

“How do the code changes affect me” An online look at the 2004 Florida building code changes regarding plumbing, gas and swimming pools.

Part 1

Affidavit:

If taking this course to earn Continuing Education Credits in order to renew my Florida Contractors license I affirm that:

When I signed up for this course I did so using my true name and contractors license number. I affirm that I will personally complete each part of this course and that I will personally take any quiz or test that is part of this course. I understand that it is a direct violation of the terms and conditions of the Aquatic Training Institute to allow any other person to use my user id and password to access any courses offered by ATI. I understand that ATI will, upon my successful completion of this course, report the course completion to the Florida Contractors Industry Licensing Board. Any violation of this policy will result in the loss of all sums remitted to take these courses and that ATI will report the violation to the CILB.

BY CONTINUING WITH THIS COURSE I AGREE WITH THE ABOVE STATEMENT AND AFFIRM THAT I AM USING MY OWN PERSONAL USER ID AND PASSWORD.

Florida Building Code Advanced

04: Plumbing/Fuel Gas (1 hour)

The 2004 Florida Building Code has undergone significant changes and it is the obligation of all Florida licensed contractors to become knowledgeable of the changes that affect their ability to construct safe and secure projects. This course is not intended to supply core code training but is intended to update the contractor in recent changes. This course meets the updating needs of those contractors performing work under the Plumbing and Fuel Gas segments of the FBC.

When you have completed this course you will be familiar with the primary changes of the plumbing and fuel gas sections from the 2001 code to previous codes including:

- General regulations
- Water supply and distribution
- Sanitary and storm drainage
- Venting regulations
- Fuel gas combustion and ventilation
- Swimming pool requirements
- Residential plumbing specifications

At the conclusion of the presented material you will answer a quiz. Upon successful completion of the quiz you will download your completion certificate. ATI will report your successful completion to the CILB. The program contains three parts. Each part is timed. You must spend at least 50 minutes total in the program.

2004 Florida Building Code

Plumbing / Fuel Gas

Version 1.0 / June 2004 – 1 hour version

Florida Building Commission

Department of Community Affairs, Codes and
Standards

2555 Shumard Oak Boulevard
Tallahassee, FL 32399-2100
(850) 487-1824

<http://www.floridabuilding.org>

CHAPTER 2

DEFINITIONS

- **DEFINITIONS**
- • ***New or modified definitions 2003 International Plumbing Code® :***
- *Air Break (Drainage System)*
- *Ball Cock*
- *Building Drain*
- *Design Flood Elevation*
- *Drainage System – Storm*
- *Fill Valve*
- *Flood Hazard Area (RESERVED)*
- *Grease Interceptor (FL specific definition)*
- *Grease Trap (FL specific definition)*
- *Sewer – Storm sewer*
- • ***Deleted Flood Zones***

CHAPTER 2

DEFINITIONS (cont.)

- • *Kept Reclaimed Water from 2001 Florida Building Code, Plumbing*
- • *Kept Reuse from 2001 Florida Building Code, Plumbing*
- • *New or modified definitions 2000 International Plumbing Code® :*
 - *Approved agency*
 - *Grease-laden Waste*
 - *Hot water*
 - *Macerating toilet systems*
 - *Medical gas systems*
 - *Tempered water*
 - *Third-party certification Agency*
 - *Third-party certified*
 - *Third-party tested*

CHAPTER 3

GENERAL REGULATIONS

- *Significant changes*
 - • **2000 International Plumbing Code® significant changes:**
 - *Added Table of products requiring third-party certification or testing*
 - *Added requirements for condensate disposal – identical to Florida Building Code, Mechanical*
 - • **2003 International Plumbing Code® significant changes:**
 - *Added code conflict language*
 - *Added alteration to trusses*
 - *Added plenum piping requirement per Florida Building Code, Mechanical*
 - *Added requirements for piping in flood hazard areas*
 - *Added requirements for test gauges*
 - • **Changes as a result of previous DEC statement**
 - *Sleeving is not required for installation of CPVC into concrete or similar material.*
 - *Freeze protection is required where design temperature is less than 32° F.*

CHAPTER 3

GENERAL REGULATIONS

SECTION 303

■ MATERIALS

- **303.4 Third-party testing and certification.**
 - *All plumbing products and materials have to comply with the referenced standards.*
 - *Alternative materials, design and methods of construction and equipment may be allowed (Section 104.11 of Florida Building Code, Building)*

CHAPTER 3

GENERAL REGULATIONS

- *Table 303.4 lists products and materials requiring third-party testing and third-party certification.*
 - **303.4 Third-party testing and certification.** All plumbing products and materials shall comply with the referenced standards, specifications and performance criteria of this code and shall be identified in accordance with Section 303.1. When required by Table 303.4, plumbing products and materials shall either be tested by an approved third-party testing agency or certified by an approved third-party certification agency.

Florida Building Code, Building

104.11 Alternative materials, design and methods of construction and equipment.

The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety. When alternate life safety systems are designed, the *SFPE Engineering Guide to Performance-Based Fire Protection Analysis and Design of Buildings* or other methods approved by the building official may be used. The building official shall require that sufficient evidence or proof be submitted to substantiate any claim made regarding the alternative.

**TABLE 303.4
PRODUCTS AND MATERIALS REQUIRING
THIRD-PARTY TESTING AND THIRD-PARTY CERTIFICATION**

PRODUCT OR MATERIAL	THIRD-PARTY CERTIFIED	THIRD-PARTY TESTED
Backflow prevention devices	Required	-----
Plumbing appliances	Required	-----
Plumbing fixtures	-----	Required
Portable water supply systems components and potable water fixture fittings	Required	-----
Sanitary drainage and vent system components	Plastic pipe, fittings and pipe-related components	All others
Special waste system components	-----	Required
Storm drainage system components	Plastic pipe, fittings and pipe-related components	All others
Subsoil drainage system components	-----	Required
Waste fixture settings	Plastic pipe, fittings and pipe-related components	All others
Water distribution system safety devices	Required	-----

CHAPTER 3

GENERAL REGULATIONS

SECTION 305

■ PROTECTION OF PIPES AND PLUMBING SYSTEM COMPONENTS

• **305.1 Corrosion.**

- *Added Exception: Sleeving is not required for installation of CPVC into concrete or similar material.*

CHAPTER 3

GENERAL REGULATIONS

SECTION 305 - PROTECTION OF PIPES AND PLUMBING SYSTEM COMPONENTS

- **305.1 Corrosion.** Pipes passing through concrete or cinder walls and floors or other corrosive material shall be protected against external corrosion by a protective sheathing or wrapping or other means that will withstand any reaction from the lime and acid of concrete, cinder or other corrosive material.
- Sheathing or wrapping shall allow for expansion and contraction of piping to prevent any rubbing action. Minimum wall thickness of material shall be 0.025 inch (0.64 mm).
- **Exception:** Sleeving is not required for installation of CPVC into concrete or similar material.

CHAPTER 3

GENERAL REGULATIONS

SECTION 305

■ PROTECTION OF PIPES AND PLUMBING SYSTEM COMPONENTS

- **305.6 Freezing.** Where the design temperature is less than 32° F (0° C), a water, soil or waste pipe shall not be installed outside of a building, in attics or crawl spaces, or be concealed in outside walls in any location subjected to freezing temperatures unless adequate provision is made to protect it from freezing by insulation or heat or both. Water service pipe shall be installed not less than 12 inches (305 mm) deep or less than 6 inches (152 mm) below the frost line.

CHAPTER 3

GENERAL REGULATIONS

SECTION 307

■ STRUCTURAL SAFETY

- **[B] 307.4 Alteration to trusses.** Truss members and components shall not be cut, drilled, notched, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g. HVAC equipment, water heater) shall not be permitted without verification that the truss is capable of supporting such additional loading.
- *Since trusses are engineered products any alteration, drilling, notching, change, addition to weight, etc., may prevent the truss from performing as designed.*

CHAPTER 3

GENERAL REGULATIONS

SECTION 307 STRUCTURAL SAFETY

- **307.6. Piping materials exposed within plenums.** All piping materials exposed within plenums shall comply with the provisions of the *Florida Building Code, Mechanical*. Typically the plenum space includes the plumbing system as well as the other building systems (fire, electrical and mechanical). Those materials exposed within the plenum must be non-combustible or have a flame spreads index of 25 or less along with a smoke-developed index of 50 or less when tested (in accordance with ASTM E 84).

CHAPTER 3

GENERAL REGULATIONS

SECTION 312

■ TESTS AND INSPECTIONS

- **312.1.1 Test gauges.** Gauges used for testing shall be as follows:
 - 1. Tests requiring a pressure of 10 pounds per square inch (psi) (69 kPa) or less shall utilize a testing gauge having increments of 0.10 psi (.69 kPa) or less.
 - 2. Test requiring a pressure of greater than 10 psi (69 kPa) but less than or equal to 100 psi (689.5 kPa) shall utilize a testing gauge having increments of 1 psi (6.9 kPa) or less.
 - 3. Tests requiring a pressure of greater than 100 psi (689.5 kPa) shall utilize a testing gauge having increments of 2 psi (13.79 kPa) or less.
- *It's important to select and use the pressure gauge that fits the range and design of what you are attempting to measure.*

CHAPTER 3

GENERAL REGULATIONS

SECTION 314

■ CONDENSATE DISPOSAL

- *Added requirements for condensate disposal—identical to Florida Building Code, Mechanical Section 307 (Condensate Disposal) Condensate piping is not plumbing. However it is covered in this section because of the possibility of plumbers installing such piping.*

CHAPTER 3

GENERAL REGULATIONS

SECTION 316

■ IRRIGATION

- *Added to this section:*

- **316.1 General.** Irrigation/sprinkler systems and risers for spray heads shall not be installed within 1 foot (305 mm) of the building sidewall.
- *This section was originally part of Section 1503.4.4 Florida Building Code 2001.*
- *The purpose of this section is to limit possible soil disturbances near the foundations of buildings. Liquid soil termiticide applied to these areas during construction can be easily disturbed by subsequent landscape operations and water input rendering a failed termiticide barrier. Inclusion of drought tolerant plants into landscape plans can aid in achieving this goal.*

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

- *Significant changes*

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

- *New look to TABLE 403.1 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES*

TABLE 403.1

MINIMUM NUMBER

OF REQUIRED PLUMBING FIXTURES

No.	Classification	Use Group	Description	Water Closets	Lavatories	Bathtubs/ Showers	Drinking Fountain	Other
2	Business	B	Buildings for the transaction of business, professional ...	1 per 25 for the first 50 and 1 per 50...	1 per 40 for the first 50 and 1 per 80 for the...	—	1 per 100	1 service sink
6	Mercantile <u>(f g)</u> <u>changed</u> <u>from g h</u>	M	Retail stores, service stations, shops...	1 per 500	1 per 750	—	1 per 1,000	<u>(RESERVED)</u>

(Entire table not listed)

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

SECTION 403

■ MINIMUM PLUMBING FACILITIES

- **403.7 Unisex toilet & bathing rooms.**

- **Notes:**

- f. In assembly and mercantile occupancies, a unisex toilet room, in accordance with Section 403.7, shall be provided where an aggregate of six or more male and female water closets are required. In buildings of mixed occupancy, only those water closets required for the assembly or mercantile occupancy shall be used to determine the unisex toilet room requirement.
- g. In recreational facilities (coliseums, arenas, stadiums, pools, etc. with less than 3,000 seats and coliseums, arenas & stadiums with more 3,000 seats or greater) where separate-sex bathing rooms are provided, a unisex bathing room in accordance with 403.7, shall be provided. Where each separate sex bathing room has only one shower or bathtub fixture, a unisex bathing room is not required.

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

- CHAPTER 4
- FIXTURES, FAUCETS AND FIXTURE FITTINGS
- SECTION 403
- MINIMUM PLUMBING FACILITIES
- *See Table P403.8 PUBLIC SWIMMING POOL FIXTURES REQUIRED (underlines are changes)*
- **403.8.1 Required fixtures.** Fixtures shall be provided as indicated on Table P403.8. An additional set of fixtures shall be provided in the men's restroom for every 5000 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.

Table P403.8

Public Swimming Pool Fixtures Required

Size	Men's Restrooms			Women's Restrooms	
	Urinals	WC	Lavatory	WC	Lavatory
0 – 2500 sq ft	1	1	1	1	1
2501 – 5000 sq ft	<u>2</u>	<u>1</u> <u>2</u>	<u>1</u> <u>2</u>	<u>5</u> <u>6</u>	<u>1</u> <u>2</u>
5001 – 7500 sq ft	<u>2</u>	<u>2</u> <u>3</u>	<u>2</u> <u>3</u>	<u>6</u> <u>9</u>	<u>2</u> <u>3</u>
7501 – 10,000 sq ft	<u>3</u>	<u>3</u> <u>4</u>	<u>3</u> <u>4</u>	<u>9</u> <u>12</u>	<u>3</u> <u>4</u>

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

SECTION 406

■ AUTOMATIC CLOTHES WASHERS

- **406.3 Waste connection.** The waste from an automatic clothes washer shall discharge through an air break into a standpipe in accordance with Section 802.4 or into a laundry sink. The trap and fixture drain for an automatic clothes washer standpipe shall be a minimum of 2 inches (51 mm) in diameter. The automatic clothes washer fixture drain shall connect to a branch drain or drainage stack a minimum of 3 inches (76 mm) in diameter.
- *Laundry sinks serving as waste receptors is a common practice. When connecting to a fixture branch, horizontal branch drain or drainage stack the minimum required size is 3 inches in diameter due to the fact that the discharge rate for an automatic clothes washer has increased to 21 gallons per minute.*

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

SECTION 410

■ DRINKING FOUNTAINS

- **410.1 Approval.** Drinking fountains shall conform to ASME A112.19.1M, ASME A112.19.2M or ASME A112.19.9M, and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. Where water is served in restaurants, drinking fountains shall not be required. In other occupancies, where drinking fountains are required, bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required drinking fountains.

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

SECTION 417

■ SHOWERS

- **417.3 Shower waste outlet.** Waste outlets serving showers shall be at least 1 ½ inches (38 mm) (*Shower drain waste outlet reduced from 2 inches to 1-1/2 inches*) in diameter and, for other than waste outlets in bathtubs, shall have removable strainers not less than 3 inches (76 mm) in diameter with strainer openings not less than 0.25 inch (6.4 mm) in minimum dimension. Where each shower space is not provided with an individual waste outlet, the waste outlet shall be located and the floor pitched so that waste from one shower does not flow over the floor area serving another shower. Waste outlets shall be fastened to the waste pipe in an approved manner.

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

SECTION 417

■ SHOWERS

- **417.5.2 Shower lining.** Floors under shower compartments, except where prefabricated receptors have been provided, shall be lined and made water tight utilizing material complying with Sections 417.5.2.1 through 417.5.2.4. Such liners shall turn up on all sides at least 2 inches (51 mm) above the finished threshold level. Liners shall be recessed and fastened to an approved backing so as not to occupy the space required for wall covering, and shall not be nailed or perforated at any point less than 1 inch (25 mm) above the finished threshold. Liners shall be pitched one-fourth unit vertical in 12 units horizontal (2-percent slope) and shall be sloped toward the fixture drains and be securely fastened to the waste outlet at the seepage entrance, making a water-tight joint between the liner and the outlet.

CHAPTER 4

FIXTURES, FAUCETS & FIXTURE FITTINGS

SECTION 424

■ FAUCETS & OTHER FIXTURE FITTINGS

- **424.3 Shower valves.** Shower and tub-shower combination valves shall be balanced pressure, thermostatic or combination balanced pressure/thermostatic valves that conform to the requirements of ASSE 1016 or CSA B125. Multiple (gang) showers supplied with a single tempered water supply pipe shall have the water supply for such showers controlled by a master thermostatic mixing valve complying with ASSE 1017. Shower and tub-shower combination valves and master thermostatic mixing valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions.

CHAPTER 5

WATER HEATERS

- • **2000 International Plumbing Code® significant changes:**
- *Changed wording of relief valve discharge (already included in 2001 Florida Building Code, Plumbing)*
- *Removed requirement for energy cutoff device (included in hot water heater standard)*
- • **2003 International Plumbing Code® significant changes:**
- *Added requirement that relief lines not be threaded, and connect independently*
- *(Note: This requirement is not in the 2004 Florida Building Code, Plumbing.)*

CHAPTER 5

WATER HEATERS

SECTION 502

■ INSTALLATION

- **502.3 Water heaters installed in garages.** Water heaters shall be installed in accordance with the manufacturer's installation instructions, which shall be available on the job site at the time of inspection.
- *This is new to original 2001 Florida Building Code, Plumbing but was changed in 2003 Revisions (Yellow Pages) to reflect this same content.*

CHAPTER 5

WATER HEATERS

SECTION 504

■ SAFETY DEVICES

- **504.6.1 Discharge.** The relief valve shall discharge full size to a safe place of disposal such as the floor, water heater pan, outside the building or an indirect waste receptor. The discharge pipe shall not have any trapped sections and shall have a visible air gap or air gap fitting located in the same room as the water heater. The discharge shall be installed in a manner that does not cause personal injury to occupants in the immediate area or structural damage to the building.
- *Note: In 2003 International Plumbing Code® this section also includes the following: ...the outlet end of the discharge pipe shall not be threaded and such discharge pipe shall not have a valve or tee installed. Relief valve piping shall be piped independent*

CHAPTER 6

WATER SUPPLY & DISTRIBUTION

- • **2000 International Plumbing Code® significant changes:**
 - *Water hammer arrestors – installation as required by manufacturer (already in 2001 Florida Building Code, Plumbing)*
- • **2003 International Plumbing Code® significant changes:**
 - *Simplified separation requirements of water and sewer pipes*
 - *Eliminated water compatibility section Requires individual shutoffs, other than residential tubs and showers (already in 2001 Florida Building Code, Plumbing) Revised language regarding where hot water is required Revised pipe fittings (there are materials and standards changes)*
- • **Florida specific glitch MOD:**
 - *New or repaired potable water systems shall be purged of deleterious matter and, where required by the Administrative Authority, disinfected prior to utilization.*

CHAPTER 6

WATER SUPPLY & DISTRIBUTION

SECTION 603

■ WATER SERVICE

- **603.2 Separation of water service and building sewer.** Water service pipe and the building sewer shall be separated by 5 feet (1524 mm) of undisturbed or compacted earth.
- **Exceptions:** 1. The required separation distance shall not apply where the bottom of the water service pipe within 5 feet (1524 mm) of the sewer is a minimum of 12 inches (305 mm) above the top of the highest point of the sewer and the pipe materials conform to Section 703.1.
- 2. Water service pipe is permitted to be located in the same trench with a building sewer, provided such sewer is constructed of materials listed in Table 702.2.
- 3. The required separation distance shall not apply where a water service pipe crosses a sewer pipe provided the water service pipe is sleeved to at least 5 feet (1525 mm) horizontally from the sewer pipe centerline, on both sides of such crossing with pipe materials listed in Table 605.3, Table 702.2 or Table 702.3.

CHAPTER 6

WATER SUPPLY & DISTRIBUTION

SECTION 605

■ MATERIALS, JOINTS & CONNECTIONS

- *Deleted water compatibility section, which stated that water service pipe and distribution pipe shall be resistant to corrosive and degrading action from the potable water supplied by the water purveyor or individual water supply system.*
- *This is the text in the 2001 edition of the Florida Building Code, Plumbing that has now*
- *been deleted:*
- **605.1 Water compatibility.** Water service pipe and water distribution pipe shall be resistant to corrosive action and degrading action from the potable water supplied by the water purveyor or individual water supply system.

Table 605.5 ~~6~~ Pipe Fittings

Material	Standard
Acrylonitrile butadiene styrene (ABS) plastic	ASTM D 2468
Cast Iron	ASME B 16.4; ASME B16.12
Chlorinated polyvinyl chloride (CPVC) plastic	ASTM F 437; ASTM F 438; ASTM F 439
Copper or copper alloy	ASME B 16.15; ASME B 16.18; ASME B 16.22; ASME B 16.23; ASME B 16.26; ASME B 16.29;
Gray iron and ductile iron	AWWA C110; AWWA C153
Malleable iron	ASME B 16.3

Table 605.5-6 Pipe Fittings (cont'd)

Material	Standard
<p>Metal (brass) insert fittings utilizing a copper crimp ring CDR9 (PEX) tubing for <u>Polyethylene/Aluminum/Polyethylene (PE-AL-PE) and Cross-linked Polyethylene/Aluminum/Polyethylene (PEX-AL-PEX)</u></p>	<p><u>ASTM F 1974</u></p>
<p>Polyethylene (PE) plastic</p>	<p>ASTM D 2609</p>
<p>Polyvinyl chloride (PVC) plastic</p>	<p>ASTM D 2464; ASTM D 2466; ASTM D 2467; CSA-B 137.2</p>
<p><u>Stainless steel (Type 304/304L)</u></p>	<p><u>ASTM A 312; ASTM A 778</u></p>
<p><u>Stainless steel (Type 316/316L)</u></p>	<p><u>ASTM A 312; ASTM A 778</u></p>
<p>Steel</p>	<p>ASME B 16.9; ASME B</p>

Review of Important Information

- This course is not intended to supply core code training but is intended to update the contractor in recent changes. This course meets the updating needs of those contractors performing work under the Plumbing and Fuel Gas segments of the FBC.
- The minimum number of public swimming pool restroom facilities have been reduced as a result of the new codes.
- Third party certification is required for backflow prevention devices, plumbing fixtures, plumbing appliances and subsoil drainage system components.
- Bottled water dispensers may not constitute more than 50% of the required drinking fountains.

Congratulations



You've completed part 1 of *Advanced Building Code*..
You should click continue with this lesson to take part 2.

“How do the code changes affect me” An online look at the 2004 Florida building code changes regarding plumbing, gas and swimming pools.

Part 2

Affidavit:

If taking this course to earn Continuing Education Credits in order to renew my Florida Contractors license I affirm that:

When I signed up for this course I did so using my true name and contractors license number. I affirm that I will personally complete each part of this course and that I will personally take any quiz or test that is part of this course. I understand that it is a direct violation of the terms and conditions of the Aquatic Training Institute to allow any other person to use my user id and password to access any courses offered by ATI. I understand that ATI will, upon my successful completion of this course, report the course completion to the Florida Contractors Industry Licensing Board. Any violation of this policy will result in the loss of all sums remitted to take these courses and that ATI will report the violation to the CILB.

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2004 Florida Building Code

Plumbing / Fuel Gas

Version 1.0 / June 2004 – 1 hour version

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Aquatic Training Institute Part 2

CHAPTER 7

SANITARY DRAINAGE

- • **2000 International Plumbing Code®**
significant changes:
- *Revised drainage fixture unit table – already included in 2001 Florida Building Code, Plumbing*
- *Removed requirement for minimum 2-inch drains underground*
- • **2003 International Plumbing Code®**
significant changes
- *Prohibits exposed drainage piping above working areas in food service establishments*

CHAPTER 7

SANITARY DRAINAGE

SECTION 701

■ GENERAL

- **701.9 Drainage piping in food service areas.**
 - *Prohibits exposed drainage piping above working, storage or eating surfaces in food service establishments.*

Table 709.1 Drainage Fixture Units for Fixtures and Groups

Fixture Type	Drainage Fixture Unit Value as Load Factors	Minimum Size of Trap (inches)
Automatic clothes washers, commercial ^a <u>g</u>	3	2
<u>Automatic clothes washers, residential ^g</u>	2	2
<u>Bathroom group (with 3.5 gpf water closet) consisting of water closet, lavatory, bidet and bathtub or shower</u>	<u>6</u>	—
Bathroom group <u>as defined in Section 202</u> (1.6 gpf water closet) ^f	5	—
<u>Bathroom group as defined in Section 202 (water closet flushing greater than 1.6 gpf)</u> ^f	<u>6</u>	—

Table 709.1 Drainage Fixture Units (cont'd)

Fixture Type	Drainage Fixture Unit Value as Load Factors	Minimum Size of Trap (inches)
Bathroom group (with 1.6 gpf flushometer tank with water closet)	5.5	—
Bathtub ^b (with or without overhead shower or whirlpool attachments)	2	1½
Bidet	<u>1</u> 2	1¼
Combination sink and tray	2	1½
Dental lavatory	1	1¼
Dental unit or cuspidor	1	1¼
Dishwashing machine ^c , domestic	2	1½
Drinking fountain	½	1¼
Emergency floor drain	0	2

Table 709.1 Drainage Fixture Units (cont'd)

Fixture Type	Drainage Fixture Unit Value as Load Factors	Minimum Size of Trap (inches)
Floor drains	2	2
Kitchen sink, domestic	2	1½
Kitchen sink, domestic with food waste grinder and/or dishwasher	2	1½
Laundry tray (1 or 2 compartments)	2	1½
Lavatory	1	1¼
Shower compartment, domestic	2	<u>1½</u>
Sink	2	1½
Urinal	4	Footnote d
Urinal, 1 gallon per flush or less	2 ^e	Footnote d

Table 709.1 Drainage Fixture Units (cont'd)

Table 709.1 Drainage Fixture Units (cont'd)

Fixture Type	Drainage Fixture Unit Value as Load Factors	Minimum Size of Trap (inches)
Wash sink (circular or multiple) each set of faucets	2	1½
Water closet, flushometer tank, public or private	4 ^e	Footnote d
Water closet, private installation	4	Footnote d
Water closet, public installation	6	Footnote d
Water closet, private (1.6 gpf), private installation	3 ^e	Footnote d
Water closet, private (3.5 gpf), private installation (flushing greater than 1.6 gpf)	4 ^e	Footnote d
Water closet (1.6 gpf), flushometer tank, private installation	3.5	Footnote d

Table 709.1 Drainage Fixture Units (cont'd)

Table 709.1 Drainage Fixture Units (cont'd)

Fixture Type	Drainage Fixture Unit Value as Load Factors	Minimum Size of Trap (inches)
Water closet, <u>public</u> (1.6 gpf) public installation	4 ^e	Foot Note d
Water closet, <u>public</u> (3.5 gpf), public installation (flushing greater than 1.6 gpf)	6 ^e	Foot Note d

Notes:

- f. For fixtures added to a dwelling unit bathroom group, add the DFU value of those additional fixtures to the bathroom group fixture count.
- g. See Section 406.3 for sizing requirements for fixture drain, branch drain, and drainage stack for an automatic clothes washer standpipe.

CHAPTER 7 SANITARY DRAINAGE

Table 709.1 – Drainage Fixture Units for Fixtures and Groups

CHAPTER 7

SANITARY DRAINAGE

- **Table 709.1 – Drainage Fixture Units for Fixtures and Groups**
- For SI: 1 inch = 25.4 mm, 1 gallon = 3.785 L.
- **Notes:**
 - a. For traps larger than 3 inches, use Table 709.2
 - b. A showerhead over a bathtub or whirlpool bathtub attachment does not increase the drainage fixture unit value.
 - c. See Sections 709.2 through 709.4 for methods of computing unit value of fixtures not listed in this table or for rating of devices with intermittent flows.
 - d. Trap size shall be consistent with the fixture outlet size.
 - e. For the purpose of computing loads on building drains and sewers, water closets and urinals shall not be rated at a lower drainage fixture unit unless the lower values are confirmed by testing.
 - f. and g. (on the previous slide)

CHAPTER 7

SANITARY DRAINAGE

SECTION 710

■ DRAINAGE SYSTEM SIZING

• **710.3 Underground drainage piping.**

- *This section was in the 2001 FBC, P and has been deleted thereby removing the requirement for minimum 2-inch drains underground*
- **2001 FBC, P - 710.3 Underground drainage piping.** Any portion of the drainage system installed underground or below a basement or cellar shall not be less than 2 inches (51 mm) in diameter.
- *This section was not included in the 2004 Florida Building Code, Plumbing.*

CHAPTER 9

VENTS

- **2000 International Plumbing Code ® *significant changes:***
 - *None*
- • **2003 International Plumbing Code ® *significant changes:***
 - *Includes language for vertical wet vents*
 - *No food waste grinders, clinical sinks or standpipes permitted on combination drain and vent systems.*

CHAPTER 9

VENTS

SECTION 909

■ WET VENTING

• **909.1.1 Vertical wet vent.**

■ *Includes language for vertical wet vents*

- *Shall extend from the connection to the dry vent down to the lowest fixture drain connection*
- *Each fixture shall connect independently*
- *Water closet drains shall connect at the same elevation with other fixture drains connecting above or at same elevation as WC drains*
- *Dry vent connection to vertical wet vent shall be an individual or common vent serving one or two fixtures*

CHAPTER 9

VENTS

- **SECTION 909**
- **WET VENTING**
- **909.1.1 Vertical wet vent.**
- Any combination of fixtures within two bathroom groups located on the same floor level is permitted to be vented by a vertical wet vent. The vertical wet vent shall extend from the connection to the dry vent down to the lowest fixture drain connection. Each fixture shall connect independently to the vertical wet vent. Water closet drains shall connect at the same elevation. Other fixture drains shall connect above or at the same elevation as the water closet fixture drains. The dry vent connection to the vertical wet vent shall be an individual or common vent serving one or two fixtures.
- *Vertical wet vents were, at one time, called stack vents. Vertical wet vents extend from the connection to the dry vent down to the lowest fixture drain connection.*

CHAPTER 9

VENTS

SECTION 912

- COMBINATION DRAIN & VENT SYSTEM
 - SECTION 912
 - COMBINATION DRAIN AND VENT SYSTEM
 - **912.1 Type of fixtures.** A combination drain and vent system shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains.
 - Combination drain and vent systems shall not receive the discharge from a food waste grinder or clinical sink.

CHAPTER 10

TRAPS, INTERCEPTORS & SEPARATORS

- • **2000 International Plumbing Code® significant changes:**
- *Maximum volume for grease interceptors is 1250 gallons; Interceptors shall be constructed in accordance with Rule 64E-6, Florida Administrative Code; Inlet piping shall connect to a tee sweep or baffle that extends 24 inches below the water level – Florida specific*
- • **2003 International Plumbing Code® significant changes:**
- *Eliminates option for deep-seal traps*
- *Adds ASME A-112.14.3 and 112.14.4 grease trap standards*

CHAPTER 10

TRAPS, INTERCEPTORS & SEPARATORS

SECTION 1002

■ TRAP REQUIREMENTS

- **1002.4 Trap seals.**

- *Floor drains subject to evaporation must have trap seal primer valve*

- *(eliminates deep-seal trap option)*

- **1002.4 Trap seals.** Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, a trap seal primer valve shall be installed. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044.

CHAPTER 10

TRAPS, INTERCEPTORS & SEPARATORS

SECTION 1003

■ INTERCEPTORS AND SEPARATORS

- *Adds requirement for a solids interceptor to separate the discharge before connecting to the grease trap*
- *Adds ASME A112.14.3 or ASME A112.14.4 to grease trap standards*

CHAPTER 10

TRAPS, INTERCEPTORS & SEPARATORS

SECTION 1003

- INTERCEPTORS AND SEPARATORS
 - **1003.5 Grease interceptors.**
 - *Maximum volume for grease interceptors is 1250 gallons.*
 - *Interceptors shall be constructed in accordance with Rule 64E-6, Florida Administrative Code.*
 - *Inlet piping shall connect to a tee sweep or baffle that extends 24 inches below the water level.*

CHAPTER 10

TRAPS, INTERCEPTORS AND SEPARATORS

- **SECTION 1003 INTERCEPTORS AND SEPARATORS**
- **1003.3 Grease traps and grease interceptors.** Grease traps and grease interceptors shall comply with the requirements of Sections 1003.3.1 through 1003.3.4.2.
- **1003.3.1 Grease traps and grease interceptors required.** A grease trap or grease interceptor shall be required to receive the drainage from fixtures and equipment with grease-laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, school kitchens, bars, factory cafeterias, or restaurants and clubs.
- **1003.3.2 Food waste grinders.** Where food waste grinders connect to grease traps, a solids interceptor shall separate the discharge before connecting to the grease trap. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste grinder.
- **1003.3.3 Grease trap and grease interceptor not required.** A grease trap or a grease interceptor shall not be required for individual dwelling units or any private living quarters.
- **1003.4 Grease traps and grease interceptors.** Grease traps and grease interceptors shall conform to PDI G101, ASME A112.14.3 or ASME A112.14.4 and shall be installed in accordance with the manufacturer's instructions.

CHAPTER 10

TRAPS, INTERCEPTORS AND SEPARATORS

- **SECTION 1003**

- **INTERCEPTORS AND SEPARATORS**

- **1003.5 Grease interceptors.** Grease interceptors shall be water and gas tight. Each interceptor shall be engineered to withstand the load, such as from vehicular traffic, to be placed on the interceptor. The minimum tank volume of grease interceptors shall be 750 gallons, and the maximum volume shall be 1250 gallons. Interceptors shall be permitted to be installed in series.
- **1003.5.1 Grease interceptor capacity.** The minimum grease retention capacity for interceptors shall be at least two times the flow-through rate.
- **1003.5.2 Construction of Interceptor.** Each interceptor shall be constructed in accordance with Rule 64E-6, *Florida Administrative Code*. Minimum depth of the liquid shall be 42 inches (1067 mm). Each compartment shall be accessible with a minimum clearance of 18 inches (457 mm) square or in diameter.
- **1003.5.3 Inlet and outlet piping.** The inlet and outlet piping shall have a twoway cleanout tee installed. Inlet piping shall enter at 2½ inches (64 mm) above the liquid level. Inlet piping shall connect to a tee sweep or baffle, which shall extend to 24 inches (610 mm) below the water level. The outlet pipe shall start at 8 inches (203 mm) above the bottom of the interceptor and extend vertically to a tee. The tee and pipe shall be no less than 4 inches (102 mm) in diameter. The tee shall be installed with the run in the vertical direction.

CHAPTER 11

STORM DRAINAGE

- *No significant changes*
- • **2000 International Plumbing Code® significant changes:**
- *None*
- • **2003 International Plumbing Code® significant changes:**
- *None*
- • **Florida specific changes:**
- *Scuppers shall be sized in accordance with Table 1106.7*

CHAPTER 11

STORM DRAINAGE

SECTION 1106

- SIZE OF CONDUCTORS, LEADERS AND STORM DRAINS
 - **1106.7 Scupper sizing.**
 - Scuppers shall be sized in accordance with Table 1106.7
 - Note: To adjust this table for other than a 5" design rain fall rate multiply the square footage on the table by 5 then divide by the local design rain fall rate.
 - Example: For 4" of design rainfall rate, a 4" long scupper with a 1" head would accommodate 287 square feet $(230 \times 5) \div 4 = 287$.
 - *Note: New table to the 2004 Florida Building Code, Plumbing.*

Table 1106.7 Sizing Scuppers for a 5" Per Hour Rate of Rainfall

Head in inches	Horizontally Projected Roof Area (square feet)						
	Length of Weir in inches						
	4	6	8	12	16	20	24
1	230	346	461	692	923	1153	1384
2	641	961	1282	1923	2564	3205	3846
3	1153	1730	2307	3461	4615	5769	6923
4	1794	2692	3589	5384	7179	8974	10769

Plumbing-Related Chapters

**2004 Florida Building Code,
Residential**

2004 Florida Building Code, Residential

Chapters specifically dealing with plumbing:

- *Chapter 25: Plumbing Administration*
- *Chapter 26 General Plumbing Requirements*
- *Chapter 27 Plumbing Fixtures*
- *Chapter 28 Water Heaters*
- *Chapter 29 Water Supply and Distribution*
- *Chapter 30 Sanitary Drainage*
- *Chapter 31 Vents*
- *Chapter 32 Traps*
- *Chapter 41 Swimming Pools*

CHAPTER 27

PLUMBING FIXTURES

■ SECTION P2709 SHOWER RECEPTORS

- **P2709.2 Lining required.** The adjoining walls and floor framing, enclosing on-site built-up shower receptors shall be lined with sheet lead, copper or a plastic liner material that complies with ASTM D 4068. The lining material shall extend not less than 3 inches (76 mm) beyond or around the rough jambs and not less than 3 inches (76 mm) above finished thresholds. Hot mopping shall be permitted in accordance with Section P2709.2.1.

- **Exception:**

- 1. Floor surfaces under showerheads provided for rinsing laid directly on the ground.
- 2. Shower compartments where the finished shower drain is depressed a minimum of 2 inches below the surrounding finished floor on the first floor level and the shower recess is poured integrally with the adjoining floor.

- *Note: Changes from 2003 International Residential Code to 2004 Florida Building Code, Residential are underlined. Also, note that the Florida Building Code, Residential requires that the liner extend not less than 3 inches above finished thresholds whereas the Florida Building Code, Plumbing requirement is 2 inches (Section 417.5.2.)*

CHAPTER 29

WATER SUPPLY & DISTRIBUTION

- *Significant changes*
- *PE-AL-PE not permitted under concrete slabs*
- *No limit on hot water distances like Florida Building Code, Plumbing (100')*

CHAPTER 29

WATER SUPPLY & DISTRIBUTION

SECTION 2904 MATERIALS, JOINTS & CONNECTIONS

- **P2904.5.1 Under concrete slabs.**
 - *PE-AL-PE not permitted under concrete slabs*
 - **P2904.5.1 Under concrete slabs.** Inaccessible water distribution piping under slabs shall be copper water tube minimum Type M, brass, ductile iron pressure pipe, cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe, chlorinated polyvinyl chloride (CPVC) or polybutylene (PB) or cross-linked polyethylene (PEX) plastic pipe or tubing—all to be installed with approved fittings or bends. The minimum pressure rating for plastic pipe or tubing installed under slabs shall be 100 psi at 180°F (689 kPa at 82°C).
 - *PE-AL-PE stands for polyethylene/aluminum/polyethylene pipe and is not listed in this section.*

CHAPTER 29

WATER SUPPLY & DISTRIBUTION

- *No limit on hot water distances like in 2004 Florida Building Code, Plumbing which includes:*
 - The hot water system shall be provided with a method of maintaining the temperature if the developed length of hot water piping from the source of hot water supply to the farthest fixture exceeds 100 feet
 - **607.2 Hot water supply temperature maintenance.** Where the developed length of hot water piping from the source of hot water supply to the farthest fixture exceeds 100 feet (30, 480 mm), the hot water supply system shall be provided with a method of maintaining the temperature in accordance with the *Chapter 13 of the Florida Building Code, Building.*

CHAPTER 30

SANITARY DRAINAGE

- *Significant changes*
- *Does not require 3" WM vertical stacks*
- *Cleanouts can be installed outside the building within 3 feet of the building wall*
- **New:**
- **2004 FLORIDA BUILDING CODE, RESIDENTIAL**
- **CHAPTER 30**
- **SANITARY DRAINAGE**
- **SECTION 3005**
- **DRAINAGE SYSTEM**
- **P3005.2.6 Base of stacks.** Accessible cleanouts shall be provided near the base of each vertical waste or soil stack. Alternatively, such cleanouts may be installed outside the building within 3 feet (914 mm) of the building wall.

CHAPTER 30

SANITARY DRAINAGE

SECTION P3005 DRAINAGE SYSTEM

- **P3005.2.7 Building drains and building sewer junction.**
 - *Does not require 3" WM vertical stacks*
 - **P3005.2.7 Building drain and building sewer junction.** There shall be a cleanout near the junction of the building drain and building sewer. This cleanout shall be either inside or outside the building wall, provided it is brought up to finish grade or to the lowest floor level. An accessible interior building drain cleanout or test tee within close proximity to the building drain exit point shall fulfill this requirement.
 - *Note: Section 708.3.5 in 2001 (and 2004) Florida Building Code, Plumbing states, in part, that the cleanout at the junction of the building drain and building sewer is not required if the cleanout on a 3-inch or larger diameter soil stack is located within a developed length of 10 feet of the building drain and building sewer connection.*

CHAPTER 31

VENTS

- *Significant changes*

CHAPTER 31

VENTS

SECTION 3105 FIXTURE VENTS P3105.1 Distance of trap from vent.

- *No limit on WC trap-to-vent distance*
- **Old: 2001 FLORIDA BUILDING CODE, PLUMBING CHAPTER 9 VENTS SECTION 906 FIXTURE VENTS**
- **906.1 Distance of trap from vent.** Each fixture trap shall have a protecting vent located so that the slope and the developed length in the fixture drain from the trap weir to the vent fitting are within the requirements set forth in Table 906.1.
- **New: 2004 FLORIDA BUILDING CODE, RESIDENTIAL CHAPTER 31 VENTS SECTION 3105 FIXTURE VENTS P3105.1 Distance of trap from vent.** Each fixture trap shall have a protecting vent located so that the slope and the developed length in the fixture drain from the trap weir to the vent fitting are within the requirements set forth in Table P3105.1.
- **Exception:** The developed length of the fixture drain from the trap weir to the vent fitting for self-siphoning fixtures, such as water closets, shall not be limited.

Table 3105.1 Maximum Distance of Fixture Trap from Vent

Size of Trap (inches)	Size of Fixture Drain (inches)	Slope (inch per foot)	Distance from Trap (feet)
1¼	1¼	¼	3½
1¼	1½	¼	5
1½	1½	¼	5
1½	2	¼	<u>6</u> 8
2	2	¼	<u>8</u> 6
3	3	1/8	<u>12</u> 10
4	4	1/8	<u>16</u> 12

Review of Important Information

- Exposed soil or waste piping not permitted above working , storage or eating areas in food service establishments.
- Lining required on shower receptors unless a floor surface provided for rinsing laid directly on ground.
- Vent requirements have changed.
- Vent maximum distances have changed.

Congratulations



You've completed part 2 of *Advanced Building Code*..
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“How do the code changes affect me” An online look at the 2004 Florida building code changes regarding plumbing, gas and swimming pools.

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2004 Florida Building Code

Plumbing / Fuel Gas

Version 1.0 / June 2004 – 1 hour version

Florida Building Commission

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CHAPTER 41

PRIVATE SWIMMING POOLS

- *Significant changes*
- *Conformance standards have changed*
- *Change in pool piping requirement (water velocity)*
- *Primer and glue on exposed aboveground piping not required to be colored*
- *Pumps installed per manufacturer requirements*
- *Spring check valves allowed*
- *Removed requirement that all pool piping had to be inspected and approved before being covered or concealed*
- *Changed skimmer calculation basis*
- *Changed calculation for number of inlet fittings*
- *Requires all mechanical equipment to be installed per manufacturer's recommendations*

CHAPTER 41

SWIMMING POOLS

SECTION R4101

■ PRIVATE SWIMMING POOLS

• R4104.6 Engineering design.

- **R4101.6.3 Water velocity.** Pool piping shall be designed so the water velocity will not exceed 10 ft/s for pressure piping and 8 ft/s for suction piping, except that the water velocity shall not exceed 8 ft/s in copper tubing.
- **Exception:** Jet inlet fittings shall not be deemed subject to this requirement.
- *Note: This change makes 2004 Florida Building Code, Residential consistent with the new NSPI/ANSI 5 Residential Standard (previously 2001 Florida Building Code, Building 424.2.6.3).*

CHAPTER 41

SWIMMING POOLS

SECTION R4101

■ PRIVATE SWIMMING POOLS

• R4101.6 Engineering design.

- R4101.6.5 Piping installation. All piping materials shall be installed in strict accordance with the manufacturer's installation standards.

- Exception: Primer and glue on exposed aboveground piping not required to be colored.

- *Note: This change was made because the colored primers and glue easily stain many exposed items. Pool owners don't want this staining. (Previously Florida Building Code, Building 424.2.6.5.)*

CHAPTER 41

SWIMMING POOLS

SECTION R4101

■ PRIVATE SWIMMING POOLS

• **R4101.8 Valves.**

- **R4101.8.3 Check valves.** Where check valves are installed they shall be of the swing, spring or vertical check patterns.
- *Note: Spring check valves are used most often with pools; this corrects the code to officially allow this use. (Previously 2001 Florida Building Code, Building 424.2.8.3.)*

CHAPTER 41

SWIMMING POOLS

SECTION R4101

■ PRIVATE SWIMMING POOLS

• R4101.12.1 Pressure test.

- *Removed requirement that all pool piping be inspected and approved before being covered or concealed.*
- **4101.12.1 Pressure test.** All pool piping shall be tested and proved tight to the satisfaction of the administrative authority, under a state water pressure or air pressure test of not less than 35 psi for 15 minutes.
- **Exception:** Circulating pumps need not be tested as required in this section.
- *Note: Open ditches around a job waiting for an inspection are a hazard. Every time it rains the ditches have to be dug out and a re-inspection fee paid. (Previously 2007 Florida Building Code, Building 424.2.12.1.)*

CHAPTER 41

SWIMMING POOLS

SECTION R4101

■ PRIVATE SWIMMING POOLS

• R4101.21 Pool fittings.

- R4101.21.2 Skimmers. ...skimmers shall be installed on the basis of one per 800 sq ft of surface area or fraction thereof, and shall be designed for a flow rate of at least 25 gpm per skimmer.
- *Note: This change brings the 2004 Florida Building Code, Residential in line with the NSPI/ANSI 5 Standard. (Previously 2001 Florida Building Code, Building 424.2.21.2.)*

CHAPTER 41

SWIMMING POOLS

SECTION R4101

■ PRIVATE SWIMMING POOLS

• R4101.21 Pool fittings.

- R4101.21.5 Inlet fittings. Approved manufactured inlet fittings for the return of recirculated pool water shall be provided on the basis of at least one per 300 sq ft of surface area...

CHAPTER 41

SWIMMING POOLS

- **SECTION R4101**
- **PRIVATE SWIMMING POOLS**
- **R4101.21.5 Inlet fittings.** Approved manufactured inlet fittings for the return of recirculated pool water shall be provided on the basis of at least one per 300 sq ft of surface area. Such inlet fittings shall be designed and constructed to insure an adequate seal to the pool structure and shall incorporate a convenient means of sealing for pressure testing of the pool circulation piping. Where more than one inlet is required, the shortest distance between any two required inlets shall be at least 10 ft.
- *Note: This change brings the 2004 Florida Building Code, Residential in line with the NSPI/ANSI 5 Standard. (Previously 2001 Florida Building Code, Building 424.2.21.5.)*

Review of Important Information

Residential swimming pools

- For residential swimming pool water velocity shall not exceed 10ft/s for pressure piping and 8ft/s for suction piping (except copper piping which is limited to 8ft/s)
- Primer and glue on above ground piping is not required to be colored.
- Spring check valves are accepted.
- All piping (except circ. Pumps) must pass a pressure test of 35 psi for 15 minutes.
- One skimmer per 800sf surface area.
- One inlet fitting per 300sf surface area.

2004 Florida Building Code, Fuel Gas

Significant changes

Changes between the 2001 Florida Building Code, Fuel Gas and the 2004 Florida

Building Code, Fuel Gas

- ***Significant changes:***

Allows serving gas supplier to convert gas equipment to a different gas.

Many additions in Section 304 (IFGS) Combustion, Ventilation and Dilution Air

The section requiring all air for combustion to be provided from outside on building of unusually tight construction was deleted and replaced with calculated volumes using air infiltration rates (304.5)

*New installation requirements for installing outdoor gas appliances consistent with the **National Fuel Gas Code.***

Florida Building Code, Fuel Gas

■ CHAPTER 3 GENERAL REGULATIONS

• Section 301 (IFGC) General

■ **301.7 Fuel types.**

- Allows serving gas supplier to convert gas equipment to a different gas.
- **301.7 Fuel types.** Fuel-fired appliances shall be designed for use with the type of fuel gas to which they will be connected and the altitude at which they are installed. Appliances that comprise parts of the installation shall not be converted for the usage of a different fuel, except where approved and converted in accordance with the manufacturer's instructions or the serving gas supplier. The fuel gas input rate shall not be increased or decreased beyond the limit rating for the altitude at which the appliance is installed.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.1 General.**
 - Requirements for air for combustion, ventilation and dilution of flue gases for gas utilization equipment installed in buildings (refer to sections 304.5 – 304.9 or 304.6 – 304.9)
 - Direct-vent appliances, gas appliances of other than natural draft design, etc. shall be in accordance with equipment manufacturer's instructions

Florida Building Code, Fuel Gas

- **SECTION 304 (IFGS) COMBUSTION, VENTILATION AND DILUTION AIR**
- *This section completely changes how you calculate combustion, ventilation*
- *and dilution air.*
- **304.1 General.** Air for combustion, ventilation and dilution of flue gases for gas utilization equipment installed in buildings shall be provided by application of one of the methods prescribed in Sections 304.5 through 304.9. Where the requirements of Section 304.5 are not met, outdoor air shall be introduced in accordance with one of the methods prescribed in Sections 304.6 through 304.9. Direct-vent appliances, gas appliances of other than natural draft design and vented gas appliances other than Category I shall be provided with combustion, ventilation and dilution air in accordance with the equipment manufacturer's instructions.
- **Exception:** Type I clothes dryers that are provided with makeup air in accordance with Section 614.5.
- **Deleted 2001 Florida Building Code, Fuel Gas 304.4.1 Number and location of openings.** At least two openings shall be provided, one commencing within 12 inches (30 cm) of the ceiling of the room and one commencing within 12 inches (30 cm) of the floor.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.5 Indoor combustion air.**
 - *Use 304.5.1 or 304.5.2 unless ACH is less than 0.40; then use 304.5.2 to determine required volume of indoor air.*

SECTION 304 (IFGS)

COMBUSTION, VENTILATION AND DILUTION AIR

- **304.5 Indoor combustion air.** The required volume of indoor air shall be determined in accordance with Section 304.5.1 or 304.5.2, except that where the air infiltration rate is known to be less than 0.40 air changes per hour (ACH), Section 304.5.2 shall be used. The total required volume shall be the sum of the required volume calculated for all appliances located within the space. Rooms communicating directly with the space in which the appliances are installed through openings not furnished with doors, and through combustion air openings sized and located in accordance with Section 304.5.3, are considered to be part of the required volume.

- **304.5.1 Standard method.** The minimum required volume shall be 50 cubic feet per 1,000 Btu/h (4.8 m³/kW) of the appliance input rating.
- **304.5.2 Known air-infiltration rate method.** Where the air infiltration rate of a structure is known, the minimum required volume shall be determined as follows:
 - For appliances other than fan-assisted, calculate volume using Equation 3-1.

$$\text{Required Volume}_{\text{fan}} \geq \frac{21 \text{ ft}^3}{\text{ACH}} \left(\frac{I_{\text{fan}}}{1,000 \text{ Btu/h}} \right)$$

For fan-assisted appliances, calculate volume using Equation 3-2.

$$\text{Required Volume}_{\text{fan}} \geq \frac{15 \text{ ft}^3}{\text{ACH}} \left(\frac{I_{\text{fan}}}{1,000 \text{ Btu/h}} \right)$$

- where: *I other* = All appliances other than fan assisted (input in Btu/h). *I fan* = Fan-assisted appliance (input in Btu/h). ACH = Air change per hour (percent of volume of space exchanged per hour, expressed as a decimal).
- For purposes of this calculation, an infiltration rate greater than 0.60 ACH shall not be used in Equations 3-1 and 3-2.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.5.3 Indoor opening size and location.**
 - *Use 304.5.3.1 and 304.5.3.2 to size and locate openings used to connect indoor spaces.*

SECTION 304 (IFGS)

COMBUSTION, VENTILATION AND DILUTION AIR

- **304.5.3 Indoor opening size and location.** Openings used to connect indoor spaces shall be sized and located in accordance with Sections 304.5.3.1 and 304.5.3.2 (see Figure 304.5.3).
- **304.5.3.1 Combining spaces on the same story.** Each opening shall have a minimum free area of 1 square inch per 1,000 Btu/h (2,200 mm²/kW) of the total input rating of all gas utilization equipment in the space, but not less than 100 square inches (0.06 m²). One opening shall commence within 12 inches (305 mm) of the top and one opening shall commence within 12 inches (305 mm) of the bottom of the enclosure. The minimum dimension of air openings shall be not less than 3 inches (76 mm).
- **304.5.3.2 Combining spaces in different stories.** The volumes of spaces in different stories shall be considered as communicating spaces where such spaces are connected by one or more openings in doors or floors having a total minimum free area of 2 square inches per 1,000 Btu/h (4402 mm²/kW) of total input rating of all gas utilization equipment.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.6 Outdoor combustion air.**
 - Outdoor combustion air shall be provided through opening(s) to the outdoors in accordance with Section 304.6.1 or 304.6.2. The minimum dimension of air openings shall be not less than 3 inches (76 mm).
 - *This section deleted the requirement from the 2001 Florida Building Code, Fuel Gas section 304.3.2 All Air From Outdoors, which included ...Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect.*

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.7 Combination indoor and outdoor combustion air.**
 - *Use 304.7.1 through 304.7.3 when using a combination of indoor and outdoor combustion air.*

COMBUSTION, VENTILATION AND DILUTION AIR

- **304.7 Combination indoor and outdoor combustion air.** The use of a combination of indoor and outdoor combustion air shall be in accordance with Sections 304.7.1 through 304.7.3.
- **304.7.1 Indoor openings.** Where used, openings connecting the interior spaces shall
 - comply with Section 304.5.3.
- **304.7.2 Outdoor opening location.** Outdoor opening(s) shall be located in accordance with Section 304.6.
- **304.7.3 Outdoor opening(s) size.** The outdoor opening(s) size shall be calculated in accordance with the following:
 - 1. The ratio of interior spaces shall be the available volume of all communicating spaces divided by the required volume.
 - 2. The outdoor size reduction factor shall be one minus the ratio of interior spaces.
 - 3. The minimum size of outdoor opening(s) shall be the full size of outdoor opening(s), calculated in accordance with Section 304.6, multiplied by the reduction factor. The
 - minimum dimensions of air openings shall be not less than 3 inches (76 mm).
- **Deleted 2001 FBC, FG 304.4.1 Number and location of openings.** At least two openings shall be provided, one commencing within 12 inches (30 cm) of the ceiling of the room and one commencing within 12 inches (30 cm) of the floor.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.9 Mechanical combustion air supply.**
 - *Where all combustion air is provided by a mechanical air supply system..the combustion air shall be supplied at a rate not less than 0.35 cu ft/min per 1000 Btu/h of total input rating of all appliances in the space.*

COMBUSTION, VENTILATION AND DILUTION AIR

- **304.9 Mechanical combustion air supply.** Where all combustion air is provided by a mechanical air supply system, the combustion air shall be supplied from the outdoors at a rate not less than 0.35 cubic feet per minute per 1,000 Btu/h (0.034 m³/min/kW) of total input rating of all appliances located within the space.
- **304.9.1 Makeup air.** Where exhaust fans are installed, makeup air shall be provided to replace the exhausted air.
- **304.9.2 Appliance interlock.** Each of the appliances served shall be interlocked with the mechanical air supply system to prevent main burner operation when the mechanical air supply system is not in operation.
- **304.9.3 Combined combustion air and ventilation air system.** Where combustion air is provided by the building's mechanical ventilation system, the system shall provide the specified combustion air rate in addition to the required ventilation air.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.10 Louvers and grilles.**
 - Added screens; assume wood louvers will have 25% free area and metal louvers and grilles will have 75% free area; screens shall have a mesh size no smaller than ¼ inch; means have to be provided to prevent main burner from igniting if the louvers fail to open during burner start-up and to shut down the main burner if the louvers close during operation.

COMBUSTION, VENTILATION AND DILUTION AIR

- **304.10 Louvers and Grilles.** The required size of openings for combustion, ventilation and dilution air shall be based on the net free area of each opening. Where the free area through a design of louver, grille or screen is known, it shall be used in calculating the size opening required to provide the free area specified. Where the design and free area of louvers and grilles are not known, it shall be assumed that wood louvers will have 25-percent free area and metal louvers and grilles will have 75-percent free area. Screens shall have a mesh size not smaller than $\frac{1}{4}$ inch. Nonmotorized louvers and grilles shall be fixed in the open position. Motorized louvers shall be interlocked with the equipment so that they are proven to be in the full open position prior to main burner ignition and during main burner operation. Means shall be provided to prevent the main burner from igniting if the louvers fail to open during burner start-up and to shut down the main burner if the louvers close during operation.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - 304.11 Combustion air ducts.
 - *Numbers 6–8 have been added.*

304.11 Combustion air ducts.

- Combustion air ducts shall comply with all of the following:
- 1. Ducts shall be of galvanized steel complying with Chapter 6 of the *Florida Building Code, Mechanical* or of equivalent corrosion-resistant material approved for this application. **Exception:** Within dwellings units, unobstructed stud and joist spaces shall not be prohibited from conveying combustion air, provided that not more than one required fireblock is removed.
- 2. Ducts shall terminate in an unobstructed space allowing free movement of combustion air to the appliances.
- 3. Ducts shall serve a single enclosure.
- 4. Ducts shall not serve both upper and lower combustion air openings where both such openings are used. The separation between ducts serving upper and lower combustion air openings shall be maintained to the source of combustion air.
- 5. Ducts shall not be screened where terminating in an attic space.
- 6. Horizontal upper combustion air ducts shall not slope downward toward the source of combustion air.
- 7. The remaining space surrounding a chimney liner, gas vent, special gas vent or plastic piping installed within a masonry, metal or factory-built chimney shall not be used to supply combustion air. **Exception:** Direct-vent gas-fired appliances designed for installation in a solid fuelburning fireplace where installed in accordance with the listing and the manufacturer's instructions.
- 8. Combustion air intake openings located on the exterior of a building shall have the lowest side of such openings located not less than 12 inches (305 mm) vertically from the adjoining grade level.

Florida Building Code, Fuel Gas

- Chapter 3, General Regulations
 - Section 304 (IFGS) Combustion, Ventilation and Dilution Air
 - **304.12 Protection from fumes and gases.**
 - *Refers to disposal of corrosive or flammable process fumes or gases—other than products of combustion.*

COMBUSTION, VENTILATION AND DILUTION AIR

- **304.12 Protection from fumes and gases.** Where corrosive or flammable process fumes or gases, other than products of combustion, are present, means for the disposal of such fumes or gases shall be provided. Such fumes or gases include carbon monoxide, hydrogen sulfide, ammonia, chlorine and halogenated hydrocarbons.
- In barbershops, beauty shops and other facilities where chemicals that generate corrosive or flammable products, such as aerosol sprays, are routinely used, nondirect-vent-type appliances shall be located in an equipment room separated or partitioned off from other areas with provisions for combustion air and dilution air from the outdoors. Direct-vent appliances shall be installed in accordance with the appliance manufacturer's installation instructions.

Florida Building Code, Fuel Gas

- Chapter 4 Gas Piping Installations
 - Section 402 (IFGS)
 - **402.2 Maximum gas demand**
 - Where an input rating is not indicated, the gas supplier, equipment manufacturer or a qualified agency are contacted...or the rating from Table 402.2 shall be used for estimating the volume of gas to be supplied.

GAS PIPING INSTALLATIONS

SECTION 402 (IFGS)

- **402.2 Maximum gas demand.** The volume of gas to be provided, in cubic feet per hour, shall be determined directly from the manufacturer's input ratings of the gas utilization equipment served. Where an input rating is not indicated, the gas supplier, equipment manufacturer or a qualified agency shall be contacted, or the rating from Table 402.2 shall be used for estimating the volume of gas to be supplied.
- The total connected hourly load shall be used as the basis for pipe sizing, assuming that all equipment could be operating at full capacity simultaneously. Where a diversity of load can be established, pipe sizing shall be permitted to be based on such loads.

Table 402.2 Approximate Gas Input for Typical Appliances

Appliance	Input BTU/H (Approx.)
Space Heating Units	
Hydronic boiler	
Single family	100,000
Multifamily, per unit	60,000
Warm-air furnace	
Single family	100,000
Multifamily, per unit	60,000
Space and Water Heating Units	
Hydronic boiler	
Single family	120,000
Multifamily, per unit	75,000

Table 402.2 Approximate Gas Input for Typical Appliances (cont'd)

Appliance	Input BTU/H (Approx.)
Water Heating Appliances	
Water heater, automatic instantaneous Capacity at 2 gal/minute	142,800
Capacity at 4 gal/minute	285,000
Capacity at 6 gal/minute	428,400
Water heater, automatic storage, 30- to 40-gal. tank	35,000
Water heater, automatic storage, 50-gal. tank	50,000
Water heater, domestic, circulating or side-arm	35,000

Table 402.2 Approximate Gas Input for Typical Appliances (cont'd)

Appliance	Input BTU/H (Approx.)
Cooking Appliances	
Built-in oven or broiler unit, domestic	25,000
Built-in top unit, domestic	40,000
Range, free-standing, domestic	65,000
Other Appliances	
Barbecue	40,000
Clothes dryer, Type 1 (domestic)	35,000
Gas fireplace, direct vent	40,000
Gas light	2,500
Gas log	80,000 ₃₆
Refrigerator	3,000

Florida Building Code, Fuel Gas

- Chapter 4 Gas Piping Installations
 - Section 404 (IFGC) Piping System Installation
 - **404.7 Above-ground outdoor piping.**
 - All outdoor piping shall be elevated not less than 3-1/2 inches above ground and, where installed across roof surfaces, shall be elevated not less than 3-1/2 inches above the roof surface.

PIPING SYSTEM INSTALLATION

- **404.7 Above-ground outdoor piping.** All piping installed outdoors shall be elevated not less than 3½ inches (152 mm) above ground and where installed across roof surfaces, shall be elevated not less than 3½ inches (152 mm) above the roof surface. Piping installed above ground, outdoors, and installed across the surface of roofs shall be securely supported and located where it will be protected from physical damage. Where passing through an outside wall, the piping shall also be protected against corrosion by coating or wrapping with an inert material. Where piping is encased in a protective pipe sleeve, the annular space between the piping and the sleeve shall be sealed.
- *Note: In the 2004 Florida Building Code, Building under Section 1522 (High Velocity Hurricane Zones—Rooftop Structures and Components), Section 1522.3.4 states, "Electrical conduit, mechanical piping or any other service lines running on the roof shall be raised not less than 8 inches (203 mm) above the finished roof surface." The more stringent code takes precedence over the Florida Building Code, Fuel Gas in the High Velocity Hurricane Zones.*

Florida Building Code, Fuel Gas

- Chapter 4 Gas Piping Installations
 - Section 409 (IFGC) Shutoff Valves
 - **409.5 Equipment shutoff valve.**
 - Shutoff valves for vented decorative appliances and decorative appliances can be placed in remote areas
 - **409.5.1 Shutoff valve in fireplace.**
 - Equipment shutoff valves located in the firebox of a fireplace shall be installed in accordance with the appliance manufacturer's instructions.

409.5 Equipment shutoff valve.

- Each appliance shall be provided with a shutoff valve separate from the appliance. The shutoff valve shall be located in the same room as the appliance, not further than 6 feet (1829 mm) from the appliance, and shall be installed upstream from the union, connector or quick disconnect device it serves. Such shutoff valves shall be provided with access.
- **Exception:** Shutoff valves for vented decorative appliances and decorative appliances for installation in vented fireplaces shall not be prohibited from being installed in an area remote from the appliance where such valves are provided with ready access. Such valves shall be permanently identified and shall serve no other equipment. Piping from the shutoff valve to within 3 feet (914 mm) of the appliance connection shall be sized in accordance with Section 402.
- **409.5.1 Shutoff valve in fireplace.** Equipment shutoff valves located in the firebox of a fireplace shall be installed in accordance with the appliance manufacturer's instructions.

Florida Building Code, Fuel Gas

- Chapter 4 Gas Piping Installations
 - Section 411 (IFGC) Appliance Connections
 - **411.1.4 Outdoor appliance connectors.**
 - This section provides installation requirements for installing outdoor gas appliances and is consistent with the National Fuel Gas Code.
 - Note that lengths shall not exceed 12 feet (3658 mm) and the connection shall only be made in the outdoor area where the equipment is to be used.

SECTION 411 (IFGC)

APPLIANCE CONNECTIONS

- **411.1.4 Outdoor appliance connectors.** Outdoor gas hose connectors are permitted to connect portable outdoor gas-fired equipment. An equipment shutoff valve, a listed quick-disconnect device, or a listed gas convenience outlet shall be installed where the connector is attached to the supply piping and in such a manner so as to prevent the accumulation of foreign matter. Lengths shall not exceed 12 feet (3658 mm) and the connection shall only be made in the outdoor area where the equipment is to be used.

Florida Building Code, Residential

■ Chapter 24 Fuel Gas

- *Note that the Florida Building Code, Residential does not contain the same degree of detail as the Florida Building Code, Fuel Gas.*

Review of Important Information

- A servicing gas supplier can convert equipment to a different gas.
- Changes have been made in the calculation of combustion, ventilation and dilution air.
- Above ground outdoor gas piping must be 3 ½ inches above ground.
- Outdoor gas hose connectors are approved for portable gas appliances if a cut off valve is properly installed.
- Shutoff valves in fire boxes are allowed if installed in accordance with manufacturers instructions.

Congratulations



You've completed part 3 of *Advanced Building Code*..
You should click continue with this lesson to take a short quiz.

Multiple Choice Quiz Question: 10 Points

Outdoor gas hose connectors are:

- Not allowed in Florida
- Only allowed for permanent appliances.
- Allowed when a gas cut off is installed according to code
- Not allowed when installed with a gas cut off

Multiple Choice Quiz Question: 10 Points

According to the 2004 FBC, the allowed maximum velocity for pressure side piping for PVC pipe for residential in ground swimming pools is:

- 18 fps
- 10 fps
- 8 fps
- 12 fps

Multiple Choice Quiz Question: 10 Points

The purpose of this course is to:

- Give a complete overview of all of the changes in the Florida 2004 Building Code
- Provide information regarding changes in the Florida Building Code, plumbing, fuel gas and residential swimming pools.

Multiple Choice Quiz Question: 10 Points

If provided with bottled water stations, the 2004 Florida Building Code:

- Allows the elimination of all water fountains
- Does not allow for a reduction in required water fountains
- Allows for a 50% reduction in required water fountains.

Multiple Choice Quiz Question: 10 Points

The 2004 FBC, residential pools, changes the allowed use of primer and glue by:

- Allowing clear primer and glue on aboveground piping
- Requiring purple primer on above ground piping
- Allowing only blue glue on above ground piping
- The 2004 code does not make any changes on the allowed use of primer and glue.

Multiple Choice Quiz Question: 10 Points

The 2004 FBC for residential pools requires that one inlet fitting be provided for each _____sf of pool surface area.

- 600
- 500
- 400
- 300

Multiple Choice Quiz Question: 10 Points

According to the 2004 FBC all piping for residential swimming pools must pass a pressure test of:

- 35psi for 15 minutes
- 15psi for 35 minutes
- 60psi for 60 minutes
- A pressure test is not required

True/False Quiz Question: 10 Points

Spring check valves are now officially allowed under the 2004 FBC for residential swimming pools.

- True
- False

Multiple Choice Quiz Question: 10 Points

A 1000 SF surface area residential swimming pool is required by the 2004 FBC to have_____ approved skimmers.

- 5
- 1
- 3
- 2

True/False Quiz Question: 10 Points

The 2004 Florida Building Code, plumbing is now based on the International Building Code. This is a significant change.

- True
- False