the selected recirculation pump*(s)* are adequate for the calculated required flows.

Cont'd…

2-1 New Construction and Substantial Alteration

2-102.3 Technical Specifications

G. The technical specifications for each AQUATIC VENUE shall include the recirculation rate, TURNOVER time, filter media, each piece of equipment, safety equipment, and any other additional information related to the project requested by the HEALTH AUTHORITY for the purposes of the construction of the AQUATIC FACILITY and each AQUATIC VENUE and all appurtenances.

2-1 New Construction and Substantial Alteration

2-103.2 Non-SUBSTANTIAL ALTERATIONS

A. The AQUATIC FACILITY OWNER planning a non-SUBSTANTIAL ALTERATION shall make application to the HEALTH AUTHORITY to review proposed changes prior to starting the non-SUBSTANTIAL ALTERATION.

B. All applications and supporting documentation, such as plans and hydraulics, shall be prepared by a DESIGN PROFESSIONAL or a licensed contractor with an appropriate classification issued by the Nevada State Contractors' Board.

C. The AQUATIC FACILITY operator shall consult with the HEALTH AUTHORITY to determine if new or modified plans are required for approval of the non-SUBSTANTIAL ALTERATIONS proposed.

2-1 New Construction and Substantial Alteration

2-103.3 Replacements

A. The replacement of pumps, filters, feeders, controllers, filter valves, or other similar equipment with SUBSTANTIALLY SIMILAR equipment may be done after Contacting the HEALTH AUTHORITY to review the proposed changes without submission of altered AQUATIC FACILITY plans, unless the review determines the need for plan submission.

B. The HEALTH AUTHORITY shall provide the AQUATIC FACILITY OWNER written approval or disapproval of the proposed replacement equipment's equivalency.

C. The AQUATIC FACILITY OWNER accepts responsibility for proper and immediate replacement if equipment installed is not deemed equivalent by the HEALTH AUTHORITY.

D. Documentation of proposed, APPROVED, and disapproved replacements shall be maintained by the HEALTH AUTHORITY.

2-1 New Construction and Substantial Alteration

2-104 Compliance Certificate

2-104.1 A certificate of construction compliance shall be submitted to the HEALTH AUTHORITY for all AQUATIC FACILITY plans for new construction and SUBSTANTIAL ALTERATIONS requiring HEALTH AUTHORITY approvals.

2-104.2 This certificate shall be prepared by a licensed professional and be within the scope of the licensed professional's practice as defined by state law.

2-104.4 If commissioning or testing reports for systems such as AQUATIC FACILITY lighting, air handling, recirculation, filtration, and/or DISINFECTION are conducted, then those reports shall be included in furnished documentation.

2-2 Materials

2-201 Pools

2-201.4 POOLS shall be designed in such a way to maintain their ability to retain the designed amount of water.

2-201.6 POOL floors in areas less than three (3) feet deep shall have a slip resistant finish with a minimum dynamic coefficient of friction at least equal to the requirements of ANSI A137.1-2012 of 0.42 as measured by the DCOF AcuTest.

2-201.8 Wood, porous stone, loose pebbles, or earth shall not be permitted as an interior finish.

2-2 Materials

2-202 Indoor Aquatic Facility

2-202.1 The interior building finishes of an INDOOR AQUATIC FACILITY shall be designed for an indoor relative humidity as not less than 80 percent.

2-202.4 INDOOR AQUATIC FACILITY window frames shall be constructed of suitable materials or shall have a suitable covering or coating designed to withstand the expected atmosphere, not contribute to microbial growth and are constructed to minimize the risk of uncontrolled condensation.

2-3 Aquatic Venue Structure

2-301 Design for Risk Management

Design of AQUATIC FACILITIES and/or AQUATIC VENUE(s) shall include the OWNER and/or an aquatic risk management consultant to incorporate operational considerations such as the layout for zones of BATHER surveillance and an unobstructed view of the bottom of the AQUATIC VENUE.

2-302 Bottom Slope

2-302.1 The bottom slope of a POOL shall be governed by the following parameters, but WAIVERS or VARIANCES may be granted for special uses and situations so long as public safety and health are not compromised.

2-3 Aquatic Venue Structure

2-303 Pool Access and Egress

2-303.1 Each POOL shall have a minimum of two means of access and egress, and no less than one for each 75 feet of perimeter, with the exception of:
SPAS;

A. WATERSLIDE LANDING POOLS;

B. WATERSLIDE RUNOUTS; and

C. WAVE POOLS.

2-303.2 Acceptable means of access/egress shall include stairs/handrails, grab rails/RECESSED STEPS, ladders, ramps, swimouts, and zero-depth entries.

2-3 Aquatic Venue Structure

2-304 Stairs

2-304.7 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.

2-304.8 Extended treads may vary from the maximum tread depth dimension values. The maximum water depth above an extended tread must not exceed 18 inches.

2-3 Aquatic Venue Structure

2-305 Handrails

2-305.1 Handrail*(s)* shall be provided for each set of stairs and not obstruct access to the stair treads.

2-305.2 Handrails shall be constructed of corrosion-resistant materials, and anchored securely with a space at least three (3) inches from the adjacent riser.

2-305.3 The upper railing surface of handrails shall extend above the POOL coping or DECK between 34 inches and 38 inches.

2-305.4 Stairs wider than five (5) feet shall have at least one additional handrail for every 10 feet of stair width.

2-3 Aquatic Venue Structure

2-305 Handrails

2-305.5 Handrails shall be designed to resist a load of 50 pounds per linear foot applied in any direction and independently a single concentrated load of 200 pounds applied in any direction at any location. Hand rails shall be designed to transfer these loads through the supports to the POOL or DECK structure.

2-3 Aquatic Venue Structure

2-306 Grab Rails

2-306.1 Where grab rails are provided, they shall be constructed of corrosion-resistant materials.

2-306.2 Grab rails shall be anchored securely.

2-306.3 Grab rails shall be provided at both sides of RECESSED STEPS.

2-306.4 The horizontal clear space between grab rails shall be not less than 18 inches and not more than 24 inches.

2-306.5 The upper railing surface of grab rails shall extend above the POOL coping or DECK a minimum of 28 inches.

2-3 Aquatic Venue Structure

2-306 Grab Rails

2-306.6 Grab rails shall be designed to resist a load of 50 pounds per linear foot applied in any direction and independently a single concentrated load of 200 pounds applied in any direction at any location. Grab rails shall be designed to transfer these loads through the supports to the POOL or DECK structure.

2-3 Aquatic Venue Structure

2-307 Recessed Steps

2-307.1 RECESSED STEPS shall:

A. Be slip-resistant;

B. Be designed to be easily cleaned; and

C. Drain into the POOL.

2-307.2 RECESSED STEPS shall be uniformly spaced not less than six (6) inches and not more than 12 inches vertically along the POOL wall.

2-307.4 The top surface of the uppermost RECESSED STEP shall be located not more than 12 inches below the POOL coping or DECK.

2-3 Aquatic Venue Structure

2-307 Recessed Steps

2-307.5 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.

2-3 Aquatic Venue Structure

2-308 Ladders

2-308.3 Ladder Treads

A. Ladder treads shall be slip-resistant.

B. treads shall have a minimum horizontal tread depth of 1.5 inches and the distance between the horizontal tread and the POOL wall shall not be greater than four (4) inches.

C. Ladder treads shall be uniformly spaced not less than seven (7) inches and not more than 12 inches vertically at the handrails.

D. The top surface of the upmost ladder tread shall be located not more than 12 inches below the POOL coping, gutter, or DECK.

2-3 Aquatic Venue Structure

2-309 Zero Depth (Sloped) Entries

2-309.1 Where ZERO DEPTH ENTRIES are provided, they shall be constructed with slip-resistant materials.

2-309.3 Trench drains shall be used along ZERO DEPTH ENTRIES at the waterline to facilitate surface skimming.

A. The trenches may be flat or follow the slope of the ZERO DEPTH ENTRY.
B. Any handholds that present a trip hazard shall not be continuous along the ZERO DEPTH ENTRY.

2-3010 Color and Finish

2-3010.2 The HEALTH AUTHORITY may grant a WAIVER to the color requirements of these Regulations for Munsell color values less than 6.5./.Competitive or lap POOLS may have lane markings and end wall targets installed in accordance with FINA, NCAA, USA Swimming, NFSHSA, or other recognized STANDARDS.

2-3 Aquatic Venue Structure

2-3011 Walls

2-3011.1POOL walls shall be plumb within a plus or minus (+/-) three degree tolerance, unless the wall design requires structural support ledges and slopes below to support the upper wall. Refer to **Figure 2-3011.3**.

2-3011.3 All structural support ledges and slopes of the wall shall fall entirely within a plane slope from the water line at not greater than a +/- three degree tolerance. A contrasting color shall be provided on the edges of any support ledge to draw attention to the ledge for BATHER safety. All corners created by adjoining walls shall be rounded or have a radius in both the vertical and horizontal dimensions to eliminate sharp corners. There shall be no projections from a POOL wall with the exception of structures or elements such as stairs, grab rails, ladders, handholds, PENINSULAS, WING WALLS, underwater lights, safety ropes, WATERSLIDES, play features, other APPROVED POOL amenities, UNDERWATER BENCHES, and UNDERWATER LEDGES as described in this section. Refer to **Figure 2-3011.3**.

2-3 Aquatic Venue Structure

Figure 2-3011.3

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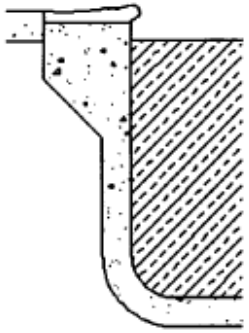
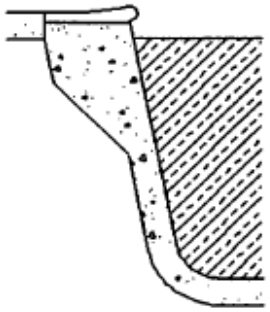
Figure 2-3011.3: AQUATIC VENUE Walls

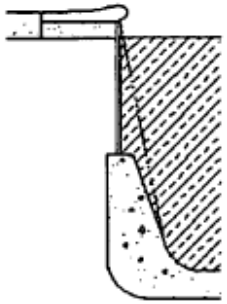
(A) Plumb within a +/- 3 degree tolerance.



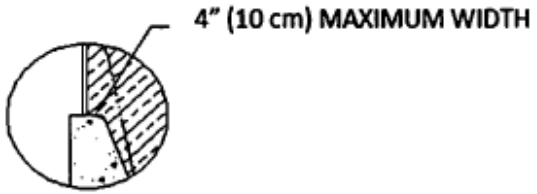
(B) Uniform slope not greater than 11 degrees or 1 in 5 from plumb.



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



(D) Underwater Ledge for support of upper wall.



2-3 Aquatic Venue Structure

2-3012 Structural Stability

2-3012.1 POOLS shall be designed to withstand the reasonably anticipated loads imposed by POOL water, BATHERS, and adjacent soils or structures.

2-3014 Infinity Edges

2-3014.1 Not more than fifty percent (50 percent) of the POOL perimeter shall incorporate an INFINITY EDGE detail, unless an adjacent and PATRON accessible DECK space conforming to Sections 2-601.1 and 2-601.3 is provided.

2-3014.2 The length of an INFINITY EDGE shall be no more than 30 feet long when in water depths greater than five (5) feet. No maximum distance is enforced for the length of INFINITY EDGES in SHALLOW WATER five (5) feet and less.

2-3 Aquatic Venue Structure

2-3014 Infinity Edges

2-3014.3 Handholds conforming to the requirements of Section 2-3013 shall be provided for INFINITY EDGES, which may be separate from, or incorporated as part of the INFINITY EDGE detail.

2-3014.4 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.

2-3014.5 Troughs, basins, or capture drains designed to receive the overflow from INFINITY EDGES shall be watertight, free from STRUCTURAL CRACKS, and have a non-toxic, smooth, and slip-resistant finish.

2-3 Aquatic Venue Structure

2-3015 Underwater Benches

2-3015.1 Where provided, UNDERWATER BENCHES shall be constructed with slip-resistant materials having a minimum dynamic coefficient of friction of friction at least equal to the requirements of ANSI A137.1-2012 of 0.42 as measured by DCOF AcuTest.

2-3015.2 The leading horizontal and vertical edges of UNDERWATER BENCHES shall be outlined with slip-resistant color contrasting tile or other permanent marking of two (2) inches on the horizontal surface and one to two inches (1-2 inches) on the vertical surface.

2-3015.3 UNDERWATER BENCHES may be installed in areas of varying depths, but the maximum POOL water depth in that area shall not exceed five (5) feet.

2-3015.4 The maximum submerged depth of any seat or sitting bench shall be 24 inches measured from the water line.

2-3 Aquatic Venue Structure

2-3016 Underwater Ledges

2-3016.1 Where UNDERWATER LEDGES are provided to enable swimmers in DEEP WATER to rest or to provide structural support for an upper wall, they shall be constructed with slip-resistant materials.

2-3016.2 UNDERWATER LEDGES for resting may be recessed or protrude beyond the vertical plane of the POOL wall, provided they meet the criteria for slip resistance and tread depth outlined in this section.

2-3016.3 UNDERWATER LEDGES for resting shall only be provided within areas of a POOL with a five (5) feet or greater water depth.

A. UNDERWATER LEDGES must start no earlier than four (4) lineal feet to the deep side of the five (5) foot slope break.

B. UNDERWATER LEDGES must be at least four (4) feet below static water level.

2-3 Aquatic Venue Structure

2-3016 Underwater Ledges

2-3016.4 UNDERWATER LEDGES for structural support of upper walls are allowed.

2-3016.5 The edges of UNDERWATER LEDGES shall be outlined with slip-resistant color contrasting tile or other permanent marking of not less than one (1) inch and not greater than two (2) inches. If they project past the plane of the POOL wall, the edges of UNDERWATER LEDGES shall be clearly visible from the DECK.

2-3016.6 UNDERWATER LEDGES shall have a maximum uniform horizontal tread depth of four (4) inches. See Figure 2-3011.3.

2-3 Aquatic Venue Structure

2-3017 Underwater Shelves

2-3017.1 UNDERWATER SHELVES may be constructed immediately adjacent to water shallower than five (5) feet.

2-3017.2 UNDERWATER SHELVES shall have a slip-resistant, color contrasting nosing at the leading horizontal and vertical edges on both the top of horizontal edges and leading vertical edges and should be viewable from the DECK or from underwater.

2-3017.3 UNDERWATER SHELVES shall have a maximum depth of 24 inches.

2-3 Aquatic Venue Structure

2-3018 Depth Markers and Markings

2-3018.2 Construction/Size

A. Depth markers shall be constructed of a durable material resistant to weather conditions.

B. Depth markers shall be slip resistant when they are located on horizontal surfaces.

C. Depth markers shall have numbers with a minimum height of four (4) inches and letters with a minimum height of one (1) inch of a contrasting color with the background.

D. Depth markers shall be marked in units of feet and inches.
   (1) Abbreviations of "FT" and "IN" may be used in lieu of "FEET" and "INCHES."
   (2) Symbols for feet (‘) and inches (“) shall not be permitted on water depth signs.
   (3) Metric units may be provided in addition to—but not in lieu of—units of feet and inches.

2-3 Aquatic Venue Structure

2-3018 Depth Markers and Markings

2-3018.5 Symmetrical AQUATIC VENUE designs with the deep point at the center may be allowed by providing a dual depth marking system APPROVED by the HEALTH AUTHORITY. The dual depth marking system must indicate the depth at the wall and at the deep point as measured in Section 2-3018.3.

2-3018.6 Controlled-access AQUATIC VENUES (such as ACTIVITY POOL, LAZY RIVERS, and other venues with limited access) shall only require depth markers on a sign at points of entry.

A. Depth marker signs shall be clearly visible to PATRONS entering the venue.

B. All lettering and symbols shall be as required for other types of depth markers.

2-3 Aquatic Venue Structure

2-3018 Depth Markers and Markings

2-3018.7 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.

A. The posted water depth shall be the water level to the floor of the AQUATIC VENUE according to a vertical measurement taken three (3) feet from the AQUATIC VENUE wall.

B. 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.

2-3018.8 A minimum of two depth markers shall be provided regardless of the shape or size of a SPA.

2-3018.9 AQUATIC VENUES where the maximum water depth is six (6) inches or less (such as WADING POOLS, CHILD AMUSEMENT LAGOONS, and ACTIVITY POOL areas) shall not be required to have depth markings or "NO DIVING" signage.

2-3 Aquatic Venue Structure

2-3019 Moveable Floors

2-3019.1 The moveable floor design shall:

A. Not impede the effectiveness of the water treatment system, and

B. Allow for inspection, cleaning and maintenance of the area underneath.

2-3019.2 The surface of the moveable floor shall be slip resistant if it is intended for installation in water depths less than five (5) feet.

2-3 Aquatic Venue Structure

2-3019 Moveable Floors

2-3019.3 Safety

A. 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.

B. The underside of the moveable floor shall not be accessible to BATHERS.

C. The design of a moveable floor shall protect against BATHER entrapment between the moveable floor and the POOL walls and floor.

D. 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.

2-3 Aquatic Venue Structure

2-3019 Moveable Floors

2-3019.4 Movement

A. The speed of a moveable floor shall be less than or equal to 1.5 feet per minute.

B. Use of the moveable floor portion of the POOL shall not be open to BATHERS when the floor is being raised or lowered. **Exception**: The moveable floor shall only be used for accessibility purposes under direct supervision.

2-3019.5 Water Depth and Markings

A. A floor depth indicator shall be provided that displays the current POOL water depth.

B. Warning markings stating “Moveable Floor” shall be provided at 25 foot intervals around the perimeter of the moveable floor.

2-3 Aquatic Venue Structure

2-3020 Bulkheads

2-3020.1 The bottom of the BULKHEAD shall be designed so that a BATHER cannot be entrapped underneath or inside of the BULKHEAD.

2-3020.2 The BULKHEAD placement shall not interfere with the required water circulation in the POOL.

2-3020.4 The gap between the BULKHEAD and the POOL wall shall be no greater than 1.5 inches.

2-3020.5 The BULKHEAD shall be designed to afford an acceptable handhold as required in Section 2-3013.

2-3020.6 Proper access and egress to the POOL as required by Section 2-303 shall be provided when the BULKHEAD is in place.

2-3 Aquatic Venue Structure

2-3020 Bulkheads

2-3020.7 Guard railings at least 34 inches tall shall be provided on both ends of the BULKHEAD.

2-3020.8 The width of the walkable area (total BULKHEAD width of a BULKHEAD shall be greater than or equal to three feet and three inches (3 ft. 3 in.).

A. If starting platforms are installed, the width of the walkable area (total BULKHEAD width of a BULKHEAD shall be greater than or equal to three feet and nine inches (3 ft. 9 in.).

B. Starting platforms shall be “side mount” style if BULKHEAD is less than four feet six inches (4 ft. 6 in.) wide.

2-3 Aquatic Venue Structure

2-3020 Bulkheads

2-3020.9 The travel of a BULKHEAD shall be in accordance with one of the following:

A. Limited such that it cannot encroach on any required clearances of other features, such as diving boards; or

B. Designed with modifications incorporated that prevent use of other features when the required clearances have been compromised by the position of the BULKHEAD.

2-4 Indoor/Outdoor Environment

2-401 Lighting

2-401.1 All lighting associated with an AQUATIC FACILITY must conform to the requirements of the latest National Electrical Code (NEC..

2-401.2 Lighting as described in this subsection shall be provided for all AQUATIC VENUES.

2-401.3 No lighting controls shall be accessible to PATRONS.

2-401.4 Where natural lighting methods are used to meet the light level requirements of Section 2-401.5. 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:

A. Automatic lighting controls based on light levels or time of day, or

B. Written operations procedures where manual controls are used.

2-4 Indoor/Outdoor Environment

2-401 Lighting

2-401.5 POOL water surface and DECK light levels shall meet the following minimum maintained light levels:

A. Indoor Water Surface: 30 horizontal footcandles (323 lux)

B. Outdoor Water Surface: 10 horizontal footcandles (108 lux)

C. DECK: 10 horizontal footcandles (108 lux).

2-401.8 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.

2-4 Indoor/Outdoor Environment

2-402 Indoor Aquatic Facility Ventilation

2-402.1 INDOOR AQUATIC FACILITY AIR HANDLING SYSTEMS shall be designed, constructed, and installed to support the health and SAFETY of the building's PATRONS.

2-402.2 The AQUATIC FACILITY OWNER shall request from the contractor installing the INDOOR AQUATIC FACILITY AIR HANDLING SYSTEM an operating manual from the manufacturer.

2-402.3 AIR HANDLING SYSTEM Commissioning : A qualified, licensed professional shall commission the AIR HANDLING SYSTEM to verify that the installed system is operating properly in accordance with the system design.

2-4 Indoor/Outdoor Environment

2-404 Indoor Aquatic Facility Electrical Systems and Components

Nothing in these Regulations shall be construed as providing relief from any applicable requirements of the NEC and local codes and amendments.

2-405 Aquatic Venue Water Heating

When designing POOL heating equipment, measures shall be taken to prevent BATHER exposure to water temperatures in excess of 104°F.

2-406 First Aid Area

Design and construction of new AQUATIC FACILITIES not directly associated with residential living quarters shall include an area designated for first aid equipment and/or treatment.

2-4 Indoor/Outdoor Environment

2-407 Drinking Fountains

2-407.2 The drinking fountain shall be located where it is readily accessible and not a hazard to BATHERS. The drinking fountain shall not be located in a SHOWER area or toilet area.

2-407.3 A single drinking fountain shall be allowed for one or more AQUATIC VENUES within an AQUATIC FACILITY.

2-407.4 The drinking fountain shall be an angle jet type installed according to applicable plumbing codes.

2-407.5 The drinking fountain shall be supplied with water from an approved potable water supply.

2-407.6 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.

2-4 Indoor/Outdoor Environment

2-409 Food and Drink Concessions

2-4010.1 An area designed for use by SPECTATORS may be located within an AQUATIC FACILITY ENCLOSURE.

2-4 Indoor/Outdoor Environment

2-4010 Spectator Areas

2-4010.1 An area designed for use by SPECTATORS may be located within an AQUATIC FACILITY ENCLOSURE.

2-4010.2 DECK : When a SPECTATOR area or access to a SPECTATOR area is located within the AQUATIC FACILITY ENCLOSURE, the DECK adjacent to the area or access shall provide egress width for the SPECTATORS in addition to the width required by these Regulations**.**

2-4010.3SPECTATOR or other area located in a balcony within ten (10) feet of or overhanging any portion of an AQUATIC VENUE shall be designed to deter jumping or diving into the AQUATIC VENUE.

2-5 Recirculation System Design, Equipment and Water Treatment

2-501 General Equipment Standards

2-501.2 Where standards do not exist, technical documentation shall be submitted to the HEALTH AUTHORITY to demonstrate acceptability for use in AQUATIC FACILITIES. The HEALTH AUTHORITY may require tests at the expense of the applicant, as proof of acceptability.

2-503 Filtration

2-503.1 Filtration shall be required for all AQUATIC VENUES that recirculate water.

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems

A. The new construction or SUBSTANTIAL ALTERATION of the following INCREASED RISK AQUATIC VENUES shall be required to use a SECONDARY DISINFECTION SYSTEM after adoption of these Regulations:
   1) AQUATIC VENUES designed primarily for children under 5 years old; such as:
      a. WADING POOLS,
      b. CHILD AMUSEMENT LAGOONS, and
      c. INTERACTIVE WATER PLAY VENUES with no standing water;
   2) THERAPY POOLS; and
   3) ISOLATION AND FLOTATION UNITS.

B. If installed and labeled as SECONDARY DISINFECTION SYSTEMS, THEN they shall conform to all requirements specified under Section 2-504.3.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

C. 3-log inactivation and OOCYST Reduction : SECONDARY DISINFECTION SYSTEMS shall be designed to achieve a minimum 3-log (99.9 percent) reduction in the number of infective *Cryptosporidium parvum* OOCYSTS per pass through the SECONDARY DISINFECTION SYSTEM.

1) The SECONDARY DISINFECTION SYSTEM shall be located in the treatment loop (post filtration) and treat a portion *(up to 100 percent)* of the filtration flow prior to return of the water to the AQUATIC VENUE or AQUATIC FEATURE.
2) The flow rate (Q) through the SECONDARY DISINFECTION SYSTEM shall be determined based upon the total volume of the AQUATIC VENUE or AQUATIC FEATURE (V) and a prescribed dilution time (T) for theoretically reducing the number of assumed infective Cryptosporidium OOCYSTS from an initial total number of 100 million (10^8) OOCYSTS to a concentration of one OOCYST/100 mL.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

3) Accounting for a 3-log (99.9 percent) reduction of infective Cryptosporidium OOCYSTS through the SECONDARY DISINFECTION SYSTEM with each pass, the SECONDARY DISINFECTION SYSTEM flow rate (Q) shall be: $Q = V \times \{[14.8 - \ln(V)] / (60 \times T)\}$, where:
   - Q = SECONDARY DISINFECTION SYSTEM flow rate (GPM)
   - V = Total water volume of the AQUATIC VENUE or AQUATIC FEATURE, including surge tanks, piping, equipment, etc. (gals)
   - T = Dilution time (hrs.)
4) The dilution time shall be the lesser of nine hours or 75 percent of the uninterrupted time an AQUATIC VENUE is closed in a 24 hour period.
5) Where a SECONDARY DISINFECTION SYSTEM is installed, a means shall be installed to confirm the required flow rate to maintain a minimum 3-log *(99.9 percent)*

Cont'd…

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

D. If not labeled as SECONDARY DISINFECTION SYSTEMS, then they shall be labeled a SUPPLEMENTAL DISINFECTION SYSTEMS and conform to requirements listed under Section 2-504.4.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

D. **UV Light Systems:** UV equipment shall be third party validated in accordance with the practices outlined in the US EPA Ultraviolet DISINFECTANT Guidance Manual dated November, 2006, publication number EPA 815-R-06-007.

1) The US EPA Ultraviolet Disinfectant Guidance Manual shall be considered a recognized national standard in these Regulations.
2) UV systems and all materials used therein shall be suitable for their intended use.
3) The UV equipment shall be installed after the filtration and before addition of primary disinfectant.
   (A. UV equipment shall be labeled with the following design specifications: maximum flow rate, minimum TRANSMISSIVITY, minimum intensity, and minimum dosage.
   (B. An inline strainer shall be installed after the UV unit to capture broken lamp glass or sleeves.

Cont'd…

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

4) 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.
5) UV systems shall not operate if the RECIRCULATION SYSTEM is not operating.
6) The UV equipment shall be complete with calibrated UV sensors, which record the output of all the UV lamps installed in a system.
   a. Where multiple lamps are fitted, sufficient sensors shall be provided to measure each lamp.
   b. If the design utilizes fewer sensors than lamps, the location of lamps and sensors shall be such that the output of all lamps is adequately measured.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

7) The automated shut down of the UV equipment for any reason shall initiate a visual alarm or other indication which will alert staff on-site or remotely.
   a. Signage instructing staff or PATRONS to notify facility management shall be posted adjacent to the visual indication.
   b. If the AQUATIC FACILITY is not staffed, the sign shall include a means to contact management whenever the AQUATIC FACILITY is in use.
8) The UV equipment shall be supplied with the appropriate validation reports and documentation for that equipment model.
9) This documentation will include a graph or chart indicating the dose at which a 3-log inactivation is guaranteed for the system in question.
   a. This dose shall be inclusive of validation factors and RED bias.
   b. System performance curves that do not include such factors are not considered validated systems.

2-5 Recirculation System Design, Equipment and Water Treatment

10) Validation records shall include the graph indicating the minimum intensity reading required at the operational flow for the minimum RED required to achieve 3-log reduction. Where systems are validated to a specific dose, the graph shall show the minimum intensity reading required at the operational flow for that dose.
11) Based on the recommended validation protocol presented in the US EPA Disinfection Guidance Manual, UV reactors certified by ÖNORM and DVGW for a Bacillus subtilis RED of 40mJ/cm^2 shall be granted 3-log Cryptosporidium and 3-log Giardia inactivation credit as required in these Regulations.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

E. Ozone DISINFECTION : SECONDARY DISINFECTION SYSTEMS using ozone shall provide the required inactivation of Cryptosporidium in the full flow of the SECONDARY DISINFECTION SYSTEM after any side-stream has remixed into the full flow of the SECONDARY DISINFECTION SYSTEM.

1) Ozone systems shall be validated by an ANSI-accredited third party testing and certification organization to confirm that they provide a minimum 3-log (99.9 percent) inactivation of Cryptosporidium in the full SECONDARY DISINFECTION SYSTEM flow after any side-stream has remixed into the full SECONDARY DISINFECTION SYSTEM flow and prior to return of the water to the AQUATIC VENUE or AQUATIC FEATURE recirculation treatment loop.
2) Ozone systems and all materials used therein shall be suitable for their intended use and shall be installed:
    a) In accordance with all applicable requirements,
    b) As listed and labeled to a specific standard by an ANSI-accredited certification organization, and
    c) As specified by the manufacturer.

Cont'd…

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

3) An ozone system shall be a complete system consisting of the following (either skid-mounted or components):

a) Ozone generator;
b) Injector / injector manifold;
c) Reaction tank (contact tank) / mixing tank / degas tower;
d) Degas valve (if applicable, to vent un-dissolved gaseous ozone;,
e) Ozone destruct (to destroy un-dissolved gaseous ozone.;
f) ORP monitor / controller;
g) Ambient ozone monitor / controller;
h) Air flow meter / controller; and
i) Water BACKFLOW prevention device in gas delivery system.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

4) These components (or skid). shall be installed as specified by the manufacturer to maintain the required system validation as noted above.

5) 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).

a) 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.
b) The minimum ORP reading shall be no less than 600 mV measured directly after (one to five feet (1ft. to 5 ft.)) the ozone side-stream remixes into the full flow of the RECIRCULATION SYSTEM.
c) The maximum ORP reading shall be no greater than 900 mV.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

6) 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.

a. The injection and mixing system shall not prevent the attainment of the recirculation rate required elsewhere in these Regulations.
b. 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.

7) At the time the ozone generating equipment is installed, again after 24 hours of operation, and annually thereafter, the air space within six (6) inches of the AQUATIC VENUE water shall be tested to determine compliance of less than 0.1 PPM gaseous ozone. Results of the test shall be maintained on site for review by the HEALTH AUTHORITY.

8) Automatic shutdown shall occur under any condition that would result in the ozone system not operating within the established parameters needed to achieve 3-log inactivation of Cryptosporidium.

Cont'd…

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

9) 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.
10) If the ORP reading for the ozone system drops below 600 mV, a visual alarm or other indication shall be initiated that will alert staff on-site or remotely. Signage to notify facility management shall be present adjacent to the visual alarm.

Cont'd…

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.3 Secondary Disinfection Systems cont'd

11) 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. The ozone system shall be supplied with the appropriate validation reports and documentation for that equipment model.

a. indicates the required operating parameters for which a 3-log inactivation is guaranteed for the system in question.
b. This dose shall be inclusive of validation factors.
c. System performance curves that do not include such factors are not considered validated systems.

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.4 SUPPLEMENTAL DISINFECTION SYSTEMS

A. AQUATIC VENUES that do not require SECONDARY DISINFECTION SYSTEMS may install SUPPLEMENTAL DISINFECTION SYSTEMS for the purpose of enhancing overall system performance and improving water quality.

1) SUPPLEMENTAL DISINFECTION SYSTEMS shall not be required on any AQUATIC VENUES.
2) It shall be clearly noted in the AQUATIC FACILITY operating instructions that these SUPPLEMENTAL DISINFECTION SYSTEMS do not meet the requirements of a SECONDARY DISINFECTION SYSTEM, and as such, are only considered SUPPLEMENTAL DISINFECTION SYSTEMS.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.4 SUPPLEMENTAL DISINFECTION SYSTEMS

3) SUPPLEMENTAL DISINFECTION SYSTEMS shall meet all of the requirements of a SECONDARY DISINFECTION SYSTEM, except:

a. They do not need to achieve a 3-log (99.9 percent) inactivation of Cryptosporidium parvum; and
b. They do not need to be able to reduce the total number of infective OOCYSTS to one OOCYST per 100 mL; and

4) Each system shall be clearly labeled, "Supplemental Water Treatment System—Does Not meet the requirements for SECONDARY DISINFECTION."

B. When UV is used as a SUPPLEMENTAL DISINFECTION SYSTEM, all requirements of Section 2-504.3(D)(2) through 2-504.3(D)(5) shall be met. Water features shall not require shut off if the supplemental UV system does not produce the required dosage.

Cont'd...

2-5 Recirculation System Design, Equipment and Water Treatment

2-504.4 SUPPLEMENTAL DISINFECTION SYSTEMS

C. When ozone is used as a SUPPLEMENTAL DISINFECTION SYSTEM, all requirements of Section 2-504.3(E)(2) through 2-504.3(E)(7) shall be met. The maximum ORP reading shall be no greater than 900 mV.

D. Only those systems that are EPA-registered for use as disinfectants in AQUATIC VENUES shall be permitted.

(1) Copper/silver systems, and all materials used therein, shall be suitable for their intended use.

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

E. UV light / hydrogen peroxide combination systems shall be prohibited for use in AQUATIC FACILITIES.

2-6 Decks and Equipment

2-601.2 Finish materials for the PERIMETER DECK shall be suitable for the POOL environment, non-toxic, and substantially impervious.

A. Continuous watertight EXPANSION JOINT material shall be provided between PERIMETER DECKS and POOL coping. 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 the adjoining DECK.

B. All conditions between adjacent concrete PERIMETER DECK pours shall be constructed with watertight EXPANSION JOINTS.

(1) Joints shall be at least 3/16 inch in continuous width.

(2) The maximum allowable vertical differential across a joint shall be ¼ inch.

2-6 Decks and Equipment

2-601.3 DECKS shall be sloped away from the AQUATIC VENUE and in accordance with the following: Smooth finishes sloped at 1/8 inch per foot; moderately textured finishes sloped at ¼ inch per foot; and heavily textured finishes sloped at 3/8 inch per foot.

A. The slope of all DECK areas shall be in accordance with the law.

(1) 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.

(2) Drainage shall remove AQUATIC VENUE water that splashes outside of the AQUATIC VENUE and beyond a POOL gutter system, DECK cleaning water, and rain water without leaving standing water.

B. The placement of DECK drains, where provided, shall effectively carry water away from the AQUATIC VENUE and off the DECK without ponding.

Cont'd...

2-6 Decks and Equipment

2-601.3 DECKS (cont'd)

C. There shall be no direct connection between the DECK drains and the sanitary sewer system. DECK drains shall not drain to the AQUATIC VENUE, gutter, or any RECIRCULATION SYSTEM.

D. Drain receptacles shall consist of non-corrosive or corrosion-resistant materials.

E. Drain covers shall be suitable for bare foot traffic with openings no greater than ½ inch and easily removable with a simple tool to facilitate regular cleaning.

2-6 Decks and Equipment

2-601.6 WING WALLS or PENINSULAS

A. WING WALLS or PENINSULAS less than 18 inches in width shall not be considered a part of the PERIMETER DECK.

(1) A WING WALL or PENINSULA greater than 18 inches wide but less than 48 inches wide may be used by LIFEGUARD personnel but shall not be considered as part of the PERIMETER DECK.

(2) Any WING WALL or PENINSULA intended to be accessed by LIFEGUARDS shall be constructed of slip-resistant materials.

B. 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.

C. WING WALLS and PENINSULAS shall be considered part of the POOL. WING WALLS and PENINSULAS shall not be accounted for in calculating the POOL perimeter.

Cont'd...

2-6 Decks and Equipment

2-601.6 WING WALLS or PENINSULAS cont'd

D. WING WALLS and PENINSULAS shall be at or above the normal operating water level of the POOL.

E. DECK drainage shall not be required for WING WALLS or PENINSULAS as they are considered part of the POOL. The tops shall be crowned to prevent standing water and sloped to the POOL or overflow system.

F. Vertical depth markers shall be provided around WING WALLS and PENINSULAS in accordance with these Regulations.

2-6 Decks and Equipment

2-601.7 ISLANDS

A. An ISLAND not more than 18 inches in width shall be designed to discourage a person from walking on the ISLAND by not providing stairs, ladders, or bridges to the ISLAND.

B. The surface of ISLANDS intended for foot traffic shall be slip resistant.

C. An ISLAND 18 inches to 48 inches wide may be allowed for use only by LIFEGUARDS.

D. Vertical depth markers shall be provided around ISLANDS in accordance with Section 2-3018.1 and visible from all sides.

E. Horizontal depth markings and warning signs shall also be required per Section 2-3018.1 if the ISLAND is designed for BATHER use. If the ISLAND is not designed for BATHER use, warning signs stating “No Entry” shall be required.

Cont’d…

2-6 Decks and Equipment

2-601.7 ISLANDS cont'd

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

G. All bridges spanning a POOL or any other structures not intended for interactive play shall have a minimum clearance of eight (8) feet from the bottom of the POOL to any structure overhead.

H. Any bridge shall have a minimum 42 inch high BARRIER on both sides.

2-6 Decks and Equipment

2-603 Starting Platforms

2-603.1 Starting platforms shall be installed and conform to applicable safety standards established by FINA, USA Swimming, NCAA, NFSHSA, YMCA, or other sanctioning body.

2-603.2 Starting platforms shall be installed in a minimum water depth of four (4) feet.

2-603.3 The leading edge of starting platforms shall have a maximum height of 30 inches above the water surface.

2-603.4 Starting platforms shall have slip resistant tread surfaces.

2-603.5 Starting platforms shall be installed and secured per manufacturer's recommendations at all times when in use.

2-6 Decks and Equipment

2-604 Enclosures and Barriers

2-604.1 The ENCLOSURE may consist of any combination of building envelopes, site walls, or fencing as provided for in this section.

ENCLOSURES shall be provided between CHEMICAL STORAGE SPACES, POOL, mechanical spaces, and areas accessible to the public, in accordance with local building codes.

2-6 Decks and Equipment

2-604 Enclosures and Barriers

2-604.4 INDOOR AQUATIC VENUES
A. Building walls enclosing an INDOOR AQUATIC FACILITY may be designated as the AQUATIC FACILITY ENCLOSURE.

B. INDOOR AQUATIC VENUES shall be securable from unauthorized entry from other building areas or the exterior.

C. Where separate indoor and outdoor AQUATIC VENUES are located on the same site, an AQUATIC VENUE ENCLOSURE shall be provided between them. **Exception:** Where all AQUATIC VENUES are operated continuously 12 months a year on the same schedule.

2-6 Decks and Equipment

2-604 Enclosures and Barriers

2-604.5 Except as otherwise required in these Regulations, one ENCLOSURE may surround multiple AQUATIC VENUES at one facility.

WADING POOLS and CHILD AMUSEMENT LAGOONS shall not require separation from other WADING POOLS and CHILD AMUSEMENT LAGOONS by a BARRIER. Refer to Section 2-1008 for additional guidance about WADING POOLS.

2-6 Decks and Equipment

2-605 Aquatic Venue Cleaning Systems

2-605.2 If there are multiple AQUATIC VENUES at one AQUATIC FACILITY, the AQUATIC FACILITY may use common cleaning equipment.

2-605.3 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.

2-605.4 Where used, portable vacuum cleaning equipment shall be powered by circuits having GFCIs.

2-605.5 Any ROBOTIC CLEANERS shall utilize low voltage for all components that are immersed in the POOL water. Any ROBOTIC CLEANER power supply shall be connected to a circuit equipped with a GFCI.

2-7 Equipment Room

2-701.4 EQUIPMENT ROOM ventilation shall address:

A. Combustion requirements;

B. Heat dissipation from equipment;

C. Humidity from surge or balance tanks;

D. Ventilation to the outside; and

E. Air quality.

2-7 Equipment Room

2-701.6 Separation from CHEMICAL STORAGE SPACES

A. Combustion equipment, air-handling equipment, and electrical equipment shall not be exposed to air contaminated with corrosive chemical vapors.

B. Doors between an EQUIPMENT ROOM and an INDOOR AQUATIC FACILITY shall be equipped with an automatic closer. The door, frame, and automatic closer shall be installed and maintained to ensure that the door closes completely, latches, and locks without human assistance.

(1) The locks shall require a key or combination to open from the INDOOR AQUATIC FACILITY side.

(2) The locks shall be designed and installed to be opened by one hand from the inside of the room under all circumstances, without the use of a key or tool.

C. Doors shall be equipped with permanent signage warning against unauthorized entry.

D. All sides of the doors shall be equipped with a gasket. The gasket shall be installed to prevent the passage of air, or vapors when the door is closed.

2-7 Equipment Room

2-701.7 Other EQUIPMENT ROOM Requirements

A. 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 must be provided to allow for inspection and service.

B. Equipment may be installed in an outdoor ENCLOSURE provided the following conditions are met:
(1) Equipment must be securely installed on level concrete pads.
(2) Exposed plumbing must be protected from UV.
(3) Overhead UV protection must be provided.
(4) Unpaved areas within the ENCLOSURE shall be graded to allow for proper drainage with suitable ground cover to prevent the generation of mud in areas between equipment.

C. Equipment installed below grade shall be equipped with stairs and an associated handrail that meets applicable building code standards.

2-7 Equipment Room

2-702 Chemical Storage Areas

Nothing in this section shall be construed as providing relief from applicable requirements of fire codes, mechanical codes, electrical codes, etc.

2-702.2 Equipment listed for outdoor use may be located in exterior CHEMICAL STORAGE SPACES as permitted.

A. Exterior CHEMICAL STORAGE SPACES not joined to a wall of a building shall be completely enclosed by fencing that is at least six (6) feet high and meets the ENCLOSURE requirements.

B. Fencing shall be equipped with a self-closing and self-latching gate having a permanent locking device.

2-702.3 Exterior CHEMICAL STORAGE SPACES shall be equipped with overhead UV protection.

2-7 Equipment Room

2-702.4 Combustion Equipment in Interior CHEMICAL STORAGE SPACES

A. No COMBUSTION DEVICE or appliance shall be installed in a CHEMICAL STORAGE SPACE, or in any other place where it will be exposed to the air from a CHEMICAL STORAGE SPACE.

B. ***Exception:*** A COMBUSTION DEVICE or appliance which meets all of the following requirements shall be acceptable:

(1) The device or appliance is required for one or more processes integral to the function of the room, such as space heat;
(2) The device is listed for such use; and
(3) The device as installed is approved by the HEALTH AUTHORITY.

2-7 Equipment Room

2-702.5 Ozone Rooms

A. 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.

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

(1) The exhaust intake shall be located approximately six (6) inches from the floor, on the opposite side of the room from the make-up air intake.

(2) 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.

(3) The manual emergency ventilation switch shall be located outside the room and near the door to the ozone room.

Cont'd...

2-7 Equipment Room

2-702.5 Ozone Rooms cont'd

C. Ozone rooms which are below grade shall be equipped with forced-draft ventilation capable of six (6) air changes per hour.

(1) The exhaust intake shall be located approximately six (6) inches from the floor, on the opposite side of the room from the make-up air intake.

(2) The ventilation system shall be arranged to:

a) Run automatically concurrent with the ozone equipment and for at least a time allowing for 15 air changes after the ozone equipment is stopped,

b) Run upon activation of the ozone detection and alarm system, and

c) Run on command of a manual switch.

(3) The manual ventilation switch shall be located outside the room and near the door to the ozone room.

2-7 Equipment Room

2-702.5 Ozone Rooms cont'd

D. In addition to the signs required on all chemical storage areas, a sign shall be posted on the exterior of the entry door, stating "DANGER - GASEOUS OXIDIZER – OZONE" in lettering not less than four (4) inches high.

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

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

(2) The ozone sensor shall be located at a height of 18-24 inches above floor level and shall be capable of measuring ozone in the range of 0-2 PPM.

(3) The alarm system shall activate when the ozone concentration equals or exceeds 0.1 PPM in the room.

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

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

2-8 General

2-801.1 All design provisions shall be required for new construction or SUBSTANTIAL ALTERATION to an existing AQUATIC FACILITY.

2-804.3 RINSE SHOWERS

A. A minimum of one RINSE SHOWER shall be provided on the DECK near an entry point to the AQUATIC VENUE.

B. Floors of RINSE SHOWERS shall be sloped to drain wastewater away from the AQUATIC VENUE and meet local applicable codes.

C. RINSE SHOWER drains shall discharge to the sanitary sewer.

D. RINSE SHOWERS in AQUATIC FACILITIES greater than 7,500 square feet of water surface area shall be situated adjacent to each AQUATIC VENUE entry point or arranged to encourage BATHERS to use the RINSE SHOWER prior to entering the AQUATIC VENUE.

Cont'd…

2-8 General

2-804.3 RINSE SHOWERS cont'd

E. A minimum of four (4) showerheads per 50 feet of beach entry AQUATIC VENUES shall be provided as a RINSE SHOWER located not more than 30 feet from the AQUATIC VENUE or queuing area.

F.A minimum of one RINSE SHOWER shall be provided at each entrance to a LAZY RIVER AQUATIC VENUE.

G. A minimum of one RINSE SHOWER shall be provided at each entrance to a WATERSLIDE queue line.

2-8 General

2-804.4 AQUATIC FACILITIES with 7,500 square feet of water area or more may be flexible in the number of CLEANSING SHOWERS they provide based on the THEORETICAL PEAK OCCUPANCY:

A. 25 percent of the required SHOWERS shall be CLEANSING SHOWERS,

B. 25 percent of the required SHOWERS shall be RINSE SHOWERS, and

C. The remaining 50 percent may be either cleansing or RINSE SHOWERS.

2-806 Foot Baths are Prohibited

Foot Baths are standing water in which BATHERS or aquatics staff rinse their feet. Foot baths are prohibited.

2-9 Water Supply and Wastewater Disposal

2-901.2 The water supply shall have sufficient capacity to simultaneously serve all PLUMBING FIXTURES.

2-901.3 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 one hour if the AQUATIC VENUE is operational at the time of the backwash.

2-902.2 The open end of fill spouts shall not have sharp edges or protrude more than two (2) inches beyond the edge of the POOL.

2-905.2 The wastewater disposal system shall have sufficient capacity to receive wastewater without flooding when filters are cleaned or when the AQUATIC VENUE is drained.

2-905.3 A separate line equipped with a valve shall be installed to bypass the filter and discharge to waste indirectly for the purpose of draining the AQUATIC VENUE.

2-9 Water Supply and Wastewater Disposal

2-905.4 The sump pit must be located where it does not impede access to equipment or present a hazard. Access to the sump pit must not be obstructed. Any cover placed over the sump pit shall allow for regular inspection and maintenance, and shall not impede flow of wastewater into the pit.

2-10 Special Use Aquatic Venues

2-1001 General Requirements

2-1001.1 SPECIAL USE AQUATIC VENUE'S shall comply with the requirements stated in these regulations as applicable in addition to the additional provisions or reliefs of this section.

2-1002 Spas

2-1002.10 The agitation system shall be connected to a minute timer that does not exceed 15 minutes that shall be located out of reach of a BATHER in the SPA.

2-1002.11 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, hydrotherapy, or agitation systems. The emergency shutoff or control switch shall be installed and readily accessible to the BATHERS, in accordance with the NEC.

2-10 Special Use Aquatic Venues

2-1003 Waterslides and Landing Pools

2-1003.9 DROP SLIDES

A. There shall be a SLIDE landing area in accordance with the SLIDE manufacturer's recommendations and ASTM F2376.

B. This area shall not infringe on the landing area for any other SLIDES, diving equipment, or any other minimum AQUATIC VENUE clearance requirements.

C. Steps shall not infringe on this area.

D. 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.

E. The minimum required water depth shall be in accordance with the SLIDE manufacturer's recommendations and ASTM F2376.

Cont'd...

2-10 Special Use Aquatic Venues

2-1003.10 POOL SLIDES cont'd

D. Clear space shall be maintained to the POOL edge and other features per manufacturer requirements.

(1) The landing area of the SLIDE shall be protected through the use of a float line, WING WALL, PENINSULA or other similar impediment to prevent collisions with other BATHERS.

(2) Netting or other BARRIERS shall be provided to prevent BATHER access underneath POOL SLIDES where sufficient clearance is not provided.

(3) Such netting or other BARRIER shall be designed such that any underwater opening does not allow for the passage of a four (4) inch ball and no opening can create a finger entrapment.

2-10 Special Use Aquatic Venues

2-1004 Wave Pools

2-1004.2 Safety

A. 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.

B. A minimum of two emergency shut-off switches to disable the wave action shall be provided, one on each side of the WAVE POOL. These switches shall be clearly labeled and readily accessible to LIFEGUARDS.

C. A sign stating “NO DIVING” in contrasting letters not less than four (4) inches in height must be posted in a conspicuous place.

D. Caisson BARRIERSshall be provided for all WAVE POOLS that prevent the passage of a two (2) inches in diameter.

2-10 Special Use Aquatic Venues

2-1005 Therapy Pools

2-1005.1 Floor slope may exceed one (1) foot in 12 feet for water shallower than five (5) feet. Break points in floor slope shall be identified with a contrasting band consistent with Section 2-3018.4(A).

2-1005.3 Special equipment may be allowed by the HEALTH AUTHORITY with proper justification.

2-10 Special Use Aquatic Venues

2-1006 Lazy Rivers

2-1006.1 Handrails, steps, stairs and propulsion jets for LAZY RIVERS shall not protrude into the river.

2-1006.2 Means of access/egress shall be provided at 150 foot intervals around the LAZY RIVER.
A. A handhold in compliance with Section 2-3013 shall be required on at least one side of the LAZY RIVER.

B. A DECK shall be provided along the entire length of the LAZY RIVER.

C. The DECK shall be allowed to alternate sides of the LAZY RIVER.

D. 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.

E. All bridges spanning a LAZY RIVER shall have a minimum clearance of both eight (8) feet from the bottom of the LAZY RIVER and four (4) feet above the entire water surface with any structure overhead.

2-10 Special Use Aquatic Venues

2-1007 Interactive Water Play Venues

2-1007.1 INTERACTIVE WATER PLAY VENUES shall have a slip-resistant and easily cleanable surface. Any manufactured surfacing shall be deemed suitable by the manufacturer for aquatic and chlorinated environments.

2-1007.3 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.

A. Flow through the drains to the INTERACTIVE WATER PLAY VENUE collection tank shall be under gravity.

B. Direct suction outlets from the INTERACTIVE WATER PLAY VENUE shall be prohibited.

2-10 Special Use Aquatic Venues

2-1007 Interactive Water Play Venues cont'd

2-1007.4 Openings in the grates covering the drains shall not exceed ½ inches wide. Gratings shall not be removable without the use of tools.

2-1007.5 The INTERACTIVE WATER PLAY VENUE collection tank shall be designed to provide ready access for cleaning and inspections, and

A. The INTERACTIVE WATER PLAY VENUE collection tank shall be capable of complete draining.

B. The access hatch or lid shall be locked or require a tool to open.

2-10 Special Use Aquatic Venues

2-1007 Interactive Water Play Venues cont'd

2-1007.6 DECK Area

A. INTERACTIVE WATER PLAY VENUES shall be kept free of landscape debris by either:
(1) Eight (8) feet of DECK area, or
(2) Raised curbs, or
(3) Raised planters.

B. The DECK shall be of a uniform, easily cleaned, impervious material.

C. The DECK shall be protected from surface runoff.

2-10 Special Use Aquatic Venues

2-1007 Interactive Water Play Venues cont'd

2-1007.8 If an AQUATIC FACILITY only consists of an INTERACTIVE WATER PLAY VENUE, then the requirements for an ENCLOSURE shall not apply unless otherwise deemed necessary by the HEALTH AUTHORITY.

2-1007.9 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.

2-1007.10 Maximum velocity at the orifice of the spray feature nozzle shall not exceed 20 feet per second.

2-1007.11 Depth markings and warning signs are not required for INTERACTIVE WATER PLAY VENUES.

2-1007.12 NEC swimming POOL requirements shall apply to INTERACTIVE WATER PLAY VENUES.

2-10 Special Use Aquatic Venues

2-10010 Surf Pools

2-10010.1 A SURF POOL may deviate from other provisions of these Regulations through the submission of a WAIVER addressing all safety concerns generated by the deviation from regulatory requirements, if its design and construction are within the limits of sound engineering practice and present no health or safety hazards.

2-10011 Isolation and Flotation Units

2-10011.2 Each unit must be located in a separate room equipped with an individual SHOWER.

2-10 Special Use Aquatic Venues

2-10013 Deluge Showers

2-10013.1 In addition to the general AQUATIC VENUE requirements stated in these Regulations, deluge showers shall comply with the additional provisions or reliefs of this section.

2-10013.2 Shall be constructed to achieve a 30 minute maximum TURNOVER.

2-10013.3 Signage must be posted in the immediate vicinity declaring that the SHOWER utilizes re-circulated water.

2-10014 Innovative Designs

An AQUATIC VENUE utilizing an innovative design may be APPROVED by the HEALTH AUTHORITY if its design and construction present no health or SAFETY hazard to the public. Applications and supporting documentation must be stamped by an engineer or architect licensed in Nevada. The HEALTH AUTHORITY will require written WAIVER(S) prior to approval.