

STATE OF FLORIDA  
BUILDING COMMISSION

<b>FILED</b>	
<small>Department of Business and Professional Regulation</small>	
<small>Deputy Agency Clerk</small>	
CLERK	Brandon Nichols
Date	2/20/2012
File #	2012-01081

In the Matter of

DAN JOHNSON,  
SWIM INCORPORATED,  
2119 Global Court  
Sarasota, Florida 34240

Petitioner.

**DS 2011-085**

**DECLARATORY STATEMENT**

The foregoing proceeding came before the Florida Building Commission (the Commission) by a Petition from Dan Johnson of Swim Incorporated, which was received on October 26, 2011. Based on the statements in the petition, the material subsequently submitted and the subsequent request by the Petitioner, it is hereby ORDERED:

**Findings of Fact**

1. The petition is filed pursuant to, and must conform to the requirements of Rule 28-105.002, Florida Administrative Code (F.A.C.).
2. The Petitioner is a pool contractor in Florida and performs work on pools in the State that is subject to the Florida Building Code (F.B.C.).
3. The Petitioner is in the process of designing a 10,700 gallon residential swimming pool with a therapy spa in Bradenton, Florida, in accordance with the 2010 Florida Building Code. The Petitioner is seeking clarification of the flow and velocity requirements for swimming pool piping contained in three standards referenced in the 2010 Florida Building Code: Section R4101.6.1, F.B.C., Residential Volume; NSPI-5; APSP-7; and APSP-15 found in Section 403.9 of the Florida Building Code, Energy Conservation.

4. The Petitioner asks three questions regarding this project:

(a). Does a pool contractor achieve compliance with NSPI-5 and R4101.6.3, F.B.C., by applying the design flow rate when specifying pipe sizes?

(b) Does a pool contractor achieve compliance with ANSI/APSP/ICC-15 by applying the maximum design flow rate when specifying swimming pool filtration pipe sizes, where the maximum design flow rate is the greater of the calculated 6-hour turnover flow rate or the optional auxiliary feature (spa) with the highest design flow requirements if operated by the circulations pump?

(c) Does a pool contractor achieve compliance with ANSI/APSP-7 by applying the maximum operational flow rate when specifying suction pipe sizes?

#### Conclusions of Law

1. The Florida Building Commission has the specific statutory authority to interpret the provisions of the Florida Building Code by entering a declaratory statement.
2. Sections R4101.6.1 and R4101.6.3 of the 2010 *Florida Building Code, Residential*, read as follows:

**R4101.6.1, Conformance standard.** Design, construction and workmanship shall be in conformity with the requirements of ANSI/NSPI 3; ANSI/NSPI 4; ANSI/NSPA 5; ANSI/NSPI 6; and ANSI/APSP 7.

**R4101.6.3, Water velocity.** Pool piping shall be designed so the water velocity will not exceed 10 feet per second (3048 mm/s) for pressure piping and 8 feet per second (2438 mm/s) for suction piping, except that the water velocity shall not exceed 8 feet per second (2438 mm/s) in copper tubing. Main suction outlet velocity must comply with ANSI/APSP 7.

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

3. Section 403.9 of the 2010 *Florida Building Code, Energy Conservation*, reads (in part) as follows:

**403.9 Swimming pools, inground spas, and portable spas (Mandatory).** The energy requirements for residential pools and inground spas shall be as specified in Sections 403.9.1 through 403.9.4 and ANSI/APSP-15. The energy requirements for portable spas shall be in accordance with Section 403.9.5 and ANSI/APSP-14.

**403.9.4 Residential pool pumps and pump motors.** Pool filtration pump motors shall meet the following requirements:

1. Pool pump motors shall not be split-phase, shaded-pole or capacitor start-induction run types.
2. Pool pumps and pool pump motors with a total horsepower (HP) of  $\geq 1$  HP shall have the capability of operating at two or more speeds. The low speed shall have a rotation rate of no more than  $\frac{1}{2}$  of the motor's maximum rotation rate.
3. Pool pumps motor controls shall have the capability of operating the pool pump at a minimum of two speeds. The default circulation speed shall be the residential filtration speed, with a higher speed override capability for a temporary period not to exceed one normal cycle or 24 hours, whichever is less.

**Exception:** Solar pool heating systems shall be permitted to run at higher speeds during periods of usable solar heat gain.

4. The three industry standards and their respective flow and velocity requirements are:

- a. **ANSI/NSPI-5, 2003 Standard for Inground Residential Swimming Pools**

The objective of this standard is to provide recommended minimum guidelines for the design, equipment, installation, and use of residential inground swimming pools. Maximum velocity limits are: 10 feet per second (fps) in return side piping and 8 fps in suction side piping. The flow and velocity requirements in this standard are intended to insure adequate water flow for sanitation, filtration, filter backwashing, etc. Maximum system flow is not defined in this standard; the flow requirement is that the equipment shall be sized to provide a turnover of the pool water at least once every twelve (12) hours.

- b. **ANSI/APSP-7, 2006 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins.**

The objective of this standard is to provide recommended minimum guidelines for suction entrapment avoidance in the design, equipment, operation and installation of new and existing swimming pools, wading pools, spas, hot tubs and catch basins for builders, installers, pool operators and service professionals. Maximum water velocity limits are: in branch suction piping (piping between dual or multiple outlets) shall be limited to 6 feet per second when one of a pair is blocked. All other suction piping velocities shall be 8 fps for residential pools. This standard does not address return side velocities. The flow and velocity limits in this standard are intended to prevent suction entrapment. I quote "This standard was written to move performance criteria for each identified hazard and allow state authorities to define clear codes for use by designers, builders and inspectors". Maximum system flow rate is defined as "The flow resulting from the lowest possible total dynamic head (TDH) for a circulation system.

**c. ANSI/APSP/ICC-15, 2011 Standard for Residential Swimming Pool and Spa Energy Efficiency**

The objective of this newly adopted conformance standard is to provide recommended minimum guidelines for the energy efficiency of permanently installed residential aboveground/onground and inground swimming pools and inground spas. Maximum water velocity limits are 8 fps in return piping and 6 fps in suction line piping. Maximum filtration flow rate is defined in this standard as "the flow rate needed to turn over the pool water volume in 6 hours (pool volume in gallons ÷ 360 = gpm) or a flow rate of 36 gpm, whichever is greater". Maximum system flow rate is defined in this standard as "the maximum flow rate for the auxiliary pool loads (a spa for example) or the filtration flow rate, whichever is greater." The maximum flow rate for pools without optional auxiliary loads is determined by a mathematical calculation based on pool volume divided by size hours – not the maximum potential flow and/or velocity as defined in the ANSI/APSP-7, 2006 standard. The intent of the ANSI-15 standard is most clear when evaluating a swimming pool system without optional auxiliary pool loads, a situation where pipe size is determined exclusively by the calculation pool volume in gallons ÷ 360 = maximum flow rate in gpm.

4. In response to the Petitioner's first question, for the project in question a pool contractor achieves compliance with NSPI-5 and R4101.6.3, F.B.C. by applying the design flow rate when specifying pipe sizes.

5. In response to the Petitioner's second question, for the project in question a pool contractor achieves compliance with ANSI/APSP/ICC-15 by applying the maximum design flow

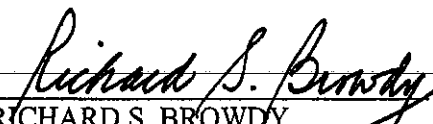
rate when specifying swimming pool filtration pipe sizes, where the maximum design flow rate is the greater of the calculated 6-hour turnover flow rate or the optional auxiliary feature (spa) with the highest design flow requirements if operated by the circulations pump.

6. In response to the Petitioner's final question, for the project in question a pool contractor achieves compliance with ANSI/APSP-7 by applying the maximum operational flow rate when specifying suction pipe sizes.

7. The answers to the above stated questions were given with the understanding that the said questions are to be considered individually and not collectively.

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, and Florida Rules of Appellate Procedure 9.110(a) and 9.030(b)(1)(C) and 9.110(a). To initiate an appeal, a Notice of Appeal must be filed with Agency Clerk, Department of Business and Professional Regulation, 1940 North Monroe Street, Tallahassee, Florida 32399-1000 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.


DONE AND ORDERED this 15 day of February, 2012 in Jacksonville,  
Duval County, State of Florida.

  
RICHARD S. BROWDY  
Chair, Florida Building Commission

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 20<sup>th</sup> day of February, 2012.



 Agency Clerk, Department of Business and Professional Regulation & Florida Building Commission  
1940 North Monroe Street  
Tallahassee, Florida 32399-1000

Via U.S. Mail

Dan Johnson  
Swim Incorporated  
2119 Global Court  
Sarasota, Florida 34240

Via Hand or Inter-Office Delivery

Mo Madani, C.B.O. Manager  
Codes and Standards Section  
Department of Business and Professional Regulation  
1940 North Monroe Street  
Tallahassee, Florida 32399

**FILED**  
Department of Business and Professional Regulation  
Deputy Agency Clerk  
CLERK Brandon Nichols  
Date 10/26/2011  
File #

Petition for Declaratory Statement before the Florida Building Commission

Petitioner:

Dan Johnson – CPC029651 & CPC057123  
Swim, Incorporated  
2119 Global Court  
Sarasota, FL 34240  
Ph. 941-371-2252  
Fx. 941-371-2262  
email: [swiminc@me.com](mailto:swiminc@me.com)

**DS 2011-085**

I am in the process of designing a residential swimming pool in Bradenton, Florida, in accordance with the 2010 Florida Building Code. It is a 10,700 gallon pool with a therapy spa. I am seeking clarification of the flow and velocity requirements for swimming pool piping contained in three standards referenced in the 2010 Florida Building Code, Chapter R4101.6.1; NSPI-5, APSP-7, and APSP-15 found in Section 403.9 of the Florida Energy & Efficiency Code. As a swimming pool contractor, I am affected when attempting to size pool piping in conformance with the velocity limits found in the three standards. It is my belief that a pool contractor must achieve compliance separately for each standard. If the separate velocity requirements are misinterpreted, project costs will escalate placing an unreasonable financial burden on the average pool buying family and seriously shrinking the market to a point where numbers of pool building contractors would likely go out of business.

This request is prompted by the inclusion of APSP-15 *Standard for Residential Swimming Pool and Spa Energy Efficiency* into the Florida Energy & Efficiency Code, which includes additional pipe velocity requirements as compared to those already referenced in the Florida Building Code, Chapter R4101.6.1.

The three standards and their respective flow and velocity requirements are:

*ANSI/NSPI-5, 2003 Standard for Inground Residential Swimming Pools.*

The objective of this standard is to provide recommended minimum guidelines for the design, equipment, installation, and use of residential inground swimming pools. Maximum velocity limits are; 10 feet per second (fps) in return side piping and 8 fps in suction side piping. The flow and velocity requirements in this standard are intended to insure adequate water flow for sanitation, filtration, filter backwashing, etc. Maximum system flow is not defined in this standard; the flow requirement is that the equipment shall be sized to provide a turnover of the pool water at least once every twelve (12) hours.

The Florida Building Code includes this same requirement in section R4101.6.3

Water velocity. Pool piping shall be designed so the water velocity will not exceed 10 feet per second (3048 mm/s) for pressure piping and 8 feet per second (2438 mm/s) for suction

pipng, except that the water velocity shall not exceed 8 feet per second (2438 mm/s) in copper tubing Main suction outlet velocity must comply with ANSI/APSP 7

*ANSI/APSP-7, 2006 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins*

The objective of this standard is to provide recommended minimum guidelines for suction entrapment avoidance in the design, equipment, operation, and installation of new and existing swimming pools, wading pools, spas, hot tubs, and catch basins for builders, installers, pool operators, and service professionals. Maximum water velocity limits are; in branch suction piping (piping between dual or multiple outlets) shall be limited to 6 feet per second when one of a pair is blocked All other suction piping velocities shall be 8 fps for residential pools This standard does not address return side velocities The flow and velocity limits in this standard are intended to prevent suction entrapment I quote "This standard was written to move toward performance-criteria for each identified hazard and allow state authorities to define clear codes for use by designers, builders, and inspectors" Maximum system flow rate is defined as "The flow resulting from the lowest possible total dynamic head (TDH) for a circulation system"

*ANSI/APSP/ICC-15, 2011 Standard for Residential Swimming Pool and Spa Energy Efficiency.*

The objective of this newly adopted conformance standard is to provide recommended minimum guidelines for the energy efficiency of permanently installed residential aboveground/onground and inground swimming pools and inground spas. Maximum water velocity limits are 8 fps in return piping and 6 fps in suction line piping. Maximum filtration flow rate is defined in this standard as "the flow rate needed to turn over the pool water volume in 6 hours (pool volume in gallons ÷ 360 = gpm) or a flow rate of 36 gpm, whichever is greater" Maximum system flow rate is defined in this standard as "the maximum flow rate for the auxiliary pool loads (a spa for example) or the filtration flow rate, whichever is greater" The maximum flow rate for pools without optional auxiliary loads is determined by a mathematical calculation based on pool volume divided by six hours – not the maximum potential flow and/or velocity as defined in the ANSI/APSP-7, 2006 standard

The adoption of the ANSI-15 standard has created much anxiety in my industry, as to how Building Officials are going to interpret the flow and velocity requirements of the 7 and the 15 standards – the fear is that velocity requirements from the ANSI-15 may be applied to the ANSI-7. If that were to happen, the cost of up-sizing the piping and fittings for virtually every residential pool we build would become prohibitive The intent of the ANSI-15 standard is most clear when evaluating a swimming pool system without optional auxiliary pool loads, a situation where pipe size is determined exclusively by the calculation pool volume in gallons – 360 = maximum flow rate in gpm

It is my belief, based on the different objectives and limitations of the ANSI-7 and the ANSI-15 standards, which are specific to each individual standard and differently defined in each standard that they can coexist without any conflict. The ANSI-15 addresses energy conservation and efficiency by creating design guidelines while encouraging lower flow rates and longer filtration times, and the ANSI-7 addresses the life/safety issue of suction entrapment avoidance by requiring operational velocity limits at suction outlets and suction piping



Therefore, compliance with each of these standards should be an independent process

A plans examiner can affirm compliance with the design requirements contained in ANSI-5, ANSI-15 and ANSI-7 individually during the permit application review process. The ANSI-7 standard, which requires verification of the performance-criteria; cover/grate flow rating, outlet spacing, etc can then be affirmed through the inspection process

With this analysis in mind, my questions regarding flow (velocity) and pipe sizing are:

1. Does a pool contractor achieve compliance with NSPI-5 and R4101.6.3 by applying the design flow rate when specifying pipe sizes?

*For the pool in question, according to my design calculations; to meet the 12-hour turnover requirement, I would need a flow rate of at least 15 gpm and could comply with velocity requirements of 8 ft. fps in the suction piping and 10 fps. in the return piping by specifying 1 1/2 inch piping.*

2. Does a pool contractor achieve compliance with ANSI/APSP/ICC – 15 by applying the maximum design flow rate when specifying swimming pool filtration pipe sizes, where the maximum design flow rate is the greater of the calculated 6-hour turnover flow rate or the optional auxiliary feature (spa) with the highest design flow requirement if operated by the circulations pump?

*For the pool in question, according to my design calculations; a 6 hour filtration turnover rate is 30 gpm, which is less than the 36 gpm limit allowed by the standard. The spa has 4 therapy jets designed to flow at 15 gpm per jet for a total of 60 gpm. I could then select a multiple-speed pump from the APSP Pool Products Spreadsheet, listed to Curve A, with at least one flow rate which does not exceed the 36 gpm flow for swimming pool filtration and circulation running at low-speed and the 60 gpm for the auxiliary pool load (spa) when running at high-speed (or use two separate pumps, in which case the auxiliary load is not considered). I could then specify 2 inch suction side piping (6 fps @ 60 gpm) and 2 inch return side piping to comply with the velocity requirements of this standard.*

3. Does a pool contractor achieve compliance with ANSI/APSP – 7 by applying the maximum operational flow rate when specifying suction pipe sizes?

*For the pool in question, according to my calculations; to meet the flow and velocity limitations size of this standard I would either have to provide a Total Dynamic Head calculation for the system, or provide Simplified TDH calculations, or show the maximum potential flow of the selected pump from the manufacturer's pump curve. I would then have to specify the sizes of; the branch piping between multiple outlets, when multiple outlets are specified, to comply with the 6 fps requirement in branch piping and the 8 fps in suction piping. Return piping is not addressed in ANSI-7, therefore the return side pipe size for this pool is based on design flow rates in accordance with -5 and -15.*