§ 28-601.1 Update.

No later than the third year after the effective date of this section and every third year thereafter, the commissioner shall submit to the city council proposed amendments that he or she determines should be made to this code to bring it up to date with the latest edition of the International Plumbing Code or otherwise modify the provisions thereof. In addition, prior to the submission of such proposal to the city council, such proposal shall be submitted to an advisory committee established by the commissioner pursuant to this title for review and comment.

§ 28-601.2*** Enactment of the New York City plumbing code.

The New York city plumbing code based on the 2003 edition of the International Plumbing Code published by the International Code Council, with changes that reflect the unique character of the city and amendments that bring it up to date with the 2009 edition of such International Plumbing Code, is hereby adopted to read as follows:

Chapter 1: Administration

Section PC 101: General

101.1 Title.

This code shall be known and may be cited as the "New York City Plumbing Code," "NYCPC" or "PC." All section numbers in this code shall be deemed to be preceded by the designation "PC".

101.2 Scope.

The provisions of this code shall apply to the erection, installation, alteration, repair, relocation, replacement, addition to, use or maintenance of plumbing systems. This code shall also regulate nonflammable medical gas, inhalation anesthetic, vacuum piping, nonmedical oxygen systems and sanitary and condensate vacuum collection systems. The installation of fuel gas distribution piping and equipment, fuel gas-fired water heaters, and water heater venting systems shall be regulated by the New York City Fuel Gas Code.

101.3 Intent.

The purpose of this code is to provide minimum standards to safeguard life or limb, health, property, public welfare and the environment by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of plumbing systems.

101.4 Severability.

If a section, subsection, sentence, clause or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

Section PC 102: Applicability

102.1 General.

Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 Existing installations.

Except as otherwise specifically provided, plumbing systems lawfully in existence at the time of the adoption or a subsequent amendment of this code shall be permitted to have their use and maintenance continued if the use, maintenance or repair is in accordance with the original design and no hazard to life, health or property is created by such plumbing system.

102.2.1 Existing buildings.

Additions, alterations, renovations or repairs related to building or structural issues shall be governed by Chapter 1 of Title 28 of the Administrative Code, the New York City Building Code and the 1968 Building Code, as applicable.

102.2.2 References to the New York City Building Code.

For existing buildings, a reference to a section of the New York City Building Code in this code shall also be deemed to refer to the equivalent provision of the 1968 Building Code, as applicable in accordance with Chapter 1 of Title 28 of the Administrative Code.

102.3 Maintenance.

Installations, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe and sanitary condition. Devices or safeguards that are required by this code shall be maintained in compliance with the applicable provisions under which they were installed.

102.3.1 Owner responsibility.

The owner or the owner's designated agent shall be responsible for maintenance of plumbing systems. To determine compliance with this provision, the commissioner shall have the authority to require any plumbing system to be inspected.

102.4 Additions, alterations or repairs.

Additions, alterations, renovations or repairs to installations shall conform to that required for new installations without requiring the existing installation to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause an existing installation to become unsafe, hazardous or overloaded.

102.4.1 Minor additions, alterations, renovations and repairs.

Minor additions, alterations, renovations and repairs to existing installations shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous and is approved.

102.4.2 Special provisions for prior code buildings.

In addition to the requirements of sections 102.4 and 102.4.1, the provisions of Sections 102.4.1.1 through 102.4.1.3 shall apply to prior code buildings.

102.4.2.1 Number of plumbing fixtures.

For prior code buildings, the number of required plumbing fixtures shall be permitted to be calculated based on the 1968 Building Code utilizing the occupant load figures for the 1968 Building Code, or shall be permitted to be calculated based on the New York City Plumbing Code utilizing the occupant load figures from the New York City Plumbing Code.
102.4.2.2 Seismic supports.

For prior code buildings, the determination as to whether seismic requirements apply to an alteration shall be made in accordance with the 1968 Building Code and interpretations by the department relating to such determinations. Any applicable seismic loads and requirements shall be permitted to be determined in accordance with Chapter 16 of the New York City Building Code or the 1968 Building Code and Reference Standard RS 9-6 of such code.

102.4.2.3 Wind resistance.

For prior code buildings, equipment, applicances and supports that are exposed to wind shall be designed and installed to resist the wind pressures determined in accordance with Chapter 16 of the New York City Building Code.

102.5 Change in occupancy.

Refer to Chapter 1 of Title 28 of the Administrative Code.

102.6 Reserved.

102.7 Reserved.

102.8 Referenced standards.

The standards referenced in this code shall be those that are listed in Chapter 13 and such standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced standards, the provisions of this code shall be the minimum requirements. Refer to Article 103 of Chapter 1 of Title 28 of the Administrative Code for additional provisions relating to referenced standards.

102.8.1 Editions of referenced standards.

References to standards in this code shall be to the editions of those standards provided for in Chapter 13 of this code, or as otherwise provided by rule.

102.9 Requirements not covered by code.

Requirements necessary for the strength, stability or proper operation of an existing or proposed plumbing system, or for the public safety, health and general welfare, not specifically covered by this code, shall be determined by the commissioner.

102.10 Application of references.

Reference to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

Section PC 103: Department of Buildings

103.1 Enforcement agency.

Refer to the New York City Charter and Chapter 1 of Title 28 of the Administrative Code.

Section PC 104: Duties and Powers of the Commissioner Of Buildings

104.1 General.

The commissioner shall have the authority to render interpretations of this code and to adopt rules, policies, and procedures in order to clarify and implement its provisions. Such interpretations, policies, procedures, and rules shall be in compliance with the intent and purposes of this code. See the New York City Charter and Chapter 1 of Title 28 of the Administrative Code for additional provisions relating to the authority of the Commissioner of Buildings.

104.2 Remedies for non-functioning storm water disposal systems.

If the commissioner determines that a system of storm water disposal which has been previously approved under the provisions of this code or of previous codes is no longer providing adequate drainage of storm water from a lot or development, the commissioner shall order repair of such system as required by section 28-301.1 of the Administrative Code; or if, in the judgment of the commissioner, repair of such system is not sufficient to ensure adequate drainage of storm water from such lot or development, the commissioner shall order that one of the methods of storm water disposal set forth in Chapter 11 shall be used to provide such drainage. The commissioner may apply to the Board of Standards and Appeals for modification of the certificate of occupancy of any building constructed on such lot or development to require the use of such method.

Section PC 105: Permits

105.1 General.

Permits shall comply with this section, with Article 105 of Chapter 1 of Title 28 of the Administrative Code, and with requirements found elsewhere in this code.

105.2 Required.

Any owner or authorized agent who intends to construct, add to, alter, repair, move, demolish, or change the occupancy of a building or structure, or to erect, install, add to, alter, repair, remove, convert or replace any gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application for construction document approval in accordance with Chapter 1 of Title 28 of the Administrative Code and this chapter and obtain the required permit.

105.3 Work exempt from permit.

Exemptions from permit requirements of this code as authorized in Chapter 1 of Title 28 of the Administrative Code and the rules of the department shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or rules.

105.4 Validity of permit.

The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other law. Permits presuming to give authority to violate or cancel the provisions of this code or other law shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the commissioner from requiring the correction of errors in the construction documents and other data. The commissioner is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other law.

105.5 Mandatory sewer and catch basin work required by Section 24-526 of the Administrative Code.

An applicant for a permit who is required pursuant to Section 24-526 of the Administrative Code to construct or repair defects in sewers or catch basins that lie outside the property shall submit certification from the Department of Environmental Protection in accordance with Section 105.9 of the New York City Building Code.

105.6 Other permits.

In addition to any permits required by the provisions of this code, the following permits shall also be required:

1. Permits for all water supplies and backflow devices for all buildings shall be obtained from the Department of Environmental Protection, and the installation of the water service system from the street main up to and including the meter outlet control valve shall be subject to inspection and approval by such department. All backflow devices shall be acceptable to the New York State Department of Health.

2. Permits for the installation of the building house sewer or drain from the street line to, and including, the spur connection at the street sewer shall be obtained from the Department of Environmental Protection, except that, in conjunction with the issuance of a permit for the construction or alteration of a structure within the curb line, the commissioner may issue a permit for connection with a sewer or drain.

3. Permits for sidewalk and street openings shall be obtained from the Department of Transportation.

4. Where groundwater discharge permits are required by the rules of the Department of Environmental Protection for the discharge of groundwater, such permits shall be obtained from the Department of Environmental Protection in accordance with such rules.
Section PC 106: Construction Documents

106.1 General.
Construction documents shall comply with Article 104 of Chapter 1 of Title 28 of the Administrative Code and other applicable provisions of this code and its referenced standards. Such construction documents shall be coordinated with architectural, structural and means of egress plans.

106.2 Required documents.
The applicant shall submit all of the documents specified in Sections 106.3 through 106.10 as appropriate to the nature and extent of the work proposed. Construction documents shall indicate the plumbing work to be performed, so drawn as to conform to the architectural and structural aspects of the building and to show in detail compliance with this code.

106.2.1 Composite plans. Composite plans showing compliance of architectural, structural, and mechanical parts of a building may be submitted provided that a clear understanding of each part is not impaired.

106.3 Lot diagram.
The lot diagram shall be provided where applicable to the work proposed, including but not limited to street connection locations and increases of impervious surfaces.

106.4 Building classification statement.
Where applicable to the proposed work, the statement shall identify:
1. The occupancy group or groups that apply to parts of the building in accordance with Section 302 of the New York City Building Code;
2. The occupancy group of the main use or dominant occupancy of the building;
3. The construction class of the building in accordance with Section 602 of the New York City Building Code;
4. The structure category in accordance with Table 1604.5 of the New York City Building Code;
5. The height of the building as defined in Section 502.1 of the New York City Building Code;
6. The applicable measurements to the highest and lowest level of Fire Department access; and
7. Whether the building is inside or outside of the fire districts.

106.5 Plumbing plans.
Construction documents for plumbing work shall contain plans which include the following data and information. Such plans shall not be required in connection with applications for limited plumbing alterations.

1. Riser diagrams showing the story heights, all plumbing fixtures with diagrammatic arrangement of their connections to soil, waste, and vent piping, all soil, waste, and vent stacks from the point of connection with the building drain to their termination above the roof, all leader and storm water piping from the point of connection with the building drain to the roof drain, and all risers.
2. Diagrammatic floor plans showing the location, layout, and spacing of all plumbing fixtures, the summation of plumbing loads, the size, location, and material for all building sewers and drains, and the soil, waste, vent, water, and gas distribution piping.
3. Floor plans showing typical layouts; and stack details shown on one drawing, provided that such details are clearly identified as to location and stack number.
4. Plans clearly indicating all appurtenant equipment, including, but not limited to, pumps, ejectors, water tanks, and piping.
5. In the case of plans for new plumbing systems, and alterations of existing plumbing systems, plans indicating:
   5.1. The relative elevation of the lowest fixture referred to the city datum provided in Section 28-104.7.6 of the Administrative Code and the approximate inside top of the public sewers;
   5.2. The number, size, and location of all proposed sewer connections and relative location and size of all water mains, leaders, and risers; and
   5.3. A statement from the Department of Environmental Protection, giving the minimum water pressure in the main serving the building.
6. Seismic protection and restraint details for piping and equipment as required by Chapter 16 of the New York City Building Code.
7. Details showing structural supports for water tanks where required.
8. In areas of special flood hazards, construction documents shall comply with Appendix G of the New York City Building Code.

106.6 Discharge of sewage and discharge and/or management of stormwater runoff.
Applications for construction document approval shall comply with Sections 106.6.1 and 106.6.2.

106.6.1 Sewage.
Applications for construction document approval shall include submittal documents relating to the availability and feasibility of a public sanitary or public combined sewer and/or other approved discharge for sewage in accordance with Sections 106.6.1.1 and 106.6.1.2 for the following types of applications:

1. New buildings that include any fixtures that produce sewage;
2. Alterations that require an increase in size to an existing sanitary or combined sewer connection; and/or
3. Alterations requiring a new connection to a sanitary or combined sewer.

106.6.1.1 Connection feasible and available.
Where a public sanitary or combined sewer is certified by the Department of Environmental Protection or certified by an applicant in accordance with rules of such department to be available and connection thereto feasible, the applicant shall submit:
1. Department of Environmental Protection certification of availability and feasibility. A sewer certification issued by the Department of Environmental Protection that a public sanitary or combined sewer is available and connection thereto is feasible. Applications for such certification shall be made to the Department of Environmental Protection on forms specified by such department (Department of Environmental Protection "house/site connection proposal application" or other form as specified in the rules of such department) and shall be reviewed and approved by such department in accordance with the rules of such department. Such certification may be conditioned by such department on part or all of the sewage to be disposed of with an on-site disposal system or with the use of an alternative disposal system; or
2. Applicant certification of availability and feasibility. A certification submitted by the applicant to the Department of Environmental Protection in accordance with the rules of such department that a public sanitary or combined sewer is available and connection thereto is feasible, in such cases where the availability and feasibility of connection to a public sanitary or combined sewer are allowed to be certified by the applicant pursuant to such rules. Such certification shall be on forms specified by such department (Department of Environmental Protection "house/site connection proposal application" or other form as specified in the rules of such department).

106.6.1.2 Connection not feasible or not available.
Where a public sanitary or combined sewer is not available, or where connection thereto is not feasible, the applicant shall submit:
1. Department of Environmental Protection or applicant certification of unavailability or non-feasibility.
   (i) A certification issued by the Department of Environmental Protection that a public sanitary or combined sewer is not available or that connection to an available sewer is not feasible. Such certification shall be on forms specified by such department (Department of Environmental Protection "house/site connection proposal application" or other form as specified in the rules of such department).
107.1 Construction documents shall include compliance documentation as required by the 106.10 rules and shall be submitted in accordance with the provisions of Section 1704.20.1 of the New York City Building Code. If a private stormwater or sewage disposal system is to be installed, a site and subsoil evaluation indicating that the site and subsoil conditions comply with the applicable laws shall be submitted.

If a private sewage treatment plant is to be constructed, a copy of plans approved by the Department of Health and Mental Hygiene and the Department of Environmental Protection shall be submitted.

If private sewers are to be constructed pursuant to subdivision b of Section 1403 of the New York City Charter, a copy of the sewer plan shall be submitted.

106.6.3 Post-construction stormwater management facilities.

Editor's note: § PC 106.6.3 has been added by L.L. 2017/097, 5/30/2017 but is not yet effective. See § 22 of the local law for effective date provisions.

106.7 Private sewers.

If private sewers are to be constructed pursuant to subdivision b of Section 1403 of the New York City Charter, a copy of the sewer plan shall be submitted.

106.8 Private sewage treatment plant.

If a private sewage treatment plant is to be constructed, a copy of plans approved by the Department of Health and Mental Hygiene and the Department of Environmental Protection shall be submitted.

106.9 Private stormwater or sewage disposal system.

If a private stormwater or sewage disposal system is to be installed, a site and subsoil evaluation indicating that the site and subsoil conditions comply with the applicable laws and rules shall be submitted in accordance with the provisions of Section 1704.20.1 of the New York City Building Code.

106.10 Energy efficiency.

Construction documents shall include compliance documentation as required by the New York City Energy Conservation Code.

Section PC 107: Inspections and Testing

107.1 General.

Except as otherwise specified, inspections required by this code or by the department during the progress of work, may be performed on behalf of the owner by approved agencies or, if applicable, by special inspectors. However, in the interest of public safety, the commissioner may direct that any of such inspections be performed by the department. All inspections shall be performed at the sole cost and expense of the owner. Refer to Article 116 of Chapter 1 of Title 28 of the Administrative Code for additional provisions relating to inspections.

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107.2 Required inspections and testing.
In addition to any inspections otherwise required by this code or applicable rules, the holder of the permit shall be responsible for the scheduling of the following required inspections:

1. Progress inspections:
   1.1. Underground inspection and/or testing shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place.
   1.2. Rough-in inspection and/or testing shall be made after the roof, framing, fireblocking, firestopping, draftstopping and bracing is in place and all sanitary, storm and water distribution piping is roughed-in, and prior to the installation of wall or ceiling membranes.
   1.3. Inspections required by the New York City Energy Conservation Code shall be made in accordance with rules of the department, as applicable.

2. Special inspections. Special inspections shall be performed in accordance with this code and Chapter 17 of the New York City Building Code, and, where applicable, Section 107.3.

3. Final inspection shall be made after the building is complete, all plumbing fixtures are in place and properly connected, and the structure is ready for occupancy. Refer to Article 116 of Chapter 1 of Title 28 of the Administrative Code for additional requirements.

107.2.1 Approved agencies.
Refer to Articles 114 and 115 of Chapter 1 of Title 28 of the Administrative Code.

107.2.2 Exposure of work.
It shall be the duty of the permit holder to cause the work to remain accessible and exposed for inspection purposes. Neither the commissioner nor the city shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

107.3 Special inspections of alternative engineered design systems.
Special inspections of alternative engineered design plumbing systems shall be conducted in accordance with Sections 107.3.1 and 107.3.2.

107.3.1 Periodic inspection.
The registered design professional or designated inspector shall periodically inspect and observe the alternative engineered design to determine that the installation is in accordance with the approved construction documents. All discrepancies shall be brought to the immediate attention of the plumbing contractor for correction. Records shall be kept of all inspections.

107.3.2 Written report.
The registered design professional shall submit a final report in writing to the commissioner upon completion of the installation, certifying that the alternative engineered design conforms to the approved construction documents.

107.4 Testing.
Plumbing work and systems shall be tested as required in Section 312 and in accordance with Sections 107.4.1 through 107.4.3. Tests shall be made by the permit holder and observed by the commissioner.

107.4.1 New, altered, extended or repaired systems.
New plumbing systems and parts of existing systems that have been altered, extended or repaired shall be tested as prescribed herein to disclose leaks and defects, except that testing is not required in the following cases:

1. In any case that does not include addition to, replacement, alteration or relocation of any water supply, drainage or vent piping.
2. In any case where plumbing equipment is set up temporarily for exhibition purposes.
3. For ordinary plumbing work, the department may accept written certification from a licensed master plumber that the job was performed in compliance with the requirements of this code and rules of the department.
4. Minor alterations and ordinary repairs.

107.4.2 Equipment, material and labor for tests.
All equipment, material and labor required for testing a plumbing system or part thereof shall be furnished by the permit holder.

107.4.3 Reinspection and testing.
Where any work or installation does not pass any initial test or inspection, the necessary corrections shall be made to comply with this code. The work or installation shall then be resubmitted to the commissioner for inspection and testing.

107.5 Sign-off of completed work.
Refer to Article 116 of Chapter 28 of the Administrative Code.

107.6 Temporary connection.
The commissioner shall have the authority to authorize the temporary connection of the building or system to the utility source for the purpose of testing plumbing systems or for use under a temporary Certificate of Occupancy.

107.7 Connection of service utilities.
Refer to Title 28 of the Administrative Code.

Section PC 108: Violations

108.1 General.
Refer to Chapters 2 and 3 of Title 28 of the Administrative Code.

Chapter 2: Definitions

Section PC 201: General

201.1 Scope.
Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings shown in this chapter.

201.2 Interchangeability.
Words stated in the present tense include the future; words stated in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural the singular.

201.3 Terms defined in other codes.
Where terms are not defined in this code and are defined in the New York City Building Code, New York City Fire Code, New York City Electrical Code, New York City Fuel Gas Code, New York City Mechanical Code, or the New York City Energy Conservation Code, such terms shall have the meanings ascribed to them as in those codes.
Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.

Section PC 202: General Definitions

Editor's note: this § PC 202 has been amended by L.L. 2017/097, 5/30/2017. See § 22 of the local law for effective date provisions.

ACCEP TED ENGINEERING PRACTICE. That which conforms to accepted principles, tests or standards of nationally recognized technical or scientific authorities.

ACCESS (TO). That which enables a fixture, appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel, door or similar obstruction (see "Ready access").

ACCESS COVER. A removable plate, usually secured by bolts or screws, to permit access to a pipe or pipe fitting for the purposes of inspection, repair or cleaning.

ADAPTER FITTING. An approved connecting device that suitably and properly joins or adjusts pipes and fittings which do not otherwise fit together.

AIR BREAK (Drainage System). A piping arrangement in which a drain from a fixture, appliance or device discharges indirectly into another fixture, receptacle or interceptor at a point below the flow level rim and above the trap seal.

AIR GAP (Drainage System). The unobstructed vertical distance through the free atmosphere between the outlet of the waste pipe and the flow level rim of the receptacle into which the waste pipe is discharging.

AIR GAP (Water Distribution System). The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture or other device and the flow level rim of the receptacle.

ALTERNATIVE ENGINEERED DESIGN. A plumbing system that performs in accordance with the intent of Chapters 3 through 12 and provides an equivalent level of performance for the protection of public health, safety and welfare. The system design is not specifically regulated by Chapters 3 through 12.

ANCHORS. See "Supports."

ANTISIPHON. A term applied to valves or mechanical devices that eliminate siphonage.

APPROVED. Acceptable to the commissioner. In reference to construction documents, the determination by the department after full examination that submitted construction documents comply with this code and other applicable laws and rules. In reference to materials, the determination by the commissioner that material is acceptable for its intended use. See Section 28-101.5 of the Administrative Code.

APPROVED AGENCY. An established and recognized agency, or other qualified person, regularly engaged in conducting tests or furnishing inspection services, when approved pursuant to department rules as qualified to perform or witness identified testing or inspection services. See Chapter 1 of Title 28 of the Administrative Code.

AREA DRAIN. A receptacle designed to collect surface or storm water from an open area.

ASPIRATOR. A fitting or device supplied with water or other fluid under positive pressure that passes through an integral orifice or constriction, causing a vacuum. Aspirators are also referred to as suction apparatus, and are similar in operation to an ejector.

BACKFLOW. The undesirable reversal of flow of water or mixtures of water and other liquids, gasses or other substances into the distribution pipes of the potable supply of water from any source or sources or the undesirable reversal of flow from the intended direction of flow in the drainage system due to a system stoppage, system overload or a higher pressure on the drainage pipe side of the house trap.

Backpressure, low head. A pressure less than or equal to 4.33 psi (29.88 kPa) or the pressure exerted by a 10-foot (3048 mm) column of water.

Backsiphonation. The backflow of potentially contaminated water into the potable water system as a result of the pressure in the potable water system falling below atmospheric pressure of the plumbing fixtures, pools, tanks or vats connected to the potable water distribution piping.

Drainage. A reversal of flow in the drainage system.

Water supply system. The flow of water or other liquids, mixtures or substances into the distribution pipes of a potable water supply from any source except the intended source.

BACKFLOW CONNECTION. Any arrangement whereby backflow is possible.

BACKFLOW PREVENTER. A device or means to prevent backflow.

BACKWATER VALVE. A device or valve installed in the building drain, sewer or any branch line where such drain or branch is subject to backflow, and which prevents drainage or waste from backing up into a lower level or fixtures and causing a flooding condition.

BALL COCK. See "Fill Valve."

BASE FLOOD ELEVATION. Refer to Section G201.2 of Appendix G of the New York City Building Code.

BATHROOM GROUP. A group of fixtures consisting of a water closet, lavatory, bathtub or shower, including or excluding a bidet, an emergency floor drain or both. Such fixtures are located together in the same room.

BEDPAN STEAMER OR BOILER. A fixture designed to wash bedpans and to flush the contents into the sanitary drainage system. Included are fixtures of this type that provide for disinfecting utensils by scalding with steam or boiling water.

BEDPAN WASHER AND STERILIZER. A fixture designed to wash bedpans and to flush the contents into the sanitary drainage system. Included are fixtures of this type that provide for disinfecting utensils by scalding with steam or boiling water.

BEDPAN WASHER HOSE. A device supplied with hot and cold water and located adjacent to a water closet or clinical sink to be utilized for cleansing bedpans.

BRANCH. Any part of the piping system that extends to fixtures on two or less consecutive floors except a riser, main or stack.

BRANCH INTERVAL. A vertical measurement of distance, 8 feet (2438 mm) or more in developed length, between the connections of horizontal branches to a drainage stack. Measurements are taken down the stack from the highest horizontal branch connection.

BRANCH VENT. A vent connecting one or more individual vents with a vent stack or stack vent.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy. The term shall be construed as if followed by the phrase "structure, premises, lot or part thereof" unless otherwise indicated by the text. See Section 28-101.5 of the Administrative Code.

BUILDING DRAIN. That part of the lowest piping of a drainage system that receives the discharge from soil, waste and other drainage pipes inside and that extends 5 feet (1524 mm) in developed length of pipe beyond the exterior walls of the building and conveys the drainage to the building sewer.

Combined. A building drain that conveys both sewage and storm water or other drainage.

Sanitary. A building drain that conveys sewage only.

Storm. A building drain that conveys storm water or other drainage, but not sewage.

BUILDING SEWER. See Sewer, Building sewer.

BUILDING SUBDRAIN. That portion of a drainage system that does not drain by gravity into the building sewer.

BUILDING TRAP. A device or fitting, without joints within the water seal, installed in the building drain to prevent circulation of air between the drainage system of the building and the building sewer.

CIRCUIT VENT. A vent that connects to a horizontal drainage branch and vents two traps to a maximum of eight traps or trapped fixtures connected into a battery.

CI STERN. A covered tank for storing rainwater to be utilized for purposes other than in the potable water supply.
CLEANOUT. An access opening in the drainage system utilized for the removal of obstructions. Types of cleanouts include a removable plug or cap, and a removable fixture or fixture trap.

CLEAR WASTE WATER. Drips from pumps and equipment, coil condensate, steam condensate, single pass refrigeration discharge, RPZ discharge, and similar matter.

CODE. The New York city plumbing code, subsequent amendments thereto, or any rules of the commissioner adopted pursuant thereto.

COMBINATION FIXTURE. A fixture combining one sink and laundry tray or a two- or three-compartment sink or laundry tray in one unit.

COMBINATION WASTE AND VENT SYSTEM. A specially designed system of waste piping embodying the horizontal wet venting of one or more sinks or floor drains by means of a common waste and vent pipe adequately sized to provide free movement of air above the flow line of the drain.

COMBINED BUILDING DRAIN. See "Building drain, combined."

COMBINED SEWER. See "Sewer, combined sewer."

COMMISSIONER. The Commissioner of Buildings of the City of New York or his or her duly authorized representative. See Section 28-101.5 of the Administrative Code.

COMMON VENT. A vent connecting at the junction of two fixture drains or to a fixture branch and serving as a vent for both fixtures.

CONCEALED FOULSURFACE. Any surface of a plumbing fixture which is not readily visible and is not scoured or cleansed with each fixture operation.

CONDUCTOR. A pipe inside the building that conveys storm water from the roof to a storm or combined building drain.

CONSTRUCTION DOCUMENTS. Plans and specifications and other written, graphic and pictorial documents, prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a building permit. See Section 28-101.5 of the Administrative Code.

CONTAMINATION. An impairment of the quality of the potable water that creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids or waste.

CRITICAL LEVEL (C-L). An elevation (height) reference point that determines the minimum height at which a backflow preventer or vacuum breaker is installed above the flood level rim of the fixture or receptor served by the device. The critical level is the elevation level below which there is a potential for backflow to occur. If the critical level marking is not indicated on the device, the bottom of the device shall constitute the critical level.

CROSS CONNECTION. Any physical connection or arrangement between two otherwise separate piping systems, one of which contains potable water and the other either water of unknown or questionable safety or steam, gas or chemical, whereby there exists the possibility for flow from one system to the other, with the direction of flow depending on the pressure differential between the two systems (see "Backflow").

DEAD END. A branch leading from a soil, waste or vent pipe; a building drain; or a building sewer, and terminating at a developed length of 2 feet (610 mm) or more by means of a plug, cap or other closed fitting.

DESIGN FLOOD ELEVATION. Refer to Section G201.2 of Appendix G of the New York City Building Code.

DETECTION SYSTEM. A system that slows and temporarily holds storm water runoff so that it can be released into the public sewer system at a controlled rate.

DEVELOPED LENGTH. The length of a pipeline measured along the centerline of the pipe and fittings.

DISCHARGE PIPE. A pipe that conveys the discharges from plumbing fixtures or appliances.

DRAIN. Any pipe that carries wastewater or water-borne wastes in a building drainage system.

DRAINAGE FITTINGS. Type of fitting or fittings utilized in the drainage system.

DRAINAGE FIXTURE UNIT (dfu). A measure of the probable discharge into the drainage system by various types of plumbing fixtures. The drainage fixture-unit value for a particular fixture depends on its volume rate of drainage discharge, on the time duration of a single drainage operation and on the average time between successive operations.

DRAINAGE SYSTEM. Piping within a public or private premise that conveys sewage, rainwater or other liquid wastes to a point of disposal. A drainage system does not include the mains of a public sewer system or a private or public sewage treatment or disposal plant.

Gravity. A drainage system that drains by gravity into the building sewer.

Sanitary. A drainage system that carries sewage or similar matter.

Storm. A drainage system that carries only stormwater, potable clear water waste, and groundwater.

DRYWELL. A covered pit constructed so as to permit liquid contents to seep into the ground.

DUAL FLUSH WATER CLOSET. A water closet that enables the user to select a high flush for solid waste or a reduced volume, low flush for liquid waste.

EFFECTIVE OPENING. The minimum cross-sectional area at the point of water supply discharge, measured or expressed in terms of the diameter of a circle or, if the opening is not circular, the diameter of a circle of equivalent cross-sectional area. For faucets and similar fittings, the effective opening shall be measured at the smallest orifice in the fitting body or in the supply piping to the fitting.

EMERGENCY FLOOR DRAIN. A floor drain that does not receive the discharge of any drain or indirect waste pipe, and that protects against damage from accidental spills, fixture overflows and leakage.

ESSENTIALLY NONTOXIC TRANSFER FLUIDS. Fluids having a Gosselin rating of 1, including propylene glycol; mineral oil; polydimethylsiloxane; hydrochlorofluorocarbon, chlorofluorocarbon and carbon refrigerants; and FDA-approved boiler water additives for steam boilers.

ESSENTIALLY TOXIC TRANSFER FLUIDS. Soil, waste or gray water and fluids having a Gosselin rating of 2 or more including ethylene glycol, hydrocarbon oils, ammonia refrigerants and hydrizine.

EXISTING INSTALLATIONS. Any plumbing system regulated by this code that was legally installed prior to the effective date of this code, or for which a permit to install has been issued.

FAUCET. A valve end of a water pipe through which water is drawn from or held within the pipe.

FILL VALVE. A water supply valve, opened or closed by means of a float or similar device, utilized to supply water to a tank. An antisiphon fill valve contains an antisiphon device in the form of an approved air gap or vacuum breaker that is an integral part of the fill valve unit and that is positioned on the discharge side of the water supply control valve.

FIXTURE. See "Plumbing fixture."

FIXTURE BRANCH. A drain serving two or more fixtures that discharges to another drain or to a stack.

FIXTURE DRAIN. The drain from the trap of a fixture to a junction with any other drain pipe.

FIXTURE FITTING.

Supply fitting. A fitting that controls the volume and/or directional flow of water and is either attached to or accessible from a fixture, or is used with an open or atmospheric discharge.

Waste fitting. A combination of components that conveys the sanitary waste from the outlet of a fixture to the connection to the sanitary drain system.

FIXTURE SUPPLY. The water supply pipe connecting a fixture to a branch water supply pipe or directly to a main water supply pipe.

FLOOD HAZARD AREA. Refer to Section G201.2 of Appendix G of the New York City Building Code.

FLOOD LEVEL RIM. The edge of the receptacle from which water overflows.

FLOOR DRAIN. A fixture set into a floor, used to drain water into a plumbing drainage system.
FLOW PRESSURE. The pressure in the water supply pipe near the faucet or water outlet while the faucet or water outlet is wide open and flowing.

FLUSH TANK. A tank designed with a fill valve and flush valve to flush the contents of the bowl or usable portion of the fixture.

FLUSHOMETER TANK. A device integrated within an air accumulator vessel that is designed to discharge a predetermined quantity of water to fixtures for flushing purposes.

FLUSHOMETER VALVE. A valve attached to a pressurized water supply pipe and so designed that when activated it opens the line for direct flow into the fixture at a rate and quantity to operate the fixture properly, and then gradually closes to reseal fixture traps and minimize water hammer.

GREAT SEWER. A plumbing appurtenance that is installed in a sanitary drainage system to intercept grease-laden wastes from a wastewater discharge. Such device has the ability to intercept free-floating fats and oils.

Flow control. A device installed upstream from the interceptor, having an orifice that controls the rate of flow through the interceptor and an air intake (vent) downstream from the orifice that allows air to be drawn into the flow stream.

GREAT SEWER. Effluent discharge that is produced from food processing, food preparation or other sources where grease, fats and oils enter automatic dishwasher pre rinse stations, sinks or other appurtenances.

GREAT SEWER REMOVAL DEVICE, AUTOMATIC (GRD). A plumbing appurtenance that is installed in the sanitary drainage system to intercept grease-laden waste from wastewater discharge. Such device operates on a time- or event-controlled basis and has the ability to remove free-floating fats, oils and grease automatically without intervention from the user, except for maintenance.

GROUNDWATER OR GROUND WATER. Water located beneath the ground surface in soil pore spaces and in the fractures of rock formations.

HAND SINK. A plumbing fixture especially designed and placed for the washing of hands.

HANGERS. See "Supports."

HORIZONTAL BRANCH DRAIN. A drainage branch pipe extending laterally from a soil or waste stack or building drain, with or without vertical sections or branches, that receives the discharge from two or more fixture drains or brandies and conducts the discharge to the soil or waste stack or to the building drain.

HORIZONTAL PIPE. Any pipe or fitting that makes an angle of less than 45 degrees (0.79 rad) with the horizontal.

HOT WATER. Water at a temperature greater than HOT (43°C).

HOUSE TRAP. See "Building trap."

INDIRECT WASTE PIPE. A waste pipe that does not connect directly with the drainage system, but that discharges into the drainage system through an air break or air gap into a trap, fixture, receptor or interceptor.

INDIVIDUAL SEWAGE DISPOSAL SYSTEM. A system for disposal of domestic sewage by means of a septic tank, or mechanical treatment, designed for utilization apart from a public sewer to serve a single establishment or building.

INDIVIDUAL VENT. A pipe installed to vent a fixture trap and connects with the vent system above the fixture served or terminates in the open air.

INDIVIDUAL WATER SUPPLY. A water supply that serves one or more families, and that is not an approved public water supply.

INTERCEPTOR. A device designed and installed to separate and retain for removal, by automatic or manual means, deleterious, hazardous or undesirable matter from normal wastes, while permitting normal sewage or wastes to discharge into the drainage system by gravity.

JOINT. Expansion. A loop, return bend, return offset or manufactured device that provides for the expansion and contraction in a piping system.

Flexible. Any joint between two pipes that permits one pipe to be deflected or moved without movement or deflection of the other pipe.

Mechanical. See "Mechanical joint."

Slip. A type of joint made by means of a washer or a special type of packing compound in which one pipe is slipped into the end of an adjacent pipe.

LEAD-FREE PIPE AND FITTINGS. Containing not more than 3.0-percent lead.

LEAD-FREE SOLDER AND FLUX. Containing not more than 0.2-percent lead.

LEADER. A drainage pipe for conveying storm water from roof or gutter drains to an approved means of disposal.

LOCAL VENT STACK. A vertical pipe to which connections are made from the fixture side of traps and through which vapor or foul air is removed from the fixture or device utilized on bedpan washers.

LOW-PRESSURE STEAM-HEATING BOILER. A boiler furnishing steam at pressures not exceeding 15 psig (103 kPa).

MACERATING TOILET SYSTEMS. An assembly consisting of a water closet and sump with a macerating pump that is designed to collect, grind and pump wastes from the water closet and up to two other fixtures connected to the sump.

MAIN. The principal pipe artery to which branches are connected.

MANIFOLD. See "Plumbing appurtenance."

MECHANICAL JOINT. A connection between pipes, fittings, or pipes and fittings that is not screwed, caulked, threaded, soldered, solvent cemented, brazed or welded. A joint in which compression is applied along the centerline of the pieces being joined. In some applications, the joint is part of a coupling, fitting or adapter.

MEDICAL GAS SYSTEM. The complete system to convey medical gases for direct patient application from central supply systems (bulk tanks, manifolds and medical air compressors), with pressure and operating controls, alarm warning systems, related components and piping networks extending to station outlet valves at patient use points.

MEDICAL VACUUM SYSTEMS. A system consisting of central-vacuum-producing equipment with pressure and operating controls, shutoff valves, alarm warning systems, gauges and a network of piping extending to and terminating with suitable station inlets at locations where patient suction may be required.

NONPOTABLE WATER. Water not safe for drinking, personal or culinary utilization.

OCCUPANCY. The purpose or activity for which a building or space is used or is designed, arranged or intended to be used.

OFFSET. A combination of approved bends that makes two changes in direction bringing one section of the pipe out of line but into a line parallel with the other section.

ONCE-THROUGH COOLING. The use of potable water to cool a condenser, other building equipment or process equipment, excluding equipment used to cool steam condensate, and then discharging the water into the sewage system.

OPEN AIR. Outside the structure.

PERMEABILITY. A measure of the rate of movement of liquid through soil.

PLUMBING. The practice, materials and fixtures utilized in the installation, maintenance, extension and alteration of all piping, fixtures, plumbing appliances, plumbing appurtenances, gas piping and limited fire protection as defined in Section 28-401.3 of the Administrative Code, within or adjacent to any structure, in connection with sanitary drainage or storm drainage facilities; venting systems; and public or private water supply systems.

PLUMBING APPLIANCE. Any one of a special class of plumbing fixtures intended to perform a special function. Included are fixtures having the operation or control dependent on one or more energized components, such as motors, controls, heating elements, or pressure- or temperature-sensing elements. Such fixtures are manually adjusted or controlled by the owner or operator, or are operated automatically through one or more of the following actions: a time cycle, a temperature range, a pressure range, a measured volume or weight.

PLUMBING APPUR Tenance. A manufactured device, prefabricated assembly or an on-the-job assembly of component parts that is an adjunct to the basic piping system and plumbing fixtures. An appurtenance demands no additional water supply and does not add any discharge load to a fixture or to the drainage system.
PLUMBING FIXTURE. A receptacle or device that is either permanently or temporarily connected to the water distribution system of the premises and demands a supply of water therefrom; discharges wastewater, liquid-borne waste materials or sewage either directly or indirectly to the drainage system of the premises; or requires both a water supply connection and a discharge to the drainage system of the premises.

PLUMBING SYSTEM. Includes the water supply and distribution pipes; plumbing fixtures and traps; water-treating or water-using equipment; soil, waste and vent pipes; and sanitary and storm sewers and building drains; in addition to their respective connections, devices and appurtenances within a structure or premises.

PEANUTMEAL SEWAGE EJECTOR VENT. A vent from pneumatic sewage ejectors that terminates separately to the open air.

POTABLE WATER. Water free from impurities present in amounts sufficient to cause disease or harmful physiological effects and conforming to the bacteriological and chemical quality requirements of the New York State Sanitary Code.

PRIVATE. In the classification of plumbing fixtures, "private" applies to fixtures in residences and apartments, and to fixtures in nonpublic toilet rooms of hotels and motels and similar installations in buildings where the plumbing fixtures are intended for utilization by a family or an individual.

PRIVATE SEWER. See "Sewer, private sewer."

PUBLIC OR PUBLIC UTILIZATION. In the classification of plumbing fixtures, "public" applies to fixtures in general toilet rooms of schools, gymnasiums, hotels, airports, bus and railroad stations, public buildings, bars, public comfort stations, office buildings, stadiums, stores, restaurants and other installations where a number of fixtures are installed so that their utilization is similarly unrestricted.

PUBLIC SEWER. See "Sewer, public sewer."

PUBLIC WATER MAIN. A water supply pipe for public utilization controlled by public authority.

QUICK-CLOSING VALVE. A valve or faucet that closes automatically when released manually or that is controlled by a mechanical means for fast-action closing.

READY ACCESS. That which enables a fixture, appliance or equipment to be directly reached without requiring the removal or movement of any panel, door or similar obstruction and without the use of a portable ladder, step stool or similar device.

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER (RPZ). A backflow prevention device consisting of two independently acting check valves, internally force-loaded to a normally closed position and separated by an intermediate chamber (or zone) in which there is an automatic relief means of venting to the atmosphere, internally loaded to a normally open position between two tightly closing shutoff valves and with a means for testing for tightness of the checks and opening of the relief means.

REGISTERED DESIGN PROFESSIONAL. Refer to Chapter 1 of Title 28 of the Administrative Code.

RELIEF VALVE.

Pressure relief valve. A pressure-actuated valve held closed by a spring or other means and designed to relieve pressure automatically at the pressure at which such valve is set.

Temperature and pressure relief (T&P) valve. A combination relief valve designed to function as both a temperature relief and a pressure relief valve.

Temperature relief valve. A temperature-actuated valve designed to discharge automatically at the temperature at which such valve is set.

RELIEF VENT. A vent whose primary function is to provide circulation of air between drainage and vent systems.

RETENTION SYSTEM. A system that captures storm water runoff on site with no release.

RIM. An unobstructed open edge of a fixture.

RISER. A water supply pipe that extends one full story or more to convey water to branches or to a group of fixtures.

ROOF DRAIN. A drain installed to receive water collecting on the surface of a roof and to discharge such water into a leader or a conductor.

ROUGH-IN. Parts of the plumbing system that are installed prior to the installation of fixtures. This includes drainage, water supply, vent piping and the necessary fixture supports and any fixtures that are built into the structure.

SANITARY SEWER. See "Sewer, sanitary sewer."

SELF-CLOSING FAUCET. A faucet containing a valve that automatically closes upon deactivation of the opening means.

SEPARATOR. See "Interceptor."

SEWAGE. Any liquid waste containing animal or vegetable matter in suspension or solution or chemicals in solution including but not limited to wastewater, human or animal wastes, non-poible clear water waste, and industrial waste.

SEWAGE EJECTORS. Mechanical devices used to pump or eject sewage.

SEWER.

Building sewer. That part of the drainage system that extends from the end of the building drain and conveys the discharge to a public sewer, private sewer, individual sewage disposal system or other point of disposal.

Combined sewer. A sewer receiving a combination of sewage, storm water, groundwater and non-poible clear water waste.

Private sewer. A private sanitary, storm, or combined sewer that is designed and constructed in accordance with the requirements of the City drainage plan to serve a specific development and is located in a finally mapped street, a record sheet, or a sewer easement, and discharges into an approved outlet.

Public sewer. A sewer that is owned by the city of New York.

Sanitary sewer. A sewer that conveys only sewage.

Storm sewer. A sewer that conveys only storm water, groundwater and potable clear water waste.

SINGLE-OCUPANT TOILET ROOM. A toilet room with no more than one water closet and no more than one urinal.

Exception: A toilet room with one urinal and a door to such room that is not securable from within.

SLOPE. The fall (pitch) of a line of pipe in reference to a horizontal plane. In drainage, the slope is expressed as the fall in units vertical per units horizontal (percent) for a length of pipe.

SOIL PIPE. A pipe that conveys sewage containing fecal matter to the building drain or building sewer.

STACK. A general term for any vertical line of soil, waste, vent or inside conductor piping that extends through at least one story with or without offsets.

STACK VENT. The extension of a soil or waste stack above the highest horizontal drain connected to the stack.

STACK VENTING. A method of venting a fixture or fixtures through the soil or waste stack.

STERILIZER.

Boiling type. A boiling-type sterilizer is a fixture of a nonpressure type utilized for boiling instruments, utensils or other equipment for disinfection. These devices are portable or are connected to the plumbing system.

Instrument. A device for the sterilization of various instruments.

Pressure (autoclave). A pressure vessel fixture designed to utilize steam under pressure for sterilizing.

Pressure instrument washer sterilizer. A pressure instrument washer sterilizer is a pressure vessel fixture designed to both wash and sterilize instruments during the operating cycle of the fixture.

Utensil. A device for the sterilization of utensils as utilized in health care services.
**Water**. A water sterilizer is a device for sterilizing water and storing sterile water.

**STERILIZER VENT.** A separate pipe or stack, indirectly connected to the building drainage system at the lower terminal, that receives the vapors from nonpressure sterilizers, or the exhaust vapors from pressure sterilizers, and conducts the vapors directly to the open air. Also called vapor, steam, atmospheric or exhaust vent.

**STORM DRAIN.** See “Drainage system, storm.”

**STORM SEWER.** See “Sewer, storm sewer.”

**STORM WATER OR STORMWATER.** The excess water running off from the surface of a drainage area during and immediately following a period of precipitation.

**STRUCTURE.** That which is built or constructed, including among others: buildings, stadia, tents, reviewing stands, platforms, stagings, observation towers, radio towers, tanks, tents, open sheds, shelters, fences, and display signs. See Section 28-101.5 of the Administrative Code.

**SUBSOIL DRAIN.** A drain that collects subsurface water or seepage water and conveys such water to a place of disposal.

**SUMP.** A tank or pit that receives clear liquid waste, located below the normal grade of the gravity system and that must be emptied by mechanical means.

**SUMP PUMP.** An automatic water pump for the removal of drainage, except sewage, from a sump, pit or low point.

**SUMP VENT.** A vent from pneumatic sewage ejectors, or similar equipment, that terminates to the sanitary vent system or separately to the open air.

**SUPPORTS.** Devices for supporting and securing pipe, fixtures and equipment.

**SWIMMING POOL.** Any structure, basin, chamber or tank containing an artificial body of water for swimming, diving or recreational bathing having a depth of 2 feet (610 mm) or more at any point.

**TEMPERED WATER.** Water having a temperature range between 85°F (29°C) and 110°F (43°C).

**THIRD-PARTY CERTIFICATION AGENCY.** An approved agency operating a product or material certification system that incorporates initial product testing, assessment and surveillance of a manufacturer's quality control system.

**THIRD-PARTY CERTIFIED.** Certification obtained by the manufacturer indicating that the function and performance characteristics of a product or material have been determined by testing and ongoing surveillance by an approved third-party certification agency. Assertion of certification is in the form of identification in accordance with the requirements of the third-party certification agency.

**THIRD-PARTY TESTED.** Procedure by which an approved testing laboratory provides documentation that a product, material or system conforms to specified requirements.

**TRAP.** A fitting or device that provides a liquid seal to prevent the emission of sewer gases without materially affecting the flow of sewage or wastewater through the trap.

**TRAP SEAL.** The vertical distance between the weir and the top of the dip of the trap.

**UNSTABLE GROUND.** Earth that does not provide a uniform bearing for the barrel of the sewer pipe between the joints at the bottom of the pipe trench.

**VACUUM.** Any pressure less than that exerted by the atmosphere.

**VACUUM BREAKER.** A type of backflow preventer installed on openings subject to normal atmospheric pressure that prevents backflow by admitting atmospheric pressure through ports to the discharge side of the device.

**VENT PIPE.** See “Vent system” and “Vent System (Methane and Radon).”

**VENT STACK.** A vertical vent pipe installed primarily for the purpose of providing circulation of air to and from any part of the drainage system.

**VENT SYSTEM (Methane and Radon).** A pipe or pipes installed to provide a flow of air to or from a drainage system, or to provide a circulation of air within such system to protect trap seals from siphonage and backpressure.

**WATER HEATER.** Any heating appliance or equipment that heats potable water and supplies such water to the potable hot water distribution system.

**WATER-MEMBER.** A device that measures the flow of water supplied from a public water main to a building and that is used by the Department of Environmental Protection to bill for water supplied to the building.

**WATER OUTLET.** A discharge opening through which water is supplied to a fixture, into the atmosphere (except into an open tank that is part of the water supply system), to a boiler or heating system, or to any devices or equipment requiring water to operate which are not part of the plumbing system.

**WATER PIPE.** A pipe that conveys only water.

**WATER-HAMMER ARRESTOR.** A device utilized to absorb the pressure surge (water hammer) that occurs when water flow is suddenly stopped in a water supply system.

**WATER CONNECTION.** A water service pipe, water distribution pipes, and the necessary connecting pipes, fittings, control valves and all appurtenances in or adjacent to the structure or premises.

**WELL.** Any structure, basin, chamber or tank containing an artificial body of water for swimming, diving or recreational bathing having a depth of 2 feet (610 mm) or more at any point.

**Bored.** A well constructed by boring a hole in the ground with an auger and installing a casing.

**Drilled.** A well constructed by making a hole in the ground with a drilling machine of any type and installing casing and screen.

**Driven.** A well constructed by driving a pipe in the ground. The drive pipe is usually fitted with a well point and screen.

**Dug.** A well constructed by excavating a large-diameter shaft and installing a casing.

**WHIRLPOOL BATH TUB.** A plumbing appliance consisting of a bathtub fixture that is equipped and fitted with a circulating piping system designed to accept, circulate and discharge bathtub water upon each use.

**YOKE VENT.** A pipe connecting upward from a soil or waste stack to a vent stack for the purpose of preventing pressure changes in the stacks.

(Am. L.L. 2016/079, 6/28/2016, eff. 10/26/2016)
Chapter 3: General Regulations

Section PC 301: General

301.1 Scope.
The provisions of this chapter shall govern the general regulations regarding the installation of plumbing not specific to other chapters.

301.2 System installation.
Plumbing shall be installed with due regard to preservation of the strength of structural members and prevention of damage to walls and other surfaces through fixture usage.

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

Exception: Fixtures discharging wastewater shall not be required to discharge to the sanitary drainage system where such fixtures discharge to a water recycling system in accordance with Appendix C.

301.4 Connections to water supply.
Every building intended for human habitation, occupancy or use shall be directly or indirectly connected to the water supply system in accordance with the provisions of this code. Every plumbing fixture, device or appliance requiring or using water for its proper operation shall be directly or indirectly connected to the water supply system in accordance with the provisions of this code.

301.5 Pipe, tube and fitting sizes.
Unless otherwise specified, the pipe, tube and fitting sizes specified in this code are expressed in nominal or standard sizes as designated in the referenced material standards.

301.6 Prohibited locations.
Plumbing systems shall not be located in an elevator shaft and plumbing systems not related to elevator machinery shall not be located in elevator equipment rooms.

Exception: Floor drains, sumps and sump pumps shall be permitted at the base of the shaft, provided they are indirectly connected to the plumbing system.

301.7 Conflicts.
In instances where conflicts occur between this code and the manufacturer's installation instructions, the more restrictive provisions shall apply.

Section PC 302: Exclusion of Materials Detrimental to the Sewer System

302.1 Detrimental or dangerous materials.
Ashes, cinders or rags; flammable, combustible, poisonous or explosive liquids or gases; oil, grease or any other insoluble material capable of obstructing, damaging or overloading the building drainage or sewer system, or capable of interfering with the normal operation of the sewage treatment processes; or any other substance or material prohibited from being discharged into the public sewers in accordance with the rules of the Department of Environmental Protection, shall not be deposited, by any means, into such systems.

302.2 Industrial wastes.
Waste products from manufacturing or industrial operations shall not be introduced into the public sewer except in accordance with the rules of the Department of Environmental Protection.

Section PC 303: Materials

303.1 Identification.
Each length of pipe and each pipe fitting, trap, fixture, material and device utilized in a plumbing system shall bear the identification of the manufacturer.

303.2 Installation of materials.
All materials used shall be installed in strict accordance with the standards under which the materials are approved. In the absence of such installation procedures, the manufacturer's installation instructions shall be followed. Where the requirements of referenced standards or manufacturer's installation instructions do not conform to minimum provisions of this code, the provisions of this code shall apply.

303.3 Plastic pipe, fittings and components.
Where permitted by this code, plastic pipe, fittings and components shall be third-party certified as conforming to NSF 14.

303.4 Third-party testing and certification.
All plumbing products and materials shall comply with the referenced standards, specifications and performance criteria of this code and shall be identified in accordance with Section 303.1. When required by Table 303.4, plumbing products and materials shall either be tested by an approved third-party testing agency or certified by an approved third-party certification agency.

Table 303.4 Products and Materials Requiring Third-Party Testing and Third-Party Certification

<table>
<thead>
<tr>
<th>Product or Material</th>
<th>Third-Party Certified</th>
<th>Third-Party Tested</th>
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</thead>
<tbody>
<tr>
<td>Potable water supply system components and potable water fixture fittings</td>
<td>Required</td>
<td>=</td>
</tr>
<tr>
<td>Sanitary drainage and vent system components</td>
<td>Plastic pipe, fittings and pipe-related components</td>
<td>All others</td>
</tr>
<tr>
<td>Waste fixture fittings</td>
<td>Plastic pipe, fittings and pipe-related components</td>
<td>All others</td>
</tr>
<tr>
<td>Storm drainage system components</td>
<td>Plastic pipe, fittings and pipe-related components</td>
<td>All others</td>
</tr>
<tr>
<td>Plumbing fixtures</td>
<td>=</td>
<td>Required</td>
</tr>
<tr>
<td>Plumbing appliances</td>
<td>Required</td>
<td>=</td>
</tr>
<tr>
<td>Backflow prevention devices</td>
<td>Required</td>
<td>=</td>
</tr>
<tr>
<td>Water distribution system safety devices</td>
<td>Required</td>
<td>=</td>
</tr>
<tr>
<td>Special waste system components</td>
<td>=</td>
<td>Required</td>
</tr>
<tr>
<td>Subsoil drainage system components</td>
<td>=</td>
<td>Required</td>
</tr>
</tbody>
</table>

Section PC 304: Rodent Proofing

304.1 General.
Plumbing systems shall be designed and installed in accordance with Sections 304.2 and 304.4 to prevent rodents from entering structures.

304.2 Strainer plates.
Section PC 305: Protection of Pipes and Plumbing System Components

305.1 Corrosion.

Pipes passing through concrete or cinder walls and floors or other corrosive material shall be protected against external corrosion by a protective sheathing or wrap planing or other means that will withstand any reaction from the lime and acid of concrete, cinder or other corrosive material. Sheathing or wrapping shall allow for movement, including expansion and contraction of piping to prevent any rubbing action. Minimum thickness of sheathing or wrapping material shall be 0.025 inch (0.64 mm).

305.2 Breakage.

Pipes passing through or under walls shall be protected from breakage.

305.3 Stress and strain.

Piping in a plumbing system shall be installed so as to prevent strains and stresses that exceed the structural strength of the pipe. Where necessary, provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement.

305.4 Sleeves.

Annular spaces between sleeves and pipes shall be filled or tightly caulked in an approved manner. Annular spaces between sleeves and pipes in fire-resistance-rated assemblies shall be filled or tightly caulked in accordance with the New York City building code.

305.5 Pipes through or under footings or foundation walls.

Any pipe that passes under a footing or through a foundation wall shall be provided with a relieving arch, or a pipe sleeve pipe shall be built into the foundation wall. The sleeve shall be two pipe sizes greater than the pipe passing through the wall.

305.6 Freezing.

Water, soil and waste pipes shall not be installed outside of a building, in attics or crawl spaces, concealed in outside walls, or in any other place subject to freezing temperature unless adequate provision is made to protect such pipes from freezing by insulation or heat or both. Exterior water supply system piping shall be installed not less than 48 inches (1219 mm) below grade.

305.6.1 Sewer depth.

Building sewers that connect to private sewage disposal systems shall be a minimum of 36 inches (914 mm) below finished grade at the point of septic tank connection. Building sewers shall be a minimum of 36 inches (914 mm) below grade.

305.7 Waterproofing of openings.

Joints at the roof and around vent pipes, shall be made water tight by the use of lead, copper, galvanized steel, aluminum, plastic or other approved flashings or flashing material. Exterior wall openings shall be made water tight.

305.8 Protection against physical damage.

In concealed locations where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates. Such shield plates shall have a thickness of not less than 0.0575-inches (1.436 mm) (No. 16 gauge). Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

305.9 Protection of components of plumbing system.

Components of a plumbing system installed along alleyways, driveways, parking garages or other locations exposed to damage shall be recessed into the wall or otherwise protected in an approved manner.

305.10 Wind resistance.

Equipment, appliances and supports that are exposed to wind shall be designed and installed to resist the wind pressures determined in accordance with the New York City Building Code.

Section PC 306: Trenching, Excavation and Backfill

306.1 Support of piping.

Buried piping shall be supported throughout its entire length.

306.2 Trenching and bedding.

Where trenches are excavated such that the bottom of the trench forms the bed for the pipe, solid and continuous load-bearing support shall be provided between joints. Bell holes, hub holes and coupling holes shall be provided at points where the pipe is joined. Such pipe shall not be supported on blocks to grade. In instances where the materials manufacturer’s installation instructions are more restrictive than those prescribed by the code, the material shall be installed in accordance with the more restrictive requirement.

306.2.1 Overexcavation.

Where trenches are excavated below the installation level of the pipe such that the bottom of the trench does not form the bed for the pipe, the trench shall be backfilled to the installation level of the bottom of the pipe with sand or fine gravel placed in layers of 6 inches (152 mm) maximum depth and such backfill shall be compacted after each placement.

306.2.2 Rock removal.

Where rock is encountered in trenching, the rock shall be removed to a minimum of 3 inches (76 mm) below the installation level of the bottom of the pipe, and the trench shall be backfilled to the installation level of the bottom of the pipe with sand tamped in place so as to provide uniform load-bearing support for the pipe between joints. The pipe, including the joints, shall not rest on rock at any point.

306.2.3 Soft load-bearing materials.

If soft materials of poor load-bearing quality are found at the bottom of the trench, pipe shall be hung from slab above.

306.3 Backfilling.

Backfill shall be free from discarded construction material and debris. Loose earth free from rocks, broken concrete and frozen chunks shall be placed in the trench in 6 inch (152 mm) layers and tamped in place until the crown of the pipe is covered by 12 inches (305 mm) of tamped earth. The backfill under and beside the pipe shall be compacted for pipe support. Backfill shall be brought up evenly on both sides of the trench to the point where the manufacturer’s installation instructions for materials are more restrictive than those prescribed by the code, the material shall be installed in accordance with the more restrictive requirement.

306.4 Tunneling.

Where pipe is to be installed by tunneling, jacking or a combination of both, the pipe shall be protected from damage during installation and from subsequent uneven loading. Where earth tunnels are used, adequate supporting structures shall be provided to prevent future settling or caving.
Section PC 307: Structural Safety

307.1 General.
In the process of installing or repairing any part of a plumbing and drainage installation, the finished floors, walls, ceilings, tile work or any other part of the building or premises that must be changed or replaced shall be left in a safe structural condition in accordance with the requirements of the New York city building code.

307.2 Cutting, notching or bored holes.
A framing member shall not be cut, notched or bored in excess of limitations specified in the New York city building code.

307.3 Penetrations of floor/ceiling assemblies and fire-resistance-rated assemblies.
Penetrations of floor/ceiling assemblies and assemblies required to have a fire-resistance rating shall be protected in accordance with the New York city building code.

307.4 Alterations to trusses.
Truss members and components shall not be cut, drilled, notched, spliced or otherwise altered in any way without written concurrency and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, water heater) shall not be permitted without verification that the truss is capable of supporting such additional loading.

307.5 Trench location.
Trenches installed parallel to footings shall not extend below the 45-degree (0.79 rad) bearing plane of the footing or wall.

307.6 Piping materials exposed within plenums.
All piping materials exposed within plenums shall comply with the provisions of the New York City Construction Codes.

Section PC 308: Piping Support

308.1 General.
All plumbing piping shall be supported in accordance with this section.

308.2 Piping seismic supports.
Where earthquake loads are applicable in accordance with the building code, plumbing piping supports shall be designed and installed for the seismic forces in accordance with the New York city building code.

308.3 Materials.
Hangers, anchors and supports shall support the piping and the contents of the piping. Hangers and strapping material shall be of approved material that will not promote galvanic action.

308.4 Structural attachment.
Hangers and anchors shall be attached to the building construction in an approved manner.

308.5 Interval of support.
Pipe shall be supported in accordance with Table 308.5.

**Table 308.5**

<table>
<thead>
<tr>
<th>Piping Material</th>
<th>Maximum Horizontal Spacing (feet)</th>
<th>Maximum Vertical Spacing (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS pipe</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Brass pipe</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Cast-iron pipe</td>
<td>5²</td>
<td>At base and at each story height no greater than 20</td>
</tr>
<tr>
<td>Copper or copper-alloy pipe</td>
<td>12</td>
<td>At each story height no greater than 12</td>
</tr>
<tr>
<td>Copper or copper-alloy tubing, 1 1/4-inch diameter and smaller</td>
<td>6</td>
<td>At each story height no greater than 10</td>
</tr>
<tr>
<td>Copper or copper-alloy tubing, 1 1/2-inch diameter and larger</td>
<td>10</td>
<td>At each story height no greater than 10</td>
</tr>
<tr>
<td>Steel pipe</td>
<td>12</td>
<td>At every story height</td>
</tr>
<tr>
<td>PVC pipe</td>
<td>4</td>
<td>10²</td>
</tr>
<tr>
<td>Stainless steel drainage systems</td>
<td>10</td>
<td>10²</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. The maximum horizontal spacing of cast-iron pipe hangers shall be increased to 10 feet where 10-foot lengths of pipe are installed.

b. Midstory guide for sizes 2 inches and smaller.

308.6 Sway bracing.
Rigid support sway bracing shall be provided at changes in direction greater than 45 degrees (0.79 rad) for pipe sizes 4 inches (102 mm) and larger.

308.7 Anchorage.
Anchorage shall be provided to restrain drainage piping from axial movement.

308.7.1 Location.
For pipe sizes greater than 4 inches (102 mm), restraints shall be provided for drain pipes at all changes in direction and at all changes in diameter greater than two pipe sizes. Braces, blocks, rodding and other suitable methods as specified by the coupling manufacturer shall be utilized.

308.8 Expansion joint fittings.
Expansion joint fittings shall be used only where necessary to provide for expansion and contraction of the pipes. Expansion joint fittings shall be of the typical material suitable for use with the type of piping in which such fittings are installed.

308.9 Parallel water distribution systems.
Piping bundles for manifold systems shall be supported in accordance with Table 308.5. Support at changes in direction shall be in accordance with the manufacturer's installation instructions. Hot and cold water piping shall not be grouped in the same bundle.
Section PC 309: Flood Hazard Resistance

309.1 General.

Plumbing systems and equipment in structures erected in flood hazard areas shall be constructed in accordance with the requirements of this section and Appendix G of the New York City Building Code.

309.2 Flood hazard.

For structures located in flood hazard areas, the following systems and equipment shall be located at or above the design flood elevation:

Exception: In accordance with Appendix G of the New York City Building Code, the following systems are permitted to be located below the design flood elevation provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.

1. All water service pipes.
2. All sanitary drainage piping.
3. Manhole covers shall be sealed, except where elevated to or above the design flood elevation.
4. All storm drainage piping.
5. Vents and vent systems.

309.3 Flood hazard areas subject to high-velocity wave action.

Structures located in flood hazard areas subject to high-velocity wave action shall meet the requirements of Section 309.2. The plumbing systems, pipes and fixtures shall not be mounted or penetrate through walls intended to break away under flood loads.

Section PC 310: Washroom and Toilet Room Requirements

310.1 Light and ventilation.

Washrooms and toilet rooms shall be illuminated and ventilated in accordance with the New York city building code and New York city mechanical code.

310.2 Location of fixtures and piping.

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

310.3 Interior finish.

Interior finish surfaces of toilet rooms shall comply with the New York city building code.

310.4 Water closet compartment.

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

Exceptions:

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

310.5 Urinal partitions.

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

Exceptions:

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

Section PC 311: Toilet Facilities for Workers

311.1 General.

Toilet facilities shall be provided for construction workers and such facilities shall be maintained in a sanitary condition. Construction worker toilet facilities of the nonsewer type shall conform to ANSI Z4.3.

Section PC 312: Tests and Inspections

312.1 Required tests.

The licensed master plumber shall make the applicable tests prescribed in Sections 312.2 through 312.10 to determine compliance with the provisions of this code. The licensed master plumber shall give two days notice to the commissioner when the plumbing work is ready for tests. The equipment, material, power and labor necessary for the inspection and test shall be furnished by the licensed master plumber and the licensed master plumber shall be responsible for determining that the work will withstand the test pressure prescribed in the following tests. All plumbing system piping shall be tested with either water or, for piping systems other than plastic, by air. After the plumbing fixtures have been set and their traps filled with water, the entire drainage system shall be submitted to final tests. The commissioner shall require the removal of any clearouts if necessary to ascertain whether the pressure has reached all parts of the system.

Exception: In accordance with Appendix G of the New York City Building Code, the following systems are permitted to be located below the design flood elevation provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation.

1. All water service pipes.
2. All sanitary drainage piping.
3. Manhole covers shall be sealed, except where elevated to or above the design flood elevation.
4. All storm drainage piping.
5. Vents and vent systems.

312.1 Test gauges.

Gauges used for testing shall be as follows:

1. Tests requiring a pressure of 10 pounds per square inch (psi) (69 kPa) or less shall utilize a testing gauge having increments of 0.10 psi (0.69 kPa) or less.
2. Tests requiring a pressure of greater than 10 psi (69 kPa) but less than or equal to 100 psi (689 kPa) shall utilize a testing gauge having increments of 1 psi (69 kPa) or less.

http://library.amlegal.com/alpscripts/get-content.aspx
Tests in accordance with this code shall be witnessed by department plumbing inspectors or approved agencies. The department shall prescribe qualifications for individuals who are authorized to witness such tests on behalf of approved agencies, including but not limited to the requirement that such individuals shall be licensed master plumbers or registered design professionals with not less than 5 years experience in the inspection and testing of piping systems. Such tests may be conducted without any inspection or tests witnessed by the department, provided that verified statements and supporting inspectorial and test reports are filed with the department within two working days of such tests.

### 312.2 Drainage and vent water test.

A water test shall be applied to the drainage system either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest openings of the section under test, and each section shall be filled with water, but no section shall be tested with less than a 10 foot (3048 mm) head of water. In testing successive sections, at least the upper 10 feet (3048 mm) of the next preceding section shall be tested so that no joint or pipe in the building, except the uppermost 10 feet (3048 mm) of the system, shall have been submitted to a test of less than a 10 foot (3048 mm) head of water. This pressure shall be held for at least 15 minutes. The system shall then be tight at all points.

### 312.3 Drainage and vent air test.

An air test shall be made by forcing air into the system until there is a uniform gauge pressure of 5 psi (34.5 kPa). This pressure shall be held for a test period of at least 15 minutes. Any adjustments to the test pressure required because of changes in ambient temperature or the seating of gaskets shall be made prior to the beginning of the test period.

### 312.4 Drainage and vent final test.

The final test of the completed drainage and vent system shall be visual and in sufficient detail to determine compliance with the provisions of this code. Where a smoke test is utilized, it shall be made by filling all traps with water and then introducing into the entire system a pungent, thick smoke produced by one or more smoke machines. When the smoke appears at stack openings on the roof, the stack openings shall be closed and a pressure equivalent to a 1-inch water column (248.8 Pa) shall be held for a test period of not less than 15 minutes.

### 312.5 Water supply system test.

Upon completion of a section or the entire water supply system, the system, or portion completed, shall be tested and proved tight under a water pressure of 50 psi (344 kPa) above its normal working pressure but not less than 150 psi (1033 kPa). The water utilized for tests shall be obtained from a potable source of supply. The required tests shall be performed in accordance with this section and Section PC 107.

#### 312.5.1 Water service pipe.

In addition to any requirements of Section 312.5, tests for water service pipes shall comply with the following:

1. In the presence of the owner or the inspector of the Department of Environmental Protection, each new service pipe or repaired service pipe shall be subjected to a water test made under the street main pressure.
2. All such pipes and appurtenances shall remain uncovered for the duration of the test and shall show no sign of leakage.
3. When any question arises as to the installation conforming with these regulations, an internal hydrostatic test as specified for materials may be applied, subject to the approval of the Department of Environmental Protection.

### 312.6 Gravity sewer test.

Gravity sewer tests shall consist of plugging the end of the building sewer at the point of connection with the public sewer, filling the building sewer with water, testing with not less than a 10-foot (3048 mm) head of water and maintaining such pressure for 15 minutes.

#### 312.7 Forced sewer test.

Forced sewer tests shall consist of plugging the end of the building sewer at the point of connection with the public sewer and applying a pressure of 5 psi (34.5 kPa) greater than the shut off pump rating, and maintaining such pressure for 15 minutes.

#### 312.8 Storm drainage system test.

Storm drain systems within a building shall be tested by water or air in accordance with Section 312.2 or 312.3. Where storm drainage piping is designed to run full, the system shall be tested to withstand the head of 10 feet (3048 mm) of water above the anticipated high water level. Exception: Corrugated HDPE pipe installed outside of a building shall be tested to withstand the head of water equal to grade.

#### 312.9 Shower liner test.

Where shower floors and receptors are made water-tight by the application of materials required by Section 417.5.2, the completed liner installation shall be tested. The pipe from the shower drain shall be plugged water-tight for the test. The floor and receptor area shall be filled with potable water to a depth of not less than 2 inches (51 mm) measured at the threshold. Where a threshold of at least 2 inches (51 mm) high does not exist, a temporary threshold shall be constructed to retain the test water in the lined floor or receptor area to a level not less than 2 inches (51 mm) deep measured at the threshold. The water shall be retained for a test period of not less than 15 minutes, and there shall not be evidence of leakage.

### 312.10 Inspection and testing of backflow prevention assemblies.

Inspection and testing of secondary backflow prevention assemblies shall comply with Sections 312.10.1 and 312.10.2.

#### 312.10.1 Inspections.

Annual inspections shall be made of all backflow prevention assemblies, air gaps, spill-proof vacuum breakers, pressure vacuum breaker assemblies, and hose connection backflow preventers to determine whether they are operable on forms provided by the department. Such forms shall be retained by the owner and shall be made available upon request to the department for a period of five years.

#### 312.10.2 Testing.

Reduced pressure principle backflow preventer assemblies, double check-valve assemblies, reduced pressure detector fire protection backflow prevention assemblies, and double check detector fire protection backflow prevention assemblies shall be tested at the time of installation, immediately after repairs or relocation, and annually thereafter. Refer to Section 608.13 and the Department of Environmental Protection for additional testing requirements. The testing procedure shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5052, ASSE 5056, CSA B64.10 or CSA B64.10.1.

### Section PC 313: Equipment Efficiencies

#### 313.1 General.

Equipment efficiencies shall be in accordance with the New York City Energy Conservation Code.

### Section PC 314: Condensate Disposal

#### 314.1 Fuel-burning appliances.

Liquid combustion by-products of condensing appliances shall be collected and discharged to an approved plumbing fixture or disposal area in accordance with the manufacturer's installation instructions. Condensate piping shall be of approved corrosion-resistant material and shall not be smaller than the drain connection on the appliance. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-percent slope).

#### 314.1.1 Condensate disposal.

Condensate from all fuel-burning appliances and associated flues shall be neutralized to a pH of at least 6 and no more than 8 prior to disposal to a sanitary system.
314.2 Evaporators and cooling coils.

Condensate drain systems shall be provided for equipment and appliances containing evaporators or cooling coils. Condensate drain systems shall be designed, constructed, and installed in accordance with Sections 314.2.1 through 314.2.4.

314.2.1 Condensate disposal.

Condensate from all cooling coils and evaporators shall be conveyed from the drain pan outlet to an approved place of disposal. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than 1/8 inch vertical in 12 units horizontal (1-percent slope). Condensate shall not discharge into a street, alley or other areas so as to cause a nuisance.

314.2.2 Drain pipe materials and sizes.

Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC, or PVC pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 relative to the material type. Condensate waste and drain line size shall not be less than 3/4 inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with Table 314.2.2.

314.2.3 Auxiliary and secondary drain systems.

In addition to the requirements of Section 314.2.1, where damage to any building components could occur as a result of overflow from the equipment primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired appliance that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1 1/2 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Metallic pans shall have a minimum thickness of not less than 0.0236 inches (0.0610 mm) (No. 24 gage) for galvanized sheet metal pans, 0.0179 inches (0.4546 mm) (No. 26 gage) for stainless steel pans, or 0.0320 inches (0.8128 mm) (No. 20 gage) for aluminum pans. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).

2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.

3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water level detection device that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.

4. A water-level detection device shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

314.2.1 Water-level monitoring devices.

On down-flow units and all other coils that do not have a secondary drain or provisions to install a secondary or auxiliary drain pan, a water-level monitoring device shall be installed inside the primary drain pan. This device shall shut off the equipment served in the event that the primary drain becomes restricted. Devices installed in the drain line shall not be permitted.

314.2.2 Appliance, equipment and insulation in pans.

Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, such portions of the appliances, equipment and insulation shall be installed above the flood level rim of the pan. Supports located inside of the pan to support the appliance or equipment shall be water resistant and approved.

314.2.4 Traps.

Condensate drains shall be trapped as required by the equipment or appliance manufacturer.

Table 314.2.2 Condensate Drain Sizing

<table>
<thead>
<tr>
<th>Equipment Capacity</th>
<th>Minimum Condensate Pipe Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 20 tons of refrigeration</td>
<td>3/4 inch</td>
</tr>
<tr>
<td>Over 20 tons to 40 tons of refrigeration</td>
<td>1 inch</td>
</tr>
<tr>
<td>Over 40 tons to 90 tons of refrigeration</td>
<td>1 1/4 inch</td>
</tr>
<tr>
<td>Over 90 tons to 125 tons of refrigeration</td>
<td>1 1/2 inch</td>
</tr>
<tr>
<td>Over 125 tons to 250 tons of refrigeration</td>
<td>2 inch</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 ton of capacity = 3.517 kW.

Chapter 4: Fixtures, Faucets and Fixture Fittings

Section PC 401: General

401.1 Scope.

This chapter shall govern the materials, design and installation of plumbing fixtures, faucets and fixture fittings in accordance with the type of occupancy, and shall provide for the minimum number of fixtures for various types of occupancies.

401.2 Prohibited fixtures and connections.

Water closets having a concealed trap seal or an unventilated space or having walls that are not thoroughly washed at each discharge in accordance with ASME A112.19.2M shall be prohibited. Any water closet that permits siphonage of the contents of the bowl back into the tank shall be prohibited. Trough urinals shall be prohibited.

401.3 Water conservation.

The maximum water flow rates and flush volume for plumbing fixtures and fixture fittings shall comply with Section 604.4.

Section PC 402: Fixture Materials

402.1 Quality of fixtures.

Plumbing fixtures shall be constructed of approved materials, with smooth, impervious surfaces, free from defects and concealed fouling surfaces, and shall conform to standards cited in this code. All porcelain enamelled surfaces on plumbing fixtures shall be acid resistant.

402.2 Materials for specialty fixtures.
Sheet copper for general applications shall conform to ASTM B 152 and shall not weigh less than 12 ounces per square foot (3.7 kg/m²).

Sheet lead for pans shall not weigh less than 4 pounds per square foot (19.5 kg/m²) coated with an asphalt paint or other approved coating.

### Section PC 403: Minimum Plumbing Facilities

#### 403.1 Minimum number of fixtures.

Plumbing fixtures shall be provided for the type of occupancy and in the minimum number shown in Table 403.1. Types of occupancies not shown in Table 403.1 shall be considered individually by the commissioner. The number of occupants shall be determined by the New York City Building Code. Occupancy classification shall be determined in accordance with the New York City Building Code.

#### Table 403.1 Minimum Number of Required Plumbing Fixtures

(See Sections 403.2 and 403.3)

<table>
<thead>
<tr>
<th>No.</th>
<th>Classification</th>
<th>Occupancy</th>
<th>Description</th>
<th>Water Closets (Urinals See Section 415.2)</th>
<th>Lavatories</th>
<th>Bathtubs/Shower</th>
<th>Drinking Fountain (See Section 418.1)</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assembly</td>
<td>A-1</td>
<td>Theaters and other buildings for the performing arts and motion pictures</td>
<td>1 per 100 for the first 1,500 and 1 per 125 for the remainder</td>
<td>1 per 100</td>
<td>1 per 200</td>
<td>1 per 500</td>
<td>1 per 500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-2</td>
<td>Nightclubs, bars, taverns, dance halls and buildings for similar purposes</td>
<td>1 per 75</td>
<td>1 per 75</td>
<td>1 per 75</td>
<td>1 per 500</td>
<td>1 per 500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-3</td>
<td>Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiaisons</td>
<td>1 per 75</td>
<td>1 per 75</td>
<td>1 per 75</td>
<td>1 per 500</td>
<td>1 per 500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-4</td>
<td>Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities</td>
<td>1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500</td>
<td>1 per 40 for the first 1,500 and 1 per 60 for the remainder exceeding 1,500</td>
<td>1 per 200</td>
<td>1 per 150</td>
<td>1 per 1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-5</td>
<td>Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities</td>
<td>1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500</td>
<td>1 per 40 for the first 1,500 and 1 per 60 for the remainder exceeding 1,500</td>
<td>1 per 200</td>
<td>1 per 150</td>
<td>1 per 1,000</td>
</tr>
<tr>
<td>2</td>
<td>Business</td>
<td>B</td>
<td>Buildings for the transaction of business, professional service, other services including merchandise, office buildings, banks, light industrial and similar uses</td>
<td>No. of persons for each sex 1-20: 21-45: 46-70: 71-100: 101-150: 141-190: 1,520</td>
<td>No. of fixtures 1-20: 4-6</td>
<td>No. of fixtures 1-20: 4-6</td>
<td>1 per 100</td>
<td>1 per 100</td>
</tr>
<tr>
<td>3</td>
<td>Educational</td>
<td>E</td>
<td>Educational facilities</td>
<td>1 per 50</td>
<td>1 per 50</td>
<td>1 per 100</td>
<td>1 per 100</td>
<td>1 per 100</td>
</tr>
<tr>
<td>4</td>
<td>Factory and industrial</td>
<td>F-1 and F-2</td>
<td>Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials</td>
<td>1 per 100</td>
<td>1 per 100</td>
<td>(see Section 411)</td>
<td>1 per 400</td>
<td>1 per 100</td>
</tr>
<tr>
<td>5</td>
<td>Institutional</td>
<td>I-1</td>
<td>Residential care</td>
<td>1 per 10</td>
<td>1 per 10</td>
<td>1 per 8</td>
<td>1 per 100</td>
<td>1 service sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I-2</td>
<td>Hospitals, ambulatory nursing home patients</td>
<td>1 per room</td>
<td>1 per room</td>
<td>1 per 15</td>
<td>1 per 100</td>
<td>1 service sink per floor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I-3</td>
<td>Employees, other than residential care</td>
<td>1 per 25</td>
<td>1 per 35</td>
<td>—</td>
<td>1 per 100</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I-4</td>
<td>Visitors, other than residential care</td>
<td>1 per 75</td>
<td>1 per 100</td>
<td>—</td>
<td>1 per 500</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I-5</td>
<td>Prisons b</td>
<td>1 per cell</td>
<td>1 per cell</td>
<td>1 per 15</td>
<td>1 per 100</td>
<td>1 service sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I-6</td>
<td>Reformatories, detention centers, and correctional facilities</td>
<td>1 per 15</td>
<td>1 per 15</td>
<td>1 per 15</td>
<td>1 per 100</td>
<td>1 service sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I-7</td>
<td>Employees b</td>
<td>1 per 25</td>
<td>1 per 35</td>
<td>—</td>
<td>1 per 100</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I-8</td>
<td>Adult daycare and Childcare b</td>
<td>1 per 15</td>
<td>1 per 15</td>
<td>1 per 15</td>
<td>1 per 100</td>
<td>1 service sink</td>
</tr>
<tr>
<td>6</td>
<td>Mercantile</td>
<td>M</td>
<td>Retail stores, service stations, shops, saloons, markets and shopping centers</td>
<td>1 per 500</td>
<td>1 per 750</td>
<td>—</td>
<td>1 per 1,000</td>
<td>1 service sink</td>
</tr>
<tr>
<td>7</td>
<td>Residential</td>
<td>R-1</td>
<td>Hotels, motels, boarding houses (transient)</td>
<td>1 per guestroom</td>
<td>1 per guestroom</td>
<td>1 per guestroom</td>
<td>—</td>
<td>1 service sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-2</td>
<td>Dormitories, fraternities, sororities and boarding houses not transient</td>
<td>1 per 10</td>
<td>1 per 10</td>
<td>1 per 8</td>
<td>1 per 100</td>
<td>1 service sink</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R-3</td>
<td>Apartment house</td>
<td>1 per dwelling unit</td>
<td>1 per dwelling unit</td>
<td>1 per dwelling unit</td>
<td>—</td>
<td>1 service sink</td>
</tr>
</tbody>
</table>

b. See Sections 419.2 and 420.1

— Kitchen sink per dwelling; 1 automatic clothes washer connection per 20
### Chapter 6: New York City Plumbing Code

#### 403.1.1 Fixture calculations.

Where separate fixture ratios are provided to male and female individually in Table 403.1, the total occupant load shall first be divided in half before the corresponding fixture ratio is applied individually to each sex. Where a single fixture ratio is provided to the total occupant load in Table 403.1, such ratio shall be applied to the total occupant load including both male and female before dividing the resulting number of fixtures equally between male and female. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number. Fixture calculations in Group B office occupancies shall utilize the total occupant load on a given floor to determine the number of fixtures required for that floor.

**Exception:** The total occupant load shall not be required to be divided in half where approved statistical data indicates a distribution of the sexes of other than 50 percent of each sex.

#### 403.1.2 Family or assisted-use toilet and bath fixtures.

Fixtures located within family or assisted-use toilet and bathing rooms required by Section 1109.2.1 of the New York City Building Code are permitted to be included in the number of required fixtures for either the male or female occupants in assembly and mercantile occupancies.

#### 403.1.3 Single-occupant toilet fixtures.

Fixtures located within single-occupant toilet rooms are permitted to be included in the number of fixtures required by Section 403, or where applicable the 1968 Building Code, for either the male or the female occupants. Fixtures located within toilet rooms subject to the exception of Section 403.2.1 are permitted to be included in the number of required fixtures for either the male or the female occupants. Fixtures located within family or assisted-use toilet and bathing rooms required by Section 1109.2.1 are permitted to be included in the number of fixtures required by Section 403, or where applicable the 1968 Building Code, for either the male or female occupants. Fixtures located within toilet rooms subject to the exception of Section 403.2.1 are permitted to be included in the number of fixtures required by Section 403, or where applicable the 1968 Building Code, only for that sex.

(L.L. 2016/079, 6/28/2016, eff. 10/26/2016)

#### 403.2 Separate facilities.

Where plumbing fixtures are required, separate facilities shall be provided for each sex.

**Exceptions:**

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. In structures or tenant spaces where combined employee and public toilet facilities are provided in accordance with Section 403.3, separate facilities shall not be required where the total number of employees, customers, patrons and visitors is 30 or fewer.
3. In structures or tenant spaces where required toilet facilities for only employee use are provided in accordance with Section 403.3, separate facilities shall not be required where the total number of employees is 30 or fewer.
4. In structures or tenant spaces where required toilet facilities for only public use are provided in accordance with Section 403.3, separate facilities shall not be required where the total number of customers, patrons and visitors is 30 or fewer.

#### 403.2.1 Single-occupant toilet rooms.

All single-occupant toilet rooms shall be made available for use by persons of any sex. Existing toilet rooms shall comply with this section by no later than January 1, 2017. Nothing in this section shall be construed to affect or alter the number of toilet rooms in a building otherwise required pursuant to this code or where applicable the 1968 Building Code.

**Exception:** Where egress from a single-occupant toilet room is through a room permissibly restricted by sex.

(L.L. 2016/079, 6/28/2016, eff. 10/26/2016)

#### 403.3 Required employee and public toilet facilities.

Employees shall be provided with toilet facilities in all occupancies. The number of plumbing fixtures located within the required employee toilet facilities shall be provided in accordance with Section PC 403 for all employees. Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization. The number of plumbing fixtures located within the required public toilet facilities shall be provided in accordance with Section PC 403 for all customers, patrons and visitors. Employee and public toilet facilities may be separate or combined. Where combined facilities are provided, the number of plumbing fixtures shall be in accordance with Section PC 403 for all users.

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### Table: Required employee and public toilet facilities

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Fixture Ratio 1</th>
<th>Fixture Ratio 2</th>
<th>Fixture Ratio 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-3</td>
<td>One- and two-family dwelling</td>
<td>1 per dwelling unit</td>
<td>1 per dwelling unit</td>
<td>1 service sink</td>
</tr>
<tr>
<td>R-3</td>
<td>Congregate living facilities with 16 or fewer persons</td>
<td>1 per 10</td>
<td>1 per 10</td>
<td>1 per 10</td>
</tr>
<tr>
<td>S-1</td>
<td>Structures for the storage of goods, warehouses, storehouse and freight depots, low and moderate hazard</td>
<td>1 per 100</td>
<td>1 per 100</td>
<td>1 per 100</td>
</tr>
</tbody>
</table>

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a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated. Any fraction of the number of persons shall be rounded up to an additional fixture. The number of occupants shall be determined by the New York City Building Code.

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

c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient sleeping unit and with provisions for privacy.

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

e. The minimum number of required drinking fountains shall comply with Table 403.1 and Chapter 11 of the New York City Building Code.

f. Drinking fountains are not required for an occupant load of 15 or fewer.

g. For the purposes of this table only, "Bar" shall mean a business establishment or a portion of a nonprofit entity devoted primarily to the selling and serving of alcoholic beverages for consumption by the public, guests, patrons, or members on the premises and in which the serving of food is only incidental.

h. The total number of occupants for a single establishment comprising of a restaurant with an accessory bar shall be considered as a restaurant for the purposes of determining the minimum number of plumbing fixtures.

i. As per the New York City Building Code.

j. The requirements for the number of water closets for a total occupancy of 150 persons or fewer shall not apply to bars except that, subject to the requirements of Section 403.2.1, there shall be at least one water closet for men and at least one water closet for women or at least two single-occupant toilet rooms.

k. The number of fixtures for building or nonaccessory tenant space used for assembly purposes by fewer than 75 persons and classified as Group B occupancy in accordance with Section 303.1, Exception 1 of the New York City Building Code shall be permitted to be calculated in accordance with the requirements for Assembly occupancies.

l. In addition to the requirements of Table 403.1, residential occupancies I-1, R-1, R-2, and R-3 shall provide fixtures in compliance with the requirements of Section PC 614 for emergency drinking water access.

(Am. L.L. 2016/079, 6/28/2016, eff. 10/26/2016)
Exception: Public utilization of toilet facilities shall not be required for:

1. Food service establishments, as defined in Section 81.03 of the New York City Health Code, with a seating capacity of less than 20, provided such establishments are less than 10,000 square feet (929 m²).

2. Establishments less than 10,000 square feet (929 m²) classified as Occupancy Group B or M pursuant to Sections 304.1 and 309.1 of the New York City Building Code, respectively, provided however that this exception shall not apply to a building or nonaccessory tenant space used for assembly purposes by fewer than 75 persons and classified as Group B occupancy in accordance with Section 303.1, Exception 1 of the New York City Building Code.

403.3.1 Access.
The route to the public toilet facilities required by Section 403.3 shall not pass through kitchens, storage rooms or closets. Access to the required facilities shall be from within the building or from the exterior of the building. All routes shall comply with the accessibility requirements of the New York City Building Code. Employees, customers, patrons and visitors shall have access to the required toilet facilities at all times that the building is occupied.

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

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

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

403.3.4 Pay facilities.
Where pay facilities are installed, such facilities shall be in excess of the required minimum facilities. Required facilities shall be free of charge.

403.4 Signage.
Required public facilities shall be designated by a legible sign for each sex or, for a single-occupant toilet room, for all sexes. Signs shall be readily visible and located near the entrance to each toilet facility. Existing single-occupant toilet rooms shall comply with this requirement by January 1, 2017.

(Am. L.L. 2016/079, 6/28/2016, eff. 10/26/2016)

403.4.1 Directional signage.
Directional signage indicating the route to the public facilities shall be posted in accordance with Section BC 1110 of the New York City Building Code. Such signage shall be located in a corridor or aisle, at the entrance to the facilities for customers, patrons, and visitors.

Section PC 404: Accessible Plumbing Facilities

404.1 Where required.
Accessible plumbing facilities and fixtures shall be provided in accordance with the New York city building code.

Section PC 405: Installation of Fixtures

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

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

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

405.3.1 Water closets, urinals, lavatories and bidets.
A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction, or closer than 30 inches (762 mm) center-to-center between adjacent fixtures. There shall be at least a 21 inch (533 mm) clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall not be less than 30 inches (762 mm) wide and 60 inches (1524 mm) deep. (see Figure 405.3.1).
Figure 405.3.1 Fixture Clearance

For SI: 1 inch = 25.4 mm

405.3.2 Public lavatories.

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

405.4 Floor and wall drainage connections.

Connections between the drain and floor outlet plumbing fixtures shall be made with a floor flange. The flange shall be attached to the drain and anchored to the structure.

Connections between the drain and wall-hung water closets shall be made with an approved closet carrier fitting. The water closet shall be bolted to the carrier with corrosion-resistant bolts or screws. Joints shall be sealed with an approved elastomeric gasket, wax ring seal, flange-to-fixture connection complying with ASME A112.4.3 or an approved setting compound.

405.4.1 Floor flanges.

Floor flanges for water closets or similar fixtures shall not be less than 0.125 inch (3.2 mm) thick for brass, 0.25 inch (6.4 mm) thick for plastic, and 0.25 inch (6.4 mm) thick and not less than a 2 inch (51 mm) caulkng depth for cast-iron or galvanized malleable iron. Floor flanges of hard lead shall weigh not less than 1 pound, 9 ounces (0.7 kg) and shall be composed of lead alloy with not less than 7.75 percent antimony by weight. Closet screws and bolts shall be of brass. Flanges shall be secured to the building structure with corrosion-resistant screws or bolts.

405.4.2 Securing floor outlet fixtures.

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

405.4.3 Securing wall-hung water closet bowls.

Wall-hung water closet bowls shall be supported by a concealed metal carrier that is attached to the building structure so that strain is not transmitted to the closet connector or any other part of the plumbing system. The carrier shall conform to ASME A112.6.1M or ASME A112.6.2.

405.5 Water-tight joints.

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

405.6 Plumbing in mental health centers.

In mental health centers, pipes or traps shall not be exposed, and fixtures shall be bolted through walls.

405.7 Design of overflows.

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

405.7.1 Connection of overflows.

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

Exception: The overflow from a flush tank serving a water closet or urinal shall discharge into the fixture served.

405.8 Slip joint connections.

Slip joints shall be made with an approved elastomeric gasket and shall only be installed on the trap outlet, trap inlet and within the trap seal. Fixtures with concealed slip-joint connections shall be provided with an access panel or utility space at least 12 inches (305 mm) in its smallest dimension or other approved arrangement so as to provide access to the slip joint connections for inspection and repair.

405.9 Design and installation of plumbing fixtures.

Integral fixture fitting mounting surfaces on manufactured plumbing fixtures or plumbing fixtures constructed on site, shall meet the design requirements of ASME A112.19.2M or ASME A112.19.3M.

Section PC 406: Automatic Clothes Washers

406.1 Approval.

All automatic clothes washers shall conform to ASSE 1007.
406.2 Water connection.
The water supply to an automatic clothes washer shall be protected against backflow by an air gap installed integrally within the machine conforming to ASSE 1007 or with the installation of a backflow preventer in accordance with Section PC 608.

406.3 Waste connection.
The waste from an automatic clothes washer shall discharge through an air break into a standpipe in accordance with Section 802.4 or into a laundry sink. The trap and fixture drain for an automatic clothes washer standpipe shall be a minimum of 2 inches (51 mm) in diameter. The automatic clothes washer fixture drain shall connect to a branch drain or drainage stack a minimum of 3 inches (76 mm) in diameter. Automatic clothes washers that discharge by gravity shall be permitted to drain to a waste receptor or an approved trench drain.

Section PC 407: Bathtubs

407.1 Approval.
Bathtubs shall conform to ANSI Z124.1, ASME A112.19.1M, ASME A112.19.4M, ASME A112.19.9M, CSA B45.2, CSA B45.3 or CSA B45.5.

407.2 Bathtub waste outlets.
Bathtubs shall have waste outlets a minimum of 1 1/2 inches (38 mm) in diameter. The waste outlet shall be equipped with an approved stopper, and a built-in overflow shall be provided.

407.3 Glazing.
Windows and doors within a bathtub enclosure shall conform to the safety glazing requirements of the New York city building code.

407.4 Bathtub enclosure.
Doors within a bathtub enclosure shall conform to ASME A112.19.15.

Section PC 408: Bidets

408.1 Approval.
Bidets shall conform to ASME A112.19.2M, ASME A112.19.9M or CSA B45.1.

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

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

Section PC 409: Dishwashing Machines

409.1 Approval.
Domestic dishwashing machines shall conform to ASSE 1006. Commercial dishwashing machines shall conform to ASSE 1004 and NSF 3.

409.2 Water connection.
The water supply to a dishwashing machine shall be protected against backflow by an air gap or backflow preventer in accordance with Section PC 608.

409.3 Waste connection.
The waste connection of a dishwashing machine shall comply with Sections 802.1.6 or 802.1.7, as applicable.

Section PC 410: Drinking Fountains

410.1 Approval.
Drinking fountains shall conform to ASME A112.19.1M, ASME A112.19.2M or ASME A112.19.9M, and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. Drinking fountains required by table 403.1 shall be equipped with both a bubbler faucet for drinking and a separate faucet designed for filling a container at least 10 inches in height.

410.2 Required drinking fountains.
Where water is served in restaurants, drinking fountains shall not be required. In other occupancies, where drinking fountains are required, up to 50 percent of the required drinking fountains conforming to Section 410.1 may be substituted by dedicated plumbing fixtures with faucets designed for filling a container at least 10 inches (254 mm) in height, provided any such dedicated plumbing fixture is adjacent to or readily visible from the location of a drinking fountain conforming to Section 410.1. Bottled water dispensers shall not be substituted for required drinking fountains.

410.3 Prohibited location.
Drinking fountains and plumbing fixtures with faucets permitted to be substituted for required drinking fountains shall not be installed in public restrooms.

Section PC 411: Emergency Showers and Eyewash Stations

411.1 Approval.
Emergency showers and eyewash stations shall conform to ISEA Z358.1.

411.2 Waste connection.
Waste connections shall not be required for emergency showers and eyewash stations.

Section PC 412: Floor and Trench Drains

412.1 Approval.
Floor drains shall conform to ASME A112.3.1, ASME A112.6.3 or CSA B79. Trench drains shall comply with ASME A112.6.3.

412.2 Floor drains.
Floor drains shall have removable strainers. The strainer shall have a waterway area of not less than the area of the tailpiece. The floor drain shall be constructed so that the drain is capable of being cleaned. Access shall be provided to the drain inlet. Ready access shall be provided to floor drains.

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

412.3 Size of floor drains.
Floor drains shall have a minimum 3 inch (76 mm) diameter drain outlet.
412.4 Public laundries and central washing facilities.

In public coin-operated laundries and in the central washing facilities of multiple-family dwellings, the rooms containing automatic clothes washers shall be provided with floor drains located to readily drain the entire floor area. Such drains shall have a minimum 3 inch (76 mm) diameter drain outlet and be provided with lint strainers.

Section PC 413: Food Waste Grinder Units

413.1 Approval.

Domestic food waste grinders shall conform to ASSE 1008. Food waste grinders shall not increase the drainage fixture unit load on the sanitary drainage system. Food waste grinders shall be permitted only within dwelling units.

413.2 Domestic food waste grinder waste outlets.

Domestic food waste grinders shall be connected to a drain of not less than 2 inches (51 mm) in diameter.

413.3 Reserved.

413.4 Water supply required.

All food waste grinders shall be provided with a supply of cold water.

Section PC 414: Garbage Can Washers

414.1 Water connection.

The water supply to a garbage can washer shall be protected against backflow by an air gap or a backflow preventer in accordance with Section 608.13.1, 608.13.2, 608.13.3, 608.13.5, 608.13.6 or 608.13.8.

414.2 Waste connection.

Garbage can washers shall be trapped separately. The receptacle receiving the waste from the washer shall have a removable basket or strainer to prevent the discharge of large particles into the drainage system.

Section PC 415: Laundry Trays

415.1 Approval.

Laundry trays shall conform to ANSI Z124.6, ASME A112.19.1M, ASME A112.19.3M, ASME A112.19.9M, CSA B45.2 or CSA B45.4.

415.2 Waste outlet.

Each compartment of a laundry tray shall be provided with a waste outlet a minimum of 1.5 inches (38 mm) in diameter and a strainer or crossbar to restrict the clear opening of the waste outlet.

Section PC 416: Lavatories

416.1 Approval.

Lavatories shall conform to ANSI Z124.3, ASME A112.19.1M, ASME A112.19.2M, ASME A112.19.3M, ASME A112.19.9M, CSA B45.1, CSA B45.2, CSA B45.3 or CSA B45.4. Group wash-up equipment shall conform to the requirements of Section PC 402. Every 20 inches (508 mm) of rim space shall be considered as one lavatory.

416.2 Cultured marble lavatories.

Cultured marble vanity tops with an integral lavatory shall conform to ANSI Z124.3 or CSA B45.5.

416.3 Lavatory waste outlets.

Lavatories shall have waste outlets not less than 1 1/4 inches (32 mm) in diameter. A strainer, pop-up stopper, crossbar or other device shall be provided to restrict the clear opening of the waste outlet. Where a stopper is utilized, a built-in overflow shall be provided.

416.4 Moveable lavatory systems.

Moveable lavatory systems shall comply with ASME A112.19.12.

416.5 Tempered water for public hand-washing facilities.

Tempered water shall be delivered from public hand-washing facilities. Tempered water shall be delivered through an approved water-temperature limiting device that conforms to ASSE 1016 or ASSE 1070 or CSA B 125.3.

Exception: Where point of use heaters are installed, outlet water temperature shall be regulated to provide tempered water.

Section PC 417: Showers

417.1 Approval.

Prefabricated showers and shower compartments shall conform to ANSI Z124.2, ASME A112.19.9M or CSA B45.5. Shower valves for individual showers shall conform to the requirements of Section 424.3.

417.2 Water supply riser.

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

417.3 Shower waste outlet.

Waste outlets serving showers shall be at least 2 inches (51 mm) in diameter and, for other than waste outlets in bathtubs, shall have removable strainers not less than 3 inches (76 mm) in diameter with strainer openings not less than 1 1/4 inch (6.4 mm) in minimum dimension. Where each shower space is not provided with an individual waste outlet, the waste outlet shall be located and the floor pitched so that waste from one shower does not flow over the floor area serving another shower. Waste outlets shall be fastened to the waste pipe in an approved manner.

417.4 Shower compartments.

All shower compartments shall have a minimum of 900 square inches (0.58 m²) of interior cross-sectional area. Shower compartments shall not be less than 30 inches (762 mm) in minimum dimension measured from the finished interior dimension of the compartment, exclusive of fixture valves, showerheads, soap dishes, and safety grab bars or rails. Except as required in Section PC 404, the minimum required area and dimension shall be measured from the finished interior dimension at a height equal to the top of the threshold and at a point tangent to its centerline and shall be continued to a height not less than 70 inches (1778 mm) above the shower drain outlet.

417.4.1 Wall area.

The wall area above built-in tubs with installed shower heads and in shower compartments shall be constructed of smooth, noncorrosive and nonabsorbent waterproof materials to a height not less than 6 feet (1829 mm) above the room floor level, and not less than 70 inches (1778 mm) where measured from the compartment floor at the drain. Such walls shall form a water-tight joint with each other and with either the tub, receptor or shower floor.
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417.5.2 Shower lining.

Floors or receptacles under shower compartments, except where prefabricated receptors have been provided, shall be lined and made watertight utilizing material complying with Sections 417.5.2.1 through 417.5.2.5. Such liners shall turn up on all sides at least 2 inches (51 mm) above the finished threshold level. Liners shall be recessed and fastened to an approved backing so as not to occupy the space required for wall covering, and shall not be nailed or perforated at any point less than 1 inch (25 mm) above the finished threshold. Liners shall be pitched one-fourth unit vertical in 12 units horizontal (2-percent slope) and shall be sloped toward the fixture drains and be securely fastened to the waste outlet at the seepage entrance, making a water-tight joint between the liner and the outlet. The completed liner shall be tested in accordance with Section 312.9.

Exceptions:
1. Floor surfaces under shower heads provided for rinsing laid directly on the ground are not required to comply with this section.
2. Where a sheet-applied, load-bearing, bonded, waterproof membrane is installed as the shower lining, the membrane shall not be required to be recessed.

417.5.2.1 PVC sheets.

Plasticized polyvinyl chloride (PVC) sheets shall be a minimum of 0.040 inch (1.02 mm) thick, and shall meet the requirements of ASTM D 4551. Sheets shall be joined by solvent welding in accordance with the manufacturer’s installation instructions.

417.5.2.2 Chlorinates polyethylene (CPE) sheets.

Nonplasticized chlorinated polyethylene sheet shall be a minimum 0.040 inch (1.02 mm) thick, and shall meet the requirements of ASTM D 4068. The liner shall be joined in accordance with the manufacturer’s installation instructions.

417.5.2.3 Sheet lead.

Sheet lead shall not weigh less than 4 pounds per square foot (19.5 kg/m²) coated with an asphalt paint or other approved coating. The lead sheet shall be insulated from conducting substances other than the connecting drain by 15-pound (6.80 kg) asphalt felt or its equivalent. Sheet lead shall be joined by burning.

417.5.2.4 Sheet copper.

Sheet copper shall conform to ASTM B 152 and shall not weigh less than 12 ounces per square foot (3.7 kg/m²). The copper sheet shall be insulated from conducting substances other than the connecting drain by 15-pound (6.80 kg) asphalt felt or its equivalent. Sheet copper shall be joined by brazing or soldering.

417.5.2.5 Sheet-applied, load-bearing, bonded, waterproof membranes.

Sheet-applied, load-bearing, bonded, waterproof membranes shall meet requirements of ANSI A118.10 and shall be applied in accordance with the manufacturer’s installation instructions.

417.6 Glazing.

Windows and doors within a shower enclosure shall conform to the safety glazing requirements of the New York city building code.

Section PC 418: Sinks

418.1 Approval.


418.2 Sink waste outlets.

Sinks shall be provided with waste outlets a minimum of 2 inches (51mm) in diameter. A strainer or crossbar shall be provided to restrict the clear opening of the waste outlet.

418.3 Moveable sink systems.

Moveable sink systems shall comply with ASME A112.19.12.

Section PC 419: Urinals

419.1 Approval.

Urinals shall conform to ANSI Z124.9, ASME A112.19.2M, CSA B45.1 or CSA B45.5. Urinals shall conform to the water consumption requirements of Section 604.4. Water-supplied urinals shall conform to the hydraulic performance requirements of ASME A112.19.6, CSA B45. 1 or CSA B45.5.

419.2 Substitution for water closets.

In each bathroom or toilet room, urinals shall not be substituted for more than 50 percent of the required water closets.

419.3 Surrounding material.

Wall and floor space to a point 2 feet (610 mm) in front of a urinal lip and 4 feet (1219 mm) above the floor and at least 2 feet (610 mm) to each side of the urinal shall be waterproofed with a smooth, readily cleanable, nonabsorbent material.

419.4 Waterless urinals.

Approved waterless urinals may be utilized only as part of an approved building water conservation plan.

Section PC 420: Water Closets

420.1 Approval.

Water closets shall conform to the water consumption requirements of Section 604.4 and shall conform to ANSI Z124.4, ASME A112.19.2M, CSA B45.1, CSA B45.4 or CSA B45.5. Water closets shall conform to the hydraulic performance requirements of ASME A112.19.6. Water closet tanks shall conform to ANSI Z124.4, ASME A112.19.2, ASME A112.19.9M, CSA B45.1, CSA B45.4 or CSA B45.5. Electro-hydraulic water closets shall comply with ASME A112.19.13.

420.2 Water closets for public or employee toilet facilities.

Water closet bowls for public or employee toilet facilities shall be of the elongated type.

420.3 Water closet seats.

Water closets shall be equipped with seats of smooth, nonabsorbent material. All seats of water closets provided for public or employee toilet facilities shall be of the hinged open-front type. Integral water closet seats shall be of the same material as the fixture. Water closet seats shall be sized for the water closet bowl type.

420.4 Water closet connections.
A 4-inch by 3-inch (102 mm by 76 mm) closet bend shall be acceptable. Where a 3-inch (76 mm) bend is utilized on water closets, a 4-inch by 3-inch (102 mm by 76 mm) flange shall be installed to receive the fixture horn.

420.5 Water closets for children's use.

In nurseries, schools, and similar places where plumbing fixtures are provided for the use of children under six years of age, such water closets shall be of a size and height suitable for the children's use.

Section PC 421: Whirlpool Bathtubs

421.1 Approval.

Whirlpool bathtubs shall comply with ASME A112.19.7M or with CSA B45.5 and CSA B45 (Supplement 1).

421.2 Installation.

Whirlpool bathtubs shall be installed and tested in accordance with the manufacturer's installation instructions. The pump shall be located above the weir of the fixture trap.

421.3 Drain.

The pump drain and circulation piping shall be sloped to drain the water in the volute and the circulation piping when the whirlpool bathtub is empty.

421.4 Suction fittings.

Suction fittings for whirlpool bathtubs shall comply with ASME A112.19.8M.

421.5 Access to pump.

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

421.6 Whirlpool enclosure.

Doors within a whirlpool enclosure shall conform to ASME A112.19.15.

Section PC 422: Health Care Fixtures and Equipment

422.1 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.

422.2 Approval.

All special plumbing fixtures, equipment, devices and apparatus shall be of an approved type.

422.3 Protection.

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 either the water supply or drainage system, shall be provided with protection against backflow, flooding, fouling, contamination of the water supply system and stoppage of the drain.

422.4 Materials.

Fixtures designed for therapy, special cleansing or disposal of waste materials, combinations of such purposes, or any other special purpose, shall be of smooth, impervious, corrosion-resistance materials and, where subjected to temperatures in excess of 180°F (82°C), shall be capable of withstanding, without damage, higher temperatures.

422.5 Access.

Access shall be provided to concealed piping in connection with special fixtures where such piping contains steam traps, valves, relief valves, check valves, vacuum breakers or other similar items that require periodic inspection, servicing, maintenance or repair. Access shall be provided to concealed piping that requires periodic inspection, maintenance or repair.

422.6 Clinical sink.

A clinical sink shall have an integral trap in which the upper portion of a visible trap seal provides a water surface. The fixture shall be designed so as to permit complete removal of the contents by siphonic or blowout action and to reseal the trap. A flushing rim shall provide water to cleanse the interior surface. The fixture shall have the flushing and cleansing characteristics of a water closet.

422.7 Prohibited usage of clinical sinks and service sinks.

A clinical sink serving a soiled utility room shall not be considered as a substitute for, or be utilized as, a service sink. A service sink shall not be utilized for the disposal of urine, fecal matter or other human waste.

422.8 Ice prohibited in soiled utility room.

Machines for manufacturing ice, or any device for the handling or storage of ice, shall not be located in a soiled utility room.

422.9 Sterilizer equipment requirements.

The approval and installation of all sterilizers shall conform to the requirements of the New York city mechanical code.

422.9.1 Sterilizer piping.

Access for the purposes of inspection and maintenance shall be provided to all sterilizer piping and devices necessary for the operation of sterilizers.

422.9.2 Steam supply.

Steam supplies to sterilizers, including those connected by pipes from overhead mains or branches, shall be drained to prevent any moisture from reaching the sterilizer. The condensate drainage from the steam supply shall be discharged by gravity.

422.9.3 Steam condensate return.

Steam condensate returns from sterilizers shall be a gravity return system.

422.9.4 Condensers.

Pressure sterilizers shall be equipped with a means of condensing and cooling the exhaust steam vapors. Non-pressure sterilizers shall be equipped with a device that will automatically control the vapor, confining the vapors within the vessel.

422.10 Special elevations.

Control valves, vacuum outlets and devices protruding from a wall of an operating, emergency, recovery, examining or delivery room, or in a corridor or other location where patients are transported on a wheeled stretcher, shall be located at an elevation that prevents bumping the patient or stretcher against the device.
Section PC 423: Specialty Plumbing Fixtures

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

423.2 Approval.
Specialties requiring water and waste connections shall be submitted for approval.

Section PC 424: Faucets and Other Fixture Fittings

424.1 Approval.
Faucets and fixture fittings shall conform to ASME A112.18.1 or CSA B125. Faucets and fixture fittings that supply drinking water for human ingestion shall conform to the requirements of NSF 61, section 9. Flexible water connectors exposed to continuous pressure shall conform to the requirements of Section 605.6.

424.1.1 Faucets and supply fittings.
Faucets and supply fittings shall conform to the water consumption requirements of Section 604.4.

424.1.2 Waste fittings.
Waste fittings shall conform to ASME A112.18.2/CSA B 125.2, ASTM F 409 or to one of the standards listed in Tables 702.1 and 702.4 for above-ground drainage and vent pipe and fittings.

424.1.3 Lavatory operation without external electrical power.
Where automatic lavatory faucets connected to an external supply of electrical power are provided in a bathroom or toilet room, at least one lavatory faucet in such bathroom or toilet room shall be capable of manual operation in the absence of an external supply of electrical power for a period of at least two weeks, either through manual operation or built-in battery back-up. Where such automatic lavatory faucets are located in a bathroom or toilet room with a required accessible lavatory, such operational lavatory faucet shall be at such required accessible lavatory.

Exception: Section 424.1.3 shall not apply to more than one bathroom or toilet room in a dwelling unit.

424.2 Hand showers.
Hand-held showers shall conform to ASME A112.18.1 or CSA B125.1. Hand-held showers shall provide backflow protection in accordance with ASME A112.18.1 or CSA B125.1 or shall be protected against backflow by a device complying with ASME A112.18.3.

424.3 Individual shower and tub valves.
Individual shower, tub and shower-tub combination valves shall be balanced pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ASSE 1016 or ASME A112.18.1/CSA B 125.1 and shall be installed at the point of use. Shower, tub and shower-tub combination valves required by this section shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions.

424.4 Multiple (gang) showers.
Multiple (gang) showers supplied with a single-tempered water supply pipe shall have the water supply for such showers controlled by an approved automatic temperature control mixing valve that conforms to ASSE 1069 or CSA B125, or each shower head shall be individually controlled by a balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valve that conforms to ASSE 1016 or CSA B125 and is installed at the point of use. Such valves shall be equipped with a means to limit the maximum setting of the valve to 120°F (49°C), which shall be field adjusted in accordance with the manufacturer's instructions.

424.5 Bathtub and whirlpool bathtub valves.
The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a maximum temperature of 120°F (49°C) by a water-temperature limiting device that conforms to ASSE 1016 or ASSE 1070 or CSA B 125.3, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section 424.3.

424.6 Hose-connected outlets.
Faucets and fixture fittings with hose-connected outlets shall conform to ASME A112.18.3M or CSA B 125.

424.7 Temperature-actuated, flow reduction valves for individual fixture fittings.
Temperature-actuated, flow reduction devices, where installed for individual fixture fittings, shall conform to ASSE 1062. Such valves shall not be used alone as a substitute for the balanced pressure, thermostatic or combination shower valves required in Section 424.3.

424.8 Transfer valves.
Deck-mounted bath/shower transfer valves containing an integral atmospheric vacuum breaker shall conform to the requirements of ASME A112.18.7.

Section PC 425: Flushing Devices for Water Closets and Urinals

425.1 Flushing devices required.
Each water closet, urinal, clinical sink and any plumbing fixture that depends on trap siphonage to discharge the fixture contents to the drainage system shall be provided with a flushometer valve, flushometer tank or a flush tank designed and installed to supply water in quantity and rate of flow to flush the contents of the fixture, cleanse the fixture and refill the fixture trap.

425.1.1 Separate for each fixture.
A flushing device shall not serve more than one fixture.

425.1.2 Water closet flushing without external electrical power.
Where automatic flushing devices connected to an external supply of electrical power are provided for water closets in a bathroom or toilet room, the flushing device of at least one water closet in such bathroom or toilet room shall be capable of manual operation in the absence of an external supply of electrical power for a period of at least two weeks, either through manual operation or built-in battery back-up. Where such automatic flushing devices are located in a bathroom or toilet room with a required accessible water closet, such operational flushing device shall be at such required accessible water closet.

Exception: Section 425.1.2 shall not apply to more than one bathroom or toilet room in a dwelling unit.

425.2 Flusherometer valves and tanks.
Flusherometer valves and tanks shall comply with ASSE 1037. Vacuum breakers on flushometer valves shall conform to the performance requirements of ASSE 1001 or CAN/CSA-B64.1.1. Access shall be provided to vacuum breakers. Flushometer valves shall be of the water-conservation type and shall not be utilized where the water pressure is lower than the minimum required for normal operation. When operated, the valve shall automatically complete the cycle of operation, opening fully and closing positively under the water supply pressure. Each flushometer valve shall be provided with a means for regulating the flow through the valve. The trap seal to the fixture shall be automatically refilled after each valve flushing cycle.

425.3 Flush tanks.
Flush tanks equipped for manual flushing shall be controlled by a device designed to refill the tank after each discharge and to shut off completely the water flow to the tank when the tank is filled to operational capacity. The trap seal to the fixture shall be automatically refilled after each flushing. The water supply to flush tanks equipped for automatic flushing shall be controlled with a timing device or sensor control devices.

425.3.1 Fill valves.
All flush tanks shall be equipped with an antisiphon fill valve conforming to ASSE 1002 or CSA B125. The fill valve backflow preventer shall be located at least 1 inch (25 mm) above the full opening of the overflow pipe.

425.3.2 Overflows in flush tanks.
Flush tanks shall be provided with overflows discharging to the water closet or urinal connected thereto and shall be sized to prevent flooding the tank at the maximum rate at which the tanks are supplied with water according to the manufacturer's design conditions. The opening of the overflow pipe shall be located above the flood level rim of the water closet or urinal or above a secondary overflow in the flush tank.

425.3.3 Sheet copper.
Sheet copper utilized for flush tank linings shall conform to ASTM B 152 and shall not weigh less than 10 ounces per square foot (0.03 kg/m²).

425.3.4 Access required.
All parts in a flush tank shall be accessible for repair and replacement.

425.4 Flush pipes and fittings.
Flush pipes and fittings shall be of nonferrous material and shall conform to ASME A112.19.5 or CSA B125.

Section PC 426: Manual Food and Beverage Dispensing Equipment

426.1 Approval.
Manual food and beverage dispensing equipment shall conform to the requirements of NSF 18.

Section PC 427: Floor Sinks

427.1 Approval.
Sanitary floor sinks shall conform to the requirements of ASME A112.6.7.

Section PC 428: Prohibited Water Uses

428.1 Prohibited potable water uses.
Potable water shall not be permitted for those uses prohibited by this section.

428.1.1 Potable water prohibited for once through cooling.
Potable water shall not be used for once-through cooling. Equipment such as ice making machines, walk-in coolers, refrigerated walk-in boxes, or air conditioning equipment shall be provided with air cooled condensers or recirculating condenser water systems, or supplied with non-potable water as permitted by Appendix C of this code.

Exceptions:
1. Once-through water-cooled ice making machines producing less than 500 pounds of ice per day at Standard Rating Conditions as specified in ARI 810.
2. Once-through water-cooled ice making machines, walk-in coolers, refrigerated walk-in boxes or air conditioning equipment supplied with potable water through piping systems installed prior to January 1, 2011 and any subsequent replacements that use the same or lesser amount of potable water.

Section PC 429: Rooftop Gardens and Landscaping

429.1 Water supply.
Where a connection to an approved water supply is required by Section 318.5 of the New York City Fire Code for rooftop gardens or landscaping exceeding 250 square feet (23 m²), an approved fixture shall be provided for connection to such water supply in accordance with this code.

Chapter 5: Water Heaters

Section PC 501: General

501.1 Scope.
The provisions of this chapter shall govern the materials, design and installation of water heaters and the related safety devices and appurtenances.

501.2 Water heater as space heater.
Where a combination potable water heating and space heating system requires water for space heating at temperatures higher than 140°F (60°C), a master thermostatic mixing valve complying with ASSE 1017 shall be provided to limit the water supplied to the potable hot water distribution system to a temperature of 140°F (60°C) or less. The potability of the water shall be maintained throughout the system.

501.3 Drain valves.
Drain valves for emptying shall be installed at the bottom of each tank-type water heater and hot water storage tank. Drain valves shall conform to ASSE 1005.

501.4 Location.
Water heaters and storage tanks shall be located and connected so as to provide access for observation, maintenance, servicing and replacement.

501.5 Water heater labeling.
All water heaters shall be third-party certified.

501.6 Water temperature control in piping from tankless heaters.
The temperature of water from tankless water heaters shall be a maximum of 140°F (60°C) when intended for domestic uses. This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

501.7 Pressure marking of storage tanks.
Storage tanks and water heaters installed for domestic hot water shall have the maximum allowable working pressure clearly and indelibly stamped in the metal or marked on a plate welded thereto or otherwise permanently attached. Such markings shall be in an accessible position outside of the tank so as to make inspection or reinspection readily possible.

501.8 Temperature controls.
All hot water supply systems shall be equipped with automatic temperature controls capable of adjustments from the lowest to the highest acceptable temperature settings for the intended temperature operating range.

Section PC 502: Installation

502.1 General.
Water heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired water heaters shall conform to the requirements of this code and the New York City Mechanical Code. Electric water heaters shall conform to the requirements of this code and provisions of the New York City Electrical Code. Gas-fired water heaters shall conform to the requirements of the New York City Fuel Gas Code. All water heaters shall conform to the New York City Energy Conservation Code.

### 502.1.1 Elevation and protection.

Elevation of water heater ignition sources and mechanical damage protection requirements for water heaters shall be in accordance with the New York City Mechanical Code and the New York City Fuel Gas Code.

### 502.2 Rooms used as a plenum.

Water heaters using solid, liquid or gas fuel shall not be installed in a room containing air-handling machinery when such room is used as a plenum.

### 502.3 Water heaters installed in attics.

Electric water heaters only shall be installed in attics. An attic containing a water heater shall be provided with an opening and unobstructed passageway large enough to allow removal of the water heater. The passageway shall not be less than 30 inches (762 mm) high and 22 inches (559 mm) wide and not more than 20 feet (6096 mm) in length when measured along the centerline of the passageway from the opening to the water heater. The passage way shall have continuous solid flooring not less than 24 inches (610 mm) wide. A level service space at least 30 inches (762 mm) deep and 30 inches (762 mm) wide shall be present at the front or service side of the water heater. The clear access opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm) where such dimensions are large enough to allow removal of the water heater.

### 502.4 Seismic supports.

Where earthquake loads are applicable in accordance with the New York City Building Code, water heater supports shall be designed and installed for the seismic forces in accordance with the New York City Building Code.

### 502.5 Clearances for maintenance and replacement.

Appliances shall be provided with access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space at least 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an appliance.

#### Section PC 503: Connections

503.1 Cold water line valve.

The cold water branch line from the main water supply line to each hot water storage tank or water heater shall be provided with a valve, located near the equipment and serving only the hot water storage tank or water heater. The valve shall not interfere or cause a disruption of the cold water supply to the remainder of the cold water system. The valve shall be provided with access on the same floor level as the water heater served.

503.2 Water circulation.

The method of connecting a circulating water heater to the tank shall provide proper circulation of water through the water heater. The pipe or pipes required for the installation of appliances that will draw from the water heater or storage tank shall comply with the provisions of this code for material and installation.

#### Section PC 504: Safety Devices

504.1 Antisiphon devices.

An approved means, such as a cold water "dip" tube with a hole at the top or a vacuum relief valve installed in the cold water supply line above the top of the heater or tank, shall be provided to prevent siphoning of any storage water heater or tank.

504.2 Vacuum relief valve.

Bottom fed water heaters and bottom fed tanks connected to water heaters shall have a vacuum relief valve installed. The vacuum relief valve shall comply with ANSI Z21.22.

504.3 Shutdown.

A means for disconnecting an electric hot water supply system from its energy supply shall be provided in accordance with the New York city electrical code. A separate valve shall be provided to shut off the energy fuel supply to all other types of hot water supply systems.

504.4 Relief valve.

All storage water heaters operating above atmospheric pressure shall be provided with an approved, self-closing (levered) pressure relief valve and temperature relief valve or combination thereof. The relief valve shall conform to ANSI Z21.22. The relief valve shall not be used as a means of controlling thermal expansion.

504.4.1 Installation.

Such valves shall be installed in the shell of the water heater tank. Temperature relief valves shall be so located in the tank as to be actuated by the water in the top 6 inches (152 mm) of the tank served. For installations with separate storage tanks, the valves shall be installed on the tank and there shall not be any type of valve installed between the water heater and the storage tank. There shall not be a check valve or shutoff valve between a relief valve and the heater or tank served.

504.5 Relief valve approval.

Temperature and pressure relief valves, or combinations thereof, and energy cutoff devices shall bear the label of an approved agency and shall have a temperature setting of not more than 210°F (99°C) and a pressure setting not exceeding the tank or water heater manufacturer's rated working pressure or 150 psi (1035 kPa), whichever is less. The relieving capacity of each pressure relief valve and each temperature relief valve shall equal or exceed the heat input to the water heater or storage tank.

504.6 Requirements for discharge piping.

The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the water heater.
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge in a manner that does not cause personal injury or structural damage.
6. Discharge to a termination point that is readily observable by the building occupants.
7. Not be trapped.
8. Be installed so as to flow by gravity.
9. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
10. Not have a threaded connection at the end of such piping.
11. Not have valves or tee fittings.
12. Be constructed of those materials listed in Section 605.4 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.

504.7 Required pan.
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Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tank or water heater shall be installed in a galvanized steel pan having a material thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage), or other pans approved for such use.

504.7.1 Pan size and drain.

The pan shall be not less than 1.5 inches (38 mm) deep and shall be of sufficient size and shape to receive all dripping or condensate from the tank or water heater. The pan shall be drained by an indirect waste pipe having a minimum diameter of 3/4 inch (19 mm). Piping for safety pan drains shall be of those materials listed in Table 605.4.

504.7.2 Pan drain termination.

The pan drain shall extend full-size and terminate over a suitably located indirect waste receptor or floor drain or extend to the exterior of the building and terminate not less than 6 inches (152 mm) and not more than 24 inches (610 mm) above the adjacent ground surface at a point that is readily observable by the building occupants.

504.8 Flow sensing switch.

On copper fin tube, gas fired domestic hot water heaters, a flow switch shall be provided to interrupt the gas supply to the heater in the event water flow through the coil is interrupted.

Section PC 505: Insulation

505.1 Unfired vessel insulation.

Unfired hot water storage tanks shall be insulated to a minimum of R-12.5 (h·ft²·°F)/Btu (R-2.2 m²·K/W).

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.
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 (25mm).

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.

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 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.

Table 604.3
Water Distribution System Design Criteria
Required Capacity at Fixture Supply Pipe Outlets

<table>
<thead>
<tr>
<th>Fixture Supply Outlet Serving</th>
<th>Flow Rate (a) (gpm)</th>
<th>Flow Pressure (b) (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathtub, no shower</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Bathtub with anti-scald protection</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Bidet</td>
<td>1.5</td>
<td>20</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>Lavatory (self closing)</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Lavatory (sensor)</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Shower</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Shower, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Silcock, 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>18</td>
<td>20</td>
</tr>
<tr>
<td>Water closet, blow out, flushometer valve</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Water closet, flushometer tank</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Water closet, siphonic, flushometer valve</td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>
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. Minimum pressures as per manufacturer’s recommendations.

### 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.

### 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[^b]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lavatory, private</td>
<td>1.5 gpm at 60 psi</td>
</tr>
<tr>
<td>Lavatory, public (self-closing)</td>
<td>0.25 gallon per metering cycle</td>
</tr>
<tr>
<td>Shower head[^a]</td>
<td>2.0 gpm at 80 psi[^d]</td>
</tr>
<tr>
<td>Sink faucet</td>
<td>2.2 gpm at 60 psi</td>
</tr>
<tr>
<td>Urinal</td>
<td>0.5 gallon per flushing cycle</td>
</tr>
<tr>
<td>Water closet</td>
<td>1.28 gallons per flushing cycle or equivalent dual flush[^c]</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.

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.

**Exception:** Water closets in public restrooms.

### 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.

### 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>Bathtubs</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>3/8</td>
</tr>
<tr>
<td>Hose bibbs</td>
<td>1/2</td>
</tr>
<tr>
<td>Kitchen sink</td>
<td>1/2</td>
</tr>
<tr>
<td>Laundry, 1, 2 or 3 compartments</td>
<td>1/2</td>
</tr>
<tr>
<td>Lavatory</td>
<td>3/8</td>
</tr>
<tr>
<td>Shower, single head</td>
<td>1/2</td>
</tr>
<tr>
<td>Sinks, flushing rim</td>
<td>3/4</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>3/4</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</td>
</tr>
<tr>
<td>Water closet, flushometer tank</td>
<td>3/8</td>
</tr>
</tbody>
</table>
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 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.

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 groundwater conditions shall be required to ascertain the acceptability of the water service or water distribution piping material for the specific installation.

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 sub-surface portion of water service pipe shall conform to one of the standards listed in the rules of the Department of Environmental Protection. The above-ground portion of water service pipe shall be metal and conform to one of the standards listed in Table 605.4.

605.3.1 Underground water distribution pipe.
Underground water distribution pipe shall conform to NSF 61 and shall conform to one of the standards listed in Table 605.3.

Table 605.3 Water Service Pipe

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass pipe</td>
<td>ASTM B 43</td>
</tr>
<tr>
<td>Copper or copper-alloy pipe</td>
<td>ASTM B 42; ASTM B 302</td>
</tr>
<tr>
<td>Copper or copper-alloy tubing (Type K)</td>
<td>ASTM B 75; ASTM B 88; ASTM B 251; ASTM B 447</td>
</tr>
<tr>
<td>Ductile iron water pipe</td>
<td>AWWA C151; AWWA C115</td>
</tr>
<tr>
<td>Stainless steel pipe (Type 304/304L)</td>
<td>ASTM A 312; ASTM A 778</td>
</tr>
<tr>
<td>Stainless steel pipe (Type 316/316L)</td>
<td>ASTM A 312; ASTM A 778</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass pipe</td>
<td>ASTM B 43</td>
</tr>
<tr>
<td>Copper or copper-alloy pipe</td>
<td>ASTM B 42; ASTM B 302</td>
</tr>
<tr>
<td>Copper or copper-alloy tubing (Type K, L)</td>
<td>ASTM B 75; ASTM B 88; ASTM B 251; ASTM B 447</td>
</tr>
<tr>
<td>Stainless steel pipe (Type 304/304L)</td>
<td>ASTM A 312; ASTM A 778</td>
</tr>
<tr>
<td>Stainless steel pipe (Type 316/316L)</td>
<td>ASTM A 312; ASTM A 778</td>
</tr>
</tbody>
</table>

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. All pipe fittings utilized in water supply systems shall also comply with NSF 61. Ductile and gray iron pipe fittings shall be cement mortar lined in accordance with AWWA C 104.

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 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.

Table 605.5
Pipe Fittings

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass</td>
<td>ASTM B862</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASME B16.4, ASME B16.12</td>
</tr>
<tr>
<td>Gray iron and ductile iron</td>
<td>AWWA C110, AWWA C153</td>
</tr>
<tr>
<td>Stainless steel (Type 304/304L)</td>
<td>ASTM A312, ASTM A778</td>
</tr>
<tr>
<td>Stainless steel (Type 316/316L)</td>
<td>ASTM A312, ASTM A778</td>
</tr>
</tbody>
</table>

605.6 Flexible water connectors.
Flexible water connectors exposed to continuous pressure shall conform to IAPMO PS 74 and PS 48, shall not exceed 24 inches (610 mm), shall be used in exposed locations only and shall be used singularly, that is, two connectors can not be joined.

605.7 Valves.
All valves shall be of an 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 605.8
Manufactured Pipe Nipples

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brass-, copper-, chromium-plated</td>
<td>ASTM B687</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>ASTM A403/A403M</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. Saddle-type fittings.

605.10 and 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 AWSA5.8.

605.12.2 Mechanical joints.
Mechanical joints shall be installed in accordance with the manufacturers' instructions and in conformance with acceptance criteria established by the commissioner.

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 manufacturers' instructions and in conformance with acceptance criteria established by the commissioner.

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.

605.13 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, ICC-ES PMG LC 1002 AND ASSE 1961.

605.14 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 solders and fluxes. "Lead free" shall mean a chemical composition equal to or less than 0.2-percent lead.

605.16 through 605.21 Reserved.
605.22 Reserved.
605.23 Stainless steel.
Joints between stainless steel pipe and fittings shall comply with Sections 605.23.1 and 605.23.2.
605.23.1 Mechanical joints.
Mechanical joints shall be installed in accordance with the manufacturer's instructions.
605.23.2 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.

605.24 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 605.24.3 and 605.24.4. Connectors or adapters 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.

605.24.1 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.

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

606.2 Reserved.
606.3 Access to valves.
Ready access shall be provided to all 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). All water supply tanks shall be equipped with a lockable cover to prevent access by unauthorized persons or vermin. Such cover shall be tamper-proof and equipped with a local alarm.

606.5.4 Overflows.
Each gravity or suction water supply tank shall be provided with an overflow not smaller than shown in Table 606.6.4(1) and/or Table 606.6.4(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 supply fixture. The overflow discharge shall be provided with durable screening with openings of not more than 1/16 inch (3.18 mm).

606.6.4.1 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.

### Table 606.5.4(1)
Size of Overflows for Gravity and Suction Tanks

<table>
<thead>
<tr>
<th>Overflow Pipe Size (inches)</th>
<th>Maximum Allowable GPM for Each Orifice Opening into Tank</th>
<th>Maximum Allowable GPM for Vertical Overflow (Piping Connecting Orifices)</th>
</tr>
</thead>
<tbody>
<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>Slotted Weir Opening into Tank Between Overflow Chamber and Water Compartment</th>
<th>Maximum GPM Allowable for Weir</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 inches x 24 inches</td>
<td>381</td>
</tr>
<tr>
<td>3 1/2 inches x 24 inches</td>
<td>475</td>
</tr>
<tr>
<td>4 1/2 inches x 24 inches</td>
<td>685</td>
</tr>
<tr>
<td>4 1/2 inches x 36 inches</td>
<td>1,037</td>
</tr>
<tr>
<td>6 inches x 36 inches</td>
<td>1,569</td>
</tr>
<tr>
<td>6 inches x 48 inches</td>
<td>2,100</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.a. Bottom of the overflow chamber must be at least 6 inches below weir.
Methods of Connecting Overflow from Gravity House and Suction Water Supply Tanks

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.

Manholes of potable water tanks shall not be located directly under any soil or waste piping or any source of contamination.
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.

606.5.4.5 Cleaning or painting.

Water tanks shall be cleaned and painted in accordance with the following:

606.5.4.5.1 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.

606.5.4.5.2 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 fitting 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.

606.5.4.5.3 Maintenance schedule.

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 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.

606.7 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.

**Exception:** Swimming pools accessory to Group R-3 occupancies.

606.8 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.

606.8.1 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.

606.8.2 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.

606.8.3 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 all 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. 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 water supply temperature maintenance.

Where the developed length of hot or tempered 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 City Energy Conservation Code.
607.2.1 Piping insulation.
Circulating hot water system piping shall be insulated in accordance with the New York City Energy Conservation Code.

607.2.2 Hot water system controls.
Automatic circulating hot water system pumps or temperature maintenance cable 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 conformance to ASSE 1016 or ASME A112.18.1/CSA B125.1, 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 608.16.10.

**Table 608.1 Application of Backflow Preventers**

<table>
<thead>
<tr>
<th>Category</th>
<th>Hazard</th>
<th>Backflow Prevention Type</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air gap</td>
<td>High or low hazard</td>
<td>Backsiphonage</td>
<td>ASME A112.1.2</td>
</tr>
<tr>
<td>Air gap fittings for use with plumbing fixtures, appliances and appurtenances</td>
<td>High or low hazard</td>
<td>Backsiphonage</td>
<td>ASME A112.1.3</td>
</tr>
<tr>
<td>Antisiphon-type fill valves for gravity water closet flush tanks</td>
<td>High hazard</td>
<td>Backsiphonage only</td>
<td>ASSE 1002, CSA B125.3</td>
</tr>
<tr>
<td>Backflow preventer for carbonated beverage machines</td>
<td>Low hazard</td>
<td>Backpressure or backsiphonage Sizes 1/4&quot; - 3/8&quot;</td>
<td>ASSE 1022</td>
</tr>
<tr>
<td>Backflow preventer with intermediate atmospheric vents</td>
<td>Low hazard</td>
<td>Backpressure or backsiphonage Sizes 1/4&quot; - 3/4&quot;</td>
<td>ASSE 1012, CAN/CSA B64.3</td>
</tr>
<tr>
<td>Barometric loop</td>
<td>High or low hazard</td>
<td>Backsiphonage only</td>
<td>(See Section 608.13.4)</td>
</tr>
<tr>
<td>Double check backflow prevention assembly</td>
<td>Low hazard</td>
<td>Backpressure or backsiphonage Sizes 3/8&quot; - 12&quot;</td>
<td>ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1</td>
</tr>
<tr>
<td>Double check detector fire protection backflow prevention assemblies</td>
<td>Low hazard</td>
<td>Backpressure or systems Sizes 2&quot; - 12&quot;</td>
<td>ASSE 1048</td>
</tr>
<tr>
<td>Dual-check-valve-type backflow preventer</td>
<td>Low hazard</td>
<td>Backpressure or backsiphonage Sizes 1/4&quot; - 1&quot;</td>
<td>ASSE 1024, CSA B64.6</td>
</tr>
<tr>
<td>Hose connection backflow preventer</td>
<td>Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes 1/2&quot; - 1&quot;</td>
<td>ASSE 1052, CSA B64.2.1.1</td>
<td></td>
</tr>
<tr>
<td>Hose connection vacuum breaker</td>
<td>High or low hazard</td>
<td>Low head backpressure or backsiphonage Sizes 1/2&quot;, 3/4&quot;, 1&quot;</td>
<td>ASSE 1011, CAN/CSA B64.2.2, CSA B64.2.1</td>
</tr>
<tr>
<td>Laboratory faucet backflow preventer</td>
<td>High or low hazard</td>
<td>Low head backpressure and Backsiphonage</td>
<td>ASSE 1035, CSA B64.7</td>
</tr>
<tr>
<td>Pipe-applied atmospheric-type vacuum Breaker</td>
<td>High or low hazard</td>
<td>Backsiphonage only Sizes 1/4&quot; - 4&quot;</td>
<td>ASSE 1001, CAN/CSA B64.1.1</td>
</tr>
<tr>
<td>Pressure vacuum breaker assembly</td>
<td>High or low hazard</td>
<td>Backsiphonage only Sizes 1/2&quot; - 2&quot;</td>
<td>ASSE 1020, CSA B64.1.2</td>
</tr>
<tr>
<td>Reduced pressure principle backflow preventer</td>
<td>High or low hazard</td>
<td>Backpressure or backsiphonage Sizes 3/8&quot; - 12&quot;</td>
<td>ASSE 1013, AWWA C511, CAN/CSA B64.4, CSA B64.4.1</td>
</tr>
<tr>
<td>Reduced pressure detector fire protection backflow prevention assemblies</td>
<td>High or low hazard</td>
<td>Backsiphonage or backpressure (Fire sprinkler systems)</td>
<td>ASSE 1047</td>
</tr>
<tr>
<td>Splitproof vacuum breaker</td>
<td>High or low hazard</td>
<td>Backsiphonage only Backs Sizes 1/4&quot; - 2&quot;</td>
<td>ASSE 1056</td>
</tr>
<tr>
<td>Vacuum breaker wall hydrants, frost-resistant, automatic draining type</td>
<td>High or low hazard</td>
<td>Low head backpressure or backsiphonage Sizes 3/4&quot;, 1&quot;</td>
<td>ASSE 1019, CAN/CSA B64.2.2</td>
</tr>
</tbody>
</table>

Sizes listed in inches. 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).

608.2 Plumbing fixtures.
The supply lines or fittings for every plumbing fixture shall be installed so as to prevent backflow. Plumbing fixture fittings shall provide backflow protection in accordance with ASME A112.18.1.

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 Valves and outlets prohibited below grade.

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

Exception: Freeze-proof 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.

In buildings where nonpotable water systems are installed, the piping conveying the nonpotable water shall be identified either by color marking or metal tags in accordance with Sections 608.8.1 through 608.8.3. All nonpotable water outlets such as hose connections, open ended pipes, and faucets shall be identified at the point of use for each outlet with the words, "Caution, Nonpotable Water. Do Not Drink." The words shall be indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches in height and color in contrast to the background on which they are applied.

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 (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 Color.

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

608.8.3 Size.

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

Table 608.8.3

<table>
<thead>
<tr>
<th>Size of Pipe Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Diameter (inches)</td>
</tr>
<tr>
<td>1/4 to 1 1/4</td>
</tr>
<tr>
<td>1 1/2 to 2</td>
</tr>
<tr>
<td>2 1/2 to 6</td>
</tr>
<tr>
<td>8 to 10</td>
</tr>
<tr>
<td>over 10</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 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 secondary 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 CSA B 64.4.1. 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. These devices shall be tested annually by a New York State certified tester employed by a New York City licensed plumber.

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 or CSA B64.1.2. 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, CSA B64.2.1, CSA B64.2.1.1, 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, CSA B64.5, CSA B64.5.1, 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 New York State certified tester employed by a New York City licensed plumber.

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.

608.14.1 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

<table>
<thead>
<tr>
<th>Fixture</th>
<th>Minimum Air Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lavatories and other fixtures with effective opening not greater than ( \frac{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 ( \frac{3}{4} ) inch in diameter</td>
<td>( \frac{1}{2} )</td>
</tr>
<tr>
<td>Over- rim bath fillers and other fixtures with effective openings not greater than 1 inch in diameter</td>
<td>( \frac{3}{4} )</td>
</tr>
<tr>
<td>Drinking water fountains, single orifice not greater than ( \frac{7}{16} ) inch in diameter or multiple orifices with a total area of 0.150 square inch (area of circle ( \frac{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.

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 be set in accordance with Section 425.3.1. Vacuum breakers 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.

Silicocks, hose bibs, 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 carbonated 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 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. Makeup water lines to any boiler with heat input greater than 2.8 million Btu/hr (600 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 recommended for billing purposes in the "Guide to Water Sub-meters" published by the Department of Environmental Protection or as otherwise provided in the rules of the department.

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-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, 608.13.3, 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

<table>
<thead>
<tr>
<th>Source of Contamination</th>
<th>Distance (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

http://library.amlegal.com/alpscripts/get-content.aspx
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. 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 resealing 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 valved 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.

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 capture and utilize solar energy for space heating or cooling, domestic hot water heating, swimming pool heating or process heating shall comply 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 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 PC 424 or a fixture conforming to Section PC 424 that is capable of attaching to a splitter and either:

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

Chapter 7: Sanitary Drainage

Section PC 701: General

701.1 Scope.

The provisions of this chapter shall govern the materials, design, construction and installation of sanitary drainage systems.

701.2 Sewer required.

Every building in which plumbing fixtures are installed and all premises having drainage piping shall be connected to a public sewer, where available and where connection thereto is feasible. Where neither a sanitary nor a combined sewer is available to which connection is feasible a private sewer or private sewage disposal system shall be provided. See Section 106.6.1 of this code for required construction documents relating to provisions for discharge for sanitary sewage.

701.2.1 Extensions of public sanitary or combined sewers.

Extensions of public sanitary or combined sewers shall be made in accordance with the regulations of the Department of Environmental Protection.

701.2.2 Availability of public sanitary or combined sewer.

The determination as to whether a public sanitary or combined sewer is available shall be made in accordance with the applicable standards of the Department of Environmental Protection.

701.2.3 Feasibility of connecting to an available sanitary or combined public sewer.
The determination as to whether connection to an available sanitary or combined public sewer is feasible shall be in accordance with the applicable standards of the Department of Environmental Protection.

701.2.4 Where public sewers are made available to premises with private sewage disposal system.

When public sewers are made available to premises with individual on-site private disposal systems, such private sewage disposal system shall be abandoned in a manner prescribed by the commissioner, and the owner shall connect the building house sewer to the available public sewer within 6 months of the date of notification that the sewer has been accepted to receive flow by the agency or agencies having jurisdiction.

701.2.5 Abandonment of existing building sewer connections.

All abandoned building sewers shall require plug permits from the Department of Environmental Protection and shall be securely sealed at a point inside the curb line and as close thereto as practicable.

701.3 Separate sewer connection.

Every building having plumbing fixtures installed and intended for human habitation, occupancy or use on premises abutting on a street, alley or easement in which there is a public sewer shall have a separate connection with the sewer. Where located on the same lot, multiple buildings shall not be prohibited from connecting to a common building sewer that connects to the public sewer, provided, however, that the common elements of an internal private drain are located in a dedicated, unobstructed right-of-way that extends to the sewer with a minimum width of 10 feet (3048 mm) located entirely outside of the building footprint and outside of all overhangs and projections that are less than 14 feet (4267 mm) in height above grade.

701.4 Sewage treatment.

Sewage or other waste shall not be discharged into surface or subsurface water unless it has been discharged by a method subject to the approval of the commissioner and of the Department of Health and Mental Hygiene, the Department of Environmental Protection, and the New York State Department of Environmental Conservation.

701.5 Damage to drainage system or public sewer.

Wastes detrimental to the public sewer system or to the functioning of the sewage-treatment plant shall be treated and disposed of in accordance with applicable rules of the Department of Environmental Protection.

701.6 Tests

The sanitary drainage system shall be tested in accordance with Section PC 312.

701.7 Connections.

Direct connection of a steam exhaust, blowoff or drip pipe shall not be made with the building drainage system. Wastewater when discharged into the building drainage system shall be at a temperature not higher than 150°F (65.6°C). When higher temperatures exist, approved cooling methods shall be provided.

701.8 Engineered systems.

Engineered sanitary drainage systems shall conform to the provisions of Section 28-113.2.2 of the Administrative Code and Section PC 714 of this code.

701.9 Drainage piping in food service areas.

Exposed soil or waste piping shall not be installed above any working, storage or eating surfaces in food service establishments.

701.10 Plastic pipe.

Plastic piping and fittings shall not be used.

Exceptions:

1. Plastic piping and fittings may be used in residential buildings five stories or less in height.
2. Plastic piping and fittings may be used as permitted in Sections PC 803 and PC 804.

Section PC 702: Materials

702.1 Above-ground sanitary drainage and vent pipe.

Above-ground soil, waste and vent pipe shall conform to one of the standards listed in Table 702.1.

### Table 702.1

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene</td>
<td>ASTM D 2661; ASTM F 628; ASTM F 1488; CAN/CSA B181.1</td>
</tr>
<tr>
<td>(ABS) plastic pipe in IPS</td>
<td></td>
</tr>
<tr>
<td>diameters, including Schedule</td>
<td></td>
</tr>
<tr>
<td>40, DR 22 (PS 200) and DR 24</td>
<td></td>
</tr>
<tr>
<td>(PS 140); with a solid, cellular</td>
<td></td>
</tr>
<tr>
<td>core or composite wall</td>
<td></td>
</tr>
<tr>
<td>Brass pipe</td>
<td>ASTM B43</td>
</tr>
<tr>
<td>Cast-iron pipe</td>
<td>ASTM A74; ASTM A888; CISPI 301</td>
</tr>
<tr>
<td>Copper or copper-alloy pipe</td>
<td>ASTM B42; ASTM B302</td>
</tr>
<tr>
<td>Copper or copper-alloy tubing</td>
<td>ASTM B75; ASTM B88; ASTM B251; ASTM B306</td>
</tr>
<tr>
<td>(Type K, L)</td>
<td></td>
</tr>
<tr>
<td>Ductile iron</td>
<td>AWWA C151</td>
</tr>
<tr>
<td>Galvanized steel pipe</td>
<td>ASTM A53</td>
</tr>
<tr>
<td>Glass pipe</td>
<td>ASTM C1053</td>
</tr>
<tr>
<td>High silicon cast iron</td>
<td>ASTM A518/A518 M</td>
</tr>
<tr>
<td>Polyolefin pipe&lt;sup&gt;a&lt;/sup&gt;</td>
<td>ASTM F 1412; ASTM D 2657; CAN/CSA B181.3</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic</td>
<td>ASTM D 2665; ASTM F 891; ASTM F 1488; CAN/CSA B181.2</td>
</tr>
<tr>
<td>pipe in IPS diameters, including</td>
<td></td>
</tr>
<tr>
<td>schedule 40, DR 22 (PS 200), and</td>
<td></td>
</tr>
<tr>
<td>DR 24 (PS 140); with a solid,</td>
<td></td>
</tr>
<tr>
<td>cellular core or composite wall&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic</td>
<td>ASTM D 2949; ASTM F 1488</td>
</tr>
<tr>
<td>pipe with a 3.25-inch O.D. and a</td>
<td></td>
</tr>
<tr>
<td>solid, cellular core or composite</td>
<td></td>
</tr>
<tr>
<td>wall&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Polyvinylidene fluoride (PVDF)</td>
<td>ASTM F 1673; CAN/CSA B181.3</td>
</tr>
<tr>
<td>plastic pipe&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Stainless steel drainage systems,</td>
<td>ASME A112.3.1</td>
</tr>
<tr>
<td>Types 304 and 316L</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Indicates the use of this material is permitted only when properly approved by the appropriate authority.
702.2 Underground building sanitary drainage and vent pipe.
Underground building sanitary drainage and vent pipe shall conform to one of the standards listed in Table 702.2.

Table 702.2
Underground Building Drainage and Vent Pipe

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast-iron pipe</td>
<td>ASTM A 74; ASTM A 888; CISPI 301</td>
</tr>
<tr>
<td>Copper or copper alloy tubing (Type K, L)</td>
<td>ASTM B75; ASTM B88; ASTM B251; ASTM B306</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>AWWA C151</td>
</tr>
<tr>
<td>Non-asbestos fiber cement pipe</td>
<td>AWWA C 1449</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic pipe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in IPS diameters, including schedule 40, DR 22 (PS 200), and</td>
</tr>
<tr>
<td></td>
<td>DR 24 (PS 140); with a solid, cellular core or composite</td>
</tr>
<tr>
<td></td>
<td>walla</td>
</tr>
<tr>
<td>Stainless steel drainage systems, Type316L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASME A112.3.1</td>
</tr>
</tbody>
</table>

a. Limited to residential buildings five stories or less in height.

702.3 Building sewer pipe.
Building sewer pipe shall conform to one of the standards listed in Table 702.3.

Table 702.3
Building Sewer Pipe

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast-iron pipe</td>
<td>ASTM A 74; ASTM A 888; CISPI 301</td>
</tr>
<tr>
<td>Concrete pipe</td>
<td>ASTM C14; ASTM C76; CAN/CSA A257.1M; CAN/CSA A257.2M</td>
</tr>
<tr>
<td>Copper or copper-alloy tubing (Type K)</td>
<td>ASTM B75; ASTM B88; ASTM B251</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>AWWA C151</td>
</tr>
<tr>
<td>Non-asbestos fiber cement pipe</td>
<td>AWWA C 1449</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic pipe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Type DWV, SDR26, SDR35, SDR41, PS50 or PS100)</td>
</tr>
<tr>
<td>Stainless steel drainage systems, types304 and 316L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASME A112.3.1</td>
</tr>
<tr>
<td>Vitrified clay pipe</td>
<td>ASTM C 4; ASTM C 700</td>
</tr>
</tbody>
</table>

a. Limited to residential buildings five stories or less in height.

702.4 Fittings.
Pipe fittings shall be approved for installation with the piping material installed and shall comply with the applicable standards listed in Table 702.4.

Table 702.4
Pipe Fittings

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
<td>ASTM D 2661; ASTM F 628; CSA B191.1</td>
</tr>
<tr>
<td>plastic pipe in IPS diametersa</td>
<td></td>
</tr>
<tr>
<td>Acrylonitrile butadiene styrene (ABS)</td>
<td>ASTM D 2751</td>
</tr>
<tr>
<td>plastic pipe in sewer and drain diameters</td>
<td></td>
</tr>
<tr>
<td>Brass</td>
<td>ASTM B862</td>
</tr>
<tr>
<td>Cast iron</td>
<td>ASME B16.4; ASME B16.12; ASTM A 74; ASTM A 888; CISPI 301</td>
</tr>
<tr>
<td>Copper or copper alloy</td>
<td>ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23;</td>
</tr>
<tr>
<td>alloy</td>
<td>ASME B16.26; ASME B16.29</td>
</tr>
<tr>
<td>Galvanized steel</td>
<td>ASTM A153; ASME B16.3</td>
</tr>
<tr>
<td>Glass</td>
<td>ASTM C 1053</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>AWWA C110</td>
</tr>
<tr>
<td>High silicon iron</td>
<td>ASTM A 861</td>
</tr>
<tr>
<td>Malleable iron</td>
<td>ASME B16.3</td>
</tr>
<tr>
<td>Non-asbestos fiber cement</td>
<td>ASTM C1449</td>
</tr>
<tr>
<td>Polyolefinb</td>
<td>CAN/CSA B181.3; ASTM F 1412; ASTM D 2657</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic</td>
<td></td>
</tr>
<tr>
<td>pipe in IPS diameters</td>
<td>ASTM D 2665; ASTM F 1866</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic</td>
<td></td>
</tr>
<tr>
<td>pipe in sewer and drain diametersb</td>
<td>ASTM D 3034</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic pipe</td>
<td></td>
</tr>
<tr>
<td>with a 3.25-inch O.D.</td>
<td>ASTM D 2949</td>
</tr>
<tr>
<td>Polyvinylidene fluoride (PVDF)</td>
<td>ASTM F 1673; CAN/CSA</td>
</tr>
</tbody>
</table>
702.5 Chemical waste system.

A chemical waste system shall be completely separated from the sanitary drainage system. The chemical waste shall be treated in accordance with Section 803.2 before discharging to the sanitary drainage system. Separate drainage systems for chemical wastes and vent pipes shall be of an approved material that is resistant to corrosion and degradation for the concentrations of chemicals involved.

702.6 Lead bends and traps.

Lead bends and traps shall not be less than \( \frac{1}{16} \) inch (3.2 mm) wall thickness.

Section PC 703: Building Sewer

703.1 Building sewer pipe near the water service.

Where the building sewer is installed within 5 feet (1524 mm) of the water service, as provided for in Section 603.2, the building sewer pipe shall conform to one of the standards for, cast-iron pipe, copper or copper-alloy tubing, or ductile iron listed in Table 702.3.

703.2 Drainage pipe in filled ground.

Where a building sewer or building drain is installed on filled or unstable ground, the drainage pipe shall conform to one of the standards for, cast-iron pipe, copper or copper-alloy tubing, ductile iron, non-asbestos fiber cement or concrete pipe listed in Table 702.3.

703.3 Sanitary and storm sewers.

Where separate systems of sanitary drainage and storm drainage are installed in the same property, the sanitary and storm building sewers or drains shall be permitted to be laid side by side in one trench.

703.4 Existing building sewers and drains.

Existing building sewers and drains shall connect with new building sewer and drainage systems only where found by examination and test to conform to the new system in quality of material. The commissioner shall notify the owner to make the changes necessary to conform to this code.

703.5 Cleanouts on building sewers.

Cleanouts on building sewers shall be located as set forth in Section PC 708.

703.6 Building house traps.

Building house traps shall be installed on all building drains near the foundation wall of the structure, inside of the street line, and on the sewer side of all connections except the connection used to receive the discharge from a sewage ejector, oil separator or leader on combined systems. If such trap is placed outside of the foundation wall or below a cellar floor, it shall be made accessible in a manhole with a cover, or by extension of the two handholes that shall be provided with cleanouts at the cellar floor or grade. Handhold extensions shall be not more than 18 inches (457 mm) above the centerline of the drain. Building (house) traps shall be the same size as the building house drain connected thereto.

703.6.1 Fresh air inlets.

Every sanitary or combined building drain equipped with a building trap, sewage pump, ejector, receiving tank, oil separator, or similar equipment, shall be provided with a fresh air inlet pipe connected to the building drain immediately upstream from, and within 4 feet (1219 mm) of, such trap or equipment. Such connection shall be made in the same manner as prescribed in Section PC 905 for vent connections to horizontal drains, and the fresh air inlet pipe shall be extended to the outer air and shall be terminated in an open end at least 6 inches (152 mm) above grade. The open end shall be protected by a perforated metal plate permanently fixed in the mouth of the inlet and having an open ventilating area at least equal to the area of the pipe, or by a return bend with its unprotected open end at least 6 inches (152 mm) above grade, located inside the street line. The size of the fresh air inlet pipe shall be at least one-half the diameter of the building drain at the point of connection, but not less than 3 inches (76 mm).

Section PC 704: Drainage Piping Installation

704.1 Slope of horizontal drainage piping.

Horizontal drainage piping shall be installed in uniform alignment at uniform slopes. The minimum slope of a horizontal drainage pipe shall be in accordance with Table 704.1.

Table 704.1

<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>Minimum Slope (inch per foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2( \frac{1}{8} ) or less</td>
<td>( \frac{1}{16} )</td>
</tr>
<tr>
<td>3 to 6</td>
<td>( \frac{1}{8} )</td>
</tr>
<tr>
<td>8 or larger</td>
<td>( \frac{1}{16} )</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 inch per foot = 0.083.3 mm/m.

704.2 Change in size.

The size of the drainage piping shall not be reduced in size in the direction of the flow. A 4 inch by 3 inch (102 mm by 76mm) water closet connection shall not be considered as a reduction in size.

704.3 Connections to offsets and bases of stacks.

Horizontal branches shall connect to the bases of stacks at a point located not less than 10 times the diameter of the drainage stack downstream from the stack. Except as prohibited by Section 711.2, horizontal branches shall connect to horizontal stack offsets at a point located not less than 10 times the diameter of the drainage stack downstream from the upper stack.

704.4 Future fixtures.

Drainage piping for future fixtures shall terminate with an approved cap or plug.

704.5 Dead ends.

In the installation or removal of any part of a drainage system, dead ends shall be prohibited. Cleanout extensions and approved future fixture drainage piping shall not be considered as dead ends.

704.6 Suds Pressure Zones Vents.

Where sinks, laundry trays, laundry washing machines, bathtubs, and similar fixtures in which detergents producing suds are normally used and discharged at an upper floor level into a soil or waste stack that also serves fixtures in other occupancy units at a lower floor level, the drainage and vent piping for such lower fixtures shall be arranged so as to avoid connection to suds pressure zones in the sanitary drainage and vent systems. If connected to the sanitary system, a suds relief vent relieving to a nonpressure zone shall be provided at each suds pressure zone where such connections are installed. The diameter of such relief vent shall be at least \( \frac{3}{8} \) inch (3.2 mm) wall thickness for all connections.
which the pressure zone occurs, but not less than 2 inches (51mm). Suds pressure zones shall be considered to exist at the following locations in sanitary drainage and vent systems when the piping serves fixtures on two or more floors that receive wastes that contain detergents producing suds: 1. In a soil or waste stack a zone shall be considered to exist in the vertical portion within 40 stack diameters of the base fitting. 2. In the horizontal drain at the base of a soil or waste stack a zone shall be considered to exist in the horizontal portion within 10 stack diameters of the base fitting. Where a 60-degree (1.05 rad) or 90-degree (1.57 rad) fitting is installed in the horizontal drain, a zone shall be considered to exist in the horizontal portion within 40 drain diameters upstream of and 10 drain diameters downstream of the fitting in accordance with Figure 704.6(2).

3. In a soil or waste stack offset of 60 degrees (1.05 rad) or 90 degrees (1.57 rad), a zone shall be considered to exist in the vertical portion of the stack within 40 stack diameters of the base fitting for the upper section of the stack. The zone shall be considered to exist in the horizontal offset within 10 stack diameters of such base fitting and within 40 stack diameters of the top fitting for the lower section of the stack.

4. In a vent stack that has its base connected to a suds pressure zone in the sanitary drainage system, a zone shall be considered to exist in the portion of the vent stack extending from its base connection up to the lowest branch vent fitting located above the level of the suds pressure zone in the sanitary drainage system.

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**Figure 704.6(2)**
Suds Pressure Zones

**Section PC 705: Joints**

705.1 General.
This section contains provisions applicable to joints specific to sanitary drainage piping.

705.2 ABS plastic.
Joints between ABS plastic pipe or fittings shall comply with Sections 705.2.1 through 705.2.3.

705.2.1 Mechanical joints.
Mechanical joints on drainage pipes shall be made with an elastomeric seal conforming to ASTM C 1173, ASTM D 3212 or CAN/CSA B602. Mechanical joints shall be installed only in underground systems unless otherwise approved. Joints shall be installed in accordance with the manufacturer’s instructions and in conformance with acceptance criteria established by the commissioner.

705.2.2 Solvent cementing.
Joint surfaces shall be clean and free from moisture. Solvent cement that conforms to ASTM D 2235 or CSA B181.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet. Joints shall be made in accordance with ASTM D 2235, ASTM D 2661, ASTM F 628 or CSA B181.1. Solvent-cement joints shall be permitted above or below ground.

705.2.3 Threaded joints.
Threads shall conform to ASME B1.20.1. Schedule 80 or heavier pipe shall be permitted to be threaded with dies specifically designed for plastic pipe. Approved thread lubricant or tape shall be applied on the male threads only.

705.3 Asbestos-cement.
Joints between asbestos-cement pipe or fittings shall be made with a sleeve coupling of the same composition as the pipe, sealed with an elastomeric ring conforming to ASTM D 1869.

705.4 Brass.
Joints between brass pipe or fittings shall comply with Sections 705.4.1 through 705.4.4.

705.4.1 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.

705.4.2 Mechanical joints.
Mechanical joints shall be installed in accordance with the manufacturers' instructions and in conformance with acceptance criteria established by the commissioner.

705.4.3 Threaded joints.

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

705.4.4 Welded joints.

All joint surfaces shall be cleaned. The joint shall be welded with an approved filler metal.

705.5 Cast iron.

Joints between cast-iron pipe or fittings shall comply with Sections 705.5.1 through 705.5.3.

705.5.1 Caulked joints.

Joints for hub and spigot pipe shall be firmly packed with oakum or hemp. Molten lead shall be poured in one operation to a depth of not less than 1 inch (25 mm). The lead shall not recede more than 0.125 inch (3.2 mm) below the rim of the hub and shall be caulked tight. Paint, varnish or other coatings shall not be permitted on the jointing material until after the joint has been tested and approved. Lead shall be run in one pouring and shall be caulked tight. Acid-resistant rope and acidproof cement shall be permitted.

705.5.2 Compression gasket joints.

Compression gaskets for hub and spigot pipe and fittings shall conform to ASTM C 564 and shall be tested to ASTM C 1563. Gaskets shall be compressed when the pipe is fully inserted.

705.5.3 Mechanical joint coupling.

Mechanical joint couplings for hubless pipe and fittings shall comply with CISPI 310 or ASTM C 1277 or ASTM C 1540. The elastomeric sealing sleeve shall conform to ASTM C 564 or CAN/CSA B602 and shall be provided with a center stop. Mechanical joint couplings shall be installed in accordance with the manufacturer's installation instructions.

705.6 Concrete joints.

Joints between concrete pipe and fittings shall be made with an elastomeric seal conforming to ASTM C 443, ASTM C 1173, CAN/CSA A257.3M or CAN/CSA B602.

705.7 and 705.8 Reserved.

705.9 Copper pipe.

Joints between copper or copper-alloy pipe or fittings shall comply with Sections 705.9.1 through 705.9.5.

705.9.1 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.

705.9.2 Mechanical joints.

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

705.9.3 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.

705.9.4 Threaded joints.

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

705.9.5 Welded joints.

All joint surfaces shall be cleaned. The joint shall be welded with an approved filler metal.

705.10 Copper tubing.

Joints between copper or copper-alloy tubing or fittings shall comply with Sections 705.10.1 through 705.10.3.

705.10.1 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.

705.10.2 Mechanical joints.

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

705.10.3 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.

705.11 Borosilicate glass joints.

Glass-to-glass connections shall be made with a bolted compression-type stainless steel (300 series) coupling with contoured acid-resistant elastomeric compression ring and a fluorocarbon polymer inner seal ring; or with caulked joints in accordance with Section 705.11.1.

705.11.1 Caulked joints.

Every lead-caulked joint for hub and spigot soil pipe shall be firmly packed with oakum or hemp and filled with molten lead not less than 1 inch (25 mm) deep and not to extend more than $\frac{1}{3}$ inch (3.2 mm) below the rim of the hub. Paint, varnish or other coatings shall not be permitted on the jointing material until after the joint has been tested and approved. Lead shall be run in one pouring and shall be caulked tight. Acid-resistant rope and acidproof cement shall be permitted.

705.12 Steel.

Joints between galvanized steel pipe or fittings shall comply with Sections 705.12.1 and 705.12.2.

705.12.1 Threaded joints.

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

705.12.2 Mechanical joints.

Joints shall be made with an approved elastomeric seal. Mechanical joints shall be installed in accordance with the manufacturers' instructions and in conformance with acceptance criteria established by the commissioner.

705.13 Lead.

Joints between lead pipe or fittings shall comply with Sections 705.13.1 and 705.13.2.

705.13.1 Burned.

Burned joints shall be uniformly fused together into one continuous piece. The thickness of the joint shall be at least as thick as the lead being joined. The filler metal shall be of the same material as the pipe.

705.13.2 Wiped.
Joints shall be fully wiped, with an exposed surface on each side of the joint not less than $\frac{3}{16}$ inch (19.1 mm). The joint shall be at least $\frac{3}{16}$ inch (9.5 mm) thick at the thickest point.

**705.14 PVC plastic.**

Joints between PVC plastic pipe or fittings shall comply with Sections 705.14.1 through 705.14.3.

**705.14.1 Mechanical joints.**

Mechanical joints on drainage pipes shall be made with an elastomeric seal conforming to ASTM C 1173, ASTM D 3212 or CAN/CSA B602. Mechanical joints shall not be installed in above-ground systems unless otherwise approved. Joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

**705.14.2 Solvent cementing.**

Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564, CSA B137.3, CSA B18.12 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

**705.14.3 Threaded joints.**

Threads shall conform to ASME B1.20.1. Schedule 80 or heavier pipe shall be permitted to be threaded with dies specifically designed for plastic pipe. Approved thread lubricant or tape shall be applied on the male threads only.

**705.15 Vitriﬁed clay.**

Joints between vitriﬁed clay pipe or fittings shall be made with an elastomeric seal conforming to ASTM C 425, ASTM C 1173 or CAN/CSA B602.

**705.16 Polyethylene plastic pipe.**

Joints between polyethylene plastic pipe and fittings shall be underground and shall comply with Section 705.16.1 or 705.16.2.

**705.16.1 Heat-fusion joints.**

Joint surfaces shall be clean and free from moisture. All joint surfaces shall be cut, heated to melting temperature and joined using tools speciﬁcally designed for the operation. Joints shall be undisturbed until cool. Joints shall be made in accordance with ASTM D 2855 and the manufacturer’s instructions.

**705.16.2 Mechanical joints.**

Mechanical joints in drainage piping shall be made with an elastomeric seal conforming to ASTM C 1173, ASTM D 3212 or CAN/CSA B602. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

**705.17 Polyoleﬁn plastic.**

Joints between polyoleﬁn plastic pipe and fittings shall comply with Sections 705.17.1 and 705.17.2.

**705.17.1 Heat-fusion joints.**

Heat-fusion joints for polyoleﬁn pipe and tubing joints shall be installed with socket-type heat-fused polyoleﬁn ﬁttings or electrofusion polyoleﬁn ﬁttings. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 1412 or CAN/CSA B181.3.

**705.17.2 Mechanical and compression sleeve joints.**

Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer’s instructions, and in conformance with acceptance criteria established by the commissioner.

**705.18 Polyvinylidene fluoride plastic.**

Joints between polyvinylidene fluoride pipe and fittings shall comply with Sections 705.18.1 and 705.18.2.

**705.18.1 Heat-fusion joints.**

Heat-fusion joints for polyvinylidene fluoride pipe and tubing joints shall be installed with socket-type heat-fused polyvinylidene ﬂuoride ﬁttings or electrofusion polyvinylidene ﬁttings and couplings. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 1673.

**705.18.2 Mechanical and compression sleeve joints.**

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

**705.19 Joints between different materials.**

Joints between different piping materials shall be made with a mechanical joint of the compression or mechanical-sealing type conforming to ASTM C 1173, ASTM C 1460 or ASTM C 1461. Connectors and adapters shall be approved for the application and such joints shall have an elastomeric seal conforming to ASTM C 425, ASTM C 443, ASTM C 564, ASTM C 1440, ASTM D 1869, ASTM F 477, CAN/CSA A257.3M or CAN/CSA B602, or as required in Sections 705.19.1 through 705.19.7. Joints between glass pipe and other types of materials shall be made with adapters having a TFE seal. Joints shall be installed in accordance with the manufacturer’s instructions.

**705.19.1 Copper or copper-alloy tubing to cast-iron hub pipe.**

Joints between copper or copper-alloy tubing and cast-iron hub pipe shall be made with a brass ferrule or compression joint. The copper or copper-alloy tubing shall be soldered to the ferrule in an approved manner, and the ferrule shall be joined to the cast-iron hub by a caulked joint or a mechanical compression joint.

**705.19.2 Reserved.**

**705.19.3 Cast-iron pipe to galvanized steel or brass pipe.**

Joints between cast-iron and galvanized steel or brass pipe shall be made by either caulked or threaded joints or with an approved adapter fitting.

**705.19.4 Plastic pipe or tubing to other piping material.**

Joints between different grades of plastic pipe or between plastic pipe and other piping material shall be made with an approved adapter ﬁtting. Joints between plastic pipe and cast-iron hub pipe shall be made by a caulked joint or a mechanical compression joint.

**705.19.5 Lead pipe to other piping material.**

Joints between lead pipe and other piping material shall be made by a wiped joint to a caulking ferrule, soldering nipple, or bushing or shall be made with an approved adapter ﬁtting.

**705.19.6 Borosilicate glass to other materials.**

Joints between glass pipe and other types of materials shall be made with adapters having a TFE seal and shall be installed in accordance with the manufacturer's instructions.

**705.19.7 Stainless steel drainage systems to other materials.**

Joints between stainless steel drainage systems and other piping materials shall be made with approved mechanical couplings.

**705.20 Drainage slip joints.**

Slip joints shall comply with Section 405.8.
Chapter 6: New York City Plumbing Code

705.21 Caulking ferrules.
Ferrules shall be of red brass and shall be in accordance with Table 705.21.

<table>
<thead>
<tr>
<th>Pipe Sizes (inches)</th>
<th>Inside Diameter (inches)</th>
<th>Length (inches)</th>
<th>Minimum Weight Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 1/4</td>
<td>4 1/2</td>
<td>1 pound</td>
</tr>
<tr>
<td>3</td>
<td>3 1/4</td>
<td>4 1/2</td>
<td>1 pound 12 ounces</td>
</tr>
<tr>
<td>4</td>
<td>4 1/4</td>
<td>4 1/2</td>
<td>2 pounds 8 ounces</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 ounce = 28.35 g, 1 pound = 0.454 kg.

705.22 Soldering bushings.
Soldering bushings shall be of red brass and shall be in accordance with Table 705.22.

<table>
<thead>
<tr>
<th>Pipe Sizes (inches)</th>
<th>Minimum Weight Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4</td>
<td>6 ounces</td>
</tr>
<tr>
<td>1 1/2</td>
<td>8 ounces</td>
</tr>
<tr>
<td>2</td>
<td>14 ounces</td>
</tr>
<tr>
<td>2 1/2</td>
<td>1 pound 6 ounces</td>
</tr>
<tr>
<td>3</td>
<td>2 pounds</td>
</tr>
<tr>
<td>4</td>
<td>3 pounds 8 ounces</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 ounce = 28.35 g, 1 pound = 0.454 kg.

705.23 Stainless steel drainage systems.
O-ring joints for stainless steel drainage systems shall be made with an approved elastomeric seal.

Section PC 706: Connections Between Drainage Piping and Fittings

706.1 Connections and changes in direction.
All connections and changes in direction of the sanitary drainage system shall be made with approved drainage fittings. Connections between drainage piping and fixtures shall conform to Section PC 405.

706.2 Obstructions.
The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Threaded drainage pipe fittings shall be of the recessed drainage type.

706.3 Installation of fittings.
Fittings shall be installed to guide sewage and waste in the direction of flow. Change in direction shall be made by fittings installed in accordance with Table 706.3. Change in direction by combination fittings, side inlets or increasers shall be installed in accordance with Table 706.3 based on the pattern of flow created by the fitting.

<table>
<thead>
<tr>
<th>Type of Fitting Pattern</th>
<th>Change in Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Horizontal to vertical</td>
</tr>
<tr>
<td>Sixteenth bend</td>
<td>X</td>
</tr>
<tr>
<td>Eighth bend</td>
<td>X</td>
</tr>
<tr>
<td>Sixth bend</td>
<td>X</td>
</tr>
<tr>
<td>Quarter bend</td>
<td>X</td>
</tr>
<tr>
<td>Short sweep</td>
<td>X</td>
</tr>
<tr>
<td>Long sweep</td>
<td>X</td>
</tr>
<tr>
<td>Sanitary tee</td>
<td>X</td>
</tr>
<tr>
<td>Wye</td>
<td>X</td>
</tr>
<tr>
<td>Combination wye and eighth bend</td>
<td>X</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.
a. The fittings shall only be permitted for a 2-inch or smaller fixture drain.
b. Three inches or larger. c. For a limitation on double sanitary tees, see Section 706.3.

Section PC 707: Prohibited Joints and Connections

707.1 Prohibited joints.
The following types of joints and connections shall be prohibited:
1. Cement or concrete joints.
2. Mastic or hot-pour bituminous joints.
3. Joints made with fittings not approved for the specific installation.
4. Joints between different diameter pipes made with elastomeric rolling O-rings.
Chapter 6: New York City Plumbing Code

Section PC 708: Cleanouts

708.1 Scope.
This section shall govern the size, location, installation and maintenance of drainage pipe cleanouts.

708.2 Cleanout plugs.
Cleanout plugs shall be brass or plastic, or other approved materials. Brass cleanout plugs shall be utilized with metallic drain, waste and vent piping only, and shall conform to ASTM A 74, ASME A112.3.1 or ASME A112.36.2M. Cleanouts with plate-style access covers shall be fitted with corrosion-resisting fasteners. Plastic cleanout plugs shall conform to the requirements of Section 702.4. Cleanout plugs shall be raised square or countersunk square heads. Countersunk heads shall be installed where raised heads are a trip hazard. Cleanout plugs with borosilicate glass systems shall be of borosilicate glass.

708.3 Where required.
Cleanouts shall be located in accordance with Sections 708.3.1 through 708.3.4.

708.3.1 Horizontal drains within buildings.
All horizontal drains shall be provided with cleanouts located not more than 100 feet (30 480 mm) apart.

708.3.2 Building sewers.
Building sewers shall be provided with cleanouts located not more than 100 feet (30 480 mm) apart measured from the upstream entrance of the cleanout. For building sewers 8 inches (203 mm) and larger, manholes shall be provided and located not more than 200 feet (60 960 mm) from the junction of the building drain and building sewer, at each change in direction and at intervals of not more than 400 feet (122 m) apart. Manholes and manhole covers shall be of an approved type.

708.3.3 Changes of direction.
Cleanouts shall be installed at each change of direction of the building drain or horizontal waste or soil lines greater than 45 degrees (0.79 rad) in the building sewer, building drain and horizontal waste or soil lines. Where more than one change of direction occurs in a run of piping, only one cleanout shall be required for each 40 feet (12 192 mm) of developed length of the drainage piping.

708.3.4 Base of stack.
A cleanout shall be provided at the base of each waste or soil stack.

708.3.5 Manholes.
Manholes serving a building drain shall have secured gas-tight covers and shall be located in accordance with Section 708.3.2.

708.4 Concealed piping.
Cleanouts on concealed piping or piping under a floor slab or in a crawl space of less than 24 inches (610 mm) in height or a plenum shall be extended through and terminate flush with the finished wall, floor or ground surface or shall be extended to the outside of the building. Cleanout plugs shall not be covered with cement, plaster or any other permanent finish material. Where it is necessary to conceal a cleanout or to terminate a cleanout in an area subject to vehicular traffic, the covering plate, access door or cleanout shall be of an approved type designed and installed for this purpose.

708.5 Opening direction.
Every cleanout shall be installed to open to allow cleaning in the direction of the flow of the drainage pipe or at right angles thereto.

708.6 Prohibited installation.
Cleanout openings shall not be utilized for the installation of new fixtures, except where approved and where another cleanout of equal access and capacity is provided.

708.7 Minimum size.
Cleanouts shall be the same nominal size as the pipe they serve up to 4 inches (102 mm). For pipes larger than 4 inches (102 mm) nominal size, the minimum size of the cleanout shall be 4 inches (102 mm).

Exceptions:
1. "P" trap connections with slip joints or ground joint connections, or stack cleanouts that are not more than one pipe diameter smaller than the drain served, shall be permitted.
2. Cast-iron cleanout sizing shall be in accordance with referenced standards in Table 702.4, ASTM A 74 for hub and spigot fittings or ASTM A 888 or CISPI 301 for hubless fittings.

708.8 Clearances.
Cleanouts on 6-inch (153 mm) and smaller pipes shall be provided with a clearance of not less than 18 inches (457 mm) for rodding. Cleanouts on 8-inch (203 mm) and larger pipes shall be provided with a clearance of not less than 36 inches (914 mm) for rodding.

708.9 Access.
Access shall be provided to all cleanouts.

Section PC 709: Fixture Units

709.1 Values for fixtures.
Drainage fixture unit values as given in Table 709.1 designate the relative load weight of different kinds of fixtures that shall be employed in estimating the total load carried by a soil or waste pipe, and shall be used in connection with Tables 710.1(1) and 710.1(2) of sizes for soil, waste and vent pipes for which the permissible load is given in terms of fixture units.

Table 709.1
Drainage Fixture Units for Fixtures and Groups

<table>
<thead>
<tr>
<th>Fixture Type</th>
<th>Drainage Fixture Unit Value as Load Factors</th>
<th>Minimum Size of Trap (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic clothes washers, commercialb</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Automatic clothes washers, residentialb</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Bathroom group as defined in Section 202 (1.6 gpf water closet)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Bathroom group as defined in Section 202 (water closet flushing greater than 1.6 gpf)</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Bathtubb (with or without overhead shower or whirlpool attachments)</td>
<td>2</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Bidet</td>
<td>1</td>
<td>1 1/2</td>
</tr>
<tr>
<td>Combination sink and tray</td>
<td>2</td>
<td>1 1/2</td>
</tr>
</tbody>
</table>

http://library.amlegal.com/alpscripts/get-content.aspx
Dental lavatory
Dental unit or cuspidor
Dishwashing machine. c domestic
Drinking fountain
Floor drains
Floor sinks
Kitchen sink, domestic
Kitchen sink, domestic with food waste grinder and/or dishwasher
Laundry tray (1 or 2 compartments)
Lavatory
Shower
Sink
Urinal
Urinal, 1 gallon per flush or less
Wash sink (circular or multiple) each set of faucets
Water closet, flushometer tank, public or private
Water closet, private (1.6 gpf)
Water closet, private (flushing greater than 1.6 gpf)
Water closet, public (1.6 gpf)
Water closet, public (flushing greater than 1.6 gpf)

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

Dental lavatory
Dental unit or cuspidor
Dishwashing machine. c domestic
Drinking fountain
Floor drains
Floor sinks
Kitchen sink, domestic
Kitchen sink, domestic with food waste grinder and/or dishwasher
Laundry tray (1 or 2 compartments)
Lavatory
Shower
Sink
Urinal
Urinal, 1 gallon per flush or less
Wash sink (circular or multiple) each set of faucets
Water closet, flushometer tank, public or private
Water closet, private (1.6 gpf)
Water closet, private (flushing greater than 1.6 gpf)
Water closet, public (1.6 gpf)
Water closet, public (flushing greater than 1.6 gpf)

For SI: 1 inch = 25.4 mm.

a. For traps larger than 3 inches, use Table 709.2.
b. A shower head over a bathtub or whirlpool bathtub attachment does not increase the drainage fixture unit value.
c. See Sections 709.2 through 709.4 for methods of computing unit value of fixtures not listed in this table or for rating of devices with intermittent flows.
d. Trap size shall be consistent with the fixture outlet size.
e. For the purpose of computing loads on building drains and sewers, water closets and urinals shall not be rated at a lower drainage fixture unit unless the lower values are verified by testing.
f. For fixtures added to a dwelling unit bathroom group, add the DFU value of those additional fixtures to the bathroom group fixture count.
g. See Section 406.3 for sizing requirements for fixture drain, branch drain, and drainage stack for an automatic clothes washer standpipe.
h. See Sections 709.4

709.2 Fixtures not listed in Table 709.1.
Fixtures not listed in Table 709.1 shall have a drainage fixture unit load based on the outlet size of the fixture in accordance with Table 709.2. The minimum trap size for unlisted fixtures shall be the size of the drainage outlet but not less than 11/4 inches (32 mm).

Table 709.2
Drainage Fixture Units for Fixture Drains or Traps

<table>
<thead>
<tr>
<th>Fixture Drain or Trap Size (inches)</th>
<th>Drainage Fixture Unit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/4</td>
<td>1</td>
</tr>
<tr>
<td>11/2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>21/2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

Section PC 710: Drainage System Sizing
1. Maximum fixture unit load.

The maximum number of drainage fixture units connected to a given size of building sewer, building drain or horizontal branch of the building drain shall be determined using Table 710.1(1). The maximum number of drainage fixture units connected to a given size of horizontal branch or vertical soil or waste stack shall be determined using Table 710.1(2).

1.1 Horizontal stack offsets.
Horizontal stack offsets shall be sized as required for building drains in accordance with Table 710.1(1), except as required by Section 711.4.

1.2 Vertical stack offsets.
Vertical stack offsets shall be sized as required for straight stacks in accordance with Table 710.1(2), except where required to be sized as a building drain in accordance with Section 711.1.1.

Table 710.1(1)
Building Drains and Sewers
### Diameter of Pipe (inches) | Maximum Number of Drainage Fixture Units Connected to any Portion of the Building Drain or the Building Sewer, Including Branches of the Building Drain\(^a\)
<table>
<thead>
<tr>
<th>Slope per foot</th>
<th>1/16 inch</th>
<th>1/8 inch</th>
<th>1/4 inch</th>
<th>1/2 inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/4</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1 1/2</td>
<td>—</td>
<td>—</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>—</td>
<td>—</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>2 1/2</td>
<td>—</td>
<td>—</td>
<td>24</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>—</td>
<td>—</td>
<td>36</td>
<td>42</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
<td>180</td>
<td>216</td>
<td>250</td>
</tr>
<tr>
<td>5</td>
<td>—</td>
<td>390</td>
<td>480</td>
<td>575</td>
</tr>
<tr>
<td>6</td>
<td>700</td>
<td>—</td>
<td>840</td>
<td>1,000</td>
</tr>
<tr>
<td>8</td>
<td>1,400</td>
<td>1,600</td>
<td>1,920</td>
<td>2,300</td>
</tr>
<tr>
<td>10</td>
<td>2,500</td>
<td>2,900</td>
<td>3,500</td>
<td>4,200</td>
</tr>
<tr>
<td>12</td>
<td>3,900</td>
<td>4,600</td>
<td>5,600</td>
<td>6,700</td>
</tr>
<tr>
<td>15</td>
<td>7,000</td>
<td>8,300</td>
<td>10,000</td>
<td>12,000</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 inch per foot = 83.3 mm/m.

\(a\). The minimum size of any building drain serving a water closet shall be 3 inches.

#### Table 710.1 (2)

**Horizontal Fixture Branches and Stacks\(^a\)**

<table>
<thead>
<tr>
<th>Diameter of Pipe (inches)</th>
<th>Total for horizontal branch</th>
<th>Maximum Number of Drainage Fixture Units (dfu)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total for Stack</td>
<td>Total for Stack</td>
</tr>
<tr>
<td></td>
<td>of Three Branch</td>
<td>Greater than Three Branch</td>
</tr>
<tr>
<td></td>
<td>Intervals or Less</td>
<td>Intervals</td>
</tr>
<tr>
<td>1 1/2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>2 1/2</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>48</td>
</tr>
<tr>
<td>4</td>
<td>160</td>
<td>240</td>
</tr>
<tr>
<td>5</td>
<td>360</td>
<td>540</td>
</tr>
<tr>
<td>6</td>
<td>620</td>
<td>960</td>
</tr>
<tr>
<td>8</td>
<td>1,400</td>
<td>2,200</td>
</tr>
<tr>
<td>10</td>
<td>2,500</td>
<td>3,800</td>
</tr>
<tr>
<td>12</td>
<td>2,900</td>
<td>6,000</td>
</tr>
<tr>
<td>15</td>
<td>7,000</td>
<td>Note c</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4mm

\(a\). Does not include branches of the building drain. Refer to Table 710.1(1).

\(b\). Stacks shall be sized based on the total accumulated connected load at each story or branch interval. No soil or waste stack shall be smaller than any horizontal branch connection thereto.

\(c\). Sizing load based on design criteria.

#### 710.2 Reserved.

**Section PC 711: Offsets In Drainage Piping In Buildings of Five Stories Or More**

#### 711.1 Horizontal branch connections above or below vertical stack offsets.

If a horizontal branch connects to the stack within 2 feet (610 mm) above or below a vertical stack offset, and the offset is located more than four branch intervals below the top of the stack, the offset shall be vented in accordance with Section PC 915.

#### 711.1.1 Omission of vents for vertical stack offsets.

Vents for vertical offsets required by section 711.1 shall not be required where the stack and its offset are sized as a building drain (see Table 710.1(1), Column 5).

#### 711.2 Horizontal branch connections to horizontal stack offsets.

Where a horizontal stack offset is located more than four branch intervals below the top of the stack, a horizontal branch shall not connect within the horizontal stack offset or within 2 feet (610 mm) above or below such offset.

#### 711.3 Horizontal stack offsets.

A stack with a horizontal offset located more than four branch intervals below the top of the stack shall be vented in accordance with Section PC 915 and sized as follows:

1. The portion of the stack above the offset shall be sized as for a vertical stack based on the total number of drainage fixture units above the offset.
2. The offset shall be sized in accordance with Section 710.1.1.
3. The portion of the stack below the offset shall be sized as for the offset or based on the total number of drainage fixture units on the entire stack, whichever is larger (see Table 710.1(2), Column 4).

#### 711.3.1 Omission of vents for horizontal stack offsets.

Vents for horizontal stack offsets required by Section 711.3 shall not be required where the stack and its offset are one pipe size larger than required for a building drain (see Table 710.1(1), Column 5) and the entire stack and offset are not less in cross-sectional area than that required for a straight stack plus the area of an offset vent as provided for in Section PC 915. Omission of offset vents in accordance with this section shall not constitute approval of horizontal branch connections within the offset or within 2 feet (610 mm) above or below the offset.
711.4 Offsets below lowest branch.

Where a vertical offset occurs in a soil or waste stack below the lowest horizontal branch, change in diameter of the stack because of the offset shall not be required. If a horizontal offset occurs in a soil or waste stack below the lowest horizontal branch, the required diameter of the offset and the stack below it shall be determined as for a building drain in accordance with Table 710.1(1).

Section PC 712: Ejectors

712.1 Building subdrains.

Building subdrains that cannot be discharged to the sewer by gravity flow shall be discharged into a gas tight covered and vented ejector pit/basin from which the liquid shall be lifted and discharged into the building gravity drainage system by automatic pumping equipment or other approved method.

712.2 Valves required.

A check valve and full open valve, located on the discharge side of the check valve, shall be installed in the pump or ejector discharge piping between the pump or ejector and the gravity drainage system. Access shall be provided to such valves. Such valves will be located above the sump cover required by Section 712.1 or, where the discharge pipe from the ejector is below grade, the valves shall be accessible located outside the sump below grade in an access pit with a removable access cover.

712.3 Ejector design.

The ejector, pit and discharge piping shall conform to the requirements of Sections 712.3.1 through 712.3.5.

712.3.1 Ejector pump.

The ejector pump capacity and head shall be appropriate to anticipated use requirements.

712.3.2 Ejector pit.

The ejector pit shall be not less than 18 inches (457 mm) in diameter and 24 inches (610 mm) deep, unless otherwise approved. The pit shall be accessible and located such that all drainage flows into the pit by gravity. The ejector pit shall be constructed of tile, concrete, steel, plastic or other approved materials. The pit bottom shall be solid and provide permanent support for the pump. The ejector pit shall be fitted with a gas-tight removable cover adequate to support anticipated loads in the area of use. The ejector pit shall be vented in accordance with Chapter 9.

712.3.3 Discharge piping.

Discharge piping and fittings shall be constructed of approved materials.

712.3.4 Maximum effluent level.

The effluent level control shall be adjusted and maintained to at all times prevent the effluent from rising to within 2 inches (51 mm) of the invert of the gravity drain inlet into the sump.

712.3.5 Ejector connection to the drainage system.

Pumps connected to the drainage system shall connect to the building sewer or shall connect to a wye fitting in the building drain a minimum of 10 feet (3048 mm) from the base of any soil stack, waste stack or fixture drain. Where the discharge line connects into horizontal drainage piping, the connector shall be made through a wye fitting into the top of the drainage piping.

712.4 Sewage pumps and sewage ejectors.

A sewage pump or sewage ejector shall automatically discharge the contents of the pit to the building drainage system downstream of the house trap.

712.4.1 Macerating toilet systems.

Macerating toilet systems shall comply with CSA B45.9 or ASME A112.3.4 and shall be installed in accordance with the manufacturer's installation instructions.

712.4.2 Capacity.

A sewage pump or sewage ejector shall have the capacity and head for the application requirements. Pumps or ejectors that receive the discharge of water closets shall be capable of handling spherical solids with a diameter of up to and including 2 inches (51 mm). Other pumps or ejectors shall be capable of handling spherical solids with a diameter of up to and including 1 inch (25.4 mm). The minimum capacity of a pump or ejector based on the diameter of the discharge pipe shall be in accordance with Table 712.4.2.

Exceptions:

1. Grinder pumps or grinder ejectors that receive the discharge of water closets shall have a minimum discharge opening of $1\frac{3}{4}$ inches (32 mm).

2. Macerating toilet assemblies that serve single water closets shall have a minimum discharge opening of $1\frac{1}{4}$ inches (32 mm)

Table 712.4.2

<table>
<thead>
<tr>
<th>Diameter of the Discharge Pipe (inches)</th>
<th>Capacity of Pump or Ejector (gpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>$2\frac{1}{2}$</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>46</td>
</tr>
</tbody>
</table>

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

Section PC 713: Health Care Plumbing

713.1 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 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.

713.2 Bedpan washers and clinical sinks.

Bedpan washers and clinical sinks shall connect to the drainage and vent system in accordance with the requirements for a water closet. Bedpan washers shall also connect to a local vent.

713.3 Indirect waste.

All sterilizers, steamers and condensers shall discharge to the drainage through an indirect waste pipe by means of an air gap. Where a battery of not more than three sterilizers discharges to an individual receptor, the distance between the receptor and a sterilizer shall not exceed 8 feet (2438 mm). The indirect waste pipe on a bedpan steamer shall be trapped.

713.4 Vacuum system station.

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Chapter 6: New York City Plumbing Code

713.5 Bottle system.
Vacuum (fluid suction) systems intended for collecting, removing and disposing of blood, pus or other fluids by the bottle system shall be provided with receptacles equipped with an overflow prevention device at each vacuum outlet station.

713.6 Central disposal system equipment.
All central vacuum (fluid suction) systems shall provide continuous service. Systems equipped with collecting or control tanks shall provide for draining and cleaning of the tanks while the system is in operation. In hospitals, the system shall be connected to the emergency power system. The exhausts from a vacuum pump serving a vacuum (fluid suction) system shall discharge separately to open air above the roof.

713.7 Central vacuum or disposal systems.
Where the waste from a central vacuum (fluid suction) system of the barometric-lag, collection-tank or bottle-disposal type is connected to the drainage system, the waste shall be directly connected to the sanitary drainage system through a trapped waste.

713.7.1 Piping.
The piping of a central vacuum (fluid suction) system shall be of corrosion-resistant material with a smooth interior surface. A branch shall not be less than 0.5 inch (12.7 mm) nominal pipe size for one outlet and shall be sized in accordance with the number of vacuum outlets. A main shall not be less than 1 inch (25 mm) nominal pipe size. The pipe sizing shall be increased in accordance with the manufacturer’s instructions as stations are increased.

713.7.2 Velocity.
The velocity of airflow in a central vacuum (fluid suction) system shall be less than 5,000 feet per minute (25 m/s).

713.8 Vent connections prohibited.
Connections between local vents serving bedpan washers or sterilizer vents serving sterilizing apparatus and normal sanitary plumbing systems are prohibited. Only one type of apparatus shall be served by a local vent.

713.9 Local vents and stacks for bedpan washers.
Bedpan washers shall be vented to open air above the roof by means of one or more local vents. The local vent for a bedpan washer shall not be less than a 2-inch-diameter (51 mm) pipe. A local vent serving a single bedpan washer is permitted to drain to the fixture served.

713.9.1 Multiple installations.
Where bedpan washers are located above each other on more than one floor, a local vent stack is permitted to be installed to receive the local vent on the various floors. Not more than three bedpan washers shall be connected to a 2-inch (51 mm) local vent stack, not more than six to a 3-inch (76 mm) local vent stack and not more than 12 to a 4-inch (102 mm) local vent stack. In multiple installations, the connections between a bedpan washer local vent and a local vent stack shall be made with tee or tee-wye sanitary pattern drainage fittings installed in an upright position.

713.9.2 Trap required.
The bottom of the local vent stack, except where serving only one bedpan washer, shall be drained by means of a trapped and vented waste connection to the sanitary drainage system. The trap and waste shall be the same size as the local vent stack.

713.9.3 Trap seal maintenance.
A water supply pipe not less than 1/4 inch (6.4 mm) in diameter shall be taken from the flush supply of each bedpan washer on the discharge or fixture side of the vacuum breaker, shall be trapped to form not less than a 3-inch (76 mm) water seal, and shall be connected to the local vent stack on each floor. The water supply shall be installed so as to provide a supply of water to the local vent stack for cleansing and drain trap seal maintenance each time a bedpan washer is flushed.

713.10 Sterilizer vents and stacks.
Multiple installations of pressure and nonpressure sterilizers shall have the vent connections to the sterilizer vent stack made by means of inverted wye fittings. Access shall be provided to vent connections for the purpose of inspection and maintenance.

713.10.1 Drainage.
The connection between sterilizer vent or exhaust openings and the sterilizer vent stack shall be designed and installed to drain to the funnel or basket-type waste fitting. In multiple installations, the sterilizer vent stack shall be drained separately to the lowest sterilizer funnel or basket-type waste fitting or receptor.

713.11 Sterilizer vent stack sizes.
Sterilizer vent stack sizes shall comply with Sections 713.11.1 through 713.11.4.

713.11.1 Bedpan steamers.
The minimum size of a sterilizer vent serving a bedpan steamer shall be 1.50 inches (38 mm) in diameter. Multiple installations shall be sized in accordance with Table 713.11.1.

Table 713.11.1
Stack Sizes for Bedpan Steamers and Boiling-Type Sterilizers (Number of Connections of Various Sizes Permitted to Various-sized Sterilizer Vent Stacks)

<table>
<thead>
<tr>
<th>Stack Size (inches)</th>
<th>Connection Size</th>
<th>1(1/2)</th>
<th>2&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(1/2)a</td>
<td>1</td>
<td>or</td>
<td>0</td>
</tr>
<tr>
<td>2a</td>
<td>2</td>
<td>or</td>
<td>1</td>
</tr>
<tr>
<td>2b</td>
<td>1</td>
<td>and</td>
<td>1</td>
</tr>
<tr>
<td>3a</td>
<td>4</td>
<td>or</td>
<td>2</td>
</tr>
<tr>
<td>3b</td>
<td>2</td>
<td>and</td>
<td>2</td>
</tr>
<tr>
<td>4a</td>
<td>8</td>
<td>or</td>
<td>4</td>
</tr>
<tr>
<td>4b</td>
<td>4</td>
<td>and</td>
<td>4</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.a. Total of each size. b. Combination of sizes.

713.11.2 Boiling-type sterilizers.
The minimum size of a sterilizer vent stack shall be 2 inches (51 mm) in diameter where serving a utensil sterilizer and 1\(1/2\) inches (38 mm) in diameter where serving an instrument sterilizer. Combinations of boiling-type sterilizer vent connections shall be sized in accordance with Table 713.11.1.

713.11.3 Pressure sterilizers.
Pressure sterilizer vent stacks shall be 2\(1/2\) inches (64mm) minimum. Those serving combinations of pressure sterilizer exhaust connections shall be sized in accordance with Table 713.11.3.
### Table 713.11.3
#### Stack Sizes for Pressure Sterilizers
(Number of Connections of Various Sizes Permitted To Various-sized Vent Stacks)

<table>
<thead>
<tr>
<th>Stack Size (inches)</th>
<th>Connection Size</th>
<th>$\frac{3}{4}^\circ$</th>
<th>$^1\circ$</th>
<th>$\frac{1}{2}^\circ$</th>
<th>$\frac{1}{4}^\circ$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1\frac{1}{2}^a$</td>
<td>3 or 2 or 1</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$1\frac{1}{4}^b$</td>
<td>2 and 1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$2^a$</td>
<td>6 or 3 or 2</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$2^b$</td>
<td>3 and 2</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$\frac{1}{2}^b$</td>
<td>2 and 1</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>$3^a$</td>
<td>15 or 7 or 5</td>
<td>3</td>
<td>1</td>
<td>2 or 1</td>
<td></td>
</tr>
<tr>
<td>$3^b$</td>
<td>1 and 1 and 5</td>
<td>1 and 2</td>
<td>1</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.

- a. Total of each size.
- b. Combination of sizes.

#### 713.11.4 Pressure instrument washer sterilizer sizes.
The minimum diameter of a sterilizer vent stack serving an instrument washer sterilizer shall be 2 inches (51 mm). Not more than two sterilizers shall be installed on a 2-inch (51 mm) stack, and not more than four sterilizers shall be installed on a 3-inch (76 mm) stack.

### Section PC 714: Computerized Drainage Design

#### 714.1 Design of drainage system.
The sizing, design and layout of the drainage system shall be permitted to be designed by approved computer design methods.

#### 714.2 Load on drainage system.
The load shall be computed from the simultaneous or sequential discharge conditions from fixtures, appurtenances and appliances or the peak usage design condition.

##### 714.2.1 Fixture discharge profiles.
The discharge profiles for flow rates versus time from fixtures and appliances shall be in accordance with the manufacturer's specifications.

##### 714.3 Selections of drainage pipe sizes.
Pipe shall be sized to prevent full-bore flow.

#### 714.3.1 Selecting pipe wall roughness.
Pipe size calculations shall be conducted with the pipe wall roughness factor \(k_s\), in accordance with the manufacturer's specifications and as modified for aging roughness factors with deposits and corrosion.

#### 714.3.2 Slope of horizontal drainage piping.
Horizontal drainage piping shall be designed and installed at slopes in accordance with Table 704.1.

### Section PC 715: Backwater Valves

#### 715.1 Sewage backflow.
Where fixtures, floor drains, or area drains are subject to overflow as the result of backwater from the public sewer system, accessible backwater valves shall be installed in the fixture drain pipe from such fixture, in the branch drain to such area drain or group of fixtures, or in the building drain at its point of exit from the building and downstream from the building trap.

#### 715.2 Material.
All bearing parts of backwater valves shall be of corrosion-resistant material. Backwater valves shall comply with ASME A112.14.1, CSA B181.1 or CSA B181.2.

#### 715.3 Seal.
Backwater valves shall be so constructed as to provide a mechanical seal against backflow. The flap shall be so designed as to hang partially open when not subject to backwater pressure.

#### 715.4 Diameter.
Backwater valves, when fully opened, shall have a capacity not less than that of the pipes in which they are installed.

#### 715.5 Accessibility.
Backwater valves shall be installed so that access is provided to the working parts for service and repair. Masonry access manholes shall be provided when the centerline of any drain line is 18 inches (457 mm) or more below a slab on grade.

### Chapter 8: Indirect/special Waste

#### Section PC 801: General

##### 801.1 Scope.
This chapter shall govern matters concerning indirect waste piping and special wastes. This chapter shall further control matters concerning food-handling establishments, sterilizers, clear-water wastes, swimming pools, methods of providing air breaks or air gaps, and neutralizing devices for corrosive wastes.

##### 801.2 Protection.
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 discharge to the drainage system, shall be provided with protection against backflow, flooding, fouling, contamination and stoppage of the drain.

### Section PC 802: Indirect Wastes
Food-handling equipment and clear-water waste shall discharge through an indirect waste pipe as specified in Sections 802.1.1 through 802.1.8. All health-care related fixtures, devices and equipment shall discharge to the drainage system through an indirect waste pipe by means of an air gap in accordance with this chapter and Section 713.3. Fixtures not required by this section to be indirectly connected shall be directly connected to the plumbing system in accordance with Chapter 7.

802.1 Food handling.

Equipment and fixtures utilized for the storage, preparation and handling of food shall discharge through an indirect waste pipe by means of an air gap.

802.1.2 Floor drains in food storage areas.

Floor drains located within walk-in refrigerators or freezers in food service and food establishments shall be indirectly connected to the sanitary drainage system by means of an air gap. Where a floor drain is located within an area subject to freezing, the waste line serving the floor drain shall not be trapped and shall indirectly discharge into a waste receptor located outside of the area subject to freezing.

Exception: Where protected against backflow by a backwater valve, such floor drains shall be indirectly connected to the sanitary drainage system by means of an air break or an air gap.

802.1.3 Potable clear-water waste.

Where devices and equipment, such as sterilizers and relief valves, discharge potable water to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air gap.

802.1.4 Swimming pools.

Where wastewater from swimming pools, backwash from filters and water from pool deck drains discharge to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air gap to a waste outlet.

802.1.5 Nonpotable clear-water waste.

Where devices and equipment such as process tanks, filters, drips and boilers discharge nonpotable water to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air break or an air gap.

802.1.6 Domestic Dishwashing machines.

Domestic dishwashing machines shall discharge indirectly through an air gap or air break into a standpipe or waste receptor in accordance with Section 802.2, or discharge into a wye-branch fitting on the tailpiece of the kitchen sink or the dishwasher connection of a food waste grinder. The waste line of a domestic dishwashing machine discharging into a kitchen sink tailpiece or food waste grinder shall connect to a deck-mounted air gap or the waste line shall rise and be securely fastened to the underside of the sink rim or counter.

802.1.7 Commercial dishwashing machines.

The discharge from a commercial dishwashing machine shall be through an air gap or air break into a standpipe or waste receptor in accordance with Section 802.2.

802.1.8 Food utensils, dishes, pots and pans sinks.

Sinks used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans or serviceware used in the preparation, serving or eating of food shall discharge indirectly through an air gap or an air break.

Exception: Hand sinks may be directly connected to the drainage system.

802.2 Installation.

All indirect waste piping shall discharge through an air gap or air break into a waste receptor or standpipe. Waste receptors and standpipes shall be trapped and vented and shall connect to the building drainage system. All indirect waste piping that exceeds 2 feet (610 mm) in developed length measured horizontally, or 4 feet (1219 mm) in total developed length, shall be trapped.

802.2.1 Air gap.

The air gap between the indirect waste pipe and the flood level rim of the waste receptor shall be a minimum of twice the effective opening of the indirect waste pipe.

802.2.2 Air break.

An air break shall be provided between the indirect waste pipe and the trap seal of the waste receptor or standpipe.

802.3 Waste receptors.

Every waste receptor shall be of an approved type. A removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall be installed in ventilated spaces. Waste receptors shall not be installed in bathrooms or toilet rooms or in any inaccessible or unventilated space such as a closet or storeroom. Ready access shall be provided to waste receptors.

802.3.1 Size of receptors.

A waste receptor shall be sized for the maximum discharge of all indirect waste pipes served by the receptor. Receptors shall be installed to prevent splashing or flooding.

802.3.2 Open hub waste receptors.

Waste receptors shall be permitted in the form of a hub or pipe extending not less than 1 inch (25.4 mm) above a water-imperious floor and are not required to have a strainer.

802.4 Standpipes.

Standpipes shall be individually trapped. Standpipes shall extend a minimum of 18 inches (457 mm) and a maximum of 42 inches (1067 mm) above the trap weir. Access shall be provided to all standpipes and drains for rodding.

Section PC 803: Special Wastes

803.1 Wastewater temperature.

Steam pipes shall not connect to any part of a drainage or plumbing system and water above 150°F (66°C) shall not be discharged into any part of a drainage system. Such pipes shall discharge into an indirect waste receptor connected to the drainage system.

803.2 Neutralizing device required for corrosive wastes.

All discharges into the public sewers are subject to regulation by the Department of Environmental Protection. The Department of Environmental Protection may prohibit the discharge of any corrosive liquids, including but not limited to spent acids or other harmful chemicals that may destroy or injure a drain, sewer, soil or waste pipe, or create noxious or toxic fumes or interfere with sewage treatment processes or may require that such liquids be neutralized or treated prior to discharge in accordance with Department of Environmental Protection regulations. Where treatment prior to discharge is required by the Department of Environmental Protection, liquids shall not be discharged into the plumbing system without being thoroughly neutralized or treated in compliance with the rules of the Department of Environmental Protection.

803.3 System design.

A chemical drainage and vent system shall be designed and installed in accordance with this code. Chemical drainage and vent systems shall be completely separated from the sanitary systems. Chemical waste shall not discharge to a sanitary drainage system until such waste has been treated in accordance with Section 803.2.

Section PC 804: Materials, Joints and Connections

804.1 General.
Chapter 6: New York City Plumbing Code

The materials and methods utilized for the construction and installation of indirect waste pipes and systems shall comply with the applicable provisions of Chapter 7.

Chapter 9: Vents

Section PC 901: General

901.1 Scope.
The provisions of this chapter shall govern the material, design, construction and installation of vent systems except for vent systems for methane and radon which shall be governed by this section.

901.1.1 Methane and radon venting.
The design and materials used in the installation of the methane and radon vent systems shall be approved by the commissioner and shall comply with all applicable rules of the fire department.

901.2 Trap seal protection.
The plumbing system shall be provided with a system of vent piping that will permit the admission or emission of air so that the seal of any fixture trap shall not be subjected to a pneumatic pressure differential of more than 1 inch of water column (249 Pa).

901.2.1 Venting required.
Every trap and trapped fixture shall be vented in accordance with one of the venting methods specified in this chapter.

901.3 Chemical waste vent system.
The vent system for a chemical waste system shall be independent of the sanitary vent system and shall terminate separately through the roof to the open air.

901.4 Use limitations.
The plumbing vent system shall not be utilized for purposes other than the venting of the plumbing system.

901.5 Tests.
The vent system shall be tested in accordance with Section PC 312.

901.6 Engineered systems.
Engineered venting systems shall conform to the provisions of Section PC 918.

Section PC 902: Materials

902.1 Vents.
The materials and methods utilized for the construction and installation of venting systems shall comply with the applicable provisions of Section PC 702.

902.2 Sheet copper.
Sheet copper for vent pipe flashings shall conform to ASTM B 152 and shall weigh not less than 8 ounces per square foot (2.5 kg/m²).

902.3 Sheet lead.
Sheet lead for vent pipe flashings shall weigh not less than 3 pounds per square foot (15 kg/m²) for field-constructed flashings and not less than 2.5 pounds per square foot (12 kg/m²) for prefabricated flashings.

Section PC 903: Vent Stacks and Stack Vents

903.1 Stack required.
Every building in which plumbing is installed shall have at least one 4 inch vent stack (or stack vent). Such stack shall run undiminished in size and as directly as possible from the building drain through to the open air above the roof.

903.1.1 Connection to drainage system.
A vent stack shall connect to the building drain or to the base of a drainage stack in accordance with Section 903.4. A stack vent shall be an extension of the drainage stack.

903.2 Vent stack required.
A vent stack shall be required for every drainage stack that is three branch intervals or more.

903.3 Vent termination.
Vent stacks or stack vents shall terminate outdoors above the roof or to the stack vent portion of the soil or waste stack, at least 6 inches (152 mm) above the flood level of the highest fixture connection discharging into the soil or waste stack.

903.4 Vent connection at base.
Every vent stack shall connect to the base of the drainage stack. The vent stack shall connect at or below the lowest horizontal branch. Where the vent stack connects to the building drain, the connection shall be located downstream of the drainage stack and within a distance of 10 times the diameter of the drainage stack.

903.5 Vent headers.
Stack vents and vent stacks connected into a common vent header at the top of the stacks and extending to the open air above the roof at one point shall be sized in accordance with the requirements of Section 916.1, but shall not be smaller than the smallest stack vent. The number of fixture units shall be the sum of all fixture units on all stacks connected thereto, and the developed length shall be the longest vent length from the intersection at the base of the most distant stack to the vent terminal in the open air, as a direct extension of one stack.

903.6 Sub stack connections.
Where it is desired to terminate stacks at a point below the roof terminus of the main vent stack, the sub-stack may connect to the main vent stack provided the portion of the main vent stack above the connection is sized for the total fixture unit load connected thereto, and for the maximum developed length of the stack or sub-stack.

Section PC 904: Vent Terminals

904.1 Roof extension.
All open vent pipes that extend through a roof shall be terminated at least 24 inches (610 mm) above the roof, except that where a roof is to be used for any purpose other than weather protection or maintenance, the vent extensions shall be run at least 7 feet (2134 mm) above the roof. Approved vandal resistant vent caps may be used.

904.2 Frost closure.
Where the 97.5-percent value for outside design temperature is 0°F (-18°C) or less, every vent extension through a roof shall be a minimum of 4 inches (102 mm) in diameter. Any increase in the size of the vent shall be made inside the structure directly below the roof.

904.3 Flashings.

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The juncture of each vent pipe with the roof line shall be made water tight by an approved flashing.

904.4 Prohibited use.
Vent terminals shall not be used as a flag pole or to support flag poles, television aerials or similar items.

904.5 Location of vent terminal.
Locations of vent terminals shall comply with Sections 904.5.1 and 904.5.2.

904.5.1 New vent terminals.
An open vent terminal from a drainage system of the new or altered building shall not be located directly beneath any door, operable window, or other air intake opening of the building or of an adjacent building, and any such vent terminal shall not be within 10 feet (3048 mm) horizontally of such an opening unless it is at least 3 feet (914 mm) above the top of such opening. When the consent of the owner of an adjoining taller building is obtained, the owner of the new or altered building shall be permitted to carry the new vent stack, with adequate support, to a level above the higher existing roof.

904.5.2 New openings.
A door, operable window, or other air intake opening of the new or altered building shall not be located within 10 feet (3048 mm) horizontally from an open vent terminal from a drainage system of an existing adjacent building unless the existing terminal is at least 3 feet (914 mm) above such opening. Whenever necessary, the owner of the new building shall at his or her own expense, and with approval of the adjoining owner, offset the vent stack of the adjacent existing building to a distance of 10 feet (3048 mm) or more from such openings, or shall extend such vent stack to a height of at least 3 feet (924 mm) above the topmost opening.

904.6 and 904.7 Reserved.

Section PC 905: Vent Connections and Grades

905.1 Connection.
All individual, branch and circuit vents shall connect to a vent stack, stack vent, or extend to the open air above the roof.

905.2 Grade.
All vent and branch vent pipes shall be so graded and connected as to drain back to the drainage pipe by gravity.

905.3 Vent connection to drainage system.
Every dry vent connecting to a horizontal drain shall connect above the centerline of the horizontal drain pipe.

905.4 Reserved.

905.5 Height above fixtures.
A connection between a vent pipe and a vent stack or stack vent shall be made at least 6 inches (152 mm) above the flood level rim of the highest fixture served by the vent. Horizontal vent pipes forming branch vents, relief vents or loop vents shall be at least 6 inches (152 mm) above the flood level rim of the highest fixture served.

905.6 Vent for future fixtures.
Where the drainage piping has been roughed-in for future fixtures, a rough-in connection for a vent shall be installed. The vent size shall be not less than one half the diameter of the rough-in drain to be served. The vent rough-in shall connect to the vent system, or shall be vented by other means as provided for in this chapter. The connection shall be identified to indicate that it is a vent.

Section PC 906: Fixture Vents

906.1 Reserved.

906.2 Venting of fixture drains.
The vent for a fixture drain, except where serving a fixture with integral traps, such as water closets, shall connect above the weir of the fixture trap being vented.

906.3 Crown vent.
A vent shall not be installed within two pipe diameters of the trap weir.

Section PC 907: Individual Vent

907.1 Individual vent permitted.
Each trap and trapped fixture is permitted to be provided with an individual vent. The individual vent shall connect not more than 4 feet (1219 mm) to the fixture drain of the trap or trapped fixture being vented.

907.2 Floor drain vents.
No vents will be required for piping serving floor drains when the floor drain is located not more than 15 feet (4572 mm) from the vented line to which it connects.

Section PC 908: Common Vent

908.1 Individual vent as common vent.
An individual vent is permitted to vent two traps or trapped fixtures as a common vent. The traps or trapped fixtures being common vented shall be located on the same floor level.

908.2 Connection at the same level.
Where the fixture drains being common vented connect at the same level, the vent connection shall be at the interconnection of the fixture drains.

908.3 Connection at different levels.
Where the fixture drains connect at different levels, the vent shall connect as a vertical extension of the vertical drain. The vertical drain pipe connecting the two fixture drains shall be considered the vent for the lower fixture drain, and shall be sized in accordance with Table 908.3. The upper fixture shall not be a water closet.

Table 908.3
Common Vent Sizes

<table>
<thead>
<tr>
<th>Pipe Size (inches)</th>
<th>Maximum Discharge from Upper Fixture Drain (dfu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/2</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2 1/2 to 3</td>
<td>6</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm.
Section PC 909: Wet Venting

909.1 Horizontal wet vent permitted.

Any combination of fixtures within one bathroom group located in the same room is permitted to be vented by a horizontal wet vent. The wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent along the direction of the flow in the drain pipe to the most downstream fixture drain connection to the horizontal branch drain. Each wet-vented fixture drain shall connect independently to the horizontal wet vent. Only the fixtures within the bathroom groups shall connect to the wet-vented horizontal branch drain. Any additional fixtures shall discharge downstream of the horizontal wet vent.

909.2 Vent connection.

The dry vent connection to the wet vent shall be an individual vent or common vent to the lavatory, bidet, shower or bathtub. The dry vent shall be sized based on the largest required diameter of pipe within the wet vent system served by the dry vent.

909.2.1 Horizontal wet vent.

The dry-vent connection for a horizontal wet-vent system shall be an individual vent or a common vent for any bathroom group fixture, except an emergency floor drain. Where the dry-vent connects to a water closet fixture drain, the drain shall connect horizontally to the horizontal wet-vent system. Not more than one wet-vented fixture drain shall discharge upstream of the dry-vented fixture drain connection.

909.3 Size.

The dry vent serving the wet vent shall be sized based on the largest required diameter of pipe within the wet-vent system served by the dry vent. The wet vent shall be a minimum size of 2 inches (51 mm).

Section PC 911: Circuit Venting

911.1 Circuit vent permitted.

A maximum of eight fixtures connected to a horizontal branch drain shall be permitted to be circuit vented. Each fixture drain shall connect horizontally to the horizontal branch being circuit vented. The horizontal branch drain shall be classified as a vent from the most downstream fixture drain connection to the most upstream fixture drain connection to the horizontal branch.

911.1.1 Multiple circuit-vented branches.

Circuit-vented horizontal branch drains are permitted to be connected together. Each group of a maximum of eight fixtures shall be considered a separate circuit vent and shall conform to the requirements of this section.

911.2 Vent connection.

The circuit vent connection shall be located between the two most upstream fixture drains. The vent shall connect to the horizontal branch and shall be installed in accordance with Section 905. The circuit vent pipe shall not receive the discharge of any soil or waste.

911.3 Slope and size of horizontal branch.

The maximum slope of the vent section of the horizontal branch drain shall be one unit vertical in 12 units horizontal (8 percent slope). The entire length of the vent section of the horizontal branch drain shall be sized for the total drainage discharge to the branch.

911.3.1 Size of multiple circuit vent.

Each separate circuit-vented horizontal branch that is interconnected shall be sized independently in accordance with Section 911.3. The downstream circuit-vented horizontal branch shall be sized for the total discharge into the branch, including the upstream branches and the fixtures within the branch.

911.4 Relief vent.

A relief vent shall be provided for circuit vented horizontal branches receiving the discharge of four or more water closets and connecting to a drainage stack that receives the discharge of soil or waste from upper horizontal branches.

911.4.1 Connection and installation.

The relief vent shall connect to the horizontal branch drain between the stack and the most downstream fixture drain of the circuit vent. The relief vent shall be installed in accordance with Section PC 905.

911.4.2 Fixture drain or branch.

The relief vent is permitted to be a fixture drain or fixture branch for fixtures located within the same branch interval as the circuit-vented horizontal branch. The maximum discharge to a relief vent shall be four fixture units.

911.5 Additional fixtures.

Fixtures, other than the circuit-vented fixtures, are permitted to discharge to the horizontal branch drain. Such fixtures shall be located on the same floor as the circuit-vented fixtures and shall be either individually or common vented.

Section PC 912: Combination Drain and Vent System

912.1 Permitted Combination Waste and Vent System.

A combination waste and vent piping system, limited for use as a means of venting the traps of floor drains and laboratory sinks, shall be permitted in conjunction with horizontal branch waste piping of an independent flammable oil waste system or acid waste systems, and as described under indirect wastes and special wastes.

912.2 Installation.

Combination drain and vent system shall comply with this section.

912.2.1 Slope.

The horizontal combination drain and vent pipe shall have a maximum slope of one-half unit vertical in 12 units horizontal (4-percent slope). The minimum slope shall be in accordance with Table 704.1.

912.2.2 Connection.

The combination drain and vent system shall be provided with a dry vent connected at any point within the system or the system shall connect to a horizontal drain that is vented in accordance with one of the venting methods specified in this chapter. Combination drain and vent systems connecting to building drains receiving only the discharge from a stack or stacks shall be provided with a dry vent. The vent connection to the combination drain and vent pipe shall extend vertically a minimum of 6 inches (152 mm) above the flood level rim of the highest fixture being vented before offsetting horizontally.

912.2.3 Vent size.

The vent shall be sized for the total drainage fixture unit load in accordance with Section 916.2.

912.3 Size.

The minimum size of a combination drain and vent pipe shall be in accordance with Table 912.3.

Table 912.3

<table>
<thead>
<tr>
<th>Diameter Pipe (inches)</th>
<th>Maximum Number of Drainage Fixture Units (dfu)</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>

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Connecting to a building drain or building subdrain

Connecting to a horizontal branch or stack

<table>
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<tr>
<th>Diameter of Soil or Waste Stack (inches)</th>
<th>Total Fixture Units Being Vented (dfu)</th>
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<th>4</th>
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</tr>
</tbody>
</table>

SI: 1 inch = 25.4 mm.

**Section PC 913: Island Fixture Venting**

**913.1 Limitation.**

Island fixture venting shall not be permitted for fixtures other than sinks and lavatories. Residential kitchen sinks with a dishwasher waste connection, a food waste grinder, or both, in combination with the kitchen sink waste, shall be permitted to be vented in accordance with this section.

**913.2 Vent connection.**

The island fixture vent shall connect to the fixture drain as required for an individual or common vent. The vent shall rise vertically to above the drainage outlet of the fixture being vented before offsetting horizontally or vertically downward. The vent or branch vent for multiple island fixture vents shall extend to a minimum of 6 inches (152 mm) above the highest island fixture being vented before connecting to the outside vent terminal.

**913.3 Vent installation below the fixture flood level rim.**

The vent located below the flood level rim of the fixture being vented shall be installed as required for drainage piping in accordance with Chapter 7, except for sizing. The vent shall be sized in accordance with Section 916.2. The lowest point of the island fixture vent shall connect full size to the drainage system. The connection shall be to a vertical drain pipe or to the top half of a horizontal drain pipe. Cleancuts shall be provided in the island fixture vent to permit rodding of all vent piping located below the flood level rim of the fixtures. Rodding in both directions shall be permitted through a cleancut.

**Section PC 914: Relief Vents--stacks of More Than 10 Branch Intervals**

**914.1 Where required.**

Soil and waste stacks in buildings having more than 10 branch intervals shall be provided with a yoke relief vent at each tenth interval installed, beginning with the top floor.

**914.2 Size and connection.**

The size of the relief yoke vent shall be equal to the size of the vent stack to which it connects. The lower end of each relief vent shall connect to the soil or waste stack through a wye below the horizontal branch serving the floor, and the upper end shall connect to the vent stack through a tee or inverted wye not less than 3 feet (914 mm) above the floor.

**Section PC 915: Vents for Stack Offsets**

**915.1 Vent for horizontal offset of drainage stack.**

Horizontal offsets of drainage stacks shall be vented where five or more branch intervals are located above the offset. The offset shall be vented by venting the upper section of the drainage stack and the lower section of the drainage stack.

**915.2 Upper section.**

The upper section of the drainage stack shall be vented as a separate stack with a vent stack connection installed in accordance with Section 903.4. The offset shall be considered the base of the stack.

**915.3 Lower section.**

The lower section of the drainage stack shall be vented by a yoke vent connecting between the offset and the next lower horizontal branch. The yoke vent connection shall be permitted to be a vertical extension of the drainage stack. The size of the yoke vent and connection shall be a minimum of the size required for the vent stack of the drainage stack.

**Section PC 916: Vent Pipe Sizing**

**916.1 Size of stack vents and vent stacks.**

The minimum required diameter of stack vents and vent stacks shall be determined from the developed length and the total of drainage fixture units connected thereto in accordance with Table 916.1, but in no case shall the diameter be less than one-half the diameter of the drain served or less than 1⅛ inches (38 mm).

**Table 916.1 Size and Developed Length of Stack Vents and Vent Stacks**

<table>
<thead>
<tr>
<th>Diameter of Soil or Waste Stack (inches)</th>
<th>Total Fixture Units Being Vented (dfu)</th>
<th>Maximum Developed Length of Vent (feet)</th>
<th>Diameter of Vent (inches)</th>
</tr>
</thead>
<tbody>
<tr>
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Table 916.5.1

<table>
<thead>
<tr>
<th>Capacity of Pump (gpm)</th>
<th>Maximum Developed Length of Vent (feet) a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1/4</td>
</tr>
<tr>
<td>10</td>
<td>No limit b</td>
</tr>
<tr>
<td>20</td>
<td>270</td>
</tr>
<tr>
<td>40</td>
<td>31</td>
</tr>
<tr>
<td>60</td>
<td>16</td>
</tr>
<tr>
<td>100</td>
<td>10 c</td>
</tr>
<tr>
<td>150</td>
<td>44</td>
</tr>
<tr>
<td>200</td>
<td>Not permitted</td>
</tr>
<tr>
<td>250</td>
<td>Not permitted</td>
</tr>
<tr>
<td>300</td>
<td>Not permitted</td>
</tr>
<tr>
<td>400</td>
<td>Not permitted</td>
</tr>
<tr>
<td>500</td>
<td>Not permitted</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 Lpm.

a. Developed length plus an appropriate allowance for entrance losses and friction due to fittings, changes in direction and diameter. Suggested allowances shall be obtained from NSB Monograph 31 or other approved sources. An allowance of 50 percent of the developed length shall be assumed if a more precise value is not available.

b. Actual values greater than 500 feet.

c. Less than 10 feet.

916.5.2 Pneumatic sewage ejector vent.

The air pressure relief pipe from a pneumatic sewage ejector shall be connected to an independent vent stack terminating as required for vent extensions through the roof. The relief pipe shall be sized to relieve air pressure inside the ejector to atmospheric pressure, but shall not be less than 1 1/2 inches (38 mm) in size.

Section PC 917: Air Admittance Valves

Reserved.

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Section PC 918: Engineered Vent Systems

918.1 General.
Engineered vent systems shall comply with this section and Section 28-113.2.2 of the Administrative Code.

918.2 Individual branch fixture and individual fixture header vents.
The maximum developed length of individual fixture vents to vent branches and vent headers shall be determined in accordance with Table 918.2 for the minimum pipe diameters at the indicated vent airflow rates. The individual vent airflow rate shall be determined in accordance with the following:

\[ Q_{v} = N_{v} \cdot Q_{d} \]

For SI: 1 inch = 25.4 mm, 1 cubic foot per minute = 0.4719 L/s, 1 foot = 304.8 mm

918.3 A Licensed Professional Engineer shall certify design.
An engineer shall also inspect and certify the system upon completion of the system.

Section PC 919: Computerized Vent Design

919.1 Design of vent system.
The sizing, design and layout of the vent system shall be permitted to be determined by computer program design methods which shall be approved by the commissioner to insure compliance with the minimum standards of this code.

919.2 System capacity.
The vent system shall be based on the air capacity requirements of the drainage system under a peak load condition.

919.3 Design shall be certified by a Licensed Professional Engineer.
An engineer shall also inspect and certify the system upon completion of the system.

Chapter 10: Traps, Interceptors and Separators

Section PC 1001: General

1001.1 Scope.
This chapter shall govern the material and installation of traps, interceptors and separators.

Section PC 1002: Trap Requirements

1002.1 Fixture traps.
Each plumbing fixture shall be separately trapped by a water-seal trap, except as otherwise permitted by this code. The trap shall be placed as close as possible to the fixture outlet. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm) and the horizontal distance shall not exceed 30 inches (762 mm) measured from the centerline of the fixture outlet to the centerline of the inlet of the trap. The height of a clothes washer standpipe above a trap shall conform to Section 802.4. A fixture shall not be double trapped.

Exceptions:
1. This section shall not apply to fixtures with integral traps.
2. A combination plumbing fixture is permitted to be installed on one trap provided that one compartment is not more than 6 inches (152 mm) deeper than the other compartment and the waste outlets are not more than 30 inches (762 mm) apart.
3. A grease interceptor intended to serve as a fixture trap in accordance with the manufacturer's installation instructions shall be permitted to serve as the trap for a single fixture or a combination sink of not more than three compartments where the vertical distance from the fixture outlet to the inlet of the interceptor does not exceed 30 inches (762 mm) and the developed length of the waste pipe from the most upstream fixture outlet to the inlet of the interceptor does not exceed 60 inches (1524 mm).

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4. This section shall not apply to outdoor drinking fountains discharging to a drywell.

1002.2 Design of traps.
Fixtures traps shall be self-scouring. Fixture traps shall not have interior partitions, except where such traps are integral with the fixture or where such traps are constructed of an approved material that is resistant to corrosion and degradation. Slip joints shall be made with an approved elastomeric gasket and shall be installed only on the trap inlet, trap outlet and within the trap seal.

1002.3 Prohibited traps.
The following types of traps are prohibited:
1. Traps that depend on moving parts to maintain the seal.
2. Bell, pot, bottle traps and traps with interior partitions.
4. Traps not integral with a fixture and that depend on interior partitions for the seal, except those traps constructed of an approved material that is resistant to corrosion and degradation.
5. "S" traps.
6. Drum traps.

Exception: Traps used as solids interceptors and traps serving chemical waste systems shall not be prohibited.

1002.4 Trap seals.
Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, a trap seal primer valve shall be installed. Trap seal primer valves shall connect to the trap at a point above the level of the trap seal. A trap seal primer valve shall conform to ASSE 1018 or ASSE 1044.

1002.5 Size of fixture traps.
Fixture trap size shall be sufficient to drain the fixture rapidly and not less than the size indicated in Table 709.1. A trap shall not be larger than the drainage pipe into which the trap discharges.

1002.6 Building traps.
Building traps shall be provided with a cleanout and a relief vent or fresh air intake but in no case less than 3 inches (76 mm) on the inlet side of the trap. The size of the relief vent or fresh air intake shall not be less than one-half the diameter of the drain to which the relief vent or air intake connects. Such relief vent or fresh air intake shall be carried above grade and shall be terminated in a screened outlet located outside the building.

1002.7 Trap setting and protection.
Traps shall be set level with respect to the trap seal and, where necessary, shall be protected from freezing.

1002.8 Recess for trap connection.  
A recess provided for connection of the underground trap, such as one serving a bathtub in slab-type construction, shall have sides and a bottom of corrosion-resistant, insect- and vermin proof construction.

1002.9 Acid-resisting traps.
Where a vitrified clay or other brittleware, acid-resisting trap is installed underground, such trap shall be embedded in concrete extending 6 inches (152 mm) beyond the bottom and sides of the trap.

1002.10 Plumbing in mental health centers.
In mental health centers, pipes and traps shall not be exposed.

Section PC 1003: Interceptors and Separators

1003.1 Where required.
Interceptors and separators shall be provided to prevent the discharge of oil, grease, sand and other substances harmful or hazardous to the building drainage system, the public sewer, the private sewage disposal system, or the sewage treatment plant or processes.

1003.2 Approval.
The size, type and location of each interceptor and of each separator shall be designed and installed in accordance with the manufacturer's instructions and the requirements of this section based on the anticipated conditions of use. Wastes that do not require treatment or separation shall not be discharged into any interceptor or separator.

1003.3 Grease interceptors.
Grease interceptors shall comply with the requirements of Sections 1003.3.1 through 1003.3.5.

1003.3.1 Grease interceptors and automatic grease removal devices required.
A grease interceptor or automatic grease removal device shall be required to receive the direct and indirect discharges from fixtures and equipment with grease-laden waste located in food preparation areas, such as in restaurants, kitchens, hospitals, bars, cafeterias (including school cafeterias), butcher shops, slaughterhouses, fish markets, supermarket food processing areas, delicatessens, or clubs. Fixtures and equipment shall include pot sinks, prerinse sinks, soup kettles or similar devices, wok stations, floor drains or sinks into which kettles are drained, food scrap sinks, scullery sinks, meat and/or poultry and/or fish preparation sinks, automatic hood wash units, and dishwashers with a maximum discharge temperature in compliance with the requirements of the Department of Environmental Protection. Grease interceptors and automatic grease removal devices shall receive waste only from fixtures and equipment that allow fats, oils or grease to be discharged.

1003.3.2 Reserved.

1003.3.3 Grease interceptors and automatic grease removal devices not required.
A grease interceptor or an automatic grease removal device shall not be required for individual dwelling units, any private living quarters, or non-culinary schools which only contain residential type stoves and sinks intended for teaching basic home cooking skills.

1003.3.4 Grease interceptor and automatic grease removal device sizing and standards.
Grease interceptors and automatic grease removal devices shall be sized in accordance with the rules of the Department of Environmental Protection. Grease interceptors and automatic grease removal devices shall be designed and tested in accordance with PDI G101, ASME A112.14.3 or ASME A112.14.4 and shall be installed in accordance with the manufacturer's instructions.

1003.3.4.1 Grease interceptor capacity.
Grease interceptors shall have a grease retention capacity in accordance with the rules of the Department of Environmental Protection.

1003.3.4.2 Rate of flow controls.
Grease interceptors shall be equipped with devices to control the rate of water flow so that the water flow does not exceed the rated flow. The flow-control device shall be vented and terminate not less than 6 inches (152 mm) above the flood rim level or be installed in accordance with the manufacturer's instructions.

1003.3.5 Automatic grease removal devices.
Where automatic grease removal devices are installed, such devices shall be located downstream of each fixture or multiple fixtures in accordance with the manufacturer's instructions. The automatic grease removal device shall be sized to pretreat the measured or calculated flows for all connected fixtures or equipment. Ready access shall be provided for inspection and maintenance.

1003.4 Oil separators required.

At repair garages, car washing facilities with engine or undercarriage cleaning capability and at factories where oily and flammable liquid wastes are produced, separators shall be installed in which all oil-bearing, grease-bearing or flammable wastes shall be discharged before emptying in the building drainage system or other point of disposal.

Exception: An oil separator is not required in hydraulic elevator pits where an automatic shut-down system is installed for the prevention of accidental discharge of oil-laden waste water into the sanitary system.

1003.4.1 Separation of liquids.

A mixture of treated or untreated light and heavy liquids with various specific gravities shall be separated in an approved receptacle.

1003.4.2 Oil separator design.

Oil separators shall be designed in accordance with Sections 1003.4.2.1 and 1003.4.2.2.

1003.4.2.1 General design requirements.

Oil separators shall have a depth of not less than 2 feet (610 mm) below the invert of the discharge drain. The outlet opening of the separator shall have not less than an 18-inch (457 mm) water seal.

1003.4.2.2 Garages and service stations.

Where automobiles are serviced, greased, repaired or washed or where gasoline is dispensed, oil separators shall have a minimum capacity of 6 cubic feet (0.17 m³) for the first 100 square feet (9.3 m²) of area to be drained, plus 1 cubic foot (0.028 m³) for each additional 100 square feet (9.3 m²) of area to be drained into the separator. Parking garages in which servicing, repairing or washing is not conducted, and in which gasoline is not dispensed, shall not require a separator. Areas of commercial garages utilized only for storage of automobiles are not required to be drained through a separator.

1003.5 Sand interceptors in commercial establishments.

Sand and similar interceptors for heavy solids shall be designed and located so as to be provided with ready access for cleaning, and shall have a water seal of not less than 6 inches (152mm).

1003.6 Laundries.

Laundry facilities not installed within an individual dwelling unit or intended for individual family use shall be equipped with an interceptor with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids 1/2 inch (12.7 mm) or larger in size, string, rags, buttons or other materials detrimental to the public sewage system.

1003.7 Bottling establishments.

Bottling plants shall discharge process wastes into an interceptor that will provide for the separation of broken glass or other solids before discharging waste into the drainage system.

1003.8 Slaughterhouses.

Slaughtering room and dressing room drains shall be equipped with approved separators. The separator shall prevent the discharge into the drainage system of feathers, entrails and other materials that cause clogging.

1003.9 Venting of interceptors and separators.

Interceptors and separators shall be designed so as not to become air bound where tight covers are utilized. Each interceptor or separator shall be vented where subject to a loss of trap seal.

1003.10 Access and maintenance of interceptors and separators.

Access shall be provided to each interceptor and separator for service and maintenance, and for inspection by the department and the Department of Environmental Protection. Interceptors and separators shall be maintained by periodic removal of accumulated grease, scum, oil, or other floating substances and solids deposited in the interceptor or separator.

Section PC 1004: Materials, Joints and Connections

1004.1 General.

The materials and methods utilized for the construction and installation of traps, interceptors and separators shall comply with this chapter and the applicable provisions of Chapters 4 and 7. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping system.

Chapter 11: Storm Drainage

Section PC 1101: General

1101.1 Scope.

The provisions of this chapter shall govern the materials, design, construction and installation of storm drainage. Storm water discharge shall be in accordance with Department of Environmental Protection requirements. Extension requirements from the public storm or combined sewer to the building sewer shall be determined by the Department of Environmental Protection.

1101.2 Where required.

All roofs, paved areas, yards, courts and courtyards shall drain into a separate storm sewer system, or a combined sewer system, or to an approved place of disposal. In accordance with the requirements of the Department of Environmental Protection, an approved system for beneficial collection and use of storm water may be installed, in which case overflow from such a system shall be discharged to a public storm or combined sewer. See Section 106.6.2 of this code for required construction documents relating to provisions for discharge for stormwater runoff.

1101.2.1 Increases in existing impervious surfaces.

Whenever impervious surfaces on the lot are increased, such impervious surfaces shall drain into a storm sewer system, or a combined sewer system, or to an approved place of disposal.

Exception: An existing one- or two-family dwelling where the area of a proposed horizontal building enlargement plus any proposed increase in impervious surfaces in total is less than or equal to 200 square feet (19 m²). In such cases, the storm water discharge may be accommodated by existing facilities. For the purposes of this exception, the 200 square feet (19 m²) shall include all enlargements and increases cumulatively after July 1, 2008.

1101.2.2 Availability of public storm or combined sewer.

The determination as to whether a public storm sewer or public combined sewer is available to a building shall be made in accordance with applicable requirements of the Department of Environmental Protection.

1101.2.3 Feasibility of connecting to an available public storm or combined sewer.

The determination as to whether connection to an available public storm sewer or combined public sewer is feasible shall be made in accordance with applicable requirements of the Department of Environmental Protection.
1101.2.4 Extensions of public storm or combined sewers.
Extensions of public storm or combined sewers shall be made in accordance with the rules of the Department of Environmental Protection.

1101.3 Prohibited drainage.
Storm water shall not be drained into sewers intended for sewage only.

1101.4 Tests.
The conductors and the building storm drain shall be tested in accordance with Section PC 312.

1101.5 Change in size.
The size of a drainage pipe shall not be reduced in the direction of flow.

Exception: Drainage pipe that is part of an approved detention system.

1101.5.1 Detention systems.
Where a detention system is provided, the pipe leaving the detention tank shall be permitted to be reduced to the flow allowed by the Department of Environmental Protection, provided, however, that an emergency overflow shall be provided to protect the building from internal flooding. Such emergency overflow shall equal the full size of the incoming storm water flow. Such emergency overflow shall discharge the overflow outside of the building into either of the following locations:
1. The tax lot; or
2. The public sewer, provided that the overflow piping is provided with a vent, of the same diameter as the overflow piping, that terminates on the front wall of the building facing the street and no more than 2 feet (610 mm) above the sidewalk, provided further that the connection from the overflow pipe to outlet pipe of the detention tank is no more than 9 inches (229 mm) below the top of the curb level. See Figure 1101.5(1).

Figure 1101.5.(1) Detention Tank Connections

1101.6 Fittings and connections.
All connections and changes in direction of the storm drainage system shall be made with approved drainage-type fittings in accordance with Table 706.3. The fittings shall not obstruct or retard flow in the system.

1101.7 Roof design.
Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drains shall be assumed to be blocked.

1101.8 Cleanouts required.
Cleanouts shall be installed in the storm drainage system and shall comply with the provisions of this code for sanitary drainage pipe cleanouts.

Exception: Subsurface drainage system.

1101.9 Backwater valves.
Storm drainage systems shall be provided with backwater valves as required for sanitary drainage systems in accordance with Section PC 715.

1101.10 Plastic pipe.
Plastic piping and fittings shall not be used.

Exceptions:
1. Plastic piping and fittings may be used in residential buildings five stories or less in height.
2. Corrugated polyethylene piping and fittings, with a diameter of 12 inches (305 mm) or more may be used in connection with any type of building for underground yard drainage and storm water piping when used outside of the foundation wall of the building and not connecting to any piping system from the interior of the building.

1101.11 Site grading.

Editor's note: this § PC 1101.11 has been amended by L.L. 2017/097, 5/30/2017. See § 22 of the local law for effective date provisions.

Except as otherwise permitted by this code, no person shall perform site grading or land contour work, as defined in Section 19-146 of the Administrative Code, that would cause storm water to flow across sidewalks or onto an adjacent property.

Section 1102: Materials

1102.1 General.
The materials and methods utilized for the construction and installation of storm drainage systems shall comply with this section and the applicable provisions of Chapter 7.

1102.2 Inside storm drainage conductors.
Inside storm drainage conductors installed above ground shall conform to one of the standards listed in Table 702.1.

1102.3 Underground building storm drain pipe.
Underground building storm drain pipe shall conform to one of the standards listed in Table 702.2.

1102.4 Building storm sewer pipe.
Building storm sewer pipe shall conform to one of the standards listed in Table 1102.4.

### Table 1102.4
Building Storm Sewer Pipe

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast-iron pipe</td>
<td>ASTM A 74; ASTM A 888; CISPI 301</td>
</tr>
<tr>
<td>Chlorinated polyvinyl chloride (CPVC) plastic</td>
<td>ASTM F 437; ASTM F 438; ASTM F 439</td>
</tr>
<tr>
<td>Concrete pipe</td>
<td>ASTM C 14; ASTM C 76; CAN/CSA A257-1M; CAN/CSA A257.2M</td>
</tr>
<tr>
<td>Ductile-iron pipe</td>
<td>AWWA C151</td>
</tr>
<tr>
<td>High density polyethylene pipe (HDPE)</td>
<td>ASTM D 3350</td>
</tr>
<tr>
<td>Non-asbestos fiber-cement pipe</td>
<td></td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic</td>
<td></td>
</tr>
<tr>
<td>Subsoil drain pipe</td>
<td></td>
</tr>
<tr>
<td>Stainless steel drainage systems, Type 316L</td>
<td>ASME A112.3.1</td>
</tr>
<tr>
<td>a. Approved plastic sewer for piping 12 inches and larger in accordance with Section 1101.10, Exception 2.</td>
<td></td>
</tr>
<tr>
<td>b. Limited to residential buildings five stories or less in height.</td>
<td></td>
</tr>
</tbody>
</table>

**1102.5 Subsoil drain pipe.**

Subsoil drains shall be open-jointed, horizontally split or perforated pipe conforming to one of the standards listed in Table 1102.5.

### Table 1102.5
Subsoil Drain Pipe

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast-iron pipe</td>
<td>ASTM A 74; ASTM A 888; CISPI 301</td>
</tr>
<tr>
<td>Polyethylene (PE) plastic</td>
<td>ASTM F 405; CAN/CSA B 162.1; CSA B182.6; CSA B182.8</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic</td>
<td></td>
</tr>
<tr>
<td>Porous concrete pipe</td>
<td>ASTM C 654</td>
</tr>
<tr>
<td>Vitrified clay pipe</td>
<td>ASTM C 4; ASTM C 700</td>
</tr>
<tr>
<td>Stainless steel drainage systems, Type 316L</td>
<td>ASME A112.3.1</td>
</tr>
<tr>
<td>a. Limited to residential buildings five stories or less in height.</td>
<td></td>
</tr>
</tbody>
</table>

**1102.6 Roof drains.**

Roof drains shall conform to ASME A112.21.2M or ASME A112.3.1.

**1102.7 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 1102.7. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Threaded drainage pipe fittings shall be of the recessed drainage type.

### Table 1102.7
Pipe Fittings

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cast-iron</td>
<td>ASME B16.4; ASME B16.12; ASTM A 888; CISPI 301; ASTM A 74</td>
</tr>
<tr>
<td>Chlorinated polyvinyl chloride (CPVC) plastic</td>
<td>ASTM F 437; ASTM F 438; ASTM F 439</td>
</tr>
<tr>
<td>Ductile iron</td>
<td>AWWA C110</td>
</tr>
<tr>
<td>High-density polyethylene (HDPE)</td>
<td>ASTM D 3350</td>
</tr>
<tr>
<td>Malleable iron</td>
<td>ASME B16.3</td>
</tr>
<tr>
<td>Nonasbestos fiber-cement</td>
<td>ASTM C 1450</td>
</tr>
<tr>
<td>Plastic, general</td>
<td>ASTM F 409</td>
</tr>
<tr>
<td>Polyethylene (PE) plastic</td>
<td>ASTM D 2306/F 2306M</td>
</tr>
<tr>
<td>Polyvinyl chloride (PVC) plastic</td>
<td>ASTMD 2484; ASTM D2466; ASTM D 2467; CSA B137.2; ASTM D 2665; ASTM F 1866</td>
</tr>
<tr>
<td>Steel</td>
<td>ASME B16.9; ASME B16.11; ASME B16.28</td>
</tr>
<tr>
<td>Stainless steel drainage systems, Type 316L</td>
<td>ASME A112.3.1</td>
</tr>
<tr>
<td>Vitrified clay</td>
<td>ASTM C 425</td>
</tr>
</tbody>
</table>
Section PC 1103: Traps

1103.1 Main trap.
Leaders and storm drains connected to a combined sewer shall be trapped. Individual storm water traps shall be installed on the storm water drain branch serving each conductor, or a single trap shall be installed in the main storm drain just before its connection with the combined building sewer or the public sewer. A hooded catch basin located within the property line shall be the equivalent of a building-house trap for the connection to a street combined sewer.

1103.2 Material.
Storm water traps shall be of the same material as the piping system to which they are attached.

1103.3 Size.
Traps for individual conductors shall be the same size as the horizontal drain to which they are connected.

1103.4 Cleanout.
An accessible cleanout shall be installed on the building side of the trap.

Section PC 1104: Conductors and Connections

1104.1 Prohibited use.
Conductor pipes shall not be used as soil, waste or vent pipes, and soil, waste or vent pipes shall not be used as conductors.

1104.2 Combining storm with sanitary drainage.
The sanitary and storm drainage systems of a structure shall be entirely separate except for minor modifications to existing buildings having combined systems. Where a combined building drain is utilized, the building storm drain shall be connected in the same horizontal plane through a single-wye fitting to the combined sewer at least 10 feet (3048 mm) downstream from any soil stack. If a separate city storm sewer is not available, building sanitary drains shall be separate and shall only be permitted to connect to a common building combined sewer downstream of building-house trap.

1104.3 Clear water drains.
Drains carrying clear water, i.e., air-conditioning drips, pump drips, cooling water, etc., may discharge into the storm water drainage system through an indirect waste connection discharging into a trapped funnel or raised lip floor drain.

Exception: Cooling tower blow-down shall discharge into the sanitary drainage system.

1104.4 Parking garage floor drains.
Floor drains provided in open or enclosed parking garages shall drain to the storm drainage system.

Section PC 1105: Roof Drains

1105.1 Strainers.
Roof drains shall have strainers extending not less than 4 inches (102 mm) above the surface of the roof immediately adjacent to the roof drain. Strainers shall have an available inlet area, above roof level, of not less than one and one-half times the area of the conductor or leader to which the drain is connected.

1105.2 Flat decks.
Roof drain strainers for use on sun decks, parking decks and similar areas that are normally serviced and maintained shall comply with Section 1105.1 or shall be of the flat-surface type, installed level with the deck, with an available inlet area not less than two times the area of the conductor or leader to which the drain is connected.

1105.3 Roof drain flashings.
The connection between roofs and roof drains which pass through the roof and into the interior of the building shall be made water tight by the use of approved flashing material.

Section PC 1106: Size of Conductors, Leaders and Storm Drains

1106.1 General.
The size of the vertical conductors and leaders, gutters, building storm drains, building storm sewers, and any horizontal branches of such drains or sewers shall be based on the 100-year hourly rainfall rate of 3 inches (76 mm) per hour. Sizing for secondary and combined primary and secondary conductors, leaders and drains shall be in accordance with Section PC 1107.

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

Table 1106.2(1)
Size of Circular Vertical Conductors and Leaders

<table>
<thead>
<tr>
<th>Diameter of Leader (inches)</th>
<th>Horizontally Projected Roof Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rainfall rate (inches per hour)</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>960</td>
</tr>
<tr>
<td>3</td>
<td>2,930</td>
</tr>
<tr>
<td>4</td>
<td>6,130</td>
</tr>
<tr>
<td>5</td>
<td>11,530</td>
</tr>
<tr>
<td>6</td>
<td>17,995</td>
</tr>
<tr>
<td>8</td>
<td>38,660</td>
</tr>
</tbody>
</table>

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

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

Table 1106.2(2)
Size of Rectangular Vertical Conductors and Leaders

<table>
<thead>
<tr>
<th>Dimensions of Common Leader Sizes width × length (inches)</th>
<th>Horizontally Projected Roof Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rainfall rate (inches per hour)</td>
</tr>
</tbody>
</table>

http://library.amlegal.com/alpscripts/get-content.aspx
For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

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

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

\[
D_e = \left( \frac{\text{width} \times \text{length}}{\text{area}} \right)^{1/2} \quad \text{(Equation 11-1)}
\]

where:

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

### 1106.3 Building storm drains and sewers.

The size of the building storm drain, building storm sewer and their horizontal branches having a slope of one-half unit or less vertical in 12 units horizontal (4 percent slope) shall be based on the maximum projected roof area in accordance with Table 1106.3. The minimum slope of horizontal branches shall be one-eighth unit vertical in 12 units horizontal (1 percent slope) unless otherwise approved.

**Table 1106.3**

Size of Horizontal Storm Drainage Piping

<table>
<thead>
<tr>
<th>Size of Horizontal Piping (inches)</th>
<th>Horizontally Projected Roof Area (square feet)</th>
<th>Rainfall rate (inches per hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>1(1/8) unit vertical in 12 units horizontal (1 percent slope)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1,096</td>
<td>548</td>
</tr>
<tr>
<td>4</td>
<td>2,506</td>
<td>1,253</td>
</tr>
<tr>
<td>5</td>
<td>4,453</td>
<td>2,227</td>
</tr>
<tr>
<td>6</td>
<td>7,133</td>
<td>3,566</td>
</tr>
<tr>
<td>8</td>
<td>15,330</td>
<td>7,600</td>
</tr>
<tr>
<td>10</td>
<td>27,600</td>
<td>13,800</td>
</tr>
<tr>
<td>12</td>
<td>44,400</td>
<td>22,200</td>
</tr>
<tr>
<td>15</td>
<td>72,800</td>
<td>39,650</td>
</tr>
<tr>
<td>1(1/4) unit vertical in 12 units horizontal (2 percent slope)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3,546</td>
<td>773</td>
</tr>
<tr>
<td>4</td>
<td>5,333</td>
<td>1,166</td>
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<tr>
<td>5</td>
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<tr>
<td>6</td>
<td>10,066</td>
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<tr>
<td>8</td>
<td>21,733</td>
<td>10,866</td>
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<tr>
<td>10</td>
<td>38,950</td>
<td>19,450</td>
</tr>
<tr>
<td>12</td>
<td>62,600</td>
<td>31,350</td>
</tr>
<tr>
<td>15</td>
<td>112,000</td>
<td>56,000</td>
</tr>
<tr>
<td>1(1/2) unit vertical in 12 units horizontal (4 percent slope)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2,295</td>
<td>1,096</td>
</tr>
<tr>
<td>4</td>
<td>5,010</td>
<td>2,500</td>
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<tr>
<td>5</td>
<td>8,900</td>
<td>4,450</td>
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<tr>
<td>6</td>
<td>13,700</td>
<td>7,140</td>
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<tr>
<td>8</td>
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<td>10</td>
<td>55,200</td>
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<tr>
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<td>44,400</td>
</tr>
<tr>
<td>15</td>
<td>158,800</td>
<td>79,250</td>
</tr>
</tbody>
</table>

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

### 1106.4 Vertical walls.

In sizing roof drains and storm drainage piping, one-half of the exposed area of any vertical wall that diverts rainwater to the roof shall be added to the projected roof area for inclusion in calculating the required size of vertical conductors, leaders and horizontal storm drain piping.

Exception: Where vertical conductors or leaders and down stream piping has been sized for secondary roof drainage in accordance with PC 1107, the contribution from vertical walls need not be added to the projected roof area.

### 1106.5 Parapet wall scupper location.

Parapet wall roof drainage scupper and overflow scupper location shall comply with the requirements of the New York city building code.
1106.6 Size of roof gutters.

The size of semicircular gutters shall be based on the maximum projected roof area in accordance with Table 1106.6.

<table>
<thead>
<tr>
<th>Diameter of Gutters (inches)</th>
<th>Horizontally Projected Roof Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.0929 m²</td>
</tr>
<tr>
<td>4</td>
<td>0.1232 m²</td>
</tr>
<tr>
<td>5</td>
<td>0.1640 m²</td>
</tr>
<tr>
<td>6</td>
<td>0.2048 m²</td>
</tr>
<tr>
<td>7</td>
<td>0.2457 m²</td>
</tr>
<tr>
<td>8</td>
<td>0.2865 m²</td>
</tr>
<tr>
<td>10</td>
<td>0.3273 m²</td>
</tr>
</tbody>
</table>

1107 Section PC 1107: Secondary (emergency) Roof Drains

1107.1 Secondary drainage required.

Secondary (emergency) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. The inlet elevation of secondary (overflow) drains and the invert elevation of overflow scuppers should be not less than 2 inches (51 mm) or more than 4 inches (102 mm) above the low point of the (adjacent to) roof surface unless a safer water depth loading, including the required hydraulic head to maintain required flow rate out of the overflow drainage system that has been determined by the structural design.

1107.2 Primary and secondary storm systems.

Where practical secondary roof drain systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade, in a location which would normally be observed by the building occupants or maintenance personnel. Where separate systems are impractical and to prevent water from flowing over sidewalk or pedestrian walkways, secondary drainage system may be into the primary drainage system in the vertical conductors.

1107.3 Sizing of secondary drains.

Secondary (emergency) roof drain systems shall be sized in accordance with Section PC 1106 based on the rainfall rate of 3 inches (76 mm) per hour. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.7. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). Where secondary drainage systems tie into primary drainage systems, the combined primary and secondary system shall be sized based on their combined rainfall rate of 6 inches (152 mm) per hour.

1108 Section PC 1108: Combined Sanitary and Storm System

1108.1 Size of combined drains and sewers.

Combined sanitary and storm sewers are not permitted in new installations. All sanitary and storm systems shall be separate up to a point within 5 feet (1524 mm) inside or outside of the foundation wall, unless rules of the Department of Environmental Protection require that the point of combination be located otherwise. With respect to repair of combined systems installed prior to the effective date of this section, the size of a combination sanitary and storm drain or sewer shall be computed in accordance with the method in Section 1106.3. The fixture units shall be converted into an equivalent projected roof or paved area. Where the total fixture load on the combined drain is less than or equal to 256 fixture units, the equivalent drainage area in horizontal projection shall be taken as 1.333 square feet (124 m²). Where the total fixture load exceeds 256 fixture units, each additional fixture unit shall be considered the equivalent of 5.2 square feet (0.48 m²) of drainage area. These values are based on a rainfall rate of 3 inch (75 mm) per hour.

1109 Section PC 1109: Values for Continuous Flow

1109.1 Equivalent roof area.

Where there is a continuous or semicontinuous discharge into the building storm drain or building storm sewer, such as from a pump, ejector, air conditioning plant or similar device, each gallon per minute of such discharge shall be computed as being equivalent to 32 square feet (2.97 m²) of roof area, based on a rainfall rate of 3 inches (75 mm) per hour.
Section PC 1110: Controlled Flow Roof Drain Systems

1110.1 General.
The roof of a structure shall be designed for the storage of water where the storm drainage system is engineered for controlled flow. The controlled flow roof drain system shall be an engineered system in accordance with this section and Section 28-113.2.2 of the Administrative Code. The controlled flow system shall be designed based on the design rainfall rate in accordance with Section 1106.1.

1110.2 Control devices.
The control devices shall be installed so that the rate of discharge of water per minute shall not exceed the values for continuous flow as indicated in Section 1109.1.

1110.3 Installation.
Runoff control shall be by control devices. Control devices shall be protected by strainers.

1110.4 Minimum number of roof drains.
Not less than two roof drains shall be installed in roof areas 10,000 square feet (929 m²) or less and not less than four roof drains shall be installed in roofs over 10,000 square feet (929 m²) in area.

Section PC 1111: Subsoil Drains

1111.1 Subsoil drains.
Subsoil drains carrying groundwater shall be open-jointed, horizontally split or perforated pipe conforming to one of the standards listed in Table 1102.5. Such drains shall not be less than 4 inches (102 mm) in diameter. Where the building is subject to backwater, the subsoil drain shall be protected by an accessibly located backwater valve. Where subsoil drainage is discharged into a public sewer, the subsoil drains shall discharge into a readily accessible silt and sand interceptor before being connected into the gravity drainage or sump system. Subsoil drainage shall discharge to a trapped area drain, sump, dry well or approved location above ground. The subsoil sump shall not be required to have either a gas-tight cover or a vent. The sump and pumping system shall comply with Section 1113.1.

Section 1112: Building Subdrains

1112.1 Building subdrains.
Building subdrains located below the public sewer level shall discharge into a sump or receiving tank, the contents of which shall be automatically lifted and discharged into the drainage system as required for building sumps. The sump and pumping equipment shall comply with Section 1113.1.

Section PC 1113: Sumps and Pumping Systems

1113.1 Pumping system.
The sump pump, pit and discharge piping shall conform to Sections 1113.1.1 through 1113.1.4.

1113.1.1 Pump capacity and head.
The sump pump shall be of a capacity and head appropriate to anticipated use requirements.

1113.1.2 Sump pit.
The sump pit shall not be less than 18 inches (457 mm) in diameter and 24 inches (610 mm) deep, unless otherwise approved. The pit shall be accessible and located such that all drainage flows into the pit by gravity. The sump pit shall be constructed of tile, steel, plastic, cast-iron, concrete or other approved material, with a removable cover adequate to support anticipated loads in the area of use. The pit floor shall be solid and provide permanent support for the pump.

1113.1.3 Electrical.
Electrical service outlets, when required, shall meet the requirements of the New York city electrical code.

1113.1.4 Piping.
Discharge piping shall meet the requirements of Section 1102.2, 1102.3 or 1102.4 and shall include a gate valve and a full flow check valve. Pipe and fittings shall be the same size as, or larger than, pump discharge tapping.

Exception: In one- and two-family dwellings, only a check valve shall be required, located on the discharge piping from the pump or ejector.

Section 1114: Private On-site Stormwater Disposal Systems

1114.1 General.
Private on-site stormwater disposal systems shall comply with the provisions of Section 1114.

1114.1.1 When permitted.
The use of private on-site stormwater disposal systems shall be permitted only in the following circumstances:

1. Pursuant to a certification issued by the New York City Department of Environmental Protection that a public storm or combined sewer is not available or that connection thereto is not feasible in accordance with Section 106.6.2.2, Item 1(i);

2. Pursuant to a certification submitted by the applicant to the New York City Department of Environmental Protection that a public storm or combined sewer is not available or that connection thereto is not feasible, in such cases where the availability and feasibility of connection to a public storm or combined sewer are allowed to be certified by the applicant pursuant to rules of the New York City Department of Environmental Protection, in accordance with Section 106.6.2.2, Item 1(ii);

3. Pursuant to a certification submitted by the applicant to the New York City Department of Environmental Protection authorizing on-site stormwater disposal in accordance with Section 106.6.2.1, Item 1;

4. For enlargements less than 1000 square feet (93 m²) in accordance with Section 106.6.2, Exception 2;

5. For outdoor drinking fountains; or

6. The disposal of foundation drainage as described in Section 1807.4.3 of the New York City Building Code.

1114.1.2 Acceptable systems.
Acceptable on-site stormwater disposal systems shall include:

1. Drywells;
2. Gravel beds;
3. Perforated pipe;
4. Stormwater chambers that facilitate infiltration; and
5. Alternate method of on-site disposal as approved by the New York City Department of Environmental Protection.

1114.1.3 Minimum setbacks.
Onsite stormwater disposal systems shall be located at least 5 feet (1524 mm) from all lot lines and 10 feet (3048 mm) from all foundations or walls existing on the date of application for a building permit or proposed under the application to construct the onsite stormwater disposal system. Systems shall be located 20 feet (6096 mm) from disposal fields and 20 feet (6096 mm) from seepage pits. Onsite stormwater disposal systems shall not be located within the building footprint.

1114.2 Field Investigation.

The size of an onsite stormwater disposal system shall be predicated on a field investigation performed prior to construction document approval that is performed at the site of a proposed onsite stormwater disposal system to assess the suitability of the soil and site. The investigation shall conform to Sections 1114.2.1 and 1114.2.2 and shall occur prior to approval of construction documents for the system. The field investigation shall be subject to special inspection in accordance with Section 1704.21 of the New York City Building Code.

1114.2.1 Classification of soil based on borings and testpits.

At least one boring and one test pit shall be made at the approximate site of each proposed onsite stormwater disposal system. Soil borings and sampling procedures shall be in accordance with ASTM D 1586 and ASTM D 1587, and generally accepted engineering practice. Soil and rock samples shall be classified in accordance with Section 1802.3 of the New York City Building Code.

1114.2.2 Soil infiltration capabilities.

The suitability of the subsurface soils must be verified in place by either a percolation test or a permeability test. Where testing determines that the infiltration rate of the subsurface soils is less than \( \frac{1}{4} \) inch (12.7 mm) per hour, private onsite stormwater disposal systems shall not be permitted. Such tests shall conform to Section 1114.2.2.1 or 1114.2.2.2, as applicable.

1114.2.2.1 Percolation tests and procedures.

The infiltration rate of subsurface soils shall be verified with a percolation test. Percolation tests shall be performed in accordance with Sections 1114.2.2.1.1 through 1114.2.2.1.3 under the supervision of a special inspection agency in accordance with Section 1704.21.1 of the New York City Building Code. At least one percolation test in each system area shall be conducted. The hole shall be spaced uniformly in relation to the bottom depth of the proposed absorption system. More percolation tests shall be made where necessary, depending on system design. The results of the percolation tests shall be filed with the department stating the suitability of the site and the capacity of the subsoil for the proposed use.

1114.2.2.1.1 Percolation test hole.

The test hole shall be dug or bored. The test hole shall have vertical sides and a horizontal dimension of 4 inches to 8 inches (102 mm to 203 mm). The bottom and sides of the hole shall be scratched with a sharp-pointed instrument to expose the natural soil. All loose material shall be removed from the hole and the bottom shall be covered with 2 inches (51 mm) of gravel or coarse sand.

1114.2.2.1.2 Test procedure, sandy soils.

The hole shall be filled with clear water to a minimum of 12 inches (305 mm) above the bottom of the hole for tests in sandy soils. The time for this amount of water to seep away shall be determined, and this procedure shall be repeated if the water from the second filling of the hole seeps away in 10 minutes or less. The test shall proceed as follows: Water shall be added to a point not more than 6 inches (152 mm) above the gravel or coarse sand. Therefore, from a fixed reference point, water levels shall be measured at 10-minute intervals for a period of 1 hour. Where 6 inches (152 mm) of water seeps away in less than 10 minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed 6 inches (152 mm). Where 6 inches (152 mm) of water seeps away in less than 2 minutes, the test shall be stopped and a rate of less than 3 minutes per inch (7.2 s/mm) shall be reported. The final water level drop shall be used to calculate the percolation rate. Soils not meeting the above requirements shall be tested in accordance with Section 1114.2.2.1.3.

1114.2.2.1.3 Test procedure, other soils.

The hole shall be filled with clear water, and a minimum water depth of 12 inches (305 mm) shall be maintained above the bottom of the hole for a 4-hour period by refilling whenever necessary or by use of an automatic siphon. Water remaining in the hole after 4 hours shall not be removed. Thereafter, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately after the soil swelling period, the measurements for determining the percolation rate shall be made as follows: Any soil sloughed into the hole shall be removed and the water level shall be adjusted to 6 inches (152 mm) above the gravel or coarse sand. Therefore, from a fixed reference point, the water level shall be measured at 30-minute intervals for a period of 4 hours, unless two successive water level drops do not vary by more than \( \frac{1}{16} \) inch (1.59 mm). At least three water level drops shall be observed and recorded. The hole shall be filled with clear water to a point not more than 6 inches (152 mm) above the gravel or coarse sand whenever it becomes nearly empty. Adjustments of the water level shall not be made during the three measurement periods except to the limits of the last measured water level drop. When the first 6 inches (152 mm) of water seeps away in less than 30 minutes, the time interval between measurements shall be 10 minutes and the test run for 1 hour. The water depth shall not exceed 5 inches (127 mm) at any time during the measurement period. The drop that occurs during the final measurement period shall be used in calculating the percolation rate.

1114.2.2.2 Permeability tests.

Soil shall be evaluated for estimated percolation based on a permeability test performed in place, in accordance with procedures established by the New York City Department of Environmental Protection and accepted engineering practice.

1114.3 Design.

The design of onsite stormwater disposal systems shall comply with the provisions of Section 1114.3.1.

1114.3.1 Runoff rate.

The runoff rate shall be calculated using the rational method, Equation 11-1. The calculation shall incorporate the total site area with a rainfall intensity value of \( I = 5.95 \) inches per hour. The weighted runoff coefficient would be calculated using Equation 11-2 and shall incorporate the different combinations of surfaces using the \( C \) values listed below.

Equation 11-1: \( Q = C_{wp} \times I \times A \)

Where:

\( Q \) = developed flow, cubic feet per second

\( C_{wp} \) = weighted runoff coefficient

\( I \) = the rainfall intensity value, 5.95 in/hr

\( A \) = the total site area, acres (ac)

Equation 11-2: \( C_{wp} = \frac{(1/A) \times (A_K \times C_{kp})}{\sum_{i=1}^{N} C_{kp}} \)

Where:

\( C_{wp} \) = weighted runoff coefficient

\( A \) = The total site area, acres (ac)

\( A_K \) = The area of each surface coverage type, acres (ac)

\( C_{kp} \) = The runoff coefficient associated with each surface coverage type

The following \( C \)-values shall be used for calculating a sites weighted runoff coefficient:

- 0.95 = roof/concrete
- 0.85 = asphalt
- 0.7 = porous asphalt/concrete or permeable pavers
- 0.7 = green roof with four or more inches of growing media
- 0.65 = gravel parking lot
.3 = undeveloped areas
.2 = grass areas
.2 = rain gardens, vegetated swales and other surface green infrastructure practices

1114.3.1.1 Storage volume.

The storage volume of an onsite stormwater disposal system shall be measured 3 feet (610 mm) above the level of the water table. The location of the water table shall be verified at the time of the field investigation conducted in accordance with Section 1114.2.1. Unless otherwise approved by the New York City Department of Environmental Protection, the storage volume of the onsite stormwater disposal system shall accommodate the total storm water volume calculated in this section. The stormwater volume shall be calculated as follows:

2. Calculate the outflow rate due to infiltration, in cubic feet per second, using Equation 11-3.
3. Calculate the outflow rate, in cubic feet per second per acre, of imperviousness using Equation 11-4.
4. Calculate the duration of the design storm in minutes using Equation 11-5.
5. Calculate the maximum required detention volume using Equation 11-6.

\[
Q_{inf} = \frac{FA_{min} \times i_{soil}}{43,200} \quad \text{(Equation 11-3)}
\]

Where:
- \( Q_{inf} \) = outflow rate due to infiltration in cubic feet per second
- \( FA_{min} \) = minimum footprint or surface area of the stormwater disposal system
- \( i_{soil} \) = soil infiltration rate in inches per hour

\[
Q_o = \frac{Q_{inf}}{(A \times C_w)} \quad \text{(Equation 11-4)}
\]

Where:
- \( Q_o \) = restricted flow rate in cubic feet per second per acre of imperviousness
- \( Q_{inf} \) = outflow rate due to infiltration cubic feet per second
- \( C_w \) = weighted runoff coefficient for the area tributary to the stormwater system

\[
t = \left(\frac{12,600 \times Q_o}{t^{1/2}}\right)^{1/2} - 15 \quad \text{(Equation 11-5)}
\]

Where:
- \( t \) = duration of the storm in minutes
- \( Q_o \) = restricted flow rate in cubic feet per second per acre of imperviousness

\[
V = \frac{(8,400 \times t^{1/2})}{40 \times t \times Q_o} \times A \times C_w \quad \text{(Equation 11-6)}
\]

Where:
- \( V \) = maximum required detention volume
- \( t \) = duration of the storm in minutes
- \( Q_o \) = restricted flow rate in cubic feet per second per acre of imperviousness
- \( A \) = Area tributary to the detention facility in acres
- \( C_w \) = weighted runoff coefficient for the area of tributary to the stormwater system

1114.4 Required components.

Onsite stormwater disposal systems shall be designed to provide adequate storage, support the use at the surface, and allow for operation and required maintenance. Systems shall be constructed with all necessary components and materials required by the manufacturers specifications. Drywell design shall incorporate a grit chamber, and where required, a sand column constructed in accordance with Figures 1114.4(1) and 1114.4(2), respectively.
1114.4.1 Grit chamber.

All drywells shall contain a grit chamber as part of the drywell system. Grit chambers shall be constructed in accordance with the following requirements:

1. Solid access cover with a minimum diameter of 15 inches (381 mm).
2. Grit chamber designed to support the maximum anticipated load.
3. Outlet invert elevation shall be a minimum of 1 inch (25 mm) lower than the lowest inlet elevation.
4. The sump shall be a minimum of 18 inch (450 mm) or 2 times the largest inlet pipe diameter, whichever is greater, as measured to the outlet invert elevation.
5. The interior dimensions shall be a minimum of 18 inches (450 mm) or 4 times the largest inlet pipe diameter whichever is greater.

1114.4.2 Onsite stormwater disposal systems other than drywells.

For onsite stormwater disposal systems other than drywells, the design and components shall be as prescribed by the registered design professional in accordance with the manufacturer's recommendations and accepted standards of professional practice.

1114.5 Onsite stormwater disposal system installation.

Onsite stormwater disposal systems shall be installed in accordance the manufacturer's recommendations and shall conform to Sections 1114.5.1 through 1114.5.3.

1114.5.1 Support of excavation.

When an onsite stormwater disposal system installation requires an excavation deeper than 5 feet (1524 mm), the sides of the excavation shall be protected and maintained in accordance with Section 3304.4 of the New York City Building Code.
1114.5.2 Sand column installation.
Where the installation of an onsite stormwater disposal system requires the installation of a sand column, measures shall be taken to ensure the sand column is installed without contamination by impervious materials.

1114.5.3 Verification.
The department reserves the right to require a 24-hour test to verify the absorption of water in the installed onsite stormwater disposal system prior to final approval.

1114.6 Special inspection.
The installation of onsite stormwater disposal systems shall be subject to special inspection in accordance with Section 1704.21 of the New York City Building Code. Minor variations, based on actual site conditions, shall be acceptable at the discretion of the registered design professional of record.

1114.7 Maintenance.
The property owner shall maintain any onsite stormwater disposal system in proper working order in accordance with the rules of the Department of Environmental Protection.

1114.8 Signage.
Signage shall be attached to the house trap or fresh air pipe in the basement that states: AN ONSITE STORMWATER DISPOSAL SYSTEM IS LOCATED ON THIS PROPERTY FOR STORMWATER DISPOSAL. INSPECTION AND MAINTENANCE OF THIS ONSITE STORMWATER DISPOSAL SYSTEM IS REQUIRED BY THE RULES OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION. This signage shall depict the location of the system on the property.

1114.9 Post-construction stormwater management facilities required by stormwater pollution prevention plan.

Chapter 12: Special Piping and Storage Systems

Section PC 1201: General

1201.1 Scope.
The provisions of this chapter shall govern the design and installation of piping and storage systems for nonflammable medical gas systems and nonmedical oxygen systems. All maintenance and operations of such systems shall be in accordance with the New York city fire code.

Section PC 1202: Medical Gases

1202.1 Nonflammable medical gases.
Nonflammable medical gas systems, inhalation anesthetic systems and vacuum piping systems shall be designed and installed in accordance with NFPA 99.

Exceptions:
1. This section shall not apply to portable systems or cylinder storage.
2. Vacuum system exhaust terminations shall comply with the New York City Mechanical Code.

Section PC 1203: Oxygen Systems

1203.1 Design and installation.
Nonmedical oxygen systems shall be designed and installed in accordance with NFPA 55 and NFPA 51.

Section PC 1204: Other Cryogenic Systems

1204.1 Design and installation.
Design and installation of cryogenic systems shall be in accordance with Sections 1202, 1203 and the New York City Fire Code.

Chapter 13: Referenced Standards

Section PC 1301: General

1301.1 General.
This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title and the section or sections of this document that reference the standard.

1301.2 Subsequent additions, modifications or deletions.
Refer to the rules of the department for any subsequent additions, modifications or deletions that may have been made to the referenced national standards set forth herein in accordance with the exception contained in Section 28-103.19 of the Administrative Code.

1301.3 Applicability.
The application of the referenced standards shall be as specified in Section 102.8.

Section PC 1302: Standards

<table>
<thead>
<tr>
<th>ANSI</th>
<th>American National Standards Institute 25 West 43rd Street, Fourth Floor New York, NY 10036</th>
</tr>
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<tr>
<td>Standard Number</td>
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<tr>
<td>A118.10-99</td>
<td>Specifications for Load Bearing, Bonded, Waterproof, Membranes for Thin Set Ceramic Tile and Dimension Stone</td>
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<tr>
<td>Z4.3-95</td>
<td>Minimum requirements for Nonsewered Waste-Disposal Systems</td>
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<tr>
<td>Z124.1-95</td>
<td>Plastic Bathtub Units</td>
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<tr>
<td>Z124.2-95</td>
<td>Plastic Shower Receptors and Shower Stalls</td>
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<td>Z 124.3-95</td>
<td>Plastic Lavatories</td>
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American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

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American Society of Sanitary Engineering
901 Canterbury Road, Suite A
Westlake, OH 44145

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Arlington, VA 22203

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| CSA | Canadian Standards Association  
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Appendix A: Plumbing Permit Fee Schedule

Reserved

Appendix B: Rates for Rainfall for Various Cities

Reserved

Appendix C: Water Recycling Systems

Section PC C101: General

C101.1 Scope.

The provisions of this appendix shall govern the materials, design, construction and installation of water recycling systems. The following water recycling uses are not addressed in this appendix:

1. Rainwater collected from piping on the exterior and used solely for subsurface irrigation, drip irrigation, watering plants using a hose and washing of sidewalks, streets, buildings or vehicles;
2. Rainwater collected utilizing a retention system through rain barrels complying with the requirements of the Department of Environmental Protection;
3. Commercial car washing facilities; and
4. Water closet-sink combinations. A fixture that enables wastewater from a lavatory to discharge directly into the flushing tank of a water closet may be utilized provided it complies with the New York City Construction Codes, including all accessibility requirements. The water closet and lavatory shall be located in the same room.

C101.2 Definitions.

The following terms shall have the meanings shown herein.

BLACK WATER. Discharge from water closets, urinals, bathtubs, showers, clothes washers, laundry trays, washdown water and blowdown water from cooling towers, and any other fixtures discharging animal or vegetable matter in suspension or solution.
GRAY WATER. Discharge from lavatories and condensate water.
RAINWATER. Precipitation collected directly from the sky or from roof and balcony runoff.
WASTEWATER. Gray and black water.

C101.3 Permits.
Permits shall be required in accordance with Section PC 105.

C101.4 Installation.
Wastewater recycling systems shall comply with Section PC C102. Water recycling systems which harvest rainwater or condensate water used solely for drip irrigation, subsurface irrigation or cooling tower makeup shall comply with Section PC C103.

C101.5 Materials.
Above-ground drain, waste and vent piping for water recycling systems shall conform to one of the standards listed in Table 702.1. Underground building drainage and vent piping shall conform to one of the standards listed in Table 702.2. Distribution piping shall conform to one of the standards listed in Tables 605.4 and 605.5 and shall be painted purple in color or covered in a purple jacket and labeled in accordance with Section C101.6. Manufactured purple piping shall be approved by the commissioner.

C101.6 Identification.
Distribution piping and reservoirs shall be identified as containing nonpotable water. Piping identification shall be in accordance with Section 608.8.

C101.6.1 Spigots and hose bibs.
Spigots and hose bibs dispensing recycled water shall be secured from unauthorized use by a locking mechanism. Signage reading “Caution: Non-potable water, do not drink” shall be placed adjacent to the location of spigots and hose bibs.

C101.7 Inspections.
Water recycling systems shall be inspected in accordance with Section PC107.

C101.8 Potable water connections.
Only connections in accordance with Section C102.3 and C103.3 shall be made between a water recycling system and a potable water system. All other connections shall be prohibited.

C101.9 Wastewater connections.
Water recycling systems shall receive only wastewater, groundwater, and rainwater.

C101.10 Collection reservoir.
Wastewater shall be collected in a reservoir constructed of durable, nonabsorbent and corrosion-resistant materials. Access openings shall be provided to allow inspection and cleaning of the reservoir interior and shall be properly gasketed and the tanks vented to prevent odors from entering into the building.

C101.10.1 Multiple collection reservoirs required.
Separate collection tanks or compartments shall be provided for influent wastewater and rainwater. Where multiple collection reservoirs are provided, a separate recycled water reservoir shall be provided which shall receive treated water from the collection systems.

C101.10.1.1 Recycled water receiver reservoirs.
Recycled water receiver reservoirs shall be provided with potable water makeup in accordance with Section C102.3.

C101.11 Filtration.
Effluent entering the collection reservoir shall pass through an acceptable filtration system suitable for the reuse application.

C101.12 Overflow.
The collection reservoir shall be equipped with an overflow pipe having the same or larger diameter as the influent pipe for the wastewater. The overflow pipe shall be connected to the appropriate building drainage system.

C101.13 Drain required.
All reservoirs shall be provided with a drain indirectly connected to the sanitary drainage system.

C101.14 Vent required.
Reservoir(s) shall be provided with a vent sized in accordance with Chapter 9 and based on the diameter of the reservoir influent pipe.

C101.15 Cooling towers.
Treated effluent shall only be utilized as water makeup on cooling towers equipped with drift eliminators and shall be operated in accordance with the New York City Building Code and Mechanical Code.

Section PC C102: Wastewater Recycling Systems

C102.1 Scope.
This section shall apply to water recycling systems collecting wastewater and rainwater. Treated effluent must comply with the water quality standards listed in Table C102.1 and may be used for flushing of water closets and urinals, cooling tower makeup, washing of sidewalks, streets or buildings, laundry, subsurface or drip landscape irrigation systems, watering plants with a hose or other approved uses that are located in the same lot as the water recycling system.

Exception: Systems collecting only rainwater and/or condensate used solely for cooling tower makeup and/or subsurface and drip irrigation shall comply with Section PC C103.

Table C102.1
Minimum Water Quality Standards

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<th>Pollutant</th>
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<tr>
<td>TSS</td>
<td>&lt; 10 mg/l</td>
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<tr>
<td>Total Coliform</td>
<td>&lt; 100 per 100 ml</td>
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<tr>
<td>E. Coli</td>
<td>&lt; 2.2 colonies per 100 ml</td>
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<tr>
<td>pH</td>
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<tr>
<td>Turbidity</td>
<td>&lt; 2.0 NTU&lt;sup&gt;b&lt;/sup&gt;</td>
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a. Effluent from rainwater and condensate collected in separate tanks or compartments from wastewater, shall not be required to meet the BOD limitations indicated above.
b. The wastewater facility effluent must meet the performance standards of < 2.0 NTU for turbidity for 95% of the measurements. At no time can the turbidity result be above 5 NTU. These results shall be recorded and compiled in the annual report.
C102.2 Disinfection.
Filtered effluent shall be disinfected prior to reuse by an acceptable method, which shall achieve the minimum water quality standards as stated in Table C102.1.

C102.3 Makeup water.
Potable water shall be supplied as a source of makeup water for water recycling systems included in Section PC C102. The potable water supply shall be protected against backflow in accordance with Section PC 608.

C102.4 Coloring.
If the treated effluent water is to be dyed, the dye shall be a food grade vegetable dye either blue or green in color. Such effluent water shall be dyed before being supplied to the fixtures.

C102.5 Reserved.
C102.6 Reserved.
C102.7 Reserved.
C102.8 Tests.

Drain, waste and vent piping for water recycling systems shall be tested in accordance with Section PC312. Distribution piping for water recycling systems shall be tested in accordance with Section 312.5 of this code. Additional tests shall be performed in accordance with Sections C102.8.1 through C102.8.3.

C102.8.1 Wet testing.
The system shall be "wet tested" with potable water to ensure no leaks exist and all equipment is fully functional.

C102.8.2 Start-up testing.
After successful wet testing and once sufficient influent is established for continuous operation, the system shall be placed into start-up mode for a minimum of two weeks. Adequate flow shall be based on design requirements and nutrient loads. Samples shall be collected five days per week and each sample must meet the water quality requirements of Table C102.1. Samples not meeting the water quality requirements of Table C102.1 shall be recorded, and included in the final start-up test report. Successful start-up tests shall demonstrate 100 percent compliance with the water quality requirements of Table C102.1 for a period of two continuous weeks. Treated water effluent from the recycling system shall be directed to a floor drain. The building shall continue to operate all fixtures using only the potable water system during this start-up testing.

C102.8.3 Temporary use testing.
The system shall be placed into temporary use mode after successful start-up testing. During the temporary use mode, treated effluent from the system shall be directed into the recycled water reservoirs and shall be utilized in accordance with Section C102.1. Samples shall be collected on a weekly basis for a period of three months. The operation of the system shall immediately cease if any test sample does not meet the minimum water quality standards of Table C102.1 in which case, tests from at least five consecutive days shall demonstrate full compliance.

Section PC C103: Rainwater Recycling Systems

C103.1 Scope.
This section shall apply to water recycling systems collecting rainwater and/or condensate used solely for cooling tower makeup and/or subsurface and drip irrigation.

C103.2 Reserved.
C103.3 Makeup water.

Makeup water shall not be required for drip or subsurface landscape irrigation systems. Where makeup water is provided, the potable water supply shall be protected against backflow in accordance with Section PC 608.

C103.4 Reserved.
C103.5 Coloring.
Treated effluent water used for cooling tower makeup and drip or subsurface landscape irrigation systems shall not be required to be dyed.

C103.6 Reserved.
C103.7 Reserved.
C103.8 Reserved.
C103.9 Reserved.
C103.10 Reserved.
C103.11 Reserved.
C103.12 Tests.

Drain, waste and vent piping for water recycling systems shall be tested in accordance with Section PC 312. Distribution piping for water recycling systems shall be tested in accordance with Section 312.5. Additional tests shall be performed in accordance with Sections C103.12.1 and C103.12.2.

C103.12.1 Wet testing.
The system shall be "wet tested" with potable water to ensure no leaks exist and all equipment is fully functional.

C103.12.2 Start-up testing.
After successful wet testing and once sufficient influent is established for continuous operation, the system shall be placed into start-up mode for a minimum of two weeks. An effluent sample from the treatment system shall be collected and shall meet the water quality requirements of Table C102.1. If the sample does not meet the water quality requirements of Table C102.1 it shall be recorded and included in the final start-up test report. Successful start-up tests shall demonstrate 100 percent compliance with the water quality requirements of Table C102.1.

Appendix D: Degree Day and Design Temperatures

Reserved

Appendix E: Sizing of Water Piping System

Section PC E101: General

E101.1 Scope.

E101.1.1 This appendix outlines two procedures which may be utilized for sizing a water piping system (see Section E103.3). The design procedures are based on the minimum static pressure available from the supply source, the head changes in the system caused by friction and elevation, and the rates of flow necessary for operation of various fixtures.
Chapter 6: New York City Plumbing Code

Section PC E102: Information Required

E102.1 Preliminary.

Obtain the necessary information regarding the minimum daily static service pressure in the area where the building is to be located. If the building supply is to be metered, obtain information regarding friction loss relative to the rate of flow for meters in the range of sizes likely to be used. Friction loss data can be obtained from manufacturers of water meters.

E102.2 Demand load.

E102.2.1 Estimate the supply demand of the building main and the principal branches and risers of the system by totaling the corresponding demand from the applicable part of Table E 103.3(3). E102.2.2 Estimate continuous supply demands in gallons per minute (L/m) for lawn sprinklers, air conditioners, etc., and add the sum to the total demand for fixtures. The result is the estimated supply demand for the building supply.

Section PC E103: Selection of Pipe Size

E103.1 General.

Decide from Table 604.3 what is the desirable minimum residual pressure that should be maintained at the highest fixture in the supply system. If the highest group of fixtures contains flush valves, the pressure for the group should not be less than 15 psi (103.4 kPa) flowing. For flush tank supplies, the available pressure should not be less than 8 psi (55.2 kPa) flowing, except blowout action fixtures must not be less than 25 psi (172.4 kPa) flowing.

E103.2 Pipe sizing.

E103.2.1 Pipe sizes can be selected according to the following procedure or by other design methods conforming to acceptable engineering practice and approved by the department. The sizes selected must not be less than the minimum required by this code. E103.2.2 Water pipe sizing procedures are based on a system of pressure requirements and losses, the sum of which must not exceed the minimum pressure available at the supply source. These pressures are as follows:

1. Pressure required at fixture to produce required flow. See Section 604.3 and Section 604.5.
2. Static pressure loss or gain (due to head) is computed at 0.433 psi per foot (9.8 kPa/m) of elevation change.

Example: Assume that the highest fixture supply outlet is 20 feet (6096 mm) above or below the supply source. This produces a static pressure differential of 8.66 psi (59.8 kPa) loss.

3. Loss through water meter. The friction or pressure loss can be obtained from meter manufacturers.
4. Loss through taps in water main.
5. Losses through special devices such as filters, softeners, backflow prevention devices and pressure regulators. These values must be obtained from the manufacturers.
6. Loss through valves and fittings. Losses for these items are calculated by converting to equivalent length of piping and adding to the total pipe length.
7. Loss due to pipe friction can be calculated when the pipe size, the pipe length and the flow through the pipe are known. With these three items, the friction loss can be determined using Figures E103.3(2), E103.3(3), E103.3(5), E103.3(6), and E103.3(7). For piping flow charts not included, use manufacturers’ tables and velocity recommendations.

Note: For the purposes of all examples, the following metric conversions are applicable:

- 1 cubic foot per minute = 0.4719 L/s
- 1 square foot = 0.0929 m²
- 1 degree = 0.0175 rad
- 1 pound per square inch = 6.895 kPa
- 1 inch = 25.4 mm
- 1 foot = 304.8 mm
- 1 gallon per minute = 3.785 L/m

E103.3 Segmented loss method.

The size of water service mains, branch mains and risers by the segmented loss method, must be determined according to water supply demand gpm (L/m), available water pressure psi (kPa) and friction loss caused by the water meter and developed length of pipe feet (m), including equivalent length of fittings. This design procedure is based on the following parameters:

- Calculate the friction loss through each length of the pipe.
- Based on a system of pressure losses, the sum of which must not exceed the minimum pressure available at the street main or other source of supply.
- Pipe sizing shall be based on (1) estimated peak demand, (2) total pressure losses caused by difference in elevation, equipment, developed length and pressure required at most remote fixture, (3) loss through taps in main, (4) losses through fittings, filters, backflow prevention devices, valves and pipe friction. Because of the variable conditions encountered in hydraulic design, it is impractical to specify definite and detailed rules for sizing of the water piping system. Current sizing methods do not address the differences in the probability of use and flow characteristics of fixtures between types of occupancies. Creating an exact model of predicting the demand for a building is impossible and final studies assessing the impact of water conservation on demand are not yet complete. The following steps are necessary for the segmented loss method.

1. Preliminary. Obtain the necessary information regarding the minimum daily static service pressure in the area where the building is to be located. If the building supply is to be metered, obtain information regarding friction loss relative to the rate of flow for meters in the range of sizes to be used. Friction loss data can be obtained from manufacturers of water meters. It is essential that enough pressure be available to overcome all system losses caused by friction and elevation so that plumbing fixtures operate properly. Section 604.6 requires the water distribution system to be designed for the minimum pressure available taking into consideration pressure fluctuations. The lowest pressure must be selected to guarantee a continuous, adequate supply of water. The lowest pressure in the public main usually occurs in the summer because of lawn sprinkling and supplying water for air-conditioning cooling towers. Future demands placed on the public main as a result of large growth or expansion should also be considered. The available pressure will decrease as additional loads are placed on the public system.

2. Demand load. Estimate the supply demand of the building main and the principal branches and risers of the system by totaling the corresponding demand from the applicable part of Table E 103.3(3). When estimating peak demand sizing methods typically use water supply fixture units (see Table E103.3(2)). This numerical factor measures the load-producing effect of a single plumbing fixture of a given kind. The use of such fixture units can be applied to a single basic probability curve (or table), found in the various sizing methods (Table E103.3(3)). The fixture units are then converted into gallons per minute (L/m) flow rate for estimating demand. 2.1. Estimate continuous supply demand in gallons per minute (L/m) for lawn sprinklers, air conditioners, etc., and add the sum to the total demand for fixtures. The result is the estimated supply demand for the building supply. Fixture units cannot be applied to constant use fixtures such as hose bibbs, lawn sprinklers and air conditioners. These types of fixtures must be metered, obtain information regarding friction loss relative to the rate of flow for meters in the range of sizes likely to be used. Friction loss data can be obtained from manufacturers of water meters. 2.2. Estimate the supply demand of the building main and the principal branches and risers of the system by totaling the corresponding demand from the applicable part of Table E103.3(3). When estimating peak demand sizing methods typically use water supply fixture units (see Table E103.3(2)). This numerical factor measures the load-producing effect of a single plumbing fixture of a given kind. The use of such fixture units can be applied to a single basic probability curve (or table), found in the various sizing methods (Table E103.3(3)). The fixture units are then converted into gallons per minute (L/m) flow rate for estimating demand. 2.3. Estimate the supply demand of the building main and the principal branches and risers of the system by totaling the corresponding demand from the applicable part of Table E103.3(3). When estimating peak demand sizing methods typically use water supply fixture units (see Table E103.3(2)). This numerical factor measures the load-producing effect of a single plumbing fixture of a given kind. The use of such fixture units can be applied to a single basic probability curve (or table), found in the various sizing methods (Table E103.3(3)). The fixture units are then converted into gallons per minute (L/m) flow rate for estimating demand. 2.4. Estimate continuous supply demand in gallons per minute (L/m) for lawn sprinklers, air conditioners, etc., and add the sum to the total demand for fixtures. The result is the estimated supply demand for the building supply. Fixture units cannot be applied to constant use fixtures such as hose bibbs, lawn sprinklers and air conditioners. These types of fixtures must be assigned the gallon per minute (L/m) value.

3. Selection of pipe size. This water pipe sizing procedure is based on a system of pressure requirements and losses, the sum of which must not exceed the minimum pressure available at the supply source. These pressures are as follows:

- 3.1. Pressure required at the fixture to produce required flow. See Section 604.3 and Section 604.5.
- 3.2. Static pressure loss or gain (due to head) is computed at 0.433 psi per foot (9.8 kPa/m) of elevation change.
- 3.3. Loss through a water meter. The friction or pressure loss can be obtained from the manufacturer.
- 3.4. Loss through taps in water main (See Table E103.3(4)).
- 3.5. Losses through special devices such as filters, softeners, backflow prevention devices and pressure regulators. These values must be obtained from the manufacturers.
- 3.6. Loss through valves and fittings. Losses for these items are calculated by converting to equivalent length of piping and adding to the total pipe length. (See Tables E103.3(5) and E103.3(6)).

Note: For the purposes of all examples, the following metric conversions are applicable:

- 1 cubic foot per minute = 0.4719 L/s
- 1 square foot = 0.0929 m²
- 1 degree = 0.0175 rad
- 1 pound per square inch = 6.895 kPa
- 1 inch = 25.4 mm
- 1 foot = 304.8 mm
- 1 gallon per minute = 3.785 L/m

http://library.amlegal.com/alpscripts/get-content.aspx
3.7. Loss due to pipe friction can be calculated when the pipe size, the pipe length and the flow through the pipe are known. With these three items, the friction loss can be determined using Figures E103.3(2), E103.3(3), E103.3(5), E103.3(6), and E103.3(7). When using charts, use pipe inside diameters. For piping flow charts not included, use manufacturer’s tables and velocity considerations. Before attempting to size any water supply system, it is necessary to gather preliminary information which includes available pressure, water demands, etc. Select the total developed length to most remote outlet and divide the water supply system into sections at major changes in elevation or where branches lead to fixture groups. The peak demand must be determined in each part of the cold and hot water supply system which includes the corresponding water supply fixture unit and conversion to gallons per minute (Gpm) flow rate to be expected through each section. Sizing methods require the determination of the "most hydraulically remote" fixture to compute the pressure loss caused by pipe and fittings. The hydraulically remote fixture represents the most downstream fixture along the circuit of piping requiring the most available pressure to operate properly. Consideration must be given to all pressure demands and losses, such as friction caused by pipe, fittings, equipment, elevation, and the residual pressure required by Table 604.3. The two most common and frequent complaints about the water supply system operation are lack of adequate pressure and noise.

Problem: What size Type L copper water pipe, service and distribution will be required to serve a two-story factory building having on each floor, back-to-back, two toilet rooms each equipped with hot and cold water? The highest fixture is 21 feet (6401 mm) above the street main, which is tapped with a 2-inch (51 mm) corporation cock at which point the minimum pressure is 55 psi (379.2 kPa). In the building basement, a 2-inch (51 mm) meter with a maximum pressure drop of 11 psi (75.8 kPa) and 3-inch (76 mm) reduced pressure principle backflow preventer on the system is connected to the city mains by a 2-inch (51 mm) corporation cock. Figure E103.3(1) shows the tabular arrangement as described in Table E103.3(1) should first be constructed. The steps to be followed are indicated by the tabular arrangement itself as they are in sequence, columns 1 through 10 and lines A through L.

Step 1 Columns 1 and 2: Divide the system into sections breaking at major changes in elevation or where branches lead to fixture groups. After point B (see Figure E103.3(1)), separate consideration will be given to the hot and cold water piping. Enter the sections to be considered in the service and cold water piping in Column 1 of the tabular arrangement shown in Table E103.3(1), (8) recommended tabular arrangement for use in solving pipe sizing. The objective in designing the water supply system is to ensure an adequate water supply and pressure to all fixtures and equipment. Column 2 provides the pounds per square inch (psi) to be considered separately from the minimum pressure available at the main. Losses to take into consideration are the following: the differences in elevations between the water supply source and the most remote outlet at no-flow conditions, meter pressure losses, the tap in main loss, special fixture devices such as water softeners and prevention devices and the pressure required at the most remote fixture outlet. The difference in elevation can influence in an increase or decrease in available pressure at the main. Where the water supply outlet is located above the source, this results in a loss in the available pressure and is subtracted from the pressure at the water source. Where the highest water supply outlet is located below the water supply source, there will be an increase in pressure that is added to the available pressure of the water source.

Column 3: According to Table E103.3(3), determine the gpm (L/m) of flow to be expected in each section of the system. These flows range from 28.6 to 108 gpm. Load values for fixtures must be determined as water supply fixture units and then converted to a gallon-per-minute (gpm) rating to determine peak demand. When calculating peak demands, the volume of water supply fixture units are added and then converted to the gallon-per-minute rating. For continuous flow fixtures such as hose bibbs and lawn sprinkler systems, add the gallon-per-minute demand to the intermittent demand of fixtures. For example, a total of 120 water supply fixture units is converted to a demand of 48 gallons per minute. When water flow is a factor, add the flow in gpm (L/m) to this result. Typical water pressure systems have a maximum of 48 gpm (180 L/m) for building systems, and a flow rate of 240 gpm (900 L/m) for fire protection systems. The maximum pressure loss of such devices is taken into consideration in the size, safe operating capacity (gpm) and maximum rates for continuous operations (gpm). Typically, equipment imparts greater pressure losses than piping.

Step 2 Line A: Enter the minimum pressure available at the main source of supply in Column 2. This is 55 psi (379.2 kPa). The local water authorities generally keep records of pressures at different times of day and year. The available pressure can also be checked from nearby buildings or from fire department hydrant checks.

Line B: Determine from Table 604.3 the highest pressure required for the fixtures on the system, which is 15 psi (103.4 kPa), to operate a flushometer valve. The remote valve pressure outlet is not necessary to compute the pressure loss caused by pipe and fittings, and represents the most downstream fixture along the circuit of piping requiring the available pressure to operate properly as indicated by Table 604.3.

Line C: Determine the pressure loss for the pipe size meter given or assumed. The total water flow from the main through the service as determined in Step 1 will serve to aid in the selection of a trial pipe size. Three common pressure losses are determined by the American Water Works Association Standards for displacement type, compound type and turbine type. The maximum pressure loss of such devices takes into consideration the meter size, safe operating capacity (gpm) and maximum rates for continuous operations (gpm). Typically, equipment imparts greater pressure losses than piping.

Line D: Select from Table E103.3(4) and enter the pressure loss for the tap size given or assumed. The loss of pressure through taps and tees in pounds per square inch (psi) are based on the total gallon-per-minute flow rate and size of the tap.

Step 3 Line E: The difference in elevation between the main and source of supply and the highest fixture on the system. As an example, Figure 1 shown, in feet, by 0.43 psi (2.98 kPa) is credited to the pressure loss on Lines B through H. Enter the pressure loss for the tap size at No Flow. The pressure loss has a significant impact on the sizing of the water supply system. The difference in elevation usually results in a loss in the available pressure because the water supply outlet is generally located above the water supply source. The loss is caused by the pressure required to lift the water to the outlet. The pressure loss is subtracted from the pressure at the water source. Where the highest water supply outlet is located below the water source, there will be an increase in pressure which is added to the available pressure of the water source.

Lines F, G and H: The pressure losses through filters, backflow prevention devices or other special fixtures must be obtained from the manufacturer or estimated and entered on these lines. Equipment such as backflow prevention devices, check valves, water softeners, instantaneous or tankless water heaters, filters and strainers can impart a much greater pressure loss than the piping. The piping losses can range from 8 psi to 30 psi.

Step 4 Line I: The sum of the pressure requirements and losses that affect the overall system (Lines B through H) is entered on this line. Summarizing the steps, all of the system losses are subtracted from the minimum water pressure. The remainder is the pressure available for friction, defined as the energy available to push the water through the pipe. This source of pressure can be used to determine the friction available for the pipe system. Selecting a certain amount for available water supply pressures as an area incurs growth, or because of aging of the pipe or equipment added to the system is recommended.

Step 5 Line J: Subtract Line I from Line A. This gives the pressure that remains available from overcoming friction losses in the system. This figure is a guide to the pipe size that is chosen for each section, incorporating the total friction losses to the most remote outlet (measured length is called developed length).

Exception: When the main is above the highest fixture, the resulting psi must be considered a pressure gain (static head gain) and omitted from the sums of Lines B through H and added to Line J. The maximum friction head that can be tolerated in the system during peak demand is the difference between the static pressure at the highest and most remote outlet at no-flow conditions and the minimum flow pressure required at that outlet. If the losses are within the required limits, then every run of pipe will also be within the required friction head loss. Static pressure loss is the most remote outlet in feet × 0.433 = loss in psi caused by elevation differences.

Step 6 Column 5: Enter the length of each section from the main to the most remote outlet (at Point E). Divide the water supply system into sections breaking at major changes in elevation or where branches lead to fixture groups.

Step 7 Column 6: When selecting a trial pipe size, the length from the water service or meter to the most remote fixture outlet must be measured to determine the developed length. However, in systems having a flush valve or temperature controlled shower at the top most floors the developed length would be from the water meter to the most remote flush valve on the system. A rule of thumb is that size will become progressively smaller as the system extends farther from the main source of supply. Trial pipe size may be arrived at by the following formula:

\[
L = \sum_{i=1}^{n} \left( \frac{L_i}{D_i^2} \right)
\]

Where: \(L\) is the developed length of the water supply system, \(L_i\) is the length of each section, \(D_i\) is the inside diameter of the pipe, and \(n\) is the number of sections.

Example: 9.36 (pressure available to overcome pipe friction) × 100/338 (Equivalent length of run = 225 ft × 1.5 = 338 feet). The total equivalent length of run for determining a trial pipe size is 338 feet.

Example E103.3(1)
Chapter 6: New York City Plumbing Code

**Pressure Loss**

<table>
<thead>
<tr>
<th>Cold Water Pipe Section</th>
<th>Fittings/Valves</th>
<th>Pressure Loss Expressed as Equivalent Length of Tube (Feet)</th>
<th>Hot Water Pipe Section</th>
<th>Fittings/Valves</th>
<th>Pressure Loss Expressed as Equivalent Length of Tube (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-B</td>
<td>3-2 1/2&quot; Gate valves</td>
<td>3</td>
<td>A-B</td>
<td>3-2 1/2&quot; Gate valves</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1-2 1/2&quot; Side branch tee</td>
<td>12</td>
<td></td>
<td>1-2 1/2&quot; Side branch tee</td>
<td>12</td>
</tr>
<tr>
<td>B-C</td>
<td>1-2 1/2&quot; Straight run tee</td>
<td>0.5</td>
<td>B-C</td>
<td>1-2&quot; Straight run tee</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1-2&quot; 90-degree ell</td>
<td>0.5</td>
</tr>
<tr>
<td>C-F</td>
<td>1-2 1/2&quot; Side branch tee</td>
<td>12</td>
<td>C-F</td>
<td>1-1 1/2&quot; Side branch tee</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>1-2 1/2&quot; 90-degree ell</td>
<td>7</td>
<td></td>
<td>1-1 1/2&quot; 90-degree ell</td>
<td>4</td>
</tr>
<tr>
<td>D-E</td>
<td>1-2 1/2&quot; Side branch tee</td>
<td>12</td>
<td>D-E</td>
<td>1-1 1/2&quot; Side branch tee</td>
<td>7</td>
</tr>
</tbody>
</table>

**Step 8** Column 7: Add the figures from Column 4 and Column 6, and enter in Column 7. Express the sum in hundreds of feet.

**Step 9** Column 8: Select from Figure E103.3(3) the friction loss per 100 feet (30 480 mm) of pipe for the gallon-per-minute flow in a section (Column 3) and trial pipe size (Column 5). Maximum friction head loss per 100 feet is determined on the basis of total pressure available for friction head loss and the longest equivalent length of run. The selection is based on the gallon-per-minute demand, the uniform friction head loss, and the maximum design velocity. Where the size indicated by hydraulic table indicates a velocity in excess of the selected velocity, a size must be selected which produces the required velocity.

**Step 10** Column 9: Multiply the figures in Columns 7 and 8 for each section and enter in Column 9. The total friction loss is determined by multiplying the friction loss per 100 feet (30 480 mm) for each pipe section in the total developed length by the pressure loss in fittings expressed as equivalent length in feet. Note: section C-F should be considered in the total pipe friction losses only if greater loss occurs in section C-F than in pipe section D-E. Section C-F is not considered in the total developed length. Total friction loss in equivalent length is determined in Example E103.3(2).

**Example E103.3(2)**

<table>
<thead>
<tr>
<th>Pipe Sections</th>
<th>Friction Loss Equivalent Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cold Water</td>
</tr>
<tr>
<td>A-B</td>
<td>0.69 x 3.2 = 2.21</td>
</tr>
<tr>
<td>B-C</td>
<td>0.085 x 3.1 = 0.28</td>
</tr>
<tr>
<td>C-D</td>
<td>0.20 x 1.9 = 0.38</td>
</tr>
<tr>
<td>D-E</td>
<td>1.62 x 1.9 = 3.08</td>
</tr>
<tr>
<td>Total pipe friction losses (Line K)</td>
<td>5.93</td>
</tr>
</tbody>
</table>

**Step 11** Line K: Enter the sum of the values in Column 9. The value is the total friction loss in equivalent length for each designated pipe section.

**Step 12** Line L: Subtract Line J from Line K and enter in Column 10. The result should always be a positive or plus figure. If it is not, repeat the operation using Columns 5, 6, 8 and 9 until a balance or near balance is obtained. If the difference between Lines J and K is a high positive number, it is an indication that the pipe sizes are too large and should be reduced, thus saving materials. In such a case, the operations using Columns 5, 6, 8 and 9 should again be repeated. The total friction losses are determined and subtracted from the pressure available to overcome pipe friction for trial pipe size. This number is critical as it provides a guide to whether the pipe size selected is too large and the process should be repeated to obtain an economically designed system.

**Answer:** The final figures entered in Column 5 become the design pipe size for the respective sections. Repeating this operation a second time using the same sketch but considering the demand for hot water, it is possible to size the hot water distribution piping. This has been worked up as a part of the overall problem in the tabular arrangement used for sizing the service and water distribution piping. Note that consideration must be given to the pressure losses from the street main to the water heater (section A-B) in determining the hot water pipe sizes.
For SI: 1 foot = 304.8 mm, 1 gpm = 3.785 L/m.

Figure E103.3(1) Example-Sizing
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Figure E103.3(5)
Friction Loss in Smooth Pipe (Type L, ASTM B 88 Copper Tubing)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 L/min, 1 psi = 6.895 kPa. 
1 foot per second = 0.305 m/s.

a. This chart applies to smooth new copper tubing with recessed (Streamline) soldered joints and to the actual sizes of types indicated on the diagram.
Figure E(633)(F)
Friction Loss in Fairly Smooth Pipe

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 l/min, 1 psi = 6.895 kPa,
1 foot per second = 0.305 m/s.

a. This chart applies to smooth new steel (fairly smooth) pipe and to actual diameters of standard-weight pipe.
FIGURE E103.3(6)  
FRICION LOSS IN FAIRLY ROUGH PIPE

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 l/min, 1 psi = 6.895 kPa,  
1 foot per second = 0.305 m/s.

a. This chart applies to fairly rough pipe and to actual diameters which in general will be less than the actual diameters of the new pipe of the same kind.
TABLE E103.3 (1)
RECOMMENDED TABULAR ARRANGEMENT FOR USE IN SOLVING PIPE SIZING PROBLEMS

<table>
<thead>
<tr>
<th>COLUMN</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line</td>
<td>Description</td>
<td>Lb per square inch (psi)</td>
<td>Gal. per min through section</td>
<td>Length of section (feet)</td>
<td>Trial pipe size (inches)</td>
<td>Equivalent length of fittings and valves (feet)</td>
<td>Total equivalent length col. 4 and col. 6 # 00</td>
<td>Friction loss per 100 feet of trial size pipe (psi)</td>
<td>Friction loss in equivalent length col. 8 x (0l.i)</td>
</tr>
<tr>
<td>A</td>
<td>Service And Cold Water Distribution Piping</td>
<td>Minimum pressure available at main</td>
<td>55.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Highest pressure required at a fixture (Section 604.3)</td>
<td>15.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Meter loss 2&quot; meter</td>
<td>11.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>Tap in main loss 2&quot; ta (Table E103A)</td>
<td>1.61</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>Static head loss 21 x 43 psi</td>
<td>9.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>Special fixture loss backflow preventer</td>
<td>9.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td></td>
<td>Special fixture loss – Filter</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td></td>
<td>Special fixture loss – Other</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td></td>
<td>Total overall losses and requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td></td>
<td>Sum of Lines B through H</td>
<td>45.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td></td>
<td>Pressure available to overcome pipe Friction (Line A minus Lines B to H)</td>
<td>9.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>Total pipe friction losses (cold)</td>
<td>5.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>Difference (Line J minus Line K)</td>
<td>3.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>Pipe section (from diagram) AB 288</td>
<td>108.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td></td>
<td>Cold water BC 264</td>
<td>104.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td></td>
<td>Distribution CD 132</td>
<td>77.0</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td></td>
<td>Piping CF-D 132</td>
<td>77.0</td>
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<td></td>
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<tr>
<td>R</td>
<td></td>
<td>DE-D 132</td>
<td>77.0</td>
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<td></td>
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<tr>
<td>S</td>
<td></td>
<td>Total pipe friction losses (hot)</td>
<td>7.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td>Difference (Line J minus Line K)</td>
<td>3.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td></td>
<td>Pipe section (from diagram) AB 288</td>
<td>108.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>V</td>
<td></td>
<td>Distribution CY 12</td>
<td>38.0</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td></td>
<td>Hot Water C'D 12</td>
<td>28.6</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>Total pipe friction losses (hot)</td>
<td>7.99</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td>Difference (Line J minus Line K)</td>
<td>3.43</td>
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<td></td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psi = 6.895 kPa, 1 gpm = 3.785 L/m.

a. To be considered as pressure gain for fixtures below main (to consider separately, omit from "I" and add to "J").

b. To consider separately, in K use C-F only if greater loss than above.

TABLE E103.3(2)
LOAD VALUES ASSIGNED TO FIXTURES

### Chapter 6: New York City Plumbing Code

#### Table E103.3(c)

**TABLE FOR ESTIMATING DEMAND**

<table>
<thead>
<tr>
<th>SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH TANKS</th>
<th>SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH VALVES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load</strong></td>
<td><strong>Demand</strong></td>
</tr>
<tr>
<td>(Water supply fixture units)</td>
<td>(Gallons per minute)</td>
</tr>
<tr>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>2</td>
<td>5.0</td>
</tr>
<tr>
<td>3</td>
<td>6.5</td>
</tr>
<tr>
<td>4</td>
<td>8.0</td>
</tr>
<tr>
<td>5</td>
<td>9.4</td>
</tr>
<tr>
<td>6</td>
<td>10.7</td>
</tr>
<tr>
<td>7</td>
<td>11.8</td>
</tr>
<tr>
<td>8</td>
<td>12.8</td>
</tr>
<tr>
<td>9</td>
<td>13.7</td>
</tr>
<tr>
<td>10</td>
<td>14.6</td>
</tr>
<tr>
<td>11</td>
<td>15.4</td>
</tr>
<tr>
<td>12</td>
<td>16.0</td>
</tr>
<tr>
<td>13</td>
<td>16.5</td>
</tr>
<tr>
<td>14</td>
<td>17.0</td>
</tr>
<tr>
<td>15</td>
<td>17.5</td>
</tr>
<tr>
<td>16</td>
<td>18.0</td>
</tr>
<tr>
<td>17</td>
<td>18.4</td>
</tr>
<tr>
<td>18</td>
<td>18.8</td>
</tr>
<tr>
<td>19</td>
<td>19.2</td>
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<tr>
<td>20</td>
<td>19.6</td>
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<tr>
<td>21</td>
<td>21.5</td>
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<tr>
<td>22</td>
<td>22.5</td>
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<td>23</td>
<td>23.3</td>
</tr>
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<td>24.9</td>
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<td>25</td>
<td>26.3</td>
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<tr>
<td>26</td>
<td>27.7</td>
</tr>
<tr>
<td>27</td>
<td>29.1</td>
</tr>
<tr>
<td>28</td>
<td>30.5</td>
</tr>
<tr>
<td>29</td>
<td>32.8</td>
</tr>
<tr>
<td>30</td>
<td>35.0</td>
</tr>
<tr>
<td>31</td>
<td>38.0</td>
</tr>
<tr>
<td>32</td>
<td>41.0</td>
</tr>
<tr>
<td>33</td>
<td>43.5</td>
</tr>
<tr>
<td>34</td>
<td>46.0</td>
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<tr>
<td>35</td>
<td>48.0</td>
</tr>
<tr>
<td>36</td>
<td>50.0</td>
</tr>
<tr>
<td>37</td>
<td>52.0</td>
</tr>
<tr>
<td>38</td>
<td>54.0</td>
</tr>
<tr>
<td>39</td>
<td>56.0</td>
</tr>
<tr>
<td>40</td>
<td>58.0</td>
</tr>
<tr>
<td>41</td>
<td>60.0</td>
</tr>
<tr>
<td>42</td>
<td>62.0</td>
</tr>
<tr>
<td>43</td>
<td>64.0</td>
</tr>
<tr>
<td>44</td>
<td>66.0</td>
</tr>
</tbody>
</table>

**a.** For fixtures not listed, loads should be assumed by comparing the fixture to one listed using water in similar quantities and at similar rates. The assigned loads for fixtures with both hot and cold water supplies are given for separate hot and cold water loads and for total load. The separate hot and cold water loads being three-fourths of the total load for the fixture in each case.
Chapter 6: New York City Plumbing Code

### TABLE E103.3(4)

<table>
<thead>
<tr>
<th>PIPE SIZE (inches)</th>
<th>ALLOWANCE IN EQUIVALENT LENGTHS OF PIPE FOR FRICTION LOSS IN VALVES AND THREADED FITTINGS (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>2/3</td>
</tr>
<tr>
<td>45-degree elbow</td>
<td>1.2</td>
</tr>
<tr>
<td>90-degree elbow</td>
<td>2.0</td>
</tr>
<tr>
<td>Tee, run</td>
<td>0.6</td>
</tr>
<tr>
<td>Tee, branch</td>
<td>3.0</td>
</tr>
<tr>
<td>Gate valve</td>
<td>0.4</td>
</tr>
<tr>
<td>Balancing valve</td>
<td>0.8</td>
</tr>
<tr>
<td>Plug-type cock</td>
<td>0.8</td>
</tr>
<tr>
<td>Check valve, swing</td>
<td>5.6</td>
</tr>
<tr>
<td>Globe valve</td>
<td>15.0</td>
</tr>
<tr>
<td>Angle valve</td>
<td>8.0</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.0175 rad.

### TABLE E103.3(5)

<table>
<thead>
<tr>
<th>FITTINGS OR VALVE</th>
<th>PIPE SIZE (inches)</th>
<th>ALLOWANCE IN EQUIVALENT LENGTHS OF PIPE FOR FRICTION LOSS IN VALVES AND THREADED FITTINGS (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>3/4</td>
<td>1</td>
</tr>
<tr>
<td>45-degree elbow</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>90-degree elbow</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Tee, run</td>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Tee, branch</td>
<td>3.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Gate valve</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Balancing valve</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Plug-type cock</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>Check valve, swing</td>
<td>5.6</td>
<td>8.4</td>
</tr>
<tr>
<td>Globe valve</td>
<td>15.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Angle valve</td>
<td>8.0</td>
<td>12.0</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.0175 rad.

### TABLE E103.3(6)

<table>
<thead>
<tr>
<th>NOMINAL OR STANDARD (inches)</th>
<th>FITTINGS</th>
<th>VALVES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard</td>
<td>Side Branch Straight Run</td>
</tr>
<tr>
<td>3/8</td>
<td>0.5</td>
<td>1.5</td>
</tr>
<tr>
<td>1/2</td>
<td>1.0</td>
<td>2.0</td>
</tr>
<tr>
<td>5/8</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td>3/4</td>
<td>2.0</td>
<td>3.0</td>
</tr>
<tr>
<td>1</td>
<td>2.5</td>
<td>4.5</td>
</tr>
<tr>
<td>1 1/4</td>
<td>3</td>
<td>5.5</td>
</tr>
<tr>
<td>1 1/2</td>
<td>4</td>
<td>7.0</td>
</tr>
<tr>
<td>2</td>
<td>5.5</td>
<td>9.0</td>
</tr>
<tr>
<td>2 1/2</td>
<td>7</td>
<td>12.0</td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.0175 rad.
Section PC E202: Determination of Pipe Volumes

E202.1 Determining volume of piping systems.

Where required for engineering design purposes, Table E202.1 shall be used to determine the approximate internal volume of water distribution piping.

Table E202.1
Internal Volume of Various Water Distribution Tubing

<table>
<thead>
<tr>
<th>Size Nominal, Inch</th>
<th>Ounces of Water Per Foot of Tube</th>
<th>Copper Type M</th>
<th>Copper Type L</th>
<th>Copper Type K</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>1.06</td>
<td>0.97</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>1.69</td>
<td>1.55</td>
<td>1.45</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>3.43</td>
<td>3.22</td>
<td>2.90</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>5.81</td>
<td>5.49</td>
<td>5.17</td>
<td></td>
</tr>
<tr>
<td>1 1/4</td>
<td>8.70</td>
<td>8.36</td>
<td>8.09</td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>12.18</td>
<td>11.83</td>
<td>11.45</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>21.08</td>
<td>20.58</td>
<td>20.04</td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.0175 rad.

For SI: 1 ounce = 0.030 liter.