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 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.

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

601.5.2 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.

601.5.3 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.

601.6 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. 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. Every structure equipped with plumbing fixtures and utilized for human occupancy or habitation shall be provided with a potable supply of water in the amounts and at the pressures specified in this chapter.

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, 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.
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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 PC 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 of water service and building sewer. Water service pipe and the building sewer shall be separated by 5 feet (1524 mm) of undisturbed or compacted earth. Exceptions:

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

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 fronting on a street in which there is a city (street) water main, and no consumer will be allowed to supply water to other persons or premises, except in a project where more than one building under a single ownership is supplied from a common house tank or booster system located in or on one of the buildings.

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. Methods utilized to determine pipe sizes shall be approved.

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 not be 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 installation instructions.

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 [3.5 gallons (13 L) per flushing cycle].
2. Vegetable sprays.
3. Clinical sinks [4.5 gallons (17 L) per flushing cycle].
4. Service sinks.
5. Emergency showers.

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 not terminate 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.

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

### Table 604.3
**WATER DISTRIBUTION SYSTEM DESIGN CRITERIA**

<table>
<thead>
<tr>
<th>FIXTURE SUPPLY OUTLET SERVING</th>
<th>FLOW RATE* (gpm)</th>
<th>FLOW PRESSURE* (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathtub</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Bidet</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Combination fixture</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Dishwasher, residential</td>
<td>2.75</td>
<td>8</td>
</tr>
<tr>
<td>Drinking fountain</td>
<td>0.75</td>
<td>8</td>
</tr>
<tr>
<td>Laundry tray</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Lavatory</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Shower</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Shower, temperature controlled</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Sillcock, hose bibb</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Sink, residential</td>
<td>2.5</td>
<td>8</td>
</tr>
<tr>
<td>Sink, service</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Urinal, valve</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Water closet, blow out</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td>Water closet, flushometer tank</td>
<td>1.6</td>
<td>15</td>
</tr>
<tr>
<td>Water closet, siphonic, flushometer valve</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>Water closet, tank, close coupled</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Water closet, tank, one piece</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>

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

### Table 604.4
**MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS**

<table>
<thead>
<tr>
<th>PLUMBING FIXTURE OR FIXTURE FITTING</th>
<th>MAXIMUM FLOW RATE OR QUANTITY*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lavatory, private</td>
<td>2.2 gpm at 60 psi</td>
</tr>
<tr>
<td>Lavatory, public, (metering)</td>
<td>0.25 gallon per metering cycle</td>
</tr>
<tr>
<td>Lavatory, public (other than metering)</td>
<td>0.5 gpm at 60 psi</td>
</tr>
<tr>
<td>Shower head*</td>
<td>2.5 gpm at 80 psi</td>
</tr>
<tr>
<td>Sink faucet</td>
<td>2.2 gpm at 60 psi</td>
</tr>
<tr>
<td>Urinal</td>
<td>1.0 gallon per flushing cycle</td>
</tr>
<tr>
<td>Water closet</td>
<td>1.6 gallons per flushing cycle</td>
</tr>
</tbody>
</table>

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

### Table 604.5
**MINIMUM SIZES OF FIXTURE WATER SUPPLY PIPES**

<table>
<thead>
<tr>
<th>FIXTURE</th>
<th>MINIMUM PIPE SIZE (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathtub‡ (60&quot; × 32&quot;) and smaller</td>
<td>1/2</td>
</tr>
<tr>
<td>Bathtub‡ (larger than 60&quot; × 32&quot;)</td>
<td>1/2</td>
</tr>
<tr>
<td>Bidet</td>
<td>3/8</td>
</tr>
<tr>
<td>Combination sink and tray</td>
<td>1/2</td>
</tr>
<tr>
<td>Dishwasher, domestic‡</td>
<td>1/2</td>
</tr>
<tr>
<td>Drinking fountain</td>
<td>3/16</td>
</tr>
<tr>
<td>Hose bibbs</td>
<td>1/16</td>
</tr>
<tr>
<td>Kitchen sink‡</td>
<td>1/16</td>
</tr>
<tr>
<td>Laundry, 1, 2 or 3 compartments‡</td>
<td>1/2</td>
</tr>
<tr>
<td>Lavatory</td>
<td>3/16</td>
</tr>
<tr>
<td>Shower, single head‡</td>
<td>1/2</td>
</tr>
<tr>
<td>Sinks, flushing rim</td>
<td>3/16</td>
</tr>
<tr>
<td>Sinks, service</td>
<td>1/2</td>
</tr>
<tr>
<td>Urinal, flush tank</td>
<td>1/2</td>
</tr>
<tr>
<td>Urinal, flush valve</td>
<td>1/2</td>
</tr>
<tr>
<td>Wall hydrant</td>
<td>1/2</td>
</tr>
<tr>
<td>Water closet, flush tank</td>
<td>3/8</td>
</tr>
<tr>
<td>Water closet, flush valve</td>
<td>1/2</td>
</tr>
</tbody>
</table>

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

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注：
* a. For additional requirements for flow rates and quantities, see Section 604.4.
  b. Minimum pressures as per manufacturer’s recommendations.
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 water-pressure reducing valve conforming to ASSE 1003 with strainer shall be installed to reduce the pressure in the building water distribution piping to 85 psi (586 kPa) static or less.

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. All 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. Water-hammer arrestors shall be installed in accordance with the manufacturer's specifications. Water-hammer arrestors shall conform to ASSE 1010 and PDI WH 201.

604.10 Parallel water distribution system manifolds. Hot water and cold water manifolds installed with parallel connected individual distribution lines to each fixture or fixture fitting shall be designed in accordance with Sections 604.10.1 through 604.10.3.

604.10.1 Manifold sizing. Hot water and cold water manifolds shall be sized in accordance with Table 604.10.1. The total gallons per minute is the demand of all outlets supplied.

<table>
<thead>
<tr>
<th>NOMINAL SIZE (inches)</th>
<th>MAXIMUM DEMAND (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Velocity at 4 feet per second</td>
</tr>
<tr>
<td>1/2</td>
<td>2</td>
</tr>
<tr>
<td>1/4</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>1 1/4</td>
<td>15</td>
</tr>
<tr>
<td>1 1/2</td>
<td>22</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 gallon per minute = 3.785 L/m,
1 foot per second = 0.305 m/s.

604.10.2 Valves. Individual fixture shutoff valves installed at the manifold shall be identified as to the fixture being supplied.

604.10.3 Access. Access shall be provided to manifolds.

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 Reserved.

605.3 Water service pipe. Water service pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table 605.3. All ductile iron water pipe shall be cement mortar lined in accordance with AWWA C104.

605.3.1 Dual check-valve-type backflow preventer. Where a dual check-valve backflow preventer is installed on the water supply system, it shall comply with ASSE 1024.

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.

605.5 Fittings. Pipe fittings shall be approved for installation with the piping material installed and shall conform to the respective pipe standards or one of the standards listed in Table 605.5. All pipe fittings utilized in water supply systems shall also conform to NSF 61. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Ductile and gray iron pipe fittings shall be cement mortar lined in accordance with AWWA C104.

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/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 0.25 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 IAPMO PS 74 95 and PS 48 92, 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. All valves shall be of the approved type and compatible with the type of piping material installed in the system.

605.8 Manufactured pipe nipples. Manufactured pipe nipples shall conform to the standard listed in Table 605.8.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass-, copper-, chromium-plated</td>
<td>ASTM B 687</td>
</tr>
</tbody>
</table>

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. Solvent-cement joints between different types of plastic pipe.
4. Saddle-type fittings.

605.10 Reserved.

605.11 Reserved.

605.12 Brass. Joints between brass pipe or fittings shall comply with Sections 605.12.1 through 605.12.3.

605.12.1 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.

605.12.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer’s instructions.
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605.12.3 **Threaded joints.** Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

605.13 **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 installation instructions.

605.14 **Copper pipe.** Joints between copper or copper-alloy pipe or fittings shall comply with Sections 605.14.1 through 605.14.4.

605.14.1 **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.

605.14.2 **Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.

605.14.3 **Soldered 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 solder and fluxes. “Lead free” shall mean a chemical composition equal to or less than 0.2-percent lead.

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

605.15 **Copper tubing.** Joints between copper or copper-alloy tubing or fittings shall comply with Sections 605.15.1 through 605.15.4.

605.15.1 **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.

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

605.15.3 **Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.

605.15.4 **Soldered 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 solder and fluxes. “Lead free” shall mean a chemical composition equal to or less than 0.2-percent lead.

605.22 **Stainless steel.** Joints between stainless steel pipe and fittings shall comply with Sections 605.22.1 and 605.22.2.

605.22.1 **Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions.

605.22.2 **Welded joints.** All joint surfaces shall be cleaned. The joint shall be welded autogenously or with an approved filler metal as referenced in ASTM A 312.

605.23 **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 605.23.1 and 605.23.3. Connectors or adaptors shall have an elastomeric seal conforming to ASTM D 1869 or ASTM F 477. Joints shall be installed in accordance with the manufacturer’s instructions.

605.23.1 **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. The copper tubing shall be soldered to the fitting in an approved manner, and the fitting shall be screwed to the threaded pipe.

605.23.2 **Reserved.**

605.23.3 **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.

SECTION PC 606

INSTALLATION OF THE BUILDING WATER DISTRIBUTION SYSTEM

606.1 **Location of full-open valves.** Full-open valves shall be installed in the following locations:

1. On the building water service pipe from the public water supply near the curb.
2. On the water distribution supply pipe at the entrance into the structure.
3. On the discharge side of every water meter.
4. 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.
5. On the top of every water down-feed pipe in occupancies other than one- and two-family residential occupancies.
6. On the entrance to every water supply pipe to a dwelling unit, except where supplying a single fixture equipped with individual stops.
7. On the water supply pipe to and from a gravity or pressurized water tank.
8. On the water supply pipe to every water heater.

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

1. On the fixture supply to each plumbing fixture other than bathtubs and showers in one- and two-family residential occupancies, and other than in individual guestrooms.
that are provided with unit shutoff valves in hotels, motels, boarding houses and similar occupancies.

2. On the water supply pipe to each silcock.

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

606.3 Access to valves. Access shall be provided to all required 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 systems. Water pressure booster systems shall be provided as required by Sections 606.5.1 through 606.5.10.

606.5.1 Water pressure booster 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 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 covered to keep out unauthorized persons, dirt and vermin. 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 (6 by 8 mesh per cm).

606.5.4 Overflows. Each gravity or suction water supply tank shall be provided with an overflow not smaller than shown in Table 606.5.4(1) and/or Table 606.5.4(2). The gallons per minute listed in the tables shall be the total automatic pump capacity connected to the tank. The overflow outlet shall discharge within 6 inches (152 mm) of a roof or roof drain, or over an open water supplied fixture. The overflow discharge shall be provided with durable screening with openings of not more than \( \frac{1}{8} \) inch (3.18 mm).

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.

### TABLE 606.5.4(1)

| SIZE OF OVERFLOWS FOR GRAVITY AND SUCTION TANKS
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERFLOW PIPE SIZE (inches)</td>
<td>MAXIMUM ALLOWABLE GPM FOR EACH ORIFICE OPENING INTO TANK</td>
<td>MAXIMUM ALLOWABLE GPM FOR VERTICAL OVERFLOW (PIPING CONNECTING ORIFICES)</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>43</td>
<td>75</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
<td>163</td>
</tr>
<tr>
<td>5</td>
<td>159</td>
<td>296</td>
</tr>
<tr>
<td>6</td>
<td>257</td>
<td>472</td>
</tr>
<tr>
<td>8</td>
<td>505</td>
<td>1,020</td>
</tr>
<tr>
<td>10</td>
<td>890</td>
<td>1,870</td>
</tr>
<tr>
<td>12</td>
<td>1,400</td>
<td>2,967</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

### TABLE 606.5.4(2)

| SIZE OF WEIRS FOR GRAVITY AND SUCTION TANKS
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SLOTTED WEIR OPENING INTO TANK BETWEEN OVERFLOW CHAMBER AND WATER COMPARTMENT</td>
<td>MAXIMUM GPM ALLOWABLE FOR WEIR</td>
</tr>
<tr>
<td>3 inches × 24 inches</td>
<td>381</td>
</tr>
<tr>
<td>3\frac{1}{2} inches × 24 inches</td>
<td>475</td>
</tr>
<tr>
<td>4\frac{1}{2} inches × 24 inches</td>
<td>685</td>
</tr>
<tr>
<td>4\frac{1}{2} inches × 36 inches</td>
<td>1,037</td>
</tr>
<tr>
<td>6 inches × 36 inches</td>
<td>1,569</td>
</tr>
<tr>
<td>6 inches × 48 inches</td>
<td>2,100</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

#### 606.5.4.2 Drain pipes for emptying tanks. Each tank or tank compartment shall be provided, at its lowest point, with a valved pipe to permit emptying the tank. The drain pipe shall discharge as required for the overflow pipe, and shall be at least 4 inches (102 mm) in diameter.

#### 606.5.4.3 Prohibited location. Potable water gravity tanks or manholes of potable water pressure tanks shall not be located directly under any soil or waste piping.

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

1. 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.

2. After the tank has been cleaned or painted, it shall be disinfected according to the following procedure before it is put back in service:
   
   2.1. 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.
   
   2.2. 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.
   
   2.3. The chlorinated water shall be allowed to remain in the tank for two hours.
   
   2.4. Finally, the tank shall be drained completely before refilling.

3. House and suction tanks shall be drained and cleaned at least once a year.

606.5.5 Low-pressure cutoff required on booster pumps. A low-pressure cutoff shall be installed on all 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 Reserved.

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 minimum size of such vacuum relief valve shall be 0.50 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 PC 312.
SECTION PC 607
HOT WATER SUPPLY SYSTEM

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

607.2 Hot water supply temperature maintenance. Where the developed length of hot water piping from the source of hot water supply to the farthest fixture exceeds 20 feet (6096 mm), the hot water supply system shall be provided with a method of maintaining the temperature in accordance with the New York State Energy Conservation Construction Code.

607.2.1 Piping insulation. Circulating hot water system piping shall be insulated in accordance with the New York State Energy Conservation Construction Code.

607.2.2 Hot water system controls. Automatic circulating hot water system pumps or heat trace shall be arranged to be conveniently turned off, automatically or manually, when the hot water system is not in operation.

607.2.3 Recirculating pump. 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. A means of controlling increased pressure caused by thermal expansion shall be provided where required in accordance with Sections 607.3.1 and 607.3.2.

607.3.1 Pressure-reducing valve. For water service system sizes up to and including 2 inches (51 mm), a device for controlling pressure shall be installed where, because of thermal expansion, the pressure on the downstream side of a pressure-reducing valve exceeds the pressure-reducing valve setting.

607.3.2 Backflow prevention device or check valve. Where a backflow prevention device, check valve or other device is installed on a water supply system utilizing storage water heating equipment such that thermal expansion causes an increase in pressure, a device for controlling pressure shall be installed.

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, where the flow of hot water corresponds to the markings on the device.

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 608.16.9.

608.2 Plumbing fixtures. The supply lines or fittings for every plumbing fixture shall be installed so as to prevent backflow.

608.3 Devices, appurtenances, appliances and apparatus. All 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 all 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 preventer, an atmospheric or spill-proof vacuum breaker, 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 protective devices are installed.

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

608.7 Stop-and-waste valves prohibited. Combination stop-and-waste valves or cocks shall not be installed underground.

608.8 Identification of potable and nonpotable water. In all buildings where two or more water distribution systems, one potable water and the other nonpotable water, are installed, each system shall be identified either by color marking or metal tags in accordance with Sections 608.8.1 through 608.8.3.

608.8.1 Information. 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 maximum intervals of 25 feet.
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 the piping is located.

608.8.2 Color. The color of the pipe identification shall be discernable and consistent throughout the building.

608.8.3 Size. The size of the background color field and lettering shall comply with Table 608.8.3.

### TABLE 608.8.3
**SIZE OF PIPE IDENTIFICATION**

<table>
<thead>
<tr>
<th>PIPE DIAMETER (inches)</th>
<th>LENGTH BACKGROUND COLOR FIELD (inches)</th>
<th>SIZE OF LETTERS (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4 to 1/4</td>
<td>8</td>
<td>0.5</td>
</tr>
<tr>
<td>1/2 to 2</td>
<td>8</td>
<td>0.75</td>
</tr>
<tr>
<td>21/2 to 6</td>
<td>12</td>
<td>1.25</td>
</tr>
<tr>
<td>8 to 10</td>
<td>24</td>
<td>2.5</td>
</tr>
<tr>
<td>over 10</td>
<td>32</td>
<td>3.5</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

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.

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

608.13 Backflow protection. Means of protection against backflow shall be provided, maintained and inspected in accordance with Sections 608.13.1 through 608.13.9.

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 preventers. Reduced pressure principle backflow preventers shall conform to ASSE 1013, AWWA C511 or CAN/CSA B64.4. 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. These devices shall be tested annually by a certified tester.

608.13.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012 or CAN/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 (10668 mm). A barometric loop shall only be utilized as an atmospheric-type or pressure-type vacuum breaker.

608.13.5 Pressure-type vacuum breakers. Pressure-type vacuum breakers shall conform to ASSE 1020 and spillproof vacuum breakers shall comply with ASSE 1056. These devices are designed for installation under continuous pressure conditions when the critical level is installed at the required height. Pressure-type vacuum breakers 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 CAN/CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CAN/CSA B64.2, CAN/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-valve assemblies. Double check-valve assemblies shall conform to ASSE 1015 or AWWA C510. Double-detector check-valve assemblies shall conform to ASSE 1048. These devices shall be capable of operating under continuous pressure conditions. These devices shall be tested annually by a certified tester.

608.13.8 Spillproof vacuum breakers. Spillproof vacuum breakers (SVB) shall conform to ASSE 1056. These devices are designed for installation under continuous-pressure conditions when 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.

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


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.
### TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

| DEVICE |
|-----------------|-----------------|-----------------|
| DEVICE |
| DEGREE OF HAZARD | APPLICATION | APPLICABLE STANDARDS |
| 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 |
| Antisiphon-type fill valves for gravity water closet flush tanks | High hazard | Backsiphonage only | ASSE 1002, CSA-B125 |
| Barometric loop | High or low hazard | Backsiphonage only | (See Section 608.13.4) |
| Reduced pressure principle backflow preventer and reduced pressure principle fire protection backflow preventer | High or low hazard | Backpressure or backsiphonage Sizes 3/8” - 16” | ASSE 1013, AWWA C511, CAN/CSA B64.4 |
| Reduced pressure detector fire protection backflow prevention assemblies | High or low hazard | Backsiphonage or backpressure (Fire sprinkler systems) | ASSE 1047 |
| Double check backflow prevention assembly and double check fire protection backflow prevention assembly | Low hazard | Backpressure or backsiphonage Sizes 3/8” - 16” | ASSE 1015, AWWA C510 |
| Double check detector fire protection backflow prevention assemblies | Low hazard | Backpressure or backsiphonage (Fire sprinkler systems) Sizes 2” - 16” | ASSE 1048 |
| Dual-check-valve-type backflow preventer | Low hazard | Backpressure or backsiphonage Sizes 3/8” - 1” | ASSE 1024 |
| Backflow preventer with intermediate atmospheric vents | Low hazard | Backpressure or backsiphonage Sizes 3/8” - 3/4” | ASSE 1012, CAN/CSA-B64.3 |
| Backflow preventer for carbonated beverage machines | Low hazard | Backpressure or backsiphonage Sizes 3/8” - 3/4” | ASSE 1022 |
| Pipe-applied atmospheric-type vacuum breaker | High or low hazard | Backsiphonage only Sizes 3/8” - 4” | ASSE 1001, CAN/CSA-B64.1.1 |
| Pressure vacuum breaker assembly | High or low hazard | Backsiphonage only Sizes 3/8” - 2” | ASSE 1020 |
| Hose-connection vacuum breaker | High or low hazard | Low head backpressure or backsiphonage Sizes 3/8” - 3/4” - 1” | ASSE 1011, CAN/CSA-B64.2 |
| Vacuum breaker wall hydrants, frost-resistant, automatic draining type | High or low hazard | Low head backpressure or backsiphonage Sizes 3/8” - 3/4” - 1” | ASSE 1019, CAN/CSA-B64.2.2 |
| Laboratory faucet backflow preventer | High or low hazard | Low head backpressure and backsiphonage | ASSE 1035, CSA B64.7 |
| Hose connection backflow preventer | High or low hazard | Low head backpressure, rated working pressure backpressure or backsiphonage Sizes 3/8” - 1” | ASSE 1052 |
| Spillproof vacuum breaker | High or low hazard | Backsiphonage only Sizes 3/8” - 2” | ASSE 1056 |

For SI: 1 inch = 25.4 mm.

- a. Low hazard.
- High hazard—See Contamination (Section 202).
- See Backpressure (Section 202).
- See Backpressure, low head (Section 202).
- See Backsiphonage (Section 202).
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.

608.15.2 Protection by a reduced pressure principle backflow preventer. Openings and outlets shall be protected by a reduced pressure principle backflow preventer.

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 a minimum of 6 inches (152 mm) above the flood level rim of the fixture or device. Fill valves shall not be installed under exhaust hoods or similar locations 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 or spillproof vacuum breakers 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 608.16.9.

608.16.1 Beverage dispensers. The water supply connection to carbonated beverage dispensers shall be protected against backflow by a backflow preventer conforming to ASSE 1022 or by an air gap. The backflow preventer device 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 equipped with a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012 or CAN/CSA B64.3. Where conditioning chemicals are introduced into the system, the potable water connection shall be protected by an air gap or a reduced pressure principle backflow preventer, complying with ASSE 1013, CAN/CSA B64.4 or AWWA C511.

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.

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 by a backflow preventer with an intermediate atmospheric vent or a reduced pressure principle backflow preventer, complying with ASSE 1013, CAN/CSA B64.4 or AWWA C511.

### TABLE 608.15.1
MINIMUM REQUIRED AIR GAPS

<table>
<thead>
<tr>
<th>FIXTURE</th>
<th>MINIMUM AIR GAP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Away from a wall (inches)</td>
</tr>
<tr>
<td>Lavatories and other fixtures with effective opening not greater than 1/2 inch in diameter</td>
<td>1</td>
</tr>
<tr>
<td>Sink, laundry trays, gooseneck back faucets and other fixtures with effective openings not greater than 3/4 inch in diameter</td>
<td>1.5</td>
</tr>
<tr>
<td>Over-rim bath fillers and other fixtures with effective openings not greater than 1 inch in diameter</td>
<td>2</td>
</tr>
<tr>
<td>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)</td>
<td>1</td>
</tr>
<tr>
<td>Effective openings greater than 1 inch</td>
<td>Two times the diameter of the effective opening</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

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.

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protected against backflow by a double check-valve assembly or a reduced pressure principle backflow preventer.

**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 preventer. Where chemical additives or antifreeze are added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle backflow preventer 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 a pipe applied atmospheric vacuum breaker conforming to ASSE 1001 or CAN/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-type vacuum breaker, a pressure-type vacuum breaker or a reduced pressure principle backflow preventer. A valve 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 preventer.

**608.16.6 Connections subject to backpressure.** Where a potable water connection is made to a nonpotable line, fixture, tank, vat, pump or other equipment subject to back-pressure, the potable water connection shall be protected by a reduced pressure principle backflow preventer.

**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, 608.13.5, 608.13.6, 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.

**608.17 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

<table>
<thead>
<tr>
<th>SOURCE OF CONTAMINATION</th>
<th>DISTANCE (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barnyard</td>
<td>100</td>
</tr>
<tr>
<td>Farm silo</td>
<td>25</td>
</tr>
<tr>
<td>Pasture</td>
<td>100</td>
</tr>
<tr>
<td>Pumphouse floor drain of cast iron draining to ground surface</td>
<td>2</td>
</tr>
<tr>
<td>Seepage pits</td>
<td>50</td>
</tr>
<tr>
<td>Septic tank</td>
<td>25</td>
</tr>
<tr>
<td>Sewer</td>
<td>10</td>
</tr>
<tr>
<td>Subsurface disposal fields</td>
<td>50</td>
</tr>
<tr>
<td>Subsurface pits</td>
<td>50</td>
</tr>
</tbody>
</table>

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 to a minimum distance of 10 feet (3048 mm) below the ground surface. All casings shall extend at least 6 inches (152 mm) above the well platform. The casing 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 minimum distance of 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 to a minimum distance of 10 feet.
WATER SUPPLY AND DISTRIBUTION

(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 to a minimum depth of 10 feet (3048 mm).

608.17.7 Cover. Every potable water well 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 at least 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. All 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: 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, and other structures with similar apparatus and equipment classified as plumbing.

609.2 Water service. All 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 PC 607.

609.4 Vacuum breaker installation. Vacuum breakers shall be installed a minimum of 6 inches (152 mm) above the flood level rim of the fixture or device in accordance with Section PC 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. All 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 PC 608.

609.7 Condensate drain trap seal. A water supply shall be provided for cleaning, flushing and rescaling the condensate trap, and the trap shall discharge through an air gap in accordance with Section PC 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. New or repaired 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 “in-plant” 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 at least 50 parts per million (50 mg/L) of chlorine, and the system or part thereof shall be filled off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing at least 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.

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 or NSF 62.

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.

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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

612.1 Solar systems. The construction, installation, alterations and repair of systems, equipment and appliances intended to 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.

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.