



CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

PURPOSE/HOW TO USE

TOPIC BACKGROUND

In addition to what is said in all the volumes of the Florida Building Code, the FBC adopts references/Standards that become part of the code. It's not hard to see how difficult it is for contractors, their salespeople/designers or even Building Department Plan Reviewers and Inspectors to keep up with and ensure compliance. So many of the code requirements for residential swimming pools have a direct effect on the level of SAFETY provided to the homeowner. We have found that not all Building Departments have the resources to purchase the adopted standards or get staff adequately trained, it is IMPORTANT that the pool plan show compliance regardless of what has been permitted in the past.

These CODE TOPICS are offered in attempt to show the individual issues that may not be obvious, even to the experience Contractor, Plan Reviewer or Inspector. In no particular order the available CODE TOPICS are:

BOND LOOP

EXCAVATION NEAR STRUCTURES

FLOOR SLOPES FOR SAFETY

HANDHOLDS FOR SAFETY

HEAT LOSS COVERS

PIPING AT FINAL

SUN SHELF WATER DEPTH

STEP ACCESS INTO SPA

POOLS WITH SECOND SHALLOW END

WATER DISTURBANCE ALARMS

CHILD BARRIER METHODS

DIFFERENT RESIDENTIAL POOL FLOWS

DEEP AREA EGRESS

SUCTION OUTLET COVERS

POOL CAGE FOOTINGS

ANSI 7 & 15 COMPLIANCE

WHAT THE CODE SAYS

Each CODE TOPIC states "What the Code Says" either directly copied, using a graphic or stating the know intents behind the requirements.

REQUIRED AT PLAN REVIEW

The CODE TOPIC will state or restate what is required for a Plan Reviewer to see or discern compliance from the plan or documents before them.

REQUIRED DURING INSPECTION

The CODE TOPIC will state particular requirements that the Field Inspector should examine or view during the inspection site visit to confirm code compliance or compliance with the approved plan.

Disclaimer: These documents represent restatement of codes and at times interpretations. This does not authorize any code violation.

CODE TOPICS

2017 FBC 6th ED SECTION 454.2 RESIDENTIAL SWIMMING POOLS

POOL BOND-LOOP-EQUIPMENT

TOPIC BACKGROUND

Everyone knows the bond loop is connected to four points of the pool steel, is to be placed 18" to 24" from the pool water in plan view and 4" to 6" below subgrade. In paver decks it is reasonable to take the pool beam as the subgrade elevation. Recent deck bonding inspections find the bond loop placed for the deck inspection before backfill and the subgrade is placed. Or the bond loop laying in the bottom of the footing excavation at the back of the pool where there is fill between the pool and footing. Most often occurs where there is a raised deck area and the retaining wall or extended footings are formed/poured after the bond loop is connected. This causes the loop to be buried much deeper than 6" in the backfill or encased in the concrete footing deeper than 6", making it useless.

WHAT THE CODE SAYS

What the 2014 NEC Section 680.26(B)(2), **Perimeter Surfaces:**

Requires the perimeter surface around a pool to have bonding connected to POOL STEEL at FOUR points around the pool/spa.

Section (b) Alternate Means says:

(b) *Alternate Means.* Where structural reinforcing steel is not available or is encapsulated in a nonconductive compound, a copper conductor(s) shall be utilized where the following requirements are met:

- (1) At least one minimum 8 AWG bare solid copper conductor shall be provided.
- (2) The conductors shall follow the contour of the perimeter surface.

(3) Only listed splices shall be permitted.

(4) The required conductor shall be 450 mm to 600 mm (18 in. to 24 in.) from the inside walls of the pool.

(5) The required conductor shall be secured within or under the perimeter surface 100 mm to 150 mm (4 in. to 6 in.) below the subgrade.

REQUIRED AT PLAN REVIEW

These requirements are already shown on our Standard Engineering sheets S1 and S2.

REQUIRED DURING INSPECTION

The bond loop must be placed after the piping trench or retaining wall backfill has been placed in order to be 4" to 6" from FINAL SUBGRADE surface at inspection.

NOT READY FOR BOND LOOP



NOT READY FOR BOND LOOP



Revised 24/06/2020

Disclaimer: This is offered as summary and guidance on code requirements. This does not authorize a code violation.

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CA 27189

CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

EXCAVATION NEAR STRUCTURES

TOPIC BACKGROUND

Recall the code and Building Department used to refer to “angle of repose” in saying the excavation had to be 1 ft off the 45° line from the foundation. Compliance was accepted if the inside of the pool wall was equal distance from the structure as the water depth. That “angle of repose” is no longer in the code.

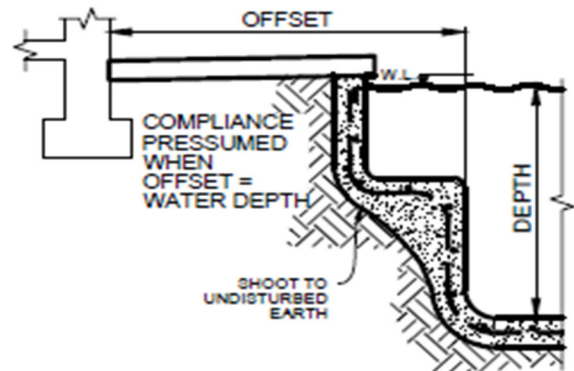
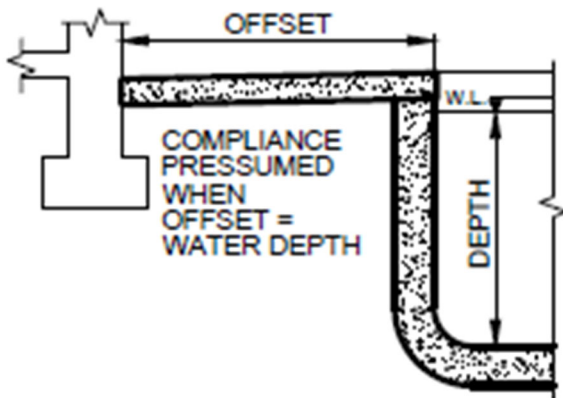
WHAT THE CODE SAYS

2017 FBC 6th Ed Section 1804.1 Excavation near foundations.

Excavation for any purpose shall not reduce lateral support from any foundation or adjacent foundation without first underpinning or protecting the foundation against detrimental lateral or vertical movement, or both.

REQUIRED AT PLAN REVIEW

Typically compliance is still accepted when the offset from the structure is equal to the water depth. When the offset is less, an Excavation Mitigation is needed. Typically, a detail showing concrete will be shot beyond the typical forms of the pool at the lower depths, allowing for effective mechanical compaction in the upper levels between the structure and the pool. A shoring specification may be required.



REQUIRED DURING INSPECTION

Regardless of the above conditions, if the contractor encounters conditions where there is threatened loss of soil support at the foundation, work should cease, the contractor must take measures to protect the foundation from loss of soil and contact the engineer for mitigation instructions.

If the inspectors find conditions where there is loss of support at the foundation, they should fail the inspection, and contact the contractor.

CODE TOPICS

2017 FBC 6th ED SECTION 454.2 RESIDENTIAL SWIMMING POOLS

HANDHOLDS FOR SAFETY

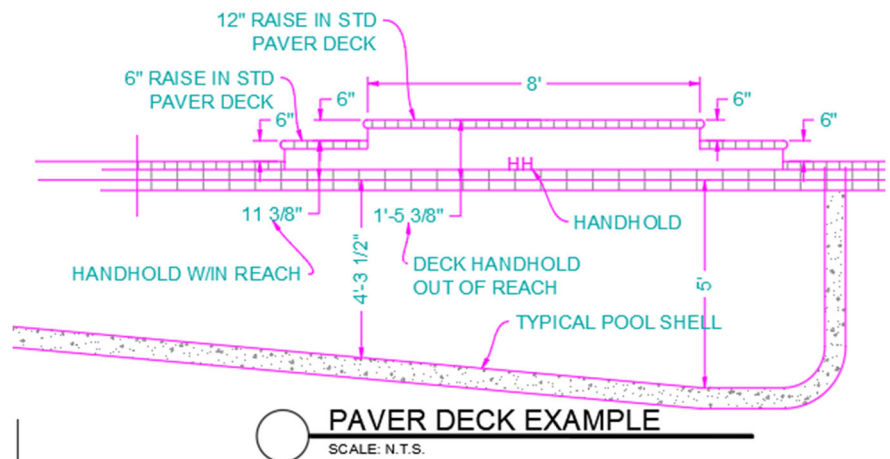
TOPIC BACKGROUND

Pool plans often show raised deck areas and based on the expected pool floor slopes handholds need to be in place at final inspection. Regardless of plan, if construction results in the following conditions, handhold(s) would be required.

WHAT THE CODE SAYS

WHAT ANSI 5 SECTION 17 SAYS:

- Handholds required where water depth exceeds 4 ft.
- Handholds must be accessible within 4 ft and not to exceed 8 ft.
- Handholds may be deck, coping or ledges no more than 12" above water line.
- Handholds may be rocks or masonry/tooled joints within 12" of water line.
- Handholds may be rope or rail places within 12" of water line.
- Ladders, stairs or underwater seats/benches may be used.
- Handholds not limited to items listed as long as the finish design affords a handhold within 12" of water line.



REQUIRED AT PLAN REVIEW

Your plan needs to show raised areas and how much it's raised, such as +6" from rest of pool deck. The raised deck area should have length dimensions. The type of handhold needs to be called out on the plan.

REASONABLE INTERPRETATIONS INCLUDE:

- Rock or stone finishes that allow for a full finger knuckle to grasp could be a handhold.
- During plan review or design, estimate the beginning of the 4 ft depth based on the planned water depths, and if there is more than 6" raised deck for more than 8 ft towards the deeper areas, one or more handholds are required.

REQUIRED DURING INSPECTION

Handholds shall be in place when shown on plan or required based on actual construction depths.

- Regardless of what is on the plan, handhold(s) may be required based on as-built conditions.

CODE TOPICS

2017 FBC 6th ED SECTION 454.2- RESIDENTIAL POOLS

HEAT LOSS COVERS

TOPIC BACKGROUND

Recall a couple code revisions ago, the energy code required a heated pool to have provide a cover to prevent heat loss. Then the code changed to allow liquid or chemical products “proven to prevent heat loss” to be used. Often pool plans with heatpumps for heaters include the call out for the heat loss cover. However, heatpumps are EXCLUDED from that requirement.

WHAT THE CODE SAYS

What the 2017 FBC-Energy Conservation, 6th ED says:

Commercial Energy Efficiency:

C404.9.3Covers.

Outdoor heated swimming pools and outdoor permanent spas shall be equipped with a vapor-retardant cover on or at the water surface or a liquid cover or other means proven to reduce heat loss.

Exception: Where more than 70 percent of the energy for heating, computed over an operating season, is from site-recovered energy such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.

Residential Energy Efficiency:

R403.10.3Covers.

Outdoor heated swimming pools and outdoor permanent spas shall be equipped with a vapor-retardant cover on or at the water surface or a liquid cover or other means proven to reduce heat loss.

Exception: Where more than 70 percent of the energy for heating, computed over an operation season, is from site-recovered energy, such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.

REQUIRED AT PLAN REVIEW

If a gas heater is proposed on the pool or spa plan, there needs to be a call out that a heat loss cover will be provided, and typically a product sheet is included in the package.

REQUIRED DURING INSPECTION

The heat loss product needs to be on site at the Final Inspection.



CODE TOPICS

2017 FBC 6th ED, SECTION 454.2 RESIDENTIAL POOLS

FINAL EQUIP PIPING REQUIRED

TOPIC BACKGROUND

There are two pieces of pool piping often missing in the final plumb at the equipment. These are requirements of the energy code. Those two pieces of pipe that are required are 18" of pipe between the filter and heater for future solar heating connection AND 4 pipe diameters of straight pipe at the pump suction inlet.

WHAT THE CODE SAYS

What ANSI 15 "Residential Swimming Pool and Spa Energy Efficiency" says:

5.5.2 For pool filtration pumps, a length of straight pipe that is at least 4 pipe diameters shall be installed before the pump.

5.5.3 Solar heating. At least 18 inches (457 mm) of horizontal or vertical pipe shall be installed between the filter and the heater or dedicated suction and return lines, or built-in or built-up connections shall be installed to allow for the future addition of solar heating equipment.

REQUIRED AT PLAN REVIEW

Specific callouts should be viewed on the contractor plan or the Engineering Standards. These requirements are already shown on our Standard Engineering sheets S1 and S2.

REQUIRED DURING INSPECTION

ANSI 15 requires TWO things related to equipment piping arrangements. There needs to be FOUR pipe diameters of straight pipe on pump suction connection, to reduce turbulence entering the pump that affects its efficiency. That's 8" of pipe in front of the pump strainer when 2" suction pipe is used, or 10" if 2.5" pipe is used, and so on. Also, there needs to be 18" of STRAIGHT pipe after the filter and before the heater, for future solar heater connection. This could be horizontal, vertical or an angle between.

Don't forget that DIRECTIONAL INLETS are also required.

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CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

SUN SHELF WATER DEPTH

TOPIC BACKGROUND

Sun shelves are a popular feature in residential pools. Each of your customers have their own opinion of what the water depth should be for their use. However, when the sun shelf is also serving as the top step for the entry to the pool, the maximum water depth is determined by the maximum 12" riser from the deck to the sun shelf as the top step. If the sun shelf is located so its not part of the pool entry, the maximum depth would likely be 24" before it would have to start meeting codes as a "pool floor."

WHAT THE CODE SAYS

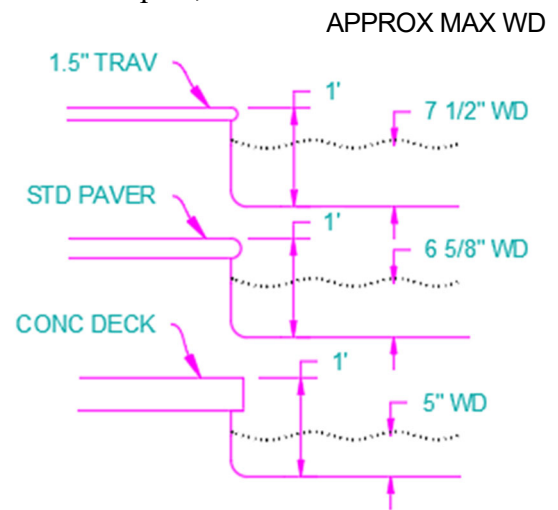
When the Sun Shelf is also the first step of the step entry at the shallow end of the pool, ANSI/APAP/ICC-5 2011 Section 6 Entry/Exit applies:

6.2.2 All risers shall have a maximum uniform height of 12 in. (305 mm), except the top riser, which may vary but shall not exceed 12 in. (305 mm).

6.2.2.1 The vertical distance from the pool coping, deck or step surface to the uppermost tread shall be a maximum of 12 in. (305 mm).

This means that depending on the coping the water depth on the sun shelf as the first step may be less than what is expected by your customer. For standard coping 6.5", for 1.5" travertine coping 7.5", or for concrete overpour 5".

If the sun shelf is part of pool entry and water depth is to be deeper than described here, add a step on the sun shelf.



REQUIRED AT PLAN REVIEW

When you have a sun shelf on the plan at the shallow end step area and its obvious it is the first step, CALL OUT THE WATER DEPTH so the customer and reviewer knows what to expect and to guide the shoot crew to be clear how to build it.

REQUIRED DURING INSPECTION

If the first step is found to exceed 12" it will need to be corrected.

CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

STEP ACCESS INTO SPA

TOPIC BACKGROUND

It may not have been obvious but safe access into residential spas is required and basically just like pools, the user needs maximum 12" from deck to safely access a spa. For your typical 18" water depth on the bench the spa must be raised 11.5" from the deck. Otherwise there must be a step on the spa bench.

WHAT THE CODE SAYS

ANSI/APAP/ICC-3 2014 SPA Standard, Section 5.6.1 Entry/Exit:

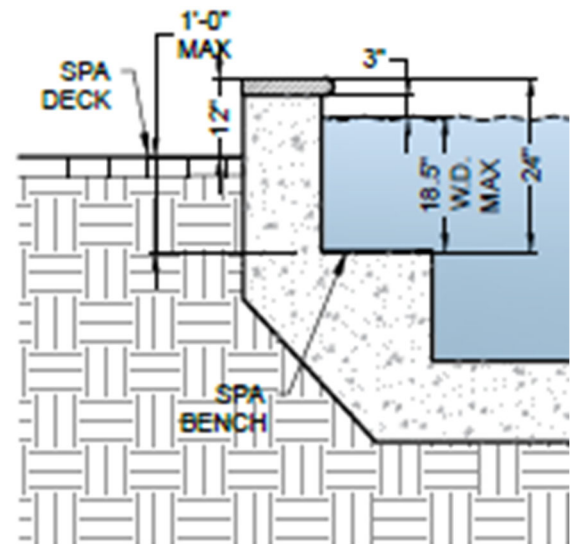
5.6.2.1 Treads shall have a minimum unobstructed horizontal depth of 10 in. (254 mm) and a minimum unobstructed walking surface area of 240 sq in. (1548 cm²).

5.6.2.2 All risers at the centerline, except for the bottom riser, shall have a maximum uniform height of 12 in. (305 mm).

5.6.2.3 The bottom riser height is allowed to vary to the floor.

5.6.2.5 The vertical distance from the spa or swim spa coping, deck, or step surface to the uppermost tread shall be a maximum of 12 in. (305 mm).

This means that for a standard coping on the spa beam, and 18" water depth on the bench, the minimum rise from the deck is 11.5" for that max 12" from deck to bench without an added step on the bench.



3 12" RAISED SPA WITH PAVER COPING WITHOUT STEP

REQUIRED AT PLAN REVIEW

First, the plan must be clear as to the relative elevation of the spa. Then if the spa is flush or raised less than 12" it needs to show a spa step on the bench with callout "minimum 240 Sq In" or obvious dimensions of at least 16"x16".

REQUIRED DURING INSPECTION

The spa step should be verified at the deck inspection so the contractor has the opportunity to correct before plastering the spa. Regardless, at final inspection, verify a step is in place or measure bench to beam and deck to beam to determine if there is violation of the maximum 12" from deck to bench for spa entry. A step may need to be added.

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CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

POOLS WITH 2ND SHALLOW END

TOPIC BACKGROUND

Many pool designs such as a “sport pool” may show the deep area in the middle with two shallow ends of the same depth. An interpretation from an ANSI Committee member says this applies to pools where the two shallow ends of the same depth.

WHAT THE CODE SAYS

ANSI/APSP/ICC-5 2011 says:

6 Entry/Exit

6.1 Entry/exit. All pools shall have a means of entry/exit in the shallow area(s) if water depth exceeds 24 in. (610 mm) at the shallowest point. The means of entry/exit shall be located on the shallow side of any first slope change. Pools having more than one shallow area, including but not limited to; center deep, play or sports pools, shall use the same means of entry/exit in all shallow areas.

2017 FBC 6th Ed, Section 454.2.18 says:

454.2.18 Ladders and steps.

All pools whether public or private shall be provided with a ladder or steps in the shallow end where water depth exceeds 24 inches (610 mm). In private pools where water depth exceeds 5 feet (1524 mm) there shall be ladders, stairs or underwater benches/ swim-outs in the deep end. Where manufactured diving equipment is to be used, benches or swim-outs shall be recessed or located in a corner.

Exception: In private pools having more than one shallow end, only one set of steps are required. A bench, swimout or ladder may be used at all additional shallow ends in lieu of an additional set of steps.

REQUIRED AT PLAN REVIEW

When the pool is shown with the deep area in the middle and shallow areas of the same depth, there needs to be a bench, steps, ladder or other means of egress stated in Section 6.1.2.

REQUIRED DURING INSPECTION

Verify depths and egress according to plan.



CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

WATER DISTURBANCE ALARMS

TOPIC BACKGROUND

Water disturbance alarms were recently allowed by statute and code as part of residential pool child safety. This option has a number of challenges that are seen in plan reviews and inspections. Our view, this is the least desirable option for child safety.

WHAT THE CODE SAYS

FBC 454.2.17 requires the combination of barriers unless a pool cover meeting ASTM F1346 is used.

FBC 454.2.17.1 allows a FOUR sided barrier such as fencing, mesh barrier or cage.

FBC 454.2.17.1.9 allows a THREE sided barrier where the dwelling wall is the FOURTH side BUT must have barrier from doors and windows by either:

- A. Door and window alarms meeting UL 2017
- B. Self-closing self-latching doors
- C. Water Disturbance Alarm(s) meeting ASTM F2208

THIS MEANS CAGE OR YARD FENCING THAT CONNECTS TO THE HOUSE IS REQUIRED WITH OPTIONS A, B, OR C.

REQUIRED AT PLAN REVIEW

The plan must show that cage or yard fencing will be used.

The brand/model must be stated on the plan and product sheet provided showing it meets ASTM F2208.

Multiple devices may be required if there is a spa or the install instructions state so based on shape/size of the pool. Because, the over the coping type device Poolguard Model PGRM-2 does not have installation instruction on “champagne spas”, that product is not permitted in those cases.

Due to the varying water levels and water disturbance in negative edge basins, water disturbance alarms are not appropriate for that design.

REQUIRED DURING INSPECTION

INSPECTION REQUIREMENTS

- ☐ All alarms must be installed and operating at the time of inspection.
- ☐ Multiple units may be required on larger pools as recommended by the product manuals.
- ☐ A separate unit is required for the spa.
- ☐ The sounding alarm must be heard from the outside unit and inside unit. This requires access to the residence to verify the interior portion is operational.
- ☐ A bucket with attached retrieval rope must be provided at the time of inspection to test the systems as described in the product manuals. This is typically a minimum of two gallons and may be single or multiple buckets.
- ☐ If the water disturbance alarm is sounding upon arrival due to wind, the inspection would be a “fail.” FYI, it seems the Lifebuoy product has an adjustment for windy conditions.
- ☐ If the alarm continues to sound after attempt to deactivate per instructions, the inspection would be a “fail.”

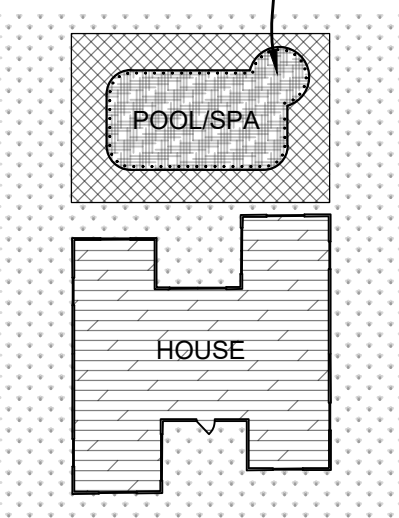
CHILD BARRIER REQUIREMENTS
2017 FBC, 6TH ED., SECTION 454.2.17

THE CHILD SAFETY BARRIER SHALL BE INSTALLED A MINIMUM
OF 20" FROM POOL EDGE AND 36" AWAY FROM STRUCTURES
THAT ALLOW THE CHILD TO CLIMB BEYOND THE BARRIER

- FENCE CRITERIA
- MIN 48" HIGH FROM OUTSIDE
 - NO GAPS OR OPENINGS TO ALLOW CLIMBING.
 - DISTANCE BETWEEN TOP MEMBER & BOTTOM MEMBER MIN 45"
 - MAX CHAIN LINK 2-1/4" SQUARE
 - GATES OUT-SWING FROM POOL AREA
 - GATES SELF CLOSING & SELF LATCHING
 - GATE RELEASE 54" HIGH
 - 4" MAX VERTICAL SPACING

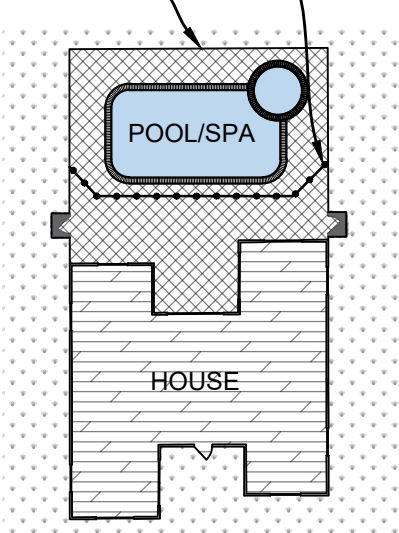
- WATER DISTURBANCE ALARM
- DECK MOUNTS NOT ACCEPTABLE ON CHAMPAGNE SPAS
 - MUST BE INSTALLED AND TESTED ACCORDING TO MANUFACTURER INSTRUCTIONS

POOL COVER
MEETS ASTM
F1346 STANDARDS



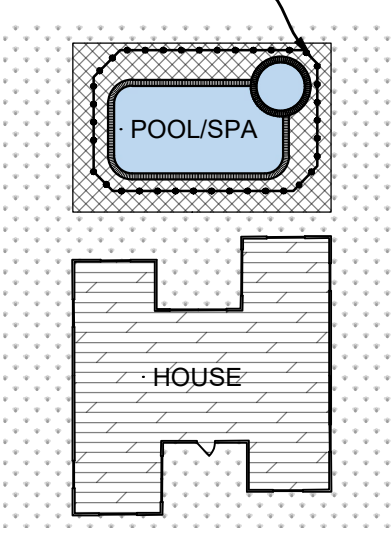
1 POOL COVER

BARRIER
CAGE



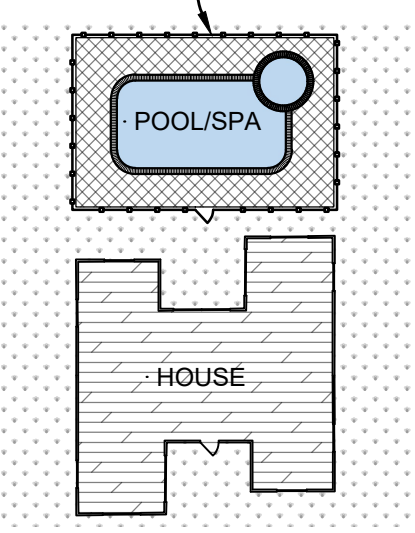
2 CAGE WITH BARRIER

BARRIER



3 BARRIER AROUND POOL

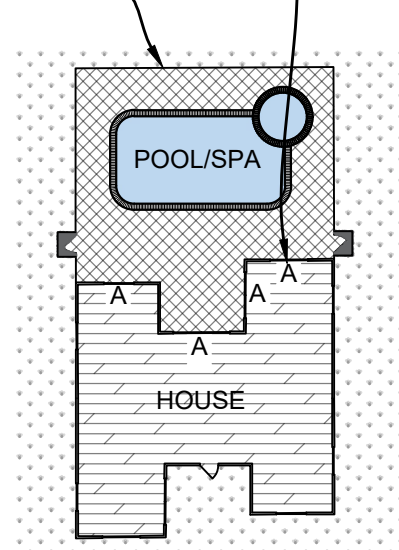
CHILD SAFE
YARD FENCE



4 FENCE AROUND POOL

DOOR & WINDOW
ALARMS MEET
UL2017 STANDARD

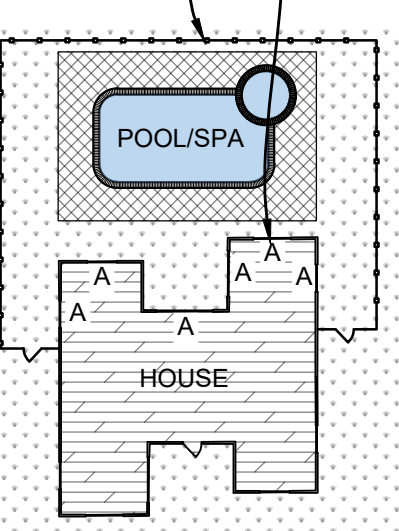
CAGE



5 HOME ALARMS WITH CAGE

DOOR & WINDOW
ALARMS MEET
UL2017 STANDARD

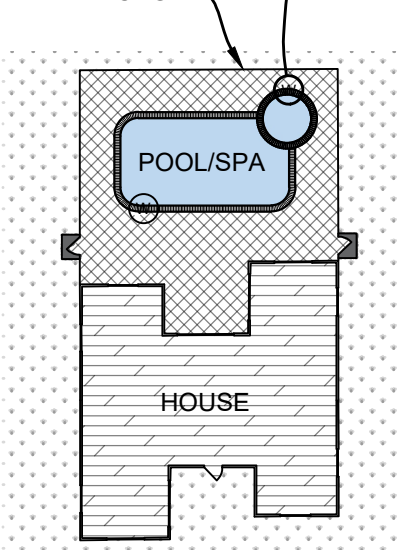
CHILD SAFE
YARD FENCE



6 HOME ALARMS WITH FENCE

WATER ALARMS
MEET ASTM F2208
STANDARDS

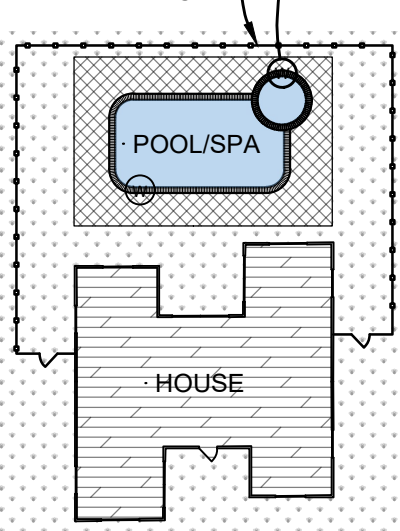
CAGE



7 WATER ALARMS WTH CAGE

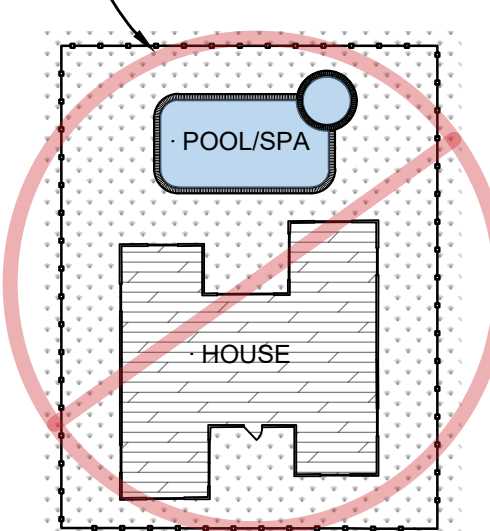
WATER ALARMS
MEET ASTM F2208
STANDARDS

CHILD SAFE
YARD FENCE



8 WATER ALARMS WITH FENCE

CHILD SAFE
YARD FENCE



9 UNACCEPTABLE METHOD
FENCE AROUND ENTIRE PROPERTY

DOOR/WINDOW OR WATER DISTURBANCE ALARMS MUST BE USED IN COMBINATION WITH CAGE OR YARD FENCE

THERE IS NO CODE OPTION
INVOLVING YARD FENCE
ENCIRCLING THE LOT



CODE TOPICS

2017 FBC 6th ED SECTION 454.2 RESIDENTIAL SWIMMING POOLS

ANSI 5, 15 AND 7 --DIFFERENT FLOWS

TOPIC BACKGROUND

Each ANSI standard has its own method of determining the applicable flow and how that flow is applied to criteria in that standard. There is no cross application of flows from one standard to another.

WHAT THE CODE SAYS

1. Applicable codes: FBC 454.2 & R4501, with ANSI 5, 7 and 15 adopted standards. FBC 454.2 and R4501 are identical, and we will reference only 454.2 sections. The FBC has no words for determining what flow is required for a pool. The various standards contain flow criteria that are determined by DIFFERENT methods and that flow is only compared to criteria within that standard for compliance. FBC 454.2.6.3 has reference to pressure and suction velocity and reference to "suction outlet velocity" (not pipe) based on ANSI 7.
2. First, FBC Section 454.2.2.20 and ANSI 5 Section 9.1.3 require at least a 12 hour (HR) turn-over. That defines the minimum circulation/ filtration flow and ANSI 5 says suction and pressure piping to be sized on 8 fps (feet per second) of the ANSI 5 flow. For plan review, there only needs to be pump, filter and piping capable of providing at least the 12 HR turnover. Given the FBC Section 454.2.6.3 pipe velocities of 10 fps pressure and 8 fps suction, the ANSI 5 is actually more restrictive at 8 fps for pressure.
3. Next, ANSI 15 and sections of the FBC energy code require a pump to have a low speed capable of flow less than the 6 hour turnover (listed pumps with stated listed ANSI 15 flows). ANSI 15 also wants the filter properly sized at that ANSI 15 flow. However the builder can set the ANSI 15 flow lower, say an 8 hr turnover, and use smaller filter and piping.
4. For pipe sizing, ANSI 15 Section 5.5 limits maximum velocity to 8 fps in returns and 6 fps in suction piping. These criteria are the code that typically controls the pipe sizing. This represent the minimum line sizes that meet all parts of the code, since pipe velocity and sizing was removed from ANSI 7. Further, ANSI 15 only applies to the filtration pump, so single speed auxiliary flow pumps can be used with "any" pipe size.
5. Finally, the new ANSI 7-2013 is without required or minimum pipe sizing with the possible exception of a branch pipe size named in the testing and listing of the maximum flow of a specific Suction Outlet Fitting Assembly (SOFA). While the ANSI 7 listings include a velocity through the open area, as referenced in the FBC section above, it is the approved flow that is the useful criterion. ANSI 7 now allows **only** the complete TDH method for establishing the maximum flow for a given (new construction) system that is used to compare to the listed flow of the SOFA. The ANSI 7 maximum possible flow is **ONLY** to be used to determine compliance with ANSI 7, suction entrapment criteria.

SUMMARY

FBC 454.2- No criteria defining minimum or maximum flow. Only reference to ANSI 5, 15 and 7.
ANSI 5 Flow- 12 HR turnover- minimum- not really a factor in pipe sizing.
ANSI 15 Flow- 6 HR turnover- max flow on lower speed of filter pump- defines minimum pipe sizes.
ANSI 7 Flow- TDH calculation - maximum flow to compare to SOFA flow (suction outlet only).

CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

DEEP AREA EGRESS

TOPIC BACKGROUND

This is a relatively simple topic, however the requirement changed in the recent code. When the current code adopts ANSI 5 2011, it changed the requirement from having a bench in deep areas 5 ft deep or greater to areas more than 5 ft deep. While the intent of the code is simply to base the requirement on the depth based on normal operation with water level a middle of waterline tile, there have been some reviewers reach beyond the intent and base the requirement on some flooded pool level.

WHAT THE CODE SAYS

First, 2017 FBC 6th Ed, Section 454.2.18 states the requirement:

Then, along with section 35 of the FBC that adopts reference standards, Section 454.2.6.1 adopts certain ANSI/APSP Standards as Conformance Standards. Specifically:

Finally, ANSI/APSP/ICC-5 2011 Section 6.1.1 of Entry/Exit says:

454.2.18 Ladders and steps. All pools whether public or private shall be provided with a ladder or steps in the shallow end where water depth exceeds 24 inches (610 mm). In private pools where water depth exceeds 5 feet (1524 mm) there shall be ladders, stairs or underwater benches/swim-outs in the deep end. Where manufactured diving equipment is to be used, benches or swim-outs shall be recessed or located in a corner.

454.2.6 Private swimming pools.

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

6.1.1 A secondary means of entry/exit shall be provided in the deep area of the pool if the water depth exceeds 5 ft (1.52 m).

REQUIRED AT PLAN REVIEW

When the plan indicates the deep area water depth of MORE than 5 ft, a form of egress needs to be provided, typically a bench. A member of the ANSI/APSP/ICC writing committee has also offered that the intention of the standard is that the egress may be located in the deep “AREA”, not strictly the deep “END.” This means that the egress may be located to the shallow side of the drain and doesn’t have to be located to the deep end beyond the drain.

REQUIRED DURING INSPECTION

Simply view the egress is installed according to plan and be aware of field changes during construction

CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

SUCTION OUTLET COVERS

TOPIC BACKGROUND

There are widely varying pool drain suction outlet covers with many code related characteristics that should be considered when making a selection and decision about installations in your pool or spa.

WHAT THE CODE SAYS

ANSI/APSP/ICC-7 2013, Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins, says:

The following standards contain provisions that, through reference in this text, constitute provisions of this standard.

ANSI/APSP-16 2011, Suction fittings for swimming and wading pools, spas, hot tubs and whirlpool bathtub appliances¹

ANSI/ASME A112.19.17-2010, Manufactured safety vacuum release systems (SVRS) for residential and commercial swimming pool, spa, hot tub and wading pool suction systems²

Those two standards define the testing and listing of Suction Outlet Fitting Assemblies (SOFAs) which means at times there is more than the drain cover that is part of the suction outlet. All such products are stamped with the testing standard, and the life of the product. There is also reference to the type of sump below the SOFA that was part of the testing/listing. The listing show the approved flow stated as a “FLOOR” or “WALL” maximum flow.

ANSI 7 defines the method of determining the **maximum flow** of your system, typically done by a detailed TDH calculation.

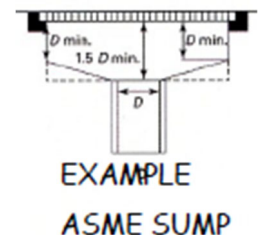
REQUIRED AT PLAN REVIEW

The SOFA selected should be shown on the plan and or in the ANSI 7 site specific documentation, including the product sheet showing the approved flow. The ANSI 7 maximum flow of the system is to be compared to the approved product flows whether used in the floor or wall. DO NOT base compliance on the flow determined for ANSI 15 compliance. Notice that the SOFAs will have either (1) a manufactured sump body specified, (2) expect the ASME Field Build Sump to be constructed, or (3) a lessor approved sump distance from suction pipe to the cover.

REQUIRED DURING INSPECTION

- At the STEEL inspection only the suction piping may be visible, either the dual or single suction lines sized based on the ANSI 7 documentation in the permit. The manufactured sump or channel drain should be visible.
- At the DECK inspection and if not verified at STEEL, the suction outlet SUMP should be examined and compared to the ANSI 7 SOFA contained in the permit. If an ASME Field Build Sump is to be constructed, ensure the sump is deep enough for the 1.5 pipe diameter clearance from the suction cover. For example, if suction is a 3” line, the top of that pipe must be 4.5” below the cover. This may also be viewed at the pre-final safety inspection.
- At FINAL inspection, ensure the suction outlet covers expected in the permit package are installed.

If there is a change from the plan where a different cover is used or there is a sidewall suction that wasn’t on the plan, a detailed evaluation needs to be conducted to ensure suction entrapment safety.



CODE TOPICS

2017 FBC 6th ED, SECTION 454.2, RESIDENTIAL POOLS

POOL SCREEN CAGE FOOTINGS

TOPIC BACKGROUND

Many contractors may not be aware that there are minimum requirements for cage footings contained in the code.

WHAT THE CODE SAYS

The 2017 FBC 6th Ed adopts the 2014 Edition of the AAF Guide to Aluminum Construction in High Wind Areas as a Reference Standard. This means that absent specific signed and sealed cage engineering, these are the minimum footing requirements. Below are two tables, annotated with information from other pages in the AAF Guide. For any work along the coast, use the 140 mph wind zone.

The allowable beam span is typically taken as the shorter distance across the pool deck. For example, a paver pool deck that is 33 ft out from the house, use the top table in the 40.0' span. The minimum footing is 16"x12" with 2 #5s. As a ribbon footing, the width and depth can be interchanged.

ALLOWABLE BEAM SPANS (FT) FOR RIBBON FOOTINGS TABLE 111

EXPOSURE B	FOOTING SIZES AND CROSS-SECTIONAL AREAS				
WIND ZONES	81	108	144	192	256
	9"X9"	9" X 12"	12" X 12"	16" X 12"	16" X 16"
up to 120	27.0	36.0	40.0	40.0	40.0
130	21.6	28.8	38.4	40.0	40.0
140	18.0	24.0	32.0	40.0	40.0
	1 #5	2 #5	2 #5	2 #5	2 #5

PAVER
DECKS

TABLE NOTES:

- 1) HEIGHT AND WIDTH DIMENSIONS MAY BE REVERSED
- 2) TABLE MAY BE INTERPOLATED BY CROSS-SECTIONAL AREA

Allowable (Maximum) Beam Spans for Monolithic Footings (Details F1/F2) in Exposure B Table 112

Wind Zone (MPH)	Slab Only	Edge Footings - Depth by Width (Detail F2)				
		D 8X8 W	D 8X12 W	D 12X8 W	D 12X12 W	D 12X16 W
up to 120	33'-8"	40'-0"	40'-0"	40'-0"	40'-0"	40'-0"
130	26'-11"	36'-7"	40'-0"	40'-0"	40'-0"	40'-0"
140	22'-5"	30'-6"	37'-7"	34'-6"	40'-0"	40'-0"
		1 #5	2 #5	1 #5	2 #5	2 #5

CONCRETE
DECKS

REQUIRED AT PLAN REVIEW

Ensure that all references to pool deck footing are consistent and meet these minimum requirements. If the pool cage permit has been submitted prior to or with the pool permit, check that application for the minimum footing requirements.

REQUIRED DURING INSPECTION

Simply view the footing size and steel to verify it is according approved plans.

Disclaimer: This is offered as a summary and guidance on code requirements. This does not authorize a code violation.



CODE TOPICS

2017 FBC 6th ED SECTION 454.2 RESIDENTIAL SWIMMING POOLS

ANSI 7 & 15 COMPLIANCE

TOPIC BACKGROUND

As you may know ANSI 7 relates to suction entrapment and ANSI 15 relates to Energy Conservation. We find all too often that contractor prepared ANSI 7 & 15 documentation for pool permits is not according to code and all too often the Building Departments issue permits that don't comply with code and at times would produce unsafe pools. The following are comments based on the most common errors seen.

WHAT THE CODE SAYS

- Only a one ANSI 15, Energy Conservation form is needed for a POOL project. This is not required for the SPA unless it is a SPA only project or a circulation system separate from the POOL.
- ANSI 7, Suction Entrapment, compliance must be demonstrated for each set of suction outlets, POOL, SPA and BASIN if used.
- Only detailed TDH calculations are allowed to determine the maximum flow to compare to the suction outlet cover rating. There is mention of alternate methods to meet the intent of the code, but not "Simple TDH".
- The ANSI 15 flow is determined by the maximum of the 6 hour turnover flow, or a lower flow as long as it meets the 12 hour turnover (stated in ANSI 5) if desired.
- Suction outlet covers must have rated flows more than the MAXIMUM flow determined by detailed TDH calculation for the pumps on that system.
- Suction outlet covers almost always have lower flows for wall installations, so when the maximum flow is more than the listed wall but less than listed floor flow, need to state "floor only suction".

REQUIRED AT PLAN REVIEW

For ANSI 15

- view the ANSI 15 flow is determined correctly and auxiliary flows are stated
- view that the selected pump has a low speed flow less than the ANSI 15 flow
- view that the filter selected can handle the ANSI 15 flow, not necessarily the maximum ANSI 7 flow
- view that there is a controller specified for multi-speed pumps
- view that heaters provided have the minimum efficiencies
- view that circulation piping is sized for maximum velocity at the ANSI 15 flow, not necessarily ANSI 7 flow

For ANSI 7

- view that the maximum flow from the pump is correctly determined
- view that the maximum flow from each pump and each suction outlet system is correctly determined
- view that the selected suction outlet fitting assemblies (SOFAs) are rated higher than the calculated MAXIMUM flows from the pump(s)
- view that if a SOFA includes a manufactured sump that is listed with specific branch pipe size, that pipe size is specified

REQUIRED DURING INSPECTION

Simply inspect to approved plans and specifications.