

Chapter 6 was amended by [Local Law 77 of 2023](#). This law has an effective date of June 10, 2023.

CHAPTER 6 WATER SUPPLY AND DISTRIBUTION

SECTION PC 601 GENERAL

601.1 Scope. This chapter shall govern the materials, design and installation of water supply systems, both hot and cold, for utilization in connection with human occupancy and habitation and shall govern the installation of individual water supply systems.

601.2 Solar energy utilization. Solar energy systems used for heating potable water or using an independent medium for heating potable water shall comply with the applicable requirements of this code. The use of solar energy shall not compromise the requirements for cross connection or protection of the potable water supply system required by this code.

601.3 Existing piping used for grounding. Existing metallic water service piping used for electrical grounding shall not be replaced with nonmetallic pipe or tubing until other approved means of grounding is provided.

601.4 Tests. The potable water distribution system shall be tested in accordance with Section 312.5.

601.5 Rehabilitation of piping systems. Cured-in-place pipe (CIPP) and epoxy spray pipe lining systems shall not be used.

601.6 Water supply. The water distribution system shall be connected to a public water main if available. Where a public water main is not available, an individual potable water supply shall be provided. Any such private system shall be provided subject to the approval of the commissioner and of any other agency or agencies having jurisdiction.

601.6.1 Extensions of public water mains. Extensions of public water mains shall be made in accordance with the regulations of the Department of Environmental Protection.

601.6.2 Availability of public water main to other than one- or two-family dwellings. A public water main shall be deemed available to a building, other than a one- or two-family dwelling, if a property line of such building is within 500 feet (152 m), measured along a street, alley, or right-of-way, of the public water supply system. The extension and connection shall be made in accordance with the applicable standards of the Department of Environmental Protection.

Exception: Where a substantial improvement of a building is contemplated on a tract of land, the public water supply system may be declared available thereto by the agencies having jurisdiction thereon even though the specified distance is exceeded.

601.6.3 Availability of public water main to one- or two-family dwellings. A public water main shall be deemed available to a one- and two-family dwelling if a property line of such dwelling is within 100 feet (30 480 mm), measured along a street, alley, or right-of-way, of the public water supply system. The extension and connection shall be made in accordance with the applicable standards of the Department of Environmental Protection.

Exception: Where two or more one- or two-family dwellings are to be constructed on a tract of land, the public water supply system may be declared available thereto by the agencies having jurisdiction thereon even though the specified distance is exceeded.

601.7 Destruction of abandoned corporation stops and wet connections. All driven corporation stops, when abandoned, shall be removed and replaced by plugs. All wet connections or screw corporation stops, when abandoned, shall be destroyed in place, and all exposed portions of the service pipe shall be cut and removed. Where a corporation stop or wet connection is destroyed and the connecting service pipe is one that is equipped with a curb valve and box, the curb box shall be removed in accordance with the rules of the Department of Environmental Protection. The expense in connection with the abandonment or destruction of a corporation stop or wet connection shall be chargeable to the owner of the property into which the service pipe entered.

**SECTION PC 602
WATER REQUIRED**

602.1 General. Structures 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.

602.2 Potable water required. Only potable water shall be supplied to plumbing fixtures that provide water for drinking, bathing or culinary purposes, or for the processing of food, medical or pharmaceutical products. Unless otherwise provided in this code, potable water shall be supplied to all plumbing fixtures.

602.3 Individual water supply. Where a potable public water supply is not available, individual sources of potable water supply shall be utilized. No well or individual water supply shall be installed for any purpose without approval of the commissioner, the Department of Health and Mental Hygiene and the Department of Environmental Protection.

602.3.1 Sources. Dependent on geological and soil conditions and the amount of rainfall, individual water supplies are of the following types: drilled well, driven well, dug well, bored well, spring, stream or cistern. Surface bodies of water and land cisterns shall not be sources of individual water supply unless properly treated by approved means to prevent contamination.

602.3.2 Minimum quantity. The combined capacity of the source and storage in an individual water supply system shall supply the fixtures with water at rates and pressures as required by this chapter.

602.3.3 Water quality. Water from an individual water supply shall be approved as potable by the authority having jurisdiction prior to connection to the plumbing system.

602.3.4 Disinfection of system. After construction or major repair, the individual water supply system shall be purged of deleterious matter and disinfected in accordance with Section 610.

602.3.5 Pumps. Pumps shall be rated for the transport of potable water. Pumps in an individual water supply system shall be constructed and installed so as to prevent contamination from entering a potable water supply through the pump units. Pumps shall be sealed to the well casing or covered with a water-tight seal. Pumps shall be designed to maintain a prime and installed such that ready access is provided to the pump parts of the entire assembly for repairs.

602.3.5.1 Pump enclosure. The pump room or enclosure around a well pump shall be drained and protected from freezing by heating or other approved means. Where pumps are installed in basements, such pumps shall be mounted on a block or shelf not less than 18 inches (457 mm) above the basement floor. Well pits shall be prohibited.

**SECTION PC 603
WATER SERVICE**

603.1 Size of water service pipe. The water service pipe shall be sized to supply water to the structure in the quantities and at the pressures required in this code. The minimum diameter of water service pipe shall be 1 inch (25 mm).

603.2 Separation from water service. Underground water service pipe and the building sewer or the building drain shall be separated by not less than 5 feet (1524 mm) of undisturbed or compacted earth.

Exceptions:

1. The required separation distance shall not apply where the bottom of the water service pipe within 5 feet (1524 mm) of the sewer or drain is a minimum of 12 inches (305 mm) above the top of the highest point of the sewer or drain and the pipe materials conform to Section 703.1.
2. Water service pipe is permitted to be located in the same trench with a building drain, provided such drain is constructed of materials listed in Table 702.2.
3. The required separation distance shall not apply where a water service pipe crosses a sewer or drain pipe provided the water service pipe is sleeved to at least 5 feet (1524 mm) horizontally from the sewer or drain

pipe centerline, on both sides of such crossing with pipe materials listed in Table 605.3, Table 702.2 or Table 702.3.

603.2.1 Water service near sources of pollution. Potable water service pipes shall not be located in, under or above cesspools, septic tanks, septic tank drainage fields or seepage pits (see Section 605.1 for soil and groundwater conditions) and shall be separated by a minimum of 10 feet (3048 mm) and shall meet all Department of Environmental Protection requirements.

603.3 Installation of service pipe. Each new service pipe shall be installed in accordance with the rules of the Department of Environmental Protection.

603.4 Location of meters. The service pipe between the house control valve and the meter shall be kept exposed. All meter locations shall be subject to approval by the Department of Environmental Protection.

603.5 Connections to city water mains. Connections to city water mains shall comply with the rules of the Department of Environmental Protection.

603.5.1 Separate supply. A separate tap and service shall be installed for each building in accordance with the rules of the Department of Environmental Protection.

603.5.2 Connections. Corporation stops, wet connections, or other connections to a street main shall be made only by employees of the Department of Environmental Protection. The cost of the installation shall be borne by the owner of the property for which the connection is made.

SECTION PC 604 DESIGN OF BUILDING WATER DISTRIBUTION SYSTEM

604.1 General. The design of the water distribution system shall conform to accepted engineering practice.

604.2 System interconnection. At the points of interconnection between the hot and cold water supply piping systems and the individual fixtures, appliances or devices, provisions shall be made to prevent flow between such piping systems.

604.3 Water distribution system design criteria. The water distribution system shall be designed, and pipe sizes shall be selected such that under conditions of peak demand, the capacities at the fixture supply pipe outlets shall be not less than shown in Table 604.3. The minimum flow rate and flow pressure provided to fixtures and appliances not listed in Table 604.3 shall be in accordance with the manufacturer's instructions.

**TABLE 604.3
WATER DISTRIBUTION SYSTEM DESIGN CRITERIA REQUIRED
CAPACITY AT FIXTURE SUPPLY PIPE OUTLETS**

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE ^a (gpm)	FLOW PRESSURE ^b (psi)
Bathtub, no shower	4	20
Bathtub with anti-scald protection	4	20
Bidet	1.5	20
Combination fixture	4	8
Dishwasher, residential	2.75	8
Drinking fountain	0.75	8

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Laundry tray	4	8
Lavatory, private	1.5	8
Lavatory, private, mixing valve	1.5	8
Lavatory, public	1.5	8
Shower	2	8
Shower, balanced-pressure, thermostatic or combination balanced-pressure/ thermostatic mixing valve	2 ^b	20
Sillcock, hose bibb	5	8
Sink, residential	2.2	8
Sink, service	3	8
Urinal, valve	18	20
Water closet, blow out, flushometer valve	25	25
Water closet, flushometer tank	3	20
Water closet, siphonic, flushometer valve	25	25
Water closet, tank, close coupled	3	15
Water closet, tank, one piece	3	20

For SI: 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 3.785 L/m.

a. For additional requirements for flow rates and quantities, see Section 604.4.

b. Where the shower mixing valve manufacturer indicates a lower flow rating for the mixing valve, the lower value shall be applied.

604.4 Maximum flow and water consumption. The maximum water consumption flow rates and quantities for all plumbing fixtures and fixture fittings shall be in accordance with Table 604.4.

Exceptions:

1. Blowout design water closets having a water consumption not greater than 3½ gallons (13 L) per flushing cycle.
2. Vegetable sprays.
3. Clinical sinks having a water consumption not greater than 4½ gallons (17 L) per flushing cycle.
4. Service sinks.
5. Emergency showers.

TABLE 604.4
MAXIMUM FLOW RATES AND CONSUMPTION FOR
PLUMBING FIXTURES AND FIXTURE FITTINGS

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY ^b
Lavatory, private	1.5 gpm at 60 psi
Lavatory, public (metering)	0.25 gallon per metering cycle
Lavatory, public (other than metering)	0.5 gpm at 60 psi
Shower head ^a	2.0 gpm at 80 psi ^d
Sink faucet	2.2 gpm at 60 psi
Urinal	0.5 gallon per flushing cycle
Water closet	1.28 gallons per flushing cycle or equivalent dual flush ^c

For SI: 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

- a. A hand-held shower spray or body spray is a shower head.
- b. Consumption tolerances shall be determined from referenced standards.
- c. A dual flush water closet where one third of the sum of the high flush volume plus twice the low flush volume is less than or equal to 1.28 gallons per flush.
- d. The total flow of all shower heads in each shower compartment or bathing unit, in residential occupancies, shall be limited to 3 gpm operating simultaneously.

604.4.1 WaterSense program label required. Showerheads, private lavatory faucets, water closets and for urinals, the urinal flush valve or fixture/valve combination, shall meet the specifications required for the WaterSense program label and shall bear such label, or shall be approved in accordance with this code.

604.5 Size of fixture supply. The minimum size of a fixture supply pipe shall be as shown in Table 604.5. The fixture supply pipe shall terminate not more than 24 inches (610 mm) from the point of connection to the fixture. Each fixture supply shall have a stop valve. A reduced-size flexible water connector installed between the supply pipe and the fixture shall be of an approved type. The connector shall be used singularly. Coupling of two or more connectors shall not be allowed. The supply pipe shall extend to the floor or wall adjacent to the fixture. The minimum size of individual distribution lines utilized in parallel water distribution systems shall be as shown in Table 604.5.

TABLE 604.5
MINIMUM SIZES OF FIXTURE WATER SUPPLY PIPES

FIXTURE	MINIMUM PIPE SIZE (inch)
Bathtubs	1/2
Bidet	3/8
Combination sink and tray	1/2
Dishwasher, domestic	1/2
Drinking fountain	3/8
Hose bibbs	1/2

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Kitchen sink	1/2
Laundry, 1, 2 or 3 compartments	1/2
Lavatory	3/8
Shower, single head	1/2
Sinks, flushing rim	3/4
Sinks, service	1/2
Urinal, flush tank	1/2
Urinal, flushometer valve	3/4
Wall hydrant	1/2
Water closet, flush tank	3/8
Water closet, flushometer tank	3/8
Water closet, flushometer valve	1
Water closet, one piece	1/2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa.

604.6 Variable street pressures. Where street water main pressures fluctuate, the building water distribution system shall be designed for the minimum pressure available.

604.7 Inadequate water pressure. Wherever water pressure from the street main or other source of supply is insufficient to provide flow pressures at fixture outlets as required under Table 604.3, a water pressure booster system conforming to Section 606.5 shall be installed on the building water supply system.

604.8 Water pressure-reducing valve or regulator. Where water pressure within a building exceeds 85 psi (586 kPa) static, an approved valve conforming to ASSE 1003 or CSA B356 with strainer shall be installed to reduce the pressure in the building water distribution piping to not greater than 85 psi (586 kPa) static.

Exception: Service lines to sill cocks and outside hydrants, and main supply risers where pressure from the mains is reduced to 85 psi (586 kPa) or less at individual fixtures.

604.8.1 Valve design. The pressure-reducing valve shall be designed to remain open to permit uninterrupted water flow in case of valve failure.

604.8.2 Repair and removal. Water pressure-reducing valves, regulators and strainers shall be so constructed and installed as to permit repair or removal of parts without breaking a pipeline or removing the valve and strainer from the pipeline.

604.9 Water hammer. The flow velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. A water-hammer arrestor shall be installed where quick-closing valves are utilized and when otherwise required by this code. Water-hammer arrestors shall be installed in accordance with the manufacturer's instructions. Water-hammer arrestors shall conform to ASSE 1010.

604.10 Reserved.

604.11 Individual pressure balancing in-line valves for individual fixture fittings. Where individual pressure balancing in-line valves for individual fixture fittings are installed, such valves shall comply with ASSE 1066. Such

valves shall be installed in an accessible location and shall not be utilized alone as a substitute for the balanced pressure, thermostatic or combination shower valves required in Section 424.3.

SECTION PC 605 MATERIALS, JOINTS AND CONNECTIONS

605.1 Soil and ground water. The installation of a water service or water distribution pipe shall be prohibited in soil and groundwater contaminated with solvents, fuels, organic compounds or other detrimental materials causing permeation, corrosion, degradation or structural failure of the piping material. Where detrimental conditions are suspected, a chemical analysis of the soil and ground water conditions shall be required to ascertain the acceptability of the water service or water distribution piping material for the specific installation. Where detrimental conditions exist, approved alternative materials or routing shall be required.

605.2 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 and shall have a weighted average lead content of 0.25 percent or less.

605.3 Water service pipe. The water service pipe shall conform to one of the standards listed in the rules of the Department of Environmental Protection.

605.4 Water distribution pipe. Water distribution pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table 605.4.

**TABLE 605.4
WATER DISTRIBUTION PIPE**

MATERIAL	STANDARD
Brass pipe	ASTM B 43
Copper or copper-alloy pipe	ASTM B 42; ASTM B 302
Copper or copper-alloy tubing (Type K, L)	ASTM B 75; ASTM B 88; ASTM B 251; ASTM B 447
Ductile iron pipe	AWWA C151/A21.51; AWWA C115/A21.15
Stainless steel pipe (Type 304/304L)	ASTM A 312; ASTM A 778
Stainless steel pipe (Type 316/316L)	ASTM A 312; ASTM A 778

605.4.1 Underground water distribution pipe. Underground water distribution pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table 605.4.1.

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TABLE 605.4.1
UNDERGROUND WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Brass pipe	ASTM B 43
Copper or copper-alloy pipe	ASTM B 42; ASTM B 302
Copper or copper-alloy tubing (Type K)	ASTM B 75; ASTM B 88; ASTM B 251; ASTM B 447
Ductile iron water pipe	AWWA C151/A21.51; AWWA C115/A21.15
Stainless steel pipe (Type 304/304L)	ASTM A 312; ASTM A 778
Stainless steel pipe (Type 316/316L)	ASTM A 312; ASTM A 778

605.5 Fittings. Pipe fittings shall be approved for installation with the piping material installed and shall comply with the applicable standards listed in Table 605.5. Pipe fittings utilized in water supply systems shall also comply with NSF 61.

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Brass	ASTM B 62
Cast iron	ASME B16.4
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F 1476; ASTM F 1548
Gray iron and ductile iron	ASTM F 1476; ASTM F 1548; AWWA C110/A21.10; AWWA C153/A21.53
Stainless steel (Type 304/304L)	ASTM A 312; ASTM A 778; ASTM F 1476; ASTM F 1548
Stainless steel (Type 316/316L)	ASTM A 312; ASTM A 778; ASTM A403/A403M; ASTM F 1476; ASTM F 1548

605.5.1 Mechanically formed tee fittings. Mechanically extracted outlets shall have a height not less than three times the thickness of the branch tube wall.

605.5.1.1 Full flow assurance. Branch tubes shall not restrict the flow in the run tube. A dimple serving as a depth stop shall be formed in the branch tube to ensure that penetration into the collar is of the correct depth. For inspection purposes, a second dimple shall be placed $\frac{1}{4}$ inch (6.4 mm) above the first dimple. Dimples shall be aligned with the tube run.

605.5.1.2 Brazed joints. Mechanically formed tee fittings shall be brazed in accordance with Section 605.14.1.

605.6 Flexible water connectors. Flexible water connectors exposed to continuous pressure shall conform to ASME A112.18.6/CSA B125.6, shall not exceed 24 inches (610 mm), shall be used in exposed locations only and shall be used singularly; that is, two connectors cannot be joined.

605.7 Valves. Valves shall be compatible with the type of piping material installed in the system. Valves shall conform to one of the standards listed in Table 605.7 or shall be approved. Valves intended to supply drinking water shall meet the requirements of NSF 61.

**TABLE 605.7
VALVES**

MATERIAL	STANDARD
Copper or copper-alloy	ASME A112.4.14; ASME A112.18.1/CSA B125.1; ASME B16.34; CSA B125.3; MSS SP-67; MSS SP-80; MSS SP-110
Gray iron and ductile iron	AWWA C500; AWWA C504; AWWA C507; MSS SP-67; MSS SP-70; MSS SP-71; MSS SP-72; MSS SP-78
Stainless steel (Type 304/304L and 316/316L)	MSS SP-67; MSS SP-110

605.8 Manufactured pipe nipples. Manufactured pipe nipples shall conform to one of the standards listed in Table 605.8.

**TABLE 605.8
MANUFACTURED PIPE NIPPLES**

MATERIAL	STANDARD
Brass-, copper-, chromium-plated	ASTM B 687
Stainless steel	ASTM A 403/A 403M

605.9 Prohibited joints and connections. The following types of joints and connections shall be prohibited:

1. Cement or concrete joints.
2. Joints made with fittings not approved for the specific installation.
3. Saddle-type fittings.
4. Removable press-connect fittings.
5. Removable push-fit fittings.

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6. Nail-type fittings.

7. Compression type fittings for other than final fixture connections.

605.10 Reserved.

605.11 Brass. Joints between brass pipe and fittings shall comply with Sections 605.11.1 through 605.11.3.

605.11.1 Brazed joints. All joint surfaces shall be cleaned. An approved flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.

605.11.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

605.11.3 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

605.12 Gray iron and ductile iron joints. Joints for gray and ductile iron pipe and fittings shall comply with AWWA C111 and shall be installed in accordance with the manufacturer's instructions.

605.13 Copper pipe. Joints between copper or copper-alloy pipe and fittings shall comply with Sections 605.13.1 through 605.13.4.

605.13.1 Brazed joints. All joint surfaces shall be cleaned. An approved flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.

605.13.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

605.13.3 Reserved.

605.13.4 Threaded joints. Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

605.14 Copper tubing. Joints between copper or copper-alloy tubing and fittings shall comply with Sections 605.14.1 through 605.14.6.

605.14.1 Brazed joints. Joint surfaces shall be cleaned. An approved flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.

605.14.2 Flared joints. Flared joints for water pipe shall be made by a tool designed for that operation.

605.14.3 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall comply with ASTM F 1476, shall be made with an approved elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be exposed or concealed.

605.14.4 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions and shall be tested, designed and evaluated in accordance with IAPMO PS 117 and ASSE 1061.

605.14.5 Press-connect joints. Press-connect joints shall conform to one of the standards listed in Table 605.5, and shall be installed in accordance with the manufacturer's instructions. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. The tube shall be fully inserted into the pressconnect fitting. Press-connect joints shall be pressed with a tool certified by the manufacturer.

605.14.6 Solder joints. Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with lead-free solders and fluxes.

605.15 Reserved.

605.16 Reserved.

605.17 Reserved.

605.18 Reserved.

605.19 Reserved.

605.20 Reserved.

605.21 Reserved.

605.22 Reserved.

605.23 Stainless steel. Joints between stainless steel pipe and fittings shall comply with Sections 605.23.1 through 605.23.3.

605.23.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

605.23.2 Welded joints. All joints shall be welded in accordance with ASME B31.9, inspected and tested in accordance with Section 312.

605.23.3 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall comply with ASTM F 1476, shall be made with an approved elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be exposed or concealed.

605.24 Joints between different materials. Joints between different piping materials shall be made with a mechanical joint of the compression or mechanical-sealing type, or as permitted in Sections 605.24.1 and 605.24.3. Joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

605.24.1 Copper or copper-alloy tubing to galvanized steel pipe. Joints between copper or copper-alloy tubing and galvanized steel pipe shall be made with a brass fitting or dielectric fitting or a dielectric union conforming to ASSE 1079. The copper tubing shall be soldered to the fitting in an approved manner, and the fitting shall be screwed to the threaded pipe.

605.24.2 Reserved.

605.24.3 Stainless steel. Joints between stainless steel and different piping materials shall be made with a mechanical joint of the compression or mechanical sealing type or a dielectric fitting or a dielectric union conforming to ASSE 1079.

605.25 Reserved.

SECTION PC 606 INSTALLATION OF THE BUILDING WATER DISTRIBUTION SYSTEM

606.1 Location of shutoff valves. Shutoff valves shall be installed in the following locations:

1. On the water distribution supply pipe at the entrance into the structure.
2. On the supply and discharge side of every water sub-meter.
3. On the base of every water riser pipe in occupancies other than multiple-family residential occupancies that are two stories or less in height and in one- and two-family residential occupancies.
4. On the top of every water down-feed pipe and on the base of every up-feed pipe in occupancies other than one- and two-family residential occupancies.
5. On the entrance to every water supply pipe to a dwelling unit, except where supplying fixtures equipped with individual stops.
6. On the water supply pipe to and from a gravity or pressurized water tank.
7. On the water supply pipe to every water heater.
8. On the water supply to each sillcock.

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9. On the water supply pipe to each appliance or mechanical equipment.

606.2 Reserved.

606.3 Access to valves. Access shall be provided to all full-open valves and shutoff valves.

606.4 Valve identification. Service and hose bibb valves shall be identified. All other valves installed in locations that are not adjacent to the fixture or appliance shall be identified, indicating the fixture or appliance served.

606.5 Water pressure booster and gravity house tank systems. Water pressure booster or gravity house tank systems shall be provided as required by Sections 606.5.1 through 606.5.10.

606.5.1 Water pressure booster or gravity house tank systems required. Where the water pressure in the public water main or individual water supply system is insufficient to supply the minimum pressures and quantities specified in this code, the supply shall be supplemented by an elevated water tank, a hydropneumatic pressure booster system or a water pressure booster pump installed in accordance with Section 606.5.5.

606.5.2 Support. All water supply tanks shall be supported in accordance with the *New York City Building Code*.

606.5.3 Covers. All water supply tanks shall be equipped with a lockable cover to keep out unauthorized persons, dirt and vermin. Such cover shall be tamper-proof and equipped with a local alarm. The covers of gravity tanks shall be vented with a return bend vent pipe with an area not less than the area of the down-feed riser pipe, and the vent shall be screened with a corrosion-resistant screen of not less than 16 by 20 mesh per inch (630 by 787 mesh per m).

606.5.4 Overflows for water supply tanks. A gravity or suction water supply tank shall be provided with an overflow with a diameter not less than that shown in Table 606.5.4. The gallons per minute listed in the table shall be the total automatic pump capacity connected to the tank. The overflow outlet shall discharge at a point not less than 6 inches (152 mm) above the roof or roof drain, or over an open water-supplied fixture. The overflow outlet shall be covered with a corrosion-resistant screen of not less than 16 by 20 mesh per inch (630 by 787 mesh per m) and by 1/4-inch (6.4 mm) hardware cloth or shall terminate in a horizontal angle seat check valve. Drainage from overflow pipes shall be directed so as not to freeze on roof walks.

**TABLE 606.5.4
SIZE OF OVERFLOWS FOR GRAVITY AND SUCTION TANKS**

OVERFLOW PIPE SIZE (inches)	MAXIMUM ALLOWABLE GPM FOR EACH ORIFICE OPENING INTO TANK	MAXIMUM ALLOWABLE GPM FOR VERTICAL OVERFLOW (PIPING CONNECTING ORIFICES)
2	19	25
3	43	75
4	90	163
5	159	296
6	257	472
8	505	1,020
10	890	1,870
12	1,400	2,967

For SI: 1 inch = 25.4 mm, 1 gallon per minute = 3.785 L/m.

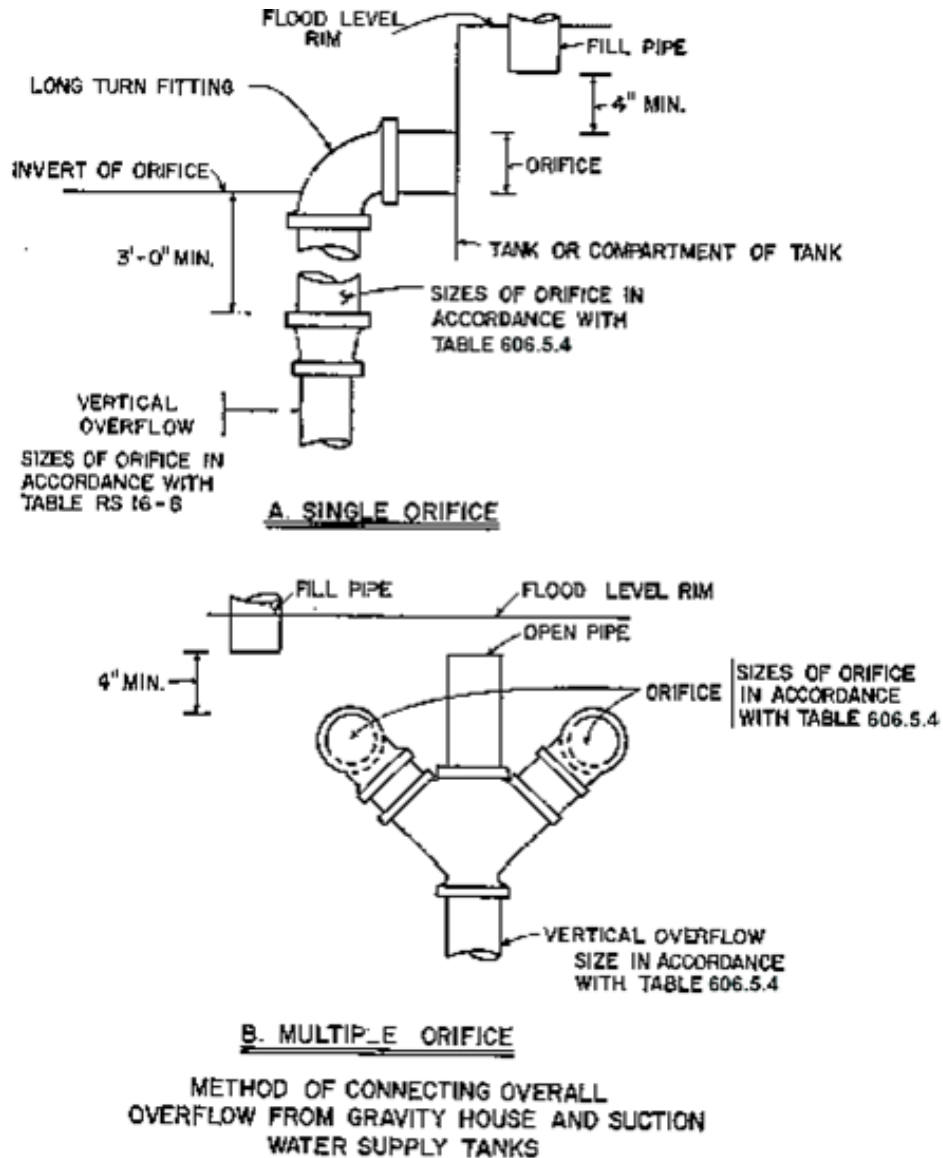


FIGURE 606.5.4
**METHODS OF CONNECTING OVERFLOW FROM GRAVITY
 HOUSE AND SUCTION WATER SUPPLY TANKS**

606.5.4.1 Water piping control and location. Water inlets to gravity house tanks shall be controlled by a ball cock or other automatic supply valve or emergency electrical cut-off so installed as to prevent the overflow of the tank in the event that the pumps filling the tanks do not shut off at the predetermined level or the street pressure rises to a point where it can fill the tank. The water inlet to a suction tank shall be controlled by a ball cock or other automatic supply valve. The inlet shall be terminated so as to provide an accepted air gap but in no case shall it be less than 4 inches (102 mm) above the top of the overflow. The outlet from a gravity tank to the distribution system shall be equipped with a strainer located at least 2 inches (51 mm) above the tank bottom to prevent solids from entering the piping system. All down-feed supplies from a tank cross connected in any manner with distribution supply piping in a building supplied by direct street or pump pressure shall be equipped with a check valve on the main cold water down supply to prevent backflow of water into the roof tank. All roof tanks shall be equipped with a high water level alarm, at or slightly below the overflow, designed to activate when the ball cock, automatic supply valve, or emergency electrical cut-off fails.

606.5.4.2 Design. The gravity house supply tank shall be built of wood, steel, or equivalent materials. Subject to the approval of the commissioner, additional linings may be installed in the tank, provided the lining material complies with NSF 61 standards and does not have a toxic or otherwise objectionable effect on the potable water. Steel tanks shall be painted both inside and outside. If a tank with a dividing partition is installed, the total capacity of the combined compartments shall be considered as the capacity of a single tank for the purpose of determining storage capacities of the tank.

606.5.4.3 Cleaning or painting. Water tanks shall be cleaned and painted in accordance with the following:

606.5.4.3.1 Prohibited materials. No water tank of any kind that is part of a building water supply system used for potable purposes shall be cleaned with any material or painted on the inside with any material that will have a toxic or otherwise objectionable effect on the potability of the water supply when the tank is put into service. No lead paint shall be used. The water supply connections to and from a tank shall be disconnected or plugged while the tank is being cleaned or painted to prevent any foreign fluid or substance from entering the distribution piping. Where the air in a tank may be insufficient to sustain human life, or may contain an injurious gas, adequate measures shall be taken for the protection of the workers.

606.5.4.3.2 Disinfection. After the tank has been cleaned or painted, it shall be disinfected according to the following procedure before it is put back in service:

1. The underside of the top, the bottom, and the walls shall be washed with a hypochlorite solution containing 100 or more parts per million of available chlorine.
2. The tank shall be filled with water to which hypochlorite solution is added during the filling in sufficient quantity so that the treated water in the tank will contain at least 10 parts per million of available chlorine.
3. The chlorinated water shall be allowed to remain in the tank for two hours.
4. Finally, the tank shall be drained completely before refilling.

606.5.4.3.3 Maintenance schedule. House and suction tanks shall be drained and cleaned at least once a year.

606.5.5 Low-pressure cutoff required. A low-pressure cutoff shall be installed on all house pumps filling a water tank, and booster pumps in a water pressure booster system to prevent creation of a vacuum or negative pressure on the suction side of the pump when a positive pressure of 10 psi (68.94 kPa) or less occurs on the suction side of the pump.

606.5.6 Reserved.

606.5.7 Tank drain pipes. A valved pipe shall be provided at the lowest point of each tank or tank compartment to permit emptying of the 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.

**TABLE 606.5.7
SIZE OF DRAIN PIPES FOR WATER TANKS**

TANK CAPACITY (gallons)	DRAIN PIPE (inches)
Up to 750	1
751 to 1,500	1½
1,501 to 3,000	2
3,001 to 5,000	2½
5,000 to 7,500	3
Over 7,500	4

For SI: 1 inch = 25.4 mm, 1 gallon = 3.785 L.

606.5.8 Prohibited location of potable supply tanks. Potable water gravity tanks or manholes of potable water pressure tanks shall not be located directly under any soil or waste piping or any source of contamination.

606.5.9 Pressure tanks, vacuum relief. All water pressure tanks shall be provided with a vacuum relief valve at the top of the tank that will operate up to a maximum water pressure of 200 psi (1380 kPa) and up to a maximum temperature of 200°F (93°C). The size of such vacuum relief valve shall be not less than 1/2 inch (12.7 mm).

Exception: This section shall not apply to pressurized captive air diaphragm/bladder tanks.

606.5.10 Pressure relief for tanks. Every pressure tank in a hydropneumatic pressure booster system shall be protected with a pressure relief valve. The pressure relief valve shall be set at a maximum pressure equal to the rating of the tank. The relief valve shall be installed on the supply pipe to the tank or on the tank. The relief valve shall discharge by gravity to a safe place of disposal.

606.6 Water supply system test. Upon completion of a section of or the entire water supply system, the system, or portion completed, shall be tested in accordance with Section 312.

606.7 Reserved.

606.8 Water sub-meters required. Water distribution pipe lines serving a commercial cooking facility, commercial laundry facility, or commercial gym or spa shall be equipped with at least one water sub-meter to measure the amount of water supplied through such lines to the water using equipment within such facility, gym or spa. Makeup water lines serving an evaporative cooling tower or swimming pool shall be equipped with at least one water sub-meter to measure the amount of water supplied through such lines to such cooling tower or swimming pool. Makeup water lines to any boiler or boiler plant with heat input greater than 2.8 million btu/h (820 kW) shall be equipped with at least one water sub-meter to measure the amount of water supplied through such lines to such boilers. Water sub-meters shall be those models approved for billing purposes by the Department of Environmental Protection.

Exception: Water sub-meters shall not be required in Group R-3 occupancies.

606.9 Pressure tanks. Tank systems containing water and air in combination under pressure exceeding 15 psi (103.4 kPa) above atmospheric pressure, where the pressure is supplied and maintained by pumps connected directly to the tanks, shall comply with the requirements of this section.

606.9.1 Design requirements. The pressure tank system shall be designed by a registered design professional. An application for a permit and plans shall be filed with the department. The plans and application shall contain, but not be limited to:

1. Size and location of high pressure tanks;
2. The operating pressures and temperatures; and
3. The location, type and specifications of pressure relief valves.

606.9.2 Location requirements. All high pressure tanks shall be located at least 5 feet (1524 mm) horizontally from a gas service or distribution line or its vertical projection upon the floor.

††† 606.9.3 Required separation. All pressure tanks shall be located in rooms separated from gas service or distribution lines by fire-resistance-rated enclosures.

SECTION PC 607 HOT WATER SUPPLY SYSTEM

607.1 Where required. In residential occupancies, hot water shall be supplied to plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance. In nonresidential occupancies, hot water shall be supplied for culinary purposes, cleansing, laundry or building maintenance purposes. In nonresidential occupancies, hot water or tempered water shall be supplied for bathing and washing purposes.

607.1.1 Temperature limiting means. A thermostat control for a water heater shall not serve as the temperature limiting means for the purposes of complying with the requirements of this code for maximum allowable hot or tempered water delivery temperature at fixtures.

WATER SUPPLY AND DISTRIBUTION

607.1.2 Tempered water temperature control. Tempered water shall be supplied through a water temperature limiting device that conforms to ASSE 1070 and shall limit the tempered water to a maximum of 110°F (43°C). This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

607.2 Hot or tempered water supply to fixtures. The developed length of hot or tempered water piping, from the source of hot water to the fixtures that require hot or tempered water, shall not exceed 20 feet (6096 mm) or the maximum length in accordance with the *New York City Energy Conservation Code*. Recirculating system piping and heat-traced piping shall be considered to be sources of hot or tempered water.

607.2.1 Circulation systems and heat trace systems for maintaining heated water temperature in distribution systems. For residential occupancies, the installation of heated water circulation and temperature maintenance systems shall be in accordance with the *New York City Energy Conservation Code*. For commercial occupancies that are three stories or less in height above grade plane, the installation of heated water circulation and heat trace systems shall be in accordance with the *New York City Energy Conservation Code*.

607.2.1.1 Pump controls for hot water storage systems. The controls on pumps that circulate water between a water heater and a storage tank for heated water shall limit operation of the pump from heating cycle startup to not greater than 5 minutes after the end of the cycle.

607.2.1.2 Demand recirculation controls for distribution systems. A water distribution system having one or more recirculation pumps that pump water from a heated water supply pipe back to the heated water source through a cold water supply pipe shall be a demand recirculation water system. Pumps shall have controls that comply with both of the following:

1. The control shall start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture, or sensing the flow of hot or tempered water to a fixture fitting or appliance.
2. The control shall limit the temperature of the water entering the cold water piping to 104°F (40°C).

††† **607.2.2 Piping for recirculation systems having master thermostatic valves.** Where a thermostatic mixing valve is used in a system with a hot water recirculating pump, the hot water or tempered water return line shall be routed to the cold water inlet pipe of the water heater and the cold water inlet pipe or the hot water return connection of the thermostatic mixing valve.

607.3 Thermal expansion control. Where a storage water heater is supplied with cold water that passes through a check valve, pressure reducing valve or backflow preventer, a thermal expansion tank shall be connected to the water heater cold water supply pipe at a point that is downstream of all check valves, pressure reducing valves and backflow preventers. Thermal expansion tanks shall be sized in accordance with the tank manufacturer's instructions and shall be sized such that the pressure in the water distribution system shall not exceed that required by Section 604.8.

607.4 Flow of hot water to fixtures. Fixture fittings, faucets and diverters shall be installed and adjusted so that the flow of hot water from the fittings corresponds to the left-hand side of the fixture fitting.

Exception: Shower and tub/shower mixing valves conforming to ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1, where the flow of hot water corresponds to the markings on the device.

607.5 Insulation of piping. For other than residential occupancies, as defined in the *New York City Energy Conservation Code* that are three stories or less in height above grade plane, piping to the inlet of a water heater and piping conveying water heated by a water heater shall be insulated in accordance with Section C404 of the *New York City Energy Conservation Code*. For residential occupancies, as defined in the *New York City Energy Conservation Code* that are three stories or less in height above grade plane, piping to the inlet of a water heater and piping conveying water heated by a water heater shall be insulated in accordance with Section R403 of the *New York City Energy Conservation Code*.

SECTION PC 608 PROTECTION OF POTABLE WATER SUPPLY

608.1 General. A potable water supply system shall be designed, installed and maintained in such a manner so as to prevent contamination from nonpotable liquids, solids or gases being introduced into the potable water supply through cross connections or any other piping connections to the system. Backflow preventer applications shall conform to

Table 608.1, except as specifically stated in Sections 608.2 through 608.16.10. Primary backflow prevention devices shall comply with the requirements of the Department of Environmental Protection.

**Table 608.1
APPLICATION OF BACKFLOW PREVENTERS**

DEVICE	DEGREE OF HAZARD ^a	APPLICATION ^b	APPLICABLE STANDARDS
Backflow prevention assemblies:			
Double check backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes $\frac{3}{8}$ " – 12"	ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or backsiphonage Sizes 2" – 12"	ASSE 1048
Pressure vacuum breaker assembly ^c	High or low hazard	Backsiphonage only Sizes $\frac{1}{2}$ " – 2"	ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow preventer	High or low hazard	Backpressure or backsiphonage Sizes $\frac{3}{8}$ " – 12"	ASSE 1013, AWWA C511, CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure	ASSE 1047
Spill-resistant vacuum breaker assembly ^c	High or low hazard	Backsiphonage only Sizes $\frac{1}{4}$ " – 2"	ASSE 1056
Backflow preventer plumbing devices:			
Antisiphon-type fill valves for gravity water closet flush tanks	High hazard	Backsiphonage only	ASSE 1002, CSA B125.3
Backflow preventer for carbonated beverage machines	Low hazard	Backpressure or backsiphonage Sizes $\frac{1}{4}$ " – $\frac{3}{8}$ "	ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard	Backpressure or backsiphonage Sizes $\frac{1}{4}$ " – $\frac{3}{8}$ "	ASSE 1012, CSA B64.3
Dual-check-valve-type backflow preventer	Low hazard	Backpressure or backsiphonage Sizes $\frac{1}{4}$ " – 1"	ASSE 1024, CSA B64.6
Hose connection backflow preventer	High or low hazard	Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes $\frac{1}{2}$ " – 1"	ASME A112.21.3, ASSE 1052, CSA B64.2.1.1
Hose connection vacuum breaker	High or low hazard	Low head backpressure or backsiphonage Sizes $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1"	ASME A112.21.3, ASSE 1011, CSA B64.2, CSA B64.2.1
Laboratory faucet backflow preventer	High or low hazard	Low head backpressure and backsiphonage	ASSE 1035, CSA B64.7
Pipe-applied atmospheric-type vacuum breaker	High or low hazard	Backsiphonage only Sizes $\frac{1}{4}$ " – 4"	ASSE 1001, CSA B64.1.1
Vacuum breaker wall hydrants, frost-resistant, automatic-draining type	High or low hazard	Low head backpressure or backsiphonage Sizes $\frac{3}{4}$ ", 1"	ASME A112.21.3, ASSE 1019, CSA B64.2.2

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Other means or methods:			
Air gap	High or low hazard	Backsiphonage or backpressure	ASME A112.1.2
Air gap fittings for use with plumbing fixtures, appliances and appurtenances	High or low hazard	Backsiphonage or backpressure	ASME A112.1.3
Barometric loop	High or low hazard	Backsiphonage only	(See Section 608.13.4)

For SI: 1 inch = 25.4 mm.

- a. Low hazard.
- High hazard—See Contamination (Section 202).
- b. See Backpressure, low head (Section 202).
See Backsiphonage (Section 202).
- c. The regulations of the Department of Environmental Protection prohibit use of vacuum breaker assemblies as primary backflow prevention devices.

608.2 Plumbing fixtures. The supply lines and fittings for plumbing fixtures shall be installed so as to prevent backflow. Plumbing fixture fittings shall provide backflow protection in accordance with ASME A112.18.1/CSA B125.1.

608.3 Devices, appurtenances, appliances and apparatus. Devices, appurtenances, appliances and apparatus intended to serve some special function, such as sterilization, distillation, processing, cooling, or storage of ice or foods, and that connect to the water supply system, shall be provided with protection against backflow and contamination of the water supply system. Water pumps, filters, softeners, tanks and other appliances and devices that handle or treat potable water shall be protected against contamination.

608.3.1 Special equipment, water supply protection. The water supply for hospital fixtures shall be protected against backflow with a reduced pressure principle backflow prevention assembly, an atmospheric or spill-resistant vacuum breaker, assembly or an air gap. Vacuum breakers for bedpan washer hoses shall not be located less than 5 feet (1524 mm) above the floor. Vacuum breakers for hose connections in health care or laboratory areas shall not be less than 6 feet (1829 mm) above the floor.

608.4 Water service piping. Water service piping shall be protected in accordance with Sections 603.2 and 603.2.1.

608.5 Chemicals and other substances. Chemicals and other substances that produce either toxic conditions, taste, odor or discoloration in a potable water system shall not be introduced into, or utilized in, such systems.

608.6 Cross connection control. Cross connections shall be prohibited, except where approved backflow prevention assemblies, backflow prevention devices or other means or methods are installed to protect the potable water supply.

608.6.1 Private water supplies. Cross connections between a private water supply and a potable public supply shall be prohibited.

608.7 Valves and outlets prohibited below grade. Potable water outlets and combination stop-and-waste valves shall not be installed underground or below grade. Freezeproof yard hydrants that drain the riser into the ground are considered to be stop-and-waste valves.

Exception: Freezeproof yard hydrants that drain the riser into the ground shall be permitted to be installed, provided that the potable water supply to such hydrants is protected upstream of the hydrants in accordance with Section 608 and the hydrants are permanently identified as nonpotable outlets by approved signage that reads as follows: "Caution, Nonpotable Water. Do Not Drink."

608.8 Identification of nonpotable water systems. Where nonpotable water systems are installed, the piping conveying the nonpotable water shall be identified either by color marking, metal tags or tape in accordance with Sections 608.8.1 through 608.8.2.3.

608.8.1 Signage required. Nonpotable water outlets, such as hose connections, open ended pipes and faucets, shall be identified with signage that reads as follows: "Nonpotable water is utilized for (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 inch (12.7 mm) in height and in colors in contrast to the background on which they are applied. In addition to the required wordage, the pictograph shown in Figure 608.8.1 shall appear on the required signage.



FIGURE 608.8.1
PICTOGRAPH—DO NOT DRINK

608.8.2 Distribution pipe labeling and marking. Nonpotable distribution piping shall be purple in color and shall be embossed, or integrally stamped or marked, with the words: “CAUTION: NONPOTABLE WATER – DO NOT DRINK” or the piping shall be installed with a purple identification tape or wrap. Pipe identification shall include the contents of the piping system and an arrow indicating the direction of flow. Hazardous piping systems shall also contain information addressing the nature of the hazard. Pipe identification shall be repeated at intervals not exceeding 25 feet (7620 mm) and at each point where the piping passes through a wall, floor or roof. Lettering shall be readily observable within the room or space where the piping is located.

608.8.2.1 Color. The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify nonpotable water distribution systems.

608.8.2.2 Lettering size. The size of the background color field and lettering shall comply with Table 608.8.2.2.

TABLE 608.8.2.2
SIZE OF PIPE IDENTIFICATION

PIPE DIAMETER (inches)	LENGTH BACKGROUND COLOR FIELD (inches)	SIZE OF LETTERS (inches)
$\frac{3}{4}$ to $1\frac{1}{4}$	8	0.5
$1\frac{1}{2}$ to 2	8	0.75
$2\frac{1}{2}$ to 6	12	1.25
8 to 10	24	2.5
over 10	32	3.5

For SI 1 inch = 25.4 mm.

608.8.2.3 Identification tape. Where used, identification tape shall be at least 3 inches (76 mm) wide and have white or black lettering on a purple field stating “CAUTION: NONPOTABLE WATER – DO NOT DRINK.” Identification tape shall be installed on top of nonpotable water distribution pipes, fastened at least every 10 feet (3048 mm) to each pipe length and run continuously the entire length of the pipe.

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608.9 Reutilization prohibited. Water utilized for the cooling of equipment or other processes shall not be returned to the potable water system. Such water shall be discharged into a drainage system through an air gap or shall be utilized for nonpotable purposes.

608.10 Reuse of piping. Piping that has been utilized for any purpose other than conveying potable water shall not be utilized for conveying potable water.

608.11 Painting of water tanks. The interior surface of a potable water tank shall not be lined, painted or repaired with any material that changes the taste, odor, color or potability of the water supply when the tank is placed in, or returned to, service. Linings, paints, and repairs must be in accordance with the requirements of the Department of Health and Mental Hygiene.

608.12 Pumps and other appliances. Water pumps, filters, softeners, tanks and other devices that handle or treat potable water shall be protected against contamination.

608.13 Backflow protection. Means of protection against secondary backflow shall be provided in accordance with Sections 608.13.1 through 608.13.10 and tested and inspected in accordance with Chapter 3.

608.13.1 Air gap. The minimum required air gap shall be measured vertically from the lowest end of a potable water outlet to the flood level rim of the fixture or receptacle into which such potable water outlet discharges. Air gaps shall comply with ASME A112.1.2 and air gap fittings shall comply with ASME A112.1.3.

608.13.2 Reduced pressure principle backflow prevention assemblies. Reduced pressure principle backflow prevention assemblies shall conform to ASSE 1013, AWWA C511, CSA B64.4 or CSA B64.4.1. Reduced pressure detector assembly backflow preventers shall conform to ASSE 1047. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged.

608.13.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012 or CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged.

608.13.4 Barometric loop. Barometric loops shall precede the point of connection and shall extend vertically to a height of 35 feet (10 668 mm). A barometric loop shall only be utilized as an atmospheric-type or pressure-type vacuum breaker.

608.13.5 Pressure vacuum breaker assemblies. Pressure vacuum breaker assemblies shall conform to ASSE 1020 or CSA B64.1.2. Spill-resistant vacuum breaker assemblies shall comply with ASSE 1056. These assemblies are designed for installation under continuous pressure conditions where the critical level is installed at the required height. Pressure vacuum breaker assemblies shall not be installed in locations where spillage could cause damage to the structure.

608.13.6 Atmospheric-type vacuum breakers. Pipe applied atmospheric-type vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASME A112.21.3, ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, CSA B64.2.2 or CSA B64.7. These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height.

608.13.7 Double check backflow prevention assemblies. Double check backflow prevention assemblies shall conform to ASSE 1015, CSA B64.5, CSA B64.5.1 or AWWA C510. Double check detector fire protection backflow prevention assemblies shall conform to ASSE 1048. These assemblies shall be capable of operating under continuous pressure conditions.

608.13.8 Spill-resistant pressure vacuum breaker assemblies. Spill-resistant pressure vacuum breaker assemblies shall conform to ASSE 1056 or CSA B64.1.3. These assemblies are designed for installation under continuous-pressure conditions where the critical level is installed at the required height.

608.13.9 Chemical dispenser backflow devices. Backflow devices for chemical dispensers shall comply with ASSE 1055 or shall be equipped with an air gap fitting.

608.13.10 Dual check backflow preventer. Dual check backflow preventers shall conform to ASSE 1024 or CSA B64.6.

608.14 Location of backflow preventers. Access shall be provided to backflow preventers as specified by the manufacturer's instructions.

608.14.1 Outdoor enclosures for backflow prevention devices. Outdoor enclosures for backflow prevention devices shall comply with ASSE 1060.

608.14.2 Protection of backflow preventers. Backflow preventers shall not be located in areas subject to freezing except where they can be removed by means of unions or are protected from freezing by heat, insulation or both.

608.14.2.1 Relief port piping. The termination of the piping from the relief port or air gap fitting of a backflow preventer shall discharge to an approved indirect waste receptor or to the outdoors where it will not cause damage or create a nuisance.

608.15 Protection of potable water outlets. All potable water openings and outlets shall be protected against backflow in accordance with Section 608.15.1, 608.15.2, 608.15.3, 608.15.4, 608.15.4.1 or 608.15.4.2.

608.15.1 Protection by air gap. Openings and outlets shall be protected by an air gap between the opening and the fixture flood level rim as specified in Table 608.15.1. Openings and outlets equipped for hose connection shall be protected by means other than an air gap.

**TABLE 608.15.1
MINIMUM REQUIRED AIR GAPS**

FIXTURE	MINIMUM AIR GAP	
	Away from a wall ^a (inches)	Close to a wall (inches)
Lavatories and other fixtures with effective openings not greater than 1/2 inch in diameter	1	1 1/2
Sinks, laundry trays, gooseneck back faucets and other fixtures with effective openings not greater than 3/4 inch in diameter	1 1/2	2 1/2
Over-rim bath fillers and other fixtures with effective openings not greater than 1 inch in diameter	2	3
Drinking water fountains, single orifice not greater than 7/16 inch in diameter or multiple orifices with a total area of 0.150 square inch (area of circle 7/16 inch in diameter)	1	1 1/2
Effective openings greater than 1 inch	Two times the diameter of the effective opening	Three times the diameter of the effective opening

For SI: 1 inch = 25.4 mm, 1 square inch = 645 mm².

a. Applicable where walls or obstructions are spaced from the nearest inside-edge of the spout opening a distance greater than three times the diameter of the effective opening for a single wall, or a distance greater than four times the diameter of the effective opening for two intersecting walls.

608.15.2 Protection by reduced pressure principle backflow prevention assembly. Openings and outlets shall be protected by a reduced pressure principle backflow prevention assembly or a reduced pressure principle fire protection backflow prevention assembly on potable water supplies.

608.15.3 Protection by a backflow preventer with intermediate atmospheric vent. Openings and outlets shall be protected by a backflow preventer with an intermediate atmospheric vent.

608.15.4 Protection by a vacuum breaker. Openings and outlets shall be protected by atmospheric-type or pressure-type vacuum breakers. The critical level of the vacuum breaker shall be set not less than 6 inches (152 mm) above the flood level rim of the fixture or device. Fill valves shall be set in accordance with Section 425.3.1.

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Vacuum breakers shall not be installed under exhaust hoods or similar that will contain toxic fumes or vapors. Pipe-applied vacuum breakers shall be installed not less than 6 inches (152 mm) above the flood level rim of the fixture, receptor or device served.

608.15.4.1 Deck-mounted and integral vacuum breakers. Approved deck-mounted or equipment mounted vacuum breakers and faucets with integral atmospheric vacuum breakers or spill-resistant vacuum breaker assemblies shall be installed in accordance with the manufacturer's instructions and the requirements for labeling with the critical level not less than 1 inch (25 mm) above the flood level rim.

608.15.4.2 Hose connections. Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection shall be protected by an atmospheric-type or pressure-type vacuum breaker or a permanently attached hose connection vacuum breaker.

Exceptions:

1. This section shall not apply to water heater and boiler drain valves that are provided with hose connection threads and that are intended only for tank or vessel draining.
2. This section shall not apply to water supply valves intended for connection of clothes washing machines where backflow prevention is otherwise provided or is integral with the machine.

608.16 Connections to the potable water system. Connections to the potable water system shall conform to Sections 608.16.1 through 608.16.10.

608.16.1 Beverage dispensers. The water supply connection to beverage dispensers shall be protected against backflow by a backflow preventer conforming to ASSE 1022 or by an air gap. The portion of the backflow preventer device downstream from the second check valve and the piping downstream therefrom shall not be affected by carbon dioxide gas.

608.16.2 Connections to boilers. The potable supply to the boiler shall be protected by an air gap or a reduced pressure principle backflow preventer, complying with ASSE 1013, CSA B64.4 or AWWA C511.

Exception: An atmospheric vent complying with ASSE 1012 or CSA B64.3 may be installed in buildings classified as Occupancy Group R-3 and which do not utilize conditioning chemicals.

608.16.3 Heat exchangers. Heat exchangers utilizing an essentially toxic transfer fluid shall be separated from the potable water by double-wall construction. An air gap open to the atmosphere shall be provided between the two walls. Heat exchangers utilizing an essentially nontoxic transfer fluid shall be permitted to be of single-wall construction.

Exceptions: Double-wall construction shall not be required for the following:

1. Heat exchangers supplied directly from the Consolidated Edison steam system; and
2. Low-pressure steam-heating boilers.

608.16.4 Connections to automatic fire sprinkler systems and standpipe systems. The potable water supply to automatic fire sprinkler and standpipe systems shall be protected against backflow by a double check backflow prevention assembly, a double check detector fire protection backflow prevention assembly, reduced pressure principle backflow prevention assembly, or a reduced pressure detector fire protection backflow prevention assembly.

Exceptions:

1. Where systems are installed as a portion of the water distribution system in accordance with the requirements of this code and are not provided with a fire department connection, isolation of the water supply system shall not be required.
2. Isolation of the water distribution system is not required for deluge, preaction or dry pipe systems.

608.16.4.1 Additives or nonpotable source. Where systems under continuous pressure contain chemical additives or antifreeze, or where systems are connected to a nonpotable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevention assembly or a reduced pressure detector fire protection backflow prevention assembly. Where chemical additives or antifreeze are added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle backflow prevention assembly or the reduced pressure detector fire protection backflow prevention assembly shall be permitted to be located so as to isolate that portion of the system. Where systems are not under

continuous pressure, the potable water supply shall be protected against backflow by an air gap or an atmospheric vacuum breaker conforming to ASSE 1001 or CSA B64.1.1.

608.16.5 Connections to lawn irrigation systems. The potable water supply to lawn irrigation systems shall be protected against backflow by an atmospheric vacuum breaker, a pressure vacuum breaker assembly or a reduced pressure principle backflow prevention assembly. Valves shall not be installed downstream from an atmospheric vacuum breaker. Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevention assembly.

608.16.6 Connections subject to backpressure. Where a potable water connection is made to a nonpotable line, fixture, tank, vat, pump, cooling tower or other equipment subject to high-hazard backpressure, the potable water connection shall be protected by a reduced pressure principle backflow prevention assembly.

608.16.7 Chemical dispensers. Where chemical dispensers connect to the potable water distribution system, the water supply system shall be protected against backflow in accordance with Section 608.13.1, 608.13.2, 608.13.5, 608.13.6, 608.13.8 or 608.13.9.

608.16.8 Portable cleaning equipment. Where the portable cleaning equipment connects to the water distribution system, the water supply system shall be protected against backflow in accordance with Section 608.13.1, 608.13.2, 608.13.3, 608.13.7 or 608.13.8.

608.16.9 Dental pump equipment. Where dental pumping equipment connects to the water distribution system, the water supply system shall be protected against backflow in accordance with Section 608.13.1, 608.13.2, 608.13.5, 608.13.6 or 608.13.8.

608.16.10 Coffee machines and noncarbonated beverage dispensers. The water supply connection to coffee machines and noncarbonated beverage dispensers shall be protected against backflow by a backflow preventer conforming to ASSE 1022 or by an air gap.

608.17 Protection of individual water supplies. An individual water supply shall be located and constructed so as to be safeguarded against contamination in accordance with Sections 608.17.1 through 608.17.8.

608.17.1 Well locations. A potable ground water source or pump suction line shall not be located closer to potential sources of contamination than the distances shown in Table 608.17.1. In the event the underlying rock structure is limestone or fragmented shale, the local or state health department shall be consulted on well site location. The distances in Table 608.17.1 constitute minimum separation and shall be increased in areas of creviced rock or limestone, or where the direction of movement of the ground water is from sources of contamination toward the well.

**TABLE 608.17.1
DISTANCE FROM CONTAMINATION TO
PRIVATE WATER SUPPLIES AND PUMP SUCTION LINES**

SOURCE OF CONTAMINATION	DISTANCE (feet)
Barnyard	100
Farm silo	25
Pasture	100
Pumphouse floor drain of cast iron draining to ground surface	2
Seepage pits	50
Septic tank	25
Sewer	10
Subsurface disposal fields	50

For SI: 1 foot = 304.8 mm.

608.17.2 Elevation. Well sites shall be positively drained and shall be at higher elevations than potential sources of contamination.

608.17.3 Depth. Private potable well supplies shall not be developed from a water table less than 10 feet (3048 mm) below the ground surface.

608.17.4 Water-tight casings. Each well shall be provided with a water-tight casing extending to 10 feet (3048 mm) below the ground surface. Casings shall extend not less than 6 inches (152 mm) above the well platform. Casings shall be large enough to permit installation of a separate drop pipe. Casings shall be sealed at the bottom in an impermeable stratum or extend several feet into the water-bearing stratum.

608.17.5 Drilled or driven well casings. Drilled or driven well casings shall be of steel or other approved material. Where drilled wells extend into a rock formation, the well casing shall extend to and set firmly in the formation. The annular space between the earth and the outside of the casing shall be filled with cement grout to a depth of not less than 10 feet (3048 mm) below the ground surface. In an instance of casing to rock installation, the grout shall extend to the rock surface.

608.17.6 Dug or bored well casings. Dug or bored well casings shall be of water-tight concrete, tile or galvanized or corrugated metal pipe extending to not less than 10 feet (3048 mm) below the ground surface. Where the water table is more than 10 feet (3048 mm) below the ground surface, the water-tight casing shall extend below the table surface. Well casings for dug wells or bored wells constructed with sections of concrete, tile or galvanized or corrugated metal pipe shall be surrounded by 6 inches (152 mm) of grout poured into the hole between the outside of the casing and the ground and extending not less than 10 feet (3048 mm) below the ground surface.

608.17.7 Cover. Potable water wells shall be equipped with an overlapping water-tight cover at the top of the well casing or pipe sleeve such that contaminated water or other substances are prevented from entering the well through the annular opening at the top of the well casing, wall or pipe sleeve. Covers shall extend downward not less than 2 inches (51 mm) over the outside of the well casing or wall. A dug well cover shall be provided with a pipe sleeve permitting the withdrawal of the pump suction pipe, cylinder or jet body without disturbing the cover. Where pump sections or discharge pipes enter or leave a well through the side of the casing, the circle of contact shall be water tight.

608.17.8 Drainage. Potable water wells and springs shall be constructed such that surface drainage will be diverted away from the well or spring.

SECTION PC 609 HEALTH CARE PLUMBING

609.1 Scope. This section shall govern those aspects of health care plumbing systems that differ from plumbing systems in other structures. Health care plumbing systems shall conform to the requirements of this section in addition to the other requirements of this code. The provisions of this section shall apply to the special devices and equipment installed and maintained in the following occupancies: hospitals, nursing homes, homes for the aged, orphanages, infirmaries, first aid stations, psychiatric facilities, clinics, professional offices of dentists and doctors, mortuaries, educational facilities, surgery, dentistry, research and testing laboratories, establishments manufacturing pharmaceutical drugs and medicines, animal care facilities, and other structures with similar apparatus and equipment classified as plumbing.

609.2 Water service. Hospitals shall have two water service pipes installed in such a manner so as to minimize the potential for an interruption of the supply of water in the event of a water main or water service pipe failure.

609.3 Hot water. Hot water shall be provided to supply all of the hospital fixture, kitchen and laundry requirements. Special fixtures and equipment shall have hot water supplied at a temperature specified by the manufacturer. The hot water system shall be installed in accordance with Section 607.

609.4 Vacuum breaker installation. Vacuum breakers shall be installed not less than 6 inches (152 mm) above the flood level rim of the fixture or device in accordance with Section 608. The flood level rim of hose connections shall be the maximum height at which any hose is utilized.

609.5 Prohibited water closet and clinical sink supply. Jet or water-supplied orifices, except those supplied by the flush connections, shall not be located in or connected with a water closet bowl or clinical sink. This section shall not prohibit an approved bidet installation.

609.6 Clinical, hydrotherapeutic and radiological equipment. Clinical, hydrotherapeutic, radiological or any equipment that is supplied with water or that discharges to the waste system shall conform to the requirements of this section and Section 608.

609.7 Condensate drain trap seal. A water supply shall be provided for cleaning, flushing and resealing the condensate trap, and the trap shall discharge through an air gap in accordance with Section 608.

609.8 Valve leakage diverter. Each water sterilizer filled with water through directly connected piping shall be equipped with an approved leakage diverter or bleed line on the water supply control valve to indicate and conduct any leakage of unsterile water away from the sterile zone.

SECTION PC 610 DISINFECTION OF POTABLE WATER SYSTEM

610.1 General. Potable water systems shall be purged of deleterious matter and disinfected prior to utilization. The method to be followed shall be that prescribed by the health authority or water purveyor having jurisdiction or, in the absence of a prescribed method, the procedure described in either AWWA C651 or AWWA C652, or as described in this section. This requirement shall apply to “on-site” or “inplant” fabrication of a system or to a modular portion of a system.

1. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet.
2. The system or part thereof shall be filled with a water/chlorine solution containing not less than 50 parts per million (50 mg/L) of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing not less than 200 parts per million (200 mg/L) of chlorine and allowed to stand for 3 hours.
3. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system.
4. The procedure shall be repeated where shown by a bacteriological examination that contamination remains present in the system.

Exception: Potable water systems are not required to be purged and disinfected after ordinary repairs.

SECTION PC 611 DRINKING WATER TREATMENT UNITS

611.1 Design. Drinking water treatment units shall meet the requirements of NSF 42, NSF 44, NSF 53, NSF 62 or CSA B483.1.

611.2 Reverse osmosis systems. The discharge from a reverse osmosis drinking water treatment unit shall enter the drainage system through an air gap or an air gap device that meets the requirements of NSF 58 or CSA B483.1.

611.3 Connection tubing. The tubing to and from drinking water treatment units shall be of a size and material as recommended by the manufacturer. The tubing shall comply with NSF 14, NSF 42, NSF 44, NSF 53, NSF 58 or NSF 61.

SECTION PC 612 SOLAR SYSTEMS

WATER SUPPLY AND DISTRIBUTION

612.1 Solar systems. The construction, installation, alterations and repair of systems, equipment and appliances intended to capture and utilize solar energy for space heating or cooling, domestic hot water heating, swimming pool heating or process heating shall be in accordance with the *New York City Mechanical Code* and this code.

SECTION PC 613 TEMPERATURE CONTROL DEVICES AND VALVES

613.1 Temperature-actuated mixing valves. Temperature actuated mixing valves, which are installed to reduce water temperatures to defined limits, shall comply with ASSE 1016 and ASSE 1017.

SECTION PC 614 EMERGENCY DRINKING WATER ACCESS

614.1 Buildings required to provide alternative potable water access. Buildings that supply potable water from the public water main for dwelling units and sleeping units in Occupancy Groups I-1, R-1, R-2, and R-3 with the assistance of pumps shall provide additional fixtures that in an emergency when such pumps are inoperable are capable of supplying potable water from the public water main to the building utilizing only the available pressure from the public water main. Such fixtures shall comply with Sections 614.1.1 through 614.1.5.

Exception: Buildings where the pumps used to supply potable water for the dwelling units or sleeping units are connected to an emergency or a standby power system that complies with the requirements of Chapter 27 of the *New York City Building Code*.

614.1.1 Emergency water fixture. Fixtures capable of supplying an emergency source of potable water in accordance with this section shall consist of a faucet conforming to Section 424 or a fixture conforming to Section 424 that is capable of attaching to a splitter either:

1. a sink conforming to Section 418; or
2. a floor drain conforming to Section 412.

614.1.2 Number of emergency water fixtures required. One such fixture shall be provided for each 100 occupants as determined by the occupant load of the building.

††† **614.1.3 Access to emergency water fixtures.** Fixtures capable of supplying an emergency source of potable water in accordance with this section shall be located indoors in one or more common areas of the building. Such area shall be on an accessible route that complies with Section 1104.3 of the *New York City Building Code*. Where such area requires users to pass through a doorway to access the emergency water fixture, such area shall further comply with Section 1107.3 of the *New York City Building Code*. Emergency fixtures shall comply with Section 1109.12 of the *New York City Building Code*.

Exception: Such fixtures shall not be located in a bathroom or toilet room.

614.1.4 Signage. Fixtures capable of supplying an emergency source of potable water in accordance with this section shall be identified by a legible sign stating: "EMERGENCY DRINKING WATER." Signs shall be readily visible and located near such fixtures and on the door to any room or closet in which such a fixture is located.

614.1.5 Retroactive requirement for existing buildings. Existing buildings greater than five stories that supply potable water from the public water main for dwelling units and sleeping units in Occupancy Groups I-1, R-1, R-2, and R-3 with the assistance of pumps shall be provided with fixtures capable of supplying an emergency source of potable water in accordance with this section within 8 years after the effective date of this section.

Exception: Areas in such existing buildings greater than five stories where emergency fixtures are installed are not required to comply with Section 1104.3 or 1107.3 of the *New York City Building Code* unless where required pursuant to Section 1101.3.