

## CHAPTER 29

# PLUMBING SYSTEMS

### SECTION 2901 GENERAL

**2901.1 Scope.** The provisions of this chapter and the *International Plumbing Code* (IPC) shall govern the design and installation of all plumbing systems and equipment, except that as provided for in Section 103.11 for functional design, water supply sources and sewage disposal systems are regulated and approved by the Virginia Department of Health and the Virginia Department of Environmental Quality. The approval of pumping and electrical equipment associated with such water supply sources and sewage disposal systems shall, however, be the responsibility of the building official.

**Note:** See also the Memorandum of Agreement in the “Related Laws Package,” which is available from DHCD.

**2901.1.1 Use of Appendix C of the IPC for gray water and rain water recycling systems.** In addition to other applicable provisions of the IPC, gray water recycling systems and rain water recycling systems shall comply with the provisions in Appendix C of the IPC. In the use of Appendix C of the IPC for rain water recycling systems, the term “rain water” shall be substituted for the term “gray water.” Gray water recycling systems and rain water recycling systems shall be separate systems and shall not be interconnected.

**2901.1.2 Changes to the IPC.** The following changes shall be made to the IPC:

1. Change Section 301.3 of the IPC to read:

**301.3 Connections to drainage system.** All plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems required by Chapter 8.

**Exception:** Bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to discharge to the sanitary drainage system where such fixtures discharge to an approved gray water system or rain water system for flushing of water closets and urinals or for subsurface landscape irrigation.

2. Delete Sections 311 and 311.1 of the IPC.
3. Change Section 602.1 of the IPC to read:

**602.1 General.** Every structure equipped with plumbing fixtures and utilized for human occupancy or habitation shall be provided with a potable supply of water in the amounts and at the pressures specified in this chapter. This shall not prohibit the use of reclaimed water distribution systems installed in accordance with this code and the Virginia Water Reclamation and Reuse Regulation (9 VAC 25-740).

4. Change Section 604.1 of the IPC to read:

**604.1 General.** The design of the water distribution system, including any reclaimed water distribution

systems governed by the Virginia Water Reclamation and Reuse Regulation (9 VAC 25-740), shall conform to accepted engineering practice. Methods utilized to determine pipe sizes shall be approved.

5. Add an exception to Section 608.8 of the IPC to read:

**Exception:** Reclaimed water supply systems shall be identified in accordance with the provisions of the Virginia Water Reclamation and Reuse Regulation (9 VAC 25-740).

6. Change Section 608.8.2 of the IPC to read:

**608.8.2 Color.** The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify rain and gray water distribution systems.

7. Delete Section 701.9 of the IPC.

8. Add Section 703.6 of the IPC to read:

**703.6 Tracer wire.** Nonmetallic sanitary sewer piping that discharges to public systems shall be locatable. An insulated copper tracer wire, 18 AWG minimum in size and suitable for direct burial or an equivalent product, shall be utilized. The wire shall be installed in the same trench as the sewer within 12 inches (305 mm) of the pipe and shall be installed to within 5 feet (1524 mm) of the building wall to the point where the building sewer intersects with the public system. At a minimum, one end of the wire shall terminate above grade in an accessible location that is resistant to physical damage, such as with a cleanout or at the building wall.

### SECTION 2902 MINIMUM PLUMBING FACILITIES

**[P] 2902.1 Minimum number of fixtures.** Plumbing fixtures shall be provided for the type of occupancy and in the minimum number shown in Table 2902.1. Types of occupancies not shown in Table 2902.1 shall be considered individually by the *building official*. The number of occupants shall be determined by this code. Occupancy classification shall be determined in accordance with Chapter 3.

**[P] 2902.1.1 Fixture calculations.** To determine the *occupant load* of each sex, the total *occupant load* shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the *occupant load* of each sex in accordance with Table 2902.1. Fractional numbers resulting from applying the fixture ratios of Table 2902.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number.

**Exception:** The total *occupant load* shall not be required to be divided in half where *approved* statistical data indi-

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cate a distribution of the sexes of other than 50 percent of each sex.

**2902.1.2 Family or assisted use toilet and bath fixtures.** Fixtures located within family or assisted use toilet and bathing rooms required by Section 1109.2.1 are permitted to be included in the number of required fixtures for either the male or female occupants in assembly and mercantile occupancies.

**[P] 2902.2 Separate facilities.** Where plumbing fixtures are required, separate facilities shall be provided for each sex.

**Exceptions:**

1. Separate facilities shall not be required for *dwelling units* and *sleeping units*.
2. Separate facilities shall not be required in structures or tenant spaces with a total *occupant load*, including both employees and customers, of 15 or less.

3. Separate facilities shall not be required in mercantile occupancies in which the maximum *occupant load* is 50 or less.

**[P] 2902.3 Required public toilet facilities.** Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization. The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 2902.1 for all users. Employees shall be provided with toilet facilities in all occupancies. Employee toilet facilities shall either be separate or combined employee and public toilet facilities.

**[P] 2902.3.1 Access.** The route to the public toilet facilities required by Section 2902.3 shall not pass through kitchens, storage rooms or closets. Access to the required facilities shall be from within the building or from the exterior of the building. All routes shall comply with the accessibility requirements of this code. The public shall have access to the required toilet facilities at all times that the building is occupied.

**[P] TABLE 2902.1  
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES<sup>a</sup>  
(See Sections 2902.2 and 2902.3)**

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAINS <sup>e, f</sup> (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MALE	FEMALE	MALE	FEMALE			
1	Assembly	A-1 <sup>d</sup>	Theaters and other buildings for the performing arts and motion pictures	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
		A-2 <sup>d</sup>	Nightclubs, bars, taverns, dance halls and buildings for similar purposes	1 per 40	1 per 40	1 per 75		—	1 per 500	1 service sink
			Restaurants, banquet halls and food courts	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		A-3 <sup>d</sup>	Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums	1 per 125	1 per 65	1 per 200		—	1 per 500	1 service sink
			Passenger terminals and transportation facilities	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
			Places of worship and other religious services	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		A-4	Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
A-5	Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink		

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[P] TABLE 2902.1—continued  
 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES<sup>a</sup>

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES		BATHTUBS OR SHOWERS	DRINKING FOUNTAINS <sup>e, f</sup> (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MALE	FEMALE	MALE	FEMALE			
2	Business	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80		—	1 per 100	1 service sink
3	Educational	E	Educational facilities	1 per 50		1 per 50		—	1 per 100	1 service sink
4	Factory and industrial	F-1 and F-2	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100		1 per 100		See Section 411 of the <i>International Plumbing Code</i>	1 per 400	1 service sink
5	Institutional	I-1	Residential care	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		I-2	Hospitals, ambulatory nursing home patients <sup>b</sup>	1 per per room <sup>c</sup>		1 per per room <sup>c</sup>		1 per 15	1 per 100	1 service sink
			Employees, other than residential care <sup>b</sup>	1 per 25		1 per 35		—	1 per 100	—
			Visitors, other than residential care	1 per 75		1 per 100		—	1 per 500	—
		I-3	Prisons <sup>b</sup>	1 per cell		1 per cell		1 per 15	1 per 100	1 service sink
		I-3	Reformatories, detention centers and correctional centers <sup>b</sup>	1 per 15		1 per 15		1 per 15	1 per 100	1 service sink
			Employees <sup>b</sup>	1 per 25		1 per 35		—	1 per 100	—
I-4	Adult day care and child care	1 per 15		1 per 15		1	1 per 100	1 service sink		
6	Mercantile	M	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500		1 per 750		—	1 per 1,000	1 service sink
7	Residential	R-1	Hotels, motels, boarding houses (transient)	1 per sleeping unit		1 per sleeping unit		1 per sleeping unit	—	1 service sink
		R-2	Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		R-2	Apartment house	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units

(continued)

[P] TABLE 2902.1—continued  
 MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES<sup>a</sup>

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAINS <sup>e, f</sup> (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MALE	FEMALE	MALE	FEMALE			
7	Residential	R-3	Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		R-4	Residential care/assisted living facilities	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
8	Storage	S-1 S-2	Structures for the storage of goods, warehouses, storehouses and freight depots, low and moderate hazard	1 per 100		1 per 100		See Section 411 of the <i>International Plumbing Code</i>	1 per 1,000	1 service sink

- a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by this code.
- b. Toilet facilities for employees shall be separate from facilities for inmates or patients.
- c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient sleeping unit and with provisions for privacy.
- d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
- e. The minimum number of required drinking fountains shall comply with Table 2902.1 and Chapter 11.
- f. Drinking fountains are not required for an occupant load of 15 or fewer.

[P] 2902.3.2 **Location of toilet facilities in occupancies other than covered mall buildings.** In occupancies other than *covered mall buildings*, the required public and employee toilet facilities shall be located not more than one *story* above or below the space required to be provided with toilet facilities and the path of travel to such facilities shall not exceed a distance of 500 feet (152 400 mm).

**Exception:** The location and maximum travel distances to required employee facilities in factory and industrial occupancies are permitted to exceed that required by this section, provided that the location and maximum travel distance are *approved*.

[P] 2902.3.3 **Location of toilet facilities in covered mall buildings.** In *covered mall buildings*, the required public and employee toilet facilities shall be located not more than one *story* above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 300 feet (91 440 mm). In *covered mall buildings*, the required facilities shall be based on total square footage, and facilities shall be installed in each individual store or in a central toilet area located in accordance with this section. The maximum travel distance to the central toilet facilities in *covered mall buildings* shall be measured from the main entrance of any store or tenant space. In *covered mall buildings*, where employees' toilet facilities are not provided in the individual store, the maximum travel distance shall be measured from the employees' work area of the store or tenant space.

[P] 2902.3.4 **Pay facilities.** Where pay facilities are installed, such facilities shall be in excess of the required minimum facilities. Required facilities shall be free of charge.

[P] 2902.4 **Signage.** A legible sign designating the sex shall be provided in a readily visible location near the entrance to each toilet facility. Signs for *accessible* toilet facilities shall comply with ICC A117.1.

**2902.4.1 Directional signage.** Directional signage indicating the route to the public facilities shall be posted in accordance with Section 3107. Such signage shall be located in a *corridor* or aisle, at the entrance to the facilities for customers and visitors.

**SECTION 2903  
 TOILET ROOM REQUIREMENTS**

[P] 2903.1 **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 day care and child 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.

[P] 2903.2 **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 more 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 a minimum of 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 back wall surface, whichever is greater.

**Exceptions:**

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

**[P] 2903.3 Interior Finish.** Interior finish surfaces of toilet rooms shall comply with Section 1210.

