

2021 Virginia Construction Code

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 103.5 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 Changes to the IPC.

The following changes shall be made to the IPC:

1. Add the following definitions to the IPC to read:

NONPOTABLE FIXTURES AND OUTLETS. Fixtures and outlets that are not dependent on potable water for the safe operation to perform their intended use. Such fixtures and outlets may include water closets, urinals, irrigation, mechanical *equipment*, and hose connections to perform operations, such as vehicle washing and lawn maintenance.

NONPOTABLE WATER SYSTEMS. Water systems for the collection, treatment, storage, distribution, and use or reuse of nonpotable water. Nonpotable systems include reclaimed water, rainwater, and graywater systems.

SERVICE SINK. A general purpose sink exclusively intended to be used for facilitating the cleaning of *abuilding* or tenant space.

STORMWATER. Precipitation that is discharged across the land surface or through conveyances to one or more waterways and that may include stormwater runoff, snow melt runoff, and surface runoff and drainage.

2. Change the following definitions in the IPC to read:

RAINWATER. Natural precipitation, including snow melt, from roof surfaces only.

RECLAIMED WATER. Reclaimed water means water resulting from the treatment of domestic, municipal, or industrial wastewater that is suitable for a water reuse that would not otherwise occur. Specifically excluded from this definition is "Graywater."

3. Change the exception to Section 301.3 of the IPC to read:

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 nonpotable graywater system in accordance with the applicable provisions of Chapter 13.

4. Delete Section 311 of the IPC in its entirety.

5. Change Table 403.1 of the IPC to read:

TABLE 403.1
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a (See Sections 403.1.1 and 403.2)

N	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUB S/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
			1 per 125	1 per 65					
			1 per 85.5 ^g						1
		Theaters and other buildings for the performing arts and motion pictures ^d			1 per 200		—	1 per 500	servi c e s i n g

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N	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1	Assembly	Nightclubs, bars, taverns, dance halls and buildings for similar purposes ^d	1 per 40	1 per 40	1 per 75	—	—	1 per 500	1 service sink
		Restaurants, banquet halls and food courts ^d	1 per 75	1 per 75	1 per 200	—	—	1 per 500	1 service sink
		Gaming areas	1 per 100 for the first 400 and 1 per 250 for the remainder exceeding 400 1 per 66.67 for the first 800 and 1 per 187.5 for the remainder exceeding 800 ^g	1 per 50 for the first 400 and 1 per 150 for the remainder exceeding 400	1 per 250 for the first 750 and 1 per 500 for the remainder exceeding 750	—	—	1 per 1,000	1 service sink
		Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums ^d	1 per 125	1 per 65	1 per 200	—	—	1 per 500	1 service sink
		Passenger terminals (other than airport terminals) and transportation facilities ^d	1 per 500	1 per 500	1 per 750	—	—	1 per 1,000	1 service sink
		Airport terminals	1 per 500	1 per 100 for the first 500 and 1 per 150 for the remainder exceeding 500	1 per 750	—	—	1 per 1,000	1 service sink

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N	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHS/SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
1		Places of worship and other religious services ^d	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
			1 per 100 ⁹						
		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
			1 per 52.2 for the first 3,025 and 1 per 80 for the remainder exceeding 3,025 ⁹		1 per 171.4 ⁹				
Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities ^f	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		
	1 per 52.2 for the first 3,025 and 1 per 80 for the remainder exceeding 3,025 ⁹		1 per 171.4 ⁹						
2	Business	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, ambulatory care, 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	Educational facilities	1 per 50	1 per 50	—		1 per 100	1 service sink	
4	Factory and industrial	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100	1 per 100	—		1 per 400	1 service sink	

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N	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
5	Institutional	Custodial care facilities	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		Medical care recipients in hospitals and nursing homes	1 per room ^c		1 per room ^c		1 per 15	1 per 100	1 service sink per floor
		Employees in hospitals and nursing homes ^b	1 per 25		1 per 35		—	1 per 100	—
		Visitors in hospitals and nursing homes	1 per 75		1 per 100		—	1 per 500	—
		Prisons ^b	1 per cell		1 per cell		1 per 15	1 per 100	1 service sink
		Reformatories, detention centers, and correctional centers ^b	1 per 15		1 per 15		1 per 15	1 per 100	1 service sink
		Employees in reformatories, detention centers and correctional centers ^b	1 per 25		1 per 35		—	1 per 100	—
		Adult day care and child day care	1 per 15		1 per 15		1	1 per 100	1 service sink

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N	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
6	Merchandise	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500		1 per 750		—	1 per 1,000	1 service sink
		Hotels, motels, boarding houses (transient)	1 per sleeping unit		1 per sleeping unit		1 per sleeping unit	—	1 service sink
		Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink

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N	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUB S/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
		Apartment house	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit		1 kitchen sink per dwelling unit; 1 automatic icc closet; 1 hose washer connection per 20 dwelling units

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N O .	C L A S S I F I C A T I O N	D E S C R I P T I O N	W A T E R C L O S E T S (U R I N A L S : S E E S E C T I O N 4 2 4 .2)		L A V A T O R I E S		B A T H T U B S/ S H O W E R S	D R I N K I N G F O U N T A I N (S E E S E C T I O N 4 1 0)	O T H E R
			M A L E	F E M A L E	M A L E	F E M A L E			
7	Residential	Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink

N	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHTUB S/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
		One- and two-family dwellings and lodging houses with five or fewer guestrooms	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit		1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit

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N O	CLASSIFICATION	DESCRIPTION	WATER CLOSETS (URINALS: SEE SECTION 424.2)		LAVATORIES		BATHS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410)	OTHER
			MALE	FEMALE	MALE	FEMALE			
8	Storage	Structures for the storage of goods, warehouses, storehouse and freight depots. Low and Moderate Hazard.	per 100		1 per 100		—	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 the [International Building Code](#).

b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.

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 provided that each patient sleeping unit has direct access to the toilet room and provision for privacy for the toilet room user is provided.

d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.

e. For business and mercantile classifications with an occupant load of 15 or fewer, service sinks shall not be required.

f. The occupant load for pools shall be in accordance with the “Skating rinks, swimming pools” category of Table 1004.5 of the [International Building Code](#).

g. Use this fixture ratio for determining the minimum number of fixtures for multiuser, gender-neutral toilet facilities.

6. Change footnote “f” and add footnote “g” to Table 403.1 of the IPC to read:

f. The occupant load for pools shall be in accordance with the “Skating rinks, swimming pools” category of Table 1004.5 of the [International Building Code](#).

g. Use this fixture ratio for determining the minimum number of fixtures for multiuser, gender-neutral toilet facilities.

7. Change Exceptions 2 and 3 to Section 403.1.1 of the IPC to read (Exception 1 remains):

2. Where multiuser facilities are designed to serve all genders, the minimum fixture count shall be calculated 100 percent, based on the total occupant load.

3. The total occupant load shall not be required to be divided in half with a distribution of sexes where single-user water closets and bathing room fixtures are provided in accordance with Section 403.1.2.

8. Add Section 403.1.4 and Table 403.1.4 to the IPC to read:

403.1.4 Marina fixtures. Notwithstanding any provision to the contrary, plumbing fixtures shall be provided for *marinas* in the minimum number shown in Table 403.1.4. Fixtures shall be located within 500 feet (152 m) walking distance from the shore end of any dock they serve. Separate facilities shall be provided for each sex with an equal number of fixtures of each type in each facility, except that separate facilities are not required where the number of *slips* is less than 25. Urinals may be substituted for up to 50 percent of water closets

**TABLE 403.1.4
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES FOR MARINAS**

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NUMBER OF SLIPS	PLUMBING FIXTURES		
	Water closets	Lavatories	Showers
1-24	1	1	1
25-49	4	4	2
50-99	6	4	2
100-149	8	6	4
150-199	10	8	4
200-249	12	10	6
250 or greater	Two additional fixtures of each type for each 100 additional slips		

9. Change exception 6 to [Section 403.2](#) of the IPC to read:

6. Separate facilities shall not be required where multiuser, gender-neutral facilities are provided in accordance with [Section 405.3](#) and [Section 1109.2.6](#) of the VCC.

10. Change [Section 403.3.3](#) of the IPC and add Exception 3 to [Section 403.3.3](#) of the IPC (Exceptions 1 and 2 remain unchanged), to read:

403.3.3 Location of toilet facilities in occupancies other than malls and airports. In occupancies other than covered and open mall *buildings* and airport terminals, 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 m).

3. The location and maximum distances of travel to the required public facilities located on cemetery property are permitted to exceed that required by this section, provided that the location and maximum travel distance are located on the same property and approved.

11. Renumber [Section 403.3.5](#) to [Section 403.3.6](#) and [Section 403.3.6](#) to [Section 403.3.7](#); and change [Section 403.3.5](#) of the IPC to read:

403.3.5 Location of toilet facilities in airport terminals. In airport terminals, the minimum number of public and employee toilet fixtures shall be located before arriving at and after leaving the main security screening checkpoints and shall comply with the following:

1. Shall be based on the actual use and occupant load of those spaces before and after the main security screening checkpoints.
2. Shall not be more than one story above or below the space required to be provided with toilet facilities.
3. The path of travel to such facilities shall not exceed a distance of 300 feet (91 mm). For employees' toilet facilities, the maximum distance of travel shall be measured from the employees' work area.

403.3.6 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.

403.3.7 Door locking. Where a toilet room is provided for the use of multiple occupants, the egress door for the room shall not be lockable from the inside of the room. This section does not apply to family or assisted-use toilet rooms.

12. Add an exception to [Section 405.3.2](#) of the IPC to read:

Exception: In educational use occupancies, the required lavatory shall be permitted to be located adjacent to the room or space containing the water closet, provided that not more than one operational door is between the water closet and the lavatory.

13. Change [Section 405.3.4](#) and add [Sections 405.3.4.1](#) and [405.3.4.2](#) to the IPC to read:

405.3.4 Water closet compartment. Each water closet utilized by the public or employees shall comply with [Sections 405.3.4.1](#) and [405.3.4.2](#), as applicable. All fully enclosed compartments shall be provided with occupancy indicators.

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.

405.3.4.1 Separate facilities. Each water closet provided in separate facilities shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy and shall comply with [Section 405.3.1](#). Accessible water closets and compartments shall comply with [ICC A117.1](#).

405.3.4.2 Multi-user gender-neutral facilities. Each water closet provided in a multiuser gender-neutral toilet facility shall occupy a separate compartment with walls or partitions including the doors thereto, which

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shall extend to the floor and to the ceiling with maximum 1/2-inch (13 mm) clearances at the floor and ceiling, with gaps not exceeding 1/8-inch (3 mm) between the doors and partitions and partitions and walls, and shall comply with Section 405.3.1. Accessible water closet compartments shall comply with ICC A117.1 and the increased toe clearance requirements.

14. Change [Section 405.3.5](#) of the IPC to read:

405.3.5 Urinal separation and partitions. Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The horizontal dimension between walls or partitions at each urinal shall be not less than 30 inches (762 mm). 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. All fully enclosed compartments shall be provided with occupancy indicators.

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.

15. Add Sections 405.3.5.1 and 405.3.5.2 to the [IPC](#) to read:

405.3.5.1 Separate facilities. The walls or partitions for urinals in separate facilities 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 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.

405.3.5.2 Multiuser gender-neutral facilities. Each urinal provided in a multiuser genderneutral toilet facility shall occupy a separate compartment with walls or partitions, including the doors thereto, where the partitions extend to the floor and to the ceiling with maximum 1/2-inch (13 mm) clearances, with gaps not exceeding 1/8-inch (3 mm) between the doors and partitions and partitions and walls, or shall all be located in a separate room with a door, enclosing the urinals to ensure privacy. Where an accessible urinal is located within a compartment, grab bars shall not be required for the urinal, the door shall be located to allow for a forward approach to the urinal, and increased toe clearances shall be provided in accordance with [ICC A117.1](#).

Exceptions:

1. A separate room or compartment shall not be required in a single-occupant toilet room with a lockable door.
2. This provision is not applicable to toilet areas located within Group I-3 occupancy housing areas.

16. Change [Section 423.1](#) of the IPC to read:

423.1 Water connections. Baptisteries, ornamental and lily pools, aquariums, ornamental fountain basins, *swimming pools*, footbaths and pedicure baths, and similar *constructions*, where provided with water supplies, shall be protected against backflow in accordance with Section 608.

17. Add an exception to [Section 424.2](#) of the IPC to read:

Exception: In each multiuser, gender-neutral bathroom or toilet room, urinals shall not be substituted for more than 22.5 percent of the total number of water closets in Assembly and Educational occupancies. Urinals shall not be substituted for more than 25 percent of the total number of water closets in all other occupancies.

18. Add Section 602.2.1 to the [IPC](#) to read:

602.2.1 Nonpotable fixtures and outlets. Nonpotable water shall be permitted to serve nonpotable-type fixtures and outlets in accordance with [Chapter 13](#).

19. Add Section 603.3 to the [IPC](#) to read:

603.3 Tracer wire. Nonmetallic water service piping that connects 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 water service piping and 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* water service pipe intersects with the public water supply. At a minimum, one end of the wire shall terminate above grade to provide access to the wire in a location that is resistant to physical damage, such as with a meter vault or at the *building* wall.

20. Change [Section 605.2.1](#) of the IPC to read:

605.2.1 Lead content of drinking water pipe and fittings. Pipe, pipe fittings, joints, valves, faucets and fixture fittings utilized to supply water for drinking or cooking purposes shall comply with NSF 372.

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21. Change Item 2 of the exception to [Section 605.15.2](#) of the IPC to read:

2. The solvent cement used is yellow or green in color.

22. Change [Section 608.15](#) of the IPC to read:

608.15 Location of backflow preventers. Access for inspection, testing, service, repair and replacement shall be provided to backflow prevention assemblies. Backflow prevention assemblies shall be installed between 12 inches (305 mm) and 60 inches (1525 mm) from grade, floor level or service platform and as specified by the manufacturer's instructions. Where the manufacturer's listed installation height conflicts with this requirement, the manufacturer's listed heights shall apply. Access shall be provided to backflow prevention devices and as specified by the manufacturer's instructions.

23. Add [Section 703.7](#) to the IPC to read:

703.7 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.

24. Delete the exception for [Section 705.10.2](#) of the IPC.

25. Change [Section 1003.3.2](#) of the IPC to read:

1003.3.2 Food waste disposers. Where food waste disposers connect to grease interceptors, a solids interceptor shall separate the discharge before connecting to the grease interceptor. Solids interceptors and grease interceptors shall be sized and rated for the discharge of the food waste disposers. Emulsifiers, chemicals, enzymes and bacteria shall not discharge into the food waste disposer.

26. Add an exception to [Section 1101.2](#) of the IPC to read:

Exception: Rainwater nonpotable water systems shall be permitted in accordance with [Chapter 13](#).

27. Delete the last sentence from [Section 1101.7](#) of the IPC.

28. Delete [Section 1105.2](#) of the IPC.

29. Delete [Section 1106.2.1](#) and change [Section 1106.2](#) of the IPC to read:

1106.2 Vertical conductors and leaders. Vertical conductors and leaders shall be sized for the maximum projected roof area, in accordance with [Tables 1106.2\(1\)](#) and [1106.2\(2\)](#).

TABLE 1106.2(1)
SIZE OF CIRCULAR VERTICAL CONDUCTORS AND LEADERS

DIAMETER OF LEADER (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)											
	Rainfall rate (inches per hour)											
	1	2	3	4	5	6	7	8	9	10	11	12
2	2,280	1,440	960	720	575	480	410	360	320	290	260	240
3	8,800	4,400	2,930	2,200	1,760	1,470	1,260	1,100	960	880	800	730
4	18,400	9,200	6,130	4,600	3,680	3,070	2,630	2,300	2,045	1,840	1,675	1,530
5	34,600	17,300	11,530	8,650	6,920	5,765	4,945	4,325	3,845	3,460	3,145	2,880
6	54,000	27,000	17,995	13,500	10,800	9,000	7,715	6,750	6,000	5,400	4,910	4,500
8	116,000	58,000	38,660	29,000	23,200	19,315	16,570	14,500	12,890	11,600	10,545	9,600

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

- a. Sizes indicated are the diameter of circular piping. This table is applicable to piping of other shapes, provided the cross-sectional shape fully enclosed a circle of the diameter indicated in this table. For rectangular leaders, see [Table 1106.2\(2\)](#). Interpolation is permitted for pipe sizes that fall between those listed in this table.

TABLE 1106.2(2)
SIZE OF RECTANGULAR VERTICAL CONDUCTORS AND LEADERS

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DIMENSIONS OF COMMON LEADER SIZES width x length (inches) ^{a,b}	HORIZONTALLY PROJECTED ROOF AREA (square feet)											
	Rainfall rate (inches per hour)											
	1	2	3	4	5	6	7	8	9	10	11	12
1 3/4 x 2 1/2	3,410	1,700	1,130	850	680	560	480	420	370	340	310	280
2 x 3	5,540	2,770	1,840	1,380	1,100	920	790	690	610	550	500	460
2 3/4 x 4 1/4	12,830	6,410	4,270	3,200	2,560	2,130	1,830	1,600	1,420	1,280	1,160	1,060
3 x 4	13,210	6,600	4,400	3,300	2,640	2,200	1,880	1,650	1,460	1,320	1,200	1,100
3 1/2 x 4	15,900	7,950	5,300	3,970	3,180	2,650	2,270	1,980	1,760	1,590	1,440	1,320
3 1/2 x 5	21,310	10,650	7,100	5,320	4,260	3,550	3,040	2,660	2,360	2,130	1,930	1,770
3 3/4 x 4 3/4	21,960	10,980	7,320	5,490	4,390	3,660	3,130	2,740	2,440	2,190	1,990	1,830
3 3/4 x 5 1/4	25,520	12,760	8,500	6,380	5,100	4,250	3,640	3,190	2,830	2,550	2,320	2,120
3 1/2 x 6	27,790	13,890	9,260	6,940	5,550	4,630	3,970	3,470	3,080	2,770	2,520	2,310
4 x 6	32,980	16,490	10,990	8,240	6,590	5,490	4,710	4,120	3,660	3,290	2,990	2,740
5 1/2 x 5 1/2	44,300	22,150	14,760	11,070	8,860	7,380	6,320	5,530	4,920	4,430	4,020	3,690
7 1/2 x 7 1/2	100,500	50,250	33,500	25,120	20,100	16,750	14,350	12,560	11,160	10,050	9,130	8,370

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

a. Sizes indicated are nominal width x length of the opening for rectangular piping.

b. For shapes not included in this table, [Equation 11-1](#) shall be used to determine the equivalent circular diameter, D_e , of rectangular piping for use in interpolation using the data from [Table 1106.2\(1\)](#).

$$D_e = (\text{width} \times \text{length})^{1/2} \quad (\text{Equation 11-1})$$

where:

D_e = equivalent circular diameter and D_e , width and length are in inches.

30. Delete [Table 1106.2](#) of the IPC and add Tables 1106.2(1) and 1106.2(2) to the IPC to read:

31. Change [Section 1106.3](#) and [Table 1106.3](#) of the IPC to read:

1106.3 Building storm drains and sewers. The size of the *building* storm drain, *building* storm sewer and their horizontal branches having a slope of one-half unit or less vertical in 12 units horizontal (4-percent slope) shall be based on the maximum projected roof area in accordance with Table 1106.3. The slope of horizontal branches shall be not less than one-eighth unit vertical in 12 units horizontal (1-percent slope) unless otherwise approved.

**TABLE 1106.3
SIZE OF HORIZONTAL STORM DRAINAGE PIPING**

SIZE OF HORIZONTAL PIPING (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)					
	Rainfall rate (inches per hour)					
	1	2	3	4	5	6
One-eighth unit vertical in 12 units horizontal (1% slope)						
3	3,288	1,644	1,096	822	657	548
4	7,520	3,760	2,506	1,800	1,504	1,253
5	13,360	6,680	4,453	3,340	2,672	2,253
6	21,400	10,700	7,133	5,350	4,280	3,527
8	46,000	23,000	15,330	11,500	9,200	7,566
10	82,800	41,400	27,600	20,700	16,580	13,600
12	133,200	66,600	44,400	33,300	26,650	21,800
15	218,000	109,000	72,800	59,500	47,600	39,650
One-fourth unit vertical in 12 units horizontal (2% slope)						
3	4,640	2,320	1,546	1,160	928	773
4	10,600	5,300	3,533	2,650	2,120	1,766
5	18,880	9,440	6,293	4,720	3,776	3,146

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SIZE OF HORIZONTAL PIPING (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)					
	Rainfall rate (inches per hour)					
	1	2	3	4	5	6
6	30,200	15,100	10,066	7,550	6,040	5,033
8	65,200	32,600	21,733	16,300	13,040	10,866
10	116,800	58,400	38,950	29,200	23,350	19,450
12	188,000	94,000	62,600	47,000	37,600	31,350
15	336,000	168,000	112,000	84,000	67,250	56,000
One-half unit vertical in 12 units horizontal (4% slope)						
3	6,576	3,288	2,295	1,644	1,310	1,096
4	15,040	7,520	5,010	3,760	3,010	2,500
5	26,720	13,360	8,900	6,680	5,320	4,450
6	42,800	21,400	13,700	10,700	8,580	7,140
8	92,000	46,000	30,650	23,000	18,400	15,320
10	171,600	85,800	55,200	41,400	33,150	27,600
12	266,400	133,200	88,800	66,600	53,200	44,400
15	476,000	238,000	158,800	119,000	95,300	79,250

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

32. Change [Section 1106.6](#) and [Table 1106.6](#) of the IPC to read:

1106.6 Size of roof gutters. The size of semicircular gutters shall be based on the maximum projected roof area in accordance with [Table 1106.6](#).

**TABLE 1106.6
SIZE OF SEMICIRCULAR ROOF GUTTERS**

DIAMETER OF Gutters (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)					
	Rainfall rate (inches per hour)					
	1	2	3	4	5	6
One-sixteenth unit vertical in 12 units horizontal (0.5% slope)						
3	680	340	226	170	136	113
4	1,440	720	480	360	288	240
5	2,500	1,250	834	625	500	416
6	3,840	1,920	1,280	960	768	640
7	5,520	2,760	1,840	1,380	1,100	918
8	7,960	3,980	2,655	1,990	1,590	1,325
10	14,400	7,200	4,800	3,600	2,880	2,400
One-eighth unit vertical in 12 units horizontal (1% slope)						
3	960	480	320	240	192	160
4	2,040	1,020	681	510	408	340
5	3,520	1,760	1,172	880	704	587
6	5,440	2,720	1,815	1,360	1,085	905
7	7,800	3,900	2,600	1,950	1,560	1,300
8	11,200	5,600	3,740	2,800	2,240	1,870
10	20,400	10,200	6,800	5,100	4,080	3,400
One-fourth unit vertical in 12 units horizontal (2% slope)						
3	1,360	680	454	340	272	226
4	2,880	1,440	960	720	576	480
5	5,000	2,500	1,668	1,250	1,000	834
6	7,680	3,840	2,560	1,920	1,536	1,280
7	11,040	5,520	3,860	2,760	2,205	1,840
8	15,920	7,960	5,310	3,980	3,180	2,655
10	28,800	14,400	9,600	7,200	5,750	4,800
One-half unit vertical in 12 units horizontal (4% slope)						

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DIAMETER OF Gutters (inches)	HORIZONTALLY PROJECTED ROOF AREA (square feet)					
	Rainfall rate (inches per hour)					
	1	2	3	4	5	6
3	1,920	960	640	480	384	320
4	4,080	2,040	1,360	1,020	816	680
5	7,080	3,540	2,360	1,770	1,415	1,180
6	11,080	5,540	3,695	2,770	2,220	1,850
7	15,600	7,800	5,200	3,900	3,120	2,600
8	22,400	11,200	7,460	5,600	4,480	3,730
10	40,000	20,000	13,330	10,000	8,000	6,660

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

33. Add [Section 1114](#), Values for Continuous Flow, to the IPC.

34. Add [Section 1114.1](#) to the IPC to read:

1114.1 Equivalent roof area. Where there is a continuous or semicontinuous discharge into the *building* storm drain or *building* storm sewer, such as from a pump, ejector, air conditioning plant, or similar device, each gallon per minute (L/m) of such discharge shall be computed as being equivalent to 96 square feet (9 m²) of roof area, based on a rainfall rate of 1 inch (25.4 mm) per hour.

35. Change [Sections 1301.1](#) through [1301.12](#) and add [Sections 1301.13](#) through [1301.18](#), including subsections, to the IPC to read:

1301.1 Scope. The provisions of [Chapter 13](#) shall govern the materials, design, *construction*, and installation of nonpotable water systems subject to this code. In addition to the applicable provision of this section, reclaimed water shall comply with the requirements of [Section 1304](#).

1301.1.1 Design of nonpotable water systems. All portions of nonpotable water systems subject to this code shall be constructed using the same standards and requirements for the potable water systems or drainage systems as provided for in this code unless otherwise specified in this chapter.

1301.2 Makeup water. Makeup water shall be provided for all nonpotable water supply systems. The makeup water system shall be designed and installed to provide supply of water in the amounts and at the pressures specified in this code. The makeup water supply shall be potable and be protected against backflow in accordance with the applicable requirements of [Section 608](#).

1301.2.1 Makeup water sources. Potable water shall be provided as makeup water for reclaimed water systems. Nonpotable water shall be permitted to serve as makeup water for graywater and rainwater systems.

1301.2.2 Makeup water supply valve. A full-open valve shall be provided on the makeup water supply line.

1301.2.3 Control valve alarm. Makeup water systems shall be fitted with a warning mechanism that alerts the user to a failure of the inlet control valve to close correctly. The alarm shall activate before the water within the storage tank begins to discharge into the overflow system.

1301.3 Sizing. Nonpotable water distribution systems shall be designed and sized for peak demand in accordance with approved engineering practice methods that comply with the applicable provisions of [Chapter 6](#).

1301.4 Signage required. All nonpotable water outlets, other than water closets and urinals, such as hose connections, open-ended pipes, and faucets, shall be identified at the point of use for each outlet with signage that reads as follows: "Nonpotable water is utilized for (insert application name). Caution: nonpotable water. DO NOT DRINK." The words shall be legibly and indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches (12.7 mm) in height and in colors in contrast to the background on which they are applied. The pictograph shown in Figure 1301.4 shall appear on the signage required by this section.

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Figure 1301.4
Pictograph DO NOT DRINK

1301.5 Potable water supply system connections. Where a potable water supply system is connected to a nonpotable water system, the potable water supply shall be protected against backflow in accordance with the applicable provisions of [Section 608](#).

1301.6 Nonpotable water system connections. Where a nonpotable water system is connected and supplies water to another nonpotable water system, the nonpotable water system that supplies water shall be protected against backflow in accordance with the applicable provisions of [Section 608](#).

1301.7 Approved components and materials. Piping, plumbing components, and materials used in the nonpotable water drainage and distribution systems shall be approved for the intended application and compatible with the water and any disinfection or treatment systems used.

1301.8 Insect and vermin control. Nonpotable water systems shall be protected to prevent the entrance of insects and vermin into storage and piping systems. Screen materials shall be compatible with system material and shall not promote corrosion of system components.

1301.9 Freeze protection. Nonpotable water systems shall be protected from freezing in accordance with the applicable provisions of [Chapter 3](#).

1301.10 Nonpotable water storage tanks. Nonpotable water storage tanks shall be approved for the intended application and comply with Sections 1301.10.1 through 1301.10.12.

1301.10.1 Sizing. The holding capacity of storage tanks shall be sized for the intended use.

1301.10.2 Inlets. Storage tank inlets shall be designed to introduce water into the tank and avoid agitating the contents of the storage tank. The water supply to storage tanks shall be controlled by fill valves or other automatic supply valves designed to stop the flow of incoming water before the tank contents reach the overflow pipes.

1301.10.3 Outlets. Outlets shall be located at least 4 inches (102 mm) above the bottom of the storage tank and shall not skim water from the surface.

1301.10.4 Materials and location. Storage tanks shall be constructed of material compatible with treatment systems used to treat water. Above-grade storage vessels shall be constructed using opaque, UV-resistant materials such as tinted plastic, lined metal, concrete, or wood or painted to prevent algae growth. Above-grade storage tanks shall be protected from direct sunlight unless their design specifically incorporates the use of the sunlight heat transfer. Wooden storage tanks shall be provided with a flexible liner. Storage tanks and their manholes shall not be located directly under soil or waste piping or sources of contamination.

1301.10.5 Foundation and supports. Storage tanks shall be supported on a firm base capable of withstanding the storage tank's weight when filled to capacity. Storage tanks shall be supported in accordance with the applicable provisions of the [International Building Code](#).

1301.10.5.1 Ballast. Where the soil can become saturated, an underground storage tank shall be ballasted, or otherwise secured, to prevent the effects of buoyancy. The combined weight of the tank and hold-down ballast shall meet or exceed the buoyancy force of the tank. Where the installation requires a foundation, the foundation shall be flat and shall be designed to support the storage tank weight when full, consistent with the bearing capability of adjacent soil.

1301.10.5.2 Structural support. Where installed below grade, storage tank installations shall be designed to withstand earth and surface structural loads without damage.

1301.10.6 Overflow. The storage tank shall be equipped with an overflow pipe having a diameter not less than that shown in [Table 606.5.4](#). The overflow outlet shall discharge at a point not less than 6 inches (152 mm) above the roof or roof drain; floor or floor drain; or over an open water-supplied fixture. The overflow outlet shall terminate through a check valve. Overflow pipes shall not be directed on walkways. The overflow drain shall not be equipped with a shutoff valve. A minimum of one cleanout shall be provided on

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each overflow pipe in accordance with the applicable provisions of [Section 708](#).

1301.10.7 Access. A minimum of one access opening shall be provided to allow inspection and cleaning of the tank interior. Access openings shall have an approved locking device or other approved method of securing access. Below grade storage tanks, located outside of the *building*, shall be provided with either a manhole not less than 24 inches (610 mm) square or a manhole with an inside diameter not less than 24 inches (610 mm). The design and installation of access openings shall prohibit surface water from entering the tank. Each manhole cover shall have an approved locking device or other approved method of securing access.

Exception: Storage tanks less than 800 gallons (3028 L) in volume installed below grade shall not be required to be equipped with a manhole, but shall have an access opening not less than 8 inches (203 mm) in diameter to allow inspection and cleaning of the tank interior.

1301.10.8 Venting. Storage tanks shall be vented. Vents shall not be connected to sanitary drainage system. Vents shall be at least equal in size to the internal diameter of the drainage inlet pipe or pipes connected to the tank. Where installed at grade, vents shall be protected from contamination by means of a U-bend installed with the opening directed downward. Vent outlets shall extend a minimum of 12 inches (304.8 mm) above grade, or as necessary to prevent surface water from entering the storage tank. Vent openings shall be protected against the entrance of vermin and insects. Vents serving graywater tanks shall terminate in accordance with the applicable provisions of [Sections 903](#) and [1301.8](#).

1301.10.9 Drain. Where drains are provided they shall be located at the lowest point of the storage tank. The tank drain pipe shall discharge as required for overflow pipes and shall not be smaller in size than specified in [Table 606.5.7](#). A minimum of one cleanout shall be provided on each drain pipe in accordance with [Section 708](#).

1301.10.10 Labeling and signage. Each nonpotable water storage tank shall be labeled with its rated capacity and the location of the upstream bypass valve. Underground and otherwise concealed storage tanks shall be labeled at all access points. The label shall read: "CAUTION: NONPOTABLE WATER — DO NOT DRINK." Where an opening is provided that could allow the entry of personnel, the opening shall be marked with the words: "DANGER — CONFINED SPACE." Markings shall be indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material mounted on the tank or shall be indelibly printed on the tank. The letters of the words shall be not less than 0.5 inches (12.7 mm) in height and shall be of a color in contrast with the background on which they are applied.

1301.10.11 Storage tank tests. Storage tanks shall be tested in accordance with the following:

1. Storage tanks shall be filled with water to the overflow line prior to and during inspection. All seams and joints shall be left exposed and the tank shall remain watertight without leakage for a period of 24 hours.
2. After 24 hours, supplemental water shall be introduced for a period of 15 minutes to verify proper drainage of the overflow system and verify that there are no leaks.
3. Following a successful test of the overflow, the water level in the tank shall be reduced to a level that is at 2 inches (50.8 mm) below the makeup water offset point. The tank drain shall be observed for proper operation. The makeup water system shall be observed for proper operation, and successful automatic shutoff of the system at the refill threshold shall be verified. Water shall not be drained from the overflow at any time during the refill test.
4. Air tests shall be permitted in lieu of water testing as recommended by the tank manufacturer or the tank standard.

1301.10.12 Structural strength. Storage tanks shall meet the applicable structural strength requirements of the [International Building Code](#).

1301.11 Trenching requirements for nonpotable water system piping. Underground nonpotable water system piping shall be horizontally separated from the *building* sewer and potable water piping by 5 feet (1524 mm) of undisturbed or compacted earth. Nonpotable water system piping shall not be located in, under, or above sewage systems cesspools, septic tanks, septic tank drainage fields, or seepage pits. Buried nonpotable system piping shall comply with the requirements of this code for the piping material installed.

Exceptions:

1. The required separation distance shall not apply where the bottom of the nonpotable water pipe within 5 feet (1524 mm) of the sewer is equal to or greater than 12 inches (305 mm) above the top of the highest point of the sewer and the pipe materials conform to [Table 702.3](#).
2. The required separation distance shall not apply where the bottom of the potable water service pipe within 5 feet (1524 mm) of the nonpotable water pipe is a minimum of 12 inches (305 mm) above the top of the highest point of the nonpotable water pipe and the pipe materials comply with the requirements of [Table 605.4](#).

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3. Nonpotable water pipe is permitted to be located in the same trench with *building* sewer piping, provided that such sewer piping is constructed of materials that comply with the requirements of [Table 702.2](#).
4. The required separation distance shall not apply where a nonpotable water pipe crosses a sewer pipe, provided that the pipe is sleeved to at least 5 feet (1524 mm) horizontally from the sewer pipe centerline on both sides of such crossing with pipe materials that comply with [Table 702.2](#).
5. The required separation distance shall not apply where a potable water service pipe crosses a nonpotable water pipe provided that the potable water service pipe is sleeved for a distance of at least 5 feet (1524 mm) horizontally from the centerline of the nonpotable pipe on both sides of such crossing with pipe materials that comply with [Table 702.2](#).

1301.12 Outdoor outlet access. Sillcocks, hose bibs, wall hydrants, yard hydrants, and other outdoor outlets that are supplied by nonpotable water shall be located in a locked vault or shall be operable only by means of a removable key.

1301.13 Drainage and vent piping and fittings. Nonpotable drainage and vent pipe and fittings shall comply with the applicable material standards and installation requirements in accordance with the provisions of [Chapter 7](#).

1301.13.1 Labeling and marking. Identification of nonpotable drainage and vent piping shall not be required.

1301.14 Pumping and control system. Mechanical *equipment*, including pumps, valves, and filters, shall be accessible and removable in order to perform repair, maintenance, and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall be designed for the intended application in accordance with the applicable provisions of [Section 604](#).

1301.15 Water-pressure reducing valve or regulator. Where the water pressure supplied by the pumping system exceeds 80 psi (552 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the nonpotable water distribution system piping to 80 psi (552 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with the applicable provisions of [Section 604.8](#).

1301.16 Distribution pipe. Distribution piping utilized in *nonpotable water systems* shall comply with Sections 1301.16.1 through 1301.16.4.

1301.16.1 Materials, joints, and connections. Distribution piping and fittings shall comply with the applicable material standards and installation requirements in accordance with the applicable provisions of [Chapter 6](#).

1301.16.2 Design. Distribution piping shall be designed and sized in accordance with the applicable provisions of [Chapter 6](#).

1301.16.3 Labeling and marking. Distribution piping labeling and marking shall comply with [Section 608.9](#).

1301.16.4 Backflow prevention. Backflow preventers shall be installed in accordance with the applicable provisions of [Section 608](#).

1301.17 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 1301.17.1 through 1301.17.5.

1301.17.1 Drainage and vent pipe test. Drain, waste, and vent piping used for graywater and *rainwater nonpotable water systems* shall be tested in accordance with the applicable provisions of [Section 312](#).

1301.17.2 Storage tank test. Storage tanks shall be tested in accordance with [Section 1301.10.11](#).

1301.17.3 Water supply system test. Nonpotable distribution piping shall be tested in accordance with [Section 312.5](#).

1301.17.4 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers and backwater valves shall be conducted in accordance with [Section 312.10](#).

1301.17.5 Inspection of vermin and insect protection. Inlets and vent terminations shall be visually inspected to verify that each termination is installed in accordance with [Section 1301.10.8](#).

1301.18 Operation and maintenance manuals. Operations and maintenance manuals for nonpotable water systems shall be provided as prescribed by the system component manufacturers and supplied to the owner to be kept in a readily accessible location.

36. Change the title of [Section 1302](#) of the IPC to "Graywater Nonpotable Water Systems."

37. Change [Sections 1302.1](#) through [1302.6](#), including subsections, of the IPC to read as follows:

1302.1 Graywater nonpotable water systems. This code is applicable to the plumbing fixtures, piping or piping systems, storage tanks, drains, appurtenances, and appliances that are part of the distribution system for graywater within *buildings* and to storage tanks and associated piping that are part of the distribution system for graywater outside of *buildings*. This code does not regulate *equipment* used for, or the methods of, processing,

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filtering, or treating graywater, that may be regulated by the Virginia Department of Health or the Virginia Department of Environmental Quality.

1302.1.1 Separate systems. Graywater nonpotable water systems, unless approved otherwise under the permit from the Virginia Department of Health, shall be separate from the potable water system of a *building* with no cross connections between the two systems except as permitted by the Virginia Department of Health.

1302.2 Water quality. Each application of graywater reuse shall meet the minimum water quality requirements set forth in Sections 1302.2.1 through 1302.2.4 unless otherwise superseded by other state agencies.

1302.2.1 Disinfection. Where the intended use or reuse application for nonpotable water requires disinfection or other treatment or both, it shall be disinfected as needed to ensure that the required water quality is delivered at the point of use or reuse.

1302.2.2 Residual disinfectants. Where chlorine is used for disinfection, the nonpotable water shall contain not more than 4 parts per million (4 mg/L) of free chlorine, combined chlorine, or total chlorine. Where ozone is used for disinfection, the nonpotable water shall not exceed 0.1 parts per million (by volume) of ozone at the point of use.

1302.2.3 Filtration. Water collected for reuse shall be filtered as required for the intended end use. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gauge or other approved method to indicate when a filter requires servicing or replacement. Shutoff valves installed immediately upstream and downstream of the filter shall be included to allow for isolation during maintenance.

1302.2.4 Filtration required. Graywater utilized for water closet and urinal flushing applications shall be filtered by a 100 micron or finer filter.

1302.3 Storage tanks. Storage tanks utilized in graywater nonpotable water systems shall comply with [Section 1301.10](#).

1302.4 Retention time limits. Untreated graywater shall be retained in storage tanks for a maximum of 24 hours.

1302.5 Tank location. Storage tanks shall be located with a minimum horizontal distance between various elements as indicated in [Table 1302.5.1](#).

**TABLE 1302.5.1
LOCATION OF NONPOTABLE GRAY WATER REUSE STORAGE TANKS**

ELEMENT	MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (feet)
Lot line adjoining private lots	5
Sewage systems	5
Septic tanks	5
Water wells	50
Streams and lakes	50
Water service	5
Public water main	10

For SI: 1 foot = 304.8 mm.

1302.6 Valves. Valves shall be supplied on graywater nonpotable water drainage systems in accordance with Sections 1302.6.1 and 1302.6.2.

1302.6.1 Bypass valve. One three-way diverter valve certified to NSF 50 or other approved device shall be installed on collection piping upstream of each storage tank, or drainfield, as applicable, to divert untreated graywater to the sanitary sewer to allow servicing and inspection of the system. Bypass valves shall be installed downstream of fixture traps and vent connections. Bypass valves shall be labeled to indicate the direction of flow, connection, and storage tank or drainfield connection. Bypass valves shall be provided with access for operation and maintenance. Two shutoff valves shall not be installed to serve as a bypass valve.

1302.6.2 Backwater valve. Backwater valves shall be installed on each overflow and tank drain pipe to prevent unwanted water from draining back into the storage tank. If the overflow and drain piping arrangement is installed to physically not allow water to drain back into the tank, such as in the form of an air gap, backwater valves shall not be required. Backwater valves shall be constructed and installed in accordance with [Section 715](#).

38. Delete [Sections 1302.7](#) through [1302.13.4](#), including subsections, of the IPC.

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39. Change the title of [Section 1303](#) of the IPC. to “Rainwater Nonpotable Water Systems.”
40. Change [Sections 1303.1](#) through [1303.10](#), including subsections, of the IPC. to read as follows:
- 1303.1 General.** The provisions of this section shall govern the design, *construction*, installation, alteration, and repair of rainwater nonpotable water systems for the collection, storage, treatment, and distribution of rainwater for nonpotable applications. The provisions of CSA B805/ICC 805 shall be permitted as an alternative to the provisions contained in this section for the design, *construction*, installation, alteration, and repair of rainwater nonpotable water systems for the collection, storage, treatment, and distribution of rainwater for nonpotable applications. Roof runoff or stormwater runoff collection surfaces shall be limited to roofing materials, public pedestrian accessible roofs, and subsurface collection identified in CSA B805/ICC 805 Table 7.1. Stormwater runoff shall not be collected from any other surfaces.
- 1303.2 Water quality.** Each application of rainwater reuse shall meet the minimum water quality requirements set forth in Sections 1303.2.1 through 1303.2.4 unless otherwise superseded by other state agencies.
- 1303.2.1 Disinfection.** Where the intended use or reuse application for nonpotable water requires disinfection or other treatment, or both, it shall be disinfected as needed to ensure that the required water quality is delivered at the point of use or reuse.
- 1303.2.2 Residual disinfectants.** Where chlorine is used for disinfection, the nonpotable water shall contain not more than 4 parts per million (4 mg/L) of free chlorine, combined chlorine, or total chlorine. Where ozone is used for disinfection, the nonpotable water shall not exceed 0.1 parts per million (by volume) of ozone at the point of use.
- 1303.2.3 Filtration.** Water collected for reuse shall be filtered as required for the intended end use. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gauge or other approved method to indicate when a filter requires servicing or replacement. Shutoff valves installed immediately upstream and downstream of the filter shall be included to allow for isolation during maintenance.
- 1303.2.4 Filtration required.** Rainwater utilized for water closet and urinal flushing applications shall be filtered by a 100 micron or finer filter.
- 1303.3 Collection surface.** Rainwater shall be collected only from above-ground impervious roofing surfaces constructed from approved materials. Overflow or discharge piping from appliances or *equipment*, or both, including but not limited to evaporative coolers, water heaters, and solar water heaters shall not discharge onto rainwater collection surfaces.
- 1303.4 Collection surface diversion.** At a minimum, the first 0.04 inches (1.016 mm) of each rain event of 25 gallons (94.6 L) per 1,000 square feet (92.9 m²) shall be diverted from the storage tank by automatic means and not require the operation of manually operated valves or devices. Diverted water shall not drain onto other collection surfaces that are discharging to the rainwater system or to the sanitary sewer. Such water shall be diverted from the storage tank and discharged in an approved location.
- 1303.5 Pre-tank filtration.** Downspouts, conductors, and leaders shall be connected to a pre-tank filtration device. The filtration device shall not permit materials larger than 0.015 inches (0.4 mm).
- 1303.6 Roof gutters and downspouts.** Gutters and downspouts shall be constructed of materials that are compatible with the collection surface and the rainwater quality for the desired end use. Joints shall be made watertight.
- 1303.6.1 Slope.** Roof gutters, leaders, and rainwater collection piping shall slope continuously toward collection inlets. Gutters and downspouts shall have a slope of not less than 1 unit in 96 units along their entire length and shall not permit the collection or pooling of water at any point.
- Exception:** Siphonic roof drainage systems installed in accordance with [Chapter 11](#) shall not be required to have slope.
- 1303.6.2 Size.** Gutters and downspouts shall be installed and sized in accordance with [Section 1106.6](#) and local rainfall rates.
- 1303.6.3 Cleanouts.** Cleanouts or other approved openings shall be provided to permit access to all filters, flushes, pipes, and downspouts.
- 1303.7 Storage tanks.** Storage tanks utilized in rainwater nonpotable water systems shall comply with [Section 1301.10](#).
- 1303.8 Location.** Storage tanks shall be located with a minimum horizontal distance between various elements as indicated in [Table 1303.8.1](#).

TABLE 1303.8.1
LOCATION OF RAINWATER STORAGE TANKS

ELEMENT	MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (feet)
Lot line adjoining private lots	5
Sewage systems	5
Septic systems	5

For SI: 1 foot = 304.8 mm.

1303.9 Valves. Valves shall be installed in collection and conveyance drainage piping of rainwater nonpotable water systems in accordance with [Sections 1303.9.1](#) and [1303.9.2](#).

1303.9.1 Influent diversion. A means shall be provided to divert storage tank influent to allow maintenance and repair of the storage tank system.

1303.9.2 Backwater valve. Backwater valves shall be installed on each overflow and tank drain pipe to prevent unwanted water from draining back into the storage tank. If the overflow and drain piping arrangement is installed to physically not allow water to drain back into the tank, such as in the form of an air gap, backwater valves shall not be required. Backwater valves shall be constructed and installed in accordance with [Section 714](#).

1303.10 Tests and inspections. Tests and inspections shall be performed in accordance with [Sections 1303.10.1](#) through [1303.10.2](#).

1303.10.1 Roof gutter inspection and test. Roof gutters shall be inspected to verify that the installation and slope is in accordance with [Section 1303.6.1](#). Gutters shall be tested by pouring a minimum of 1 gallon (3.785 L) of water into the end of the gutter opposite the collection point. The gutter being tested shall not leak and shall not retain standing water.

1303.10.2 Collection surface diversion test. A collection surface diversion test shall be performed by introducing water into the gutters or onto the collection surface area. Diversion of the first quantity of water in accordance with the requirements of [Section 1303.4](#) shall be verified.

41. Delete [Sections 1303.11](#) through [1303.16.4](#), including subsections, of the IPC.

42. Change [Sections 1304.1](#) and [1304.2](#) of the IPC to read as follows:

1304.1 General. Reclaimed water, water reclamation systems, reclaimed water distribution systems, and allowable nonpotable reuses of reclaimed water are as defined or specified in and governed by the Virginia Water Reclamation and Reuse Regulation (9VAC25-740). Permits from the Virginia State Water Control Board are required for such systems and reuses. The provisions of Section 1304 shall govern the design, *construction*, installation, alterations, and repair of plumbing fixtures, piping or piping systems, storage tanks, drains, appurtenances, and appliances that are part of the distribution system for reclaimed water within *buildings* and to storage tanks for reclaimed water as defined in the Virginia Water Reclamation and Reuse Regulation (9VAC25-740) and associated piping outside of *buildings* that deliver reclaimed water into *buildings*. Where conflicts occur between this code and the Virginia Water Reclamation and Reuse Regulation (9VAC25-740), the provisions of the Virginia Water Reclamation and Reuse Regulation (9VAC25-740) shall apply unless determined otherwise by the Virginia Department of Environmental Quality and *DHCD* through a memorandum of agreement.

1304.2 Design of reclaimed water systems. The design of reclaimed water systems shall conform to applicable requirements of [Section 1301](#).

Exception: The design of reclaimed water systems shall conform to applicable requirements of the Virginia Water Reclamation and Reuse Regulation (9VAC25-740) for the following:

1. Identification, labeling, and posting of signage for reclaimed water systems in lieu of signage requirements described in [Section 1301.4](#).
2. Sizing of system storage as defined in the Virginia Water Reclamation and Reuse Regulation (9VAC25-740), in addition to storage sizing requirements described in [Section 1301.10.1](#).
3. Signage and labeling for reclaimed water storage in addition to labeling and signage requirements described in [Section 1301.10.10](#).
4. Minimum separation distances and configurations for in-ground reclaimed water distribution piping in lieu of trenching requirements for nonpotable water systems described in [Section 1301.11](#).

43. Delete [Sections 1304.3](#) and [1304.4](#), including subsections, of the IPC.

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CHAPTER 29 PLUMBING SYSTEMS

SECTION 2902 MINIMUM PLUMBING FACILITIES

2902.1 Minimum number of fixtures.

Plumbing fixtures shall be provided in the minimum number as shown in Table 403.1 of the *Virginia Plumbing Code (VPC)* based on the actual use of the building or space. Uses not shown in Table 403.1 of the VPC shall be considered individually by the code official. The number of occupants shall be determined by this code.

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CHAPTER 29 PLUMBING SYSTEMS

SECTION 2903 INSTALLATION OF FIXTURES DELETED

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