SWIMMING POOL TAC
WITH COMMENTS

TThis document created by the Florida Department of Business and Professional Regulation -
850-487-1824

Total Mods for report: 17

TAC: Swimming Pool

Total Mods for **Swimming Pool** in **Approved as Submitted: 10**

Total Mods for report: 17

Sub Code: Building

SW7175

1

Date Submitted	11/2/2018	**Section**	454.1.9.2.1	**Proponent**	Michael Weinbaum
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments **No**

Alternate Language **Yes**

Related Modifications

Summary of Modification

Plunge pool dimensional standards are deferred to the design engineer

Rationale

Manufacturers have been designing Florida-only slide termini. Manufacturers have successfully installed slide plunge pools (raft rides) with 18" and smaller depths all over the US.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The code enforcement official will have to determine how much evidence is required to satisfy them.

Impact to building and property owners relative to cost of compliance with code

This does not affect existing installed slides

Impact to industry relative to the cost of compliance with code

The cost to slide manufacturers is reduced, no more "Florida-only" slides

Impact to small business relative to the cost of compliance with code

The design engineer is already expected to "Demonstrate to the jurisdictional building department's satisfaction" certain aspects of the design. "This complied with the earlier version of the code" should be an adequate "demonstration."

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, it is easy for riders to be injured if a slide and plunge pool are not well-matched. Both the current code and the proposal prevent this injury.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, this allows new types of plunge pool designs to be used that are more appropriate to new types of slides.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Additional latitude is granted in all cases.

Does not degrade the effectiveness of the code

All of these aspects still require the participation and satisfaction of the building official.

Alternate Language

2nd Comment Period

7175-A2

Proponent Michael Weinbaum **Submitted** 4/24/2019 **Attachments** Yes

Rationale

added the year to the ASTM document's name both places that it is mentioned.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

see original proposal

Impact to building and property owners relative to cost of compliance with code

see original proposal

Impact to industry relative to the cost of compliance with code

see original proposal

Impact to Small Business relative to the cost of compliance with code

The design engineer is already expected to "Demonstrate to the jurisdictional building department's satisfaction" certain aspects of the design. "This complied with the earlier version of the code" should be an adequate "demonstration."

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

see original proposal

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

see original proposal

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

see original proposal

Does not degrade the effectiveness of the code

see original proposal

1st Comment Period History

SW7175-G1

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

1st Comment Period History

SW7175-G2

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code amendment.

1st Comment Period History

SW7175-G3

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

The current ASTM F2376 in dated 2017, the one proposed is dated 2013. Why is this older version used, since the ASTM workgroup has likely updated some safety criteria. Without incorporating this standard by reference into the FBC, and requiring all of the items in it be certified by the Professional Engineer or Architect that it complies with the standard, we anticipate another highly variable, and potentially unsafe set of conditions to implement statewide. Dept. of Health does not agree it is wise to delete the water depth, setbacks and the dimensions of the plunge pool from the existing FBC without further review of the newer 2017 ASTM standard. Please provide a copy of this newer standard for all TAC members to review.

Text of Modification

454.1.9.2.1.1 ~~Plunge pool water depth~~Adequate space at terminus

The design engineer must demonstrate to the jurisdictional building department's satisfaction that the water depth, clear area, distance between adjacent slides, floor slope, rope line placement, and pool floor surface finish are all adequate to prevent injury or harm to riders or other users of the pool, making reference ASTM F2376-17a Standard Practice for Classification, Design, Manufacture, Construction, and Operation of Water Slide Systems, as appropriate. The minimum plunge pool operating water depth at the slide flume terminus shall be 3 feet (914 mm). This depth shall be maintained for a minimum distance of 10 feet (3048 mm) in front of the slide terminus from which point the plunge pool floor may have a constant upward slope to allow a minimum water depth of 2 feet (51 mm) at the base of the steps. The floor slope shall not exceed 1 in 10. The plunge pool water depth shall be commensurate with safety and the ease of exit from the plunge pool.

454.1.9.2.1.2 Reserved Plunge pool dimension.

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

454.1.9.2.1.3 Slide flume terminus.

454.1.9.2.1.3.1

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

454.1.9.2.1.3.2

The minimum distance between any plunge pool side wall and the outer edge of any slide terminus shall be 5 feet (1524 mm). The minimum distance between adjacent slide flumes shall be 6 feet (18 288 mm).

454.1.9.2.1.3.3

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

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Chapter 35 Referenced Standards

ASTM

F2376-17a Standard Practice for Classifcation, Design, Manufacture, Construction, and Operation of Water Slide Systems

454.1.9.2.1.1

454.1.9.2.1.1 ~~Plunge pool water depth~~Adequate space at terminus

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Chapter 35 Referenced Standards

ASTM

F2376 Standard Practice for Classifcation, Design, Manufacture, Construction, and Operation of Water Slide Systems

454.1.9.2.1.1

This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: F2376 – 17a

Standard Practice for Classification, Design, Manufacture, Construction, and Operation of Water Slide Systems[1]

This standard is issued under the fixed designation F2376; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice applies to the classification, design, manufacture, construction, and operation of water slide systems. Water slide systems shall be defined as rides intended for use by riders in bathing attire where the action of the ride involves possible and purposeful immersion of the rider's body either in whole or in part in water, and uses circulating water to mobilize or lubricate the rider's transportation along a purpose built path. This includes slides used with or without vehicles as defined below. The terms water slides, waterslides, and slides shall be considered equivalent when used in this practice.

1.2 For the purposes of this practice, a water slide system includes:

1.2.1 The flume,

1.2.2 The water-circulation system,

1.2.3 The starting platform with associated means of access and egress,

1.2.4 The structural supports,

1.2.5 Vehicles or other aquatic accessories that are part of the water slide as defined by the manufacturer, and

1.2.6 Means of slide termination.

1.3 This practice shall not apply to:

1.3.1 Any water slides installed in private residences,

1.3.2 Water flume amusement rides where contact with water is merely incidental (for example, log flume rides, shoot-the-chutes),

1.3.3 Amusement rides and devices whose design criteria are specifically addressed in another ASTM standard,

1.3.4 Lazy river type attractions operating at constant elevation, constructed in the ground, and

1.4 Pre-existing designs manufactured after the effective date of publication of this practice if the design is service proven or previously compliant, as defined in Section 3.1.26 of Practice F2291, and the manufacturer provides:

1.4.1 A historical summary of the water slide, or major modification as defined in Terminology F747, and

1.4.2 A statement that the design is service proven or previously compliant. Water slides and major modifications to water slides may qualify as previously compliant for five years following the date of publication of this practice. Thereafter, water slides and major modifications to water slides must qualify as service proven or meet the requirements of this practice.

1.4.3 Service proven or previously compliant designs shall comply with Section 8.

1.5 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

NOTE 1—The conversion factor from inch-pound to metric units is 1 in. = 25.4 mm, and 1 lb = 4.4482 N.

1.6 This practice includes an Appendix, which provides additional information to enhance the user's understanding of and application of the criteria presented in this practice, for example, rationale, background, drawings, interpretation, or commentary. The information in the Appendix shall not be considered a mandatory part of this practice.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D570 Test Method for Water Absorption of Plastics

[1] This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.70 on Water Related Amusement Rides and Devices.

Current edition approved Dec. 1, 2017. Published January 2018. Originally approved in 2006. Last previous edition approved in 2017 as F2376 – 17. DOI: 10.1520/F2376-17A.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D638 Test Method for Tensile Properties of Plastics
D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
F747 Terminology Relating to Amusement Rides and Devices
F770 Practice for Ownership, Operation, Maintenance, and Inspection of Amusement Rides and Devices
F846 Guide for Testing Performance of Amusement Rides and Devices (Withdrawn 2013)[3]
F853 Practice for Maintenance Procedures for Amusement Rides and Devices (Withdrawn 2014)[3]
F893 Guide for Auditing Amusement Rides and Devices (Withdrawn 2013)[3]
F1193 Practice for Quality, Manufacture, and Construction of Amusement Rides and Devices
F1305 Guide for Classification of Amusement Ride and Device Related Injuries and Illnesses (Withdrawn 2011)[3]
F2291 Practice for Design of Amusement Rides and Devices

2.2 *ACI Standard:*[4]
ACI-318 Building Code Requirements for Structural Concrete

2.3 *ASCE Standard:*[5]
ANSI/ASCE 7 Minimum Design Loads for Buildings and Other Structures

2.4 *USDA Document:*[6]
USDA-72 The Wood Handbook

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *landing pool*—pool intended to receive riders from a water slide.

3.1.2 *landing zone*—area in a landing pool intended for receiving riders from a particular slide.

3.1.3 *lifeguard*—individual specially trained in lifesaving and emergency procedures, responsible for monitoring patrons and responding to aquatic and other emergencies.

3.1.4 *owner/operator*—person or organization that is responsible for the maintenance and operation of a water slide system.

4. Slide Classification

4.1 Water slides are classified by their physical and intended use characteristics. The classification may be a combination of the specific rider vehicle used the type of geometric path, often serpentine or straight, and the designation as a speed slide if the rider's velocity exceeds 25 ft/s. The following are definitions of the types of water slides.

4.1.1 *body slides*—water slide used without a vehicle.

4.1.2 *children's slides*—Water slides generally intended only for use by persons under the height of 48 in. Water slide has a maximum fall distance of 3 in. from slide exit where the rider enters the water and water depth is no greater than 24 in.

4.1.3 *mat slides*—water slide used with a designated mat as a vehicle.

4.1.4 *serpentine slide*—curved path as viewed in geometric slide path.

4.1.5 *specialty slides*—proprietary water slide design, such as an uphill, half-pipe, or bowl ride, which does not conform to standard classification.

4.1.6 *specialty vehicle slides*—water slide used with a proprietary vehicle specified by the manufacturer.

4.1.7 *speed slide*—water slide where the rider(s) achieve a velocity of 25 ft/s or more during the course of the ride.

4.1.8 *tube slides*—water slide used with a single or multi-person water slide tube.

5. Materials

5.1 *Flume Material*—Any material that has the following basic properties and that meets all other requirements of this practice may be used to construct water slides.

5.1.1 Flumes riding surfaces shall be constructed to be smooth.

5.1.2 Flume material shall be demonstrated as strong enough to support specified loads as defined in Section 8.

5.1.3 Flume components, maintained using the manufacturer's instructions, shall not deteriorate over time in such a way that a hazard will develop.

5.2 *Support Materials*—Any material that has the following basic properties and that meets all other requirements of this practice may be used to construct water slide supports.

5.2.1 Supports for water slides shall be constructed from durable materials such as wood, metal, concrete, or engineered composites.

5.2.2 Supports for water slides fabricated from metal shall be either inherently corrosion resistant, or be finished in such a way as to provide protection from corrosion.

5.2.3 Wood materials shall be finished in such a way to provide protection against deterioration.

5.2.4 Support material shall be demonstrated as strong enough to support specified loads as defined in Section 7.

5.2.5 Supports shall be constructed to accommodate regular inspection and maintenance for structural integrity, material deterioration, or corrosion, or a combination thereof.

6. Notification Requirement

6.1 A water slide system shown to comply with this practice shall meet all applicable requirements specified in this practice. Anyone representing compliance with this practice shall keep such essential records as are necessary to document any claim that the requirements within this specification have been met.

6.2 The owner/operator of a water slide shall notify the appropriate manufacturer(s) of any known incident as specified in Guides F1305 and F893.

6.3 The manufacturer shall notify the appropriate owner(s)/operator(s) of similar water slides of an incident that resulted in

[3] The last approved version of this historical standard is referenced on www.astm.org.
[4] Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333.
[5] Available from The American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191.
[6] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

a serious injury promptly upon the determination by the manufacturer that the incident is significantly repeatable.

6.3.1 Such manufacturer notification shall be a bulletin as specified in Sections 4.1.14.3 through 4.1.14.8 of Practice F853.

7. Structural Design of Water Slides

7.1 This section defines the loading and strength criteria that shall be used in the structural engineering of water slide flumes and supporting structures. The strength and stability of the water slide system shall be demonstrated by generally accepted engineering methods certified by a professional engineer.

7.2 *Dead Loads (symbol DL)*—Forces resulting from weight of all components of the ride and includes all loads that do not fluctuate with respect to time.

7.3 *Operational Loads*—Forces from water, riders, or vehicles, or a combination thereof, in the ride under normal operations.

7.3.1 *Water Load (symbol WL)*—In free flowing water slides where water does not collect in pools or streams greater than 2 in. deep, the water load shall be a minimum of 15 lbs/linear ft for every 1000 gal/min of flow. Where the flow is such that water collects in pools or streams greater than 2 in. deep, the actual maximum water load shall be determined and used in calculation, design, or load tests, or a combination thereof.

7.3.2 *Rider Load (symbol RL)*—The manufacturer shall specify the rider vehicle and the maximum number of riders that are to ride in the flume at one time.

7.3.2.1 For water slides intended for multiple rider use, the weight assigned to each rider shall be, at a minimum, the weight specified for an adult rider in Section 8.6.1 of Practice F2291.

7.3.2.2 For single rider water slides, the rider weight shall be a maximum of 300 lb.

7.3.2.3 For water slides intended for use by children only, the weight assigned to a child shall be as specified in Section 8.6.2 of Practice F2291.

7.3.2.4 Ride loads shall be so arranged to cause the greatest realistic operational load to the system.

7.3.2.5 Lateral centripetal forces shall be considered in curved sections of flume. Predicted rider speeds should be used to calculate these forces. If speeds cannot be predicted, then a minimum of 15 ft/s for flumes under 15 % slope and 30 ft/s for all other flumes shall be used.

7.3.2.6 If the manufacturer places maximum rider total weight limits on a slide, then that restricted load may be used.

7.3.2.7 The weight of the rider vehicle shall be included in determining rider load.

7.4 *Environmental Loads*—Forces from environmental conditions of the site such as wind, precipitation, earthquake, and changes in temperature.

7.4.1 Loads and forces due to environmental conditions shall be in accordance with applicable local code requirements or ANSI/ASCE 7, or other equivalent national standard.

7.4.2 The manufacturer/designer shall clearly indicate the environmental loads the water slide was designed for in the operating and maintenance instructions as specified in the sections on Manufacturer's Responsibility of Practices F770 and F853. In addition to the environmental load information, any restriction, limitations, or special procedures associated with water slides exposed to these environmental loads shall be included.

7.4.3 *Lateral Wind Load (symbol LWL)*—For outdoor slides, the minimum wind load for all types of water slides shall be calculated based on 100-mph wind (3-s gust) for non-operational conditions. Lateral wind load may be reduced by an importance factor of less than 1.0, where appropriate, for water slide structures that are unoccupied during extreme weather.

7.4.4 *Reduced Lateral Wind Load (symbol RLWL)*—For outdoor slides, the minimum wind load for all types of water slides shall be calculated based on Section 8.13.1 of Practice F2291 for operational conditions.

7.4.5 *Other Lateral Loads (symbol OLL)*—A minimum lateral load equivalent to 10 % of the dead weight of the structure shall be included.

7.4.6 *Snow Load (symbol SL)*—The snow load for all types of water slides shall be calculated in accordance with the relevant local ground snow load(s).

7.5 *Overload*—Forces from water, riders, or vehicles, or a combination thereof, under extraordinary operational conditions due to user overload.

7.5.1 Calculations for extraordinary operational conditions that consider user overload shall be based on conditions specified by the manufacturer and need not consider any other live load in combination with such overload.

7.6 *Load Combinations*—Engineering calculations may use either allowable stress methods (ASD) or load and resistance factor methods (LRFD). Engineering calculations shall consider load conditions and combinations of loads in accordance with generally accepted engineering methods. Calculations shall consider that water slide systems may not be occupied during extremes of weather.

7.7 *Metal Structures*—Strength of steel structures under or above noted loads shall be designed in accordance with current AISC, ASCE standards,[5] or equivalent national standards.

7.8 *Wood Structures*—Strength of timber structures under or above noted loads shall be designed in accordance with current USDA-72, ASCE standards,[5] or equivalent national standards.

7.9 *Concrete Structures*—Strength of concrete structures under above noted loads shall be designed in accordance with current ACI-318 or equivalent national standards.

7.10 *Plastic and Plastic Composite Structures:*

7.10.1 Strength of plastic structures under above noted loads shall be designed in accordance with generally accepted engineering methods. Assessment shall be performed in a manner suitable for the specific material and structure.

7.10.2 Fiberglass reinforced plastic or other composite materials used structurally shall have samples tested for strength with accelerated aging in accordance with Test Methods D570, D638, and D790.

7.10.3 Loads from normal operational conditions shall demonstrate a minimum of 5 to 1 factor of safety against rupture for fiberglass reinforced plastic or other composite materials.

7.10.4 Calculations for extraordinary operational conditions from user overload shall demonstrate a minimum of 2 to 1 factor of safety against rupture of fiberglass reinforced plastic or other composite materials.

8. Performance Requirements

8.1 *General Requirements:*

8.1.1 The following are minimum requirements and should not be substituted where manufacturer experience suggests more acrimonious values.

8.1.2 Surfaces in reach by slide attendants and riders shall be made in such a way as to reduce the potential for injury.

8.1.3 A water slide shall be designed and constructed so that forces on riders allow the rider to use the slide in accordance with the rules and instructions under normal operating conditions.

8.2 *Slide Access:*

8.2.1 *General*—Fencing, guardrails, and handrails shall be installed in accordance with Section 14 of Practice F2291.

8.2.2 If the water slide system includes a starting platform and the platform is more than 21 in. above surrounding terrain, the platform shall provide at least 36 in. in distance between the slide entry and the top of stairs or ramp. Sufficient space shall be provided on the platform for slide attendant workspace, signage, and any communication devices needed for operation. Except where a stair or ramp or slide entry joins it, the platform shall be surrounded on all sides by a guardrail in accordance with Section 14 of Practice F2291.

8.2.3 Surface of steps, access ramp, and deck shall be slip-resistant and self-draining.

8.2.4 Slide entry section should interface with the platform guardrail so that a 4 in. sphere cannot pass between the slide entry component and the adjacent guardrail component.

8.3 *Open Flume Geometry:*

8.3.1 Flume cross-section shape shall be configured to contain the rider(s) or vehicle, or both, under all reasonable operating conditions. Total depth of section and shape of cross-section of a flume may be created in a single piece or more than one piece.

8.3.2 Open water slide flumes shall be kept clear of obstacles within the water slide clearance envelope as shown in Figs. 1 and 2. Flume riser sections may be added to block access to anything encroaching in the area.

8.3.3 Water slides shall have additional sidewall height provided by a flume riser section on the outside part of all horizontal curves to contain the rider. This flume riser shall be concave facing the center of the cross-section. The flume riser may be an integral or separate part from the main flume component.

8.3.3.1 *Flume Riser Transition*—Flume riser parts shall be transitioned from sections without flume risers to sections with flume risers with a maximum angle of 45° from the horizontal. See Fig. 3.

8.3.3.2 *Other Additions*—Where a cover, a tube entrance, or a flume riser is fitted other than at the beginning of the slide, the sides of the slide shall have a smooth transition from horizontal to vertical. Maximum angle of transition will be 45°.

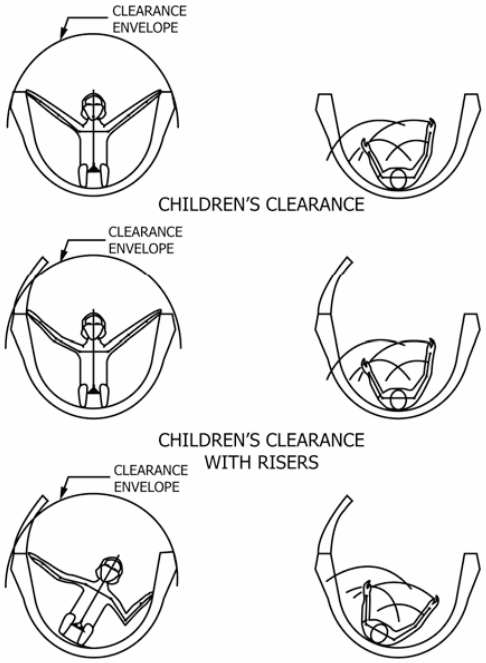

FIG. 1 Water Slide Clearance Envelope

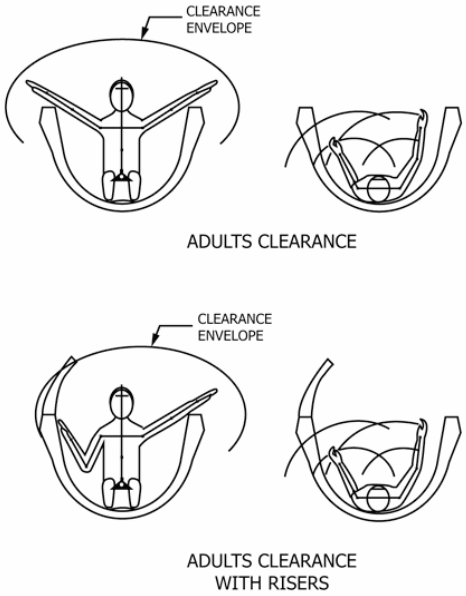

FIG. 2 Water Slide Clearance Envelope

The inside height of the entrance to the cover or flume riser shall be at least 48 in.

8.3.4 Body slides with curved bottom flume sections such that the cross-section of the bottom and the sides are a continuously curving surface shall have:

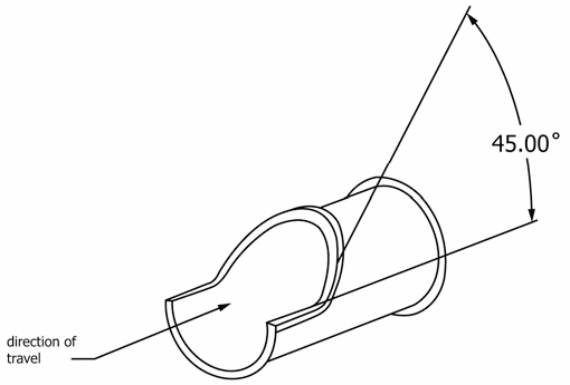

FIG. 3 Flume Riser

8.3.4.1 Minimum inside width of 30 in., minimum sidewall height of 15 in., and

8.3.4.2 The top 1 in. of curved sidewalls shall be within 10° of vertical.

8.3.5 Tube slides with flat bottom flume sections shall have:

8.3.5.1 Minimum width of 48 in. inside sidewalls,

8.3.5.2 Minimum sidewall height of 24 in, and

8.3.5.3 Sidewalls that are straight may diverge from vertical a maximum of 2 in. measured at 24 in. from bottom.

8.3.6 Tube slides with curved bottom flume sections such that the cross-section of the bottom and the sides are a continuously curving surface shall have:

8.3.6.1 Minimum inside width of 52 in.,

8.3.6.2 Minimum sidewall height of 26 in., and

8.3.6.3 The top 1 in. of curved sidewalls shall be within 10° of vertical.

8.3.7 Mat slides that are straight in plan shall have:

8.3.7.1 Minimum width of 22 in. inside sidewalls,

8.3.7.2 Minimum sidewall height of 16 in.,

8.3.7.3 Sidewalls that are straight may diverge from vertical a maximum of 6 in. measured at 16 in. from bottom, and

8.3.7.4 The top 1 in. of curved sidewalls shall be within 10° of vertical.

8.3.8 *Multiple Parallel Lane Flumes*—Where more than one flume runs in parallel straight-line path (in plan).

8.3.8.1 The outermost sections shall have sidewalls a minimum of 24 in. in height.

8.3.8.2 Where the flume path runs adjacent, there shall be a dividing barrier a minimum of 8 in. high between the lanes.

8.3.8.3 Each lane shall be a minimum of 22 in. inside width.

8.3.9 Water slides such as specialty slides that cannot be classified above shall conform to the requirements of 9.4.

8.3.10 Combination rides may be designed such that sections of the slide conform to the requirements of the respective specifications above.

8.4 *Closed Flume Geometry:*

8.4.1 The following are minimum requirements and should not be substituted where manufacturer experience suggests more conservative values. Total shape of cross-section of a flume may be created in two or more pieces.

8.4.2 Body slides with curved bottom flumes shall have a minimum inside dimension of 30 in.

8.4.3 Tube slides with flat bottom closed flume sections shall have a minimum inside dimension of 48 in.

8.4.4 Tube slides with curved bottom closed flume sections shall have a minimum inside dimension of 52 in.

8.5 *Flow Rate*—The water flow in each slide has an effect on the performance of the sliding surface.

8.5.1 The manufacturer shall determine the flow rate and shall set a fixed range of acceptability for each installation at the time of commissioning.

8.5.2 The water flow valves shall be secured from interference or adjustment by unauthorized personnel.

8.5.3 Flow meters, calibrated means of flow measurement, or marker(s) indicating proper operational water flow/level shall be provided for each flume.

8.6 *Run Out Lanes:*

8.6.1 Run out sections shall be designed to contain, decelerate, and stop riders to allow them to exit the slide.

8.6.2 A weir or other device shall regulate the water level in the run out to the correct level given correct flow rate for the ride.

8.6.3 To facilitate proper deceleration, a marker shall be provided to indicate the operational water level in the run out, which the slide attendant/lifeguard may verify prior to allowing the next rider entry to the slide.

8.7 *Landing Pools:*

8.7.1 Landing pools shall be designed to decelerate and stop riders and allow them to exit the water slide without encountering an obstruction.

8.7.2 The exit path for riders shall not cross with the landing zone of other slides. The designated pool exit shall be such as to force the riders to move forward and away from the paths of riders from other flumes.

8.7.3 Water slides entering a landing pool shall have a landing pool of sufficient length to decelerate and stop riders and minimize the potential for contact with the pool wall or stationary objects (stair, ladder, railing, and so forth) in the landing pool. Water slides classified as speed slides (rider velocity over 25 ft/s) will require additional pool length.

8.7.4 Pool depth in the landing zone for water slides for persons over 48 in. tall shall have a minimum pool depth of 3 ft.

8.7.5 Flume geometry at pool entry shall be straight viewed in plan for the last 8 ft of the water slide entering a pool.

8.7.6 Landing pools for waterslides with a fall distance greater than 6 in. shall have an increase in pool depth from the 3 ft minimum according to manufacturer recommendation to minimize potential impact with pool bottom.

8.7.7 If water supply for the slide(s) is drawn directly from landing pools or other areas accessible to the public, the suction line shall be divided into at least two lines, where connected to the pool, such that one person cannot block more than one suction line. The fittings and piping details shall be designed so that the full volume of water for the slide may be drawn through the remaining fittings at a velocity not to exceed 1 ft/s, assuming one suction fitting is fully blocked.

8.7.8 *Body Slide Landing Pools:*

8.7.8.1 Body slides entering a landing pool shall have a minimum distance between the inside of the widest part of the flume riding surface and the closest pool wall of 5 ft. The place of measurement in the pool shall be at any point from water level to 3 ft below water level and 6 ft in front of the flume termination. The lateral pool wall shall be parallel to or diverge from the axis of the slide. See Fig. 4.

8.7.8.2 Body slides entering a common landing pool should be arranged so as to minimize the potential for riders to come in contact with each other when exiting the flumes of adjacent slides simultaneously.

8.7.9 *Tube Slide Landing Pools:*

8.7.9.1 Tube slides entering a landing pool shall have a minimum distance between the inside of the widest part of the flume riding surface and the closest pool wall of 4.5 ft. The place of measurement in the pool shall be at any point from water level to 3 ft below water level and 6 ft in front of the flume termination. The pool wall shall be parallel to or diverge from the axis of the slide. See Fig. 4.

8.7.9.2 Tube slides entering a common landing pool should be arranged to minimize the opportunity for contact with other riders when exiting the flumes of adjacent slides simultaneously.

8.8 *Openings and Apertures in Flume Surfaces:*

8.8.1 Openings may be provided in flume surfaces for introduction of water, drains, special effects, light, and other similar purposes. All edges in openings within reach of riders shall be smooth with a minimum radius of ⅛ in. Openings shall not present an entrapment risk.

8.8.2 Openings at the slide start for the main water supply do not require guards or gratings unless the rider stands, sits, walks, or slides over the face of the opening during normal slide operation, or if the configuration of the opening is such that a rider moving in the usual direction of travel would not become entrapped. Grating shall have a maximum width of slot or hole diameter of ½ in.

8.9 *Seams and Joints:*

8.9.1 The surface of the sliding section shall form a smooth, secure, and continuous surface. If adjacent edges of lateral joints are not perfectly tangent, the upstream edge shall be set above the downstream edge on the riding surface a maximum of 3⁄16 in. to ensure that riders will not hit the edge of a lateral joint. (For the purposes of this section, riding surface shall be taken to mean the part of the flume where the path of riders is expected or found to pass over, for example, the outside half of a curved flume section.)

8.9.2 Longitudinal joints on the riding surface shall be made tangent.

8.9.3 Edges of lateral joints on body slides may have a radius of up to 3⁄16 in. Edges of longitudinal joints in closed flumes may have a radius of up to ¼ in. Edges of longitudinal joints in open flume risers may have a radius of up to ⅜ in.

8.9.4 Edges of lateral joints on mat and tube slides may have a radius of up to ½ in.

8.10 *Accelerations:*

8.10.1 Slide paths shall be designed so riders in seated or prone (laying face down) positions do not experience greater than 2 Gs acceleration from gravity and centrifugal acceleration vectors added together. This limit may be increased to 3 Gs if the duration is less than 1 s.

8.10.2 Slide paths shall be designed so that riders in supine (laying face up) positions do not experience greater than 3 Gs acceleration from gravity and centripetal acceleration vectors added together.

8.11 *Slide Vehicles:*

8.11.1 Slide vehicle(s), if specifically required by the manufacturer, shall be utilized.

8.11.2 Alternative slide vehicles shall be approved for use on water slides in writing from the manufacturer prior to guest use.

8.11.3 In the event the manufacturer does not provide written documentation of approval for an alternative slide vehicle, testing shall be performed and documented to determine if the proposed alternative vehicle is acceptable as outlined in Section 9.

8.11.4 Slide vehicles shall be maintained in operating condition, including but not limited to all handles or other holding devices, and conditions of vehicle surfaces in contact with the slide surface.

8.11.5 Slide vehicles should be removed from service for repair or replacement when components are missing or damage is detected, or both.

8.11.6 Slide vehicles shall be constructed to have a cushioning effect for riders who can come into contact with another vehicle during normal operation of the slide.

8.11.7 Slide vehicles shall float when used in a landing pool.

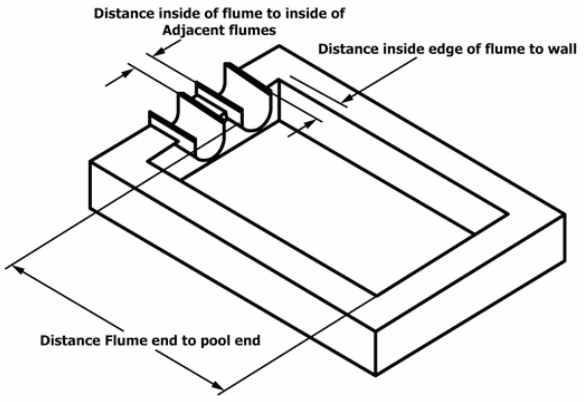

FIG. 4 Body Slide Landing Pool

9. Test and Inspection Methods

9.1 The manufacturer of a new slide or major modification to an existing slide shall specify prior to commissioning or re-certification, test or inspection procedures, or both, in compliance with Guide F846 and Practice F1193, including but not limited to the following.

9.2 *Operational Testing*—As specified in Guide F846, Section 7.

9.3 The manufacturer shall provide a written report to the owner/operator, which provides detail of the installation and operational test procedures, time and place of test, test results and supporting data, and identification of the person conducting the test.

9.4 *Special Testing*—In the event that a new or innovative product or method is used in the design, construction, or operation of a water slide that does not comply with Section 8, such a product shall be deemed acceptable as follows.

9.4.1 The manufacturer shall prepare a testing procedure, this procedure shall be designed to verify the performance of the slide that does not otherwise comply with Section 8 of this practice.

9.4.2 The test procedure shall include riders that represent the largest and the smallest body types that shall be allowed on the slide.

9.4.3 The test procedure shall be reviewed and approved by a third party consultant experienced and an expert in water slide operations.

10. Identification Marking

10.1 Installed water slides shall be identified in accordance with Practice F1193, Section 10.

11. Manufacturer Responsibilities

11.1 The following instructions outline requirements under Practice F770 as applicable to water slides and include requirements not specified in Practice F770 which are necessary and unique to water slides. Manufacturers are responsible for determining the following:

11.2 Water flow rate requirements for water slide operation and point at which water level in run outs or landing pools are benchmarked.

11.3 Maximum total passenger weight and maximum number of passengers per slide vehicle.

11.4 Recommended patron dispatch intervals.

11.5 Recommended warnings concerning forces and actions that could aggravate physical conditions such as heart conditions, pregnancy, neck and back conditions, and so forth.

11.6 Specifications for inspection, maintenance and repair of the slide that shall include, but not be limited to, the following:

11.6.1 A phone number or fax number to be used by the owner/operator to secure maintenance or operating assistance from the manufacturer.

11.6.2 Periodic minimum service and component inspection checklists.

11.6.3 Cleaning, waxing, repairing, and patching instructions to include recommended materials.

11.6.4 Description of the recommended, daily pre-opening inspection to be performed by slide attendants or maintenance personnel, or both, prior to daily operations should include but not be limited to:

11.6.4.1 Obstruction in the slide path,

11.6.4.2 Cracks, chips, or bubbles in the sliding surface,

11.6.4.3 Rough patch work at joints or cracks,

11.6.4.4 Leaking seals or joints,

11.6.4.5 Loose flume risers in turns,

11.6.4.6 Excessive movement of the flume,

11.6.4.7 Joint openings,

11.6.4.8 Signage placement,

11.6.4.9 Communication device functional,

11.6.4.10 Water flow rate in operating range,

11.6.4.11 Landing pool or run out water level in operating range,

11.6.4.12 Visual check of slide vehicles, and

11.6.4.13 Visual inspection of entrances, exits, stairways, and ramps.

12. Owner/Operator Responsibilities

12.1 As specified in Section 4 of Practice F770, the following instructions outline requirements as applicable to water slides and include requirements not specified in Practice F770 which are necessary and unique to water slides.

12.2 Each owner/operator shall have written operating procedures for the individual water slide, which are an integral part of their staff-training program. These procedures shall include but not be limited to:

12.2.1 Specific water slide operation policies and procedures with pertinent information from the manufacturer's instructions including dispatch procedures. Dispatch procedures shall be established for each water slide should include, but not be limited to, the following:

12.2.1.1 Informing each patron of the proper rider position.

12.2.1.2 Established dispatch time intervals for each water slide.

12.2.1.3 Established communication system between the slide attendant and lifeguard positioned at the landing pool or run-out section.

12.2.1.4 Limiting the number of patrons in the dispatch pool as required by the manufacturer specifications.

12.2.1.5 Established dispatch procedures shall be followed by slide attendants prior to dispatching each rider.

12.3 Verbal instructions, when required by the manufacturer, concerning water slide rules that shall be announced to patrons prior to each ride cycle. Pre-ride instructions may include, but not be limited to: the required position of hands and feet, rider conduct, exiting procedures, and other instructions deemed appropriate.

12.4 Signage shall be placed by the owner/operator as specified in Practice F770, subsection 4.3. For water slides, these signs shall include safety, warning, and instructional signage reflecting manufacturer recommendations. Signage shall be prominently displayed at the slide entrance or other appropriate area, or both, and shall include but not be limited to the following:

12.4.1 Instructions, which include:

12.4.1.1 Proper riding position,

12.4.1.2 Expected rider conduct,

12.4.1.3 Dispatch procedures,

12.4.1.4 Exiting procedures, and

12.4.1.5 Obey slide attendant/lifeguard instructions.

12.4.2 Warnings, which include:

12.4.2.1 Slide characteristics, such as descriptions of speed or attraction rating, and

12.4.2.2 Water depth of landing zone.

12.4.3 Requirements which include:

12.4.3.1 Riders being free of medical conditions, including but not limited to pregnancy and heart, back, or musculoskeletal problems,

12.4.3.2 Maximum/minimum height and weight, and

12.4.3.3 Any swimming or physical ability requirement, or both.

12.5 *Major Modifications*—As specified in Terminology F747, major modifications shall not occur without written approval from the manufacturer.

12.5.1 In the event the manufacturer does not provide written approval for a major modification, the owner/operator may retain a different manufacturer or designer/engineer to complete or approve the major modification, or both.

12.5.2 Testing shall be performed and documented in accordance with Guide F846 to verify the modification is acceptable as outlined in Section 9 of this practice.

12.6 The owner/operator shall maintain appropriate water quality in accordance with local requirements for bathing facilities.

12.7 *Inspection and Maintenance Program*—Based on the water slide manufacturer's recommendations, each owner shall implement a program of maintenance, testing, and inspection, providing for the duties and responsibilities necessary to care for the water slide, safety equipment, and the slide facilities.

12.7.1 Inspections shall be conducted in accordance with the procedures as specified in Practices F770 and F853.

12.8 Visual checks of safety signs, slide entry, flume, run out, landing pool, and structural components, water flow, landing pool water level, and run out water level shall be maintained according to the manufacturer's specifications.

13. Rider Responsibility

13.1 See Practice F770.

14. General Design Criteria

14.1 General design criteria shall be in accordance with Practice F2291, Section 5 with the following revisions:

14.1.1 Delete 5.1.1.4 (2).

14.1.2 *Patron Restraint and Containment Analysis*—A patron restraint and containment analysis shall be performed.

14.1.3 Delete 5.1.1.4 (3).

14.1.4 *Patron Clearance Envelope Analysis*—A patron clearance envelope analysis shall be performed.

14.1.5 Delete 5.5.2.

14.1.6 The coordinate system shown in Fig. 1 shall be used as the standard reference for acceleration directions.

14.1.7 Delete 5.6.4.1.

14.1.8 General drawings or diagrams in plan, elevation, and section views showing the general arrangement of components, including side clearance envelope as described in ASTM F2376, Section 8.3.2.

15. Pneumatics

15.1 Pneumatics shall be designed in accordance with Practice F2291, Section 10.

16. Safety Related Control Systems

16.1 Safety Related Control Systems shall be designed in accordance with Practice F2291, Section 11.

17. Mechanical Systems and Components

17.1 Mechanical Systems and Components shall be designed in accordance with Practice F2291, Section 13.

18. Welding

18.1 Welding procedures, methodology, and inspection shall be in accordance with Practice F2291, Section 15.

19. Fasteners

19.1 Fastened connections shall be designed in accordance with Practice F2291, Section 16.

20. Adhesive Bonding

20.1 Adhesive Bonding shall be in accordance with Practice F2291, Subsection 16.3.

21. Coatings

21.1 Coatings shall be in accordance with Practice F2291, Section 19.

22. Sanitation/Disinfection

22.1 Sanitation/Disinfection shall be in accordance with Practice F2291, Section 21.

23. Keywords

23.1 construction; design; flume; manufacture; water slide

APPENDIXES

(Nonmandatory Information)

X1. ADDITIONAL DEFINITIONS

X1.1 *Definitions:*

X1.1.1 *closed flume*—flume that encloses the rider in a pipe-like cross-section.

X1.1.2 *fall distance*—vertical distance between the terminus of the slide surface and the water surface of the landing pool.

X1.1.3 *flow meter*—device used to measure the water flow for a water slide.

X1.1.4 *flume*—that part of the water slide that contains the rider(s) and defines the path of the water slide within which sliding takes place.

X1.1.5 *flume riser (splashguard)*—extension of the sidewall of an open flume to contain riders or water and is capable of use as a riding surface.

X1.1.6 *instructional signage*—signage displayed in public view prior to the entrance of the ride with information provided to the rider, which informs them of instructions for proper use, riding position, and expected rider behavior.

X1.1.7 *mat*—flexible sheet usually made of plastic or foam, suitable for use as a vehicle in a water slide flume to carry a rider.

X1.1.8 *open flume*—flume that does not completely encircle or enclose the rider.

X1.1.9 *rider*—any person who is in the act of entering the flume, using the flume, or getting off of the flume.

X1.1.10 *run-out section*—flume surface of a water slide where riders are intended to decelerate or come to a stop, or both.

X1.1.11 *slide attendant*—individual trained in facility and ride-specific operating and emergency procedures.

X1.1.12 *slide entry section*—that part of the water slide where riders enter the flume from the starting platform.

X1.1.13 *slide height*—difference in elevation from the centerline of the flume at the slide exit to the centerline of the flume at slide entry, measured at the riding surface.

X1.1.14 *slide path*—geometric layout of the flume sections that make up the water slide.

X1.1.15 *slide vehicle*—device intended for use on a water slide upon which the rider(s) sits or lays while sliding.

X1.1.16 *specialty vehicle*—proprietary vehicle sufficiently different from other vehicles designated by the slide manufacturer as suitable for use in a water slide.

X1.1.17 *starting platform*—deck structure, usually of separate construction from the water slide, from which a given water slide starts.

X1.1.18 *water flow*—water volume per unit time for a given water slide.

X1.1.19 *water slide*—see definition in Section 1.

X1.1.20 *water slide clearance envelope*—design clearance to minimize the opportunity for contact between the rider and other objects, outside of the flume, where said contact is likely to cause injury. See Figs. 1 and 2.

X1.1.21 *water slide system*—see definition in Section 1.

X1.1.22 *water slide tube*—inflated vehicle that floats in a stable fashion in a pool intended for rider use on water slides. The vehicle may have a bottom or have a hole intended for seating and contains one or more riders as they ride in the flume; often called a raft, boat, or tube.

X2. COMMENTS

X2.1 Section 3.1, Terminology

X2.1.1 Many terms have a common accepted use in the water slide industry that is unique. This is to establish a basic common vocabulary as well as a basis for classification that differentiates design parameters. All terms in this practice are candidates for inclusion in Terminology F747.

X2.2 Section X1.1.20, Clearance Envelope

X2.2.1 Water slides are distinct from other amusement rides in that riders are not restrained and may assume unusual and arbitrary positions. Hence the methodology of assuming a statistical dimension of a body part restrained in a vehicular harness is not applicable to slide designs. Historically, manufacturers have set individual internal standards. The desire in this practice is to establish generally agreed upon values that have provided historically safe rides.

X2.3 Section 5.2, Support Materials

X2.3.1 Many materials have been used for water slide supports including: steel, concrete, wood, aluminum, and fiberglass reinforced plastics. Corrosion has proved the major issue for metal construction primarily for cosmetic concerns. With respect to corrosion of metals, maintenance has proved the most effective factor in minimizing occurrence. Requirements are left deliberately open and emphasize the performance issue of durability and strength.

X2.4 Section 7, Structural Design of Waterslides

X2.4.1 Fundamentally, water slides and related access structures should not be considered the same as buildings. Some loading conditions commonly accepted for buildings simply will not occur for water slides. Therefore, complete adherence to building codes requires unreasonable load combinations. The simplest example is loads from high winds. No water slide is operated during a storm. Water slides are not intended to provide the function of shelter. Section 8.13 of Practice F2291 recognizes this for amusement rides where operational loads are calculated with 34 mph wind.

X2.4.2 Some manufacturers depend on designs prepared for an example job for all jobs. Some use load-testing criteria. In Europe, TUV will perform tests on water slides using proof loads if calculations are not submitted.

X2.4.3 The intent here is to establish a commonly acceptable base standard for designs. If individual jurisdictions decide to require application of local building codes that is their right.

X2.4.4 Combinations of loads for design analysis or for determining test forces:

DL + WL + RL
DL + SL + LWL
DL + LWL
DL + RL + (RLWL)
DL + RL + OLL

X2.5 Section 9, Test and Inspection Methods

X2.5.1 Water slides are distinct from amusement rides in that they are mechanically very simple. The only moving component of a slide is the rider. Pumps and mechanical devices are separate and isolated from the rider. One could argue slides have no moving parts. Therefore, requirements for testing and inspection do not require the level of care common with machines. NDT testing of bearings, shafts, and moving parts is unnecessary. The requirements of Guide F846 are not applicable for the most part. Inspection/testing commonly occurs at three points in water slide manufacture: (*1*) material supply QA, (*2*) manufacture/fabrication QA, (*3*) installation, and (*4*) operation. The last has two aspects, one being verification of the structure often by engineers, and the other being the actual performance of the slide. The following has been modified from the basic Guide F846 requirements to reflect common practice.

X2.6 Section 9.4, Special Testing

X2.6.1 This section has been added to address concerns that many of the provisions of the performance section would inhibit or prevent innovation. A radical or new ride may introduce a safe feature that goes against requirements in this practice that are based on past experience. Demonstrating this with testing is an obvious solution. However, a higher degree of care and completeness in such testing is required compared to products that have dozens or hundreds of previous successful examples. The use of respected third party consultants is a normal part of water slide operations and management. Therefore, this provides a high level of confidence to verification tests of this type of slide.

X2.7 Section 13, Rider

X2.7.1 Responsibility is based on Section 5.x of Practice F770, as already accepted by F24.

Designation: F2376 – 13

Standard Practice for Classification, Design, Manufacture, Construction, and Operation of Water Slide Systems[1]

This standard is issued under the fixed designation F2376; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice applies to the classification, design, manufacture, construction, and operation of water slide systems. Water slide systems shall be defined as rides intended for use by riders in bathing attire where the action of the ride involves possible and purposeful immersion of the rider's body either in whole or in part in water, and uses circulating water to mobilize or lubricate the rider's transportation along a purpose built path. This includes slides used with or without vehicles as defined below. The terms water slides, waterslides, and slides shall be considered equivalent when used in this practice.

1.2 For the purposes of this practice, a water slide system includes:

1.2.1 The flume,

1.2.2 The water-circulation system,

1.2.3 The starting platform with associated means of access and egress,

1.2.4 The structural supports,

1.2.5 Vehicles or other aquatic accessories that are part of the water slide as defined by the manufacturer, and

1.2.6 Means of slide termination.

1.3 This practice shall not apply to:

1.3.1 Any water slides installed in private residences,

1.3.2 Water flume amusement rides where contact with water is merely incidental (for example, log flume rides, shoot-the-chutes),

1.3.3 Amusement rides and devices whose design criteria are specifically addressed in another ASTM standard,

1.3.4 Lazy river type attractions operating at constant elevation, constructed in the ground, and

1.4 Pre-existing designs manufactured after the effective date of publication of this practice if the design is service proven or previously compliant, as defined in Section 3.1.26 of Practice F2291, and the manufacturer provides:

1.4.1 A historical summary of the water slide, or major modification as defined in Terminology F747, and

1.4.2 A statement that the design is service proven or previously compliant. Water slides and major modifications to water slides may qualify as previously compliant for five years following the date of publication of this practice. Thereafter, water slides and major modifications to water slides must qualify as service proven or meet the requirements of this practice.

1.4.3 Service proven or previously compliant designs shall comply with Section 8.

1.5 The values stated in inch-pound units are to be regarded as standard. No other units of measurement are included in this standard.

NOTE 1—The conversion factor from inch-pound to metric units is 1 in. = 25.4 mm, and 1 lb = 4.4482 N.

1.6 This practice includes an Appendix, which provides additional information to enhance the user's understanding of and application of the criteria presented in this practice, for example, rationale, background, drawings, interpretation, or commentary. The information in the Appendix shall not be considered a mandatory part of this practice.

1.7 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D570 Test Method for Water Absorption of Plastics

D638 Test Method for Tensile Properties of Plastics

D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

F747 Terminology Relating to Amusement Rides and Devices

[1] This practice is under the jurisdiction of ASTM Committee F24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.70 on Water Related Amusement Rides and Devices.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

F770 Practice for Ownership, Operation, Maintenance, and Inspection of Amusement Rides and Devices
F846 Guide for Testing Performance of Amusement Rides and Devices (Withdrawn 2013)[3]
F853 Practice for Maintenance Procedures for Amusement Rides and Devices (Withdrawn 2014)[3]
F893 Guide for Auditing Amusement Rides and Devices (Withdrawn 2013)[3]
F1193 Practice for Quality, Manufacture, and Construction of Amusement Rides and Devices
F1305 Guide for Classification of Amusement Ride and Device Related Injuries and Illnesses (Withdrawn 2011)[3]
F2291 Practice for Design of Amusement Rides and Devices

2.2 *ACI Standard:*[4]
ACI-318 Building Code Requirements for Structural Concrete

2.3 *ASCE Standard:*[5]
ANSI/ASCE 7 Minimum Design Loads for Buildings and Other Structures

2.4 *USDA Document:*[6]
USDA-72 The Wood Handbook

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *landing pool*—pool intended to receive riders from a water slide.

3.1.2 *landing zone*—area in a landing pool intended for receiving riders from a particular slide.

3.1.3 *lifeguard*—individual specially trained in lifesaving and emergency procedures, responsible for monitoring patrons and responding to aquatic and other emergencies.

3.1.4 *owner/operator*—person or organization that is responsible for the maintenance and operation of a water slide system.

4. Slide Classification

4.1 Water slides are classified by their physical and intended use characteristics. The classification may be a combination of the specific rider vehicle used the type of geometric path, often serpentine or straight, and the designation as a speed slide if the rider's velocity exceeds 25 ft/s. The following are definitions of the types of water slides.

4.1.1 *body slides*—water slide used without a vehicle.

4.1.2 *children's slides*—Water slides generally intended only for use by persons under the height of 48 in. Water slide has a maximum fall distance of 3 in. from slide exit where the rider enters the water and water depth is no greater than 24 in.

4.1.3 *mat slides*—water slide used with a designated mat as a vehicle.

4.1.4 *serpentine slide*—curved path as viewed in geometric slide path.

4.1.5 *specialty slides*—proprietary water slide design, such as an uphill, half-pipe, or bowl ride, which does not conform to standard classification.

4.1.6 *specialty vehicle slides*—water slide used with a proprietary vehicle specified by the manufacturer.

4.1.7 *speed slide*—water slide where the rider(s) achieve a velocity of 25 ft/s or more during the course of the ride.

4.1.8 *tube slides*—water slide used with a single or multi-person water slide tube.

5. Materials

5.1 *Flume Material*—Any material that has the following basic properties and that meets all other requirements of this practice may be used to construct water slides.

5.1.1 Flumes riding surfaces shall be constructed to be smooth.

5.1.2 Flume material shall be demonstrated as strong enough to support specified loads as defined in Section 8.

5.1.3 Flume components, maintained using the manufacturer's instructions, shall not deteriorate over time in such a way that a hazard will develop.

5.2 *Support Materials*—Any material that has the following basic properties and that meets all other requirements of this practice may be used to construct water slide supports.

5.2.1 Supports for water slides shall be constructed from durable materials such as wood, metal, concrete, or engineered composites.

5.2.2 Supports for water slides fabricated from metal shall be either inherently corrosion resistant, or be finished in such a way as to provide protection from corrosion.

5.2.3 Wood materials shall be finished in such a way to provide protection against deterioration.

5.2.4 Support material shall be demonstrated as strong enough to support specified loads as defined in Section 7.

5.2.5 Supports shall be constructed to accommodate regular inspection and maintenance for structural integrity, material deterioration, or corrosion, or a combination thereof.

6. Notification Requirement

6.1 A water slide system shown to comply with this practice shall meet all applicable requirements specified in this practice. Anyone representing compliance with this practice shall keep such essential records as are necessary to document any claim that the requirements within this specification have been met.

6.2 The owner/operator of a water slide shall notify the appropriate manufacturer(s) of any known incident as specified in Guides F1305 and F893.

6.3 The manufacturer shall notify the appropriate owner(s)/operator(s) of similar water slides of an incident that resulted in a serious injury promptly upon the determination by the manufacturer that the incident is significantly repeatable.

6.3.1 Such manufacturer notification shall be a bulletin as specified in Sections 4.1.14.3 through 4.1.14.8 of Practice F853.

[3] The last approved version of this historical standard is referenced on www.astm.org.
[4] Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333.
[5] Available from The American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191.
[6] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

7. Structural Design of Water Slides

7.1 This section defines the loading and strength criteria that shall be used in the structural engineering of water slide flumes and supporting structures. The strength and stability of the water slide system shall be demonstrated by generally accepted engineering methods certified by a professional engineer.

7.2 *Dead Loads (symbol DL)*—Forces resulting from weight of all components of the ride and includes all loads that do not fluctuate with respect to time.

7.3 *Operational Loads*—Forces from water, riders, or vehicles, or a combination thereof, in the ride under normal operations.

7.3.1 *Water Load (symbol WL)*—In free flowing water slides where water does not collect in pools or streams greater than 2 in. deep, the water load shall be a minimum of 15 lbs/linear ft for every 1000 gal/min of flow. Where the flow is such that water collects in pools or streams greater than 2 in. deep, the actual maximum water load shall be determined and used in calculation, design, or load tests, or a combination thereof.

7.3.2 *Rider Load (symbol RL)*—The manufacturer shall specify the rider vehicle and the maximum number of riders that are to ride in the flume at one time.

7.3.2.1 For water slides intended for multiple rider use, the weight assigned to each rider shall be, at a minimum, the weight specified for an adult rider in Section 8.6.1 of Practice F2291.

7.3.2.2 For single rider water slides, the rider weight shall be a maximum of 300 lb.

7.3.2.3 For water slides intended for use by children only, the weight assigned to a child shall be as specified in Section 8.6.2 of Practice F2291.

7.3.2.4 Ride loads shall be so arranged to cause the greatest realistic operational load to the system.

7.3.2.5 Lateral centripetal forces shall be considered in curved sections of flume. Predicted rider speeds should be used to calculate these forces. If speeds cannot be predicted, then a minimum of 15 ft/s for flumes under 15 % slope and 30 ft/s for all other flumes shall be used.

7.3.2.6 If the manufacturer places maximum rider total weight limits on a slide, then that restricted load may be used.

7.3.2.7 The weight of the rider vehicle shall be included in determining rider load.

7.4 *Environmental Loads*—Forces from environmental conditions of the site such as wind, precipitation, earthquake, and changes in temperature.

7.4.1 Loads and forces due to environmental conditions shall be in accordance with applicable local code requirements or ANSI/ASCE 7, or other equivalent national standard.

7.4.2 The manufacturer/designer shall clearly indicate the environmental loads the water slide was designed for in the operating and maintenance instructions as specified in the sections on Manufacturer's Responsibility of Practices F770 and F853. In addition to the environmental load information, any restriction, limitations, or special procedures associated with water slides exposed to these environmental loads shall be included.

7.4.3 *Lateral Wind Load (symbol LWL)*—For outdoor slides, the minimum wind load for all types of water slides shall be calculated based on 100-mph wind (3-s gust) for non-operational conditions. Lateral wind load may be reduced by an importance factor of less than 1.0, where appropriate, for water slide structures that are unoccupied during extreme weather.

7.4.4 *Reduced Lateral Wind Load (symbol RLWL)*—For outdoor slides, the minimum wind load for all types of water slides shall be calculated based on Section 8.13.1 of Practice F2291 for operational conditions.

7.4.5 *Other Lateral Loads (symbol OLL)*—A minimum lateral load equivalent to 10 % of the dead weight of the structure shall be included.

7.4.6 *Snow Load (symbol SL)*—The snow load for all types of water slides shall be calculated in accordance with the relevant local ground snow load(s).

7.5 *Overload*—Forces from water, riders, or vehicles, or a combination thereof, under extraordinary operational conditions due to user overload.

7.5.1 Calculations for extraordinary operational conditions that consider user overload shall be based on conditions specified by the manufacturer and need not consider any other live load in combination with such overload.

7.6 *Load Combinations*—Engineering calculations may use either allowable stress methods (ASD) or load and resistance factor methods (LRFD). Engineering calculations shall consider load conditions and combinations of loads in accordance with generally accepted engineering methods. Calculations shall consider that water slide systems may not be occupied during extremes of weather.

7.7 *Metal Structures*—Strength of steel structures under or above noted loads shall be designed in accordance with current AISC, ASCE standards,[5] or equivalent national standards.

7.8 *Wood Structures*—Strength of timber structures under or above noted loads shall be designed in accordance with current USDA-72, ASCE standards,[5] or equivalent national standards.

7.9 *Concrete Structures*—Strength of concrete structures under above noted loads shall be designed in accordance with current ACI-318 or equivalent national standards.

7.10 *Plastic and Plastic Composite Structures:*

7.10.1 Strength of plastic structures under above noted loads shall be designed in accordance with generally accepted engineering methods. Assessment shall be performed in a manner suitable for the specific material and structure.

7.10.2 Fiberglass reinforced plastic or other composite materials used structurally shall have samples tested for strength with accelerated aging in accordance with Test Methods D570, D638, and D790.

7.10.3 Loads from normal operational conditions shall demonstrate a minimum of 5 to 1 factor of safety against rupture for fiberglass reinforced plastic or other composite materials.

7.10.4 Calculations for extraordinary operational conditions from user overload shall demonstrate a minimum of 2 to 1 factor of safety against rupture of fiberglass reinforced plastic or other composite materials.

8. Performance Requirements

8.1 *General Requirements:*

8.1.1 The following are minimum requirements and should not be substituted where manufacturer experience suggests more acrimonious values.

8.1.2 Surfaces in reach by slide attendants and riders shall be made in such a way as to reduce the potential for injury.

8.1.3 A water slide shall be designed and constructed so that forces on riders allow the rider to use the slide in accordance with the rules and instructions under normal operating conditions.

8.2 *Slide Access:*

8.2.1 *General*—Fencing, guardrails, and handrails shall be installed in accordance with Section 14 of Practice F2291.

8.2.2 If the water slide system includes a starting platform and the platform is more than 21 in. above surrounding terrain, the platform shall provide at least 36 in. in distance between the slide entry and the top of stairs or ramp. Sufficient space shall be provided on the platform for slide attendant workspace, signage, and any communication devices needed for operation. Except where a stair or ramp or slide entry joins it, the platform shall be surrounded on all sides by a guardrail in accordance with Section 14 of Practice F2291.

8.2.3 Surface of steps, access ramp, and deck shall be slip-resistant and self-draining.

8.2.4 Slide entry section should interface with the platform guardrail so that a 4 in. sphere cannot pass between the slide entry component and the adjacent guardrail component.

8.3 *Open Flume Geometry:*

8.3.1 Flume cross-section shape shall be configured to contain the rider(s) or vehicle, or both, under all reasonable operating conditions. Total depth of section and shape of cross-section of a flume may be created in a single piece or more than one piece.

8.3.2 Open water slide flumes shall be kept clear of obstacles within the water slide clearance envelope as shown in Figs. 1 and 2. Flume riser sections may be added to block access to anything encroaching in the area.

8.3.3 Water slides shall have additional sidewall height provided by a flume riser section on the outside part of all horizontal curves to contain the rider. This flume riser shall be concave facing the center of the cross-section. The flume riser may be an integral or separate part from the main flume component.

8.3.3.1 *Flume Riser Transition*—Flume riser parts shall be transitioned from sections without flume risers to sections with flume risers with a maximum angle of 45° from the horizontal. See Fig. 3.

8.3.3.2 *Other Additions*—Where a cover, a tube entrance, or a flume riser is fitted other than at the beginning of the slide, the sides of the slide shall have a smooth transition from horizontal to vertical. Maximum angle of transition will be 45°. The inside height of the entrance to the cover or flume riser shall be at least 48 in.

8.3.4 Body slides with curved bottom flume sections such that the cross-section of the bottom and the sides are a continuously curving surface shall have:

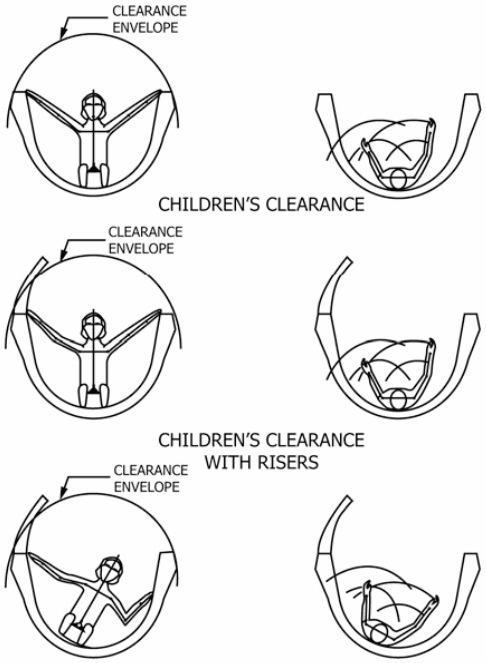

FIG. 1 Water Slide Clearance Envelope

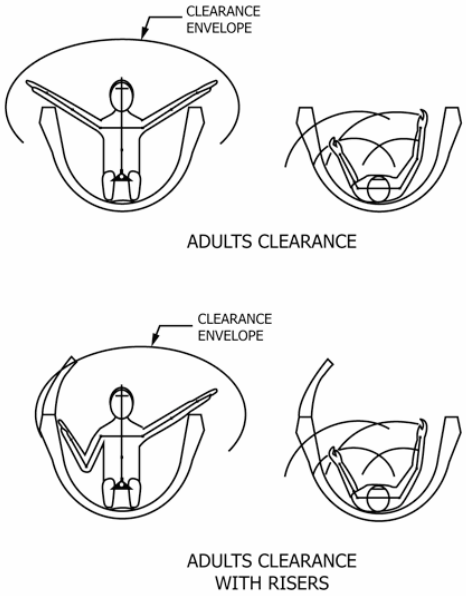

FIG. 2 Water Slide Clearance Envelope

8.3.4.1 Minimum inside width of 30 in., minimum sidewall height of 15 in., and

8.3.4.2 The top 1 in. of curved sidewalls shall be within 10° of vertical.

8.3.5 Tube slides with flat bottom flume sections shall have:

8.3.5.1 Minimum width of 48 in. inside sidewalls,

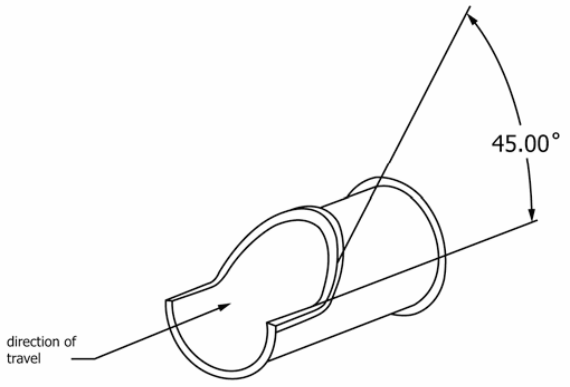

FIG. 3 Flume Riser

8.3.5.2 Minimum sidewall height of 24 in, and

8.3.5.3 Sidewalls that are straight may diverge from vertical a maximum of 2 in. measured at 24 in. from bottom.

8.3.6 Tube slides with curved bottom flume sections such that the cross-section of the bottom and the sides are a continuously curving surface shall have:

8.3.6.1 Minimum inside width of 52 in.,

8.3.6.2 Minimum sidewall height of 26 in., and

8.3.6.3 The top 1 in. of curved sidewalls shall be within 10° of vertical.

8.3.7 Mat slides that are straight in plan shall have:

8.3.7.1 Minimum width of 22 in. inside sidewalls,

8.3.7.2 Minimum sidewall height of 16 in.,

8.3.7.3 Sidewalls that are straight may diverge from vertical a maximum of 6 in. measured at 16 in. from bottom, and

8.3.7.4 The top 1 in. of curved sidewalls shall be within 10° of vertical.

8.3.8 *Multiple Parallel Lane Flumes*—Where more than one flume runs in parallel straight-line path (in plan).

8.3.8.1 The outermost sections shall have sidewalls a minimum of 24 in. in height.

8.3.8.2 Where the flume path runs adjacent, there shall be a dividing barrier a minimum of 8 in. high between the lanes.

8.3.8.3 Each lane shall be a minimum of 22 in. inside width.

8.3.9 Water slides such as specialty slides that cannot be classified above shall conform to the requirements of 9.4.

8.3.10 Combination rides may be designed such that sections of the slide conform to the requirements of the respective specifications above.

8.4 *Closed Flume Geometry:*

8.4.1 The following are minimum requirements and should not be substituted where manufacturer experience suggests more conservative values. Total shape of cross-section of a flume may be created in two or more pieces.

8.4.2 Body slides with curved bottom flumes shall have a minimum inside dimension of 30 in.

8.4.3 Tube slides with flat bottom closed flume sections shall have a minimum inside dimension of 48 in.

8.4.4 Tube slides with curved bottom closed flume sections shall have a minimum inside dimension of 52 in.

8.5 *Flow Rate*—The water flow in each slide has an effect on the performance of the sliding surface.

8.5.1 The manufacturer shall determine the flow rate and shall set a fixed range of acceptability for each installation at the time of commissioning.

8.5.2 The water flow valves shall be secured from interference or adjustment by unauthorized personnel.

8.5.3 Flow meters, calibrated means of flow measurement, or marker(s) indicating proper operational water flow/level shall be provided for each flume.

8.6 *Run Out Lanes:*

8.6.1 Run out sections shall be designed to contain, decelerate, and stop riders to allow them to exit the slide.

8.6.2 A weir or other device shall regulate the water level in the run out to the correct level given correct flow rate for the ride.

8.6.3 To facilitate proper deceleration, a marker shall be provided to indicate the operational water level in the run out, which the slide attendant/lifeguard may verify prior to allowing the next rider entry to the slide.

8.7 *Landing Pools:*

8.7.1 Landing pools shall be designed to decelerate and stop riders and allow them to exit the water slide without encountering an obstruction.

8.7.2 The exit path for riders shall not cross with the landing zone of other slides. The designated pool exit shall be such as to force the riders to move forward and away from the paths of riders from other flumes.

8.7.3 Water slides entering a landing pool shall have a landing pool of sufficient length to decelerate and stop riders and minimize the potential for contact with the pool wall or stationary objects (stair, ladder, railing, and so forth) in the landing pool. Water slides classified as speed slides (rider velocity over 25 ft/s) will require additional pool length.

8.7.4 Pool depth in the landing zone for water slides for persons over 48 in. tall shall have a minimum pool depth of 3 ft.

8.7.5 Flume geometry at pool entry shall be straight viewed in plan for the last 8 ft of the water slide entering a pool.

8.7.6 Landing pools for waterslides with a fall distance greater than 6 in. shall have an increase in pool depth from the 3 ft minimum according to manufacturer recommendation to minimize potential impact with pool bottom.

8.7.7 If water supply for the slide(s) is drawn directly from landing pools or other areas accessible to the public, the suction line shall be divided into at least two lines, where connected to the pool, such that one person cannot block more than one suction line. The fittings and piping details shall be designed so that the full volume of water for the slide may be drawn through the remaining fittings at a velocity not to exceed 1 ft/s, assuming one suction fitting is fully blocked.

8.7.8 *Body Slide Landing Pools:*

8.7.8.1 Body slides entering a landing pool shall have a minimum distance between the inside of the widest part of the flume riding surface and the closest pool wall of 5 ft. The place of measurement in the pool shall be at any point from water level to 3 ft below water level and 6 ft in front of the flume

termination. The lateral pool wall shall be parallel to or diverge from the axis of the slide. See Fig. 4.

8.7.8.2 Body slides entering a common landing pool should be arranged so as to minimize the potential for riders to come in contact with each other when exiting the flumes of adjacent slides simultaneously.

8.7.9 *Tube Slide Landing Pools:*

8.7.9.1 Tube slides entering a landing pool shall have a minimum distance between the inside of the widest part of the flume riding surface and the closest pool wall of 4.5 ft. The place of measurement in the pool shall be at any point from water level to 3 ft below water level and 6 ft in front of the flume termination. The pool wall shall be parallel to or diverge from the axis of the slide. See Fig. 4.

8.7.9.2 Tube slides entering a common landing pool should be arranged to minimize the opportunity for contact with other riders when exiting the flumes of adjacent slides simultaneously.

8.8 *Openings and Apertures in Flume Surfaces:*

8.8.1 Openings may be provided in flume surfaces for introduction of water, drains, special effects, light, and other similar purposes. All edges in openings within reach of riders shall be smooth with a minimum radius of ⅛ in. Openings shall not present an entrapment risk.

8.8.2 Openings at the slide start for the main water supply do not require guards or gratings unless the rider stands, sits, walks, or slides over the face of the opening during normal slide operation, or if the configuration of the opening is such that a rider moving in the usual direction of travel would not become entrapped. Grating shall have a maximum width of slot or hole diameter of ½ in.

8.9 *Seams and Joints:*

8.9.1 The surface of the sliding section shall form a smooth, secure, and continuous surface. If adjacent edges of lateral joints are not perfectly tangent, the upstream edge shall be set above the downstream edge on the riding surface a maximum of 3⁄16 in. to ensure that riders will not hit the edge of a lateral joint. (For the purposes of this section, riding surface shall be taken to mean the part of the flume where the path of riders is expected or found to pass over, for example, the outside half of a curved flume section.)

8.9.2 Longitudinal joints on the riding surface shall be made tangent.

8.9.3 Edges of lateral joints on body slides may have a radius of up to 3⁄16 in. Edges of longitudinal joints in closed flumes may have a radius of up to ¼ in. Edges of longitudinal joints in open flume risers may have a radius of up to ⅜ in.

8.9.4 Edges of lateral joints on mat and tube slides may have a radius of up to ½ in.

8.10 *Accelerations:*

8.10.1 Slide paths shall be designed so riders in seated or prone (laying face down) positions do not experience greater than 2 Gs acceleration from gravity and centrifugal acceleration vectors added together. This limit may be increased to 3 Gs if the duration is less than 1 s.

8.10.2 Slide paths shall be designed so that riders in supine (laying face up) positions do not experience greater than 3 Gs acceleration from gravity and centripetal acceleration vectors added together.

8.11 *Slide Vehicles:*

8.11.1 Slide vehicle(s), if specifically required by the manufacturer, shall be utilized.

8.11.2 Alternative slide vehicles shall be approved for use on water slides in writing from the manufacturer prior to guest use.

8.11.3 In the event the manufacturer does not provide written documentation of approval for an alternative slide vehicle, testing shall be performed and documented to determine if the proposed alternative vehicle is acceptable as outlined in Section 9.

8.11.4 Slide vehicles shall be maintained in operating condition, including but not limited to all handles or other holding devices, and conditions of vehicle surfaces in contact with the slide surface.

8.11.5 Slide vehicles should be removed from service for repair or replacement when components are missing or damage is detected, or both.

8.11.6 Slide vehicles shall be constructed to have a cushioning effect for riders who can come into contact with another vehicle during normal operation of the slide.

8.11.7 Slide vehicles shall float when used in a landing pool.

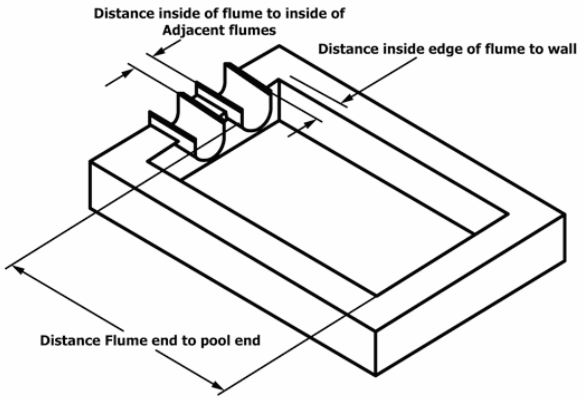

FIG. 4 Body Slide Landing Pool

9. Test and Inspection Methods

9.1 The manufacturer of a new slide or major modification to an existing slide shall specify prior to commissioning or re-certification, test or inspection procedures, or both, in compliance with Guide F846 and Practice F1193, including but not limited to the following.

9.2 *Operational Testing*—As specified in Guide F846, Section 7.

9.3 The manufacturer shall provide a written report to the owner/operator, which provides detail of the installation and operational test procedures, time and place of test, test results and supporting data, and identification of the person conducting the test.

9.4 *Special Testing*—In the event that a new or innovative product or method is used in the design, construction, or operation of a water slide that does not comply with Section 8, such a product shall be deemed acceptable as follows.

9.4.1 The manufacturer shall prepare a testing procedure, this procedure shall be designed to verify the performance of the slide that does not otherwise comply with Section 8 of this practice.

9.4.2 The test procedure shall include riders that represent the largest and the smallest body types that shall be allowed on the slide.

9.4.3 The test procedure shall be reviewed and approved by a third party consultant experienced and an expert in water slide operations.

10. Identification Marking

10.1 Installed water slides shall be identified in accordance with Practice F1193, Section 10.

11. Manufacturer Responsibilities

11.1 The following instructions outline requirements under Practice F770 as applicable to water slides and include requirements not specified in Practice F770 which are necessary and unique to water slides. Manufacturers are responsible for determining the following:

11.2 Water flow rate requirements for water slide operation and point at which water level in run outs or landing pools are benchmarked.

11.3 Maximum total passenger weight and maximum number of passengers per slide vehicle.

11.4 Recommended patron dispatch intervals.

11.5 Recommended warnings concerning forces and actions that could aggravate physical conditions such as heart conditions, pregnancy, neck and back conditions, and so forth.

11.6 Specifications for inspection, maintenance and repair of the slide that shall include, but not be limited to, the following:

11.6.1 A phone number or fax number to be used by the owner/operator to secure maintenance or operating assistance from the manufacturer.

11.6.2 Periodic minimum service and component inspection checklists.

11.6.3 Cleaning, waxing, repairing, and patching instructions to include recommended materials.

11.6.4 Description of the recommended, daily pre-opening inspection to be performed by slide attendants or maintenance personnel, or both, prior to daily operations should include but not be limited to:

11.6.4.1 Obstruction in the slide path,

11.6.4.2 Cracks, chips, or bubbles in the sliding surface,

11.6.4.3 Rough patch work at joints or cracks,

11.6.4.4 Leaking seals or joints,

11.6.4.5 Loose flume risers in turns,

11.6.4.6 Excessive movement of the flume,

11.6.4.7 Joint openings,

11.6.4.8 Signage placement,

11.6.4.9 Communication device functional,

11.6.4.10 Water flow rate in operating range,

11.6.4.11 Landing pool or run out water level in operating range,

11.6.4.12 Visual check of slide vehicles, and

11.6.4.13 Visual inspection of entrances, exits, stairways, and ramps.

12. Owner/Operator Responsibilities

12.1 As specified in Section 4 of Practice F770, the following instructions outline requirements as applicable to water slides and include requirements not specified in Practice F770 which are necessary and unique to water slides.

12.2 Each owner/operator shall have written operating procedures for the individual water slide, which are an integral part of their staff-training program. These procedures shall include but not be limited to:

12.2.1 Specific water slide operation policies and procedures with pertinent information from the manufacturer's instructions including dispatch procedures. Dispatch procedures shall be established for each water slide should include, but not be limited to, the following:

12.2.1.1 Informing each patron of the proper rider position.

12.2.1.2 Established dispatch time intervals for each water slide.

12.2.1.3 Established communication system between the slide attendant and lifeguard positioned at the landing pool or run-out section.

12.2.1.4 Limiting the number of patrons in the dispatch pool as required by the manufacturer specifications.

12.2.1.5 Established dispatch procedures shall be followed by slide attendants prior to dispatching each rider.

12.3 Verbal instructions, when required by the manufacturer, concerning water slide rules that shall be announced to patrons prior to each ride cycle. Pre-ride instructions may include, but not be limited to: the required position of hands and feet, rider conduct, exiting procedures, and other instructions deemed appropriate.

12.4 Signage shall be placed by the owner/operator as specified in Practice F770, subsection 4.3. For water slides, these signs shall include safety, warning, and instructional signage reflecting manufacturer recommendations. Signage shall be prominently displayed at the slide entrance or other appropriate area, or both, and shall include but not be limited to the following:

12.4.1 Instructions, which include:

12.4.1.1 Proper riding position,

12.4.1.2 Expected rider conduct,

12.4.1.3 Dispatch procedures,

12.4.1.4 Exiting procedures, and

12.4.1.5 Obey slide attendant/lifeguard instructions.

12.4.2 Warnings, which include:

12.4.2.1 Slide characteristics, such as descriptions of speed or attraction rating, and

12.4.2.2 Water depth of landing zone.

12.4.3 Requirements which include:

12.4.3.1 Riders being free of medical conditions, including but not limited to pregnancy and heart, back, or musculoskeletal problems,

12.4.3.2 Maximum/minimum height and weight, and

12.4.3.3 Any swimming or physical ability requirement, or both.

12.5 *Major Modifications*—As specified in Terminology F747, major modifications shall not occur without written approval from the manufacturer.

12.5.1 In the event the manufacturer does not provide written approval for a major modification, the owner/operator may retain a different manufacturer or designer/engineer to complete or approve the major modification, or both.

12.5.2 Testing shall be performed and documented in accordance with Guide F846 to verify the modification is acceptable as outlined in Section 9 of this practice.

12.6 The owner/operator shall maintain appropriate water quality in accordance with local requirements for bathing facilities.

12.7 *Inspection and Maintenance Program*—Based on the water slide manufacturer's recommendations, each owner shall implement a program of maintenance, testing, and inspection, providing for the duties and responsibilities necessary to care for the water slide, safety equipment, and the slide facilities.

12.7.1 Inspections shall be conducted in accordance with the procedures as specified in Practices F770 and F853.

12.8 Visual checks of safety signs, slide entry, flume, run out, landing pool, and structural components, water flow, landing pool water level, and run out water level shall be maintained according to the manufacturer's specifications.

13. Rider Responsibility

13.1 See Practice F770.

14. Keywords

14.1 construction; design; flume; manufacture; water slide

APPENDIXES

(Nonmandatory Information)

X1. ADDITIONAL DEFINITIONS

X1.1 *Definitions:*

X1.1.1 *closed flume* —flume that encloses the rider in a pipe-like cross-section.

X1.1.2 *fall distance* —vertical distance between the terminus of the slide surface and the water surface of the landing pool.

X1.1.3 *flow meter* —device used to measure the water flow for a water slide.

X1.1.4 *flume*—that part of the water slide that contains the rider(s) and defines the path of the water slide within which sliding takes place.

X1.1.5 *flume riser (splashguard)*—extension of the sidewall of an open flume to contain riders or water and is capable of use as a riding surface.

X1.1.6 *instructional signage*—signage displayed in public view prior to the entrance of the ride with information provided to the rider, which informs them of instructions for proper use, riding position, and expected rider behavior.

X1.1.7 *mat*—flexible sheet usually made of plastic or foam, suitable for use as a vehicle in a water slide flume to carry a rider.

X1.1.8 *open flume* —flume that does not completely encircle or enclose the rider.

X1.1.9 *rider*—any person who is in the act of entering the flume, using the flume, or getting off of the flume.

X1.1.10 *run-out section*—flume surface of a water slide where riders are intended to decelerate or come to a stop, or both.

X1.1.11 *slide attendant* —individual trained in facility and ride-specific operating and emergency procedures.

X1.1.12 *slide entry section*—that part of the water slide where riders enter the flume from the starting platform.

X1.1.13 *slide height* —difference in elevation from the centerline of the flume at the slide exit to the centerline of the flume at slide entry, measured at the riding surface.

X1.1.14 *slide path* —geometric layout of the flume sections that make up the water slide.

X1.1.15 *slide vehicle* —device intended for use on a water slide upon which the rider(s) sits or lays while sliding.

X1.1.16 *specialty vehicle*—proprietary vehicle sufficiently different from other vehicles designated by the slide manufacturer as suitable for use in a water slide.

X1.1.17 *starting platform*—deck structure, usually of separate construction from the water slide, from which a given water slide starts.

X1.1.18 *water flow* —water volume per unit time for a given water slide.

X1.1.19 *water slide* —see definition in Section 1.

X1.1.20 *water slide clearance envelope*—design clearance to minimize the opportunity for contact between the rider and other objects, outside of the flume, where said contact is likely to cause injury. See Figs. 1 and 2.

X1.1.21 *water slide system*—see definition in Section 1.

X1.1.22 *water slide tube*—inflated vehicle that floats in a stable fashion in a pool intended for rider use on water slides.

The vehicle may have a bottom or have a hole intended for seating and contains one or more riders as they ride in the flume; often called a raft, boat, or tube.

X2. COMMENTS

X2.1 Section 3.1, Terminology

X2.1.1 Many terms have a common accepted use in the water slide industry that is unique. This is to establish a basic common vocabulary as well as a basis for classification that differentiates design parameters. All terms in this practice are candidates for inclusion in Terminology F747.

X2.2 Section X1.1.20, Clearance Envelope

X2.2.1 Water slides are distinct from other amusement rides in that riders are not restrained and may assume unusual and arbitrary positions. Hence the methodology of assuming a statistical dimension of a body part restrained in a vehicular harness is not applicable to slide designs. Historically, manufacturers have set individual internal standards. The desire in this practice is to establish generally agreed upon values that have provided historically safe rides.

X2.3 Section 5.2, Support Materials

X2.3.1 Many materials have been used for water slide supports including: steel, concrete, wood, aluminum, and fiberglass reinforced plastics. Corrosion has proved the major issue for metal construction primarily for cosmetic concerns. With respect to corrosion of metals, maintenance has proved the most effective factor in minimizing occurrence. Requirements are left deliberately open and emphasize the performance issue of durability and strength.

X2.4 Section 7, Structural Design of Waterslides

X2.4.1 Fundamentally, water slides and related access structures should not be considered the same as buildings. Some loading conditions commonly accepted for buildings simply will not occur for water slides. Therefore, complete adherence to building codes requires unreasonable load combinations. The simplest example is loads from high winds. No water slide is operated during a storm. Water slides are not intended to provide the function of shelter. Section 8.13 of Practice F2291 recognizes this for amusement rides where operational loads are calculated with 34 mph wind.

X2.4.2 Some manufacturers depend on designs prepared for an example job for all jobs. Some use load-testing criteria. In Europe, TUV will perform tests on water slides using proof loads if calculations are not submitted.

X2.4.3 The intent here is to establish a commonly acceptable base standard for designs. If individual jurisdictions decide to require application of local building codes that is their right.

X2.4.4 Combinations of loads for design analysis or for determining test forces:

DL + WL + RL
DL + SL + LWL
DL + LWL
DL + RL + (RLWL)
DL + RL + OLL

X2.5 Section 9, Test and Inspection Methods

X2.5.1 Water slides are distinct from amusement rides in that they are mechanically very simple. The only moving component of a slide is the rider. Pumps and mechanical devices are separate and isolated from the rider. One could argue slides have no moving parts. Therefore, requirements for testing and inspection do not require the level of care common with machines. NDT testing of bearings, shafts, and moving parts is unnecessary. The requirements of Guide F846 are not applicable for the most part. Inspection/testing commonly occurs at three points in water slide manufacture: (*1*) material supply QA, (*2*) manufacture/fabrication QA, (*3*) installation, and (*4*) operation. The last has two aspects, one being verification of the structure often by engineers, and the other being the actual performance of the slide. The following has been modified from the basic Guide F846 requirements to reflect common practice.

X2.6 Section 9.4, Special Testing

X2.6.1 This section has been added to address concerns that many of the provisions of the performance section would inhibit or prevent innovation. A radical or new ride may introduce a safe feature that goes against requirements in this practice that are based on past experience. Demonstrating this with testing is an obvious solution. However, a higher degree of care and completeness in such testing is required compared to products that have dozens or hundreds of previous successful examples. The use of respected third party consultants is a normal part of water slide operations and management. Therefore, this provides a high level of confidence to verification tests of this type of slide.

X2.7 Section 13, Rider

X2.7.1 Responsibility is based on Section 5.x of Practice F770, as already accepted by F24.

SW7798

Date Submitted	12/9/2018	**Section**	454.1.6.1	**Proponent**	Mo Madani
Chapter	4	**Affects HVHZ**	No	**Attachments**	Yes

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Table 406.3 Plumbing

Summary of Modification

Incorporating Commission's declaratory statements as required by 553.73(7)(d), Florida Statutes. DS2018-040

Rationale

To clarify that the square footage of interactive water features are required to be considered when calculating the "size of pool" for purpose of determining the type and number of fixtures for sanitary facilities.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

There is no fiscal impact on the local entity relative to enforcement.

Impact to building and property owners relative to cost of compliance with code

There is no fiscal impact to building and property owners relative to the cost of compliance.

Impact to industry relative to the cost of compliance with code

There is no fiscal impact to industry relative to the cost of compliance.

Impact to small business relative to the cost of compliance with code

There is no fiscal impact to small business relative to the cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Has a reasonable and substantial connection with the health and safety and welfare of the general public - the code change clarifies the code

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Strengthens or improves the code by making the code requirements clearer to the user.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate against materials, products, methods, or systems of construction.
The proposed code change provides clarification to the code.

Does not degrade the effectiveness of the code

Does not degrade the effectiveness of the code.

The code change improves the effectiveness of the code by making it more clear.

Alternate Language

2nd Comment Period

7798-A5

Proponent Kari Hebrank **Submitted** 5/25/2019 **Attachments** Yes

Rationale

The Florida Swimming Pool believes this alternative language is a proper compromise to the original code proposal. A wading pool with an Interactive Water Feature doesn't necessarily create the need for additional sanitary facilities. Allowing the installation of a unisex bathroom when the combined pool size square footage exceeds the facilty threshold count is a better alternative.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The alternative language should reduce enforcement costs as a unisex bathroom will need to be inspected instead of separate facilities.

Impact to building and property owners relative to cost of compliance with code

The alternative language provides a cost-savings to building and property owners.

Impact to industry relative to the cost of compliance with code

The industry will receive a cost-savings by including a unisex bathroom rather than separate sanitary facilities.

Impact to Small Business relative to the cost of compliance with code

There is no fiscal impact to small business relative to the cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The alternative modification protects the health, safety and welfare of the public.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

The alternative language provides a better method and system of construction.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

The alternative language does not discriminate against products, methods or systems of construction.

Does not degrade the effectiveness of the code

The alternative language enhances the code by providing a logical, cost-effective alternative.

Alternate Language

2nd Comment Period

7798-A1

Proponent Jacqueline Feliciano **Submitted** 5/1/2019 **Attachments** Yes

Rationale

The inclusion of IWFs in the calculation of the “size of pool” is illogical and inconsistent with the Code’s purpose to promote health and safety. The the bathing load indicates the maximum number of persons allowed in the entire pool area, not just in the water. When calculating the bathing load, IWFs should not be included in such calculation if they accompany a conventional swimming pool on the same property—the “multiple pool” exception. As such, increasing the “size of pool” calculation to account for the square footage of an IWF serves no purpose and would have absolutely no beneficial impact because the inclusion of an IWF does not add to the bathing load, nor the number of persons permitted in the general pool area (which includes the IWF). Simply put, it is counterintuitive to require additional restroom fixtures when additional people will not be permitted to use such restrooms—the added restrooms would be rendered superfluous. There would be no benefit to the health and/or safety of the bathers, in direct contradiction of the purpose of the Code. We believe adding a unisex restroom would be a perfect compromise to any concern raised.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

When calculating the bathing load, IWFs are not to be included in such calculation if they accompany a conventional swimming pool on the same property—the “multiple pool” exception.

Impact to building and property owners relative to cost of compliance with code

Would create an increase in the cost of construction of the extra fixtures, increased utility costs, and increased water consumption by the property, yet would not provide any benefit to the health and/or safety of the bathers, in direct contradiction of the purpose of the Code.

Impact to industry relative to the cost of compliance with code

Would affect an entire project: building’s requirements for HVAC, plumbing, electrical, parking spaces, and green space impacted significantly. The foregoing are all needless expenses that would be borne by the owner of the pool, and ultimately by those persons who enjoy the use of same.

Impact to Small Business relative to the cost of compliance with code

There is no fiscal impact to small business relative to the cost of compliance.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Compromises by providing for a unisex bathroom, without the additional expense. Simply put, it is counterintuitive to require additional restroom fixtures when additional people will not be permitted to use such restrooms—the added restrooms would be rendered superfluous.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Provides better alternative.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate.

Does not degrade the effectiveness of the code

Does not degrade effectiveness of the code, rather strengthens.

1st Comment Period History

SW7798-G1

Proponent	Kari Hebrank	**Submitted**	2/13/2019	**Attachments**	No

Comment:

The Florida Swimming Pool Association is OPPOSED to this code modification.

1 Square Footage of Interactive Water Features are required to be included when calculating the "size of pool for the purposes of determining the type and number of fixtures for the sanitary facilities. For those facilities with an Interactive Water Feature in addition to the pool, causing the combined pool size square-footage to exceed the threshold required category fixture count, a unisex restroom may be installed to satisfy the fixture requirement for every additional 1,250 square feet or fraction thereof.

Language at the end of the footnote in table 454.1.6.1 should be modified to read:

In the event, the facility has an Interactive Water Feature in addition to the pool, causing the combined pool size square-footage to exceed the threshold required category fixture count, in unisex restroom may beinstalled to satisfy the fixture requirement for every additional 1,250 square feet or fraction thereof.

For example:

454.1.6.1.1 Required fixtures.

Fixtures shall be provided as indicated on Table 454.1.6.1. The fixture count on this chart is deemed to be adequate for the pool and pool deck area that is up to three times the area of the pool surface provided. When multiple fixture sets are required and separate facilities are provided for each sex, the fixtures used in ancillary family-style restrooms can be used to meet the requirements of this section. In the event, the facility has an Interactive Water Feature in addition to the pool, causing the combined pool size square-footage to exceed the threshold required category fixture count, in unisex restroom may beinstalled to satisfy the fixture requirement for every additional 1,250 square feet or fraction thereof.

Explanation:

When the amenity has a pool that is close to the threshold to go to the next level restroom fixtures, and a spa, Interactive Water Feature ("IWF"), or wade pool is going to put them over, the owner can provide a unisex restroom rather than additional fixtures. This would only be for pools that are on the threshold for the category square-footage, and the spa, IWF, or wade pool put them over.

FBC, Building

Revise table to add Note 1

TABLE 454.1.6.1

PUBLIC SWIMMING POOL—REQUIRED FIXTURE COUNT

(No change to the Table)

Note:

[1] Square Footage of Interactive water features are required to be included when calculating the "size of pool" for the purposes of determining the type and number of fixtures for the sanitary facilities.

FBC, Plumbing

Revise table to add Note 1

TABLE 406.3

PUBLIC SWIMMING POOL—REQUIRED FIXTURE COUNT

(No change to the Table)

Note:

[1] Square Footage of Interactive water features are required to be included when calculating the "size of pool" for the purposes of determining the type and number of fixtures for the sanitary facilities.

STATE OF FLORIDA
BUILDING COMMISSION

In the Matter of

G.B. COLLINS ENGINEERING, P.A.

DS 2018-040

Petitioner.
_____/

DECLARATORY STATEMENT

The foregoing proceeding came before the Florida Building Commission (Commission) by a Petition from Samuel A. Liberatore, for G.B. Collins Engineering, P.A. (Petitioner) that was received May 23, 2018. Based on the statements in the petition, the material subsequently submitted and the subsequent request by the Petitioner, the Commission states the following:

Findings of Fact

1. The petition is filed pursuant to, and must conform to the requirements of Rule 28-105.002, Florida Administrative Code.

2. Petitioner's representative in this matter is Samuel A. Liberatore, 300 Alternate 19 North, Suite A, Palm Harbor, FL 34683.

3. Petitioner is a professional design engineering company that is considering undertaking two projects, each of which would include a public swimming pool and interactive water features. The first project would feature a swimming pool with an area of 1,330 square feet, and an interactive water feature with an area of 1,256 square feet. The second project would feature a swimming pool with an area of 1,060 square feet, and an interactive water feature with an area of 2,490 square feet.

4. Petitioner seeks clarification of section 454.1.6.1.1, Florida Building Code, Building, 6th Edition (2017), as it pertains to the provision of sanitary facilities for the projects in question.

5. Specifically, the Petitioner requests an answer to the following question based upon the projects described within the petition for declaratory statement:

> For the prospective projects, should the proposed interactive water features be considered when calculating the "size of pool" for the purpose of determining the type and number of fixtures for sanitary facilities at the accompanying public swimming pools?

Conclusions of Law

6. The Commission has the specific statutory authority pursuant to Section 553.775(3)(a), Florida Statutes (2018) to interpret the provisions of the Florida Building Code by issuing a declaratory statement.

7. Section 454.1, Florida Building Code, Building, 6th Edition (2017), states:

> **Public swimming pools and bathing places.**
> Public swimming pools and bathing places shall comply with the design and construction standards of this section.
>
> **Exceptions:**
> 1. A portable pool used exclusively for providing swimming lessons or related instruction in support of an established educational program sponsored or provided by a school district may not be regulated as a public pool. Such pool shall be regulated as a private swimming pool under Section 454.2.
> 2. A temporary pool may not be regulated as a public pool. Such pool shall be regulated as a private swimming pool under Section 454.2.

8. Section 454.1.1, Florida Building Code, Building, 6th Edition (2017), states:

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

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

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

...

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

...

A **"public swimming pool" or "public pool"** means a watertight structure of concrete, masonry, or other approved materials which is located either indoors or outdoors, used for bathing or swimming by humans, and filled with a filtered and disinfected water supply, together with buildings, appurtenances, and equipment used in connection therewith. A public swimming pool or public pool shall mean a conventional pool, spa-type pool, wading pool, special purpose pool, interactive water feature or water recreation attraction, to which admission may be gained with or without payment of a fee and includes, but is not limited to, pools operated by or serving camps, churches, cities, counties, day care centers, group home facilities for eight or more clients, health spas, institutions, parks, state agencies, schools, subdivisions, or the cooperative living-type projects of five or more living units, such as apartments, boardinghouses, hotels, mobile home parks, motels, recreational vehicle parks, and townhouses. The term does not include a swimming pool located on the grounds of a private residence.

...
"Spa pool" means a pool used in conjunction with high-velocity air or water.
...
"Wading pool" means a shallow pool designed to be used by children.
"Water recreation attraction" means a facility with design and operational features that provide patron recreational activity and purposefully involves immersion of the body partially or totally in the water. Water recreation attractions include water slides, river rides, water course rides, water activity pools, interactive water features, wave pools and any additional pool within the boundaries of the attraction.
"Water activity pool" means a water recreation attraction which has water-related activities such as rope ladders, rope swings, cargo nets and other similar activities.

(underscore provided).

9. Section 454.1.1.1, Florida Building Code, Building, 6th Edition (2017), states:

Sizing.
The bathing load for conventional swimming pools, wading pools, interactive water features, water activity pools less than 24 inches (610 mm) deep and special purpose pools shall be computed on the basis of one person per 5 gpm (0.32 L/s) of recirculation flow. The bathing load for spa type pools shall be based on one person per each 10 square feet (0.9 m^2) of surface area. The filtration system for swimming pools shall be capable of meeting all other requirements of these rules while providing a flow rate of at least 1 gpm (0.06 L/s) for each living unit at transient facilities and $^3/_4$ gpm (0.04 L/s) at nontransient facilities. Recreational vehicle sites, campsites and boat slips designated for live-aboards shall be considered a transient living unit. For properties with multiple pools, this requirement includes the cumulative total gpm of all swimming pools, excluding spas, wading pools and interactive water features. All other types of projects shall be sized according to the anticipated bathing load and proposed uses. For the purpose of determining minimum pool size only, the pool turnover period used cannot be less than 3 hours.

10. Section 454.1.6, Florida Building Code, Building, 6th Edition (2017), states:

Sanitary facilities.
Public swimming pools and bathing places shall comply with the

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

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

TABLE 454.1.6.1
PUBLIC SWIMMING POOL—REQUIRED FIXTURE COUNT

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

For SI: 1 square foot = 0.0929 m².

11. Section 454.1.6.1.1, Florida Building Code, Building, 6th Edition (2017), states:

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

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

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

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

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

An additional set of fixtures shall be provided in the men's restroom for every 7,500 square feet (697 m^2) or major fraction thereof for pools greater than 10,000 square feet (929 m^2).

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

Lavatory counts shall be equal.

12. Section 403.6, Florida Building Code, Plumbing, 6th Edition (2017), states:

Sanitary facilities for public swimming pools.
Swimming pools with a bathing load of 20 persons or less may utilize a unisex restroom. Pools with bathing loads of 40 persons or less may utilize two unisex restrooms or meet the requirement of Table 403.6. Unisex restrooms shall meet all the requirements for materials, drainage and signage as indicated in Sections 454.1.6.1.1 through 454.1.6.1.4 of the Florida Building Code, Building. Each shall include a water closet, a diaper change table, a urinal, and a lavatory. Pools with a bathing load larger than 40 persons shall provide separate sanitary facilities labeled for each sex. The entry doors of all restrooms shall be located within a 200-foot (60 960 mm) walking distance of the nearest water's edge of each pool served by the facilities.

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

13. Section 403.6.1, Florida Building Code, Plumbing, 6th Edition (2017), states:

> **Required fixtures.**
> Fixtures shall be provided as indicated on Table 403.6. The fixture count of Table 403.6 is deemed to be adequate for the pool and pool deck area that is up to three times the area of the pool surface provided. An additional set of fixtures shall be provided in the men's restroom for every 7,500 square feet or major fraction thereof for pools greater than 10,000 square feet. Women's restrooms shall have a ratio of three to two water closets provided for women as the combined total of water closets and urinals provided for men. Lavatory counts shall be equal.

14. Table 403.6, Florida Building Code, Plumbing, 6th Edition (2017), states:

TABLE 403.6
PUBLIC SWIMMING POOL - REQUIRED FIXTURES COUNT

SIZE (square feet)	MEN'S RESTROOMS			WOMEN'S RESTROOMS	
	Urinals	WC	Lavatory	WC	Lavatory
0 - 2500 sq ft	1	1	1	1	1
2501 - 5000 sq ft	2	1	1	5	1
5001 - 7500 sq ft	2	2	2	6	2
7501 - 10,000 sq ft	3	2	3	8	3

For SI: 1 square foot = 0.0929 m².

15. In response to Petitioner's question, the answer is yes. Pursuant to section 454.1.6.1.1 and table 454.1.6.1, Florida Building Code, Building, 6th Edition (2017), and section 403.6 and table 403.6 Florida Building Code, Plumbing, 6th Edition (2017), the size of the proposed interactive water features is required to be included when calculating the "size of pool" for the purpose of determining the type and number of fixtures for the sanitary facilities for the projects in question.

DONE AND ORDERED this 21st day of August, 2018, in Punta Gorda, Charlotte County, State of Florida.

E. JAY CARLSON
Chairman, Florida Building Commission

NOTICE OF RIGHT TO APPEAL

Petitioner and all other interested parties are hereby advised of their right to seek judicial review of this Order in accordance with Section 120.68(2)(a), Florida Statutes (2018), and Florida Rules of Appellate Procedure 9.110(a) and 9.030(b)(1)(C). To initiate an appeal, a Notice of Appeal must be filed with the Agency Clerk, Department of Business and Professional Regulation, 2601 Blair Stone Road, Tallahassee, Florida 32399-2203 and with the appropriate District Court of Appeal not later than thirty (30) days after this Order is filed with the Clerk of the Department of Business and Professional Regulation. A Notice of Appeal filed with the District Court of Appeal shall be accompanied by the filing fee specified by Section 35.22(3), Florida Statutes (2018).

CERTIFICATE OF FILING AND SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing order has been filed with the undersigned and furnished by U. S. Mail to the persons listed below this 28th day of August, 2018.

Brandon M. Nichols

Agency Clerk's Office
Department of Business and Professional Regulation
& Florida Building Commission
2601 Blair Stone Road
Tallahassee, Florida 32399-2203

Via U.S. Mail

G.B. Collins Engineering, P.A.
Attn: Samuel A. Liberatore
300 Alternate 19 North, Suite A
Palm Harbor, FL 34683

Anthony Tilton
113 S. Monroe Street
Tallahassee, FL 32301

Via Inter-Office or Email Delivery

Mo Madani, Planning Manager
Codes and Standards Section
Department of Business and Professional Regulation
2601 Blair Stone Road
Tallahassee, Florida 32399
Mo.Madani@myfloridalicense.com

Marjorie Holladay
Joint Administrative Procedures Committee
Pepper Building, Room 680
Tallahassee, Florida 32399-1300

SW7851

Date Submitted	12/10/2018	**Section**	454.1.1	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Summary of Modification

Clarifies the definition of a collector tank for a commercial pool.

Rationale

FDOH inspectors have been interpreting this definition to mean the tank vent must be 2.25 sf in area, which is incorrect. This mod clarifies the definition and will help avoid the misinterpretation.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None.

Impact to building and property owners relative to cost of compliance with code

The misinterpretation makes the tanks more expensive, so this clarification will reduce the cost of the tanks slightly.

Impact to industry relative to the cost of compliance with code

The misinterpretation makes the tanks more expensive, so this clarification will reduce the cost of the tanks slightly.

Impact to small business relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Does not change the manner in which the tank operates, which is already the safest way to avoid entrapment in swimming pools.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Clarifies the definition and reduces confusion between FDOH, engineers, manufacturers, and builders.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No.

Does not degrade the effectiveness of the code

No.

Alternate Language

2nd Comment Period

7851-A2

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** Yes

Rationale

To clarify futher the mod submittal so as to allow other animal excluders besides screen, and to specify the installed vent is made of piping.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

None, or cheaper

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, several types of animal excluders available

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, allows alternatives, and specifies piping

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does Not

Does not degrade the effectiveness of the code

Does Not

Alternate Language

2nd Comment Period

7851-A1

Proponent James LePetrie **Submitted** 5/17/2019 **Attachments** Yes

Rationale

See previous rationale.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Minimal.

Impact to industry relative to the cost of compliance with code

Minimal.

Impact to Small Business relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Does not change the manner in which the tank operates.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Clarifies the definition and reduces confusion between FDOH, engineers, manufacturers, and builders.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

1st Comment Period History

SW7851-G1

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

Approving this modification could lead to collector tanks installed with sealed covers on vented with only small two-inch to four-inch vent pipes (or any size since the minimum vent pipe size is not proposed). Request the applicant specify in greater detail for the code other details for long-term functionality. Otherwise, this design is a step backwards, and undermines the overall design and intent of a collector tank. This modification would make it more difficult for building officials to understand the intent of the building code. Florida has a long history with main drain vent lines, first used on direct suction main drains for spas to avoid entrapment accidents. Inspections have revealed that overtime, those vent lines can be intentionally and unintentionally capped, abandoned, filled and plugged by animal nests. Without additional details and appropriate size and materials for collector tank vents, these issues could be repeated.

"Collector tank" means a reservoir, with a minimum of 2.25 square feet (0.2 m2) water surface area, that is vented **by piping** and/or open to the atmosphere, from which the recirculation or feature pump takes suction, which receives the gravity flow from the main drain line and surface overflow system or feature water source line, and that is cleanable. The vent shall measure a minimum of 12.56 square inches in area and shall be equipped with a screen**, or equivalent device,** to prohibit entry by animals. Vent shall be designed to minimize rain water entry into the tank. Tanks with vented lids shall not be required to be equipped with a separate vent.

"Collector tank" means a reservoir, with a minimum of 2.25 square feet (0.2 m2) water surface area, that is vented and/or open to the atmosphere, from which the recirculation or feature pump takes suction, which receives the gravity flow from the main drain line and surface overflow system or feature water source line, and that is cleanable. The vent shall measure a minimum of 12.56 square inches in area and shall be equipped with a screen to prohibit entry by animals. Vent shall be designed to minimize rain water entry into the tank. Tanks with vented lids shall not be required to be equipped with a separate vent.

"Collector tank" means a reservoir, with a minimum of 2.25 square feet (0.2 m2) water surface area, that is vented and/or

open to the atmosphere, from which the recirculation or feature pump takes suction, which receives the gravity flow from the main drain line and surface overflow system or feature water source line, and that is cleanable.

SW7900

Date Submitted	12/11/2018	**Section**	454.1.2.1	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments Yes

Alternate Language Yes

Related Modifications

Summary of Modification

Requires the design of swimming pools to meet currently accepted standards for concrete construction.

Rationale

Building Code Requirements for Structural Concrete (ACI 318-05) and Commentary (ACI 318R-05) specifies a minimum steel-to-concrete ratio of 0.2%. Many swimming pools in Florida are being designed using #3 bars at 12” centers which does not meet this requirement. #3 bars can also deform when pneumatically applied concrete methods are employed.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

There would be a negligible increase in material cost for #4 bars versus #3 bars.

Impact to industry relative to the cost of compliance with code

None

Impact to small business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Shells utilizing #3 bars at 12" centers do not meet ACI standards for steel-to-concrete ratio, making the pool shell weaker than if it were properly designed. #3
bars are more likely to deform and vibrate during shotcrete/gunite shooting.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Provides a construction requirement that would lead to a higher quality pool shell.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Alternate Language

2nd Comment Period

7900-A1

Proponent James LePetrie **Submitted** 5/17/2019 **Attachments** Yes

Rationale

Better defines standards to be used for design and construction of concrete pools. Clarifies that concrete pools shall be designed and constructed as reinforced concrete structures.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Negligible increase in the cost of construction.

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Helps to ensure against potential cracking of concrete pool shells.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Ensures that a higher quality shell is constructed for commercial pools.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

2nd Comment Period

SW7900-G2

Proponent Samuel Liberatore **Submitted** 4/12/2019 **Attachments** Yes

Comment:

Based on the technical support provide, and responses from several commercial pool contractors, GCE is opposed to this code change. GCE is requesting Item SW 7900 be eliminated from the FBC 2020 code modifications, and request the Commission not allow this item to be approved.

2nd Comment Period

SW7900-G3

Proponent James LePetrie **Submitted** 5/17/2019 **Attachments** Yes

Comment:

It is our understanding that this proposed code modification has generated concern among designers and contractors who disagree with the proposed language. We have consulted with a structural engineer (not an aquatics engineer) who has stated that the use of #3 rebar at 12" centers does not meet any ACI standard for a 6" thick concrete pool shell with regard to steel to concrete ratio. In our experience, many contractors are aware of this but continue to use this specification anyway. We do not understand why some designers and contractors are not willing to follow nationally accepted standards for concrete construction when designing or building commercial pools. We believe this reflects very poorly on our industry, especially if certain industry groups also disagree with the proposed language. Using this deficient steel specification since it is easier to bend #3 bars in the field than #4 bars is not an adequate reason to continue to use the specification. In addition, if designers and contractors wish to continue to use #3 bars, they may do so and comply with the standards if 10" spacing is used. A technical article from the industry is attached that provides additional information backing up the proposed code modification.

2nd Comment Period

SW7900-G4

Proponent Kari Hebrank **Submitted** 5/25/2019 **Attachments** Yes

Comment:

y, the Florida Swimming Pool Association (FSPA) supported this code modification out of professional courtesy; however, upon further review and evaluation, the FSPA is now OPPOSED to SW 7900 code modification for a couple of reasons as most eloquently articulated by Kimes Engineering & Management Services in the attached file. The ACI standard referenced is not the most current standard. Additionally, we believe that the project and design engineer are better suited to determining the most accurate standard for the steel bar, whether a #3 or #4 should be utilized based on site-specific design, soil type, depth of the pool shell, and site conditions. There are also concerns relating to unnecessary increased costs for a #4 bar when a less-costly #3 bar is adequate for the specific project. Engineers should be able to design the concrete pools and apply the correct ACI standards without mandating a specific standard in all cases as designs, soil types, conditions and pool depths vary. For example, soil-supported slabs would not be appropriate for this standard.

1st Comment Period History

SW7900-G1

Proponent Kari Hebrank **Submitted** 2/13/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

Pools shall be constructed of concrete or other impervious and structurally rigid material. Concrete pools shall be designed and constructed as reinforced concrete structures in accordance with American Concrete Institute (ACI) 318-latest, “Building Code Requirements for Structural Concrete and Commentary" and/or ACI 350-latest, "Code Requirements for Environmental Engineering Concrete Structures."

Pools shall be constructed of concrete or other impervious and structurally rigid material. Concrete pools shall be designed and constructed in accordance with American Concrete Institute 318, "Building Code Requirements for Structural Concrete and Commentary."

REMAINING TEXT UNCHANGED

National Pools Since 1972

MAILING ADDRESS: P.O. BOX 1038 - PORT RICHEY FL 34673
PHYSICAL LOCATION: 10208 SCENIC DRIVE - PORT RICHEY FL 34668
PHONE: (727) 868-5504 FAX: (727) 863-4119
WEBSITE: WWW.NATIONALPOOLS.NET
STATE CERTIFIED: CPC1457034

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pools, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Maurice F. Weisberg Jr.
President
National Pools of Pasco, Inc.
CPC1457034

UPSA UNITED POOL & SPA ASSOCIATION

MEMBER FSPA Florida Swimming Pool Association

Landmark Pools
INCORPORATED

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
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This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Bartley S.C. O'Connell
CPC-1459121
CEO
Landmark Pools, Inc.

13253 Byrd Dr. • Odessa, FL 33556 • www.landmarkpools.com • (813) 792-1331 • Fax (813) 792-5277

MEMBER NATIONAL SPA & POOL INSTITUTE

ELITE WEILER POOLS
SINCE 1984

640 Apex Rd.
Sarasota, FL 34240
T: (941) 343-9001
F: (941) 343-9007
www.EliteWeiler.com

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
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This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

John D Kennedy Contractor/Owner
Elite Weiler Pools, Inc.
License # CPC 045946
License # CVC 56772

EXECUTIVE POOLS INC.

commercial & municipal construction

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

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This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Art Stitzel
VP

317 West Highland Drive • Lakeland, Florida 33813
Phone: 863.619.2221 • Fax: 863.607.4550 • State Certified #CPC056954

Curtis Pools Since 1956 MASTER POOLS GUILD

State License No. CPC1456828

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
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Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pools, and how pools are constructed. #3 bar is most commonly used throughout the industry and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Randall W. Pickelmann Jr.
President.
CPC1456828

150 Commerce Drive North, Largo, Florida 33770
Telephone (727) 559-7946 • Facsimile (727) 584-5756 • www.curtispools.com

davenport post pools

3090 WINTER LAKE ROAD
LAKELAND, FLORIDA 33803-9711
LAKELAND: 863.665.4952
FAX: 863.666.2559
E-Mail: dppools@tampabay.rr.com

ESTABLISHED 1977
STATE CERTIFIED CONTRACTORS: CPC 011101 & CPC 056895

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction and make much more difficult to shape.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Rod Post, V.P.

Rod Post, Vice President – Davenport Post Pools

Clear-Tech Pools
8045 46th Ave N.
Saint Petersburg, FL 33709
727-347-6770
dtilney@cleartechpools.com

4/1/2019

Doug Tilney
Clear Tech Pools
Saint Petersburg, FL 33709

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
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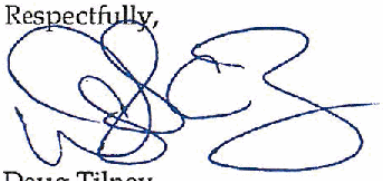
This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,



Doug Tilney
Clear Tech Pools
State Licensed Commercial Pool Contractor
CPC 1457980

Aqua-Man Pools

Thursday, April 4, 2019

OPPOSITION LETTER

Submitted to: Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Dave Graham/CPC # 1456764
CBC # 1253942

9660 49th Way • Pinellas Park, FL 33782 • Phone: 727.482.0000 • aquamanpools@yahoo.com

FLEISCHMANGARCIA
ARCHITECTURE | PLANNING | INTERIOR DESIGN

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

FleischmanGarcia **Architecture • Planning • Interior Design**

Sol J. Fleischman, Jr., A.I.A.
Chief Executive Officer

324 Hyde Park Avenue • Suite 300 • Tampa, Florida 33606 • 813.251.4400 • Fax 813.251.1994
195 4th Avenue, North • Safety Harbor, Florida 34695 • 727.725.8880 • 727.725.3900
5967 Cattlemen Lane • Suite 6 • Sarasota, Florida 34232 • 941.342.9293 • Fax 941.342.9253

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Jordan Hidalgo

Jordan Hidalgo
CPC1458569

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

ROBERT SICIGNANO
CPC1457671

April 2, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to directly oppose the proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding item # SW 7900, and elimination of #3 bar in commercial swimming pools.

This modification directly impacts commercial pool, and how pools are constructed. #3 bar is frequently used throughout the industry, and elimination of #3 bar would greatly inflate the cost of pool construction.

I'm requesting the Commission reject modification SW 7900 and deny its approval.

Respectfully,

Robert Grosso
813-927-0825
CPC # 1456781

A-BETTER POOL
Bob Grosso
(813) 927-0825
www.a-betterpool.com
abetterpool@outlook.com

April 11, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Proposed 2020 code changes to Florida Building Code 454.1

Dear Mr. Madoni:

I am sending you this letter regarding concerns of proposed changes to the FBC 454.1 - Public Swimming Pool and Bathing Places. My main concerns are that of # SW 7900 and #SW 7922.

Before I address my concerns of these proposed changes, I would like to qualify Pinellas Pools as to the industry and trade of swimming pool construction. Pinellas Pools has engaged in the aspect of new construction and major remodeling of both residential and commercial swimming pools since 1960. Pinellas Pools has respectively spent its many years of business in Florida, however our trade has taken us out of state as well as the Bahamas. As family owned and operated business with almost 60 years in the trade, we have constructed a lifetime amount of Residential and Commercial Swimming Pools, Water Parks, Mosque Domes, Municipal storm water drainage and concrete rehabilitation projects. With regards to pool construction, since 1994 we have exclusively only engaged in commercial pool projects.

With regards to proposed change # SW 7900. We have constructed a lifetime of swimming pools using 3/8 rebar in everything from wading pools to competition pools up to 12' depth with no structural failure. Often times with the intricate detail of designs, many on site bends are necessary and readily completed. The use of #4 or # 5 would constitute the use of very costly machine pre-bents as well as the substantial cost increase of the steel and labor itself. With all due respect, structural failures I have personally seen in my forty years of pool construction have resulted due to concrete shell thickness, poor mix designs & application, poor soil conditions, etc. ,none of which using a different steel schedule would have prevented. From an estimating stand point, specifications requiring the use of a heavier steel schedule, do add a significant cost to the shell construction.

With regards to proposed change # SW7922. Allowing this change would in my opinion would drastically change the whole dynamics of the reason for a gutter system design that has been used for decades. Given the fact that Florida is such a high transient state with guest and vacationers and often times heavy usage in public facilities, coupled the high awareness and

importance of skin protection, the displacement of body oils and sunscreen oils is drastically increased. With increased use of skimmers on larger pools, this would only increase oil residue remaining in the bathing area due to the lack of skimming action to remove.

Understanding and installing a gravity system is something of extreme importance and must be installed by highly trained and experienced personnel. I clearly remember when the use of skimmers were first allowed in 800 sq. ft pools and then 1000 sq.ft pools made every residential pool contractor a commercial pool contractor simply by upgrading one's license thus resulting in plumbing complications. With implementing a change of this nature and only to be eventually being allowed on all pools, would ultimately result in adverse complications.

In closing, I would appreciate your consideration to reject # SW7900 and #SW7922 and deny approval.

Respectfully,

William W. Hooper
Pinellas Pools Inc.
CPCO57118

GCE – AQUATIC ENGINEERS

GARDNER B. COLLINS - FOUNDED 1972
DBA - G.B. COLLINS ENGINEERING PA

April 12, 2019

Mr. Mo Madoni
Florida Building Code Manager
Florida Department of Building Regulations
2601 Blair Stone Rd
Tallahassee, FL 32399

Re: Opposition to proposed code changes to 454.1 FBC (2020 code cycle)
Modification # SW 7900 – Building Code Requirements for Structural Concrete

Dear Mr. Madoni:

I'm writing this letter to inform you I was recently notified regarding a proposed modification to the Florida Building Code (FBC) section 454.1 – Commercial Swimming Pool, regarding structural concrete and the steel-to-concrete ratio, and elimination of #3 bar in commercial swimming pools. The modification states, #3 bar will make the shells weaker, and do not meet the ACI standards.

Gardner Collins Engineering PA (GCE) greatly disagrees with this proposed modification, and believes the reasoning for this is misleading, and inaccurate. The intent of this modification is personal preference for design standards and is a direct conflict to how GCE designs commercial pools.

GCE has been engineering swimming pools since the early 1970's, and has designed pools with #3 bar for decades. GCE sees no reason to modify the code for preferential standards. Provided are our design calculations, and reasoning to prove this modification should not be made. GCE designs approximately 100 to 200 commercial pools a year, and a large percentage of the pools are designed using #3 bar as described in the modification.

GCE is opposed to this code change, and we are requesting Item SW 7900 be eliminated from the FBC 2020 code modifications, and request the Commission not allow this item to be approved.

Certificate of Authorization #27934
300 Alt. 19, Suite A
Palm Harbor, Florida 34683
Tel: (727) 442-8443 Fax: (727) 442-6988
gb_collins@verizon.net

GCE – AQUATIC ENGINEERS

GARDNER B. COLLINS – FOUNDED 1972
DBA – G.B. COLLINS ENGINEERING PA

Technical Support:

It was stated, #3 bar at 12" on-center does not meet the ACI (American Concrete Institute) 318-05 and Commentary 318R-05 standards specifying the steel-to-concrete ratio of 0.2%.

1. Inaccurate Code Reference-
   Current building code requirements for Structural Concrete are ACI 318-14 and Commentary ACI 318R-14. Any reference to previous standards should be disregarded or should reference the latest ACI standards.

2. Requiring Commercial Swimming Pools to meet ACI standards-
   ACI 318-14 standards are a 10-part technical document with 27 chapters detailing specific structural formulas for concrete design, to calculate: sectional strengths, reinforcement, structural analysis, wall design, beam design, anchoring, connections and joints, earthquake resistance, material durability.

   The ACI provides a variety of construction applications for concrete with steel reinforcement, but is not specific to swimming pools. Data for concrete design is extracted from the ACI to provide a bases for engineers to derive technical data for structural design. Most engineers utilize ACI as a design reference, but many design references in ACI are from ASCE/SEI 7, and ASTM. Additionally, there are several other technical documents that can be referenced for commercial pool design including Walker Publications, Portland Cement Association (PCA) Concrete Masonry Construction. All these books are reference material to construct commercial swimming pools.

   ACI reference rebar as "stirrups", and pool steel is not technically a "structural panel open spanning between beam supports". I don't believe the FBC should reference one specific standard for pool design. Commercial pools design is unique, and do not match the exact reinforcement requirements. An engineer should have the ability to design the pool with standards he is confident in, and ultimately stand by them, weather they are ACI or not. The pool engineer is ultimately responsible, and liable, for his own calculations and design.

Certificate of Authorization #27934
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Palm Harbor, Florida 34683
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GCE – AQUATIC ENGINEERS

GARDNER B. COLLINS – FOUNDED 1972
DBA – G.B. COLLINS ENGINEERING PA

3. Design Calculations-
Included with this report is GCE's design calculations for a swimming pool using #3 bar, 12" on-center each way. Our analysis and design criteria are based on calculating the service loads for lateral soil pressure, wall forces, and hydrostatic loads. Also, the rebar was designed for the middle or equal of each face, in pool wall at inward soil pressure before restrained at top and the pool filled. Only wall flexural capacities for sections under tensional-control were calculated, and the slabs flexural and axial loads where calculated. (Refer to attached design calculations).

Based on the ACI 318 Strength and Serviceability Formulas provided in standards, and the flexure capacity calculation, #3 bar, spaced 12" on center with 3,000 psi concrete, will satisfy the design shear and momently fractural and axial compression.

This calculation rebuts proposed modification.

4. Steel-to-Concrete Ratio-
As previously stated, ACI is a technical reference manual that provides 27 chapters of design calculations to analyze the tensile and compressional forces and loads on concrete and steel, but is not specific to pool shells, or belong grade conditions. The ACI steel-to-concrete ratio is not specifying proper concrete installation for pools, but for structural conditions.

Even if we were to calculate the ratio, I believe the percent steel in our 6"x12" cross section area meets the minimum steel-to-concrete ratio and is adequate. It provides 0.31% (3/8" rebar cross section area = 0.1104 in sq. x 2 = 0.2209 in sq./ (6x12) = 0.0031 or 0.31%). There are at least 2-12" long bars per sq. foot of shell. Also: 6x12x12=864 cu. in. concrete and 0.1104 x 24 = 2.6496 cu. In. = 0.31% ratio). This is equivalent to the standard home footing size in chapter 3, of the FBC. A 10" x 20" section with (2) #3 bars = (1) #5 bar. Our pool area section with #3 bar, slab on grade, is the same as a footing with #5 bar.

To base the code modification on a steel-to-concrete ratio, is not providing accurate design analysis for pool shell construction and should not be marginalize into one factor. Pool shell design should be entrusted in the design engineer and technical documentation needs to support their design.

Certificate of Authorization #27934
300 Alt. 19, Suite A
Palm Harbor, Florida 34683
Tel: (727) 442-8443 Fax: (727) 442-6988
gb_collins@verizon.net

GCE – AQUATIC ENGINEERS

GARDNER B. COLLINS – FOUNDED 1972
DBA – G.B. COLLINS ENGINEERING PA

5. Higher Quality Material-
   Implying #3 bar is a lesser or weaker construction material than #4 bar is also a falsity, because either material can be replaced with the other. GCE has often specified #4 bar for a specific application, but have been asked to substitute #3 bar and provide "double-the-steel", by either constructing two (2) mats of steel with thicker concrete or making the #3 bar, 6" on-center rather than #4 bar, 12" on-center. A higher quality of pool shell is not based on the steel, but how it is designed. There is no benefit designing a pool shell with #4 bar vs. #3 bar, the design can always be altered to provide the same result.

   Otherwise, why wouldn't we specify a higher-grade steel than #4 bar? Why don't we build pools with 12" thick concrete vs. 6" thick concrete shells? ACI design calculations do not limit us to a specific steel size, and can be designed with any size steel. It's a preference and should not be a design requirement. To presume #4 is a higher quality material would be misleading based on industry and construction standards. The cliental GCE works with prefer using #3 bar over #4 bar, because it is less expensive, easier to work with, and readily available. #4 bar needs to be manufactured in order to be bent. This can delay construction and inflate costs by 10% to 20%.

Based on the technical support listed above, GCE is opposed to this code change, and we are requesting Item SW 7900 be eliminated from the FBC 2020 code modifications, and request the Commission not allow this item to be approved.

Sincerely,
G.B. Collins Engineering PA

Samuel A. Liberatore

Samuel A. Liberatore, P.E.
President

Enc.

CC: Florida Swimming Pool TAC committee
FSPA

Certificate of Authorization #27934
300 Alt. 19, Suite A
Palm Harbor, Florida 34683
Tel: (727) 442-8443 Fax: (727) 442-6988
gb_collins@verizon.net

GARDNER COLLINS ENGINEERING, PA

PROJECT :
CLIENT :
JOB NO. :

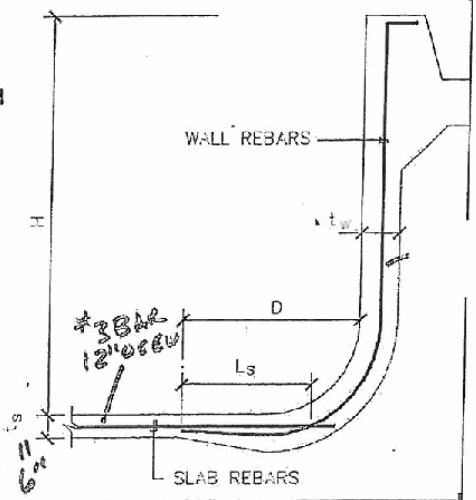
DATE : 1/15/2015

PAGE : 1
DESIGN BY : SAL
REVIEW BY : SAL

Concrete Pool Design Based on ACI 318-14

INPUT DATA & DESIGN SUMMARY

CONCRETE STRENGTH	f_c'	=	3	ksi	~3000psi
REBAR YIELD STRESS	f_y	=	60	ksi	
LATERAL SOIL PRESSURE	P_a	=	45	pcf	← CONFIRM
(equivalent fluid pressure)					
BACKFILL WEIGHT	γ_b	=	110	pcf	
SURCHARGE WEIGHT	w_s	=	50	psf	
SEISMIC GROUND SHAKING	P_E	=	20	psf /ft, ASD	
(soil pressure, if no report $3S_{DS}$ suggested.)					
POOL DEPTH	H	=	5	ft	
THICKNESS OF WALL	t_w	=	8	in	
THICKNESS OF SLAB	t_s	=	6	In	
SLAB REBARS	#	3	@	12	In o.c. at mid
WALL BAR LOCATION (1=at middle, 2=at each face)				1	at middle
LAP LENGTH	L_s	=	15	In	
SLAB THICKER DISTANCE	D	=	2	ft	[THE W



ANALYSIS

DESIGN CRITERIA

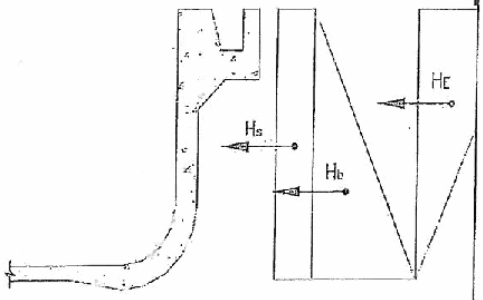
1. THE CRITERICAL DESIGN, FOR REBAR AT MIDDLE OR EQUAL OF EACH FACE, IS POOL WALL AT INWARD SOIL PRESSURE BEFORE RESTRAINED AT TOP AND POOL FILLED.
2. SINCE THE WALL AXIAL LOAD SMALL AND SECTIONS UNDER TENSION-CONTROLLED (ACI 318-14 21.2.2), ONLY CHECK WALL FLEXURAL CAPACITIES ARE ADEQUATE.
3. SINCE THE SLAB AT FLEXURAL & AXIAL LOADS, THE COMBINED CAPACITY OF FLEXURAL & AXIAL MUST BE CHECKED.

SERVICE LOADS ✓ Confirm

$H_b = 0.5\, P_a (H + t_s)^2$ = 0.68 kips / ft

$H_s = w_s P_a (H + t_s) / \gamma_b$ = 0.11 kips / ft

$H_E = 0.5\, P_E (H + t_s)^2$ = 0.30 kips / ft



FACTORED LOADS

$\gamma H_b = 1.6\, H_b$ = 1.09 kips / ft

$\gamma H_s = 1.6\, H_s$ = 0.18 kips / ft

$\gamma H_E = 1.6\, H_E$ = 0.48 kips / ft

CHECK WALL FLEXURE CAPACITY (ACI 318-14 13.2, 7.6, 7.7, 24.4.3, & 25.4.2)

$M_u = (0.5\gamma H_s + 0.33\gamma H_b + 0.67\gamma H_E) H$ = 3.88 ft-kip

P_u = 1.11 kips / ft, (concrete wall self weight)

d = 4.00 in, b = 12 in, A_s = 0.24 in^2 / ft

$\phi M_n = \phi \left[A_s f_y \left(d - \frac{A_s f_y - P_u}{1.7 b f_c'} \right) \right]$

= 4.09 ft-kips / ft > M_u [Satisfactory] ✓

ρ_{Provd} = 0.005 < ρ_{MAX} = 0.015

> ρ_{min} = 0.004 [Satisfactory]

CHECK WALL SHEAR CAPACITY (ACI 318-14 9.3.4, 7.4.3, & 22.5)

$V_u = 1.6 H_s + 1.6 H_b + 1.6 H_E$ = 1.97 kips / ft, (entire lateral loads used conservatively)

$\phi V_n = \phi 2 \sqrt{f_c'} b d$

= 3.94 kips / ft > V_u [Satisfactory] ✓

(cont'd)

CHECK SLAB COMBINED CAPACITY OF FLEXURE & AXIAL (ACI 318-14 21 & 22)

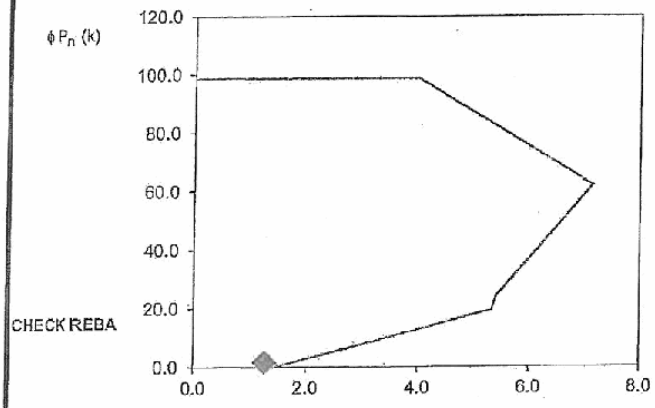
ρ_t = 0.00206 ρ_{MAX} = 0.08 (for compression, ACI 318-14 10.6.1.1)

$\phi V_n = 2\phi b d\sqrt{f'_c}$ ρ_{MIN} = 0.0018 (for flexural, ACI 318-14 7.6 7.7)

[Satisfactory] ✓

	ϕP_n	ϕM_n
AT AXIAL LOAD ONLY	98.8	0.0
AT MAXIMUM LOAD	98.8	4.0
AT MIDDLE	62.0	7.2
AT ε_t = 0.002	25.2	5.5
T BALANCED	24.7	5.4
T ε_t = 0.005	19.4	5.3
T FLEXURE ONLY	0.0	1.4

Note: For middle reforming the max ϕM_n is at c equal to 0.5 t / β_1, not at balanced condition.)



P_u =	1.76	kips / ft
M_u =	1.29	ft-kips / ft

[Satisfactory] ✓

CHECK REBA

, (ACI 318-14 25.4.2.3)

< L_s [Satisfactory] ✓

where Bar size # 3 , (governing size)

A_b = 0.375 in

$$L_d = MAX\left(\frac{\rho_{required}}{\rho_{provided}}\frac{0.075\psi_t\psi_e\psi_s d_b f_y}{\lambda\sqrt{f'_c}\left(\frac{c_b+K_{tr}}{d_b}\right)},\ 12\ in\right)$$

= eqd / $A_{s,provd}$, ACI 318-14 25.4.10.1)

= over more than 12", ACI 318-14 25.4.2.4)

oated, ACI 318-14 25.4.2.4)

ψ_s = 0.8 (0.8 for # 6 or smaller, 1.0 for other)

λ = 1.0 (0.75 for light weight, ACI 318-14 25.4.2.4)

c_b = 3.2 in, min(c', 0.5s), (ACI 318-14 25.4.2.4)

K_{tr} = (A_{tr} f_{yt} / 1500 s n) = 0 (ACI 318-14 25.4.2.4)

(c_b + K_{tr}) / d_b = 2.5 < 2.5 , (ACI 318-14 25.4.2.3)

CONCRETE DESIGN 3/27/19

TABLE 19.2.1.1 - LIMITS OF f'_c

MIN. psi 2,500 MAX. NONE

$f'_c = 3000$ psi

MODULUS OF RUPTURE:

$f_r = 7.5 \lambda \sqrt{f'_c}$

$\lambda = 1.0$

TABLE: 19.2.4.2

NORMAL WEIGHT

$f_r = 7.5(1)\sqrt{3000}$

$f_r = 7.5 \times 54.77$

$f_r = 410.79$ psi

STEEL REINFORCEMENT - 20.2.2 3/27/19

ASTM A706, GRADE 60
REFER TO ACI 20.2.2.5
ASTM A615 GRADE 40
REBAR YIELD STRENGTH = 60,000 psi

STRENGTH REDUCTION FACTORS - 21.2.1

TABLE 21.2.1
STRENGTH REDUCTION FACTOR = ϕ
$\phi = 0.75$

SECTIONAL STRENGTH

22.9.3.1 DESIGN SHEAR STRENGTH ACROSS THE ASSUMED SHEAR PLANE SHALL SATISFY:

$$\phi V_n \geq V_u$$

REINFORCEMENT DETAILS

DEVELOPMENT LENGTH FOR DEFORMED BARS AND DEFORMED WIRE IN TENSION

L_d per 25.4.2.2

CLEAR SPACING OF BARS OR WIRES BEING DEVELOPED OR LAP SPLICED AT LEAST $2d_b$ AND CLEAR COVER AT LEAST d_b.

NO 6 AND SMALLER

$$L_d = \left(\frac{f_y \, \psi_t \, \psi_e}{25 \lambda \sqrt{f'_c}} \right) d_b$$

$f'_c = 3000$ psi

$\lambda = 1.0$

$\psi_t = 1.0$

$\psi_e = 1.0$

$f_y = 60{,}000$ psi

REFER TO 20.6.1.3.1 SPECIFIC CONCRETE COVER FOR CAST-IN-PLACE EXPOSED TO WEATHER OR IN CONTACT W/ GROUND.
1 1/2" COVER TO 3" #5 BAR OR SMALLER.

$$L_d = \frac{60{,}000(1)(1)}{25(1)(54.77)} d_b$$

$$L_d = \frac{60{,}000}{1369.25} d_b$$

$$L_d = 43.8\, d_b$$

DEVELOPMENT OF STANDARD HOOKS IN TENSION

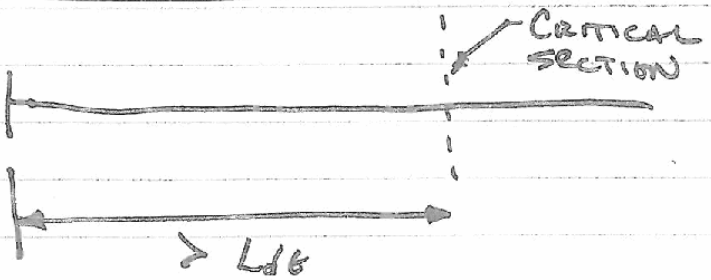
TABLE 25.4.2.4

$\lambda = 1.0$ NORMAL WEIGHT CONCRETE

SIZE $\Psi_s = 0.8$ FOR #6 BAR OR SMALLER

CAST POSITION $\Psi_t = 1.0$ OTHER

DETERMINING L_{dt} LENGTH AND SPACING



Pg. 416

IN WHICH THE CONFINEMENT TERM $(c_b + K_{tr})/d_b$ SHALL NOT EXCEED 2.5, AND

$$K_{tr} = \frac{40 A_{tr}}{sn}$$

WHERE n IS THE NUMBER OF BARS OR WIRES BEING DEVELOPED ALONG THE PLANE OF SPLITTING

SERVICE LOADS - POOL WALL CHECK CALC.

$H_b = 0.5 P_a (H + t_s)^2$

$H_s = w_s P_a (H + t_s) / \gamma_b$

$H_E = 0.5 P_E (H + t_s)$

$H_b = 0.68$ kip/ft

$H_s = 0.11$ kip/ft

$H_E = 0.30$ kip/ft

P_a = LAT. SOIL PRESSURE = 45 pcf

γ_b = BACKFILL WEIGHT = 110 pcf

w_s = SURCHARGE WEIGHT = 50 psf

H = POOL DEPTH = 3'-5'

t_s = THICKNESS OF SLAB: 6"

P_E = SEISMIC GROUND SNOW = 20 psf/ft

L_s = LAP LENGTH = 15"

D = SLAB RADIUS = 2'

f'_c = CONCRETE STRENGTH = 3000 psi

f_y = REBAR YIELD ST. = 60,000 kip

γ = SAFETY FACTOR = 1.6

SPECIFICATION: SLAB REBAR = #3, 12" OCEW

CHECK WALL FLEXURE CAPACITY

ACI-14-SECTIONS 13.2, 7.6, 7.7

$M_u = (0.5(1.6(H_s))) + (0.33(1.6(H_b))) + (0.67(1.6(H_E)))$

$M_u = 0.5(0.08) + 0.33(1.09) + 0.67(0.30)$ 24.4.4.3, 25.4.2

$M_u = 3.88$ ft-kip

A_s MIN. 1.2 TIMES CRACKED COND BASED ON f_r 19.2.3.

$f_r = 7.5 \lambda \sqrt{f'_c}$

$f_y = 410$

$A_s = 492.95$

Florida dbpr

Proposed Code Modifications
USER: Public User

Modification #	SW7900
Name	James LePetrie
Address	4337 Pablo Oaks Court Suite 101
City	Jacksonville
State	FL
Zip Code	32224
Email	jel@wetengineering.net
Primary Phone	(904) 223-9773
Alternate Phone	
Fax	(866) 832-9236
Modification Status	Verified
View Request History	
TAC	Swimming Pool
TAC Recommendation	Approved as Submitted
Commission Action	Pending Review
Archived	No
Code Version	2020
Code Change Cycle	2020 Triennial Original Modification 11/02/2018 - 12/15/2018
Sub Code	Building
Chapter & Topic	Chapter 4 - Special Detailed Requirements Based on Use and Occupancy
Section	454.1.2.1
Related Modifications	
Affects High Velocity Hurricane Zone (HVHZ)	No

Summary of Modification

Requires the design of swimming pools to meet currently accepted standards for concrete construction.

Text of Modification

Pools shall be constructed of concrete or other impervious and structurally rigid material. Concrete pools shall be designed and constructed in accordance with American Concrete Institute 318, "Building Code Requirements for Structural Concrete and Commentary."

REMAINING TEXT UNCHANGED

Date	Attached File
02/04/2019	Mod_7900_TextOfModification.pdf

Rationale

Building Code Requirements for Structural Concrete (ACI 318-05) and Commentary (ACI 318R-05) specifies a minimum steel-to-concrete ratio of 0.2%. Many swimming pools in Florida are being designed using #3 bars at 12" centers which does not meet this requirement. #3 bars can also deform when pneumatically applied concrete methods are employed.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code (553.73(9)(b),F.S.)

None

Impact to building and property owners relative to cost of compliance with code (553.73(9)(b),F.S.)

There would be a negligible increase in material cost for #4 bars versus #3 bars.

Impact to industry relative to the cost of compliance with code (553.73(9)(b),F.S.)

None

Impact to small business relative to the cost of compliance with code (553.73(9)(b),F.S.)

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public (553.73(9)(a)2,F.S.)

Shells utilizing #3 bars at 12" centers do not meet ACI standards for steel-to-concrete ratio, making the pool shell weaker than if it were properly designed. #3 bars are more likely to deform and vibrate during shotcrete/gunite shooting.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction (553.73(9)(a)3,F.S.)

Provides a construction requirement that would lead to a higher quality pool shell.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities (553.73(9)(a)4,F.S.)

No

Does not degrade the effectiveness of the code (553.73(9)(a)5,F.S.)

No

History

Date Submitted	12/11/2018
Date Verified	12/19/2018
Date TAC Recommendation Set	03/29/2019
Date Commission Action Set	12/11/2018
DBPR Staff Notes	

Record of Modification

Mod #	Stage	Date Submitted	Submitted By	Code Change Cycle
SW7900-G1	General Comment	02/13/2019	Kari Hebrank	2020 Triennial First Comment Period 01/02/2019 - 02/18/2019

Cancel Print

Jump to Top

Pools shall be constructed of concrete or other impervious and structurally rigid material. Concrete pools shall be designed and constructed in accordance with American Concrete Institute 318, "Building Code Requirements for Structural Concrete and Commentary."

REMAINING TEXT UNCHANGED

Building Swimming Pools with Shotcrete Using the National Spa and Pool Institute (NSPI) Manual: Reinforcement of Shotcrete Pools/Plastering

By Denis Beaupré

Introduction

The objective of this paper is to discuss some aspects of shotcrete pool construction, using Chapter 7, "Pool Structure," of the *NSPI Builders Manual* as a guide. The author came into contact with this manual after being asked, on behalf of ASA's Education Committee, to prepare a shotcrete pool class session for the NSPI annual meeting on November 28, 2001, in Phoenix, Arizona. This paper is also to be discussed at that conference.

Concrete technology

Before getting into the details of the pool construction, I would like to first make a comment on the *NSPI Manual*'s content, at least regarding the portion related to concrete and shotcrete. The chairman, Rizzo, and the other authors, Baron, Eden, Biscornet, Hope, Brumfield, and Romano, have done a good job in preparing this manual, especially the section on the fundamentals of concrete. I think shotcrete craftsmen should read and study this 15-page section. It is complete, and, most importantly, it has been written with technical terminology that can be understood by most shotcrete or pool craftsmen. As Chairman of the American Shotcrete Association's (ASA) Education Committee, I will try to work out some agreement with NSPI to have these pages reprinted in a later issue of ASA's *Shotcrete* Magazine. Every nozzleman would benefit from studying these pages before taking the ACI Nozzleman Certification written exam.

Figure 1: Example of steel layout for a pool being constructed in the city of Quebec. Note the two layers of #10M steel (between US#3 and US#4) spaced at 8 in. (200 mm) in both directions.

Pool reinforcement

The *NSPI Builders Manual* defines three types of concrete pools: first, shotcrete; second, cast-in-place concrete; and third, masonry block pools. Shotcrete pools often contain some cast concrete, mostly for floors and stairs. They are also often coated with mortar or plaster prior to painting. The *NSPI Builders Manual* also provides minimum requirements for floor/wall thickness, reinforcing bars, etc. It also recognizes the differences in climate between the southern and northern states. The minimum requirements are thus different throughout North America.

To a structural engineer, the minimum steel requirements in the *NSPI Builders Manual* appear low. The minimum steel requirement in the south is a #3 bar spaced every foot (#3 @ 12-in. (300 mm) O/C) vertically and horizontally. This represents a steel ratio (area of steel divided by area of concrete) of 0.16% for a 6 in. (150 mm) thick wall and 0.12% for an 8 in. (200 mm) thick wall. This is less than the usual minimum requirement of 0.2% steel required for crack control of reinforced concrete in most structural standard specifications.

In the north, the NSPI minimum steel requirement is to use #4 bars with similar spacing (#4 @ 12-in. (300 mm) O/C). This repre-

sents a steel ratio of 0.29% for a 6 in. (150 mm) thick wall, 0.22% for a 8 in. (200 mm) thick wall, and 0.17% for a 10 in. (250 mm) thick wall. These steel ratios are closer to the usual 0.2% steel ratio specified for reinforced concrete structures.

Although the use of #3 bars does not meet the minimum steel ratio required in most structural specifications, it is reported to have performed well in many pools where ground conditions are satisfactory. One must remember that this steel layout is only a minimum; anybody is free to use larger bars (#4 instead of #3), or reduce bar spacing to get a higher reinforcement ratio. The practice is also valid for cast-in-place concrete pools.

In shotcrete construction, #3 bars are often used because they are three times as flexible as #4 bars, which allows for ease of bending to fit pool contours. However, the #3 bars are more likely to deform and vibrate during shotcrete shooting. This increases the potential for shotcrete delamination, or poor bond between steel and shotcrete, and effort should be taken to try to minimize vibration when possible.

In order to increase the steel ratio, there are two options one can choose. The first choice is to increase bar size or reduce spacing. For shotcrete, it might be a better idea to increase bar size from #3 to #4 instead of reducing spacing. Of course, in curved areas with a short radius, it might be easier to use #3 bars rather than #4 bars, because they are easier to bend in place to fit the pool shape. If that is the case, reducing the spacing between bars is a better way to obtain the recommended steel ratio. An example would be to use #3 bars @ 10 in. (250 mm) O/C for a 6 in. (150 mm) thick wall, or #3 bars @ 7-in. (175 mm) O/C for a 8 in. (200 mm) thick wall, for a steel ratio of 0.2%.

In terms of comparing the costs of using #4 in lieu of #3 bar, consider the following: for a 30 x 20 x 6 ft pool (9 x 6 x 1.8 m), the replacement of all #3 bars with #4 bars (for a spacing of 12 in (300 mm) O/C in both directions) represents an increase in steel equal to approximately 700 lbs (320 kg). The cost to place the steel remains essentially the same; the only increase in cost is the extra weight of steel, which should amount to $200 or less, because #4 bar usually costs less per pound than #3 bar. This might be an inexpensive insurance measure, and one that makes good sense—the drawbacks being the extra work to install the #4 bar and the difficulty of bending it on site.

Finishing and plastering

Some cast-in-place pools, many shotcrete pools, and almost all masonry ones are coated with a plaster. This plaster is usually a cement-based mortar, which is usually applied by hand to provide the final grade and a smooth finish before painting. This operation is also referred to as plastering, and is briefly described in Chapter 12, "Interior surface," of the *NSPI Builders Manual*. More details, mostly on troubleshooting topics, are given in the *Technical Manual* of the National Plasterers Council.

Since the finishing operations for shotcrete pools can be long and labor-intensive, it is often easier to use a final plaster layer. It also speeds up the shotcreting operations of the pool surface, which has relatively short workable life. The

Figure 2: Use of mechanical screed and finishing machine. It took a crew of three craftsmen about an hour to finish the wall.

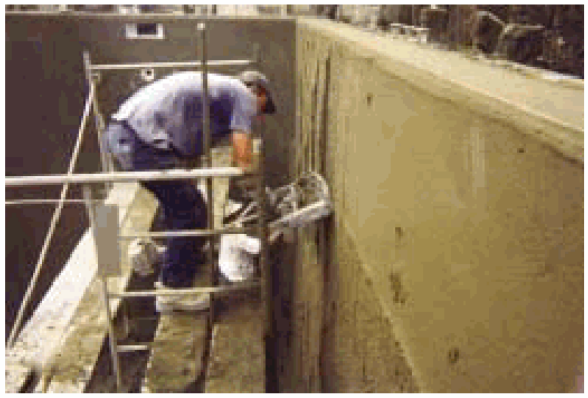


Figure 3: Close-up of the screeding device. Note the wall in the background, made of one monolithic layer of shotcrete and fully finished (no plastering needed).

placement of shotcrete using the wet process is a relatively rapid operation, but it is often difficult for finishers, when using only hand tools, to keep up with nozzlemen. Using this double-layer construction technique (shotcrete + plaster) allows the finisher only to screed the surface during the shotcreting operation to the correct grade and not to bother with the smoothness of the surface.

The plastering is usually done a few days after the pool is shot. Plastering can also be performed on old pools as a maintenance operation before repainting. In both cases, this could be compared to a thin concrete repair, and, as for all concrete repairs, proper surface preparation is very important to insure good bond.

In terms of surface preparation, the *NSPI Builders Manual* points out that after the pool structure has been completed, it is wise to acid wash and rinse it completely prior to plastering, so that it is as clean as possible. In normal concrete repair, acid is sometimes used to remove calcite as well as the carbonated layers of old concrete. This is done, at times, in lieu of sandblasting, and is done to improve plaster bond with the concrete/shotcrete. In newly constructed pools (say a few days old), the shotcrete surface is not likely to have old calcium deposits, so an acid wash is not needed. Cleaning with a high-pressure

water jet (1500 to 2000 psi) is usually sufficient to clean the surface from dust and overspray and to insure good bond if the plaster is properly applied (see *Shotcrete Magazine*, May 1999, Vol.1, No.2, pp.12-15). The use of acid for a newly constructed pool is, in my view, not necessary; it is bad for the environment and is a potential health hazard. It can, however, be used for the replastering of old pools where concrete/shotcrete carbonation has taken place.

New finishing and plastering tools

In recent years, in the province of Quebec, Canada, mechanical finishing machines (Figure 2) were developed and are now commonly used on all types of shotcrete jobs, including pool construction. This mechanical equipment is used not only to finish shotcrete, but also for plastering operations. New composite pads (foam and smooth natural rubber) have been developed and tested for plaster application. Very recently, a mechanical screeding device has also been developed and used for the construction of a pool. The use of mechanical tools for plastering operations can reduce plastering time by about 50 to 60%, which is something to think about as a reduction in labor cost.

The mechanization of finishing operations will probably reduce the number of pools built with a final plaster coat. With the finishing machine and power screed, it is easier for the finisher to keep up with the shotcrete application even with the wet-mix shotcrete process. More pools with monolithic shotcrete as a final finish (no final plaster coat) will be constructed, as in the first days of the shotcrete pool business, when the dry-mix shotcrete process was the only process used.

Denis Beaupré completed a PhD thesis at the University of British Columbia in 1994. He is currently teaching in the Civil Engineering Department at Laval University. His research field includes rheology, self-consolidating concrete, repair, pumping, and all aspects of shotcrete technology. Mr. Beaupré is a member of many ACI and RILEM committees. He is the Vice President of the American Shotcrete Association (ASA).

May 24, 2019

Comment on Code Modification SW7900:

The current standard adopted in the 2017 FBC 6th Ed, ACI 318-14, Commentary R8-Two-Way Slabs, states "Slabs-on-ground that do not transmit vertical loads from other parts of the structure to the soil are excluded." Soil supported pool shells meet this criteria for exclusion.

The code modification system indicates pools designed with #3 bars @ 12" on center each way (OCEW) are not "properly designed." The above stated exclusion indicates that the current practice is not a blanket improper design. Further, it seems the stated goal of the modification is to have #4 bars used instead of #3 bars.

The typical design criteria for concrete pool shells indicates that the typical 6" shell with #3 bars at 12" OCEW works for many common pool installations, but is limited to certain soil conditions and depths of vertical portions of shell.

In reality, #3 bars @ 11" OCEW would meet the 0.2% steel-to-concrete ratio referenced in ACI 314-14 and still not be adequate for deeper pool shells or address the two concerns outlined in the proposed modification. The concern over poor concrete application due to deformation or vibration of the steel, is more an application failure.

Further, while we haven't been able to survey suppliers for the cost difference between #3 and #4 bars, the following can be offered. Given a price of steel per ton, the number of #3 bars per ton and #4 bar per ton indicates #4 bars may cost 1.7 times that of #3 bars varies. Another variability may be the availability of Grade 40 vs Grade 60 bars, which plays a role in cost and design.

First, application failure remains the responsibility of the contractor. The astute contractor should ensure the concrete subcontractor uses and ACI Certified Nozzleman, if not in the hole with the nozzle, overseeing the entire shoot. Those considerations are in the category contractor "means and methods" which engineers typically do not address.

Since a modification requiring pools to meet that ACI 318 criteria would not result in the use of steel to address the concerns raised, other alternatives should be considered.

We believe the real issue is pour application and in the case of gunite, extreme variability in the quality of the final product. The following issues could be considered to achieve a more consistent product which seems to be the goal of the modification:

- Use of Certified Nozzleman on every shoot
- Tie steel at all crossings
- Restrict #3 bars @ 12" OCEW to max 5 ft deep pools
- Require minimum steel as #3 @ 9" OCEW, or #4 @ 12" OCEW in pools to 6 ft deep, verified by an engineer based on site conditions, and site specific designs for pools deeper than 6 ft.

We don't have a solution that fits a code modification process, but the above options should be considered by engineers.

3990 E SR 64 / BRADENTON, FLORIDA 34208 / 941-749-0311

SW7906

Date Submitted	12/11/2018	**Section**	454.1.3.1.2	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

7905

Summary of Modification

Clarifies the how much of a pool deck can slope towards a deck-level perimeter overflow gutter or slot, and at what slope.

Rationale

Deck level perimeter overflow systems are becoming more common for swimming pools but are not well-addressed in the code. There is a necessity for the deck to be sloped towards the drain trench or slot to help contain wave action. Some designers are therefore designing for slopes that exceed the standard deck maximum since this issue is not specifically addressed in the code. This mod will clarify the maximum slope and slope distance.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Clarifies deck slope requirements for deck-level perimeter overflow pools and makes this easier to enforce.

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Impact to small business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Ensures a safe slope on a pool deck where deck-level perimeter overflow systems are utilized.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Alternate Language

2nd Comment Period

7906-A1

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** Yes

Rationale

Added clarification

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

YES it does with the better slope and stipulations added here.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves clarity

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not discriminate

Does not degrade the effectiveness of the code

does not degrade

1st Comment Period History

SW7906-G1

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

This proposed Mod needs additional requirements to assure that the deck level perimeter overflow systems are treated as all other deck obstructions are. By adding this term to the definition of 'wet deck area' and to Section 454.1.3.1.3 this deck level perimeter overflow system will be assured to achieve the 4-foot-wide wet deck installed around the entire perimeter.

Edits provided for clarity and are underlined and bolded on A1 submittal.

Other code section language is unchanged

454.1.3.1.2 No change. Deck**s level perimeter overflow systems** may be sloped at a maximum of 4% towards trench or slot drains for a maximum distance of 18 inches where deck–level perimeter overflow systems are utilized. **These must be slip resistant. This distance is not applicable to zero depth entries in section 454.1.9.6.2.** Wet deck area in accordance with 454.1.3.1.3 shall be provided beyond the trench grate or slot **drain**. Textured deck finishes that provide pitting and crevices of more than 3/16 Inch (4.8 mm) deep that accumulate soil are prohibited.

Decks may be sloped at a maximum of 4% towards trench or slot drains for a maximum distance of 18 inches where deck-level perimeter overflow systems are utilized. Textured deck finishes that provide pitting and crevices of more than 3/16 Inch (4.8 mm) deep that accumulate soil are prohibited.

REMAINING TEXT UNCHANGED

SW7923

Date Submitted	12/11/2018	**Section**	454.1.9.6.1	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments Yes

Alternate Language Yes

Related Modifications

Summary of Modification

Allows for a slope transition where zero entry pools achieve 3'0" of water depth.

Rationale

The intent of this code is to ensure a continuous slope from the zero entry to the point where 3 feet of water is achieved (i.e. the 'deep end' of the zero entry area). Some FDOH plan reviewers have misconstrued it to mean a continuous slope from the zero entry all the way to the deep point of a pool, which in many cases is not possible. These types of pools are typically family-style where we design for flatter slopes once we are able to slope down as quickly as possible to 3 feet of depth. The slopes in zero entry pools are typically 1:10 or 1:12, so to continue these slopes across the entire pool would result in deep points of 7 or 8 feet, which is not feasible. Hundreds of these types of pools are in use in Florida with the slope transition at 3 feet water depth with no threat to public safety.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Would lower construction costs if a deeper pool would be required.

Impact to industry relative to the cost of compliance with code

None

Impact to small business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Provides the ability to design for zero entry pools with less slope and more shallow water than would normally be allowed, making pools safer for weaker swimmers.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Clarifies the code.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Alternate Language

2nd Comment Period

7923-A1

Proponent James LePetrie **Submitted** 5/17/2019 **Attachments** Yes

Rationale

Clarifies that the slope beyond the transition point must be less steep than the slope in the zero entry portion.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Ensures there is no steep dropoff from the transition point.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

2nd Comment Period

SW7923-G3

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** No

Comment:

The Alternative 1 proposed by Mr. LePetrie is acceptable to the Florida Dept. of Health due to it being much safer for patrons than the original modification proposed.

1st Comment Period History

SW7923-G1

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

1st Comment Period History

SW7923-G2

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

The proposed Mod does not state if the transitioned slope is steeper or less steep at this 3' deep floor than the zero entry slope, so, it could be interpreted as either. The justification notes provided imply it is less steep, but the Mod language does not reflect this specifically. A steeper slope toward the pool's deep end without floor markers and a floating safety line would create drowning hazards for all small non-swimmers. Only if this proposal for the slope is amended to be 'shallower' could the department concur with the proposal (that is: a less steep floor plane past 3' deep than the zero depth entry slope to the 3' depth) .

Zero depth entry pools shall have a continuous floor slope from the water edge to ~~the deep end.~~ 3 feet of water depth at which point the slope can transition to another, less steep continuous slope. Floating safety ropes and slope transition markings are not required at this transition point.

Zero depth entry pools shall have a continuous floor slope from the water edge to ~~the deep end.~~ 3 feet of water depth at which point the slope can transition to another continuous slope. Floating safety ropes and slope transition markings are not required at this transition point.

SW7931

Date Submitted	12/11/2018	**Section**	454.1.9.8.6.9	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments Yes

Alternate Language Yes

Related Modifications

7914

Summary of Modification

Exempts the fencing requirement for IWFs that are located within 50 feet of other pools if the walking distance is 50 feet or more.

Rationale

Aquatics areas can be designed so that walking distances between IWFs and pools is at or greater than 50 feet using landscaping, walls, etc. This allows elimination of fences that are not aesthetically pleasing and are an additional unneeded cost if the intent of the rule is already being met.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Would eliminate the need for costly fencing if certain criteria are met.

Impact to industry relative to the cost of compliance with code

None

Impact to small business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No effect

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Alternate Language

2nd Comment Period

7931-A1

Proponent James LePetrie **Submitted** 5/17/2019 **Attachments** Yes

Rationale

Provides a mechanism for the reviewing authority to determine the adequacy of a barrier to prohibit a young child from going over or through the barrier.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Provides flexibility to designers with site layout. Save money on the cost of fencing.

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No effect

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

2nd Comment Period

SW7931-G2

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** No

Comment:

Same as for 7914 mod:

I suggest you call the barrier in this section and phrase an "effective barrier"which is defined in the FBC 454.1.

The Department is defined in the FBC as the permitting/inspection authority, thus the local building department. bob vincent

1st Comment Period History

SW7931-G1

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

IWFs shall be fenced in the same fashion as wading pools as noted in Section 454.1.7.7. Where the walking distance ~~IWF~~ is at least 50 feet (15240 mm) ~~from~~ between the IWF and all other pools and the IWF is not designed to have any standing water, fencing requirements should be carefully considered by the applicant to control usage, but are not required by rule. Barriers that are designed to define the walking path shall be subject to review and approval by the Department.

IWFs shall be fenced in the same fashion as wading pools as noted in Section 454.1.7.7. Where the walking distance ~~IWF~~ is at least 50 feet (15240 mm) ~~from~~ between the IWF and all other pools and the IWF is not designed to have any standing water, fencing requirements should be carefully considered by the applicant to control usage, but are not required by rule.

SW7933

Date Submitted	12/11/2018	**Section**	454.1.9.8.7.3	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments Yes

Alternate Language Yes

Related Modifications

7914
7931

Summary of Modification

Exempts the fencing requirement for pools designed for small children at water theme parks that are located within 50 feet of other pools if the walking distance is 50 feet or more.

Rationale

Aquatics areas can be designed so that walking distances between pools designed for small children and other pools is at or greater than 50 feet using landscaping, walls, etc. This allows elimination of fences that are not aesthetically pleasing and are an additional unneeded cost if the intent of the rule is already being met.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Eliminates the requirement for costly fencing if certain criteria are met.

Impact to industry relative to the cost of compliance with code

None

Impact to small business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No effect

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Alternate Language

2nd Comment Period

7933-A1

Proponent James LePetrie **Submitted** 5/17/2019 **Attachments** Yes

Rationale

Provides a mechanism for the reviewing authority to determine the adequacy of a barrier to prohibit going over or through by a young child.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Provides flexibility to designers with site layout. Saves money on fencing.

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No effect

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

2nd Comment Period

SW7933-G2

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** No

Comment:

See comments for the two similar mods proposed: 7914 and 7931.
Alternative language is better than original, and this mod is acceptable to the Dept. of Health for a water theme park because they have lifeguards and safety plans that are approved and monitored by the Dept. of Health.

1st Comment Period History

SW7933-G1

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

Water theme parks are exempt from the fencing requirements of Section 454.1.3.1.9, except that pools designed for small children shall be fenced when located within 50 feet (15240 mm) walking distance of a pool with water depths of 3 feet (914 mm) or more. Where the walking distance is at least 50 feet (15240 mm) between a pool designed for small children and all other pools, fencing requirements should be carefully considered by the applicant to control usage, but are not required by rule. Barriers that are designed to define the walking path shall be subject to review and approval by the Department.

Water theme parks are exempt from the fencing requirements of Section 454.1.3.1.9, except that pools designed for small children shall be fenced when located within 50 feet (15240 mm) walking distance of a pool with water depths of 3 feet (914 mm) or more. Where the walking distance is at least 50 feet (15240 mm) between a pool designed for small children and all other pools, fencing requirements should be carefully considered by the applicant to control usage, but are not required by rule.

SW8327

Date Submitted	12/15/2018	**Section**	454	**Proponent**	robert vincent
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Summary of Modification

Adds code language for permitting constructed impounded public bathing places, so that when public swimming pool-like structures are constructed, the referenced public swimming pool code section may be applied.

Rationale

The FBC has jurisdiction for public bathing places, but has no current code language to assure the safety and sanitation of artificially impounded bathing places, and the play features associated with the bathing place.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Slight impact, as very few of these facilities are built in FL. They account for less than 0.5% of the public swimming pools built. These code edits would take less time, or the same time, for the local enforcement authority to review, approve and inspect for a single public pool.

Impact to building and property owners relative to cost of compliance with code

Injuries and illnesses should be reduced at these aquatic facilities when the current pool code's sound engineering and public health practices are applied to these pool-like facilities constructed; thus the owners' liability for injuries/illnesses would be reduced.

Impact to industry relative to the cost of compliance with code

Nominal, would require permitting and engineering submittals.

Impact to small business relative to the cost of compliance with code

Nominal, would require permitting and engineering submittals.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, nearly identical to the public swimming pool construction requirements that prevent injuries, fatalities, and illnesses.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes, improves code and provides better construction assurances for safety and sanitation.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

None

Does not degrade the effectiveness of the code

None

Alternate Language

2nd Comment Period

8327-A2

Proponent Jeff Littlejohn **Submitted** 5/26/2019 **Attachments** Yes

Rationale

This language is submitted to add more specificity to the new section of code proposed by FDOH.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Code edits should reduce the time needed for local building officials to review and approve applications for artificial lagoons/public bathing places.

Impact to building and property owners relative to cost of compliance with code

No impact.

Impact to industry relative to the cost of compliance with code

No impact.

Impact to Small Business relative to the cost of compliance with code

Nominal, would require permitting and engineering submittals.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Specific code requirements for public bathing places would benefit the health, safety and welfare of the public by ensuring that these facilities meet minimum standards.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code to cover a new type of facility that is being developed in Florida, and the new code provisions are consistent with codes being developed or are in use in other states.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

None.

Does not degrade the effectiveness of the code

None.

Alternate Language

1st Comment Period History

8327-A1

Proponent Jeff Littlejohn **Submitted** 2/18/2019 **Attachments** Yes

Rationale

This language is submitted to add more specificity to the new section of code proposed by FDOH.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Agree that code edits should reduce the time needed for local building official to review and approve applications for artificial impoundments (artificially constructed public bathing places).

Impact to building and property owners relative to cost of compliance with code

No impact.

Impact to industry relative to the cost of compliance with code

No impact.

Impact to Small Business relative to the cost of compliance with code

Nominal, would require permitting and engineering submittals.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Specific code requirements for public bathing places would benefit the health, safety and welfare of the public by ensuring that these facilities meet minimum standards.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves the code to cover a new type of facility that is being developed in Florida.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

None

Does not degrade the effectiveness of the code

None

1st Comment Period History

SW8327-G1

Proponent John Hall **Submitted** 1/3/2019 **Attachments** Yes

Comment:

This is a much needed code modification. These large impoundments are being installed in Florida. The entity installing these structures is arguing that the provisions of FBC Building Section 454.1 do not apply because the structures are not swimming pools, but are public bathing places. This contention is based on the misapplication of a final order declaratory statement (2018-0137) from the Department of Health. As a consequence much time and effort is necessary on the part of the authority having jurisdiction to make the case that the provisions of 454.1 are applicable to public bathing places. The original design of these structures does not include the many safety features that are required for swimming pools. This modification makes clear that FBC Building 454.1 is applicable to these structures. This code modification will result in a significant cost savings to the enforcing authority through time saved in debating the applicability of the Florida Building code to these pool-like structures.

1st Comment Period History

SW8327-G2

Proponent Kari Hebrank **Submitted** 2/13/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this change.

454.1.11 Public Bathing Places- Artificial Lagoons

454.1.11.1 General

An artificial lagoon is a type of artificial impoundment and public bathing place that is modified or man-made and has a total water surface area of at least 1 acre (43,560 square feet) in size, utilizes an impervious containment system such as an artificial liner, and incorporates a method of disinfectant that results in a disinfectant residual in the swimming zone(s) that is protective of the public health. Such artificial lagoons shall be designed and constructed within the limits of sound engineering practice and the provisions of this section.

454.1.11.2 Sizing and Sanitary Facilities for Artificial Lagoons

The maximum bathing load shall be limited by total square footage of the entire impoundment with 50 square feet assigned per bather. Sanitary facilities within an artificial lagoon are exempt from the fixture count requirements in Section 454.1.6.1.1. All sanitary facilities shall be located as near to the designated swimming area(s) as prudent to ensure patron use, but not over 200 feet (61 m) walking distance from the designated swimming area(s).

454.1.11.3 Construction Standards for Artificial Lagoons

If an artificial liner is utilized as a containment system, the artificial liner used to contain the water shall consist of a material certified under NSF/ANSI Standard 61-2017, Drinking Water System Components-Health Effects, dated March 13, 2017, hereby incorporated by reference, which has been deemed copyright protected, and is available for review at the Department of State, R.A. Gray Building, 500 South Bronough Street, Tallahassee, Florida 32399-0250. Alternatively, the material used as a liner shall be tested under a Toxicity Characterization Leaching Procedure (TCLP) to comply with the TCLP standards, which were adopted by the US EPA in 1990 and can be found at https://www.epa.gov/hw-sw846/sw-846-test-method-1311-toxicity-characteristic-leaching-procedure. The liner or artificial bottom, floor, and the walls, if any, shall be white or light in color. The design of such liner system is the responsibility of a professional engineer licensed in Florida.

454.1.11.4 Access to Artificial Lagoons

Points of access shall be provided as needed to provide adequate entrance to and exit from the artificial lagoon. Means of access may consist of ladders, stairs, recessed treads, and swimouts, designed in compliance with Section 454.1.2.5, zero depth entry areas, and docks, in any number and combination that is appropriate for the intended use(s) of the artificial lagoon. Permanent or portable steps, ramps, handrails, lifts or other devices designed to accommodate handicapped individuals may be provided. Lifts mounted into the wet deck shall have a minimum 4-foot-wide (1219 mm) deck behind the lift mount.

454.1.11.5 Decks and Walkways for Artificial Lagoons

Decks and walkways shall be designed in compliance with Sections 454.1.3.1.1 to 451.1.3.1.5, except for zero depth entry areas (in designated swimming areas) and docks (for aquatic activities such as sailing or kayaking), which are exempt from these requirements. Artificial lagoons are exempt from the fencing requirements of Section 454.1.3.1.9, except that separate swimming pools designed for small children shall be fenced when located within 50 feet (15 240 mm) of an artificial lagoon.

454.1.11.6 Safety for Artificial Lagoons

The portion(s) of artificial lagoons designated for swimming shall meet the safety requirements in Section 454.1.3.3. Such designated swimming area(s) shall be visually separated from the rest of the artificial lagoon using a buoyed safety line(s) or similar device(s) approved by the local authority. Additionally, the floor slope at any designated swimming area(s) shall not exceed 1 unit vertical in 10 units horizontal. The depth at the deepest point in any designated swimming area shall be indicated, along with the other rules and regulations signage required in Section 454.1.2.3.5. Where a deck is provided, no diving signage shall be posted at intervals not to exceed 25 feet along the deck. Markings shall be of such materials that will not fade over time. Where slides or water activity features are used in or adjacent to the artificial lagoon, a lifeguard safety plan shall be submitted to the health department for approval and implemented by the owner/operator. Slides and water activity features shall be reviewed and approved by the local authority to conform with the same criteria for public swimming pools. If boating is allowed in the lagoon, provisions for bather safety and injury prevention must be specified and provided to the health department.

454.1.11.7 Electrical Systems for Artificial Lagoons

Electrical equipment wiring and installation, including the bonding and grounding of components, shall comply with Section 2701 of the Florida Building Code, Building. Outlets supplying pump motors connected to single-phase 120-volt through 240-volt branch circuits, whether by receptacle or by direct connection, and outlets supplying other electrical equipment and underwater luminaires operating at voltages greater than the low voltage contact limit, connected to single-phase, 120 volt through 240 volt branch circuits, rated 15 or 20 amperes, whether by receptacle or by direct connection, shall be provided with ground-fault circuit interrupter protection for personnel. Any portions of the artificial lagoon designated for swimming at night shall comply with the underwater lighting requirements in Sections 454.1.4.2.1. and 454.1.4.2.3.

454.1.11.8 Equipment Rooms for Artificial Lagoons

Equipment rooms for artificial lagoons shall comply with Section 454.1.5.

454.1.11.9 Treatment Systems for Artificial Lagoons

The treatment system shall be designed to meet the water quality criteria specified in 64E-9.013 F.A.C. Compliance with this section is provided through mandatory monitoring as required in 64E-9.013, F.A.C. If continuous or intermittent chemical disinfection and/or non-chemical disinfection is provided to the artificial lagoon water, the

equipment that feeds or generates the chemical shall be NSF/ANSI Standard 50 certified. The disinfectant chemical shall be applied in accordance with the manufacturer's instructions, and must be a NSF/ANSI Standard 60 certified chemical, a US EPA registered microbial biocide, or an alternate method of disinfectant approved by the Department of Health. Any other chemicals applied to the water for water quality treatment must be applied in accordance with the manufacturer's instructions and must be an NSF/ANSI Standard 60 or Standard 50 certified chemical. Vacuum systems shall not be used in designated swimming area(s) while such area(s) is(are) open for swimming, and all suction outlets shall comply with the requirements of section 514.0315, Florida Statutes.

454.1.11 Public Bathing Places- Artificial Impoundments-

454.1.11.1 General

An artificial impoundment is a type of public bathing place that is modified or man-made and has a total water surface area of at least 1 acre (43,560 square feet) in size. Such artificial impoundments shall be designed and constructed within the limits of sound engineering practice.

454.1.11.2 Sizing

The bathing load shall be limited by total square footage of the entire impoundment with 50 square feet assigned per bather.

454.1.11.3 Construction Standards

If a liner or artificial bottom is used to contain the water, the material used as a liner shall be certified under NSF/ANSI Standard 61-2017, Drinking Water System Components-Health Effects, dated March 13, 2017, is hereby incorporated by reference, has been deemed copyright protected, and is available for review at the Department of State, R.A. Gray Building, 500 South Bronough Street, Tallahassee, Florida 32399-0250, or the material used as a liner shall be tested under a Toxicity Characterization Leaching Procedure (TCLP) to comply with the TCLP standards, which were adopted by the US EPA in 1990 and can be found in https://www.epa.gov/hw-sw846/sw-846-test-method-1311-toxicity-characteristic-leaching-procedure. This certification requirement does not apply to cementitious materials. The liner or artificial bottom, floor, and the walls, if any, shall be white or light in color. The design of such liner system is the responsibility of a professional engineer licensed in Florida.

454.1.11.4 Access

Points of access shall be provided as needed to provide adequate entrance to and exit from the Artificial Impoundment. Means of access may consist of ladders, stairs, recessed treads, and swimouts, designed in compliance with Section 454.1.2.5, zero depth entry areas, and docks. Permanent or portable steps, ramps, handrails, lifts or other devices designed to accommodate handicapped individuals may be provided. Lifts mounted into the wet deck shall have a minimum 4-foot-wide (1219 mm) deck behind the lift mount.

454.1.11.5 Decks and walkways

Decks and walkways shall be designed in compliance with Sections 451.1.3.1.1 to 451.1.3.1.5, except for zero depth entry areas (in designated swimming areas) and docks (for aquatic activities such as sailing or kayaking), which are exempt from these requirements. Artificial impoundments are exempt from the fencing requirements of Section 454.1.3.1.9, except that swimming pools designed for small children shall be fenced when located within 50 feet (15 240 mm) of an Artificial Impoundment.

454.1.11.6 Safety

The portion(s) of artificial impoundments designated for swimming shall meet the safety requirements in Section 454.1.3.3.1. Where slides or water activity features are used in or adjacent to the bathing place, a lifeguard safety plan shall be submitted to the health department for approval and implemented by the owner/operator. Slides and water activity features shall be reviewed and approved by the local enforcement authority to conform with the same criteria for public swimming pools. If boating is allowed in the impoundment, provisions for bather safety and injury prevention must be specified and provided to the health department.

454.1.11.7 Electrical Systems

Electrical equipment wiring and installation, including the bonding and grounding of components shall comply with Chapter 27 of the Florida Building Code, Building. Outlets supplying pump motors connected to single-phase 120-volt through 240-volt branch circuits, whether by receptacle or by direct connection, and outlets supplying other electrical equipment and underwater luminaires operating at voltages greater than the low voltage contact limit, connected to single-phase, 120 volt through 240 volt branch circuits, rated 15 or 20 amperes, whether by receptacle or by direct connection, shall be provided with ground-fault circuit interrupter protection for personnel. Any portions of Artificial Impoundments designated for swimming at night shall comply with underwater lighting requirements from Sections 454.1.4.2.1. and 454.1.4.2.3.

454.1.11.8 Equipment Rooms

Equipment rooms for Artificial Impoundments shall comply with Section 454.1.5

454.1.11.9 Treatment Systems

The treatment system shall be designed to meet the water quality criteria specified in 64E-9.013 F.A.C. Compliance with this section is provided through mandatory monitoring as required in 64E-9.013, F.A.C. If continuous or intermittent chemical disinfection and/or non-chemical disinfection is provided to the bathing place water, the equipment that feeds or generates the chemical shall be NSF/ANSI Standard 50 certified. The disinfectant chemical shall be applied in accordance with the manufacturer's instructions, and must be a NSF/ANSI Standard 60 certified chemical, or a US EPA registered microbial biocide. Any other chemicals applied to the water for water quality treatment must be applied in accordance with the manufacturer's instructions and must be an NSF/ANSI Standard 60 or Standard 50 certified chemical. Vacuum systems shall not be used in designated swimming area(s) while such area(s) is open for swimming, and all suction outlets shall comply with the requirements of section 514.0315, Florida Statutes.

454.1.11 Public Bathing Places- Artificial Impoundments-

454.1.11.1 If continuous or intermittent chemical disinfection and/or non-chemical disinfection is provided to the bathing place water, the equipment that feeds or generates the chemical shall be NSF/ANSI Standard 50 certified. The disinfectant chemical shall be applied in accordance with the manufacturer's instructions, and must be a NSF/ANSI Standard 60 certified chemical, or a US EPA registered microbial biocide.

454.1.11.2 Any other chemicals applied to the water for water quality treatment must be applied in accordance with the manufacturer's instructions and must be an NSF/ANSI Standard 60 or Standard 50 certified chemical. Any water quality treatment methods employed shall be reviewed and approved by the jurisdictional building official as part of the construction building permit process.

454.1.11.3 The water encompassing the swimming area plus the recreational area of bathing places shall be at least 2 acres in size. The bathing load shall be limited by square footage with 50 square feet assigned per bather.

454.1.11.4 If a liner or artificial bottom is used to contain the water, the material used as a liner shall be certified under NSF/ANSI Standard 61-2017, Drinking Water System Components-Health Effects, dated March 13, 2017, is hereby incorporated by reference, has been deemed copyright protected, and is available for review at the Department of State, R.A. Gray Building, 500 South Bronough Street, Tallahassee, Florida 32399-0250. This certification requirement does not apply to cementitious materials. The liner or artificial bottom, floor, and the walls, if any, shall be white or light in color such that it meets the color criteria for public pool walls and floors.

454.1.11.5 If boating is allowed in the impoundment, provisions for bather safety and injury prevention must be specified and provided to the health department.

454.1.11.6 Vacuum systems shall not be used while the area is open for swimming, and all suction outlets shall comply with the requirements of section 514.0315, Florida Statutes.

454.1.11.7 Where public pool-like construction is planned using walls, stairs, ladders, slides, or floating, tethered or other play features are planned, they shall be reviewed and approved by the local enforcement authority in accordance with the FBC criteria for these issues for public pools.

454.1.11.8 Where public pool-like walls, stairs, benches, swimouts, sun shelfs, vertical drop-offs, floor slope transitions, and other similar structures or conditions are planned, the installation of depth, 'no-diving', floor and edge markers, injury prevention caution statements for safe egress, and other appropriate safety precautions for patrons shall conform with the criteria for these issues for public pools and shall be reviewed and approved by the local enforcement authority.

454.1.11.9 Where slides or water activity features are used in or adjacent to the bathing place, a lifeguard safety plan shall be submitted to the health department for approval and implemented by the owner/operator. Slides and water activity features shall be reviewed and approved by the local enforcement authority to conform with the same criteria for public swimming pools.

STATE OF FLORIDA
DEPARTMENT OF HEALTH

IN RE:

CRYSTAL LAGOONS U.S. CORP.,

DOH Case No..: 2018-0137
Rendition No.: DOH-18-0357-FOI-HO

Petition for Declaratory Statement.
_____/

FINAL ORDER

THIS CAUSE is before the Department of Health (Department) on the Petition for Declaratory Statement (Petition) filed on June 15, 2018, by Crystal Lagoons U.S. Corp. (Crystal Lagoons). The Department noticed receipt of the Petition on June 29, 2018. See Notice 20603981, 44 Fla. Admin. Reg. 127 (Jun. 29, 2018). No timely-filed motion to intervene has been filed.

The assertions of fact set forth in the Petition are treated as true and materially complete for purposes of issuing this Final Order on the Petition filed by Crystal Lagoons. If material facts were misrepresented or omitted from the Petition, this Final Order will be of no force and effect. This Final Order is inapplicable to, and cannot be relied up by, any person other than Crystal Lagoons.

This Final Order applies only to Chapter 514, Florida Statutes (2017), and the Department's authority to administer and enforce the provisions of that chapter. This Final Order does not represent the opinion of the Department as to the applicability of any other Federal, state, or local statute, rule, regulation, ordinance, or other law applicable to Crystal Lagoons' activities. This Final Order does not bind any agency or entity other than the Department. Legal representations and arguments in the Petition, if any, are not adopted by the Department.

FINDINGS OF FACT

1. Crystal Lagoons seeks a declaratory statement that the bodies of water created and operated by Crystal Lagoons' licensees using the process patented by Crystal Lagoons are "public bathing places" as defined by section 514.011(4), Florida Statutes (2017). Pet. for Decl. Stmt., ¶¶ 17, 18.

2. Crystal Lagoons licenses its patented process to licensees in Florida to create and operate bodies of water that are used for swimming, diving, and recreational bathing and are held out by the owner to the public for this purpose. Pet. for Decl. Stmt., ¶¶ 3, 4.

3. Crystal Lagoons' patented process involves the creation and operation of an artificial impoundment of water. Pet. for Decl. Stmt., ¶ 3.

4. Crystal Lagoons' process does not use filtration of the total volume of the body of water as the primary means to meet established health standards. Pet. for Decl. Stmt., ¶ 16.

CONCLUSIONS OF LAW

1. The Department has jurisdiction of the subject matter of this cause, being authorized to administer and enforce Chapter 514, Florida Statutes, and the rules adopted thereunder. See § 514.021, Fla. Stat. (2017).

2. Crystal Lagoons requests this Final Order pursuant to section 120.565, Florida Statutes, and Chapter 28-105, of the *Florida Administrative Code*. These sections authorize a substantially affected person to petition an agency that has authority to administer a statute or rule to issue a declaratory statement of the applicability of the statute or rule to that person's particular circumstances. See § 120.565, Fla. Stat. (2017); Fla. Admin. Code R. 28-105.

3. Crystal Lagoons has standing to seek a final order on the Petition because Crystal Lagoons has a substantial interest in correctly representing to its licensees that the Crystal Lagoons process creates a public bathing place as opposed to a public swimming pool, as those terms are defined under existing Florida law. See First Nat. Bank & Trust Co. of Muskogee v. Heilman, 62 F.2d 157, 159 (C.C.A. 10th Cir. 1932) (a company licensed in the state is presumed to know the law governing its transactions).

4. A "public swimming pool" is a "structure" that is "filled with a filtered and disinfected water supply." See § 514.011(2), Fla. Stat. (2017). To meet established health standards, filtration systems must maintain the total volume recirculation rate described at rule 64E-9.008(10)(b), *of the Florida Administrative Code*. Crystal Lagoons' process does not employ a total volume recirculation system to meet established health standards. Pet. for Decl. Stmt., ¶ 16. Consequently, bodies of water created using the Crystal Lagoons process are not public swimming pools.

5. A "public bathing place" is "a body of water, natural or modified by humans," held out to the public for swimming, diving, and recreational bathing, the bathing waters of which include, but are not limited to "artificial impoundments." See § 514.011(4), Fla. Stat. (2017).

6. The Crystal Lagoons patented process creates or modifies bodies of water to form artificial impoundments of water having a discernible shoreline. Pet. for Decl. Stmt., ¶ 12. Crystal Lagoons' licensees create, operate, and hold out these bodies of water to the public for swimming, diving, and recreational bathing. Pet. for Decl. Stmt., ¶ 22. Consequently, bodies of water created and operated using Crystal Lagoons' patented process are public bathing places.

7. This Final Order applies solely to persons licensed by Crystal Lagoons to use a process that was patented by Crystal Lagoons and recorded by the United States Patent and Trademark Office as of the date of the filing of the Petition. This Final Order does not apply to non-patented processes developed or in development by Crystal Lagoons, whether or not those processes are currently licensed by Crystal Lagoons for the creation and operation of bodies of water in Florida.

ORDER

Based on the foregoing Findings of Fact and Conclusions of Law, bodies of water created and operated by Crystal Lagoons' licensees using a process that was patented in the name of Crystal Lagoons, as owner, and recorded by the United States Patent and Trademark Office as of the date of the filing of the Petition are "public bathing places" as that term is defined by section 514.011(4), Florida Statutes (2017).

DONE and ORDERED this 22 day of AUGUST, 2018, in Tallahassee, Leon County, Florida.

Celeste Philip, MD, MPH
Surgeon General and Secretary

By: [signature]
Marsha Lindeman, ARNP, MSN
Interim Assistant Deputy Secretary for Health

FILED ON THIS DATE PURSUANT TO § 120.52, FLORIDA STATUTES, WITH THE DESIGNATED DEPARTMENT CLERK, RECEIPT OF WHICH IS HEREBY ACKNOWLEDGED.

[signature]
CLERK

8/21/18
DATE

NOTICE OF RIGHT TO JUDICIAL REVIEW

A party adversely affected by this Final Order is entitled to judicial review pursuant to section 120.68, Florida Statutes. Review proceedings are governed by the Florida Rules of Appellate Procedure. Such proceedings must be initiated by filing a notice of appeal with the Department of Health, Agency Clerk, and a copy of the notice of appeal, with the appropriate filing fee, with the District Court of Appeal having jurisdiction. The notice of appeal must be filed within thirty (30) days of the filing of this Final Order.

Copies to:

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing Final Order has been sent by U.S. Mail, interoffice mail, or hand delivery to each of the above-named persons this 21st day of August, 2018.

Shannon Revels

Shannon Revels, Agency Clerk
Department of Health
4052 Bald Cypress Way, Bin # A02
Tallahassee, FL 32399-1703

CHAPTER 514

PUBLIC SWIMMING AND BATHING FACILITIES

514.011 Definitions.—As used in this chapter:

(1) "Department" means the Department of Health.

(2) "Public swimming pool" or "public pool" means a watertight structure of concrete, masonry, or other approved materials which is located either indoors or outdoors, used for bathing or swimming by humans, and filled with a filtered and disinfected water supply, together with buildings, appurtenances, and equipment used in connection therewith. A public swimming pool or public pool shall mean a conventional pool, spa-type pool, wading pool, special purpose pool, or water recreation attraction, to which admission may be gained with or without payment of a fee and includes, but is not limited to, pools operated by or serving camps, churches, cities, counties, day care centers, group home facilities for eight or more clients, health spas, institutions, parks, state agencies, schools, subdivisions, or the cooperative living-type projects of five or more living units, such as apartments, boardinghouses, hotels, mobile home parks, motels, recreational vehicle parks, and townhouses.

(3) "Private pool" means a facility used only by an individual, family, or living unit members and their guests which does not serve any type of cooperative housing or joint tenancy of five or more living units.

(4) "Public bathing place" means a body of water, natural or modified by humans, for swimming, diving, and recreational bathing used by consent of the owner or owners and held out to the public by any person or public body, irrespective of whether a fee is charged for the use thereof. The bathing water areas of public bathing places include, but are not limited to, lakes, ponds, rivers, streams, artificial impoundments, and waters along the coastal and intracoastal beaches and shores of the state.

(5) "Portable pool" means a pool or spa, and related equipment systems of any kind, which is designed or intended to be movable from location to location.

(6) "Temporary pool" means a pool intended to be used in conjunction with a sanctioned national or international swimming or diving competition event that does not exceed 30 consecutive days of use.

History.—ss. 1, 14, ch. 85-173; s. 4, ch. 91-429; s. 676, ch. 97-103; s. 77, ch. 97-237; s. 45, ch. 98-151; s. 1, ch. 2000-309; s. 103, ch. 2012-184; s. 10, ch. 2016-129.

514.0115 Exemptions from supervision or regulation; variances.—

(1) Private pools and water therapy facilities connected with facilities connected with hospitals, medical doctors' offices, and licensed physical therapy establishments shall be exempt from supervision under this chapter.

(2)(a) Pools serving no more than 32 condominium or cooperative units which are not operated as a public lodging establishment shall be exempt from supervision under this chapter, except for water quality.

(b) Pools serving condominium or cooperative associations of more than 32 units and whose recorded documents prohibit the rental or sublease of the units for periods of less than 60 days are exempt from supervision under this chapter, except that the condominium or cooperative owner or association must file applications with the department and obtain construction plans approval and receive an initial operating permit. The department shall inspect the swimming pools at such places annually, at the fee set forth in s. 514.033(3), or upon request by a unit owner, to determine compliance with department rules relating to water quality and lifesaving equipment. The department may not require compliance with rules relating to swimming pool lifeguard standards.

(3) A private pool used for instructional purposes in swimming shall not be regulated as a public pool.

(4) Any pool serving a residential child care agency registered and exempt from licensure pursuant to s. 409.176 shall be exempt from supervision or regulation under this chapter related to construction standards if the pool is used exclusively by the facility's residents and if admission may not be gained by the public.

(5) A portable pool used exclusively for providing swimming lessons or related instruction in support of an established educational program sponsored or provided by a school district may not be regulated as a public pool.

(6) A temporary pool may not be regulated as a public pool.

(7) The department may grant variances from any rule adopted under this chapter pursuant to procedures adopted by department rule. The department may also grant, pursuant to procedures adopted by department rule, variances from the provisions of the Florida Building Code specifically pertaining to public swimming pools and bathing places when requested by the pool owner or the pool owner's representative to relieve hardship in cases involving deviations from the Florida Building Code provisions, when it is shown that the hardship was not caused intentionally by the action of the applicant, where no reasonable alternative exists, and the health and safety of the pool patrons is not at risk.

History.—ss. 1, 14, ch. 85-173; s. 2, ch. 87-117; s. 46, ch. 98-151; s. 1, ch. 99-182; s. 13, ch. 2014-154; s. 67, ch. 2015-2; s. 11, ch. 2016-129.

514.021 Department authorization.—

(1) The department may adopt and enforce rules to protect the health, safety, or welfare of persons by setting sanitation and safety standards for public swimming pools and public bathing places. The department shall review and revise such rules as necessary, but not less than biennially. Sanitation and safety standards shall be limited to matters relating to source of water supply; microbiological, chemical, and physical quality of water in the pool or bathing area; method of water purification, treatment, and disinfection; lifesaving apparatus; and measures to ensure safety of bathers.

(2) The department may not establish by rule any regulation governing the design, alteration, modification, or repair of public swimming pools and bathing places which has no impact on sanitation and safety of persons using public swimming pools and bathing places. Further, the department may not adopt by rule any regulation governing the construction, erection, or demolition of public swimming pools and bathing places. It is the intent of the Legislature to preempt those functions to the Florida Building Commission through adoption and maintenance of the Florida Building Code. The department shall provide technical assistance to the commission in updating the construction standards of the Florida Building Code which govern public swimming pools. This subsection does not abrogate the authority of the department to adopt and enforce appropriate sanitary regulations and requirements as authorized in subsection (1).

History.—ss. 2, 14, ch. 85-173; s. 65, ch. 87-225; s. 4, ch. 91-429; s. 49, ch. 2000-141; s. 48, ch. 2000-242; s. 27, ch. 2000-367; s. 34, ch. 2001-186; s. 3, ch. 2001-372; s. 104, ch. 2012-184.

514.023 Sampling of beach waters; and public bathing places; health advisories.—

(1) As used in this section, the term "beach waters" means the waters along the coastal and intracoastal beaches and shores of the state, and includes salt water and brackish water.

(2) The department may adopt and enforce rules to protect the health, safety, and welfare of persons using the beach waters and public bathing places of the state. The rules must establish health

standards and prescribe procedures and timeframes for bacteriological sampling of beach waters and public bathing places.

(3) The department may issue health advisories if the quality of beach waters or a public bathing place fails to meet standards established by the department. The issuance of health advisories related to the results of bacteriological sampling of beach waters is preempted to the state.

(4) When the department issues a health advisory against swimming in beach waters or a public bathing place on the basis of finding elevated levels of fecal coliform, *Escherichia coli*, or enterococci bacteria in a water sample, the department shall concurrently notify the municipality or county in which the affected beach waters are located, whichever has jurisdiction, and the local office of the Department of Environmental Protection, of the advisory. The local office of the Department of Environmental Protection shall promptly investigate wastewater treatment facilities within 1 mile of the affected beach waters or public bathing place to determine if a facility experienced an incident that may have contributed to the contamination and provide the results of the investigation in writing or by electronic means to the municipality or county, as applicable.

History.—s. 2, ch. 2000-309; s. 1, ch. 2009-231; s. 105, ch. 2012-184.

514.0231 Advisory committee to oversee sampling of beach waters.—The Department of Health shall form an interagency technical advisory committee to oversee the performance of the study required in s. 514.023 and to advise it in rulemaking pertaining to standards for public bathing places along the coastal and intracoastal beaches and shores of the state. Membership on the committee shall consist of equal numbers of staff of the Department of Health and the Department of Environmental Protection with expertise in the subject matter of the study. Members shall be appointed by the State Surgeon General and the Secretary of Environmental Protection. The committee shall be chaired by a representative from the Department of Health.

History.—s. 5, ch. 2000-309; s. 22, ch. 2001-63; s. 109, ch. 2008-6.

514.025 Assignment of authority to county health departments.—

(1) The department shall assign to county health departments that are staffed with qualified engineering personnel the functions of reviewing applications and plans for the construction, development, or modification of public swimming pools or bathing places; of conducting inspections; and of issuing all permits. If the county health department determines that qualified staff are not available, the department shall be responsible for such functions.

(2) County health departments are responsible for routine surveillance of water quality in all public swimming pools and bathing places, including routine inspections, complaint investigations, enforcement procedures, and operating permits.

(3) The department may assign the responsibilities and functions specified in this section to any multicounty independent special district created by the Legislature to perform multiple functions, to

include municipal services and improvements, to the same extent and under the same conditions as provided in subsections (1) and (2), upon request of the special district.

History.—s. 7, ch. 78-356; s. 2, ch. 81-318; ss. 3, 13, 14, ch. 85-173; s. 66, ch. 87-225; s. 4, ch. 91-429; s. 151, ch. 97-101; s. 2, ch. 2009-231; s. 106, ch. 2012-184.

Note.—Former s. 514.032.

514.028 Advisory review board.—

(1) The Governor shall appoint an advisory review board which shall meet as necessary or at least quarterly, to recommend agency action on variance request, rule and policy development, and other technical review problems. The board shall be comprised of:

(a) A representative from the office of licensure and certification of the department.

(b) A representative from the county health departments.

(c) Three representatives from the swimming pool construction industry.

(d) A representative from the public lodging industry.

(e) A representative from a county or local building department.

(2) The purpose of the advisory review board is to promote better relations, understanding, and cooperation between such industries and the department; to review and make recommendations regarding department product approval standards; to suggest means of better protecting the health, welfare, or safety of persons using the services offered by such industries; and to give the department the benefit of the knowledge and experience of the board concerning the industries and individual businesses affected by the laws and rules administered by the department.

(3) Members shall be reimbursed for travel expenses incurred in connection with service on the advisory review board pursuant to s. 112.061.

History.—ss. 8, 14, 15, ch. 85-173; ss. 4, 5, ch. 91-429; s. 152, ch. 97-101; s. 78, ch. 97-237; s. 17, ch. 2011-222.

514.03 Approval necessary to construct, develop, or modify public swimming pools or public bathing places.—

(1) A person or public body desiring to construct, develop, or modify a public swimming pool must submit an application, containing the information required under s. 514.031(1)(a)1.-6. to the department for an operating permit before filing an application for a building permit under s. 553.79. A copy of the final inspection required under s. 514.031(1)(a)5. shall be submitted to the department upon receipt by the applicant. The application shall be deemed incomplete pursuant to s. 120.60 until such copy is submitted to the department.

(2) Local governments or local enforcement districts may determine compliance with the general construction standards of the Florida Building Code, pursuant to s. 553.80. Local governments or local enforcement districts may conduct plan reviews and inspections of public swimming pools and public bathing places for this purpose.

History.—s. 2, ch. 7825, 1919; CGL 3769; ss. 19, 35, ch. 69-106; s. 3, ch. 76-168; s. 447, ch. 77-147; s. 1, ch. 77-457; ss. 2, 9, ch. 78-356; s. 2, ch. 81-318; ss. 4, 13, 14, ch. 85-173; s. 4, ch. 91-429; s. 47, ch. 98-151; s. 50, ch. 2000-141; s. 3, ch. 2000-309; s. 107, ch. 2012-184; s. 14, ch. 2014-154.

514.031 Permit necessary to operate public swimming pool.—

(1) It is unlawful for any person or public body to operate or continue to operate any public swimming pool without a valid permit from the department, such permit to be obtained in the following manner:

(a) Any person or public body desiring to operate any public swimming pool shall file an application for an operating permit with the department, on application forms provided by the department, and shall accompany such application with:

1. A description of the structure, its appurtenances, and its operation.
2. A description of the source or sources of water supply, and the amount and quality of water available and intended to be used.
3. The method and manner of water purification, treatment, disinfection, and heating.
4. The safety equipment and standards to be used.
5. A copy of the final inspection from the local enforcement agency as defined in s. 553.71.
6. Any other pertinent information deemed necessary by the department.

(b) The applicant shall respond to a request for additional information due to an incomplete application for an operating permit pursuant to s. 120.60. Upon receipt of an application, whether complete or incomplete, as required in s. 514.03 and as set forth under this section, the department shall review and provide to the local enforcement agency and the applicant any comment or proposed modifications on the information received pursuant to subparagraphs (a)1.-6.

(c) If the department determines that the public swimming pool is or may reasonably be expected to be operated in compliance with this chapter and the rules adopted hereunder, the department shall grant the application for permit.

(d) If the department determines that the public swimming pool does not meet the provisions outlined in this chapter or the rules adopted hereunder, the department shall deny the application for a permit pursuant to the provisions of chapter 120. Such denial shall be in writing and shall list the circumstances for the denial. Upon correction of such circumstances, an applicant previously denied permission to operate a public swimming pool or bathing place may reapply for a permit.

(2) Operating permits shall not be required for coastal or intracoastal beaches.

(3) Operating permits may be transferred from one name or owner to another. When the ownership or name of an existing public swimming pool is changed and such establishment is operating at the time of the change with a valid permit from the department, the new owner of the establishment shall apply to the department, upon forms provided by the department, within 30 days after such a change.

(4) Each such operating permit shall be renewed annually and the permit must be posted in a conspicuous place.

(5) An owner or operator of a public swimming pool, including, but not limited to, a spa, wading, or special purpose pool, to which admittance is obtained by membership for a fee shall post in a prominent location within the facility the most recent pool inspection report issued by the department pertaining to the health and safety conditions of such facility. The report shall be legible and readily accessible to members or potential members. The department shall adopt rules to enforce this subsection. A portable pool may not be used as a public pool unless it is exempt under s. 514.0115.

History.—s. 7, ch. 78-356; s. 2, ch. 81-318; ss. 5, 13, 14, ch. 85-173; s. 4, ch. 91-429; s. 48, ch. 98-151; s. 49, ch. 2000-154; s. 4, ch. 2000-309; s. 108, ch. 2012-184; s. 15, ch. 2014-154; s. 13, ch. 2016-129.

514.0315 Required safety features for public swimming pools and spas.—

(1) A public swimming pool or spa must be equipped with an anti-entrapment system or device that complies with American Society of Mechanical Engineers/American National Standards Institute standard A112.19.8, or any successor standard.

(2) A public swimming pool or spa built before January 1, 1993, with a single main drain other than an unblockable drain must be equipped with at least one of the following features that complies with any American Society of Mechanical Engineers, American National Standards Institute, American Society for Testing and Materials, or other applicable consumer product safety standard for such system or device and protects against evisceration and body-and-limb suction entrapment:

(a) A safety vacuum release system that ceases operation of the pump, reverses the circulation flow, or otherwise provides a vacuum release at a suction outlet when a blockage is detected and that has been tested by an independent third party and found to conform to American Society of Mechanical Engineers/American National Standards Institute standard A112.19.17, American Society for Testing and Materials standard F2387, or any successor standard.

(b) A suction-limiting vent system with a tamper-resistant atmospheric opening.

(c) A gravity drainage system that uses a collector tank.

(d) An automatic pump shut-off system.

(e) A device or system that disables the drain.

(3) The determination and selection of a feature under subsection (2) for a public swimming pool or spa constructed before January 1, 1993, is at the sole discretion of the owner or operator of the public swimming pool or spa. A licensed contractor described in s. 489.105(3)(j), (k), or (l) must install the feature.

History.—s. 18, ch. 2011-222; s. 68, ch. 2012-5.

514.033 Creation of fee schedules authorized.—

(1) The department is authorized to establish a schedule of fees to be charged by the department or by any authorized county health department as detailed in s. 514.025. Fees assessed under this chapter shall be in an amount sufficient to meet the cost of carrying out the provisions of this chapter.

(2) The fee schedule shall be: for original construction or development plan approval, not less than $275 and not more than $500; for modification of original construction, not less than $100 and not more than $150; for an initial operating permit, not less than $125 and not more than $250; and for review of variance applications, not less than $240 and not more than $400. The department shall assess the minimum fees provided in this subsection until a fee schedule is promulgated by rule of the department.

(3) Fees shall be based on pool aggregate gallonage, which shall be: up to and including 25,000 gallons, not less than $75 and not more than $125; and in excess of 25,000 gallons, not less than $160 and not more than $265, except for a pool inspected pursuant to s. 514.0115(2)(b) for which the annual fee shall be $50.

(4) Fees collected by the department in accordance with this chapter shall be deposited into the Grants and Donations Trust Fund or the County Health Department Trust Fund. Any fee collected under this chapter is nonrefundable.

(5) The department may not charge any fees for services provided under this chapter other than those fees authorized in this section. However, the department shall prorate the initial annual fee for an operating permit on a half-year basis.

History.—s. 7, ch. 78-356; s. 2, ch. 81-318; s. 9, ch. 83-230; ss. 6, 13, 14, ch. 85-173; s. 1, ch. 87-117; s. 4, ch. 91-429; s. 9, ch. 96-407; s. 225, ch. 97-101; s. 49, ch. 98-151; s. 109, ch. 2012-184.

514.04 Right of entry.—For the purpose of this chapter, department personnel at any reasonable time may enter upon any and all parts of the premises of such public swimming pools and bathing places to make an examination and investigation to determine the sanitary and safety conditions of such places.

History.—s. 3, ch. 7825, 1919; CGL 3770; ss. 19, 35, ch. 69-106; s. 3, ch. 76-168; s. 448, ch. 77-147; s. 1, ch. 77-457; ss. 3, 9, ch. 78-356; s. 2, ch. 81-318; ss. 7, 13, 14, ch. 85-173; s. 4, ch. 91-429.

514.05 Denial, suspension, or revocation of permit; administrative fines.—

(1) The department may deny an application for a permit, suspend or revoke a permit issued to any person or public body, or impose an administrative fine upon the failure of such person or public body to comply with the provisions of this chapter or the rules adopted hereunder.

(2) The department may impose an administrative fine, which shall not exceed $500 for each violation, for the violation of this chapter or the rules adopted hereunder and for the violation of any of the provisions of chapter 386. Notice of intent to impose such fine shall be given by the department to the alleged violator. Each day that a violation continues may constitute a separate violation.

(3) In determining the amount of fine to be imposed, if any, for a violation, the following factors shall be considered:

(a) The gravity of the violation and the extent to which the provisions of the applicable statutes or rules were violated.

(b) Actions taken by the operator to correct violations.

(c) Any previous violations.

(4) All amounts collected pursuant to this section shall be deposited into the Grants and Donations Trust Fund or into the County Health Department Trust Fund, whichever is applicable.

(5) Under conditions specified by rule, the department may close a public pool that is not in compliance with this chapter or the rules adopted under this chapter.

History.—s. 4, ch. 7825, 1919; CGL 3771; ss. 19, 35, ch. 69-106; s. 3, ch. 76-168; s. 449, ch. 77-147; s. 1, ch. 77-457; ss. 4, 9, ch. 78-356; s. 2, ch. 81-318; ss. 9, 13, 14, ch. 85-173; s. 4, ch. 91-429; s. 153, ch. 97-101; s. 50, ch. 98-151; s. 110, ch. 2012-184.

514.06 Injunction to restrain violations.—Any public swimming pool or public bathing place presenting a significant risk to public health by failing to meet sanitation and safety standards established pursuant to this chapter is declared to be a public nuisance, dangerous to health or safety. Such nuisances may be abated or enjoined in an action brought by the county health department or the department.

History.—s. 5, ch. 7825, 1919; CGL 3772; ss. 19, 35, ch. 69-106; s. 139, ch. 71-355; s. 3, ch. 76-168; s. 450, ch. 77-147; s. 1, ch. 77-457; ss. 5, 9, ch. 78-356; s. 2, ch. 81-318; ss. 10, 13, 14, ch. 85-173; s. 4, ch. 91-429; s. 154, ch. 97-101; s. 111, ch. 2012-184.

514.071 Certification of swimming instructors and lifeguards required.—

(1) Any person working as a swimming instructor or lifeguard at a public swimming pool must be certified by the American Red Cross, the Y.M.C.A., or other nationally recognized aquatic training programs. Swimming instructors must be currently certified in swimming instruction, first aid, and cardiopulmonary resuscitation. Lifeguards must be currently certified in lifeguarding, first aid, and cardiopulmonary resuscitation.

(2) In addition to any other remedies available to the department, the department may sue to enjoin the operation of any public swimming pool that uses any swimming instructor or lifeguard in violation of subsection (1).

(3) The department shall adopt rules necessary to implement this section which shall include, but not be limited to, defining the terms “swimming instructor,” “lifeguard,” and “nationally recognized aquatic training program.”

History.—ss. 1, 3, ch. 90-47; s. 4, ch. 91-429.

514.072 Certification of swimming instructors for people who have developmental disabilities.— Any person working at a swimming pool who holds himself or herself out as a swimming instructor

specializing in training people who have developmental disabilities, as defined in s. 393.063, may be certified by the Dan Marino Foundation, Inc., in addition to being certified under s. 514.071. The Dan Marino Foundation, Inc., must develop certification requirements and a training curriculum for swimming instructors for people who have developmental disabilities. A person certified under s. 514.071 must meet the additional certification requirements of this section within 6 months after receiving certification under s. 514.071.

History.—s. 1, ch. 2006-153; s. 69, ch. 2012-5; s. 18, ch. 2013-162.

514.075 Public pool service technician; certification.—The department may require that a public pool, as defined in s. 514.011, be serviced by a person certified as a pool service technician. To be certified, an individual must demonstrate knowledge of public pools which includes, but is not limited to: pool cleaning; general pool maintenance; source of the water supply; bacteriological, chemical, and physical quality of water; and water purification, testing, treatment, and disinfection procedures. The department may, by rule, establish the requirement for the certification course and course approval. The department shall deem certified any individual who is certified by a course of national recognition or any person licensed under s. 489.105(3)(j), (k), or (l). This requirement does not apply to a person, or the direct employee of a person, permitted as a public pool operator under s. 514.031.

History.—s. 19, ch. 96-298; s. 73, ch. 96-388.

SW8341

Date Submitted	12/15/2018	**Section**	454.1	**Proponent**	robert vincent
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation Approved as Submitted
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Summary of Modification

Several improvements and clarifications to public swimming pool code with one added definition for clarification.

Rationale

These revisions clarify code language for pool design that are frequently misinterpreted.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Nominal to none.

Impact to building and property owners relative to cost of compliance with code

Nominal.

Impact to industry relative to the cost of compliance with code

Nominal.

Impact to small business relative to the cost of compliance with code

Nominal.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Each code revision item suggested provides a better pool construction for safety and sanitation.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves clarity for ease of interpretation.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not.

Does not degrade the effectiveness of the code

Does not

Alternate Language

2nd Comment Period

8341-A1

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** Yes

Rationale

Final edits needed to clarify the code requirements.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

None known, these topics are now clarified, and were previously invoked

Impact to industry relative to the cost of compliance with code

None known, these topics are now clarified, and were previously invoked

Impact to Small Business relative to the cost of compliance with code

Nominal.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, all are health and/or safety related

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves code

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does Not discriminate

Does not degrade the effectiveness of the code

Does not degrade

Text of Modification **454.1 "Collector tank"** means a reservoir, with a minimum of 2.25 square feet (0.2 m2) water surface area open to the atmosphere, from which the recirculation or feature pump takes suction, which receives the gravity flow from the main drain line and surface overflow system or feature water source line, and that is cleanable. Tanks shall be shall be constructed of concrete or other impervious and structurally rigid material, shall be watertight, free from structural cracks and shall have a nontoxic smooth and slip-resistant finish.

454.1 "Offset" means set back into the deck from the normal pool wall perimeter (three sides must be surrounded by pool deck).

454.1.2.8.1 Sun shelf dimensional requirements. Sun shelf areas must be a minimum of 20 inches (508 mm) wide and provide a minimum of 10 square feet (0.93 m2) of horizontal surface adjoining on the edge of the pool (three sides of shelf must be surrounded by pool deck) over a distance of not less than 3 feet (914 mm). The sun shelf floor shall be horizontal or shall a have uniform slope from a zero depth entry, and its maximum depth shall be between 8 inches (203 mm) to 12 inches (254 mm) below the water surface. In pools utilizing automatic recessed surface skimmers, there shall be at least one skimmer in each sun shelf area.

454.1.5.5 Access. The opening to an equipment room or area shall be a minimum 3 feet by 6 feet (914 mm by 1829 mm) and shall provide easy access to the equipment. Below grade collector tank(s) must have adequate access for cleaning, maintenance, and inspection.

454.1.9.6.2 The deck level perimeter overflow system with grate shall be provided at the water's edge across the entire zero depth portion of the pool. Zero entry grate must be 8 to 12 inches wide, slip resistant, and constructed for intended purpose of submersion in water and exposure to UV sunlight.

454.1 "Collector tank" means a reservoir, with a minimum of 2.25 square feet (0.2 m2) water surface area open to the atmosphere, from which the recirculation or feature pump takes suction, which receives the gravity flow from the main drain line and surface overflow system or feature water source line, and that is cleanable. Tanks shall be shall be constructed of concrete or other impervious and structurally rigid material, shall be watertight, free from structural cracks and shall have a nontoxic smooth and slip-resistant finish.

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454.1.5.5 Access. The opening to an equipment room or area shall be a minimum 3 feet by 6 feet (914 mm by 1829 mm) and shall provide easy access to the equipment. Below grade collector tank(s) must have adequate access for cleaning, maintenance, and inspection.

454.1.9.6.2 The deck level perimeter overflow system with grate shall be provided at the water's edge across the entire zero depth portion of the pool. Zero entry grate must be 8 to 12 inches wide, slip resistant, and constructed for intended purpose of submersion in water and exposure to UV sunlight.

TAC: Swimming Pool

Total Mods for **Swimming Pool** in **No Affirmative Recommendation: 7**

Total Mods for report: 17

Sub Code: Building

SW7177

11

Date Submitted	11/2/2018	**Section**	454.1.3.1.2	**Proponent**	Michael Weinbaum
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation

Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Summary of Modification

Allowing longer infinity edges

Rationale

This is the part of the code intended to make sure that a bystander with a shepherd's hook can reach a bather in distress. The deck being up to 36" below the water's edge does not impede the bystander from using the deck to help people.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Pools with these features are rejected today. The local entity would have to learn the new rule and apply it if necessary.

Impact to building and property owners relative to cost of compliance with code

Pools that are compliant today are still compliant

Impact to industry relative to the cost of compliance with code

No new devices or materials are required

Impact to small business relative to the cost of compliance with code

Pools that are compliant today are still compliant

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

The limitation of deck obstructions is to allow bystanders to assist bathers in distress. This modification is intended to preserve that.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Overflowing edges on pools are attractive and beautiful to people

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No method of construction or product is mentioned here.

Does not degrade the effectiveness of the code

This is not a blanket allowance for all overflowing edges. They are limited to be only 36" tall or else they will still be considered obstructions.

Alternate Language

2nd Comment Period

7177-A1

Proponent Michael Weinbaum **Submitted** 4/23/2019 **Attachments** Yes

Rationale

Infinity edges are commonplace in other states and in residential pools. The current code considers them an obstruction and limits them to 20 ft in length. The first proposal allowed the whole pool to have this edge type, but this alternate language allows infinity edges up to 60 ft so long as additional safety considerations are met.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Some added complexity

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

Pools that are compliant today are still compliant

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, it is possible for a person standing up to 36" below the waterline to assist a bather in distress. But if the deck is much lower than that, assistance becomes more difficult.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not.

Does not degrade the effectiveness of the code

Does not, though the first proposal did.

1st Comment Period History

SW7177-G1

Proponent Kari Hebrank **Submitted** 2/14/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

1st Comment Period History

SW7177-G2

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

Five issues with this proposal: 1) no code definition of infinity edge,
2) Reference to section 454.1.3.1.4 must be incorrect, as this Section is about wet deck slope, its finish, and a 10” curb, , please provide correct reference,
3) Any other type of pool constructed would not have to follow the ten-inch maximum curb height. A conventional swimming pool that has no extra features could install a raised beam with no maximum height/step over from the top step.
4) Justification assumes that any pool patron on the pool deck could use a shepherd’s hook to assist a bather in distress. If you put a 36” high barrier in front of that person, they may not have the physical strength, or height, to lift a distressed patron with the hook. A 36” high elevated swimming pool, can completely block the view of the pool from the lower pool deck so that a parent could not see over the “wall” to see if anyone was in distress in the swimming pool. Having a 36” high barrier impends the ability of emergency response personnel from removing a distressed or diving accident patient from the pool by creating a barrier to lift the person over.
5) In section 454.1.3.1.6, the proposed change to exclude an infinity edge from the 20% total deck obstruction allows for unlimited amounts of the deck to be inaccessible for visual viewing and safety. When combining an infinity edge with an additional 20% obstruction, it is possible to create a pool that have extremely limited deck access.

454.1.3.1.2

Pool wet decks shall be uniformly sloped at a minimum of 2 percent to a maximum of 4 percent away from the pool or to deck drains to prevent standing water. Textured deck finishes that provide pitting and crevices of more than $^{3}/_{16}$ inch (4.8 mm) deep that accumulate soil are prohibited. If settling or weathering occurs that would cause standing water, the original slopes shall be restored or corrective drains installed. When a curb is provided, the deck shall not be more than 10 inches (254 mm) below the top of the curb. When a perimeter overflowing edge is provided, up to 40 percent of the deck may be lowered. Lowered portions of deck shall be at least 10 in (254 mm) but not more than 36 inches (9144 mm) below the pool water level. Lowered portions of deck shall not be more than 60 feet (18 288mm) long, and shall adjoin the rest of the deck via stairs or ramps at both ends.

...

454.1.3.1.6

Twenty percent of the deck along the pool perimeter may be obstructed as long as any one obstruction does not exceed 10 percent of the pool perimeter or 20 feet (6096 mm), whichever is less, in any one area where water depth is 5 feet (1524 mm) or less. No lowered portion of the deck may be obstructed. Obstructions shall have a wet deck area behind or through them, with the near edge of the walk within 15 feet (4572 mm) of the water except approved slide obstructions shall have the near edge of the walk within 35 feet (10 668 mm) of the water. These obstructions must be protected by a barrier or must be designed to discourage patron access. Obstructions shall not include pool exit points. When an obstruction exists in multiple areas around the pool, the minimum distance between obstructions shall be 4 feet (1219 mm).

454.1.3.1.2

Pool wet decks shall be uniformly sloped at a minimum of 2 percent to a maximum of 4 percent away from the pool or to deck drains to prevent standing water. Textured deck finishes that provide pitting and crevices of more than $^{3}/_{16}$ inch (4.8 mm) deep that accumulate soil are prohibited. If settling or weathering occurs that would cause standing water, the original slopes shall be restored or corrective drains installed. ~~When~~If a curb or overflowing infinity edge is provided, and the deck ~~shall not be~~is more than 10 inches (254 mm) below the top of the curb or edge, a means of access from the deck to the top of the curb or edge shall be provided wherever a means of access into the pool is required by 454.1.2.5. The deck shall not be more than 36" below the top of the curb or edge.

...

454.1.3.1.6

Twenty percent of the deck along the pool perimeter may be obstructed as long as any one obstruction does not exceed 10 percent of the pool perimeter or 20 feet (6096 mm), whichever is less, in any one area where water depth is 5 feet (1524 mm) or less. Obstructions shall have a wet deck area behind or through them, with the near edge of the walk within 15 feet (4572 mm) of the water except approved slide obstructions shall have the near edge of the walk within 35 feet (10 668 mm) of the water. These obstructions must be protected by a barrier or must be designed to discourage patron access. Obstructions shall not include pool exit points. When an obstruction exists in multiple areas around the pool, the minimum distance between obstructions shall be 4 feet (1219 mm). Infinity edges that comply with 454.1.3.1.2 are not obstructions.

SW7178

Date Submitted	11/2/2018	**Section**	454.1.9.2.6	**Proponent**	Michael Weinbaum
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation
Commission Action Pending Review

Comments

General Comments Yes

Alternate Language Yes

Related Modifications

Summary of Modification

No special requirements added for filters on waterslides

Rationale

Extra filter area does not promote public health, other requirements are already in earlier parts of code or are unenforceable

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Simplifies their approach, they are not required to put a tape measure on strainer baskets or define the amount of dirt associated with "peak bather load" or take NTU measurements of installed systems.

Impact to building and property owners relative to cost of compliance with code

If there is any impact, it will be reduction of cost.

Impact to industry relative to the cost of compliance with code

If there is any impact, it will be reduction of cost.

Impact to small business relative to the cost of compliance with code

If there is any impact, it will be reduction of cost.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Filters and strainers are already called for in other parts of the code

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This eliminates special requirements that have no proven benefit.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Currently there is a discrimination against installing waterslides, which would be eliminated here.

Does not degrade the effectiveness of the code

Filters and strainers are already called for in other parts of the code

Alternate Language

2nd Comment Period

7178-A1

Proponent Michael Weinbaum **Submitted** 4/23/2019 **Attachments** Yes

Rationale

The doubling of filter area allows for more time to pass between cleaning the filter. An owner may desire this, but it should not be required.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Code enforcement is simpler

Impact to building and property owners relative to cost of compliance with code

Costs reduced

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

If there is any impact, it will be reduction of cost.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes, turbidity requirement remains in this alternate language

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No change

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No change

Does not degrade the effectiveness of the code

No change

2nd Comment Period

SW7178-G4

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** No

Comment:
Edited in new Alternative to mod 7894. Bob Vincent

1st Comment Period History

SW7178-G1

Proponent Kari Hebrank **Submitted** 2/14/2019 **Attachments** No

Comment:
The Florida Swimming Pool Association SUPPORTS this code proposal.

1st Comment Period History

SW7178-G2

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:
The Florida Swimming Pool Association SUPPORTS this code modification.

1st Comment Period History

SW7178-G3

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:
454.1.9.2.6 The Dept. of Health intent when placing this requirement in the code many years ago was to ensure that water clarity could be maintained and during peak pool usage, a minimum water clarity standard could be achieved. Rather than an ambiguous state of clarity, a measurable standard of 5/10 NTU was established. The turbidity standard should be left in the FBC, and the smaller filter systems as designed and operated should achieve this performance standard.
454.1.9.2.6.3 All suction pumps should be designed with hair and lint strainers to capture debris before it enters a recirculation pump. However, this is strictly a maintenance issue. If debris is routinely captured in the pump impellers, maintenance staff can evaluate this issue and add a hair and lint strainer at a future date.

454.1.9.2.6.2 Filter ~~areas~~ performance.

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

~~**454.1.9.2.6.2Filter areas.**~~

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

~~**454.1.9.2.6.3Hair and lint strainer.**~~

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

SW7222

Date Submitted	11/8/2018	**Section**	454	**Proponent**	Robert Cohen
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

none

Summary of Modification

Change section 454.1.4.2.3 from that in the 2017 FBC back to that in the 2014 FBC

Rationale

There are NO requirements in Chapter 27 of the 2017 FBC specific to swimming pool underwater luminaires.
The wording of the 2014 FRC is more complete and specifically makes it much easier to determine that LED or similar luminaires are acceptable.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

Much easier to determine acceptability of alternate (LED) luminaires for underwater swimming pool lighting.

Impact to building and property owners relative to cost of compliance with code

None or reduced.

Impact to industry relative to the cost of compliance with code

None or reduced

Impact to small business relative to the cost of compliance with code

None or reduced

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Provide better safety for underwater swimming pool lighting.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Makes it much easier to determine Code compliance of alternate luminiaires.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

None. Provides for alternate products

Does not degrade the effectiveness of the code

NO, it improves it.

Alternate Language

2nd Comment Period

7222-A4

Proponent Robert Cohen **Submitted** 4/25/2019 **Attachments** Yes

Rationale

Reinstate significant life safety requirements that were in the 2014 and several prior codes but deleted from the 2017 Code

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

none These requirements have been enforced for a number of years.

Impact to building and property owners relative to cost of compliance with code

None. Clarifies lighting details.

Impact to industry relative to the cost of compliance with code

Reduced cost if alternate luminaires and used and deletes some requirements for engineering certification compared to prior codes.

Impact to Small Business relative to the cost of compliance with code

None or reduced

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Yes

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Yes

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Yes

Does not degrade the effectiveness of the code

Yes

Alternate Language

1st Comment Period History

7222-A1

Proponent Robert Cohen **Submitted** 2/18/2019 **Attachments** Yes

Rationale

Revised proposed change 7222 in response to comments G1 and G2.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

none - reverts to 2014 level of requirements

Impact to building and property owners relative to cost of compliance with code

unknown - reverts to 2014 level of requirements

Impact to industry relative to the cost of compliance with code

unknown - reverts to 2014 level of requirements

Impact to Small Business relative to the cost of compliance with code

None or reduced

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Provides for outdoor night swimming and indoor swimming life safety protections as in the 2014 FBC and years of prior practice in Florida.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Provides for outdoor night swimming and indoor swimming life safety protections as in the 2014 FBC and years of prior practice in Florida.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Yes - incorporates easier rules for alternate luminaires

Does not degrade the effectiveness of the code

no

1st Comment Period History

SW7222-G1

Proponent Kari Hebrank **Submitted** 2/13/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association is OPPOSED to this code proposal which would revert to the 2014 FBC underwater lighting standards.

1st Comment Period History

SW7222-G2

Proponent James LePetrie **Submitted** 2/15/2019 **Attachments** No

Comment:

If this passes there ought to be language for LED lights that allows depth of submersion to be according to manufacturer's specifications. 18" is not necessary for these types of lights.

Revise Sections 454.1.4.2.1, 454.1.4.2.2 and 454.1.4.2.3 as follows:

454.1.4.2.1 Outdoor pool lighting. Lighting shall provide a minimum of 3 footcandles (30 lux) of illumination at the pool water surface and the pool wet deck surface. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter or as required or recommended by the luminaire manufacturer. Underwater lighting shall be a minimum of ~~1/2~~0.5 watt per square foot of pool water surface area when incandescent luminaires are used. Alternative lighting systems such as LED (light emitting diode) or fiber-optic systems, may be utilized if the manufacturer's specifications provide for the equivalency to incandescent illumination provided at 0.5 watt per square foot or where a professional engineer certifies that the equivalent illumination will be provided.

454.1.4.2.2 Indoor pool lighting. Lighting shall provide a minimum of 10 foot candles (100 lux) of illumination at the pool water surface and the pool wet deck surface. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter or as required or recommended by the luminaire manufacturer. Underwater lighting shall be a minimum of ~~8/10~~ 0.8 watt per square foot of pool water surface area when incandescent luminaires are used. Alternative lighting systems such as LED (light emitting diode) or fiber-optic systems, may be utilized if the manufacturer's specifications provide for the equivalency to incandescent illumination provided at 0.8 watt per square foot or where a professional engineer certifies that the equivalent illumination will be provided..

454.1.4.2.3 Underwater lighting. Underwater luminaires shall comply with Chapter 27 of the *Florida Building Code, Building*. The location of the underwater luminaires shall be as specified in 454.1.4.2.1 or 454.1.4.2.2 and shall be such that the underwater illumination is as uniform as possible. Underwater lighting requirements ~~can~~ may be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface.

My comment is fairly simple and clarifies that ONLY the Alternate Language as in proposed Mod SW7222-A1 is what I now propose.

Revise Sections 454.1.4.2.1, 454.1.4.2.2 and 454.1.4.2.3 as follows:

454.1.4.2.1 Outdoor pool lighting. Lighting shall provide a minimum of 3 footcandles (30 lux) of illumination at the pool water surface and the pool wet deck surface. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter or as required or recommended by the luminaire manufacturer. Underwater lighting shall be a minimum of ~~1/2~~0.5 watt per square foot of pool water surface area when incandescent luminaires are used. Alternative lighting systems such as LED (light emitting diode) or fiber-optic systems, may be utilized if the manufacturer's specifications provide for the equivalency to incandescent illumination provided at 0.5 watt per square foot or where a professional engineer certifies that the equivalent illumination will be provided.

454.1.4.2.2 Indoor pool lighting. Lighting shall provide a minimum of 10 foot candles (100 lux) of illumination at the pool water surface and the pool wet deck surface. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter or as required or recommended by the luminaire manufacturer. Underwater lighting shall be a minimum of ~~8/10~~ 0.8 watt per square foot of pool water surface area when incandescent luminaires are used. Alternative lighting systems such as LED (light emitting diode) or fiber-optic systems, may be utilized if the manufacturer's specifications provide for the equivalency to incandescent illumination provided at 0.8 watt per square foot or where a professional engineer certifies that the equivalent illumination will be provided..

454.1.4.2.3 Underwater lighting. Underwater luminaires shall comply with Chapter 27 of the *Florida Building Code, Building*. The location of the underwater luminaires shall be as specified in 454.1.4.2.1 or 454.1.4.2.2 and shall be such that the underwater illumination is as uniform as possible. Underwater lighting requirements ~~can~~ may be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface.

454.1.4.2.3 Underwater lighting. ~~Underwater luminaires shall comply with Chapter 27 of the Florida Building Code, Building. The location of the underwater luminaires shall be such that the underwater illumination is as uniform as possible. Underwater lighting requirements can be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface.~~

Underwater lighting shall utilize transformers and low-voltage circuits with each underwater light being grounded. The maximum voltage for each light shall be 15 volts and the maximum incandescent lamp size shall be 300 watts. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter. All underwater lights which depend upon submersion for safe operation shall have protection from overheating when not submerged. Underwater lighting requirements can be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface. Alternative lighting systems which use 15 volts or less, or use no electricity in the pool or on the pool deck, such as LED (light emitting diode) fiber-optic systems, may be utilized if the manufactures specifications provide for the equivalency in watt output.

Comment response re: mod 7222-G1. February 18, 2019 robert.cohen92023@gmail.com 703-618-1753

FBC 2014	FBC 2017	PROPOSED FBC 2020	PROPOSED CHANGES from 2017 to 2020
454.1.4 Electrical systems.	**454.1.4 Electrical systems.**	**454.1.4 Electrical systems.**	**none**
454.1.4.1 Electrical equipment and wiring. Electrical equipment wiring and installation, including the grounding of pool components shall conform with Chapter 27 of this code.	**454.1.4.1 Electrical equipment and wiring.** Electrical equipment wiring and installation, including the grounding of pool components shall conform with Chapter 27 of this code.	**454.1.4.1 Electrical equipment and wiring.** Electrical equipment wiring and installation, including the grounding of pool components shall conform with Chapter 27 of this code.	**none**
454.1.4.2 Lighting. Artificial lighting shall be provided at all swimming pools which are to be used at night or which do not have adequate natural lighting so that all portions of the pool, including the bottom, may be readily seen without glare.	**454.1.4.2 Lighting.** Artificial lighting shall be provided at all swimming pools which are to be used at night or which do not have adequate natural lighting so that all portions of the pool, including the bottom, may be readily seen without glare.	**454.1.4.2 Lighting.** Artificial lighting shall be provided at all swimming pools which are to be used at night or which do not have adequate natural lighting so that all portions of the pool, including the bottom, may be readily seen without glare.	**none**
454.1.4.2.1 Outdoor pool lighting. Lighting shall provide a minimum of 3 footcandles (30 lux) of illumination at the pool water surface and the pool wet deck surface. Underwater lighting shall be a minimum of 1/2 watt per square foot of pool water surface area.	**454.1.4.2.1 Outdoor pool lighting.** Lighting shall provide a minimum of 3 footcandles (30 lux) of illumination at the pool water surface and the pool wet deck surface. Underwater lighting shall be a minimum of 1/2 watt per square foot of pool water surface area.	**454.1.4.2.1 Outdoor pool lighting.** Lighting shall provide a minimum of 3 footcandles (30 lux) of illumination at the pool water surface and the pool wet deck surface. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter or as required or recommended by the luminaire manufacturer. Underwater lighting shall be a minimum of 1/2 watt per square foot of pool water surface area when incandescent luminaires are used. Alternative lighting systems such as LED (light emitting diode) or fiber-optic systems, may be utilized if the manufacturer's specifications provide for the equivalency to incandescent illumination provided at 0.5 watt per square foot or where a professional	**Revised to be equivalent to underwater illumination levels as in the 2014 and 2017 FBC and as suggested by Mod comments 7222-G1 and G2.**

		engineer certifies that the equivalent illumination will be provided.	
454.1.4.2.2 Indoor pool lighting. Lighting shall provide a minimum of 10 foot candles (100 lux) of illumination at the pool water surface and the pool wet deck surface. Underwater lighting shall be a minimum of 8/10 watt per square foot of pool surface area.	**454.1.4.2.2 Indoor pool lighting.** Lighting shall provide a minimum of 10 foot candles (100 lux) of illumination at the pool water surface and the pool wet deck surface. Underwater lighting shall be a minimum of 8/10 watt per square foot of pool surface area.	**454.1.4.2.2 Indoor pool lighting.** Lighting shall provide a minimum of 10 foot candles (100 lux) of illumination at the pool water surface and the pool wet deck surface. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal operating water level determined by the center-line of the skimmer or top lip of the gutter or as required or recommended by the luminaire manufacturer. Underwater lighting shall be a minimum of 8/10 watt per square foot of pool water surface area when incandescent luminaires are used. Alternative lighting systems such as LED (light emitting diode) or fiber-optic systems, may be utilized if the manufacturer's specifications provide for the equivalency to incandescent illumination provided at 0.8 watt per square foot or where a professional engineer certifies that the equivalent illumination will be provided..	**Revised to be equivalent to underwater illumination levels as in the 2014 and 2017 FBC and as suggested by Mod comments 7222-G1 and G2.**
454.1.4.2.3 Underwater lighting. Underwater lighting shall utilize transformers and low-voltage circuits with each underwater light being grounded. The maximum voltage for each light shall be 15 volts and the maximum incandescent lamp size shall be 300 watts. The location of the underwater lights shall be such that the underwater illumination is as uniform as possible and shall not be less than 18 inches (457 mm) below the normal	**454.1.4.2.3 Underwater lighting.** Underwater luminaires shall comply with Chapter 27 of the *Florida Building Code, Building*. The location of the underwater luminaires shall be such that the underwater illumination is as uniform as possible. Underwater lighting requirements can be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface.	**454.1.4.2.3 Underwater lighting.** Underwater luminaires shall comply with Chapter 27 of the *Florida Building Code, Building*. The location of the underwater luminaires shall be as specified in 454.1.4.2.1 or 454.1.4.2.2 and shall be such that the underwater illumination is as uniform as possible. Underwater lighting requirements ~~can~~ may be waived when the overhead lighting provides at least 15 footcandles	**Revised to add cross references.**

operating water level determined by the center-line of the skimmer or top lip of the gutter. All underwater lights which depend upon submersion for safe operation shall have protection from overheating when not submerged. Underwater lighting requirements can be waived when the overhead lighting provides at least 15 footcandles (150 lux) of illumination at the pool water surface and pool wet deck surface. Alternative lighting systems which use 15 volts or less, or use no electricity in the pool or on the pool deck, such as LED (light emitting diode) fiber-optic systems, may be utilized if the manufactures specifications provide for the equivalency in watt output.		(150 lux) of illumination at the pool water surface and pool wet deck surface.	
454.1.4.2.4 Overhead wiring. Overhead service wiring shall not pass within an area extending a distance of 10 feet (3048 mm) horizontally away from the inside edge of the pool walls, diving structures, observation stands, towers or platforms. Allowances for overhead conductor clearances to pools that meet the safety standards in the *National Electrical Code* may be used instead. Electrical equipment wiring and installation, including the grounding of pool components, shall comply with Chapter 27 of this code.	**454.1.4.2.4 Overhead wiring.** Overhead service wiring shall not pass within an area extending a distance of 10 feet (3048 mm) horizontally away from the inside edge of the pool walls, diving structures, observation stands, towers or platforms. Allowances for overhead conductor clearances to pools that meet the safety standards in the *National Electrical Code* may be used instead. Electrical equipment wiring and installation including the grounding of pool components shall comply with Chapter 27 of the *Florida Building Code, Building*.	**454.1.4.2.4 Overhead wiring.** Overhead service wiring shall not pass within an area extending a distance of 10 feet (3048 mm) horizontally away from the inside edge of the pool walls, diving structures, observation stands, towers or platforms. Allowances for overhead conductor clearances to pools that meet the safety standards in the *National Electrical Code* may be used instead. Electrical equipment wiring and installation including the grounding of pool components shall comply with Chapter 27 of the *Florida Building Code, Building*.	

SW7259

Date Submitted	11/13/2018	**Section**	454.1.1.1	**Proponent**	Michael Weinbaum
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Summary of Modification

Sizing code revised

Rationale

Owners are struggling to comply with the existing code, giving unexpected and undesirable results.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

The code actually becomes simpler because the math will be the same regardless of pool classification.

Impact to building and property owners relative to cost of compliance with code

Owners will have more and less expensive options to comply with the code.

Impact to industry relative to the cost of compliance with code

No new products are required

Impact to small business relative to the cost of compliance with code

New and remodeled facilities will have lower costs for adding pools

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Overcrowded pools give an ugly image and can overwhelm pool sanitation systems

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This creates a stronger tie between the intended use of the pool and the required rate of cleaning the pool water.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

This eliminates a discrimination between pools vs. spas and IWFs

Does not degrade the effectiveness of the code

Higher turnover rates are still encouraged where usage is expected to be high.

Alternate Language

2nd Comment Period

7259-A1

Proponent Michael Weinbaum **Submitted** 4/23/2019 **Attachments** Yes

Rationale

The current code produces unexpected results. Owners are providing pools that are deeper than either they or the guests would like, or they are turning pools into spas. This alternate language only allows one bather per 20 sf, rather than 10 sf. An owner can only get down to 10 sf per bather by complying with the entire spa code.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No more complicated than current code

Impact to building and property owners relative to cost of compliance with code

Costs for new or refurbished developments are the same or reduced.

Impact to industry relative to the cost of compliance with code

No new equipment required

Impact to Small Business relative to the cost of compliance with code

New and remodeled facilities will have lower costs for adding pools

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

It is undesirable for a large hotel to be paired with a small pool, the crowding at the pool is not pleasant and could be dangerous.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

This incentivizes owners to take intermediate steps between a three hour turnover, which is too long in some cases, to a 30 minute turnover, which is too short in these cases

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not.

Does not degrade the effectiveness of the code

Does not.

1st Comment Period History

SW7259-G1

Proponent Kari Hebrank **Submitted** 2/13/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this proposed code modification.

The bathing load for conventional swimming pools, wading pools, interactive water features, water activity pools ~~less than 24 inches (610 mm) deep~~ and special purpose pools shall be computed either on the basis of one person per 5 gpm (0.32 L/s) of recirculation flow, or one person per each 20 square feet (0.9 m^2) of surface area, whichever is less. The bathing load for spa type pools shall be based on one person per each 10 square feet (0.9 m^2) of surface area. ~~The filtration system for swimming pools shall be capable of meeting all other requirements of these rules while providing a flow rate of at least 1 gpm (0.06 L/s) for each living unit at transient facilities and $^3/_4$ gpm (0.04 L/s) at nontransient facilities.~~ The pools provided at a transient facility shall be able to accommodate one bather per five living units, while the bathing load at a non-transient facility shall be at least one bather per seven living units. Recreational vehicle sites, campsites and boat slips designated for live-aboards shall be considered a transient living unit. For properties with multiple pools, this requirement includes the cumulative total ~~gpm~~ bathing load of all swimming pools, ~~excluding~~ spas, wading pools and interactive water features. All other types of projects shall be sized according to the anticipated bathing load and proposed uses. ~~For the purpose of determining minimum pool size only, the pool turnover period used cannot be less than 3 hours.~~

454.1.1.1 Sizing.

The bathing load for conventional swimming pools, spas, wading pools, interactive water features, water activity pools ~~less than 24 inches (610 mm) deep~~ and special purpose pools shall be computed either on the basis of one person per 5 gpm (0.32 L/s) of recirculation flow, or ~~. The bathing load for spa type pools shall be based on~~ one person per each 10 square feet (0.9 m^2) of surface area, whichever is less. ~~The filtration system for swimming pools shall be capable of meeting all other requirements of these rules while providing a flow rate of at least 1 gpm (0.06 L/s) for each living unit at transient facilities and ¾ gpm (0.04 L/s) at nontransient facilities.~~The pools provided at a transient facility shall be able to accommodate one bather per five living units, while the bathing load at a non-transient facility shall be at least one bather per seven living units. Recreational vehicle sites, campsites and boat slips designated for live-aboards shall be considered a transient living unit. For properties with multiple pools, this requirement includes the cumulative total ~~gpm~~ bathing load of all swimming pools, ~~excluding~~ spas, wading pools and interactive water features. All other types of projects shall be sized according to the anticipated bathing load and proposed uses. ~~For the purpose of determining minimum pool size only, the pool turnover period used cannot be less than 3 hours.~~

SW7894

Date Submitted	12/11/2018	**Section**	454.1.1	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Summary of Modification

Clarifies the definition of a plunge pool.

Rationale

FDOH personnel have been requiring multipurpose commercial swimming pools to meet the plunge pool criteria of 454.1.9.2.1 when a water slide is included. This causes several requirements to be met that are not needed for swimming pools, for example a separate pump reservoir, requiring filter areas to be twice what is normally required, and enhanced turnover time at the area where the slide terminates. Since the swimming pool will typically contain a much larger water volume than will a dedicated plunge pool, concerns regarding water quality are not as great.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Would save costs due to misinterpretation of code. A separate pump reservoir, additional filter area, and piping associated with additional turnover would not be required.

Impact to industry relative to the cost of compliance with code

None.

Impact to small business relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Would not have an effect.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Clarifies the code so that swimming pools are not categorized as plunge pools.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No.

Does not degrade the effectiveness of the code

No.

Alternate Language

2nd Comment Period

7894-A1

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** Yes

Rationale

Without specific engineering criteria for the wide ranges of volumes and flows at these conventional pools, the code will be still open for interpretation. Thus, these several edits offered to A1 will narrow the interpretations that may be arrived at in readers minds.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None to slight.

Impact to building and property owners relative to cost of compliance with code

Cost savings likely

Impact to industry relative to the cost of compliance with code

Cost savings likely

Impact to Small Business relative to the cost of compliance with code

None.

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Health of patrons should not be hampered with all suggested edits to code implemented

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves by clarification

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not

Does not degrade the effectiveness of the code

Does not with all suggested edits to code implemented

1st Comment Period History

SW7894-G1

Proponent Kari Hebrank **Submitted** 2/13/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code modification.

1st Comment Period History

SW7894-G2

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

As swimming pools have become more complex, recreations water slides are no longer reserved for water park venues, but are appearing in large CDD or HOA complexes. Existing multipurpose swimming pools are also being upgraded and adding slides to existing swimming pools. The Department of Health applies all applicable sections of 454.1.9.2.1 - 454.1.9.2.1.6.2 FBC when conducting critical health and safety plan reviews or initial permitting inspections. Further vetting between regulatory and design professionals is needed on this topic, delay for this conversation needed.

1st Comment Period History

SW7894-G3

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

As swimming pools have become more complex, recreational water slides are no longer reserved for water park venues, but are appearing in large CDD or HOA complexes. Existing multipurpose swimming pools are also being upgraded and adding slides to existing swimming pools. The Department of Health applies all applicable sections of 454.1.9.2.1 - 454.1.9.2.1.6.2 FBC when conducting critical health and safety plan reviews or initial permitting inspections. Further vetting between regulatory and design professionals is needed on this topic, with delay for decision needed here.

Edits are inserted or deleted and shown in bold font in the A1 presented here:

"Plunge pool" means the receiving body of water located at the terminus of a recreational water slide~~.~~ and is dedicated solely for that purpose. Conventional public swimming pools that are not ~~**defined**~~ **dedicated** as plunge pools that include a **recreational** water slide as part of the design shall meet the requirements of Section 454.1.9.2 with the exception of Sections 454.1.9.2.1.6.1, 454.1.9.2.3, and **a portion of** 454.1.9.2.6.2., **which are deemed optional only for conventional pool recreational slides**.

The following sections need to be modified to assure they carry forward the appropriate sizing and equipment now needed for continuous sanitary water quality performance monitoring:

454.1.9.2.6.1 Recirculation rate. (NO CHANGE TO CURRENT LANGUAGE) **Add:** The total water volume shall include the water in the plunge pool dimensions stipulated by code, plus the slide water.

454.1.9.2.6.2 Filter areas. Minimum filter area requirements shall be twice the filter areas specified for the recirculation rates stipulated in Section 454.1.6.5.5.1. This exception is only applicable to conventional pool recreational slides. The filtration system shall be capable of returning the pool water turbidity to 5/10ths (0.50) NTU within 8 hours or less after peak bather load. A continuous readout/electronic recording in-line turbidity meter shall be installed and used to determine compliance with this NTU criteria whenever the filter area size is optionally not doubled in size.

"Plunge pool" means the receiving body of water located at the terminus of a recreational water slide~~.~~ and is dedicated solely for that purpose.

SW7914

Date Submitted	12/11/2018	**Section**	454.1.7.7	**Proponent**	James LePetrie
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation
Commission Action Pending Review

Comments

General Comments Yes

Alternate Language Yes

Related Modifications

Summary of Modification

Exempts the fencing requirement for wading pools that are located within 50 feet of other pools if the walking distance is 50 feet or more.

Rationale

Aquatics areas can be designed so that walking distances between wading pools and other pools is at or greater than 50 feet using landscaping, walls, etc. This allows elimination of fences that are not aesthetically pleasing and are an additional unneeded cost if the intent of the rule is already being met.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Would eliminate the need for a fence around a wading pool if certain conditions are met.

Impact to industry relative to the cost of compliance with code

None

Impact to small business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No effect.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

Alternate Language

2nd Comment Period

7914-A1

Proponent James LePetrie **Submitted** 5/17/2019 **Attachments** Yes

Rationale

Provides a mechanism for the reviewing authority to determine the adequacy of a proposed barrier to prohibit going over or walking through the barrier by young children.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

May result in costs savings, and provides flexibility to designers for the site layout.

Impact to industry relative to the cost of compliance with code

None

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

No effect

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

No effect

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No

Does not degrade the effectiveness of the code

No

2nd Comment Period

SW7914-G4

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** No

Comment:

I suggest you call the barrier in this section and phrase an "effective barrier" which is defined in the FBC 454.1.

The Department is defined in the FBC as the permitting/inspection authority, thus the local building department. bob vincent

1st Comment Period History

SW7914-G1

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

1st Comment Period History

SW7914-G2

Proponent Kari Hebrank **Submitted** 2/17/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code proposal.

1st Comment Period History

SW7914-G3

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** No

Comment:

Children at wading pools and IWFs are there for a reason, they typically cannot swim.
Note that an “effective barrier” defined in 454.1 and used in this section does not include a landscape ‘barrier’, it includes a 48” wall, building or fence. The Department inspectors have observed numerous problems with 'barrier' landscaping that result in placement of an effective barrier (sometimes nearly invisible in the landscaping): landscaping is often not impenetrable by small people, plants are often not maintained alive, dense plantings may conceal children en-route to the pool, and the plant organic debris falls into pool water using up a fraction of the treatment.
If this Mod is allowed, the effective barrier requirements for an IWF to a pool would be changed too, as they are controlled by this wade pool section.

When within 50 feet of ~~adjacent to~~ swimming pools, wading pools shall be separated from the swimming pool by a barrier or a fence of a minimum of 48 inches (1219 mm) in height with self-latching and self-closing gates. When adjacent to areas less than 1 foot (305 mm) deep of zero depth entry pools, the fence or effective barrier is required if the water edges are less than 40 feet (12 192 mm) apart. Where the walking distance is at least 50 feet (15240 mm) between the wading pool and all other pools, fencing requirements should be carefully considered by the applicant to control usage, but are not required by rule. Barriers that are designed to define the walking path shall be subject to review and approval by the Department.

When within 50 feet of ~~adjacent to~~ swimming pools, wading pools shall be separated from the swimming pool by a barrier or a fence of a minimum of 48 inches (1219 mm) in height with self-latching and self-closing gates. When adjacent to areas less than 1 foot (305 mm) deep of zero depth entry pools, the fence or effective barrier is required if the water edges are less than 40 feet (12 192 mm) apart. Where the walking distance is at least 50 feet (15240 mm) between the wading pool and all other pools, fencing requirements should be carefully considered by the applicant to control usage, but are not required by rule.

REMAINING TEXT UNCHANGED

SW8365

Date Submitted	12/15/2018	**Section**	454.1	**Proponent**	robert vincent
Chapter	4	**Affects HVHZ**	No	**Attachments**	No

TAC Recommendation No Affirmative Recommendation
Commission Action Pending Review

Comments

General Comments No

Alternate Language Yes

Related Modifications

Summary of Modification

Glitches to correct. No change to the existing code language that is left off here.

Rationale

The make the FBC code consistent with the Department of Health rule Chapter 64E-9, FAC

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

None

Impact to industry relative to the cost of compliance with code

None

Impact to small business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Consistency with health rule

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Consistency with other rule

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

None

Does not degrade the effectiveness of the code

None

Alternate Language

2nd Comment Period

8365-A2

Proponent robert vincent **Submitted** 5/26/2019 **Attachments** Yes

Rationale

This change to the beverage signage keeps chlorine-consuming spill-able beverages and food a safe distance away from the pool water while allowing the patrons using the pool for excercise, lounging, etc. the ability to hydrate with plain water without leaving the pool.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

None

Impact to building and property owners relative to cost of compliance with code

Nominal cost of sticker to change or add to pool rules sign.

Impact to industry relative to the cost of compliance with code

Nominal cost of sticker to change or add to pool rules sign.

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Provides: public notification to the patrons of ability to use hydration water at the pool side, with no impact on pool water quality; a legal way to allow pool owners to allow bottled water only for excercising patrons and for those that are medically necessary.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

Improves code

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

Does not

Does not degrade the effectiveness of the code

Does not

Alternate Language

1st Comment Period History

8365-A1

Proponent robert vincent **Submitted** 2/18/2019 **Attachments** Yes

Rationale

To keep chlorine consuming spill-able beverages away from the pool water while allowing the pool patrons that use the pool for exercise the ability to hydrate with plain water without leaving the pool.

Fiscal Impact Statement

Impact to local entity relative to enforcement of code

No impact; Operational for DOH to manage after the statements on pool rules sign posted.

Impact to building and property owners relative to cost of compliance with code

Positive consumer relations impact expected. This will be for new pool rules signs and eventually for those signs replaced after fading to illegible.

Impact to industry relative to the cost of compliance with code

Nominal impact expected for added words on new signs and replaced signs.

Impact to Small Business relative to the cost of compliance with code

None

Requirements

Has a reasonable and substantial connection with the health, safety, and welfare of the general public

Should be very good for the patrons health and for the pool water quality. Positive welfare (mental health) benefits as well.

Strengthens or improves the code, and provides equivalent or better products, methods, or systems of construction

YES, this is a highly requested modification from community owned pools.

Does not discriminate against materials, products, methods, or systems of construction of demonstrated capabilities

No discrimination expected

Does not degrade the effectiveness of the code

Does not degrade FBC code, and DOH will implement this mod operationally after the pool rule sign code language is revised.

Is the proposed code modification part of a prior code version? No

1st Comment Period History

SW8365-G1

Proponent Kari Hebrank **Submitted** 2/13/2019 **Attachments** No

Comment:

The Florida Swimming Pool Association SUPPORTS this code modification.

No change to the existing code language that is left off here.

454.1.2.3.5 Rules and regulations signage.Rules and regulations for bathers shall be installed in minimum 1-inch (25.4 mm) letters which must be legible from the pool deck, and shall contain the following:
1. No food or beverages in the pool ~~or on pool wet deck~~. or on pool wet deck.

Commercially bottled water in plastic bottles are allowed on the pool wet deck for pool patron hydration.

454.1.9.8.7.1 Rules and regulations for water theme parks shall be posted in minimum 1-inch (305 mm) letters at each entrance to the park and shall contain the following:
1. No food, drink, glass or animals in pool or on the pool decks.

454.1.9.8.1 Waters discharged from all fountain or spray features shall not pond on the feature floor but shall flow by gravity through a main drain fitting to a ~~below or~~ collection system which discharges to a collector tank.

No change to the existing code language that is left off here.

No change to the existing code language that is left off here.

454.1.2.3.5 Rules and regulations signage.Rules and regulations for bathers shall be installed in minimum 1-inch (25.4 mm) letters which must be legible from the pool deck, and shall contain the following:
1. No food or beverages in the pool or on pool wet deck.

Commercially bottled water in plastic bottle allowed on the pool wet deck for hydration while bather exercises .

454.1.9.8.7.1 Rules and regulations for water theme parks shall be posted in minimum 1-inch (305 mm) letters at each entrance to the park and shall contain the following:
1. No food, drink, glass or animals in pool or on the pool decks.

No change to the existing code language that is left off here.

454.1.2.3.5 Rules and regulations signage.Rules and regulations for bathers shall be installed in minimum 1-inch (25.4 mm) letters which must be legible from the pool deck, and shall contain the following:
1. No food or beverages in the pool ~~or on pool wet deck~~.

454.1.9.8.7.1 Rules and regulations for water theme parks shall be posted in minimum 1-inch(305 mm) letters at each entrance to the park and shall contain the following:
1. No food, drink, glass or animals in pool or on the pool decks.

454.1.9.8.1 Waters discharged from all fountain or spray features shall not pond on the feature floor but shall flow by gravity through a main drain fitting to a ~~below or~~ collection system which discharges to a collector tank.

No change to the existing code language that is left off here.