

*New Code Requirements to the
2012 International Plumbing Code*

**Chapter 4
Fixtures, Faucets and Fixture
Fittings**

Part 2

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CHAPTER 4

FIXTURES

FAUCETS

FIXTURE FITTINGS

CHAPTER 4

Fixtures, faucets and Fixture Fittings

Chapter 4 covers the requirements for plumbing fixtures and the materials used to connect them to the plumbing system.

All fixtures and fittings must be manufactured to recognized standards and installed by methods which comply to those listed in this chapter.



SECTION 405

INSTALLATION OF FIXTURES

The following code sections deal with the specifics of installing fixtures on a plumbing system.

1. They lay out spacing requirements.
2. Discuss specifics of connecting fixtures to the system
3. Cover changes in the 2012 IPC

SECTION 405

INSTALLATION OF FIXTURES

405.1 The supply lines and fittings for every plumbing fixture shall be installed so as to prevent backflow.

405.2 Plumbing fixtures shall be installed so as to afford easy access for cleaning both the fixture and the area around the fixture.

405.3 Fixtures shall be set level and in proper alignment with reference to adjacent walls.

These three requirements are called the Major rules for installing plumbing fixtures.

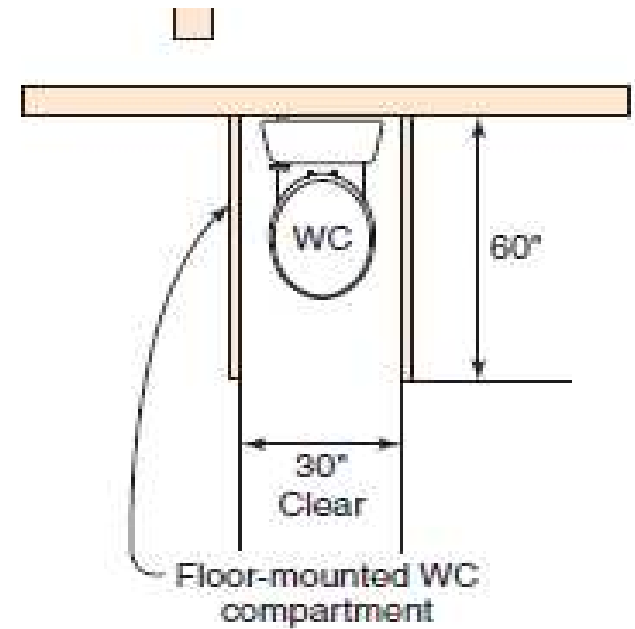
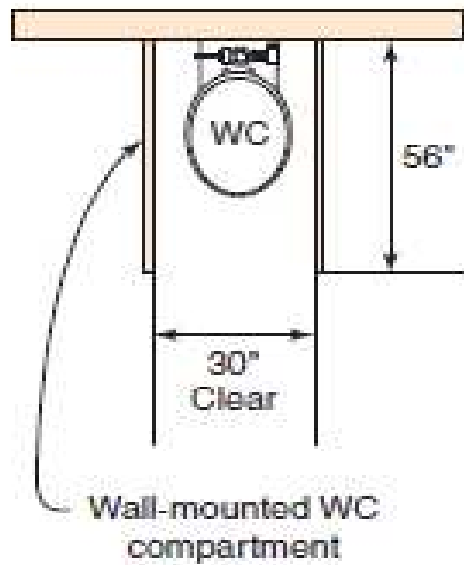
Section 403.5 Chapter 4

405.3.1 Water Closets, Urinals, Lavatories, and

Bidets. A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction, or closer than 30 inches (762 mm) center to center between adjacent fixtures. There shall be at least a 21-inch (533-mm) clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall be not less than 30 inches (762 mm) in width and 60 inches (1524 mm) in depth for floor mounted water closets and not less than 30 inches (762 mm) in width and 56 inches (1422 mm) in depth for wall hung water closets (see Figure 405.3.1).

This section was changed in the 2012 IPC to reflect the use of wall mounted water closets. In the past water closet compartments in public and employee rest rooms were required to be a minimum of 30 inches by 60 inches deep. The new code recognizes that wall hung water closets require less floor space and resized the compartment to 30 inches by 56 inches deep when installing these type fixtures.

Section 403.5 Chapter 4



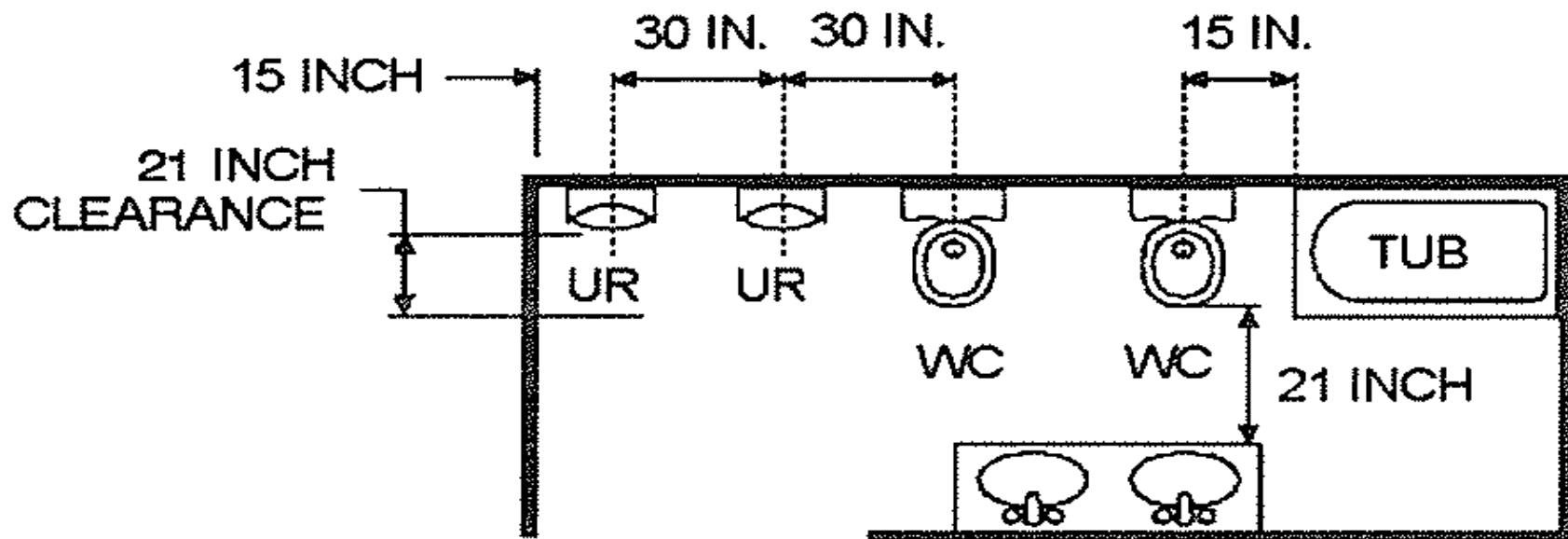
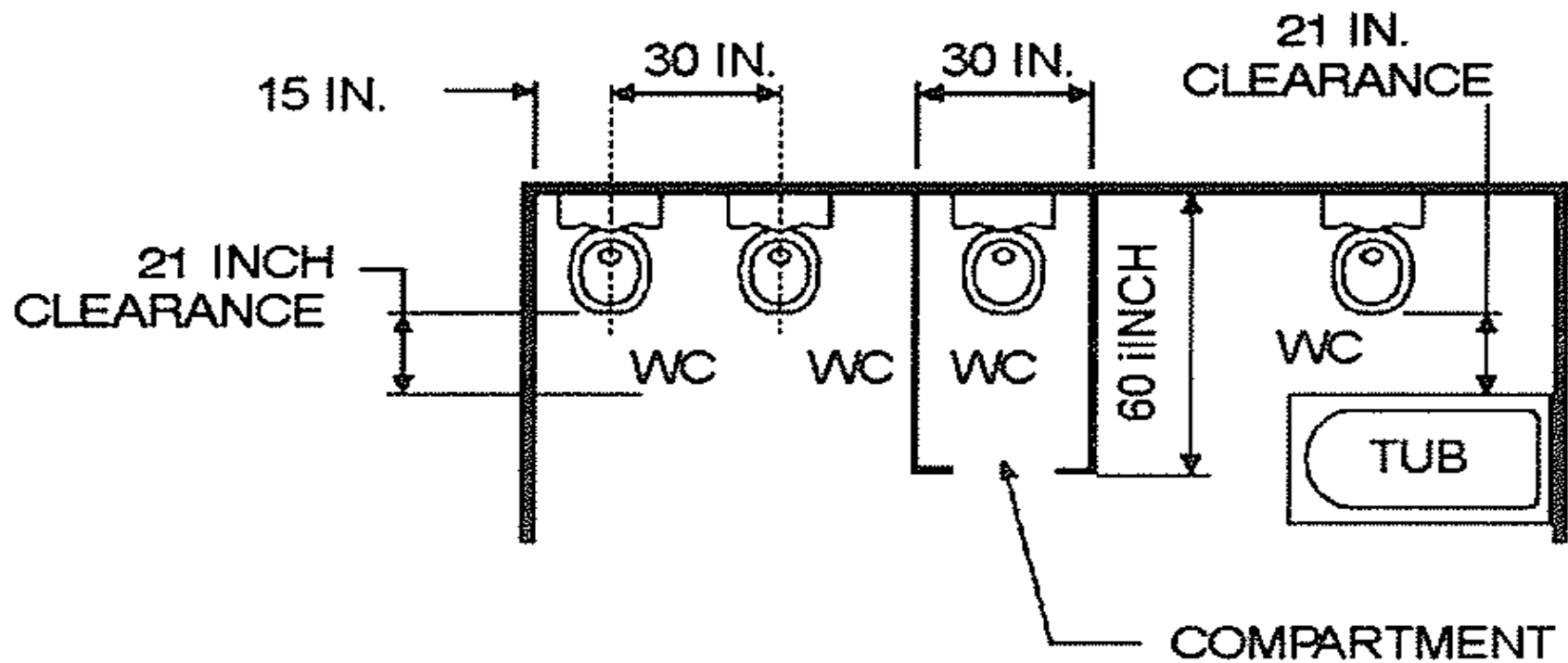
**Difference in Water Closet
compartment sizing requirements**

405.3.2 Water closets, lavatories and bidets

405.3.2 Public lavatories. In employee and *public* toilet rooms, the required lavatory shall be located in the same room as the required water closet.



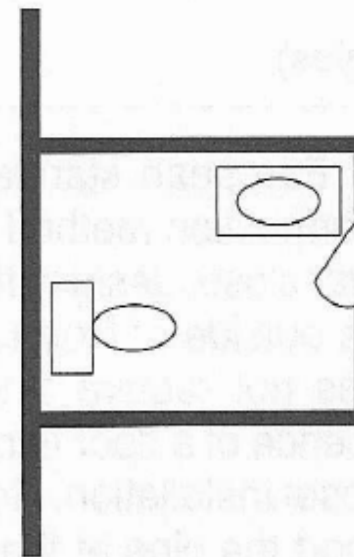
The 2012 IPC now requires the lavatory to be in the same rooms as the water closet and urinals.



405.3.3 Water closets, lavatories and bidets

405.3.3 Location of fixtures and piping. Piping, fixtures or equipment shall not be located in such a manner as to interfere with the normal operation of windows, doors or other means of egress openings

DOOR OPENS ONLY 36°



PROHIBITED INSTALLATION

For SI: 1 degree = 0.01745 rad.

Figure 405.3.2
FIXTURE AND PIPING OBSTRUCTION

405.3.4 Water closets, lavatories and bidets

405.3.4 Water closet compartment. Each water closet utilized by the *public* or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

405.3.5 Water closets, lavatories and bidets

405.3.5 Urinal partitions. Each urinal utilized by the *public* or employees shall occupy a separate area with walls or partitions to provide privacy. The walls or partitions shall begin at a height not greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single occupant or family/assisted-use toilet room with a lockable door.
2. Toilet rooms located in child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

405.3.5 Water closets, lavatories and bidets



Chapter 4 Fixtures

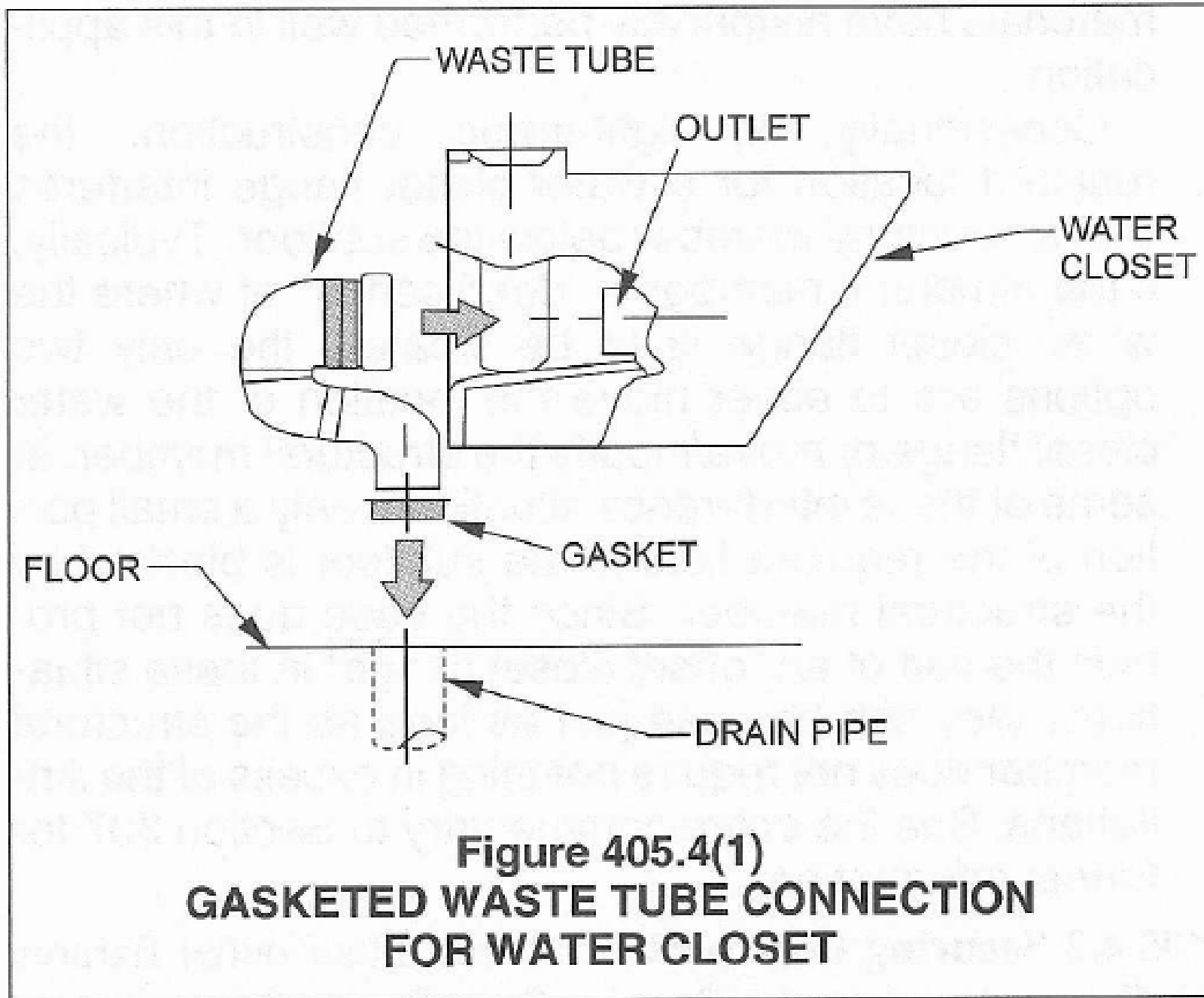
The following Code Sections cover Certain Fixtures and their specific requirements.

Many new fixtures that are used in other countries are now being sold and installed in the USA. Some use different methods of connecting the fixtures to the system. The 2012 IPC requires these fixtures to be installed per manufacturer's instructions.

Chapter 4 Fixtures

405.4 Floor and wall drainage connections. Connections between the drain and floor outlet plumbing fixtures shall be made with a floor flange or a waste connector and sealing gasket. The waste connector and sealing gasket joint shall comply with the joint tightness test of ASME A112.4.3 and shall be installed in accordance with the manufacturer's instructions. The flange shall be attached to the drain and anchored to the structure. Connections between the drain and wall-hung water closets shall be made with an *approved* extension nipple or horn adaptor. The water closet shall be bolted to the hanger with corrosion-resistant bolts or screws. Joints shall be sealed with an *approved* elastomeric gasket, flange-to-fixture connection complying with ASME A112.4.3 or an *approved* setting compound.

Chapter 4 Fixtures

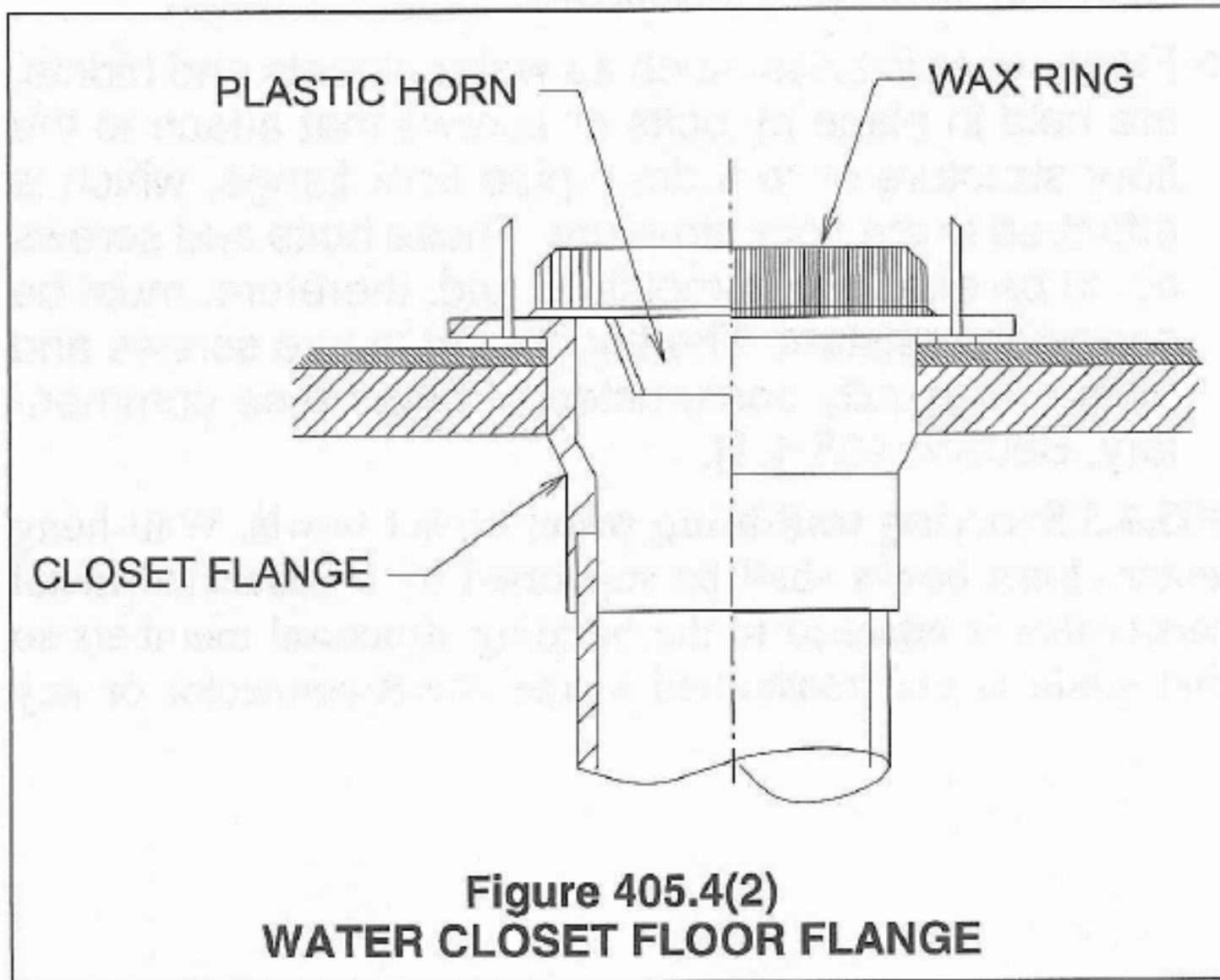


405.4.1 Floor Flanges

405.4.1 Floor flanges. Floor flanges for water closets or similar fixtures shall not be less than 0.125 inch (3.2 mm) thick for brass, 0.25 inch (6.4 mm) thick for plastic, and 0.25 inch (6.4 mm) thick and not less than a 2-inch (51 mm) caulking depth for cast-iron or galvanized malleable iron.

Floor flanges of hard lead shall weigh not less than 1 pound, 9 ounces (0.7 kg) and shall be composed of lead alloy with not less than 7.75-percent antimony by weight. Closet screws and bolts shall be of brass. Flanges shall be secured to the building structure with corrosion-resistant screws or bolts.

405.4.1 Floor Flanges



405.4.1 Floor Flanges

405.4.2 Securing floor outlet fixtures. Floor outlet fixtures shall be secured to the floor or floor flanges by screws or bolts of corrosion-resistant material.

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405.4.3 Securing wall-hung water closet bowls

405.4.3 Securing wall-hung water closet bowls. Wall-hung water closet bowls shall be supported by a concealed metal carrier that is attached to the building structural members so that strain is not transmitted to the closet connector or any other part of the plumbing system. The carrier shall conform to ASME A112.6.1.

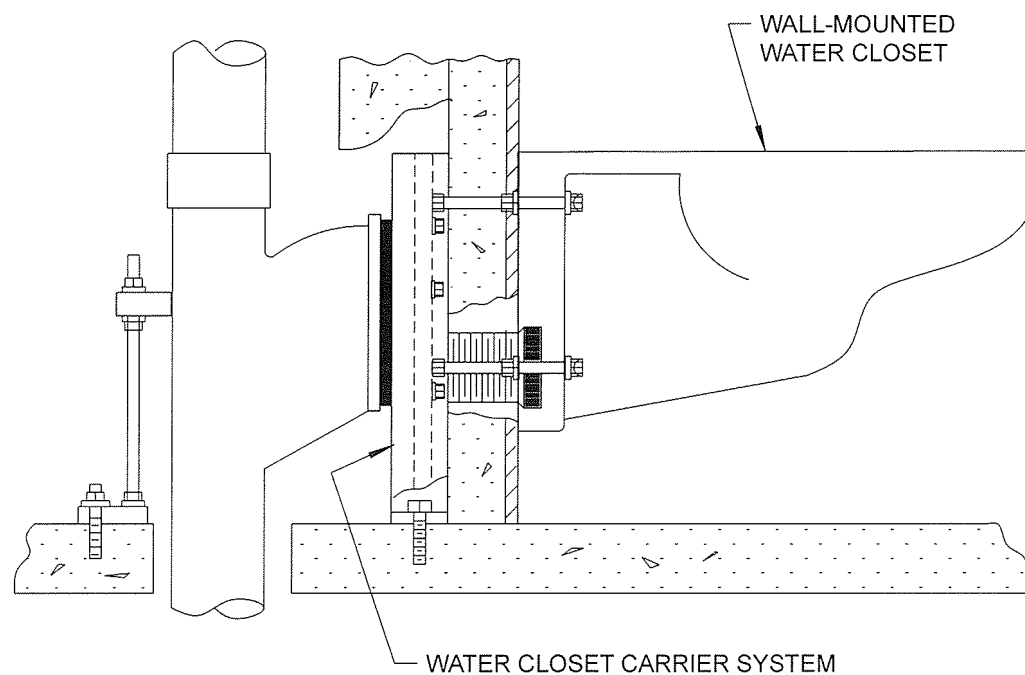


Figure 405.4.3
WALL-HUNG WATER CLOSET

405.5 Water-tight Joints

Joints formed where fixtures come in contact with walls or floors **shall be sealed.**

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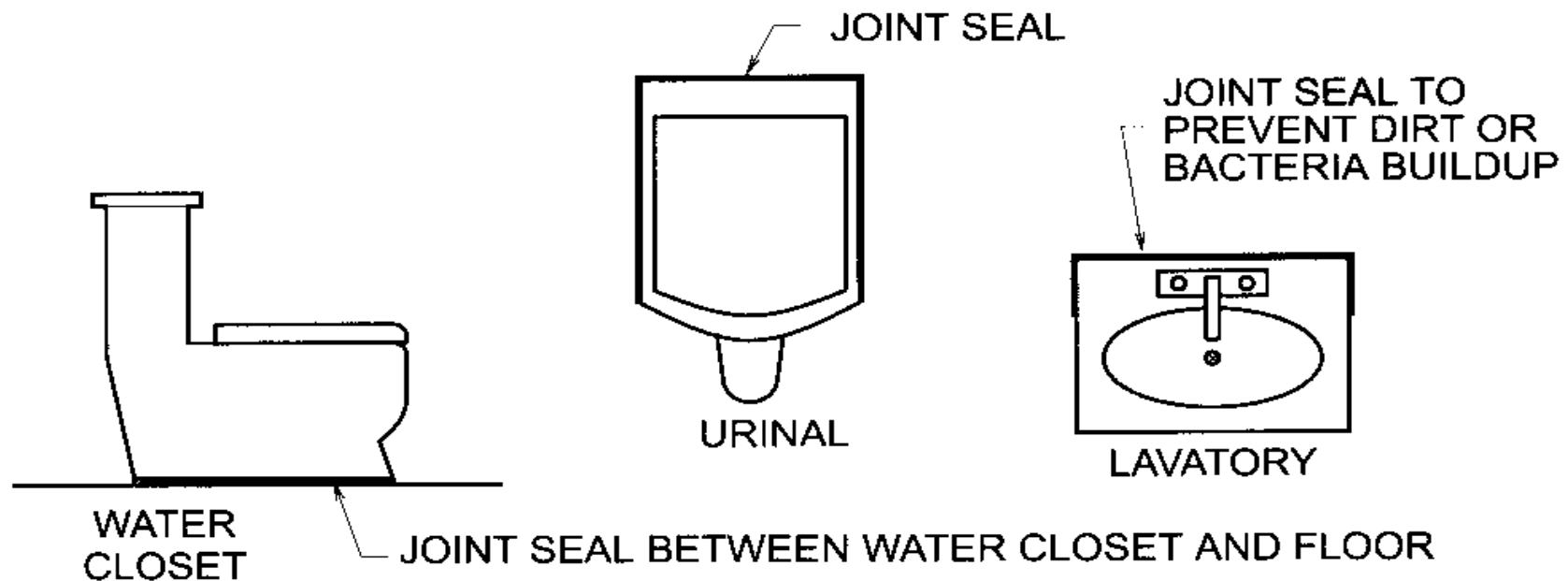


Figure 405.5
JOINTS BETWEEN FIXTURES AND WALLS OR FLOORS

Fixture Design

405.7 Design of overflows. Where any fixture is provided with an overflow, the waste shall be designed and installed so that standing water in the fixture will not rise in the overflow when the stopper is closed, and no water will remain in the overflow when the fixture is empty.

Overflows were not required on a lavatory or tub in the 2006 IPC. While it is still not required on a lavatory, the 2012 IPC added the requirement tubs to have an overflow..

Fixture Design

405.7.1 Connection of overflows. The overflow from any fixture shall discharge into the drainage system on the inlet or fixture side of the trap.

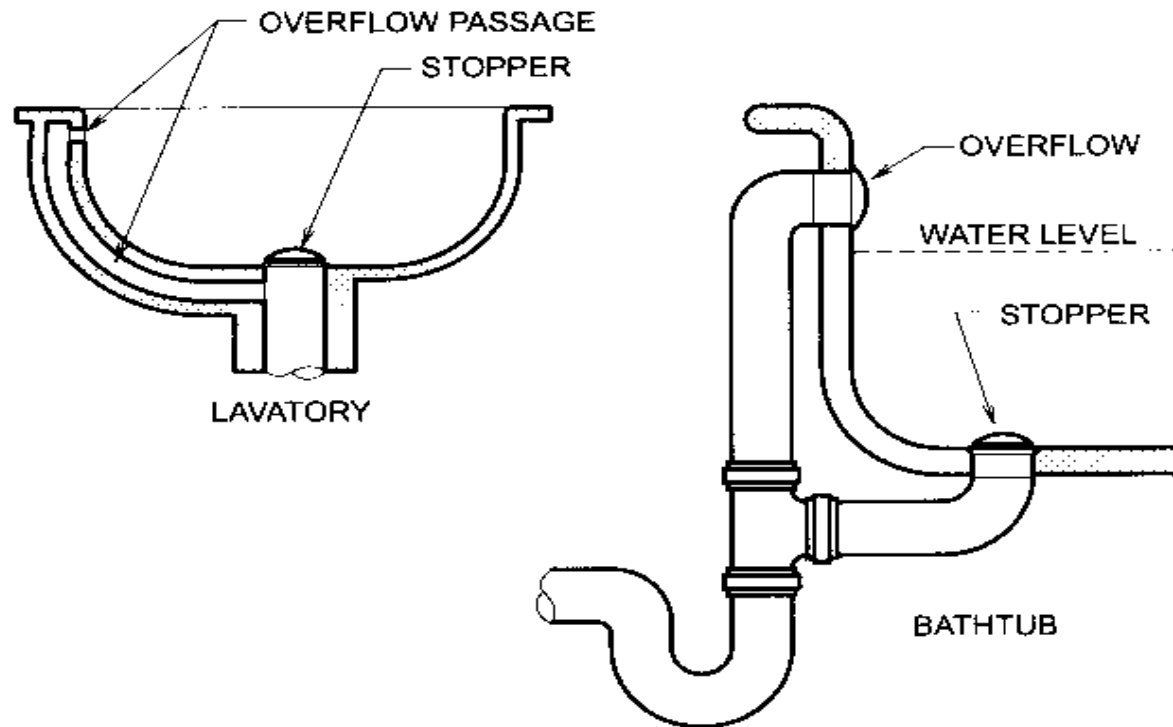
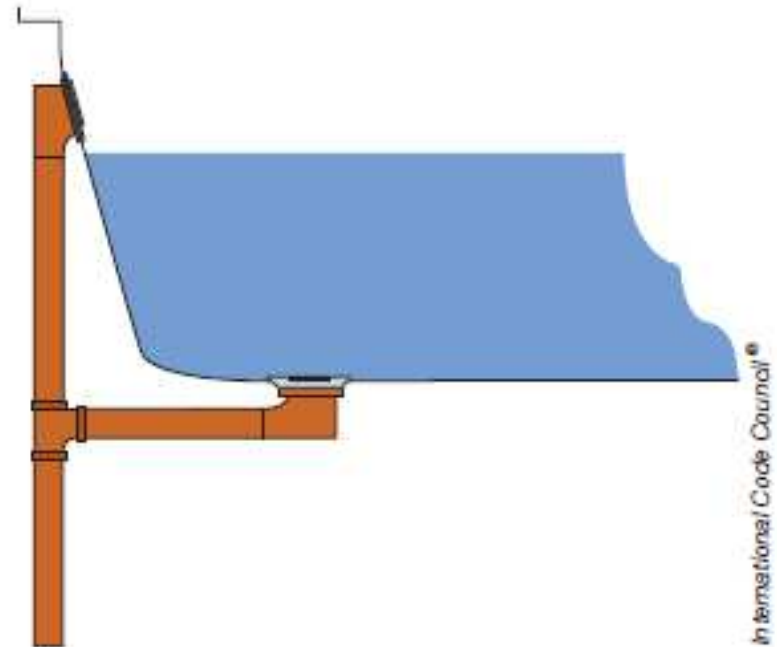


Figure 405.7
FIXTURE OVERFLOW

Section 403.5 Chapter 4

2012 CODE: 407.2 Bathtub Waste Outlets and Overflows. Bathtubs shall have be equipped with a waste outlets and an overflow outlet. The minimum outlets shall of be connected to waste tubing or piping not less than 1 ½ inches (38 mm) in diameter and the waste outlet shall be equipped with an approved watertight stopper.



Bathtub waste outlet and overflow

SECTION 408

Bidets

408.2 Water connection. The water supply to a bidet shall be protected against backflow by an *air gap* or backflow preventer in accordance with Section 608.13.1, 608.13.2, 608.13.3, 608.13.5, 608.13.6 or 608.13.8.

408.3 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to a maximum temperature of 110°F (43°C) by a water temperature limiting device conforming to ASSE 1070.

If you supply hot water to a bidet it must be tempered.

Section 410 Chapter 4

Drinking Fountains

The 2012 IPC included wording and requirements from the 2010 ADA regarding plumbing fixtures.

One of the main revisions dealt with drinking fountains. The revision was that if a drinking fountain was installed in an occupancy then you either had to install a high/low fixture or the you install two fountains with one being wheel chair handicap accessible. This was so a non-handicapped person would not have to bend down so low to use the drinking fountain

The following slides show the change in requirements.

Section 410 Chapter 4

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1/CSA B45.2 or ASME A112.19.2/CSA B45.1 and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9.

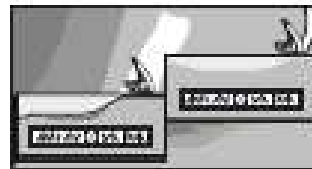
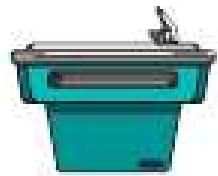
410.2 Minimum Number. Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exception: A single drinking fountain that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains. (High/Low Fixture)

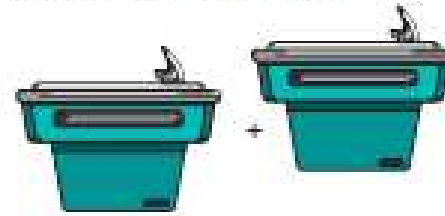
Section 410.2 Chapter 4

Where the plumbing code requires this number of drinking fountains:

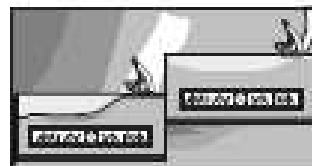
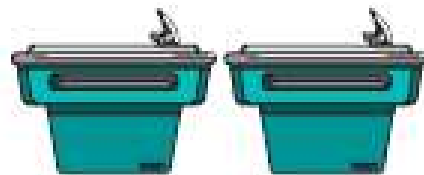
The building code requires either of these configurations:



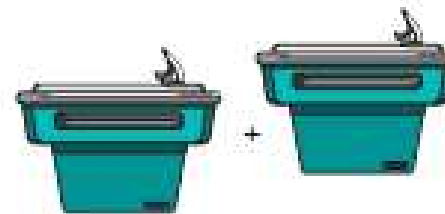
or



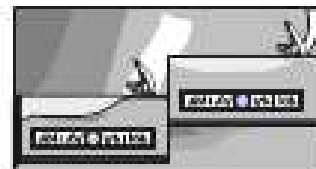
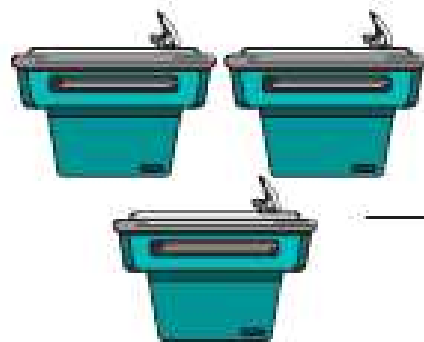
Combo "Hi-Lo Units"



or



Combo "Hi-Lo Units"



+



or



+



+



Combo "Hi-Lo Units"

Section 410 Chapter 4

410.3 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies, where drinking fountains are required, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

410.4 Prohibited location. Drinking fountains, water coolers and bottle water dispensers shall not be installed in *public* restrooms.

This revision put the same restrictions on bottled water dispensers as the code placed on drinking fountains.

Section 412.2 Chapter 4

2009 CODE: 412.2 Floor Drains. Floor drains shall have removable strainers. The floor drain shall be constructed so that the drain is capable of being cleaned. Access shall be provided to the drain inlet. Ready access shall be provided to floor drains.

Exception: Floor drains serving refrigerated display cases shall be provided with access.

Floor drains are almost always required by design professionals around refrigerated display cases for food products and vegetables because of condensation and cleaning. As the IPC required them to be readily accessible so they could not be installed under or behind these cases. The new code requires them to only be accessible so they can now be installed in these locations.

Section 412.2 Chapter 4

2009 CODE: 412.2 Floor Drains. Floor drains shall have removable strainers. The floor drain shall be constructed so that the drain is capable of being cleaned. Access shall be provided to the drain inlet. Ready access shall be provided to floor drains.

Exception: Floor drains serving refrigerated display cases shall be provided with access.



An open display case used to store fresh vegetables. The case has a drain, so the vegetables can be moistened by hand or with an automatic sprinkler. Courtesy KES Science and Technology Inc.

SECTION 413

FOOD WASTE GRINDER UNITS

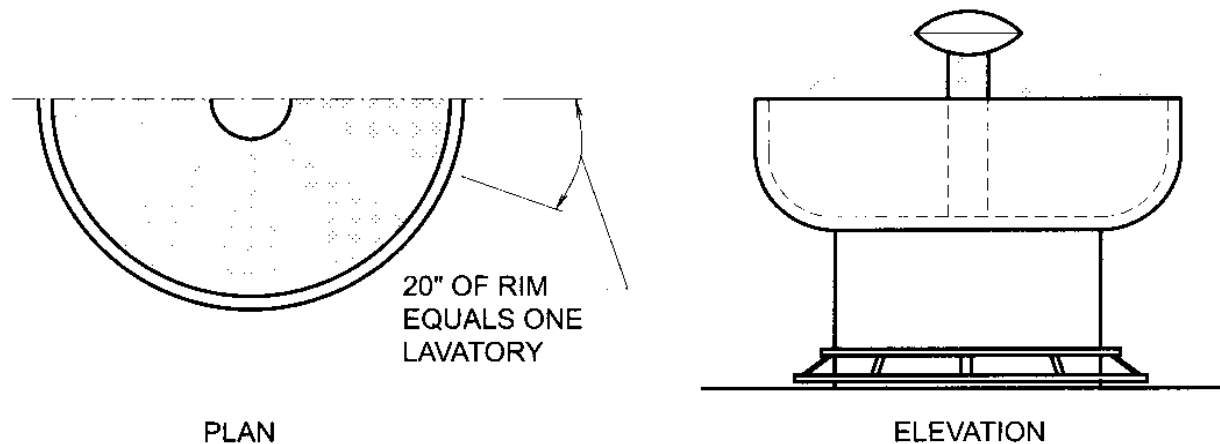
413.2 Domestic food waste grinder waste outlets. Domestic food waste grinders shall be connected to a drain of not less than 1 ½ inches (38 mm) in diameter.

The 2006 IPC required a minimum 2 inch drain on a commercial garbage disposal. As many smaller commercial units are used in smaller shops and restaurants the 2012 IPC reduced the size to 1 1/2 inches.

SECTION 416

LAVATORIES

- 416.1 Group wash up equipment shall conform to the requirements of Section 402. Every 20 inches (508 mm) of rim space shall be considered as one lavatory.



or SI: 1 inch = 25.4 mm.

Figure 416.1(1)
GROUP WASH-UP FIXTURE

LAVATORIES CON'T

416.5 Tempered water for public hand-washing facilities. *Tempered water shall be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. Tempered water shall be delivered through an approved water-temperature limiting device that conforms to ASSE 1070 or CSA B125.3.*

This code requirement required tempered water be delivered from lavatories faucets in public bathrooms. Georgia changed this section to make having hot water at the lavatories optional. The state changed the word shall to may stating that hot water was no longer required at these lavatories.

LAVATORIES CON'T

GA Amendment

SECTION 416 LAVATORIES

*Revise Section 416.5 'Tempered water for public hand-washing facilities' as follows:

416.5 Tempered water for public hand-washing facilities. *Tempered water* may be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. If provided, *tempered water* shall be delivered through an *approved* water-temperature limiting device that conforms to ASSE 1070 or CSA B125.3.

(Effective January 1, 2014)

SHOWERS

417.2 Water supply riser. Water supply risers from the shower valve to the shower head outlet, whether exposed or concealed, shall be attached to the structure. The attachment to the structure shall be made by the use of support devices designed for use with the specific piping material or by fittings anchored with screws.

This revision to the 2012 IPC was taken from the International Residential Building Code regarding the anchoring of shower head fittings to the building structure. This is something that the IPC had not covered in the past. It states that anchoring must be done with an approved support device or the fitting must be attached with screws.

SHOWERS

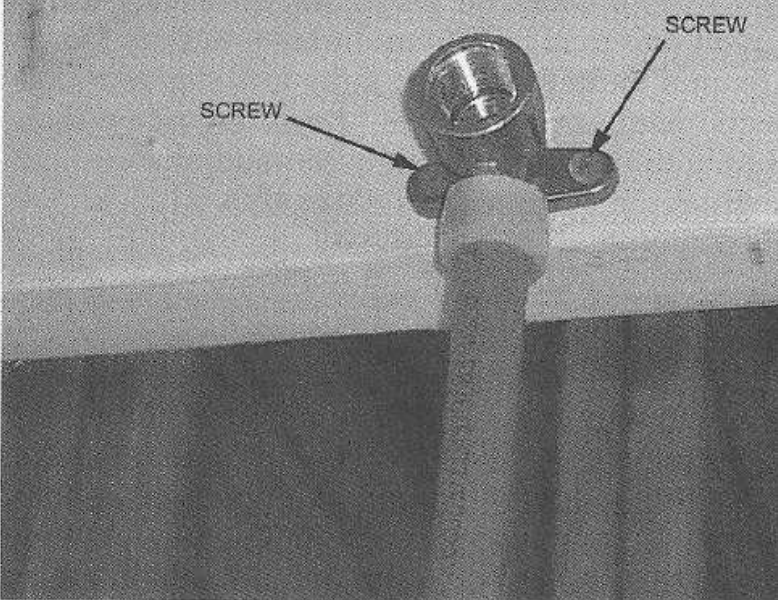
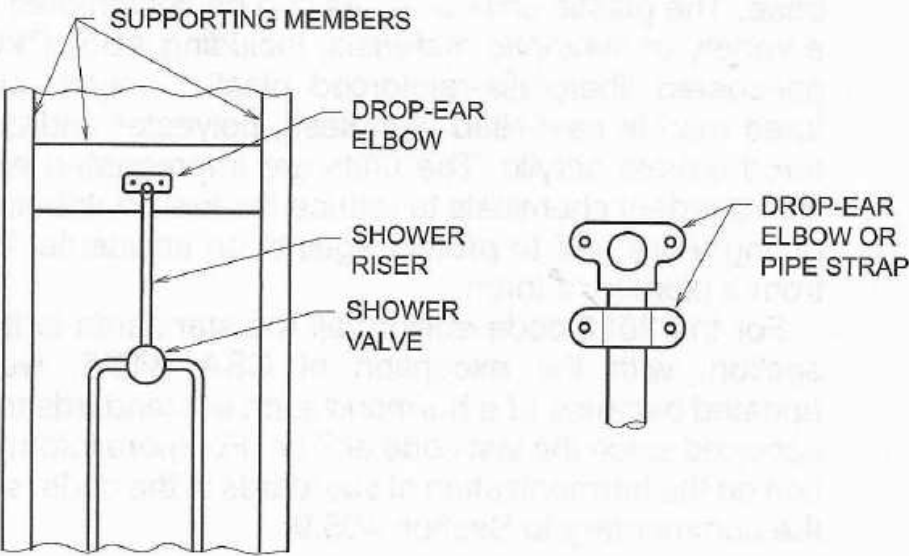


Figure 417.2(1)
SECURING SHOWER RISER

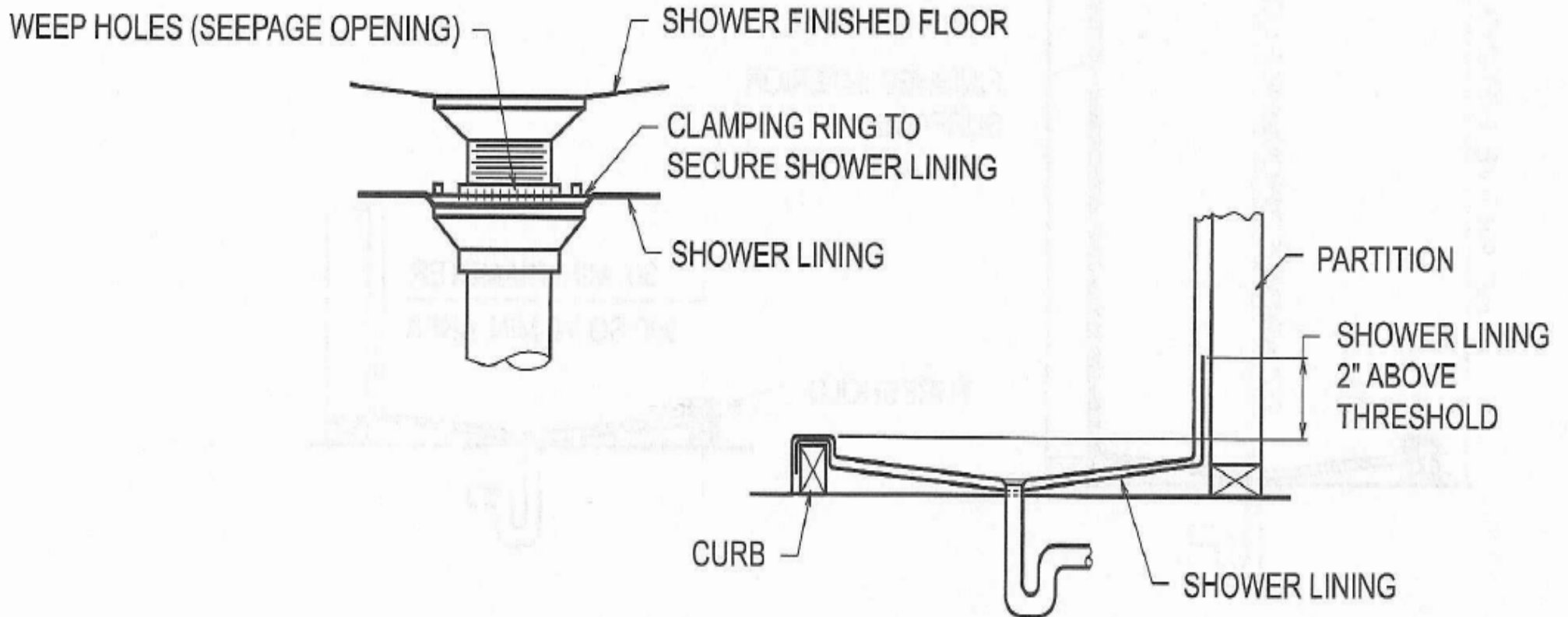


Figure 417.2(2)
SPECIAL BRACKET FOR SHOWER RISER
(Photo courtesy of Holdrite-Hubbard Enterprises)

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 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 (25.4 mm) above the finished threshold. Liners shall be pitched one-fourth unit vertical in 12 units horizontal (2-percent slope) and shall be sloped towards 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.

SHOWERS



For SI: 1 inch = 25.4 mm.

Figure 417.5.2
SHOWER LINING CONNECTION

SECTION 419

URINALS

GA Amendment

Non-water urinals shall conform to ASME A112.19.3/CSA B45.4 or A112.19.19, CSA B45.4. Where non-water urinals are employed, they shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed they shall have a properly sized water distribution line roughed-in to the urinal location at a minimum height of 56 inches (1,422 mm) to allow for the installation of an approved backflow prevention device in the event of a retrofit. Such water distribution lines shall be installed with shut-off valves located as close as possible to the distributing main to prevent the creation of dead ends. Where nonwater urinals are installed, a minimum of one water supplied fixture rated at a minimum of one water supply fixture unit shall be installed upstream on the same drain line to facilitate drain line flow and rinsing.

(Effective January 1, 2014)

SECTION 419

URINALS

419.2 Substitution for water closets. In each bathroom or toilet room, urinals shall not be substituted for more than 67 per-cent of the required water closets in assembly and educational occupancies. Urinals shall not be substituted for more than 50 percent of the required water closets in all other occupancies.

419.3 Surrounding material. Wall and floor space to a point 2 feet in front of a urinal lip and 4 feet above the floor and at least 2 feet to each side of the urinal shall be waterproofed with a smooth, readily cleanable, nonabsorbent material.

SECTION 421

WHIRLPOOL BATHTUBS

- **421.5 Access to pump.** Access shall be provided to circulation pumps in accordance with the fixture or pump manufacturer's installation instructions. Where the manufacturer's instructions do not specify the location and minimum size of field-fabricated access openings, a 12-inch by 12-inch (305 mm by 305 mm) minimum sized opening shall be installed to provide access to the circulation pump. Where pumps are located more than 2 feet (609 mm) from the access opening, an 18-inch by 18-inch (457 mm by 457 mm) minimum sized opening shall be installed. A door or panel shall be permitted to close the opening. In all cases, the access opening shall be unobstructed and of the size necessary to permit the removal and replacement of the circulation pump.

SECTION 424

Faucets and Other Fixture Fittings

424.3 Individual shower valves. Individual 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 and shall be installed at the point of use. Shower and tub-shower combination 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. In-line thermostatic valves shall not be utilized for compliance with this section.

SECTION 424

Faucets and Other Fixture Fittings

Table 424.3
TEMPERATURE BURN CHART

TIME AND TEMPERATURE RELATIONSHIP TO SERIOUS BURNS

Water temperature	Time required for a third-degree burn to occur	
	Adults (skin thickness of 2.5 mm)	Children (skin thickness of .56 mm)
155°F (68°C)	1 second	0.5 second
148°F (64°C)	2 seconds	1 second
140°F (60°C)	5 seconds	1 second
133°F (56°C)	15 seconds	4 seconds
127°F (53°C)	1 minute	10 seconds
124°F (51°C)	3 minutes	1.5 minutes
120°F (49°C)	5 minutes	2.5 minutes
100°F (38°C)	Safe temperature for bathing	Safe Temperature for bathing