

Int. No. 1481-A

By Council Members Cornegy, Grodenchik and Louis (by request of the Mayor)

A Local Law to amend the administrative code of the city of New York and the New York city plumbing code in relation to bringing such code up to date with the 2015 edition of the international plumbing code with differences that reflect the unique character of the city and repealing chapter 11 and appendices C, F, and G of the New York city plumbing code in relation thereto.

Be it enacted by the Council as follows:

Section 1. Legislative intent. This local law implements section 28-601.1 of the administrative code, which requires triennial updates of the New York city plumbing code to reflect changes in the International Plumbing Code. These amendments will bring the New York city plumbing code up to date with the 2015 International Plumbing Code published by the International Code Council, with differences to accommodate the unique nature of construction in the city. The local law is divided into parts from A through P with each part comprising amendments to a separate chapter or appendix of the code in separately numbered sections within the part.

§2. Section 28-601.2 of the administrative code of the city of New York, as amended by local law number 141 for the year 2013, is amended to read as follows:

§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]~~2015 edition of such International Plumbing Code, is hereby adopted to read as follows:

PART A

CHAPTER 1

§1. Chapter 1 of the New York city plumbing code, as added by local law number 8 for the year 2008, section 106.10 as amended by local law number 85 for the year 2009, section 101.3 as amended by local law number 49 for the year 2010, sections 102.1, 102.2, 102.3, 102.4, 102.10, 104.10, 105.6, 106.9 and PC 107 as amended by local law number 41 for the year 2012, sections 102.4.2 and 102.8.1 as added by local law number 141 for the year

2013, and sections 106.6 and 106.6.3 as amended by local law number 97 for the year 2017, is amended 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~~ on July 1, 2008 or on the effective date of 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. ~~[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.]~~

102.3.1 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. ~~[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.]~~

102.4.1 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]~~ Sections 102.4 and 102.4.1, the provisions of Sections ~~[102.4.1.1]~~ 102.4.2.1 through ~~[102.4.1.3]~~ 102.4.2.3 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 from 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, appliances 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~~] Chapter 15 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~~] apply. 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~~] Chapter 15, 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, and establish 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 purpose 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 nonfunctioning 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 APPROVALS

105.1 Approvals. Refer to Chapter 1 of Title 28 of the *Administrative Code*.

SECTION PC [~~105~~] 106 PERMITS

[105.1] 106.1 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] 106.2 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] 106.3 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] 106.4 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] 106.5 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] 106.6 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.

5. Permits for the installation of temporary connections at the street for water and sewer shall be obtained from the Department of Environmental Protection.

106.7 Permits with respect to limited alteration applications. For permits with respect to limited alteration applications refer to Sections 28-101.5 and 28-104.6, Exception 1 of the *Administrative Code*.

SECTION PC ~~[106]~~ 107 CONSTRUCTION DOCUMENTS

~~[106.1]~~ 107.1 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]~~ 107.2 Required documents. The applicant shall submit all of the documents specified in Sections ~~[106.3]~~ 107.3 through ~~[106.10]~~ 107.10 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]~~ 107.2.1 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]~~ 107.3 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]~~ 107.4 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]~~ type 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 ~~[502.4]~~ 202 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~~[-]~~ ; and
8. Whether the building is inside or outside a flood hazard area as such term is defined in Appendix G of the *New York City Building Code*.

~~[106.5]~~ 107.5 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]~~ hazard areas, construction documents shall comply with Appendix G of the *New York City Building Code*.

~~[106.6]~~ **107.6 Discharge of sewage and discharge and/or management of stormwater runoff.** Applications for construction document approval shall comply with Sections ~~[106.6.1, 106.6.2 and 106.6.3]~~ 107.6.1, 107.6.2 and 107.6.3.

~~[106.6.1]~~ **107.6.1 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]~~ 107.6.1.1 and ~~[106.6.1.2]~~ 107.6.1.2 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]~~ **107.6.1.1 Connection feasible and available.** Where a public sanitary or

combined sewer availability 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]~~ **107.6.1.2 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) or (ii) A certification submitted by the applicant to the Department of Environmental Protection that a public sanitary 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 sanitary or combined sewer are allowed to be certified by the applicant pursuant to the rules of such department. 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); and
2. **On-site disposal.** A proposal for the design and construction of a system for the on-site disposal of sewage conforming to the provisions of this code and other applicable laws and rules including but not limited to minimum required distances from lot lines or structures and subsoil conditions. Construction documents for such

system shall be subject to the approval of the department.

[106.6.2] 107.6.2 Stormwater. Applications for construction document approval shall include submittal documents relating to the availability and feasibility of a public combined or storm sewer or other approved method for stormwater discharge in accordance with Sections ~~[106.6.2.1]~~ 107.6.2.1 and ~~[106.6.2.2]~~ 107.6.2.2 for the following types of applications:

1. New buildings;
2. Alterations of buildings proposing horizontal building enlargement; and/or
3. Alterations that increase impervious surfaces on the tax lot.

Exceptions:

1. Applications for construction document approval for the alteration of an existing one- or two-family dwelling need not include such submittal documents, where the ~~[area]~~ footprint of a proposed horizontal building enlargement and any proposed increase in impervious surfaces combined is less than or equal to 200 square feet (19 m²). Construction documents shall include the amount of proposed increase in impervious area.
 - 1.1. This exception shall not apply if the horizontal building enlargement and increase in impervious surface related to the current application for construction document approval and any other enlargement or increase in impervious surface made on the same tax lot after July 1, 2008 together exceed 200 square feet (19 m²).
2. Applications for construction document approval for the alteration of a building need not include such submittal documents, where the ~~[area of a]~~ increase in area of the footprint resulting from a proposed horizontal building enlargement and any proposed increase in impervious surfaces on a lot combined is less than or equal to 1,000 square feet (93 m²), and on-site disposal of stormwater conforming to the provisions of the applicable laws and rules as determined by the department is proposed for such enlargement and/or increase in impervious surface. Construction documents shall include the amount of proposed increase in impervious area.
 - 2.1. This exception shall not apply where on-site disposal cannot be designed to conform to the provisions of the applicable laws and rules including but not limited to minimum required distances from lot lines or structures or subsoil conditions as determined by the department.
 - 2.2. This exception shall not apply if the horizontal building enlargement and increase in impervious surface related to the current application for construction document approval and all other enlargements or increases in impervious surface made on the same tax lot after July 1, 2008 together exceed 1,000 square feet (93 m²).

[106.6.2.1] 107.6.2.1 Connection feasible and available. Where a public combined or storm sewer availability 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 is feasible, applicants 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 storm 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 stormwater runoff to be disposed of through an on-site detention or retention system, or by use of alternative disposal methods including but not limited to ditches, swales or watercourses; 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 storm or combined sewer is available and connection thereto is 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 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).

[106.6.2.2] 107.6.2.2 Connection not feasible or not available. Where a public combined or storm sewer is not available, or where connection thereto is not feasible, applicants shall submit:

1. **Department of Environmental Protection or applicant certification of unavailability or non-feasibility.** (i) Certification issued by the Department of Environmental Protection that a public storm or combined sewer is not available or that connection thereto 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); or (ii) Certification submitted by the applicant to the 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 such department. 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); and
2. **On-site disposal.** A proposal for the design and construction of a system for the on-site disposal of stormwater conforming to the provisions of this code and other applicable laws and rules including but not limited to minimum required distances from lot lines or structures and subsoil conditions. Construction documents for such system shall be subject to the approval of the department.

[106.6.3] 107.6.3 Post-construction stormwater management facilities. A post-construction stormwater management facility that is constructed as a part of a covered development project

located within the MS4 area, shall comply with the rules of the Department of Environmental Protection and with this code.

[106.7] 107.7 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] 107.8 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] 107.9 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] 107.10 Energy efficiency. Construction documents shall include compliance documentation as required by the *New York City Energy Conservation Code*.

107.11 Retention of construction and submittal documents. Refer to Section 28-104.11 of the *Administrative Code*.

SECTION PC [107] 108 INSPECTIONS AND TESTING

[107.1] 108.1 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.

[107.2] 108.2 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 of installed piping, valves, fittings, support structures, anti-corrosion equipment and associated underground components shall be made [after trenches or ditches are excavated and bedded, piping installed, and] before backfill is put in place. When excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the piping or cause corrosive action, clean backfill shall be on the job site ready for use in backfilling.
- 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.

Exception: When new water, waste and vent piping is installed or replaced and all of the piping is to be permanently exposed there shall be no requirement for a rough-in inspection.

- 1.3. Inspections required by the *New York City Energy Conservation Code* shall be made in accordance with the 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]~~ **108.2.1 Approved agencies.** Refer to Articles 114 and 115 of Chapter 1 of Title 28 of the *Administrative Code*.

108.2.2 Inspection of prefabricated construction assemblies. Prior to the approval of a prefabricated construction assembly having concealed work and the issuance of a permit, the department shall require the submittal of an evaluation report by an approved agency on each prefabricated construction assembly, indicating the complete details of the installation, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information and other data as necessary for the commissioner to determine conformance to this code.

108.2.2.1 Test and inspection records. Required test and inspection records shall be available to the commissioner at all times during the fabrication of the installation and the erection of the building; or such records as the commissioner designates shall be filed.

~~[107.2.2]~~ **108.2.3 Exposure of work.** ~~[It shall be the duty of the permit holder to cause the]~~ The work shall~~[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]~~ **108.3 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]~~ 108.3.1 and ~~[107.3.2]~~ 108.3.2.

~~[107.3.1]~~ **108.3.1 Periodic inspection.** The ~~[registered design professional or designated]~~ special inspector shall periodically inspect and observe the work being performed to determine that the installation is in accordance with the approved construction documents for 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]~~ **108.3.2 Written report.** The ~~[registered design professional]~~ special inspector shall submit a final report in writing to the commissioner upon completion of the installation, certifying that the alternative engineered design installation conforms to the approved construction documents.

~~[107.4]~~ **108.4 Testing.** Plumbing work and systems shall be tested as required in Section 312 and in accordance with Sections ~~[107.4.1]~~ 108.4.1 through ~~[107.4.3]~~ 108.4.3. Tests shall be made by the permit holder and ~~[observed by the commissioner]~~ witnessed by the department.

~~[107.4.1]~~ **108.4.1 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 [~~in lieu of the inspection requirements otherwise set forth in this code~~].
4. Minor alterations and ordinary repairs.
5. In accordance with the exceptions in Section 312.1.

~~[107.4.2 Equipment]~~ **108.4.2 Apparatus, material and labor for tests.** All ~~[equipment]~~ apparatus, material and labor required for testing a plumbing system or part thereof shall be furnished by the permit holder.

~~[107.4.3]~~ **108.4.3 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]~~ **108.5 Sign-off of completed work.** Refer to Article 116 of [~~Chapter 28~~] Chapter 1 of Title 28 of the *Administrative Code*.

~~[107.6]~~ **108.6 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. Additional permits may be required in accordance with Section 106.6.

~~[107.7]~~ **108.7 Connection of service utilities.** Refer to Title 28 of the *Administrative Code*.

SECTION PC ~~[108]~~ 109 VIOLATIONS

~~[108.1]~~ **109.1 General.** Refer to Chapters 2 and 3 of Title 28 of the *Administrative Code*.

PART B

CHAPTER 2

§1. Section 201.3 of chapter 2 of the New York city plumbing code, as amended by local law number 41 for the year 2012, is amended to read as follows:

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.

§2. Chapter 2 of the New York city plumbing code is amended by adding a new section 201.3.1 to read as follows:

201.3.1 Terms defined in the general administrative provisions. The following terms are defined in Section 28-101.5 of the *Administrative Code*:

1968 BUILDING CODE.

1968 OR PRIOR CODE BUILDINGS OR STRUCTURES (PRIOR CODE BUILDINGS).

ACCEPTANCE OR ACCEPTED.

ADDITION.

ADMINISTRATIVE CODE.

ALTERATION.

APPROVAL OR APPROVED.

APPROVED AGENCY.

APPROVED FABRICATOR.

APPROVED INSPECTION AGENCY.

APPROVED TESTING AGENCY.

ARCHITECT.

BUILDING.

CHARTER.

CERTIFICATE OF COMPLIANCE.

CITY.

COMMISSIONER.

CONSTRUCTION DOCUMENTS.

DAY.

DEFERRED SUBMITTAL.

DEMOLITION.

DEMOLITION, FULL.

DEMOLITION, PARTIAL.

DEPARTMENT.

ENGINEER.

ENLARGEMENT.

EXISTING BUILDING OR STRUCTURE.

FABRICATED ITEM.

FIRE PROTECTION PLAN.
HEREAFTER.
HERETOFORE.
INSPECTION CERTIFICATE.
LABEL.
LABELED.
LAND SURVEYOR.
LANDSCAPE ARCHITECT.
LETTER OF COMPLETION.
LIMITED OIL-BURNING BOILER ALTERATIONS.
LIMITED PLUMBING ALTERATIONS.
LIMITED SPRINKLER ALTERATIONS.
LIMITED STANDPIPE ALTERATIONS.
LISTED.
MAIN USE OR DOMINANT OCCUPANCY (OF A BUILDING).
MANUFACTURER'S DESIGNATION.
MARK.
MATERIALS.
OCCUPANCY.
OWNER.
PARTY WALL.
PERMIT.
PERSON.
PREMISES.
PRIOR CODE BUILDING.
PROFESSIONAL CERTIFICATION.
PROGRESS INSPECTION.
PROJECT.
REGISTERED DESIGN PROFESSIONAL.
REGISTERED DESIGN PROFESSIONAL OF RECORD.
REQUIRED.
RETAINING WALL.
SERVICE EQUIPMENT.

SIGN-OFF.

SINGLE ROOM OCCUPANCY MULTIPLE DWELLING.

SPECIAL INSPECTION.

SPECIAL INSPECTION AGENCY.

SPECIAL INSPECTOR.

STRUCTURE.

SUBMITTAL DOCUMENTS.

SUPERINTENDENT OF CONSTRUCTION (CONSTRUCTION SUPERINTENDENT).

USE (USED).

UTILITY COMPANY OR PUBLIC UTILITY COMPANY.

UTILITY CORPORATION OR PUBLIC UTILITY CORPORATION.

WORK NOT CONSTITUTING MINOR ALTERATIONS OR ORDINARY REPAIRS.

WRITING (WRITTEN).

WRITTEN NOTICE.

ZONING RESOLUTION.

§3. The definitions of “1968 or prior code buildings or structures (prior code buildings)”, “approved”, “approved agency”, “building”, “code”, “commissioner”, “construction documents”, “lead free pipe and fittings”, “occupancy”, “registered design professional”, and “structure” as set forth in section PC 202 of chapter 2 of the New York city plumbing code are REPEALED.

§4. The definitions of “access (to)”, “adapter fitting”, “alternative engineered design” “back flow preventer”, “building drain”, “clear water waste”, “combination waste and vent system”, concealed fouling surface” “contamination”, “detention system”, “discharge pipe”, “drain”, “drainage fitting”, “drainage system” , “essentially nontoxic transfer fluid” , “essentially toxic transfer fluid”, “existing installation”, “fixture fitting”, “grease interceptor”, “grease removal device”, “groundwater or ground water”, “horizontal pipe”, “hot water”, “individual vent”, “joint”, “leader”, “low-pressure steam-heating boiler”, “macerating toilet system”, “mechanical joint”, “medical vacuum system”, “plumbing appliance”, “plumbing fixture”, “plumbing appurtenance”, “plumbing system”, “ready access”, “relief valve”, “retention system”, “sewage”, “sewer”, “single-occupant toilet room”, “sterilizer”, “storm water or stormwater”, “swimming pool”, “trap” “water pipe”, and “well”, as set forth in section PC202 of chapter 2 of the New York city plumbing code, as added by local law number 99 for the year 2005, clear water waste, grease removal device, groundwater or ground water, low pressure steam heating boiler, retention system, storm water or stormwater, as added by and grease interceptor and sewage as amended by local law 41 for the year 2012, single-occupant toilet room as added by local law number 79 for the year 2016, are amended to read as follows:

ACCESS (TO). That which enables a device, 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 (to)”).

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

ALTERNATIVE ENGINEERED DESIGN. A plumbing system that performs in accordance with the intent of [~~Chapters 3 through 12~~] this code 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~~] this code.

BACKFLOW PREVENTER. A backflow prevention assembly, a backflow prevention device or other means or method to prevent backflow into the potable water supply.

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~~] to the exterior [walls of the] face of the exterior building wall, or the outlet of the most downstream trap, private manhole, catch basin, detention tank, or similar fixture or equipment, and conveys the drainage directly to the building sewer or, in the absence of building sewer, to an approved place of disposal.

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.

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

COMBINATION WASTE AND VENT SYSTEM. A specially designed system of waste piping embodying the horizontal wet venting of one or more [~~sinks,~~] lavatories, drinking fountains 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.

CONCEALED FOULING SURFACE. Any surface of a plumbing fixture [~~which~~] that is not readily visible and is not scoured or cleansed with each fixture operation.

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.

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

DISCHARGE PIPE. A pipe that conveys the [~~discharges~~] discharge from plumbing fixtures or appliances.

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

DRAINAGE [~~FITTINGS~~] FITTING. [~~Type~~] The type of fitting or fittings utilized in the drainage system.

DRAINAGE SYSTEM. Piping within a public or private premise that conveys sewage, rainwater or other liquid [~~wastes~~] waste 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.

ESSENTIALLY NONTOXIC TRANSFER [FLUIDS] FLUID. 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] FLUID. Soil, waste or gray water and fluids having a Gosselin rating of 2 or more, including ethylene glycol, hydrocarbon oils, ammonia refrigerants and hydrazine.

EXISTING [INSTALLATIONS] INSTALLATION. Any plumbing system regulated by this code that was legally installed prior to [~~the effective date of this code~~] July 1, 2008, or for which a permit to install has been issued prior to such date or prior to the effective date of a subsequent amendment of this code.

FIXTURE FITTING.

Supply fitting. A fitting that controls the volume [~~and/or directional~~] direction of flow or both, 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 drainage system.

GREASE INTERCEPTOR. 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.]~~

GREASE REMOVAL DEVICE, AUTOMATIC (GRD). A plumbing appurtenance that is installed in the sanitary drainage system to intercept [~~grease laden waste~~] free-floating fats, oils and grease from [~~wastewater~~] waste water discharge. Such a 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 and any water removed from the ground.

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

HOT WATER. Water at a temperature greater than or equal to 110°F (43°C).

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

JOINT:

Expansion. A loop, return bend, return offset or manufactured device that provides for the expansion and contraction in a piping system and is utilized in tall buildings or where there is a rapid change of temperature, as in power plants, steam rooms and similar occupancies.

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.

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

LOW-PRESSURE STEAM-HEATING BOILER. A boiler ~~[furnishing]~~ in which steam is generated and that operates at [pressures] a steam pressure not exceeding 15 psig (103 kPa gauge).

MACERATING TOILET [SYSTEMS] SYSTEM. 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.

MECHANICAL JOINT. A connection between pipes, fittings, or pipes and fittings that is not screwed, caulked, threaded, soldered, solvent cemented, brazed~~[-or]~~ , welded or heat fused. 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 VACUUM [SYSTEMS] SYSTEM. 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.

PLUMBING APPLIANCE. ~~[Any one of a special class of plumbing fixtures]~~ Water or drain-connected devices intended to perform a special function. ~~[Included are fixtures having the]~~ These devices have their operation or control dependent on one or more energized components, such as motors, controls, or heating elements~~[-or pressure or temperature sensing elements]~~. Such ~~[fixtures-]~~ devices 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 APPURTENANCE. 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.] A receptacle or device that is connected to a water supply system or discharges to a drainage system or both. Such receptacles or devices require a supply of water; or discharge liquid waste or liquid-borne solid waste; or require a supply of water and discharge waste to a drainage system.~~

PLUMBING SYSTEM. [~~Includes~~] A system that 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; and the water service, building sewer and building storm sewer serving such structure or premises.

READY ACCESS (TO). That which enables a device, 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.

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.

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

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

SEWER.

Building sewer. That part of the drainage system that extends from the end of the building drain, or the outlet of the most downstream trap, private manhole, catch basin, detention tank or similar fixture or equipment, 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-potable~~] nonpotable 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 street, 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-OCCUPANT TOILET ROOM. [~~A toilet room with no more than one water closet and no more than one urinal.~~] An enclosed space defined by walls and having a securable door that does not contain fixtures in excess of one water closet, one urinal, and one lavatory which is intended to be used by a single individual independently or an individual requiring assistance. The water closet shall not be within a secondary enclosure.

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

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.

STORM WATER OR STORMWATER. [~~The excess water running off from the surface of a drainage area during and immediately following a period of precipitation.~~] Natural precipitation, including snow melt, that has contacted a surface at or below grade.

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)~~] 3 feet (915 mm) or more at any point.

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~~] waste water through the trap.

WATER PIPE.

Water distribution pipe. A pipe within the structure or on the premises that conveys water from the water service pipe, or from the meter when the meter is at the structure, to the points of utilization.

Water service pipe. The pipe from the water main or other source of potable water supply, or from the meter when the meter is at the public right of way, to the water distribution system of the building served.

WELL.

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 a 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.

§5. Section PC 202 of chapter 2 of the New York city plumbing code is amended by adding the definitions of “CONVEYANCE PIPE” , “CURED-IN-PLACE PIPE (CIPP)” , “DEMAND RECIRCULATION WATER SYSTEM” , “DRINKING FOUNTAIN” , “FLOW CONTROL (Vented)” , “FOOD WASTE DISPOSER” , “GRAY WATER” , “NONMEDICAL GAS SYSTEM” , “NONPOTABLE WATER” , “ON-SITE NONPOTABLE WATER” , “ON-SITE NONPOTABLE WATER REUSE SYSTEM” “RAINWATER” , ‘TOILET FACILITY’ , “WALL-HUNG WATER CLOSET” , “WASTE RECEPTOR” , and “WATER CLOSET COMPARTMENT” , “WATER PIPE, CONVEYANCE” , in alphabetical order, to read as follows:

CONVEYANCE PIPE. See “Water Pipe, conveyance.”

CURED-IN-PLACE PIPE (CIPP). A piping repair method utilizing a resin-impregnated, flexible tube inverted into existing conduit by use of a hydrostatic head or air pressure, or by a process that sprays epoxy directly onto the walls of the rehabilitated pipe.

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where one or more pumps prime the service hot water piping with heated water upon a demand for hot water.

DRINKING FOUNTAIN. A plumbing fixture that is connected to the potable water distribution system and drains to an approved point of disposal. The fixture allows the user to obtain a drink directly from a stream of flowing water without the use of any accessories.

FLOW CONTROL (Vented). 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.

FOOD WASTE DISPOSER. An electric motor-driven device installed between a sink’s drain and trap for grinding food waste and disposing of such ground food waste through the plumbing drainage system.

GRAY WATER. Discharge from lavatories, bathtubs, showers, clothes washers, and laundry trays.

NONMEDICAL GAS SYSTEM. The complete system to convey nonmedical gases for use in laboratory, research, and educational facilities which are not for patient application from a central supply system. Nonmedical gas systems shall not include those for industrial applications.

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

ON-SITE NONPOTABLE WATER. Nonpotable water from other than public utilities, on-site surface sources and subsurface natural freshwater sources. Examples of such water are gray water, on-site reclaimed water, collected rainwater, captured condensate and rejected water from reverse osmosis systems.

ON-SITE NONPOTABLE WATER REUSE SYSTEM. A water system for the collection, treatment, storage, distribution and reuse of nonpotable water generated on site.

RAINWATER. Water from natural precipitation.

TOILET FACILITY. A room or space that contains not less than one water closet and one lavatory.

WALL-HUNG WATER CLOSET. A wall-mounted water closet installed in such a way that the fixture does not touch the floor.

WASTE RECEPTOR. A floor sink, standpipe, hub drain or floor drain that receives the discharge of one or more indirect waste pipes.

WATER CLOSET COMPARTMENT. An enclosed space defined by either walls or partitions and having a securable door that does not contain plumbing fixtures in excess of one water closet.

WATER PIPE, conveyance. A pipe within the structure or on the premises that conveys water from a source to the points of utilization, and including piping to and from storage containers. Such piping shall be used only in nonpotable water systems, including water recycling and irrigation.

PART C

CHAPTER 3

§1. Chapter 3 of the New York city plumbing code, as added by local law number 99 for the year 2005, sections 301.3, 301.7, 302.1, 302.2, 305.1, 305.8, 307.6, 308.9, 309.1, 310.4, PC 312, 314.1, 314.1.1, 314.2, 314.2.1, 314.2.2, 314.2.3.1, 314.2.3.2, 314.2.4, and tables 308.5 and 314.2.2 as amended by, and section 310.5 as added by, local law number 41 for the year 2012, and sections 301.4, 303.2, 308.5, and 309.2 as amended by local law 8 for the year 2008, and section 313.1 as amended by local law number 85 for the year 2009, and section 314.2.3 as amended by, and section 301.6 as added by, local law number 51 for the year 2014, is amended to read as follows:

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]~~ Plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid ~~[wastes]~~ waste 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]~~ indicated, 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 that they are indirectly connected to the plumbing system and comply with Section 1003.4.

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 and any markings required by the applicable referenced standards.

303.2 Installation of materials. All materials used shall be installed in strict accordance with the standards under which the materials are accepted and approved. In the absence of such installation procedures, the manufacturer's [~~installation~~] instructions shall be followed. Where the requirements of referenced standards or 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~~] be listed by a third-party certification agency as complying with the referenced [~~standards, specifications and performance criteria of this code and~~] standards. Products and materials 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~~

PRODUCT OR MATERIAL	THIRD-PARTY CERTIFIED	THIRD-PARTY TESTED
Portable water supply system components and potable water fixture fittings	Required	—
Sanitary drainage and vent system components	Plastic pipe, fittings and pipe-related components	All others
Waste fixture fittings	Plastic pipe, fittings and pipe-related components	All others
Storm drainage system components	Plastic pipe, fittings and pipe-related components	All others
Plumbing fixtures	—	Required
Plumbing appliances	Required	—
Backflow prevention devices	Required	—
Water distribution system safety devices	Required	—
Special waste system components	—	Required
Subsoil drainage system components	—	Required

]

SECTION PC 304 RODENTPROOFING

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. All strainer plates on drain inlets shall be designed and installed so that all openings are not greater than ~~[0.5 inch]~~ ½ inch (12.7 mm) in least dimension.

304.3 Reserved.

304.4 Openings for pipes. In or on structures where openings have been made in walls, floors or ceilings for the passage of pipes, ~~[such openings shall be closed and protected in an approved manner]~~ the annular space between the pipe and the sides of the opening shall be sealed with caulking materials or closed with gasketing systems compatible with the piping materials and locations.

SECTION PC 305
PROTECTION OF PIPES AND PLUMBING SYSTEM COMPONENTS

305.1 Corrosion. Pipes passing through or encased in concrete or cinder walls and floors or other corrosive material shall be protected against external corrosion by a protective sheathing or wrapping 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~~] Thickness of sheathing or wrapping material shall be not less than 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] 305.3 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] 305.4 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 subjected to freezing [temperature] temperatures 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] 305.4.1 Building sewer and building drain depth.** Building [sewers] drains 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 and drains shall be a minimum of 36 inches (914 mm) below grade.~~

~~**[305.7] 305.5 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] 305.6 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~~] 1½ inches (38 mm) 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)~~] 0.0575 inch (1.463 mm) (No. 16 gage). Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend [~~a minimum of~~] not less than 2 inches (51 mm) above sole plates and below top plates.~~

~~**[305.9] 305.7 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.~~

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

~~[305.10]~~ **305.9 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 ~~[Over excavation]~~ 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]~~ not greater than 6 inches (152 mm) ~~[maximum]~~ in 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]~~ not less than 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]~~ Material used under and beside pipes shall be clean backfill, [shall be] free [from] of discarded construction material and debris. Loose earth free from rocks, broken concrete and frozen chunks shall be placed in the trench in ~~[6-inch]~~ 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 pipe so that the pipe remains aligned. In instances 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. Backfilling is subject to progress inspection in accordance with Section 108.

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*.]~~

307.2 Loading. Alterations resulting in the addition of loads to any member, such as appliances and equipment, shall not be permitted without verification that the members are capable of supporting such additional loading.

307.3 Cutting, notching and boring. The cutting, notching and boring of structural elements shall be in accordance with the limitations specified in Appendix C.

~~[307.3]~~ **307.4 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]~~ **307.5 Trusses.** Truss members of any material and components shall not be cut, drilled, notched, spliced or otherwise altered in any way without written concurrence 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 Protection of footings. Trenching installed parallel to footings and walls shall not extend into the bearing plane of a footing or wall. The upper boundary of the bearing plane is a line that extends downward, at an angle of 34 degrees (1:1.5 slope) from horizontal, from the outside bottom edge of the footing or wall.

~~[307.6]~~ **307.7 Piping materials exposed within plenums.** ~~[All piping]~~ Piping materials exposed within plenums shall comply with the provisions of the *New York City [Construction Codes] Mechanical Code*.

SECTION PC 308 PIPING SUPPORT

308.1 General. ~~[All plumbing]~~ 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.

[**Exception:** The interval of support for piping systems designed to provide for expansion/contraction shall conform to the engineered design in accordance with Section 28-113.2.2 of the *Administrative Code*.]

**TABLE 308.5
HANGER SPACING**

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
Acrylonitrile butadiene styrene (ABS) pipe	4	10 ^b
Brass pipe	10	10
Cast-iron pipe	5 ^a	At base and at each story height no greater than [20] <u>15</u>
Copper or copper-alloy pipe	12	At each story height no greater than 12
Copper or copper-alloy tubing, 1 ¹ / ₄ -inch diameter and smaller	6	At each story height no greater than 10
Copper or copper-alloy tubing, 1 ¹ / ₂ -inch diameter and larger	10	At each story height no greater than 10
[Steel pipe]	[12]	[At every story height]
Polyvinyl chloride (PVC) pipe	4	10 ^b
Stainless steel drainage systems	10	10 ^b
<u>Steel pipe</u>	<u>12</u>	<u>At base and at each story height no greater than 15</u>

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.] For sizes 2 inches and smaller, a guide shall be installed midway between required vertical supports. Such guides shall prevent pipe movement in a direction perpendicular to the axis of the pipe.

308.5.1 No-hub type cast iron soil pipe, fittings, and couplings. Intervals of support for no-hub cast iron soil pipe, fittings, and couplings shall comply with CISPI 310.

308.5.2 Movement. Piping systems and supports shall be designed to account for thermal expansion and contraction, building movement, and seismic conditions.

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.

308.6.1 No-hub type cast iron soil pipe, fittings, and couplings. Installation of sway bracing for no-hub cast iron soil pipe, fittings, and couplings shall comply with CISPI 310.

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]~~ and installed as required by Appendix G of the *New York City Building Code*:

~~[**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]~~ Water service pipes.
2. Pump seals in individual water supply systems where the pump is located below the design flood elevation.
3. Covers on potable water wells shall be sealed, except where the top of the casing well or pipe sleeve is elevated to ~~[at least]~~ not less than 1 foot [(304.8 mm)] (305 mm) above the design flood elevation.
4. ~~[All sanitary]~~ Sanitary drainage piping.
5. ~~[All storm]~~ Storm drainage piping.
6. Manhole covers shall be sealed, except where elevated to or above the design flood elevation.
7. ~~[All other]~~ Other plumbing fixtures, faucets, fixture fittings, piping systems and equipment.

8. Water heaters.
9. Vents and vent systems.

Exception: In accordance with Appendix G of the *New York City Building Code*, the above 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.

309.3 [~~Flood hazard~~] Coastal high-hazard areas [subject to high-velocity wave action] and coastal A zones. Structures located in [~~flood hazard~~] coastal high-hazard areas [subject to high-velocity wave action] and coastal A zones shall meet the requirements of Section 309.2. The plumbing systems, pipes and fixtures shall not be mounted on 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 [~~pipng~~] compartments. [~~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.~~] The location of plumbing fixtures and the requirements for compartments and partitions shall be in accordance with Section 405.

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]~~ 312.11 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 cleanouts if necessary to ascertain whether the pressure has reached all parts of the system.

[Exception] Exceptions:

1. The repair, replacement or alteration to existing water, waste, vent, ~~[or]~~ storm water piping or ~~[the]~~, building drain in an existing occupied building shall require only a visual inspection of waste, vent and storm water pipe roughing and finish in addition to a pressure test of water piping at available building water pressure.
2. The addition of no more than ~~[three (3)]~~ five (5) plumbing fixtures or roof drains to an existing floor of an existing occupied building shall require only a visual inspection of waste, vent and storm water pipe roughing and finish in addition to a pressure test of water piping at available building water pressure.

312.1.1 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)]~~ (6.9 kPa) or less.
3. Tests requiring a pressure of greater than 100 psi (689 kPa) shall utilize a testing gauge having increments of 2 psi (14 kPa) or less.

312.1.2 Witnessing tests. 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]~~ 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]~~ 10-foot (3048 mm) head of water. This pressure shall be held for ~~[at least]~~ not less than 15 minutes. The system shall then be tight at all points.

312.3 Drainage and vent air test. Plastic piping shall not be tested using air. An air test shall be made by forcing air into the system until there is a uniform gauge of 5 psi (34.5 kPa). This pressure shall be held for a test period of ~~[at least]~~ not less than 15 minutes. Any adjustments to the test pressure required because of changes in ambient ~~[temperature]~~ temperatures or the seating of gaskets shall be made prior to the beginning of the test period.

312.4 Drainage and vent final ~~[test]~~ inspection. The final ~~[test]~~ inspection of the completed drainage and vent systems 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 of 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). This pressure shall be held for not less than 15 minutes. 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]~~ 108.

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 tapper or 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.]~~ **Reserved.**

312.7 Forced ~~sewer~~ drain test. Forced ~~sewer~~ drain tests shall consist of plugging the end of the ~~building sewer~~ pump discharge at the point of connection with the ~~public sewer~~ building drain 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~~ Storm drainage piping installed outside of a building shall be tested to withstand the head of water equal to grade, but such testing may be conducted after inspection and backfilling.

312.9 Shower liner test. Where shower floors and receptors are made ~~water tight~~ 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~~ 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~~ check, pressure vacuum breaker, reduced pressure detector fire protection ~~backflow prevention assemblies, and~~ , double check detector fire protection ~~backflow prevention assemblies~~ , and spill-resistant vacuum breaker backflow preventer assemblies and hose connection backflow preventers 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. Refer to Section 608.13 and the Department of Environmental Protection for additional testing requirements.

312.11 Joint inspection. Inspections of welded joints shall consist of visual examination, during or after manufacture, fabrication, assembly, or pressure tests as appropriate. Supplementary types of nondestructive inspection techniques, such as magnetic-particle, radiographic, ultrasonic, etc., shall not be required unless specifically listed herein or in the engineering design.

312.11.1 Welder's qualifications. Welders installing domestic water piping within buildings at any pressure shall comply with the following:

1. Welders shall be qualified for all pipe sizes, wall thicknesses and all positions in accordance with the ASME Boiler and Pressure Vessel Code, Section IX. Requalification of a welder is required should the welder fail to maintain welder's continuity every 6 months. The licensed master plumber employing the welder shall maintain a welder continuity log and the log shall be made available to the department upon request.
2. Welder qualification testing shall be performed by an approved agency and the inspector witnessing the test shall be an authorized AWS Certified Welding Inspector.
3. Copies of the certified welder qualification reports shall be maintained by both the approved agency and the licensed master plumber employing the welder{(s)} for at least six years and shall be made available to the department upon request.

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 in accordance with Section 803 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~~] 314.2.5.

Exception: Evaporators and cooling coils that are designed to operate in sensible cooling only and not support condensation shall not be required to meet the requirements of this section.

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 $[\frac{1}{8}]$ one-eighth unit 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. Polypropylene tubing may be used in lengths that do not exceed 12" for an individual drain application. ~~[All components]~~ 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 be not ~~[be]~~ less than ~~$[\frac{3}{4}$ inch (19 mm)]~~ $\frac{3}{4}$ -inch (19.1 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.

**TABLE 314.2.2
CONDENSATE DRAIN SIZING**

EQUIPMENT CAPACITY	MINIMUM CONDENSATE PIPE DIAMETER [inch]
Up to 20 tons of refrigeration	$\frac{3}{4}$ inch
Over 20 tons to 40 tons of refrigeration	1 inch
Over 40 tons to 90 tons of refrigeration	$1\frac{1}{4}$ [inch] <u>inches</u>
Over 90 tons to 125 tons of refrigeration	$1\frac{1}{2}$ [inch] <u>inches</u>
Over 125 tons to 250 tons of refrigeration	2 [inch] <u>inches</u>

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

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 not less than 1½ inches (38 mm), shall ~~[not]~~ be not 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]~~ 0.0236-inch (0.6010 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]~~ 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 listed ~~[water level]~~ 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 listed 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.

314.2.3.1 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.

314.2.3.2 Appliance, equipment and insulation in pans. Where ~~[appliances]~~ an appliance, equipment or insulation ~~[are]~~ is subject to water damage when auxiliary drain pans fill, ~~[such portions]~~ that portion of the ~~[appliances]~~ appliance, equipment and insulation shall be installed above the flood level rim of the ~~[pan]~~ pans. Supports located inside of the ~~[pan]~~ pans to support the appliance or equipment or insulation shall be water resistant and approved.

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

314.2.5 Drain line maintenance. Condensate drain lines shall be configured to permit the clearing of blockages and performance of maintenance without requiring the drain line to be cut.

314.2.6 Condensate discharge. Where multiple evaporators and or condensate pumps discharge into the same piping system, it shall be piped to prevent the discharge of condensate from one appliance to another.

SECTION PC 315 **PENETRATIONS**

315.1 Sealing of annular spaces. The annular space between the outside of a pipe and the inside of a pipe sleeve or between the outside of a pipe and an opening in a building envelope wall, floor, or ceiling assembly penetrated by a pipe shall be sealed in an approved manner with caulking material, foam sealant or closed with a gasketing system. The caulking material, foam sealant or gasketing system shall be designed for the conditions at the penetration location and shall be compatible with the pipe, sleeve and building materials in contact with the sealing materials. Annular spaces created by pipes penetrating fire-resistance-rated assemblies or membranes of such assemblies shall be sealed or closed in accordance with Section 714 of the *New York City Building Code*.

SECTION PC 316 **RESERVED**

PART D

CHAPTER 4

§1. Chapter 4 of the New York city plumbing code, as added by local law number 99 for the year 2005, section 417.1 as amended by and section 421.4 as renumbered by local law number 8 for the year 2008, section 428 as added by local law number 54 for the year 2010, section 410 as added by local law number 55 for the year 2010, sections 403, 408.3, 417.5.1, 417.5.2 and 419.4 as added by and sections 405.3.1, 405.4, 405.4.3, 406.3, 407.2, 408.2, 412.1, 412.2, 413.1, 416.3, 416.5, 417.2, 417.3, 417.4.2, 419.1, 421.2, 421.5, 421.6 and 424 as amended by local law number 41 for the year 2012, sections 424.1.3 and 425.1.2 as added by local law number 79 for the year 2013, sections 401.3, 403.3 and 410.2 and footnote k of table 403.1 as amended by local law number 141 for the year 2013, no. 5, and 7. and footnote m of table 403.1 as amended by local law number 110 for the year 2013, section 429 as added by local law number 148 for the year 2013, occupancy A-5 of table 403.1 as amended by local law number 51 for the year 2014 and footnote j of table 403.1, and sections 403.1.3 and 403.2.1 as added by and section 403.4 as amended by local law number 79 for the year 2016, is amended to read as follows:

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~~] ASME A112.19.2/CSA B45.1 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~~] 604.

SECTION PC 402 FIXTURE MATERIAL

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 enameled surfaces on plumbing fixtures shall be acid resistant.

402.2 Materials for specialty fixtures. Materials for specialty fixtures not otherwise covered in this code shall be of stainless steel, soapstone, chemical stoneware or plastic, or shall be lined with lead, copper-base alloy, nickel-copper alloy, corrosion-resistant steel or other material especially suited to the application for which the fixture is intended.

402.3 Sheet copper. 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).

402.4 Sheet lead. Sheet lead for pans shall not weigh less than 4 pounds per square foot (19.5 kg/m²) and shall be 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^a
(See Sections [403.2] 403.1.1 and [403.3] 403.2)

NO.	CLASSIFICATION	OCCUPANCY ^(h)	DESCRIPTION	WATER CLOSETS [(URINALS SEE SECTION 419.2)] [(URINALS: SEE SECTION 419.2)]		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN [(SEE SECTION 410.1) ^(e,f)] [(SEE SECTION 410) ^(e)]	OTHER
				MALE	FEMALE	MALE	FEMALE			
1	Assembly	A-1 ^d	Theaters and other buildings for the performing arts and motion pictures	1 per 70 for the first 210 and 1 per 125 for the remainder exceeding 210	1 per 35 for the first 210 and 1 per 65 for the remainder exceeding 210	1 per 200		—	1 per 500	1 service sink
		A-2 ^d	Nightclubs, bars ^(g) , taverns, dance halls and buildings for similar purposes	1 per 75 ^(j)	1 per 40 ^(j)	1 per 75		—	1 per 500	1 service sink
			Restaurants ^(h) , banquet halls and food courts	1 per 75	1 per 75	1 per 200		—	1 per 500	1 service sink
		A-3 ^d	Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, [libraries,] arcades and gymnasiums	1 per 70 for the first 210 and 1 per 125 for the remainder exceeding 210	1 per 35 for the first 210 and 1 per 65 for the remainder exceeding 210	1 per 200		—	1 per 500	1 service sink

			Passenger terminals and transportation facilities	1 per 500	1 per 500	1 per 750		—	1 per 1,000	1 service sink
			Places of worship and other religious services	1 per 150	1 per 75	1 per 200		—	1 per 1,000	1 service sink
		A-4	Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first [1,500] 1,520 and 1 per 60 for the remainder exceeding [1,500] 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		A-5	Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	B ^{(k),l,m}	Buildings for the transaction of business, professional services, other services including merchandise, office buildings, banks, light industrial and similar uses	No. of persons for each sex 1 -20 21-45 46-70 71-100 101-140 141-190	No. of fixtures 1 2 3 4 5 6	No. of persons of for each sex fixtures 1-25 26-50 51-75 76-115 116-160	No. 1 2 3 4 5	—	1 per 100	1 service sink ^m
				1 fixture for each additional 50 persons		1 fixture for each additional 60 persons				

3	Educational	E	Educational facilities, including libraries, accessory to Group E	1 per 50	1 per 50	—	1 per 100	1 service sink
4	Factory and industrial	F-1 and F-2	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100	1 per 100	(see Section 411)	1 per 400	1 service sink
5	Institutional	I-1 ^(m) k	Residential care	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		I-2	[Hospital] Hospitals, ambulatory nursing home [patients] care recipient	1 per room ^c	1 per room ^c	1 per 15	1 per 100	1 service sink per floor
			Employees, other than residential care ^b	1 per 25	1 per 35	—	1 per 100	—
			Visitors, other than residential care	1 per 75	1 per 100	—	1 per 500	—
		I-3	Prisons ^b	1 per cell	1 per cell	1 per 15	1 per 100	1 service sink
			Reformatories, detention centers, and correctional centers ^b	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink
			Employees ^b	1 per 25	1 per 35	—	1 per 100	—
I-4	Adult day care and [Child care] child day care	1 per 15	1 per 15	1 per 15	1 per 100	1 service sink		
6	Mercantile	M	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500	1 per 750	—	1 per 1,000	1 service sink ^m

7	Residential	R-1 ^{[m]k}	Hotels, motels, boarding houses (transient)	1 per guestroom	1 per guestroom	1 per guestroom	—	1 service sink
		R-1 ^{[m]k}	Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		R-2 ^{[m]k}	Apartment house	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per 20 dwelling units
		R-3	One- and two-family dwellings <u>and lodging houses with five or fewer guestrooms</u>	1 per dwelling unit	1 per dwelling unit	1 per dwelling unit	—	1 kitchen sink per dwelling unit; 1 automatic clothes washer connection per dwelling unit
		R-3 ^{[m]k}	Congregate living facilities with 16 or fewer persons	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
8	Storage	S-1 [and] S-2	Structures for the storage of goods, warehouses, storehouse and freight depots. Low and [moderate hazard] <u>Moderate Hazard.</u>	1 per 100	1 per 100	See Section 411	1 per 1,000	1 service sink

- a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated. Any fraction of the number of persons requires 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~~ care recipients.
- c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted 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 foundations 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.]~~ f. 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.]~~ g. 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.]~~ h. As per the *New York City Building Code*.
- ~~[j.]~~ i. 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.]~~ j. 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 2 of the *New York City Building Code* shall be permitted to be calculated in accordance with the requirements for Assembly occupancies.
- ~~[m.]~~ k. 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 614 for emergency drinking water access.
- m. For business and mercantile occupancies with an occupant load of 15 or fewer, service sinks shall not be required.
- n. Libraries that are not classified as accessory to Group E per Section 304.1 of the *New York City Building Code* shall comply with fixture counts for Group B occupancies.

403.1.1 Fixture calculations. ~~[Where separate fixture ratios are provided to male and female individually in Table 403.1]~~ To determine the occupant load of each sex, 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.] To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. 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 fixtures required by Section 403, or where applicable the 1968 Building Code, only for that sex.

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 Family or assisted-use toilet facilities serving as separate facilities. Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family or assisted-use toilet facilities shall be

permitted to serve as the required separate facilities. Family or assisted use toilet facilities shall not be required to be identified for exclusive use by either sex as required by Section 403.4.

403.2.2 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.

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.

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 a Group B occupancy in accordance with Section [~~303.1, Exception 2~~] 303.1.2 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~~] Routes shall comply with the accessibility requirements of the *New York City Building Code*. [~~Employees, customers, patrons and visitors~~] The public shall have access to the required toilet facilities at all times that the building is occupied.

403.3.2 Prohibited toilet room location. Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

403.3.3 Location of toilet facilities in occupancies other than [~~covered~~] malls. In occupancies other than covered and open 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 of travel 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 of travel are approved [~~by the department~~].

~~[403.3.3]~~ **403.3.4 Location of toilet facilities in [~~covered~~] malls.** In covered and open 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)~~] (91 m). In [~~covered~~] mall buildings, the required facilities shall be based on total square footage within a covered mall building or within the perimeter line of an open mall building, 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 of travel 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 of travel shall be measured from the employees' work area of the store or tenant space.

~~[403.3.4]~~ **403.3.5 Pay facilities.** Where pay facilities are installed, such facilities shall be in excess of the required minimum facilities. Required facilities shall be free of charge.

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

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~~].

403.4.1 Directional signage. Directional signage indicating the route to the required public toilet facilities shall be posted in accordance with Section [~~BC~~] 1110 of the *New York City Building Code*. Such signage shall be located in a lobby, corridor [~~or aisle, at the~~], aisle or similar space, such that the sign can be readily seen from the main entrance to the [~~facilities for customers, patrons, and visitors~~] building or tenant space.

403.5 Drinking fountain location. Drinking fountains shall not be required to be located in individual tenant spaces provided that public drinking fountains are located on each story within a distance of travel of 500 feet (152 m) of the most remote location in the tenant space on such story. Where the tenant space is in a covered or open mall, such distance shall not exceed 300 feet (91 m). Drinking fountains shall be located on an accessible route.

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*.

404.2 Accessible fixture requirements. Accessible plumbing fixtures shall be installed with the clearances, heights, spacings and arrangements in accordance with ICC A117.1.

404.3 Exposed pipes and surfaces. Water supply and drain pipes under accessible lavatories and sinks shall be covered or otherwise configured to protect against contact. Pipe coverings shall comply with ASME A112.18.9.

SECTION PC 405 INSTALLATION OF FIXTURES

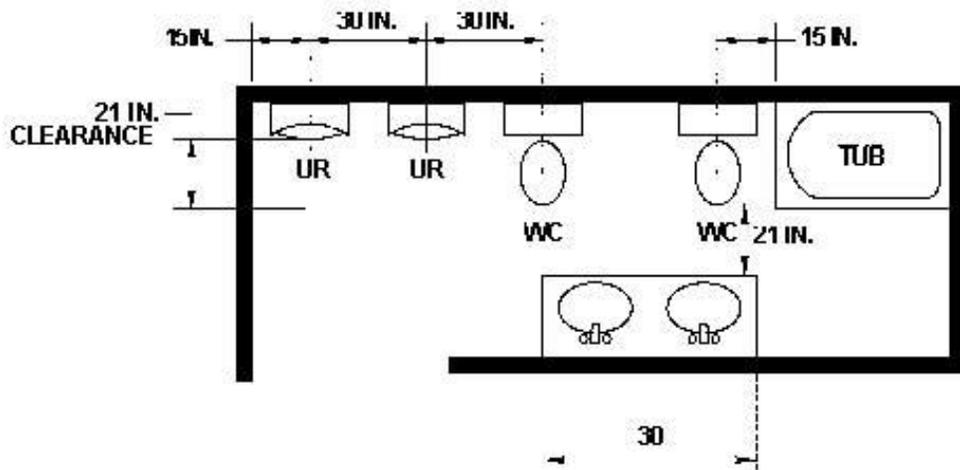
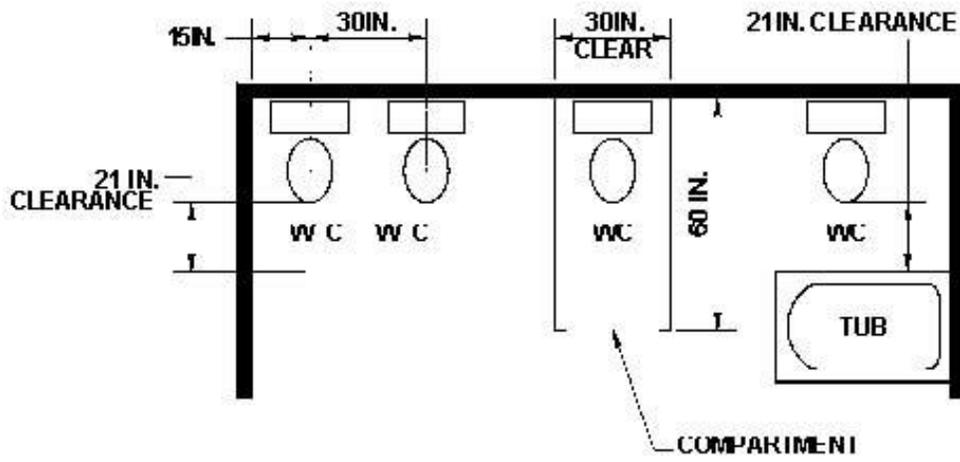
405.1 Water supply protection. The supply lines and fittings for every plumbing fixture shall be installed so as to prevent backflow.

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~~] center to center between adjacent fixtures. There shall be [~~at least~~] not less than a [~~21-inch~~] 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 ~~be~~ not [~~be~~] less than 30 inches (762 mm) [~~wide~~] in width and not less than 60 inches (1524 mm) [~~deep (see Figure 405.3.1)~~] in depth for floor-mounted water closets and not less than 30 inches (762 mm) in width and 56 inches (1422 mm) in depth for wall-hung water closets.

[



]

[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.

405.3.3 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.

405.3.4 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 child day 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.

405.3.5 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 greater than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal not less than 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

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

405.4 Floor and wall drainage connections. Connections between the drain and floor outlet plumbing fixtures shall be made with a floor flange or a waste connector and sealing gasket. The waste connector and sealing gasket joint shall comply with the joint tightness test of ASME A112.4.3 and shall be installed in accordance with the manufacturer's instructions. 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 [~~elocet carrier fitting~~] extension nipple or horn adaptor. 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 be 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~~] 2-inch (51 mm) caulking 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~~] 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.

Exception: Existing overflows for bath tubs utilizing standing wastes.

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]~~ not less than 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]~~ ASME A112.19.2/CSA B45.1 or ~~[ASME A112.19.3M]~~ ASME A112.19.3/CSA B45.4.

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]~~ that is integral with the [installation of] machine or a backflow preventer shall be installed in accordance with Section ~~[PC-]~~ 608. Air gaps shall comply with ASME A112.1.2 or A112.1.3.

[406.3] 406.2 Waste connection. The waste from an automatic clothes washer shall discharge through an air break into a standpipe in accordance with Section ~~[802.4]~~ 802 or into a laundry sink. The trap and fixture drain for an automatic clothes washer standpipe shall be ~~[a minimum of]~~ not less than 2 inches (51 mm) in diameter. The ~~[automatic]~~ fixture drain for the standpipe serving an

automatic clothes washer [fixture drain] shall connect to a [branch drain or drainage stack a minimum of 3 inches] 3-inch (76 mm) [in] or larger diameter fixture branch, building drain, or stack. 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~~] ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4, or CSA B45.5/IAPMO Z124.

407.2 Bathtub waste outlets and overflows. Bathtubs shall [~~have~~] be equipped with a waste [~~outlets a minimum of 1. inches (38 mm) in diameter~~] outlet and an overflow outlet. The outlets shall be connected to waste tubing or piping not less than 1½ inches (38 mm) in diameter. The waste outlet shall be equipped with [~~an approved stopper, and a built-in overflow shall be provided~~] a water-tight stopper.

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~~] in 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 B45.4~~] ASME A112.19.2/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~~] 608.13.

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 or CSA B125.3.

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. Commercial dishwashing machines with integral gas-fired heating must be tested and evaluated in accordance with UL 921.

409.2 Water connection. The water supply to a dishwashing machine shall be protected against backflow by an air gap that is integral with the machine or a backflow preventer shall be installed in accordance with Section [~~PC~~] 608. Air gaps shall comply with ASME A112.1.2 or A112.1.3.

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 802.

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,~~] ASME A112.19.1/CSA B45.2 or ASME A112.19.2/CSA B45.1 and water coolers shall conform to [~~ARI 1010~~] AHRI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9 and ICC A117.1. 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 (254 mm) in height. Drinking fountains and water coolers shall comply with the lead requirements of Section 605.

410.2 Small occupancies. Drinking fountains shall not be required for an occupant load of 15 or fewer.

410.3 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 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]~~ **410.4 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~~] drain outlet not less than 3 inches (76 mm) in 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~~] an outlet of not less than 3 inches (76 mm) in diameter [~~drain outlet~~] and be provided with lint strainers.

SECTION PC 413
FOOD WASTE [GRINDER] DISPOSER UNITS

413.1 Approval. Domestic food waste [~~grinders~~] disposers shall conform to ASSE 1008 and shall be listed and labeled in accordance with UL 430. Food waste [~~grinders~~] disposers shall not increase the drainage fixture unit load on the sanitary drainage system. Food waste [~~grinders~~] disposers shall be permitted only within dwelling units.

413.2 Domestic food waste [grinder] disposer waste outlets. [~~Domestic~~] The outlets of domestic food waste [~~grinders~~] disposers shall be connected to a drain of not less than 2 inches (51 mm) in diameter.

413.3 [~~Reserved.~~] Commercial food waste disposer units. Commercial food waste disposers shall be prohibited unless approved for use by the Department of Environmental Protection.

413.4 Water supply required. [~~All food~~] Food waste [~~grinders~~] disposers 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~~] ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A119.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124.

415.2 Waste outlet. Each compartment of a laundry tray shall be provided with a waste outlet [~~a minimum of 1.5~~] not less than 1½ 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 A112.19.4M, ASME A112.19.9M, CSA B45.1, CSA B45.2, CSA B45.3 or CSA B45.4~~] ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. 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~~] CSA B45.5/IAPMO Z124.

416.3 Lavatory waste outlets. Lavatories shall have waste outlets not less than 1¼ 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 lavatories and group wash fixtures located in public [hand-washing] toilet facilities provided for customers, patrons and visitors. Tempered water shall be delivered through an approved water-temperature limiting device that conforms to [~~ASSE 1016 or~~ ASSE 1070 ~~or CSA B125.3~~].

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~~] ASME A112.19.2/CSA B45.1 or CSA B45.5/IAPMO Z124. 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~~] not less than 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 ¼ inch (6.4 mm) in [~~minimum~~] least 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~~] Shower compartments shall [~~have a minimum of~~] be not less than 900 square inches (0.58 m²) [~~of~~] in interior cross-sectional area. Shower compartments shall be not [~~be~~] less than 30 inches (762 mm) in [~~minimum~~] least dimension as 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~~] Floor and wall area. [~~The wall area~~] Bathtub floors, shower floors, wall areas above built-in tubs [~~with~~] that have installed shower heads and walls in shower compartments shall be constructed of smooth, [~~noncorrosive~~] corrosion-resistant and nonabsorbent waterproof materials. Wall materials shall extend to a height of 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~~ above the drain of the tub or shower. Such walls shall form a water-tight joint with each other and with either the tub~~[-receptor]~~ or shower floor.

417.4.2 Access. The shower compartment access and egress opening shall have a ~~[minimum-]~~ clear and unobstructed finished width of not less than 22 inches (559 mm). Shower compartments required to be designed in conformance to accessibility provisions shall comply with Section 404.1.

417.5 Shower floors or receptors. Floor surfaces shall be constructed of impervious, noncorrosive, nonabsorbent and waterproof materials.

417.5.1 Support. Floors or receptors under shower compartments shall be laid on, and supported by, a smooth and structurally sound base.

417.5.2 Shower lining. Floors under shower compartments, except where prefabricated receptors have been provided, shall be lined and made water tight utilizing material complying with Sections 417.5.2.1 through ~~[417.5.2.5]~~ 417.5.2.6. Such liners shall turn up on all sides ~~[at least]~~ not less than 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 Chlorinated 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 not less than 4 pounds per square foot (19.5 kg/m²) and shall be 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]~~ an equivalent. Sheet lead shall be joined by burning or soldering.

417.5.2.4 Sheet copper. Sheet copper shall conform to ASTM B 152 and shall weigh not ~~[weight]~~ 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]~~ an 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.

417.5.2.6 Liquid-type, trowel-applied, load-bearing, bonded waterproof materials. Liquid-type, trowel-applied, load-bearing, bonded waterproof materials shall meet the requirements of ANSI A118.10 and shall be applied in accordance with the manufacturer's 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. Sinks shall conform to [~~ANSI Z124.6, ASME A112.19.1M, ASME A112.19.2M, ASME A112.19.3M, ASME A112.19.4M, ASME A112.19.9M, CSA B45.1, CSA B45.2, CSA B45.3 or CSA B45.4~~] ASME A112.19.1/CSA B45.2, ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124.

418.2 Sink waste outlets. Sinks shall be provided with waste outlets [~~a minimum of 2 inches (51 mm) in diameter~~] having a diameter not less than 1½ inches (38 mm). 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~~] ASME A112.19.2/CSA B45.1, ASME A112.19.19 or CSA B45.5/IAPMO Z124. 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~~] ASME A112.19.2/CSA B45.1 or CSA B45.5/IAPMO Z124.

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 prepared in accordance with the rules of the department.

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~~] ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. Water closets shall conform to the hydraulic performance requirements of [~~ASME A112.19.6~~] ASME A112.19.2/CSA B45.1. 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~~] ASME A112.19.2/CSA

B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. Electro-hydraulic water closets shall comply with [ASME A112.19.13] ASME A112.19.2/CSA B45.1. Water closets equipped with a dual flushing device shall comply with ASME A112.19.14.

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 6 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)~~] ASME A112.19.7/CSA B45.10 and shall be listed and labeled in accordance with UL 1795.

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~~] ASME A112.19.7/CSA B45.10.

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~~] an opening not less than 12 inches by 12 inches (305 mm by 305 mm) 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~~] opening not less than 18 inches by 18 inches (457 mm by 457 mm) 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: hospitals, nursing homes, homes for the aged, orphanages, infirmaries, first aid stations, psychiatric facilities, clinics, professional offices of dentists and doctors, mortuaries, educational facilities, surgery, dentistry, research and testing laboratories, establishments manufacturing pharmaceutical drugs and medicines, animal care facilities, and other structures with similar apparatus and equipment classified as plumbing.

422.2 Approval. All special plumbing fixtures, equipment, devices, assemblies 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-resistant 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. Nonpressure 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.

423.3 Footbaths, pedicure baths and head shampoo sinks. The water supplied to specialty plumbing fixtures, such as pedicure chairs having an integral foot bathtub, footbaths, and head shampoo sinks, shall be limited to a maximum temperature of 120°F (49°C) by a water temperature limiting device that conforms to ASSE 1070 or CSA B125.3.

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~~] ASME A112.18.1/CSA B125.1. 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 B125.2, ASTM F 409 or to one of the standards listed in Tables 702.1 and 702.4 for [~~above-ground~~] aboveground 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 normal 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]~~ ASME A112.18.1/CSA B125.1. Hand-held showers shall provide backflow protection in accordance with ~~[ASME A112.18.1 or CSA B125.1]~~ ASME A112.18.1/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]~~ tub-shower combination valves shall be ~~[balanced pressure]~~ balanced-pressure, thermostatic or combination balanced-pressure/thermostatic valves that conform to the requirements of ~~[ASSE 1016]~~ ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 and shall be installed at the point of use.~~[-]~~ Shower~~[-tub and shower tub]~~ and tub-shower 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. In-line thermostatic valves shall not be utilized for compliance with this section.

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]~~ CSA B125.3, 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]~~ ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1 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 manufacturers' instructions.

424.5 Bathtub and whirlpool bathtub valves. The hot water supplied to bathtubs and whirlpool bathtubs, including bathtubs equipped with hand-held showers, 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 B125.3, 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 B125]~~ ASME A112.18.3 or ASME A112.18.1/CSA B125.1.

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]~~ 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]~~ ASME A112.18.1/CSA B125.1.

424.9 Water closet personal hygiene devices. Personal hygiene devices integral to water closets or water closet seats shall conform to the requirements of ASME A112.4.2.

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 normal 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 Flushometer valves and tanks. Flushometer valves and tanks shall comply with ASSE 1037 or CSA B125.3. Vacuum breakers on flushometer valves shall conform to the performance requirements of ASSE 1001 or ~~[CAN/CSA B64.1.1]~~ CSA B64.1.1. Access shall be provided to vacuum breakers. Flushometer valves shall be of the ~~[water conservation]~~ water conservation type and shall not be ~~[utilized]~~ used 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]~~ Flush tanks shall be equipped with an antisiphon fill valve conforming to ASSE 1002 or ~~[CSA B125]~~ CSA B125.3. The fill valve backflow preventer shall be located ~~[at least]~~ not less than 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]~~ ASME A112.19.5/CSA B45.15.

**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 as permitted by Appendix C of this code~~].

Exceptions:

1. Once-through water-cooled ice making machines producing less than 500 pounds (227 kg) of ice per day at Standard Rating Conditions as specified in [~~ARI~~] AHRI 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 and are installed in accordance with RCNY Title 15 Chapter 20 Section 20-06.
3. Use of once-through cooling may be permitted for temporary emergency conditions where approved by the commissioner.

**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.

PART E

CHAPTER 5

§1. Chapter 5 of the New York city plumbing code, as added by local law number 99 for the year 2005, sections 502, 504.6, 504.7 and 505.1, as amended by local law number 41 for the year 2012, is amended to read as follows:

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.]~~

501.2 Water heaters utilized for space heating. Water heaters utilized both to supply potable hot water and provide hot water for space-heating applications shall be listed and labeled for such applications by the manufacturer and shall be built in accordance with Section IV of the ASME Boiler and Pressure Vessel Code with an “H” code stamp. They shall be installed in accordance with the manufacturer’s instructions, the ASME Boiler and Pressure Vessel Code and the *New York City Mechanical Code*.

501.2.1 Cross connection. Water heaters utilized for both potable hot water and hot water for space heating applications shall have separate heating sections and connections for distribution systems and shall not be cross-connected. The potability of the domestic water shall be maintained throughout the system in accordance with Chapter 6.

501.2.2 Sizing. Water heaters utilized for both potable water-heating and space-heating applications shall be sized to prevent the space-heating load from diminishing the required potable water-heating capacity.

501.2.3 Temperature limitation. Where a combination potable water-heating and space-heating system requires water for space-heating, a temperature actuated mixing valve complying with ASSE 1017 shall be provided to temper the water supplied to the potable hot water distribution system in accordance with Section 607.

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.] The drain valve inlet shall be not less than ¾-inch (19 mm) nominal iron pipe size and the outlet shall be provided with male garden hose threads.

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]~~ 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]~~ not greater than 140°F (60°C) ~~[when]~~ where 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]~~ 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.

501.9 Supplemental water-heating devices. Potable water-heating devices that utilize refrigerant-to-water heat exchangers shall be approved and installed in accordance with this code, the applicable provisions of the New York City Energy Conservation Code and the manufacturer's instructions.

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*, and shall comply with UL 732. Approval for oil-fired water heaters 350,000 Btu/h input (1025 kW) and above shall be obtained from the New York City Department of Environmental Protection. Electric water heaters shall conform to the requirements of this code and provisions of the *New York City Electrical Code*. Domestic electric water heaters shall comply with UL 174 or UL 1453. Commercial electric water heaters shall comply with UL 1453. 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]~~ where such room is used as a plenum.

502.3 Water heaters installed in attics. ~~[Electric water]~~ Water heaters ~~[only shall be]~~ installed in attics shall be electric. ~~[An attic]~~ Attics 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 be not ~~[be]~~ less than 30 inches (762 mm) ~~[high]~~ in height and 22 inches (559 mm) ~~[wide]~~ in width 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 passageway shall have continuous solid flooring not less than 24 inches (610 mm) ~~[wide]~~ in width. A level service space ~~[at least]~~ not less than 30 inches (762 mm) ~~[deep]~~ in length and 30 inches (762 mm) ~~[wide]~~ in width shall be present at the front or service side of the water heater. ~~[The]~~ Dimensions of the clear access opening ~~[dimensions]~~ shall be ~~[a minimum of]~~ not less than 20 inches by 30 inches (508

mm by 762 mm) [~~where such dimensions are~~] and shall be 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~~] not less than 30 inches [deep] in length and 30 inches [~~wide~~] in width (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 tubes 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 in accordance with the *New York City Fuel Gas Code* and *New York City Mechanical Code*.

504.4 Relief valve. [~~All storage~~] 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 storage 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~~] approved, self-closing (levered) pressure relief valve and temperature relief valve or

combination thereof conforming to ANSI Z21.22, shall be installed on both the ~~[tank and there shall not be any type of valve installed between the]~~ storage 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]~~ Terminate not more than 6 inches (152 mm) above ~~[the floor or]~~ and not less than two times the discharge pipe diameter above the floor or flood level rim of the 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. Where a storage tank-type water ~~[heaters]~~ heater or a hot water storage ~~[tanks are]~~ tank is installed in ~~[locations]~~ a location where water leakage ~~[of]~~ from the ~~[tanks or connections]~~ tank 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]~~ 1½ inches (38 mm) ~~[deep]~~ in depth 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 not less than ¾ inch (19 mm). Piping for safety pan drains shall be of those materials listed in Table 605.4.

Exception: A pan drain shall not be required for a replacement water heater where a pan drain was not previously installed, provided that a leak detector is installed within the pan.

504.7.2 Pan drain termination. The pan drain shall extend [~~full-size~~] 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)~~] in accordance with the *New York City Energy Conservation Code*.

PART F

CHAPTER 6

§1. Chapter 6 of the New York city plumbing code, as added by local law number 99 for the year 2005, sections 601.5, 602.3, and 608.13.3 as amended by, and sections 601.5.3, 601.6, 603.3, 603.4, and 603.5 as added by, local law number 8 for the year 2008, and sections 603 through 608 and 612 and tables 604.3, 604.5, 605.3, 605.5, 605.8, 606.5.4(1), 606.5.4(2), 608.1, and 608.15.1, and figure 606.5.4 as amended by, local law number 41 for the year 2012, and section 606.5.4.1 as amended by local law number 56 for the year 2010, and sections 605.2 and 608.1, and tables 604.4 and 605.4 as amended by local law number 141 for the year 2013, and section 604.4.1 as added by local law number 57 for the year 2010, and sections 605.12.2 and 605.14.2 as amended by local law number 71 for the year 2009, and section 607.2.1 as amended by local law number 85 for the year 2009, and sections 614.1 through 614.1.5 as added by local law number 110 for the year 2013, is amended to read as follows:

CHAPTER 6

WATER SUPPLY AND DISTRIBUTION

SECTION PC 601

GENERAL

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

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

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

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

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

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

~~601.5.1~~ 601.6.1 Extensions of public water mains. Extensions of public water mains shall be made in accordance with the regulations of the Department of Environmental Protection.

~~601.5.2~~ 601.6.2 Availability of public water main to other than one- or two-family dwellings. A public water main shall be deemed available to a building, other than a one- or

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

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

[601.5.3] 601.6.3 Availability of public water main to one- or two-family dwellings. A public water main shall be deemed available to a one- and two-family dwelling if a property line of such dwelling is within 100 feet (30 480 mm), measured along a street, alley, or right-of-way, of the public water supply system. The extension and connection shall be made in accordance with the applicable standards of the Department of Environmental Protection.

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

[601.6] 601.7 Destruction of abandoned corporation stops and wet connections. All driven corporation stops, when abandoned, shall be removed and replaced by plugs. All wet connections or screw corporation stops, when abandoned, shall be destroyed in place, and all exposed portions of the service pipe shall be cut and removed. Where a corporation stop or wet connection is destroyed and the connecting service pipe is one that is equipped with a curb valve and box, the curb box shall be removed in accordance with the rules of the Department of Environmental Protection. The expense in connection with the abandonment or destruction of a corporation stop or wet connection shall be chargeable to the owner of the property into which the service pipe entered.

SECTION PC 602 WATER REQUIRED

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

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

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

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

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

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

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

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

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

SECTION PC 603 WATER SERVICE

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

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

Exceptions:

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

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

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

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

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

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

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

**SECTION PC 604
DESIGN OF BUILDING WATER DISTRIBUTION SYSTEM**

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

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

604.3 Water distribution system design criteria. The water distribution system shall be designed, and pipe sizes shall be selected such that under conditions of peak demand, the capacities at the fixture supply pipe outlets shall be not [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 instructions.

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

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

FIXTURE SUPPLY OUTLET SERVING	FLOW RATE ^a (gpm)	FLOW PRESSURE ^b (psi)
Drinking fountain	0.75	8
Laundry tray	4	8
Lavatory, <u>private</u>	[2] <u>1.5</u>	8
Lavatory[(self-closing)] , <u>private, mixing valve</u>	[2] <u>1.5</u>	[20] <u>8</u>
Lavatory[(sensor)] , <u>public</u>	[2] <u>1.5</u>	[20] <u>8</u>
Shower	[3] <u>2</u>	8
Shower, balanced-pressure, thermostatic or combination balanced-pressure/thermostatic mixing valve	[3] <u>2^b</u>	20
Sillcock, hose bibb	5	8
Sink, residential	[2.5] <u>2.2</u>	8
Sink, service	3	8
Urinal, valve	18	20
Water closet, blow out, flushometer valve	25	25 [25]
Water closet, flushometer tank	3	20
Water closet, siphonic, flushometer valve	25	25
Water closet, tank, close coupled	3	15
Water closet, tank, one piece	3	20

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

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

b. [Minimum pressures as per manufacturer's recommendations.] Where the shower mixing valve manufacturer indicates a lower flow rating for the mixing valve, the lower value shall be applied.

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

Exceptions:

1. Blowout design water closets [~~3.5 gallons (13 L) per flushing cycle~~] having a water consumption not greater than 3½ gallons (13 L) per flushing cycle.
2. Vegetable sprays.

3. Clinical sinks [~~4.5 gallons (17 L) per flushing cycle~~] having a water consumption not greater than 4½ gallons (17 L) per flushing cycle.
4. Service sinks.
5. Emergency showers.

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

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

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

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

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

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

**TABLE 604.5
MINIMUM SIZES OF FIXTURE WATER SUPPLY PIPES**

FIXTURE	MINIMUM PIPE SIZE (inch)
Bathtubs	1/2
Bidet	3/8
Combination sink and tray	1/2
Dishwasher, domestic	1/2
Drinking fountain	3/8
Hose bibbs	1/2
Kitchen sink	1/2
Laundry, 1, 2 or 3 compartments	1/2
Lavatory	3/8
Shower, single head	1/2
Sinks, flushing rim	3/4
Sinks, service	1/2
Urinal, flush tank	1/2
Urinal, [flush] flushometer valve	3/4
Wall hydrant	1/2
Water closet, flush tank	3/8
[Water closet, flush valve]	[±]
Water closet, flushometer tank	3/8
<u>Water closet, flushometer valve</u>	<u>1</u>
<u>Water closet, one piece</u>	<u>1/2</u>

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

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

604.7 Inadequate water pressure. Wherever water pressure from the street main or other source of supply is insufficient to provide flow pressures at fixture outlets as required under Table 604.3,

a water pressure booster system conforming to Section 606.5 shall be installed on the building water supply system.

604.8 ~~[Water pressure-reducing]~~ 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 or CSA B356 with strainer shall be installed to reduce the pressure in the building water distribution piping to not greater than 85 psi (586 kPa) static ~~[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]~~ Water pressure-reducing valves, regulators and strainers shall be so constructed and installed as to permit repair or removal of parts without breaking a pipeline or removing the valve and strainer from the pipeline.

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

604.10 Reserved.

**[TABLE 604.10.1
MANIFOLD SIZING**

NOMINAL SIZE INTERNAL DIAMETER (inches)	MAXIMUM DEMAND (gpm)	
	Velocity at 4 feet per second	Velocity at 8 feet per second
$\frac{1}{2}$	2	5
$\frac{3}{4}$	6	11
1	10	20
$1\frac{1}{4}$	15	31
$1\frac{1}{2}$	22	44

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

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

not be utilized alone as a substitute for the balanced pressure, thermostatic or combination shower valves required in Section 424.3.

**SECTION PC 605
MATERIALS, JOINTS AND CONNECTIONS**

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

605.2 Lead content of drinking water pipe and fittings. Pipe, pipe fittings, joints, valves, faucets and fixture fittings utilized to supply water for drinking or cooking purposes shall comply with NSF 372 and shall have a weighted average lead content of 0.25 percent or less.

605.3 Water service pipe. The ~~[subsurface 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.]~~

**[TABLE 605.3]
[WATER SERVICE PIPE]**

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

~~**605.3.1 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.]~~

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

TABLE 605.4

WATER DISTRIBUTION PIPE

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

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

TABLE 605.4.1
UNDERGROUND WATER DISTRIBUTION PIPE

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

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]~~ 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.]~~

**TABLE 605.5
PIPE FITTINGS**

MATERIAL	STANDARD
<u>Brass</u>	<u>ASTM B 62</u>
Cast iron	ASME B16.4[; ASME B16.12]
Copper or copper alloy	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME [B-16.29] <u>B16.51</u> ; <u>ASSE 1061</u> ; <u>ASTM F 1476</u> ; <u>ASTM F 1548</u>
Gray iron and ductile iron	<u>ASTM F 1476</u> ; <u>ASTM F 1548</u> ; <u>AWWA C110/A21.10</u> ; <u>AWWA C153/A21.53</u>
Stainless steel (Type 304/304L)	ASTM A 312; ASTM A 778; <u>ASTM F 1476</u> ; <u>ASTM F 1548</u>
Stainless steel (Type 316/316L)	ASTM A 312; ASTM A 778; ASTM <u>A403/A403M</u> ; <u>ASTM F 1476</u> ; <u>ASTM F 1548</u>

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]~~ dimple serving as a depth stop shall be formed in the branch tube to ensure that penetration into the collar is of the correct depth. For inspection purposes, a second dimple shall be placed ¼ inch (6.4 mm) above the first dimple. Dimples shall be aligned with the tube run.

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

605.6 Flexible water connectors. Flexible water connectors exposed to continuous pressure shall conform to ~~[APMO PS74 and PS 48]~~ ASME A112.18.6/CSA B125.6, shall not exceed 24 inches (610 mm), shall be used in exposed locations only and shall be used singularly; that is, two connectors cannot be joined.

605.7 Valves. ~~[All valves]~~ Valves shall be ~~[of an approved type and]~~ compatible with the type of piping material installed in the system. Valves shall conform to one of the standards listed in Table

605.7 or shall be approved. Valves intended to supply drinking water shall meet the requirements of NSF 61.

TABLE 605.7
VALVES

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

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

TABLE 605.8
MANUFACTURED PIPE NIPPLES

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

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

1. Cement or concrete joints.
2. Joints made with fittings not approved for the specific installation.
3. Saddle-type fittings.
4. Removable press-connect fittings.
5. Removable push-fit fittings.
6. Nail-type fittings.
7. Compression type fittings for other than final fixture connections.

605.10 Reserved.

605.11 [Reserved.]

[605.12] Brass. Joints between brass pipe and fittings shall comply with Sections ~~[605.12.1]~~ 605.11.1 through ~~[605.12.4]~~ 605.11.3.

~~[605.12.1]~~ **605.11.1 Brazed joints.** All joint surfaces shall be cleaned. An approved flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.

~~[605.12.2]~~ **605.11.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

~~[605.12.3]~~ **605.11.3 Threaded joints.** Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

[605.13] 605.12 Gray iron and ductile iron joints. Joints for gray and ductile iron pipe and fittings shall comply with AWWA C111 and shall be installed in accordance with the manufacturer's ~~[installation]~~ instructions.

[605.14] 605.13 Copper pipe. Joints between copper or copper-alloy pipe ~~[ø]~~ and fittings shall comply with Sections ~~[605.14.1]~~ 605.13.1 through ~~[605.14.4]~~ 605.13.4.

~~[605.14.1]~~ **605.13.1 Brazed joints.** All joint surfaces shall be cleaned. An approved flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.

~~[605.14.2]~~ **605.13.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

~~[605.14.3]~~ **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.]~~

605.13.3 Reserved.

~~[605.14.4]~~ **605.13.4 Threaded joints.** Threads shall conform to ASME B1.20.1. Pipe-joint compound or tape shall be applied on the male threads only.

[605.15] 605.14 Copper tubing. Joints between copper or copper-alloy tubing ~~[ø]~~ and fittings shall comply with Sections ~~[605.15.1]~~ 605.14.1 through ~~[605.15.4]~~ 605.14.6.

~~[605.15.1]~~ **605.14.1 Brazed joints.** ~~[All joint]~~ 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]~~ **605.14.2 Flared joints.** Flared joints for water pipe shall be made by a tool designed for that operation.

~~[605.15.3]~~ **605.14.3 Grooved and shouldered mechanical joints.** Grooved and shouldered mechanical joints shall comply with ASTM F 1476, shall be made with an approved

elastomeric seal and shall be installed in accordance with the manufacturer's instructions. Such joints shall be exposed or concealed.

605.14.4 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions and shall be tested, designed and evaluated in accordance with IAPMO PS 117[, ICC-ES PMG LC 1002] and ASSE 1061.

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

~~[605.15.4 Soldered]~~ **605.14.6 Solder joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. All cut tube ends shall be reamed to the full inside diameter of the tube end. All joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32. The joining of water supply piping shall be made with lead-free solders and fluxes. [~~"Lead-free" shall mean a chemical composition equal to or less than 0.2 percent lead.~~]

605.15 Reserved.

605.16 Reserved.

605.17 Reserved.

605.18 Reserved.

605.19 Reserved.

605.20 Reserved.

605.21 Reserved.

605.22 Reserved.

605.23 Stainless steel. Joints between stainless steel pipe and fittings shall comply with Sections 605.23.1 [~~and 605.23.2~~] through 605.23.3.

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

605.23.2 Welded joints. All [~~joint surfaces~~] joints shall be [~~cleaned. The joint shall be welded autogenously or with an approved filler metal as referenced in ASTM A 312~~] welded in accordance with ASME B31.9, inspected and tested in accordance with Section 312.

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

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

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

605.24.2 Reserved.

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

605.25 Reserved.

SECTION PC 606

INSTALLATION OF THE BUILDING WATER DISTRIBUTION SYSTEM

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

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

606.2 Reserved.

606.3 Access to valves. [~~Ready access~~] Access shall be provided to all full-open valves and shutoff valves.

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

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

606.5.1 Water pressure booster or gravity house tank systems required. Where the water pressure in the public water main or individual water supply system is insufficient to supply the minimum pressures and quantities specified in this code, the supply shall be supplemented

by an elevated water tank, a hydropneumatic pressure booster system or a water pressure booster pump installed in accordance with Section 606.5.5.

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

606.5.3 Covers. All water supply tanks shall be ~~[covered]~~ equipped with a lockable cover to keep out unauthorized persons, dirt and vermin. Such cover shall be tamper-proof and equipped with a local alarm. The covers of gravity tanks shall be vented with a return bend vent pipe with an area not less than the area of the down-feed riser pipe, and the vent shall be screened with a corrosion-resistant screen of not less than 16 by 20 mesh per inch ~~[(6 by 8 mesh per cm)]~~ (630 by 787 mesh per m). ~~[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 for water supply tanks. ~~[Each]~~ A gravity or suction water supply tank shall be provided with an overflow with a diameter not [smaller] less than that shown in [Table 606.5.4(1) and/or Table 606.5.4(2)] Table 606.5.4. The gallons per minute listed in the ~~[tables]~~ table shall be the total automatic pump capacity connected to the tank. The overflow outlet shall discharge ~~[within]~~ at a point not less than 6 inches (152 mm) [of a] above the roof or roof drain, or over an open [water-supplied] water-supplied fixture. The overflow ~~[discharge]~~ outlet shall be [provided with durable screening] covered with [openings of not more than ¹/₈ inch (3.18 mm)-] a corrosion-resistant screen of not less than 16 by 20 mesh per inch (630 by 787 mesh per m) and by 1/4-inch (6.4 mm) hardware cloth or shall terminate in a horizontal angle seat check valve. Drainage from overflow pipes shall be directed so as not to freeze on roof walks.

~~[TABLE 606.5.4(1)]~~ **TABLE 606.5.4**
SIZE OF OVERFLOWS FOR GRAVITY AND SUCTION TANKS
~~[[See Figure 606.5.4 (Single Orifice/Multiple Orifice)]]~~

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

OVERFLOW PIPE SIZE (inches)	MAXIMUM ALLOWABLE GPM FOR EACH ORIFICE OPENING INTO TANK	MAXIMUM ALLOWABLE GPM FOR VERTICAL OVERFLOW (PIPING CONNECTING ORIFICES)
10	890	1,870
12	1,400	2,967

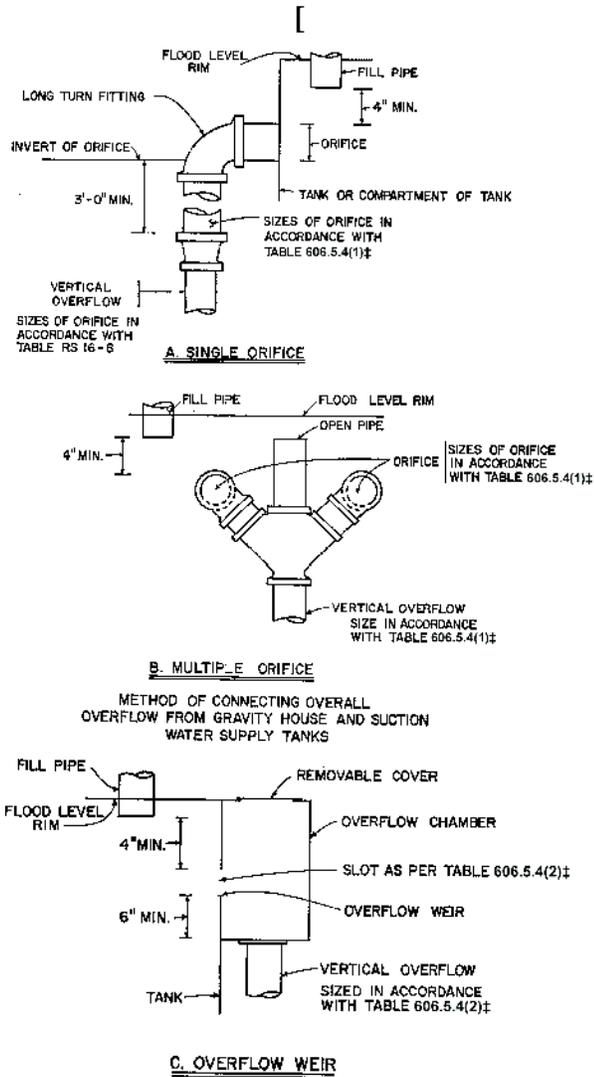
For SI: 1 inch = 25.4 mm, 1 gallon per minute = 3.785 L/m.

**[TABLE 606.5.4(2)
SIZE OF WEIRS FOR GRAVITY AND SUCTION TANKS
[See Figure 606.5.4 (Overflow Weir)]**

SLOTTED WEIR OPENING INTO TANK BETWEEN OVERFLOW CHAMBER AND WATER COMPARTMENT^a	MAXIMUM GPM ALLOWABLE FOR WEIR
3 inches × 24 inches	381
3 ¹ / ₂ inches × 24 inches	475
4 ¹ / ₂ inches × 24 inches	685
4 ¹ / ₂ inches × 36 inches	1,037
6 inches × 36 inches	1,569
6 inches × 48 inches	2,100

For SI: 1 inch = 25.4 mm.

a. — Bottom of the overflow chamber must be at least 6 inches below weir.



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

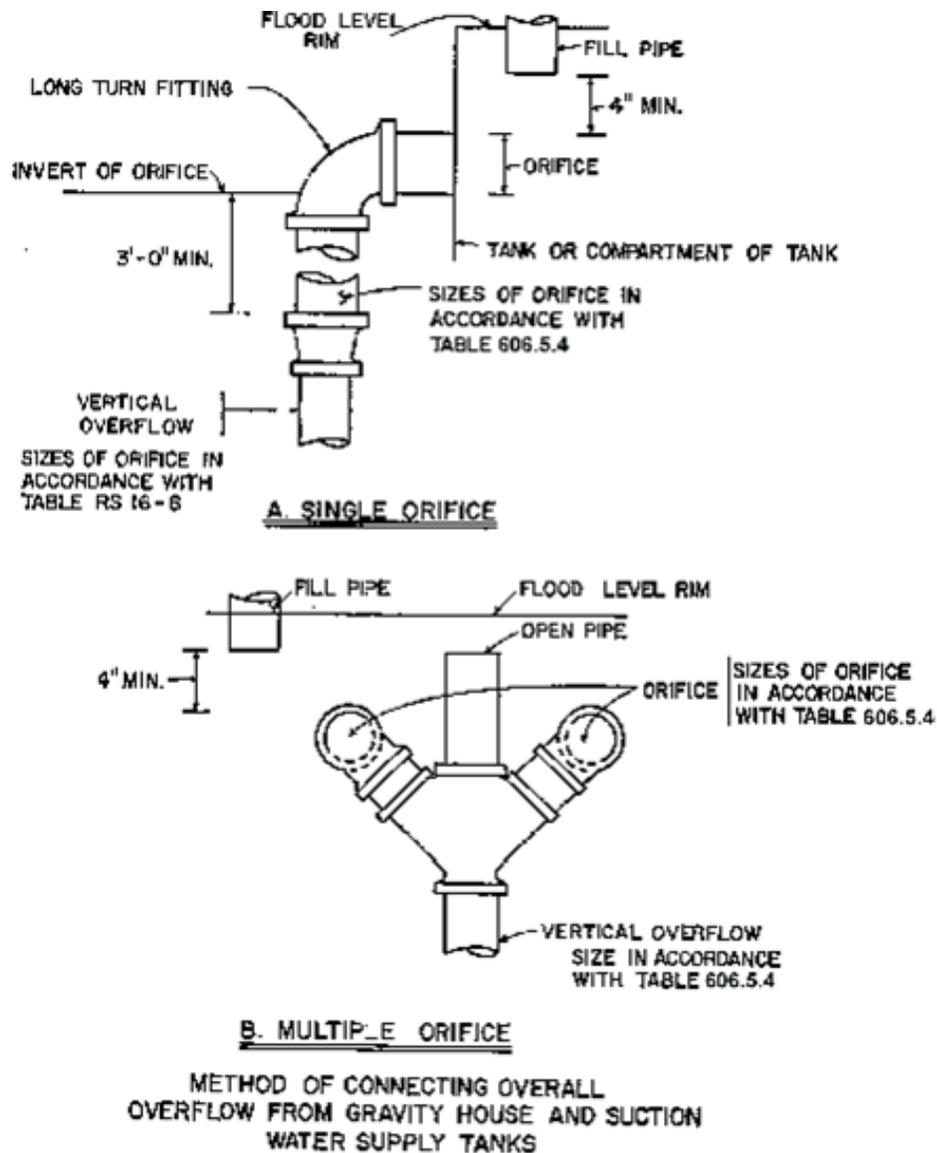


FIGURE 606.5.4
METHODS OF CONNECTING OVERFLOW FROM GRAVITY
HOUSE AND SUCTION WATER SUPPLY TANKS

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

pressure shall be equipped with a check valve on the main cold water down supply to prevent backflow of water into the roof tank. All roof tanks shall be equipped with a high water level alarm, at or slightly below the overflow, designed to activate when the ball cock, automatic supply valve, or emergency electrical cut-off fails.

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

[606.5.4.5] 606.5.4.3 Cleaning or painting. Water tanks shall be cleaned and painted in accordance with the following:

[606.5.4.5.1] 606.5.4.3.1 Prohibited materials. No water tank of any kind that is part of a building water supply system used for potable purposes shall be cleaned with any material or painted on the inside with any material that will have a toxic or otherwise objectionable effect on the potability of the water supply when the tank is put into service. No lead paint shall be used. The water supply connections to and from a tank shall be disconnected or plugged while the tank is being cleaned or painted to prevent any foreign fluid or substance from entering the distribution piping. Where the air in a tank may be insufficient to sustain human life, or may contain an injurious gas, adequate measures shall be taken for the protection of the workers.

[606.5.4.5.2] 606.5.4.3.2 Disinfection. After the tank has been cleaned or painted, it shall be disinfected according to the following procedure before it is put back in service:

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

[606.5.4.5.3] 606.5.4.3.3 Maintenance schedule. House and suction tanks shall be drained and cleaned at least once a year.

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

606.5.6 Reserved.

606.5.7 [~~Reserved.~~] Tank drain pipes. A valved pipe shall be provided at the lowest point of each tank or tank compartment to permit emptying of the tank. The tank drain pipe shall discharge as required for overflow pipes and shall not be smaller in size than specified in Table 606.5.7.

TABLE 606.5.7
SIZE OF DRAIN PIPES FOR WATER TANKS

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

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

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

606.5.9 Pressure tanks, vacuum relief. All water pressure tanks shall be provided with a vacuum relief valve at the top of the tank that will operate up to a maximum water pressure of 200 psi (1380 kPa) and up to a maximum temperature of 200°F (93°C). The [~~minimum~~] size of such vacuum relief valve shall be [~~0.50 inch~~] not less than ½ 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 [~~PE~~] 312.

606.7 Reserved.

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

Exception: [~~Swimming pools accessory to~~] Water sub-meters shall not be required in Group R-3 occupancies.

~~[606.8]~~ **606.9 Pressure tanks.** Tank systems containing water and air in combination under pressure exceeding 15 psi (103.4 kPa) above atmospheric pressure, where the pressure is supplied and maintained by pumps connected directly to the tanks, shall comply with the requirements of this section.

~~[606.8.1]~~ **606.9.1 Design requirements.** The pressure tank system shall be designed by a registered design professional. An application for a permit and plans shall be filed with the department. The plans and application shall contain, but not be limited to:

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

~~[606.8.2]~~ **606.9.2 Location requirements.** All high pressure tanks shall be located at least 5 feet (1524 mm) horizontally from a gas service or distribution line or its vertical projection upon the floor.

~~[606.8.3]~~ **606.9.3 Required separation.** All pressure tanks shall be located in rooms separated from gas service or distribution lines by fire-resistance rated enclosures.

SECTION PC 607 HOT WATER SUPPLY SYSTEM

607.1 Where required. In residential occupancies, hot water shall be supplied to [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.

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

607.1.2 Tempered water temperature control. Tempered water shall be supplied through a water temperature limiting device that conforms to ASSE 1070 and shall limit the tempered

water to a maximum of 110°F (43°C). This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

607.2 Hot or tempered water supply ~~[temperature maintenance]~~ to fixtures. ~~[Where the]~~ The developed length of hot or tempered water piping, from the source of hot water [supply] to the [farthest fixture exceeds] fixtures that require hot or tempered water, shall not exceed 20 feet (6096 mm)[,] or the maximum length in accordance with the *New York City Energy Conservation Code*. Recirculating [the hot water supply] system piping and heat-traced piping shall be [provided with a method of maintaining the temperature in accordance with the *New York City Energy Conservation Code*] considered to be sources of hot or tempered water.

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

~~[607.2.2]~~**607.2.1.1 ~~[Hot]~~ Pump controls for hot water storage [system controls] systems.** ~~[Automatic circulating hot water system]~~ The controls on pumps [or temperature maintenance cable shall be arranged to be conveniently turned off, automatically or manually, when the hot water system is not in] that circulate water between a water heater and a storage tank for heated water shall limit operation of the pump from heating cycle startup to not greater than 5 minutes after the end of the cycle.

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

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

~~[607.2.3 Recirculating pump.]~~ **607.2.2 Piping for recirculation systems having master thermostatic valves.** Where a thermostatic mixing valve is used in a system with a hot water recirculating pump, the hot water or tempered water return line shall be routed to the cold water inlet pipe of the water heater and the cold water inlet pipe or the hot water return connection of the thermostatic mixing valve.

607.3 Thermal expansion control. ~~[A means of controlling increased]~~ Where a storage water heater is supplied with cold water that passes through a check valve, pressure [caused by] reducing valve or backflow preventer, a thermal expansion tank shall be [provided where required in accordance with Sections 607.3.1 and 607.3.2.] connected to the water heater cold water supply pipe at a point that is downstream of all check valves, pressure reducing valves and backflow

preventers. Thermal expansion tanks shall be sized in accordance with the tank manufacturer's instructions and shall be sized such that the pressure in the water distribution system shall not exceed that required by Section 604.8.

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

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

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

Exception: Shower and tub/shower mixing valves conforming to ~~[ASSE 1016]~~ ASSE 1016/ASME A112.1016/CSA B125.16 or ASME A112.18.1/CSA B125.1^[7], where the flow of hot water corresponds to the markings on the device.

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

**SECTION PC 608
PROTECTION OF POTABLE WATER SUPPLY**

608.1 General. A potable water supply system shall be designed, installed and maintained in such a manner so as to prevent contamination from nonpotable liquids, solids or gases being introduced into the potable water supply through ~~[cross-connections]~~ cross connections or any other piping connections to the system. Backflow preventer applications shall conform to Table 608.1, except as specifically stated in Sections 608.2 through 608.16.10. Primary backflow prevention devices shall comply with the requirements of the Department of Environmental Protection.

**TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS**

<u>DEVICE</u>	<u>DEGREE OF HAZARD^a</u>	<u>APPLICATION^b</u>	<u>APPLICABLE STANDARDS</u>
<u>Backflow prevention assemblies:</u>			

<u>DEVICE</u>	<u>DEGREE OF HAZARD^a</u>	<u>APPLICATION^b</u>	<u>APPLICABLE STANDARDS</u>
[Air gap]	[High or low hazard]	[Backsiphonage or backpressure]	[ASME A112.1.2]
[Air gap fittings for use with plumbing fixtures, appliances and appurtenances]	[High or low hazard]	[Backsiphonage or backpressure]	[ASME A112.1.3]
[Antisiphon type fill valves for gravity water closet flush tanks]	[High hazard]	[Backsiphonage only]	[ASSE 1002, CSA B 125.3]
[Backflow preventer for carbonated beverage machines]	[Low hazard]	[Backpressure or backsiphonage Sizes 1/4" – 3/8"]	[ASSE 1022]
[Backflow preventer with intermediate atmospheric vents]	[Low hazard]	[Backpressure or backsiphonage Sizes 1/4" – 3/4"]	[ASSE 1012, CAN/CSA B64.3]
[Barometric loop]	[High or low hazard]	[Backsiphonage only]	[(See Section 608.13.4)]
Double check backflow prevention assembly	Low hazard	Backpressure or backsiphonage Sizes 3/8" – 12"	ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double check detector fire protection backflow prevention assemblies	Low hazard	Backpressure or [systems] backsiphonage [(Fire sprinkler systems)] Sizes 2" – 12"	ASSE 1048
[Dual check valve type backflow preventer]	[Low hazard]	[Backpressure or backsiphonage Sizes 1/4" – 1"]	[ASSE 1024, CSA B64.6]
[Hose connection backflow preventer]	[High or low hazard]	[Low head backpressure, rated working pressure, backpressure or backsiphonage Sizes 1/2" – 1"]	[ASSE 1052, CSA B64.2.1.1]

<u>DEVICE</u>	<u>DEGREE OF HAZARD^a</u>	<u>APPLICATION^b</u>	<u>APPLICABLE STANDARDS</u>
[Hose connection vacuum breaker]	[High or low hazard]	[Low head backpressure or backsiphonage Sizes 1/2", 3/4", 1"]	[ASSE 1011, CAN/CSA B64.2, CSA B64.2.1]
[Laboratory faucet backflow preventer]	[High or low hazard]	[Low head backpressure and Backsiphonage]	[ASSE 1035, CSA B64.7]
[Pipe applied atmospheric type vacuum Breaker]	[High or low hazard]	[Backsiphonage only Sizes 1/4" - 4"]	[ASSE 1001, CAN/CSA B64.1.1]
Pressure vacuum breaker assembly ^c	High or low hazard	Backsiphonage[v] only Sizes 1/2" - 2"	ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow preventer	High or low hazard	Backpressure or backsiphonage Sizes 3/8" - 12"	ASSE 1013, AWWA C511, [CAN/]CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assemblies	High or low hazard	Backsiphonage or backpressure [(Fire sprinkler systems)]	ASSE 1047
[Spillproof] <u>Spill-resistant vacuum breaker assembly^c</u>	High or low hazard	Backsiphonage only [Backs] Sizes 1/4" - 2"	ASSE 1056
[Vacuum breaker wall hydrants, frost resistant, automatic draining type]	[High or low hazard]	[Low head backpressure or backsiphonage Sizes 3/4", 1"]	[ASSE 1019, CAN/CSA B64.2.2]
<u>Backflow preventer plumbing devices:</u>			
<u>Antisiphon-type fill valves for gravity water closet flush tanks</u>	<u>High hazard</u>	<u>Backsiphonage only</u>	<u>ASSE 1002, CSA B 125.3</u>
<u>Backflow preventer for carbonated beverage machines</u>	<u>Low hazard</u>	<u>Backpressure or backsiphonage Sizes 1/4" - 3/8"</u>	<u>ASSE 1022</u>

<u>DEVICE</u>	<u>DEGREE OF HAZARD^a</u>	<u>APPLICATION^b</u>	<u>APPLICABLE STANDARDS</u>
<u>Backflow preventer with intermediate atmospheric vents</u>	<u>Low hazard</u>	<u>Backpressure or backsiphonage</u> <u>Sizes 1/4" - 3/8"</u>	<u>ASSE 1012,</u> <u>CSA B64.3</u>
<u>Dual-check-valve-type backflow preventer</u>	<u>Low hazard</u>	<u>Backpressure or backsiphonage</u> <u>Sizes 1/4" - 1"</u>	<u>ASSE 1024, CSA</u> <u>B64.6</u>
<u>Hose connection backflow preventer</u>	<u>High or low hazard</u>	<u>Low head backpressure, rated working pressure, backpressure or backsiphonage</u> <u>Sizes 1/2" - 1"</u>	<u>ASME A112.21.3,</u> <u>ASSE 1052, CSA</u> <u>B64.2.1.1</u>
<u>Hose connection vacuum breaker</u>	<u>High or low hazard</u>	<u>Low head backpressure or backsiphonage</u> <u>Sizes 1/2", 3/4", 1"</u>	<u>ASME A112.21.3,</u> <u>ASSE 1011, CSA</u> <u>B64.2, CSA B64.2.1</u>
<u>Laboratory faucet backflow preventer</u>	<u>High or low hazard</u>	<u>Low head backpressure and backsiphonage</u>	<u>ASSE 1035, CSA</u> <u>B64.7</u>
<u>Pipe-applied atmospheric-type vacuum breaker</u>	<u>High or low hazard</u>	<u>Backsiphonage only</u> <u>Sizes 1/4" - 4"</u>	<u>ASSE 1001,</u> <u>CSA B64.1.1</u>
<u>Vacuum breaker wall hydrants, frost-resistant, automatic-draining type</u>	<u>High or low hazard</u>	<u>Low head backpressure or backsiphonage</u> <u>Sizes 3/4", 1"</u>	<u>ASME A112.21.3,</u> <u>ASSE 1019,</u> <u>CSA B64.2.2</u>
<u>Other means or methods:</u>			
<u>Air gap</u>	<u>High or low hazard</u>	<u>Backsiphonage or backpressure</u>	<u>ASME A112.1.2</u>
<u>Air gap fittings for use with plumbing fixtures, appliances and appurtenances</u>	<u>High or low hazard</u>	<u>Backsiphonage or backpressure</u>	<u>ASME A112.1.3</u>
<u>Barometric loop</u>	<u>High or low hazard</u>	<u>Backsiphonage only</u>	<u>(See Section</u> <u>608.13.4)</u>

[~~Sizes listed in inches.~~] For SI: 1 inch = 25.4 mm.

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

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

608.3 Devices, appurtenances, appliances and apparatus. [~~All devices~~] 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~~] prevention assembly, an atmospheric or [~~spill-proof~~] spill-resistant vacuum breaker assembly or an air gap. Vacuum breakers for bedpan washer hoses shall not be located less than 5 feet (1524 mm) above the floor. Vacuum breakers for hose connections in health care or laboratory areas shall not be less than 6 feet (1829 mm) above the floor.

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

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

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

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

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

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

608.8 Identification of nonpotable water systems. [~~In buildings where~~] Where nonpotable water systems are installed, the piping conveying the nonpotable water shall be identified either by color marking[~~or~~] , metal tags or tape in accordance with Sections 608.8.1 through [~~608.8.3~~] 608.8.2.3. [~~All nonpotable~~]

608.8.1 Signage required. Nonpotable water outlets, such as hose connections, open ended pipes[;] and faucets, shall be identified [at the point of use] with signage that reads as follows: “Nonpotable water is utilized for [each outlet with the words, “Caution. Nonpotable Water. Do Not Drink.”] (application name). **CAUTION: NONPOTABLE WATER – DO NOT DRINK.**” The words shall be legibly and indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than [0.5 inches] **0.5 inch (12.7 mm)** in height and [color] **in colors** in contrast to the background on which they are applied. In addition to the required wordage, the pictograph shown in Figure 608.8.1 shall appear on the required signage.



FIGURE 608.8.1
PICTOGRAPH—DO NOT DRINK

~~[608.8.1 Information.]~~**608.8.2 Distribution pipe labeling and marking.** Nonpotable distribution piping shall be purple in color and shall be embossed, or integrally stamped or marked, with the words: “CAUTION: NONPOTABLE WATER – DO NOT DRINK” or the piping shall be installed with a purple identification tape or wrap. Pipe identification shall include the contents of the piping system and an arrow indicating the direction of flow. Hazardous piping systems shall also contain information addressing the nature of the hazard. Pipe identification shall be repeated at [maximum] intervals [of] not exceeding 25 feet (7620 mm) and at each point where the piping passes through a wall, floor or roof. Lettering shall be readily observable within the room or space where the piping is located.

~~[608.8.2]~~ **608.8.2.1 Color.** The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify nonpotable[recycled, rain and gray] water distribution systems.

~~[608.8.3 Size.]~~ **608.8.2.2 Lettering size.** The size of the background color field and lettering shall comply with Table ~~[608.8.3]~~ 608.8.2.2.

TABLE [608.8.3] 608.8.2.2
SIZE OF PIPE IDENTIFICATION

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

For SI 1 inch = 25.4 mm.

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

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

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

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

608.12 Pumps and other appliances. Water pumps, filters, softeners, tanks and [aH]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] 608.13.10 and tested and inspected in accordance with Chapter 3.

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

608.13.2 Reduced pressure principle backflow [preventers] prevention assemblies. Reduced pressure principle backflow [preventers] prevention assemblies shall conform to ASSE 1013, AWWA C511, CSA B64.4 or CSA B64.4.1. Reduced pressure detector assembly backflow preventers shall conform to ASSE 1047. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge

by air gap and shall be prevented from being submerged. [~~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~~] CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged.

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

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

608.13.6 Atmospheric-type vacuum breakers. [~~Pipe-applied~~] Pipe applied atmospheric-type vacuum breakers shall conform to ASSE 1001 or [~~CAN/CSA B64.1.1~~] CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASME A112.21.3, ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, [CAN/CSA B64.2]CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, [CAN/CSA B64.2.2] 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~~] check backflow prevention assemblies. Double [~~check-valve~~] check backflow prevention assemblies shall conform to ASSE 1015, CSA B64.5, CSA B64.5.1[~~2~~] or AWWA C510. [~~Double detector check-valve~~] Double check detector fire protection backflow prevention assemblies shall conform to ASSE 1048. These [~~devices~~] assemblies 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~~] Spill-resistant pressure vacuum [breakers] breaker assemblies. [~~Spillproof~~] Spill-resistant pressure vacuum [breakers-(SVB)] breaker assemblies shall conform to ASSE 1056 or CSA B64.1.3. These [~~devices~~] assemblies are designed for installation under continuous-pressure conditions [~~when~~] where the critical level is installed at the required height.

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

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

608.14 Location of backflow preventers. Access shall be provided to backflow preventers as specified by the [~~installation~~] manufacturer's 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[7] or 608.15.4.2.

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

**TABLE 608.15.1
MINIMUM REQUIRED AIR GAPS**

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

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

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

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

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

608.15.4 Protection by a vacuum breaker. Openings and outlets shall be protected by atmospheric-type or pressure-type vacuum breakers. The critical level of the vacuum breaker shall be set [~~a minimum of~~] not less than 6 inches (152 mm) above the flood level rim of the fixture or device. Fill valves shall be set in accordance with Section 425.3.1. Vacuum breakers shall not be installed under exhaust hoods or similar that will contain toxic fumes or vapors. Pipe-applied vacuum breakers shall be installed not less than 6 inches (152 mm) above the flood level rim of the fixture, receptor or device served.

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

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

Exceptions:

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

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

608.16.1 Beverage dispensers. The water supply connection to [~~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/h (820 kW) shall be equipped~~]

~~with at least one water sub-meter to measure the amount of water supplied through such lines to such boilers. Water sub-meters shall be those models 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.]~~

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

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

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

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

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

Exceptions:

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

608.16.4.1 Additives or nonpotable source. Where systems under continuous pressure contain chemical additives or antifreeze, or where systems are connected to a nonpotable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevention assembly or a reduced pressure detector fire protection backflow prevention assembly. Where chemical additives or antifreeze are added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle backflow ~~preventer~~ prevention assembly or the reduced pressure detector fire protection backflow prevention assembly shall be permitted to be located so as to isolate that portion of the system. Where systems are not under continuous pressure, the potable water supply shall be protected against backflow by an air gap or ~~a pipe applied~~ an atmospheric vacuum breaker conforming to ASSE 1001 or [CAN/CSA B64.1.1] 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~~ atmospheric vacuum breaker, a ~~pressure-type~~ pressure vacuum breaker assembly or a reduced pressure principle backflow ~~preventer~~ prevention assembly. ~~A valve~~ Valves shall not be installed downstream

from an atmospheric vacuum breaker. Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow ~~[preventer]~~ prevention assembly.

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

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

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

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

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

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

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

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

SOURCE OF CONTAMINATION	DISTANCE (feet)
Barnyard	100
Farm silo	25
Pasture	100
Pumphouse floor drain of cast iron draining to ground surface	2

SOURCE OF CONTAMINATION	DISTANCE (feet)
Seepage pits	50
Septic tank	25
Sewer	10
Subsurface disposal fields	50
Subsurface pits	50

For SI: 1 foot = 304.8 mm.

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

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

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

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

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

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

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

SECTION PC 609 HEALTH CARE PLUMBING

609.1 Scope. This section shall govern those aspects of health care plumbing systems that differ from plumbing systems in other structures. Health care plumbing systems shall conform to the requirements of this section in addition to the other requirements of this code. The provisions of this section shall apply to the special devices and equipment installed and maintained in the following occupancies: hospitals, nursing homes, homes for the aged, orphanages, infirmaries, first aid stations, psychiatric facilities, clinics, professional offices of dentists and doctors, mortuaries,

educational facilities, surgery, dentistry, research and testing laboratories, establishments manufacturing pharmaceutical drugs and medicines, animal care facilities, and other structures with similar apparatus and equipment classified as plumbing.

609.2 Water service. [~~All hospitals~~] 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~~] not less than 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~~] 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~~] 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”~~] “inplant” fabrication of a system or to a modular portion of a system.

1. The pipe system shall be flushed with clean, potable water until dirty water does not appear at the points of outlet.
2. The system or part thereof shall be filled with a water/chlorine solution containing [~~at least~~] not less than 50 parts per million (50 mg/L) of chlorine, and the system or part thereof shall be valved off and allowed to stand for 24 hours; or the system or part thereof shall be filled with a water/chlorine solution containing [~~at least~~] not less than 200 parts per million (200 mg/L) of chlorine and allowed to stand for 3 hours.

3. Following the required standing time, the system shall be flushed with clean potable water until the chlorine is purged from the system.
4. The procedure shall be repeated where shown by a bacteriological examination that contamination remains present in the system.

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

SECTION PC 611 DRINKING WATER TREATMENT UNITS

611.1 Design. Drinking water treatment units shall meet the requirements of NSF 42, NSF 44, NSF 53~~[-0F]~~ , NSF 62 or CSA B483.1.

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

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

SECTION PC 612 SOLAR SYSTEMS

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

SECTION PC 613 TEMPERATURE CONTROL DEVICES AND VALVES

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

SECTION PC 614 EMERGENCY DRINKING WATER ACCESS

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

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

614.1.1 Emergency water fixture. Fixtures capable of supplying an emergency source of potable water in accordance with this section shall consist of a faucet conforming to Section

[PE] 424 or a fixture conforming to Section [PE] 424 that is capable of attaching to a splitter either:

1. a sink conforming to Section [PE] 418; or
2. a floor drain conforming to Section [PE] 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.

PART G

CHAPTER 7

§1. Chapter 7 of the New York city plumbing code, as added by local law number 99 for the year 2005, sections 701.2, 701.3,701.4, 701.5, 701.8, 701.10, tables 702.1, 702.2, and 702.3, section and table 702.4, section 702.6, figure 704.6, sections 705.5.2, 705.5.3,705.11.1, 705.13.2, 705.16 through 705.18 and 705.20, section 708.3.3, table 709.1, section 709.2, table 710.1, and sections 713.11.2, 713.11.3, as amended by local law number 41 for the year 2012 and section 703.6.1 as added by such local law; sections 705.2.1, 705.4.2, 705.9.2, 705.10.2, 705.12.2, 705.14.1 as amended by local law number 71 for the year 2009; sections 705.19 and table 705.22 as amended by local law number 141 for the year 2014; and section 715.1 as amended by local law number 83 for the year 2013, is amended to read as follows:

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~~] Buildings 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~~] 107.6.1 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]~~ A 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]~~ Waste 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]~~ **701.7 Engineered systems.** Engineered sanitary drainage systems shall conform to the provisions of Section 28-113.2.2 of the *Administrative Code* and ~~[PC]~~ 714 of this code.

~~[701.9]~~ **701.8 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]~~ **701.9 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]~~ Section 803 ~~[and PC 804]~~.

701.10 Cured-in-place pipe. Cured-in-place pipe (CIPP) and epoxy spray pipe lining systems shall not be used.

701.11 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.

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
ABOVE-GROUND DRAINAGE AND VENT PIPE**

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters, including Schedule 40, DR 22 (PS 200) and DR 24 (PS 140); with a solid, cellular core or composite wall ^a	ASTM D 2661; ASTM F 628; ASTM F 1488; CSA B181.1
Brass pipe	ASTM B 43
Cast-iron pipe	ASTM A 74; ASTM A 888; CISPI 301
Copper or copper-alloy pipe	ASTM B 42; ASTM B 302
Copper or copper-alloy tubing (Type [K, L] <u>K or L</u>)	ASTM B 75; ASTM B 88; ASTM B 251 [; ASTM B 306]
Ductile iron	[AWWA C 151] <u>AWWA C151</u>
Galvanized steel pipe	ASTM A 53
[Glass pipe]	[ASTM C 1053]
[High silicon cast iron]	[ASTM A 518 A/518 M]
[Polyolefin pipe^a]	[ASTM F 1412; ASTM D 2657; CAN/CSA B 181.3]
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including [schedule] <u>Schedule</u> 40, DR 22 (PS 200), and DR 24 (PS 140); with a solid, cellular core or composite wall ^a	ASTM D 2665; ASTM F 891; ASTM F 1488; CSA B181.2
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. and a solid, cellular core or composite wall ^a	ASTM D 2949; ASTM F 1488
[Polyvinylidene fluoride (PVDF) plastic pipe^{a†}]	[ASTM F 1673; CAN/CSA B 181.3]
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1

For SI: 1 inch = 25.4 mm.

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

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**

MATERIAL	STANDARD
Cast-iron pipe	ASTM A 74; ASTM A 888; CISPI 301
Copper or copper-alloy tubing (Type K or L)	ASTM B 75; ASTM B 88; ASTM B 251[; ASTM B 306]
Ductile iron	[AWWA C 151] <u>AWWA C151</u>
[Nonasbestos fiber cement pipe]	[ASTM C 1449]
<u>Polyolefin pipe</u>	<u>ASTM F 1412; CSA B181.3</u>
Polyvinyl chloride (PVC) plastic pipe in IPS diameters, including [schedule] <u>Schedule 40, DR 22 (PS 200), and DR 24 (PS 140)</u> ; with a solid, cellular core or composite wall ^a	ASTM D 2665; ASTM F 891; ASTM F 1488; CSA B181.2
Stainless steel drainage systems, Type 316L	ASME A112.3.1

For SI: 1 inch = 25.4 mm.

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

702.3 Building [~~sewer~~] drain pipe. Building [~~sewer~~] drain pipe shall conform to one of the standards listed in Table 702.3.

**TABLE 702.3
BUILDING [~~SEWER~~] DRAIN PIPE**

MATERIAL	STANDARD
Cast-iron pipe	ASTM A 74; ASTM A 888; CISPI 301
<u>Chlorinated polyvinyl chloride (CPVC) plastic^a</u>	<u>ASTM F 437; ASTM F 438; ASTM F 439</u>
[Concrete pipe]	[ASTM C 14; ASTM C 76; CAN/CSA A257.1M; CAN/CSA A257.2M]

MATERIAL	STANDARD
Copper or copper-alloy tubing (Type K or L)	ASTM B 75; ASTM B 88; ASTM B 251
Ductile iron	AWWA C151
<u>Galvanized steel pipe</u>	<u>ASTM A 53; ASTM A 123</u>
[Nonasbestos fiber cement pipe]	[ASTM C 1449]
Polyvinyl chloride (PVC) plastic pipe (Type DWV, SDR26, SDR35, SDR41, PS50 or PS100) ^a	ASTM D 2665; ASTM D 3034; ASTM F 891; CSA B182.2; [CAN/] CSA B182.4; CSA B181.2
Stainless steel drainage systems, Types 304 and 316L	ASME A112.3.1
[Vitrified clay pipe]	[ASTM C 4; ASTM C 700]

For SI: 1 inch = 25.4 mm.

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**

MATERIAL	STANDARD
Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters ^a	ASTM D 2661; ASTM F 628; CSA B181.1
[Acrylonitrile] <u>Acrylonitrile</u> butadiene styrene (ABS) plastic pipe in sewer and drain diameters	ASTM D 2751
Brass	ASTM B 62
Cast iron	[ASME B 16.4; ASME B 16.12;] <u>ASME B16.4; ASME B16.12;</u> ASTM A 74; ASTM A 888; CISPI 301
<u>Chlorinated polyvinyl chloride (CPVC) plastic^a</u>	<u>ASTM F 437; ASTM F 438; ASTM F 439</u>

MATERIAL	STANDARD
Copper or copper alloy	[ASME B 16.15; ASME B 16.18; ASME B 16.22; ASME B 16.23; ASME B 16.26; ASME B 16.29] <u>ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29</u>
Galvanized steel	ASTM A 153; [ASME B 16.3] <u>ASME B16.3</u>
[Glass]	[ASTM C 1053]
Ductile iron	[AWWA C 110] <u>AWWA C110</u>
[High silicon iron]	[ASTM A 861]
Malleable iron	[ASME B 16.3] <u>ASME B16.3</u>
[Non-asbestos fiber cement]	[ASTM C 1449]
<u>Polyethylene (PE) plastic pipe^a</u>	<u>ASTM F 2306/F 2306M</u>
[Polyolefin ^{a1}]	[CAN/CSA B181.3; ASTM F 1312; ASTM D 2657]
Polyvinyl chloride (PVC)[Plastic] <u>plastic</u> in IPS diameters ^a	ASTM D 2665; ASTM F 1866
Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters ^a	ASTM D 3034
Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D. ^a	ASTM D 2949
[Polyvinylidene fluoride (PVDF) plastic pipe ^{a1}]	[ASTM F 1673; CAN/CSA B181.3]
Stainless steel drainage systems, Types 304 and 316L	[ASME A 112.3.1] <u>ASME A 112.3.1</u>
[Vitrified clay pipe]	[ASTM C 425]

For SI: 1 inch = 25.4 mm.

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

702.5 Temperature rating. Where the waste water temperature will be greater than 140°F (60°C), the sanitary drainage piping material shall be rated for the highest temperature of the waste water.

~~[702.5]~~ **702.6 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]~~ constructed in accordance with Section 803.3.

~~[702.6]~~ **702.7 Lead bends and traps.** ~~[Lead]~~ The wall thickness of lead bends and traps shall be not [be] less than 1/8 inch (3.2 mm)[-wall thickness].

SECTION PC 703 BUILDING ~~[SEWER]~~ DRAIN

703.1 Building ~~[sewer]~~ drain pipe near the water service. Where the building ~~[sewer]~~ drain is installed underground and within 5 feet (1524 mm) of the water service, as provided for in Section 603.2, the building ~~[sewer]~~ drain 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, nonasbestos fiber cement or concrete pipe listed in Table 702.3.

703.3 Sanitary and storm ~~[sewers]~~ drains. 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]~~ drains. Cleanouts on building ~~[sewers]~~ drains shall be located as set forth in Section ~~[PC]~~ 708.

703.6 Combined sanitary and storm public sewer. Where the public sewer is a combined system for both sanitary and storm water, the sanitary building drain shall be connected in accordance with Section 1109.1.

~~[703.6]~~ **703.7 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]~~ in accordance with Section 1002.6.

~~[703.6.1]~~ **703.7.1 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] the building 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).

703.7.2 Fresh air inlets located in flood hazard areas. Fresh air inlets located in flood hazard areas shall be located above the design flood elevation in accordance with Section G304 of Appendix G of the *New York City Building Code*.

**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]~~ not less than that indicated in Table 704.1.

**TABLE 704.1
SLOPE OF HORIZONTAL DRAINAGE PIPE**

SIZE (inches)	MINIMUM SLOPE (inch per foot)
2 ¹ / ₂ or less	1/4
3 to 6	1/8
8 or larger	1/16

For SI: 1 inch = 25.4 mm, 1 inch per foot = ~~[83.3]~~ 83.33 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]~~ 4-inch by ~~[3-inch]~~ 3-inch (102 mm by 76 mm) water closet connection shall not be considered as a reduction in size.

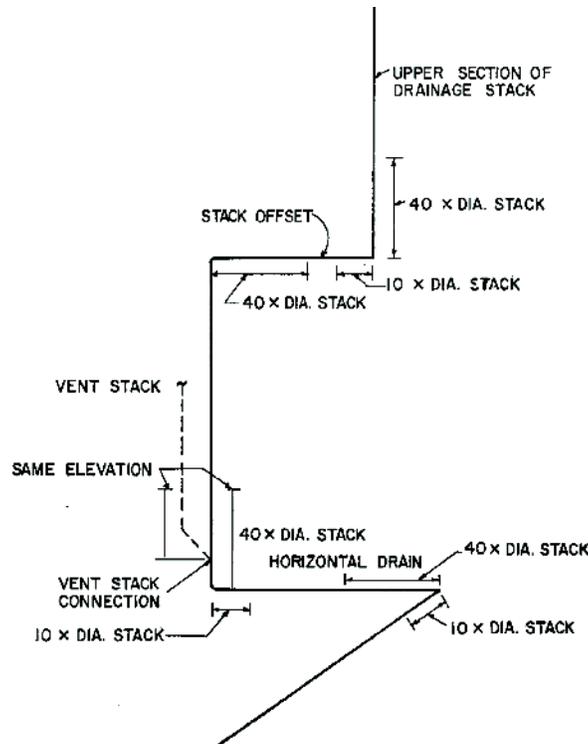
704.3 Connections to offsets and bases of stacks. Horizontal branches shall connect to the bases of stacks at a point located not less than 10 times the diameter of the drainage stack downstream from the stack. ~~[Except as prohibited by Section 711.2, horizontal]~~ Horizontal branches shall connect 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 three-quarters the diameter of the piping in which the pressure zone occurs, but not less than 2 inches (51 mm). 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)]~~ Figure 704.6.
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.



**FIGURE [704.6(2)] 704.6
SUDS PRESSURE ZONES**

704.7 Collection pipe labeling and marking. Collection piping that conveys untreated water for reuse shall be painted gray in color or covered in a gray jacket and shall be labelled, embossed, or integrally stamped or marked, with the words: “CAUTION: UNTREATED WATER FOR RE-USE” or the piping shall be installed with a gray identification tape or wrap. Pipe identification shall include the contents of the piping system and an arrow indicating the direction of flow. Hazardous piping systems shall also contain information addressing the nature of the hazard. Pipe identification shall be repeated at intervals not exceeding 25 feet (7620 mm) and at each point where the piping passes through a wall, floor or roof. Lettering shall be readily observable within the room or space where the piping is located.

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~~] 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]~~ 705.3.1 through ~~[705.4.4]~~ 705.3.4.~~

~~**[705.4.1] 705.3.1 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] 705.3.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.~~

~~**[705.4.3] 705.3.3 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] 705.3.4 Welded joints.** All joint surfaces shall be cleaned. The joint shall be welded with an approved filler metal.~~

~~**[705.5] 705.4 Cast iron.** Joints between cast-iron pipe or fittings shall comply with Sections ~~[705.5.1]~~ 705.4.1 through ~~[705.5.3]~~ 705.4.3.~~

~~**[705.5.1] 705.4.1 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]~~ 1/8 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] 705.4.2 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] 705.4.3 Mechanical joint coupling.** Mechanical joint couplings for hubless pipe and fittings shall consist of an elastomeric sealing sleeve and a metallic shield that comply with CISPI 310~~[-Ø]~~, ASTM C 1277 or ASTM C 1540. The elastomeric sealing sleeve shall conform to ASTM C 564 or ~~[CAN/CSA B602]~~ 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]~~ **705.5 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]~~ CSA A257.3M or ~~[CAN/CSA B602]~~ CSA B602.

~~[705.7 Reserved.]~~

~~[705.8 Reserved.]~~

~~[705.9]~~ **705.6 Copper pipe.** Joints between copper or copper-alloy pipe or fittings shall comply with Sections ~~[705.9.1]~~ 705.6.1 through ~~[705.9.5]~~ 705.6.5.

~~[705.9.1]~~ **705.6.1 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]~~ **705.6.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

~~[705.9.3]~~ **705.6.3 ~~[Soldered]~~ Solder joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. ~~[All-cut]~~ 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]~~ **705.6.4 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]~~ **705.6.5 Welded joints.** All joint surfaces shall be cleaned. The joint shall be welded with an approved filler metal.

~~[705.10]~~ **705.7 Copper tubing.** Joints between copper or copper-alloy tubing or fittings shall comply with Sections ~~[705.10.1]~~ 705.7.1 through ~~[705.10.3]~~ 705.7.3.

~~[705.10.1]~~ **705.7.1 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]~~ **705.7.2 Mechanical joints.** Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

~~[705.10.3]~~ **705.7.3 ~~[Soldered]~~ Solder joints.** Solder joints shall be made in accordance with the methods of ASTM B 828. ~~[All-cut]~~ 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.]

705.8 Reserved.

~~[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 1/8 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]~~ **705.9 Steel.** Joints between galvanized steel pipe or fittings shall comply with Sections ~~[705.12.1]~~ 705.9.1 and ~~[705.12.2]~~ 705.9.2.

~~[705.12.1]~~ **705.9.1 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]~~ **705.9.2 Mechanical joints.** Joints shall be made with an approved elastomeric seal. Mechanical joints shall be installed in accordance with the manufacturer's instructions and in conformance with acceptance criteria established by the commissioner.

~~[705.13]~~ **705.10 Lead.** Joints between lead pipe or fittings shall comply with Sections ~~[705.13.1]~~ 705.10.1 and ~~[705.13.2]~~ 705.10.2.

~~[705.13.1]~~ **705.10.1 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]~~ **705.10.2 Wiped.** Joints shall be fully wiped, with an exposed surface on each side of the joint not less than ¾ inch (19.1 mm). The joint shall be ~~[at least]~~ not less than ⅜ inch (9.5 mm) thick at the thickest point.

~~[705.14]~~ **705.11 PVC plastic.** Joints between PVC plastic pipe or fittings shall comply with Sections ~~[705.14.1]~~ 705.11.1 through ~~[705.14.3]~~ 705.11.3.

~~[705.14.1]~~ **705.11.1 Mechanical joints.** Mechanical joints on drainage pipe shall be made with an elastomeric seal conforming to ASTM C 1173, ASTM D 3212 or ~~[CAN/CSA B602]~~ 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]~~ **705.11.2 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 B 137.3, CSA B 181.2 or CSA B 182.1]~~ CSA B137.3, CSA B181.2 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.

Exception: A primer is not required where both of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The solvent cement is used only for joining PVC drain, waste and vent pipe and fittings in nonpressure applications in sizes up to and including 4 inches (102 mm) in diameter.

~~[705.14.3]~~ **705.11.3 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]~~ **705.12** **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]~~ CSA B602.

~~[705.16]~~ **705.13** **Polyethylene plastic pipe.** Joints between polyethylene plastic pipe and fittings shall be underground and shall comply with Section ~~[705.16.1]~~ 705.13.1 or ~~[705.16.2]~~ 705.13.2.

~~[705.16.1]~~ **705.13.1** **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 2657 and the manufacturer's instructions.

~~[705.16.2]~~ **705.13.2** **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]~~ 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.]~~

705.14 Reserved.

~~[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 plastic pipe and fittings shall comply with Sections ~~705.18.1 and 705.18.2.]~~

705.15 Reserved.

~~[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]~~ **705.16** **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]~~ CSA A257.3M or ~~[CAN/CSA B602]~~ CSA B602, or as required in Sections ~~[705.19.1, 705.19.3, 705.19.4 and 705.19.7]~~ 705.16.1 through 705.16.7. 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] 705.16.1 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.] 705.16.2 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 converter fitting or dielectric fitting. The copper tubing shall be soldered to the fitting in an approved manner, and the fitting shall be screwed to the threaded pipe.

[705.19.3] 705.16.3 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] 705.16.4 Plastic pipe or tubing to other piping material. Joints between different ~~grades~~ types 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] 705.16.5 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] 705.16.6 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] 705.16.7 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] 705.17 Drainage slip joints. Slip joints shall comply with Section 405.8.

[705.21] 705.18 Caulking ferrules. Ferrules shall be of red brass and shall be in accordance with ~~Table 705.21~~ Table 705.18.

**TABLE [705.21] 705.18
CAULKING FERRULE SPECIFICATIONS**

PIPE SIZES (inches)	INSIDE DIAMETER (inches)	LENGTH (inches)	MINIMUM WEIGHT EACH
2	2 ¹ / ₄	4 ¹ / ₂	1 pound
3	3 ¹ / ₄	4 ¹ / ₂	1 pound 12 ounces
4	4 ¹ / ₄	4 ¹ / ₂	2 pounds 8 ounces

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

[705.22] 705.19 Soldering bushings. Soldering bushings shall be of red brass and shall be in accordance with ~~[Table 705.22]~~ Table 705.19.

**TABLE ~~[705.22]~~ 705.19
SOLDERING BUSHING SPECIFICATIONS**

PIPE SIZES (inches)	MINIMUM WEIGHT EACH
1 ¹ / ₄	6 ounces
1 ¹ / ₂	8 ounces
2	14 ounces
2 ¹ / ₂	1 pound 6 ounces
3	2 pounds
4	3 pounds 8 ounces

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

[705.23] 705.20 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. This section shall not be applicable to tubular waste fittings used to convey vertical flow upstream of the trap seal liquid level of a fixture trap.

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 706.3
FITTINGS FOR CHANGE IN DIRECTION**

TYPE OF FITTING PATTERN	CHANGE IN DIRECTION		
	Horizontal to vertical	Vertical to horizontal	Horizontal to horizontal
Sixteenth bend	X	X	X
Eighth bend	X	X	X
Sixth bend	X	X	X
Quarter bend	X	X ^a	X ^a
Short sweep	X	X ^{a,b}	X ^a
Long sweep	X	X	X
Sanitary tee	X ^c	[³ / ₄] =	[³ / ₄] =
Wye	X	X	X
Combination wye and eighth bend	X	X	X

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.

706.4 Reserved.

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

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. Plugs shall have 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] Cleanouts required. Cleanouts shall be [located] provided for drainage piping in accordance with Sections [708.3.1] 708.1.1 through [708.3.4] 708.1.12.

[708.3.1] 708.1.1 Horizontal drains [within buildings] and building drains. [All horizontal drains] Horizontal drainage pipes in buildings shall [be provided with] have cleanouts located at intervals of not more than 100 feet (30 480 mm) [apart]. Building drains shall have cleanouts located at intervals of not more than 100 feet (30 480 mm).

Exception: Horizontal fixture drain piping serving a nonremovable trap shall not be required to have a cleanout for the section of piping between the trap and the vent connection for such trap.

[708.3.2] 708.1.2 Building sewers. Building sewers smaller than 8 inches (203 mm) shall [be provided with] have cleanouts located at intervals of not more than 100 feet (30 480 mm)[apart measured from the upstream entrance of the cleanout]. [For building] Building sewers 8 inches (203 mm) and larger[, manholes shall be provided and] shall have a manhole 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.] The interval length shall be measured from the cleanout or manhole opening, along the developed length of the piping to the next drainage fitting providing access for cleaning, a manhole or the end of the building sewer.

708.1.3 Building drain and building sewer junction. The junction of the building drain and the building sewer shall be served by a cleanout that is located at the junction or within 10 feet (3048 mm) of the developed length of piping upstream of the junction. For the requirements of this section, the cleanout access shall not be provided by water closet removal.

[708.3.3] 708.1.4 Changes of direction. [Cleanouts shall be installed at each] Where a horizontal drainage pipe, a building drain or a building sewer has a change of horizontal 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] a cleanout shall be installed at the change of direction. Where more than one change of horizontal direction greater than 45 degrees (0.79 rad) occurs [in a run of piping, only one cleanout shall be required for each] within 40 feet (12 192 mm) of developed length of [the drainage-] piping, the cleanout installed for the first change of direction shall serve as the cleanout for all changes in direction within that 40 feet (12 192 mm) of developed length of piping.

708.1.5 Cleanout size. Cleanouts shall be the same size as the piping served by the cleanout, except that cleanouts for piping larger than 4 inches (102 mm) need not be larger than 4 inches (102 mm).

Exceptions:

1. A removable P-trap with slip or ground joint connections can serve as a cleanout for drain piping that is one size larger than the P-trap size.

2. Cleanouts located on stacks can be one size smaller than the stack size.
3. The size of cleanouts for cast-iron piping can be in accordance with the referenced standards for cast-iron fittings as indicated in Table 702.4.

708.1.6 Cleanout plugs. Cleanout plugs shall be of brass, plastic or other approved materials. Cleanout plugs for borosilicate glass piping systems shall be of borosilicate glass. Brass cleanout plugs shall conform to ASTM A 74 and shall be limited for use only on metallic piping systems. Plastic cleanout plugs shall conform to the referenced standards for plastic pipe fittings, as indicated in Table 702.4. Cleanout plugs shall have a raised square head, a countersunk square head or a countersunk slot head. Where a cleanout plug will have a trim cover screw installed into the plug, the plug shall be manufactured with a blind end threaded hole for such purpose.

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

~~[708.3.5]~~ **708.1.7 Manholes.** Manholes ~~[serving a building drain shall have secured gas-tight covers and shall be located in accordance with Section 708.3.2.]~~ and manhole covers shall be of an approved type. Manholes located inside of a building shall have gas-tight covers that require tools for removal.

708.1.8 Installation arrangement. The installation arrangement of a cleanout shall enable cleaning of drainage piping only in the direction of drainage flow.

Exceptions:

1. Test tees serving as cleanouts.
2. A two-way cleanout installation that is approved for meeting the requirements of Section 708.1.3.

708.1.9 Required clearance. Cleanouts for 6-inch (153 mm) and smaller piping shall be provided with a clearance of not less than 18 inches (457 mm) from, and perpendicular to, the face of the opening to any obstruction. Cleanouts for 8-inch (203 mm) and larger piping shall be provided with a clearance of not less than 36 inches (914 mm) from, and perpendicular to, the face of the opening to any obstruction.

708.1.10 Cleanout access. Required cleanouts shall be provided with access. 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. Cleanouts with openings at a finished wall shall have the face of the opening located within 1½ inches (38 mm) of the finished wall surface. Cleanouts located below grade shall be extended to grade level so that the top of the cleanout plug is at or above grade. A cleanout installed in a floor or walkway that will not have a trim cover installed shall have a countersunk plug installed so the top surface of the plug is flush with the finished surface of the floor or walkway.

708.1.10.1 Cleanout plug trim covers. Trim covers and access doors for cleanout plugs shall be designed for such purposes and shall be approved. Trim cover fasteners that thread into cleanout plugs shall be corrosion resistant. Cleanout plugs shall not be covered with mortar, plaster or any other permanent material.

709.1.10.2 Floor cleanout assemblies. Where it is necessary to protect a cleanout plug

from the loads of vehicular traffic, cleanout assemblies in accordance with ASME A112.36.2M shall be installed.

708.1.11 Prohibited use. The use of a threaded cleanout opening to add a fixture or to extend piping shall be prohibited except where another cleanout of equal size is installed with the required access and clearance.

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

~~[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**

FIXTURE TYPE	DRAINAGE FIXTURE UNIT VALUE AS LOAD FACTORS	MINIMUM SIZE OF TRAP (inches)
Automatic clothes washers, commercial ^{a,g}	3	2
Automatic clothes washers, residential ^g	2	2
Bathroom group as defined in Section 202[(1.6 gpf water closet)] ^f	5	—
[Bathroom group as defined in Section 202 (water closet flushing greater than 1.6 gpf)] ^f	[6]	[—]
Bathtub ^b (with or without overhead shower or whirlpool attachments)	2	1½
Bidet	1	[1½] 1¼
Combination sink and tray	2	1½
Dental lavatory	1	[1½] 1¼
Dental unit or cuspidor	1	1¼
Dishwashing [machine, ^e] <u>machine</u> ^c , domestic	2	1½
Drinking fountain	½	1¼
<u>Emergency floor drain</u>	<u>0</u>	<u>2</u>
Floor drains	2 ^h	3
Floor sinks	Note h	2
<u>Hand wash sinks and lavatories (circular or multiple) each faucet</u>	<u>2</u>	<u>1½</u>
Kitchen sink, domestic	2	2
Kitchen sink, domestic with food waste [grinder] <u>disposer</u> and/or dishwasher	2	2
Laundry tray (1 or 2 compartments)	2	2

FIXTURE TYPE	DRAINAGE FIXTURE UNIT VALUE AS LOAD FACTORS	MINIMUM SIZE OF TRAP (inches)
Lavatory	1	[1 ^{1/2}] 1 ^{1/4}
<u>Multiple (gang) shower (based on the total flow rate through shower heads and body sprays)</u> <u>Flow rate:</u> <u>5.7 gpm or less</u> <u>Greater than 5.7 gpm to 12.3 gpm</u> <u>Greater than 12.3 gpm to 25.8 gpm</u> <u>Greater than 25.8 gpm to 55.6 gpm</u>	 <u>2</u> <u>3</u> <u>5</u> <u>6</u>	 <u>2</u> <u>2</u> <u>3</u> <u>4</u>
Shower	2	2
Sink	2	2
Urinal	4	Note d
Urinal, 1 gallon per flush or less	2 ^e	Note d
<u>Urinal, nonwater supplied</u>	<u>1/2</u>	<u>Note d</u>
[Wash sink (circular or multiple) each set of faucets]	[2]	[1 ^{1/2}]
Water closet, flushometer, tank, public or private	4 ^e	Note d
[Water closet, private (flushing greater than 1.6 gpf)]	[3 ^e]	[Note d]
[Water closet, public (1.6 gpf)]	[4 ^e]	[Note d]
[Water closet, public (flushing greater than 1.6 gpf)]	[6 ^e]	[Note d]

For SI: 1 inch = 25.4 mm, 1 gallon = 3.785 L, gpf = gallon per flushing cycle, gpm = gallon per minute.

- a. For traps larger than 3 inches, use Table 709.2.
- b. A showerhead over a bathtub or whirlpool bathtub attachment does not increase the drainage fixture unit value.
- c. See Sections 709.2 through [709.4] 709.4.1 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 confirmed by testing.
- f. For fixtures added to a [dwelling unit] bathroom group, add the [DFU] 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 and 709.4.1.

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 1^{1/4}

inches (32 mm).

**TABLE 709.2
DRAINAGE FIXTURE UNITS FOR FIXTURE DRAINS OR TRAPS**

FIXTURE DRAIN OR TRAP SIZE (inches)	DRAINAGE FIXTURE UNIT VALUE
1 ¹ / ₄	1
1 ¹ / ₂	2
2	3
2 ¹ / ₂	4
3	5
4	6

For SI: 1 inch = 25.4 mm.

709.3 Values for continuous and semicontinuous flow. Drainage fixture unit values for continuous and semicontinuous flow into a drainage system shall be computed on the basis that 1 gpm (0.06 L/s) of flow is equivalent to two fixture units.

709.4 Values for indirect waste receptor. The drainage fixture unit load of an indirect waste receptor receiving the discharge of indirectly connected fixtures shall be the sum of the drainage fixture unit values of the fixtures that discharge to the receptor, but not less than the drainage fixture unit value given for the indirect waste receptor in Table 709.1 or 709.2.

709.4.1 Clear-water waste receptors. Where waste receptors such as funnel drains, floor sinks and hub drains receive only clear-water waste from display cases, refrigerated display cases, ice bins, coolers and freezers, such receptors shall have a drainage fixture unit value of one-half.

**SECTION PC 710
DRAINAGE SYSTEM SIZING**

710.1 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).

**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			
	Slope per foot			
	1/16 inch	1/8 inch	1/4 inch	1/2 inch
1 1/4	—	—	1	1
1 1/2	—	—	3	3
2	—	—	21	26
2 1/2	—	—	24	31
3	—	36	42	50
4	—	180	216	250
5	—	390	480	575
6	—	700	840	1,000
8	1,400	1,600	1,920	2,300
10	2,500	2,900	3,500	4,200
12	3,900	4,600	5,600	6,700
15	7,000	8,300	10,000	12,000

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

DIAMETER OF PIPE (inches)	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)		
	Total for horizontal branch	Stacks ^b	
		Total for stack of three branch Intervals or less	Total for stack greater than three branch intervals
1½	3	4	8
2	6	10	24
2½	12	20	42
3	20	48	72
4	160	240	500
5	360	540	1,100
6	620	960	1,900
8	1,400	2,200	3,600
10	2,500	3,800	5,600
12	3,900	6,000	8,400
15	7,000	Note c	Note c

For SI: 1 inch = 25.4 mm.

- 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.

710.1.1 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~~ 711.3.

710.1.2 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.

710.2 ~~Reserved.~~ Future fixtures. Where provision is made for the future installation of fixtures, those provided for shall be considered in determining the required sizes of drain pipes.

**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] 907.

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] (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] 907 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] (see Table 710.1(2), Column 4).~~

~~**[711.3.1] 711.2.1 Omission of vents for horizontal stack offsets.** Vents for horizontal stack offsets required by Section [711.3] 711.2 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] (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] 907. [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] 711.3 Offsets below lowest branch.** Where a vertical offset occurs in a soil or waste stack below the lowest horizontal branch, a 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]~~ 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 a full open valve^[7] located on the discharge side of the check valve^[7] 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

~~[with]~~ shall 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 accessibly 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 ~~[not less than]~~ 24 inches (610 mm) ~~[deep]~~ in depth, 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 that is installed flush with grade or floor level, or above grade or floor level. The cover shall be 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]~~ pipe and fittings. Discharge ~~[piping]~~ pipe and fittings servicing ejectors shall be constructed of ~~[approved]~~ materials in accordance with Sections 712.3.3.1 and 712.3.3.2 and shall be approved.

712.3.3.1 Materials. Pipe and fitting materials shall be in accordance with Table 702.1 and Table 702.2.

712.3.3.2 Ratings. Pipe and fittings shall be rated for the maximum system operating pressure and temperature. Pipe fitting materials shall be compatible with the pipe material. Where pipe and fittings are buried in the earth, they shall be suitable for burial.

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]~~ Waste pump and waste ejector connection to the drainage system. Pumps connected to the drainage system shall connect to ~~[the]~~ a 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]~~ horizontal branch drain. Where the discharge line connects into horizontal drainage piping, the ~~[connector]~~ connection shall be made through a wye fitting into the top of the drainage piping and such wye fitting shall be located not less than 10 pipe diameters from the base of any soil stack, waste stack or fixture drain.

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.]~~ **Exceptions:** Macerating toilet systems ~~[shall]~~ that comply with ~~[CSA B45.9 or ASME A112.3.4]~~ ASME A112.3.4/CSA B45.9 and ~~[shall be]~~ installed in accordance with the manufacturer's ~~[installation]~~ instructions. Macerating toilet systems shall be permitted to discharge to a horizontal drain or stack in accordance with Section 712.3.5.

~~[712.4.2]~~ **712.4.1 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)~~] (25 mm). The [~~minimum~~] capacity of a pump or ejector based on the diameter of the discharge pipe shall be [~~in accordance with~~] not less than that indicated in Table [712.4.2] 712.4.1.

Exceptions:

1. Grinder pumps or grinder ejectors that receive the discharge of water closets shall have a [~~minimum~~] discharge opening of not less than 1¼ inches (32 mm).
2. Macerating toilet assemblies that serve single water closets shall have a [~~minimum~~] discharge opening of not less than ¾ inch [~~(19 mm)~~] (19.1 mm).

**TABLE [712.4.2] 712.4.1
MINIMUM CAPACITY OF SEWAGE PUMP OR SEWAGE EJECTOR**

DIAMETER OF THE DISCHARGE PIPE (inches)	CAPACITY OF PUMP OR EJECTOR (gpm)
2	21
2½	30
3	46

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~~] 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. Ready access shall be provided to vacuum system station receptacles. Such receptacles shall be built into cabinets or recesses and shall be visible.

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]~~ 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 be not ~~[be]~~ less than ~~[0.5-inch]~~ ½-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 be not ~~[be]~~ less than ~~[1-inch]~~ 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 be 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 ¼ 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[_s] 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~~] 1½ 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)**

STACK SIZE (inches)	CONNECTION SIZE		
	1½"		2"
1½ ^a	1	or	0
2 ^a	2	or	1
2 ^b	1	and	1
3 ^a	4	or	2
3 ^b	2	and	2
4 ^a	8	or	4
4 ^b	4	and	4

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 not less than 2 inches (51 mm) in diameter where serving a utensil sterilizer and not less than 1½ 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 2½ inches (64 mm) 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)**

STACK SIZE (inches)	CONNECTION SIZE			
	¾"	1"	1¼"	1½"
1½ ^a	3 or	2 or	1	—
1½ ^b	2 and	1	—	—
2 ^a	6 or	3 or	2 or	1
2 ^b	3 and	2	—	—
2 ^b	2 and	1 and	1	—
2 ^b	1 and	1 and	—	1
3 ^a	15 or	7 or	5 or	3
3 ^b	1 and	1 and 5 and	2 and[—]	2 1

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 not less than 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 (ks), 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. Buildings located in ~~[areas of special]~~ flood hazard areas~~[, as established by Section G102.2 of Appendix G of the New York City Building Code,]~~ shall be deemed to be subject to overflow as the result of backwater from the public sewer system and shall be provided with backwater valves in accordance with the additional requirements of Section 7.3.3 of ASCE 24 as modified by Appendix G of the *New York City Building Code*.

715.2 Material. ~~[All bearing]~~ 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.

SECTION PC 716
RESERVED

SECTION PC 717
RESERVED

PART H
CHAPTER 8

§1. Chapter 8 of the New York city plumbing code, as added by local law number 99 for the year 2005, section 802.1 as amended by local law number 141 for the year 2013, sections 802.1.4 and 803.2 as amended by, and section 802.1.8 as added by, local law 41 of 2012, is amended to read as follows:

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~~ waste, swimming pools, methods of providing air breaks or air gaps, and neutralizing devices for corrosive wastes.

801.2 Protection. ~~[All devices,]~~ 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

802.1 Where required. Food-handling equipment~~[-and]~~ , in other than dwelling units, clear-water waste, dishwashing machines and utensils, pots, pans and dishwashing sinks shall discharge through an indirect waste pipe as specified in Sections 802.1.1 through 802.1.8. ~~[All health-care]~~ 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.

802.1.1 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. Each well of a multiple-compartment sink shall discharge independently to a waste receptor.

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]~~ waste water 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]~~ 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]~~ wye branch fitting on the tailpiece of the kitchen sink or the dishwasher connection of a food waste ~~[grinder]~~ disposer. The waste line of a domestic dishwashing machine discharging into a kitchen sink tailpiece or food waste ~~[grinder]~~ disposer 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, in other than dwelling units, used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans or ~~[serviceware]~~ service ware 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]~~ 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]~~ Indirect waste piping that exceeds ~~[2 feet (610 mm)]~~ 30 inches (762 mm) in developed length measured horizontally, or ~~[4 feet (1219 mm)]~~ 54 inches (1372 mm) in total developed length, shall be trapped.

Exception: Where a waste receptor receives only clear-water waste and does not directly connect to a sanitary drainage system, the receptor shall not require a trap.

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]~~ not less than 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]~~ For other than hub drains that receive only clear-water waste ~~[receptor shall be of an approved type. A]~~ and standpipes, a removable strainer or basket shall cover the ~~[waste]~~ outlet of waste receptors. Waste receptors shall not be installed in ~~[ventilated]~~ concealed 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]~~ plenums, crawl spaces, attics,

interstitial spaces above ceilings and below floors. 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~~] Hub drains. [~~Waste receptors~~] A hub drain shall be [~~permitted~~] in the form of a hub or a pipe extending not less than 1 inch [~~(25.4 mm)~~] (25 mm) above a water-impervious floor [~~and are not required to have a strainer~~].

~~[802.4]~~ **802.3.3 Standpipes.** Standpipes shall be individually trapped. Standpipes shall extend [~~a minimum of~~] not less than 18 inches (457 mm) [~~and a maximum of~~] but not greater than 42 inches [~~(1067 mm)~~] (1066 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 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 the 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~~] Chemical waste 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.

803.3.1 Chemical drainage and vent pipe. Chemical waste and vent pipe shall conform to one of the standards listed in Table 803.3.1.

**TABLE 803.3.1
CHEMICAL WASTE AND VENT PIPE**

<u>MATERIAL</u>	<u>STANDARD</u>
Chlorinated polyvinyl chloride (CPVC) plastic	ASTM F 2618
Glass pipe	ASTM C 1053

<u>MATERIAL</u>	<u>STANDARD</u>
<u>High silicon cast iron</u>	<u>ASTM A 518 A/518 M</u>
<u>Polyolefin pipe</u>	<u>ASTM F 1412; CSA B181.3</u>
<u>Polypropylene (PP) pipe</u>	<u>ASTM F 1412</u>
<u>Polyvinylidene fluoride (PVDF) plastic pipe</u>	<u>ASTM F 1673; CSA B181.3</u>

803.3.2 Chemical drainage and vent pipe fittings. Chemical waste and vent pipe fittings shall conform to one of the standards listed in Table 803.3.2.

TABLE 803.3.2
CHEMICAL WASTE AND VENT PIPE FITTINGS

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Chlorinated polyvinyl chloride (CPVC) plastic</u>	<u>ASTM F 2618</u>
<u>Glass</u>	<u>ASTM C 1053</u>
<u>High silicon iron</u>	<u>ASTM A 861</u>
<u>Polyolefin pipe</u>	<u>ASTM F 1412; CSA B181.3</u>
<u>Polypropylene (PP) pipe</u>	<u>ASTM F 1412</u>
<u>Polyvinylidene fluoride (PVDF) plastic pipe</u>	<u>ASTM F 1673; CSA B181.3</u>

803.3.3 Chemical drainage and vent pipe installation. The installation of chemical waste and vent pipe shall conform to Sections 704.1, 704.2, 704.3, 704.4. and 704.5.

803.3.4 Chemical drainage and vent pipe joints. This section contains provisions applicable to joints specific to chemical drainage and vent piping. Joints between different materials shall conform to Section 705.

803.3.4.1 CPVC plastic. Joints between CPVC plastic pipe or fittings shall comply with Sections 803.3.4.1.1, 803.3.4.1.2 and 803.3.4.1.3.

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

803.3.4.1.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. Joints shall be made in accordance with the pipe manufacturer's installation instructions. Where such instructions require that a primer be used, the primer shall be applied to the joint surfaces and a solvent cement orange in color and conforming to ASTM F 2618 shall be applied to the joint surfaces. Where such instructions allow for a one-step solvent cement, yellow in color and conforming to ASTM F 2618, to be used, the joint surfaces shall not require application of a primer before the solvent cement is applied. The joint shall be made while the cement is wet and in accordance with ASTM F 2618. Solvent cement joints shall be permitted above or below ground.

803.3.4.1.3 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, but the pressure rating of the pipe shall be reduced by 50 percent. Thread by socket molded fittings shall be permitted. Approved thread lubricant or tape shall be applied on the male threads only.

803.3.4.2 Borosilicate glass joints. Joints between Borosilicate glass pipe and fittings shall comply with Sections 803.3.4.2.1 and 803.3.4.2.2.

803.3.4.2.1 Mechanical joints. Glass-to-glass connections shall be made with a bolted compression-type, 300 series stainless steel coupling with contoured acid-resistant elastomeric compression ring and a fluorocarbon polymer inner seal ring; or with caulked joints in accordance with Section 803.3.4.2.2.

803.3.4.2.2 Caulked joints. Lead-caulked joints 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) in depth and not to recede more than 1/8 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.

803.3.4.3 High silicon cast iron. Joints in high silicon cast iron system shall be in accordance with Section 705.4.

803.3.4.4 Polyolefin. Joints between polyolefin plastic pipe and fittings shall comply with Sections 803.3.4.4.1 and 803.3.4.4.2.

803.3.4.4.1 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 CSA B181.3.

803.3.4.4.2 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.

803.3.4.5 Polypropylene (PP) plastic. Joints between PP plastic pipe and fittings shall comply with Section 803.3.4.5.1 or 803.3.4.5.2.

803.3.4.5.1 Heat-fusion joints. Heat-fusion joints for polypropylene pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings, butt-fusion polypropylene fittings or electrofusion polypropylene 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.

803.3.4.5.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

803.3.4.6 Polyvinylidene fluoride plastic. Joints between polyvinylidene plastic pipe and fittings shall comply with Sections 803.3.4.6.1 and 803.3.4.6.2.

803.3.4.6.1 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.

803.3.4.6.2 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.

803.3.5 Chemical drainage and vent pipe cleanouts. Chemical waste and vent pipe cleanouts shall conform to Sections 708.1.1, 708.1.4, 708.1.5, 708.1.6, 708.1.8, 708.1.9, 708.1.10 and 708.1.11.

803.3.6 Chemical drainage and vent pipe sizing. Sizing of chemical waste and vent pipe shall conform to Sections 709 and 710.

803.3.7 Offsets in chemical drainage and vent pipe sizing. Offsets of chemical waste and vent pipe shall conform to Section 711.

SECTION PC 804 MATERIALS, JOINTS AND CONNECTIONS

804.1 General. 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.

PART I

CHAPTER 9

§1. Chapter 9 of the New York city plumbing code, as added by local law 99 of 2005, sections 909.1 and 919.1 as amended by local law 71 of 2009, sections 904.5, 916.5.1, and 918.1 as amended by local law 8 of 2008 and sections 903.3, 907.2, 909.1, 906.5.1, and 906.5.2 as amended by local law 41 of 2012, is amended to read as follows:

CHAPTER 9 VENTS

SECTION PC 901 GENERAL

901.1 Scope. The provisions of this chapter shall govern the materials, 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~~] 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~~] Traps and trapped [~~fixture~~] fixtures shall be vented in accordance with one of the venting methods specified in this chapter.

901.3 Chemical waste vent [~~system~~] systems. 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~~] outdoors.

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~~] 919.

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~~] 2½ pounds per square foot (12 kg/m²) for prefabricated flashings.

SECTION PC 903
VENT [STACKS AND STACK VENTS] TERMINALS

903.1~~[Stack required. Every building in which plumbing is installed shall have at least one 4-inch (102 mm) 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.]~~ **Roof extension.** Open vent pipes that extend through a roof shall be terminated not less than 24 inches (610 mm) above the roof. Where a roof is to be used for assembly or as a promenade, observation deck, sun bathing deck or similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof. Approved vandal-resistant vent caps may be used.

903.2 Frost closure. Vent extensions through a roof or wall shall be not less than 4 inches (102 mm) in diameter. Any increase in the size of the vent shall be made not less than 1 foot (305 mm) inside the thermal envelope of the building.

903.3 Flashings. The juncture of each vent pipe with the roof line shall be made water tight by an approved flashing.

903.4 Prohibited use. A vent terminal shall not be used for any purpose other than a vent terminal.

903.5 Location of vent terminal. Locations of vent terminals shall comply with Sections 903.5.1 and 903.5.2.

903.5.1 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.

903.5.2 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.

903.6 Reserved.

903.7 Reserved.

SECTION PC 904
OUTDOOR VENT EXTENSIONS

904.1 Required vent extension. The vent system serving each building drain shall have not less than one vent pipe that extends to the outdoors.

904.1.1 Installation. The required vent shall be a dry vent that connects to the building drain or an extension of a drain that connects to the building drain. Such vent shall not be an island fixture vent as allowed by Section 916.

904.1.2 Size. The required vent shall be sized in accordance with Section 906.2 based on the required size of the building drain.

[903.2] 904.2 Vent stack required. A vent stack shall be required for every drainage stack that ~~is~~ has three branch intervals or more.

[903.3] 904.3 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] 904.4 Vent connection at base. ~~Every vent stack~~ Vent stacks 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] 904.5 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~~ 906.1, 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] 904.6 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. 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 Reserved.]~~

~~[904.7 Reserved.]~~

SECTION PC 905 VENT CONNECTIONS AND GRADES

905.1 Connection. ~~[All individual]~~ 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]~~ 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]~~ not less than 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]~~ located not less than 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]~~ VENT PIPE SIZING

906.1 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 906.1, but in no case shall the diameter be less than one-half the diameter of the drain served or less than 1¼ inches (32 mm).

**TABLE 906.1
SIZE AND DEVELOPED LENGTH OF STACK VENTS AND VENT STACKS**

<u>DIAMETER OF SOIL OR WASTE STACK (inches)</u>	<u>TOTAL FIXTURE UNITS BEING VENTED (dfu)</u>	<u>MAXIMUM DEVELOPED LENGTH OF VENT (feet)^a</u>										
		<u>DIAMETER OF VENT (inches)</u>										
		<u>1¼</u>	<u>1½</u>	<u>2</u>	<u>2½</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>8</u>	<u>10</u>	<u>12</u>
<u>1¼</u>	<u>2</u>	<u>30</u>										
<u>1½</u>	<u>8</u>	<u>50</u>	<u>150</u>	=	=	=	=	=	=	=	=	=
<u>1½</u>	<u>10</u>	<u>30</u>	<u>100</u>									
<u>2</u>	<u>12</u>		<u>75</u>	<u>200</u>								
<u>2</u>	<u>20</u>	<u>30</u>	<u>50</u>	<u>150</u>		=	=	=	=	=	=	=
<u>2½</u>	<u>42</u>	<u>26</u>	<u>30</u>	<u>100</u>	<u>300</u>							
<u>3</u>	<u>10</u>		<u>42</u>	<u>150</u>	<u>360</u>	<u>1,040</u>						
<u>3</u>	<u>21</u>	=	<u>32</u>	<u>110</u>	<u>270</u>	<u>810</u>	=	=	=	=	=	=
<u>3</u>	<u>53</u>		<u>27</u>	<u>94</u>	<u>230</u>	<u>680</u>						
<u>3</u>	<u>102</u>		<u>25</u>	<u>86</u>	<u>210</u>	<u>620</u>						
<u>4</u>	<u>43</u>	=		<u>35</u>	<u>85</u>	<u>250</u>	<u>98</u>	=	=	=	=	=
<u>4</u>	<u>140</u>			<u>27</u>	<u>65</u>	<u>200</u>	<u>75</u>					
<u>4</u>	<u>320</u>		=	<u>23</u>	<u>55</u>	<u>170</u>	<u>640</u>					
<u>4</u>	<u>540</u>	=		<u>21</u>	<u>50</u>	<u>150</u>	<u>580</u>	=	=	=	=	=
<u>5</u>	<u>190</u>				<u>28</u>	<u>82</u>	<u>320</u>	<u>990</u>				
<u>5</u>	<u>490</u>				<u>21</u>	<u>63</u>	<u>250</u>	<u>760</u>				
<u>5</u>	<u>940</u>	=	=	=	<u>18</u>	<u>53</u>	<u>210</u>	<u>670</u>	=	=	=	=
<u>5</u>	<u>1,400</u>				<u>16</u>	<u>49</u>	<u>190</u>	<u>590</u>				
<u>6</u>	<u>500</u>					<u>33</u>	<u>130</u>	<u>400</u>	<u>1,000</u>			
<u>6</u>	<u>1,100</u>	=	=	=	=	<u>26</u>	<u>100</u>	<u>310</u>	<u>780</u>	=	=	=
<u>6</u>	<u>2,000</u>					<u>22</u>	<u>84</u>	<u>260</u>	<u>660</u>			

<u>DIAMETER OF SOIL OR WASTE STACK (inches)</u>	<u>TOTAL FIXTURE UNITS BEING VENTED (dfu)</u>	<u>MAXIMUM DEVELOPED LENGTH OF VENT (feet)^a</u> <u>DIAMETER OF VENT (inches)</u>										
		<u>1^{1/4}</u>	<u>1^{1/2}</u>	<u>2</u>	<u>2^{1/2}</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>8</u>	<u>10</u>	<u>12</u>
<u>6</u>	<u>2,900</u>					<u>20</u>	<u>77</u>	<u>240</u>	<u>600</u>			
<u>8</u>	<u>1,800</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>		<u>31</u>	<u>95</u>	<u>240</u>	<u>940</u>	<u>—</u>	<u>—</u>
<u>8</u>	<u>3,400</u>						<u>24</u>	<u>73</u>	<u>190</u>	<u>729</u>		
<u>8</u>	<u>5,600</u>						<u>20</u>	<u>62</u>	<u>160</u>	<u>610</u>		
<u>8</u>	<u>7,600</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>18</u>	<u>56</u>	<u>140</u>	<u>560</u>		<u>—</u>
<u>10</u>	<u>4,000</u>							<u>31</u>	<u>78</u>	<u>310</u>	<u>960</u>	
<u>10</u>	<u>7,200</u>							<u>24</u>	<u>60</u>	<u>240</u>	<u>740</u>	
<u>10</u>	<u>11,000</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>20</u>	<u>51</u>	<u>200</u>	<u>630</u>	<u>—</u>
<u>10</u>	<u>15,000</u>							<u>18</u>	<u>46</u>	<u>180</u>	<u>571</u>	
<u>12</u>	<u>7,300</u>								<u>31</u>	<u>120</u>	<u>380</u>	<u>940</u>
<u>12</u>	<u>13,000</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>24</u>	<u>94</u>	<u>300</u>	<u>720</u>
<u>12</u>	<u>20,000</u>								<u>20</u>	<u>79</u>	<u>250</u>	<u>610</u>
<u>12</u>	<u>26,000</u>								<u>18</u>	<u>72</u>	<u>230</u>	<u>500</u>
<u>15</u>	<u>15,000</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>		<u>40</u>	<u>130</u>	<u>310</u>
<u>15</u>	<u>25,000</u>									<u>31</u>	<u>96</u>	<u>240</u>
<u>15</u>	<u>38,000</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>26</u>	<u>81</u>	<u>200</u>
<u>15</u>	<u>50,000</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>24</u>	<u>74</u>	<u>180</u>

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

a. The developed length shall be measured from the vent connection to the open air.

906.2 Vents other than stack vents or vent stacks. The diameter of individual vents, branch vents, circuit vents and relief vents shall be at least one-half the required diameter of the drain served. The required size of the drain shall be determined in accordance with Table 710.1(2). Vent pipes shall not be less than 1/4 inches (32 mm) in diameter. Vents shall be sized in accordance with Table 906.1 utilizing the drainage fixture units and the corresponding developed length. Relief vents for soil and waste stacks in buildings having more than 10 branch intervals shall be sized in accordance with Section 908.2.

906.3 Developed length. The developed length of individual, branch, circuit and relief vents shall be measured from the farthest point of vent connection to the drainage system to the point of connection to the vent stack, stack vent or termination outside of the building.

906.4 Multiple branch vents. Where multiple branch vents are connected to a common branch vent, the common branch vent shall be sized in accordance with this section based on the size of the common horizontal drainage branch that is or would be required to serve the total drainage fixture unit load being vented.

906.5 Ejector vents. Ejector vent sizes shall be determined in accordance with Sections 906.5.1 and 906.5.2.

906.5.1 Sewage pumps and sewage ejectors other than pneumatic. Drainage piping below sewer level shall be vented in the same manner as that of a gravity system. Building sump vent sizes for sumps with sewage pumps or sewage ejectors, other than pneumatic, shall be determined in accordance with Table 906.5.1. Where a building sump vent connects to a sanitary vent system, the sanitary branch vent shall be at least 3 inches (76 mm) in diameter.

**TABLE 906.5.1
SIZE AND LENGTH OF SUMP VENTS**

<u>DISCHARGE CAPACITY OF PUMP (gpm)</u>	<u>MAXIMUM DEVELOPED LENGTH OF VENT (feet)^a</u>					
	<u>Diameter of vent (inches)</u>					
	<u>1¹/₄</u>	<u>1¹/₂</u>	<u>2</u>	<u>2¹/₂</u>	<u>3</u>	<u>4</u>
<u>10</u>	<u>No limit^b</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>
<u>20</u>	<u>270</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>
<u>40</u>	<u>72</u>	<u>160</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>
<u>60</u>	<u>31</u>	<u>75</u>	<u>270</u>	<u>No limit</u>	<u>No limit</u>	<u>No limit</u>
<u>80</u>	<u>16</u>	<u>41</u>	<u>150</u>	<u>380</u>	<u>No limit</u>	<u>No limit</u>
<u>100</u>	<u>10^c</u>	<u>25</u>	<u>97</u>	<u>250</u>	<u>No limit</u>	<u>No limit</u>
<u>150</u>	<u>Not permitted</u>	<u>10^c</u>	<u>44</u>	<u>110</u>	<u>370</u>	<u>No limit</u>
<u>200</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>20</u>	<u>60</u>	<u>210</u>	<u>No limit</u>
<u>250</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>10</u>	<u>36</u>	<u>132</u>	<u>No limit</u>
<u>300</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>10^c</u>	<u>22</u>	<u>88</u>	<u>380</u>
<u>400</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>10^c</u>	<u>44</u>	<u>210</u>

<u>DISCHARGE CAPACITY OF PUMP (gpm)</u>	<u>MAXIMUM DEVELOPED LENGTH OF VENT (feet)^a</u>					
	<u>Diameter of vent (inches)</u>					
	<u>1¹/₄</u>	<u>1¹/₂</u>	<u>2</u>	<u>2¹/₂</u>	<u>3</u>	<u>4</u>
<u>500</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>Not permitted</u>	<u>24</u>	<u>130</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

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 NBS 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.

906.5.2 Pneumatic sewage ejectors. 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 be not less than 1½ inches (38 mm) in size.

SECTION PC 907 **VENTS FOR STACK OFFSETS**

907.1 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.

907.2 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 904.4. The offset shall be considered the base of the stack.

907.3 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 908 **RELIEF VENTS—STACKS OF MORE THAN 10 BRANCH INTERVALS**

908.1 Where required. Soil and waste stacks in buildings having more than 10 branch intervals shall be provided with a relief vent at each tenth interval installed, beginning with the top floor.

908.2 Size and connection. The size of the relief 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 909 **FIXTURE VENTS**

[906.1 Reserved.]

909.1 Distance of trap from vent. Each fixture trap shall have a protecting vent located so that the slope and the developed length in the fixture drain from the trap weir to the vent fitting are within the requirements set forth in Table 909.1.

Exception: The developed length of the fixture drain from the trap weir to the vent fitting for self-siphoning fixtures, such as water closets, shall not be limited.

**TABLE 909.1
MAXIMUM DISTANCE OF FIXTURE TRAP FROM VENT**

<u>SIZE OF TRAP</u> <u>(inches)</u>	<u>SLOPE</u> <u>(inch per foot)</u>	<u>DISTANCE FROM TRAP</u> <u>(feet)</u>
1 ¹ / ₄	1 ¹ / ₄	5
1 ¹ / ₂	1 ¹ / ₄	6
2	1 ¹ / ₄	8
3	1 ¹ / ₈	12
4	1 ¹ / ₈	16

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 inch per foot = 83.3 mm/m.

[906.2] 909.2 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] 909.3 Crown vent. A vent shall not be installed within two pipe diameters of the trap weir.

**SECTION PC [907] 910
INDIVIDUAL VENT**

[907.1] 910.1 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 in accordance with section 909.1, but at a distance not to exceed 16 feet (4876 mm).

[907.2] 910.2 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] 911
COMMON VENT**

[908.1] 911.1 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] 911.2 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.

Exception: Where wet vents are permitted by this code, the wet vent connection may be located downstream of the interconnection.

[908.3] 911.3 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] 911.3. The upper fixture shall not be a water closet.

**TABLE [908.3] 911.3
COMMON VENT SIZES**

PIPE SIZE (inches)	MAXIMUM DISCHARGE FROM UPPER FIXTURE DRAIN (dfu)
1½	1
2	4
2½ to 3	6

For SI: 1 inch = 25.4 mm.

**SECTION PC [909]912
WET VENTING**

[909.1] 912.1 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.

912.1.1 Vertical wet vent permitted. Any combination of fixtures within one bathroom group is permitted to be vented by a vertical wet vent. The vertical wet vent shall be considered the vent for the fixtures and shall extend from the connection of the dry vent down to the lowest fixture drain connection. Each wet-vented fixture shall connect independently to the vertical wet vent. Fixture drains shall connect above or at the same elevation as the water closet fixture drain. The dry-vent connection to the vertical wet vent shall be an individual or common vent serving one or two fixtures.

[909.2] 912.2 [Vent] Dry-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.]~~ The required dry-vent connection for wet-vented systems shall comply with Sections 912.2.1 and 912.2.2.

[909.2.1] 912.2.1 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.

912.2.2 Vertical wet vent. The dry-vent connection for a vertical wet-vent system shall be an individual vent or common vent for the most upstream fixture drain.

[909.3] 912.3 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 of a [minimum size of 2 inches (51 mm)] size not less than that specified in Table 912.3, based on the fixture unit discharge to the wet vent.

TABLE 912.3
WET VENT SIZE

<u>MINIMUM WET VENT PIPE SIZE</u> <u>(inches)</u>	<u>MAXIMUM DRAINAGE FIXTURE</u> <u>UNIT LOAD (dfu)</u>
<u>2</u>	<u>4</u>
<u>2¹/₂</u>	<u>6</u>
<u>3</u>	<u>12</u>

For SI: 1 inch = 25.4 mm.

SECTION PC ~~[910]~~913
~~[WASTE STACK VENT]~~
RESERVED

SECTION PC ~~[911]~~914
CIRCUIT VENTING

[911.1] 914.1 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] 914.1.1 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] 914.2 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] 914.3 Slope and size of horizontal branch. The ~~[maximum]~~ slope of the vent section of the horizontal branch drain shall be not greater than one unit vertical in 12 units horizontal ([8-percent] 8.3-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] 914.3.1 Size of multiple circuit vent. Each separate circuit-vented horizontal branch that is interconnected shall be sized independently in accordance with Section ~~[911.3]~~ 914.3.

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] 914.4 Relief vent. A relief vent shall be provided for ~~[circuit-vented]~~ 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] 914.4.1 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] 914.4.2 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] 914.5 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]~~ 915 COMBINATION ~~[DRAIN]~~ WASTE AND VENT SYSTEM

[912.1] 915.1 ~~[Permitted combination waste and vent system]~~ Types of fixtures. A combination waste and vent ~~[piping]~~ system ~~[, limited for use as a means of venting the traps of]~~ shall not serve fixtures other than floor drains ~~[and laboratory sinks]~~ , lavatories and drinking fountains ~~[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]~~. Combination waste and vent systems shall not receive the discharge from a food waste disposer or clinical sink.

[912.2] 915.2 Installation. ~~[Combination drain and vent system shall comply with this section.]~~ The combination waste and vent system shall be a horizontal piping system. The only vertical pipe of a combination waste and vent system shall be the connection between the fixture drain and the horizontal combination waste and vent pipe. The vertical distance shall not exceed 8 feet (2438 mm).

[912.2.1] 915.2.1 Slope. The slope at a horizontal combination ~~[drain]~~ waste and vent pipe shall ~~[have a maximum slope of]~~ not exceed one-half unit vertical in 12 units horizontal (4-percent slope) ~~[. The minimum slope]~~ and shall not be less than indicated in ~~[accordance with]~~ Table 704.1.

915.2.2 Size and length. The size of a combination waste and vent pipe shall be not less than that indicated in Table 915.2.2. The horizontal length of a combination waste and vent system shall be unlimited.

TABLE 915.2.2 SIZE OF COMBINATION WASTE AND VENT PIPE

<u>DIAMETER PIPE (inches)</u>	<u>MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)</u>	
	<u>Connecting to a horizontal branch or stack</u>	<u>Connecting to a building drain or building subdrain</u>
<u>2</u>	<u>3</u>	<u>4</u>
<u>2½</u>	<u>6</u>	<u>26</u>
<u>3</u>	<u>12</u>	<u>31</u>
<u>4</u>	<u>20</u>	<u>50</u>
<u>5</u>	<u>160</u>	<u>250</u>
<u>6</u>	<u>360</u>	<u>575</u>

For SI: 1 inch = 25.4 mm.

[912.2.2] 915.2.3 Connection. The combination ~~[drain]~~ waste 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]~~ serves vented ~~[in accordance with one of]~~ fixtures located on the ~~[venting methods specified in this chapter]~~ same floor. Combination ~~[drain]~~ waste and vent systems connecting to building drains receiving only the discharge from ~~[a stack]~~ one or more stacks shall be provided with a dry vent. The vent connection to the combination ~~[drain]~~ waste and vent pipe shall extend vertically ~~[a minimum of]~~ to a point not less than 6 inches (152 mm) above the flood level rim of the highest fixture being vented before offsetting horizontally.

[912.2.3] 915.2.4 Vent size. The vent shall be sized for the total drainage fixture unit load in accordance with Section ~~[916.2]~~906.2.

[912.3 Size.] 915.2.5 Fixture branch or drain. The ~~[minimum size of a]~~ fixture branch or fixture drain shall connect to the combination ~~[drain]~~ waste and vent within a distance specified in Table 909.1. The combination waste and vent pipe shall be ~~[in accordance with Table 912.3]~~ considered the vent for the fixture.

[**TABLE 912.3**
SIZE OF COMBINATION DRAIN AND VENT PIPE

<u>DIAMETER PIPE</u>	<u>MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)</u>	
	<u>Connecting to a horizontal branch or stack</u>	<u>Connecting to a building drain or building subdrain</u>
<u>2</u>	<u>3</u>	<u>4</u>

DIAMETER PIPE	MAXIMUM NUMBER OF DRAINAGE FIXTURE UNITS (dfu)	
	Connecting to a horizontal branch or stack	Connecting to a building drain or building subdrain
2 ¹ / ₂	6	26
3	12	31
4	20	50
5	160	250
6	360	575

For SI: 1 inch = 25.4 mm.]

**SECTION PC [913] 916
ISLAND FIXTURE VENTING**

[913.1] 916.1 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~~] disposer, or both, in combination with the kitchen sink waste, shall be permitted to be vented in accordance with this section.

[913.2] 916.2 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~~] point not less than 6 inches (152 mm) above the highest island fixture being vented before connecting to the outside vent terminal.

[913.3] 916.3 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] 906.2. 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. Cleanouts 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 cleanout.

~~**[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 1½ inches (38 mm).]

**[TABLE 916.1
SIZE AND DEVELOPED LENGTH OF STACK VENTS AND VENT STACKS]**

DIAMETER OF SOIL OR WASTE STACK (inches)	TOTAL FIXTURE UNITS BEING VENTED (dfu)	MAXIMUM DEVELOPED LENGTH OF VENT (feet) ^a DIAMETER OF VENT (inches)									
		1½	2	2½	3	4	5	6	8	10	12
1½	8	150									
1½	10	100									
2	12	75	200								
2	20	50	150		—	—	—	—	—	—	—
2½	42	30	100	300							
3	10	42	150	360	1,040						

DIAMETER OF SOIL OR WASTE STACK (inches)	TOTAL FIXTURE UNITS BEING VENTED (dfu)	MAXIMUM DEVELOPED LENGTH OF VENT (feet) ^a									
		DIAMETER OF VENT (inches)									
		1½	2	2½	3	4	5	6	8	10	12
3	21	32	110	270	810	—	—	—	—	—	—
3	53	27	94	230	680	—	—	—	—	—	—
3	102	25	86	210	620	—	—	—	—	—	—
4	43	—	35	85	250	980	—	—	—	—	—
4	140	—	27	65	200	750	—	—	—	—	—
4	320	—	23	55	170	640	—	—	—	—	—
4	540	—	21	50	150	580	—	—	—	—	—
5	190	—	—	28	82	320	990	—	—	—	—
5	490	—	—	21	63	250	760	—	—	—	—
5	940	—	—	18	53	210	670	—	—	—	—
5	1,400	—	—	16	49	190	590	—	—	—	—
6	500	—	—	—	33	130	400	1,000	—	—	—
6	1,100	—	—	—	26	100	310	780	—	—	—
6	2,000	—	—	—	22	84	260	660	—	—	—
6	2,900	—	—	—	20	77	240	600	—	—	—
8	1,800	—	—	—	—	31	95	240	940	—	—
8	3,400	—	—	—	—	24	73	190	720	—	—
8	5,600	—	—	—	—	20	62	160	610	—	—
8	7,600	—	—	—	—	18	56	140	560	—	—
10	4,000	—	—	—	—	—	31	78	310	960	—
10	7,200	—	—	—	—	—	24	60	240	740	—
10	11,000	—	—	—	—	—	20	51	200	630	—
10	15,000	—	—	—	—	—	18	46	180	570	—
12	7,300	—	—	—	—	—	—	31	120	380	940

DIAMETER OF SOIL OR WASTE STACK (inches)	TOTAL FIXTURE UNITS BEING VENTED (dfu)	MAXIMUM DEVELOPED LENGTH OF VENT (feet) ^a									
		DIAMETER OF VENT (inches)									
		1½	2	2½	3	4	5	6	8	10	12
12	13,000	—	—	—	—	—	—	24	94	300	720
12	20,000	—	—	—	—	—	—	20	79	250	610
12	26,000	—	—	—	—	—	—	18	72	230	500
15	15,000	—	—	—	—	—	—	—	40	130	310
15	25,000	—	—	—	—	—	—	—	31	96	240
15	38,000	—	—	—	—	—	—	—	26	81	200
15	50,000	—	—	—	—	—	—	—	24	74	180

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

a. — The developed length shall be measured from the vent connection to the open air.]

[916.2 Vents other than stack vents or vent stacks. The diameter of individual vents, branch vents, circuit vents and relief vents shall be at least one-half the required diameter of the drain served. The required size of the drain shall be determined in accordance with Table 710.1(2). Vent pipes shall not be less than 1½ inches (38 mm) in diameter. Vents shall be sized in accordance with Table 916.1 utilizing the drainage fixture units and the corresponding developed length. Relief vents for soil and waste stacks in buildings having more than 10 branch intervals shall be sized in accordance with Section 914.2.]

[916.3 Developed length. The developed length of individual, branch, circuit and relief vents shall be measured from the farthest point of vent connection to the drainage system to the point of connection to the vent stack, stack vent or termination outside of the building.]

[916.4 Multiple branch vents. Where multiple branch vents are connected to a common branch vent, the common branch vent shall be sized in accordance with this section based on the size of the common horizontal drainage branch that is or would be required to serve the total drainage fixture unit (dfu) load being vented.]

[916.5 Ejector vents. Ejector vent sizes shall be determined in accordance with Sections 916.5.1 and 916.5.2.]

[916.5.1 Sewage pumps and sewage ejectors other than pneumatic. Drainage piping below sewer level shall be vented in a similar manner to that of a gravity system. Building sump vent sizes for sumps with sewage pumps or sewage ejectors, other than pneumatic, shall be determined in accordance with Table 916.5.1. Where a building sump vent connects to a sanitary vent system, the sanitary branch vent shall be at least 3 inches (76 mm) in diameter.]

**[TABLE 916.5.1
SIZE AND LENGTH OF SUMP VENTS**

DISCHARGE CAPACITY OF PUMP (gpm)	MAXIMUM DEVELOPED LENGTH OF VENT (feet) ^a					
	Diameter of vent (inches)					
	1 ¹ / ₄	1 ¹ / ₂	2	2 ¹ / ₂	3	4
10	No limit ^b	No limit	No limit	No limit	No limit	No limit
20	270	No limit	No limit	No limit	No limit	No limit
40	72	160	No limit	No limit	No limit	No limit
60	31	75	270	No limit	No limit	No limit
80	16	41	150	380	No limit	No limit
100	10 ^e	25	97	250	No limit	No limit
150	Not permitted	10 ^e	44	110	370	No limit
200	Not permitted	Not permitted	20	60	210	No limit
250	Not permitted	Not permitted	10	36	132	No limit
300	Not permitted	Not permitted	10 ^e	22	88	380
400	Not permitted	Not permitted	Not permitted	10 ^e	44	210
500	Not permitted	Not permitted	Not permitted	Not permitted	24	130

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m.

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 ejectors 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 1½ inches (38 mm) in size.]~~

SECTION PC 917
[AIR ADMITTANCE VALVES]
RESERVED

SECTION PC 918
RESERVED

SECTION PC [918] 919
ENGINEERED VENT SYSTEMS

[918.1] 919.1 General. Engineered vent systems shall comply with this section and Section 28-113.2.2 of the *Administrative Code*.

[918.2] 919.2 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] 919.2 for the minimum pipe diameters at the indicated vent airflow rates. [~~The individual vent airflow rate shall be determined in accordance with the following:~~]

The individual vent airflow rate shall be determined in accordance with the following:

$$Q_{h,b} = N_{n,b} Q_v \quad \text{(Equation 9-1)}$$

For SI: $Q_{h,b} = N_{n,b} Q_v (0.4719 \text{ L/s})$

where:

$N_{n,b}$ = Number of fixtures per header (or vent branch) ÷ total number of fixtures connected to vent stack.

$Q_{h,b}$ = Vent branch or vent header airflow rate (cfm).

Q_v = Total vent stack airflow rate (cfm).

$$Q_v(\text{gpm}) = [27.8 r_s^{2/3} (1 - r_s) D^{8/3}] \quad 27.8 r_s^{2/3} (1 - r_s) D^{8/3}$$

$$Q_v(\text{cfm}) = 0.134 Q_v(\text{gpm})$$

where:

D = Drainage stack diameter (inches).

Q_w = Design discharge load (gpm).

r_s = Waste water flow area to total area.

$$= Q_w / 27.8 D^{8/3}$$

Individual vent airflow rates are obtained by equally distributing $Q_{h,b}$ into one-half the total number of fixtures on the branch or header for more than two fixtures; for an odd number of total fixtures, decrease by one; for one fixture, apply the full value of $Q_{h,b}$.

Individual vent developed length shall be increased by 20 percent of the distance from the vent stack to the fixture vent connection on the vent branch or header.

TABLE [918.2] 919.2
MINIMUM DIAMETER AND MAXIMUM LENGTH OF INDIVIDUAL BRANCH
FIXTURE VENTS AND
INDIVIDUAL FIXTURE HEADER VENTS FOR SMOOTH PIPES

DIAMETER OF VENT PIPE (inches)	INDIVIDUAL VENT AIRFLOW RATE (cubic feet per minute)																			
	Maximum developed length of vent (feet)																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1/2	95	25	13	8	5	4	3	2	1	1	1	1	1	1	1	1	1	1	1	1
3/4	100	88	47	30	20	15	10	9	7	6	5	4	3	3	3	2	2	2	2	1
1	—	—	100	94	65	48	37	29	24	20	17	14	12	11	9	8	7	7	6	6
1 1/4	—	—	—	—	—	—	—	100	87	73	62	53	46	40	36	32	29	26	23	21
1 1/2	—	—	—	—	—	—	—	—	—	—	—	100	96	84	75	65	60	54	49	45
2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100

For SI: 1 inch = 25.4 mm, 1 cubic foot per minute = 0.4719 L/s, 1 foot = 304.8 mm.

[918.3] 919.3 A licensed professional engineer shall certify design. An engineer shall also inspect and certify the system upon completion of the system.

**SECTION PC [919] 920
COMPUTERIZED VENT DESIGN**

[919.1] 920.1 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] 920.2 System capacity. The vent system shall be based on the air capacity requirements of the drainage system under a peak load condition.

[919.3] 920.3 Design shall be certified by a licensed professional engineer. An engineer shall also inspect and certify the system upon completion of the system.

PART J

CHAPTER 10

§1. Chapter 10 of the New York city plumbing code, as added by local law number 99 for the year 2005, sections 1002.1, 1002.3, 1002.4, 1003.1, 1003.3, 1003.3.1, 1003.3.2, 1003.3.3, 1003.3.4, 1003.3.4.1, 1003.3.4.2, 1003.4, 1003.6, and 1003.10 as amended by, and section 1003.3.5 as added by, local law number 41 for the year 2012, is amended to read as follows:

**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]~~ liquid-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)]~~ 48 inches (1220 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]~~ 802.3.3. 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).
4. Floor drains in multilevel parking structures that discharge to a building storm sewer shall not be required to be individually trapped. Where floor drains in multilevel parking structures are required to discharge to a combined building sewer system, the floor drains shall not be required to be individually trapped provided that they are connected to a main trap in accordance with Section 1103.1.
5. This section shall not apply to outdoor drinking fountains discharging to a drywell.
6. This section shall not apply where local acid neutralizing systems are utilized in accordance with the rules of the Department of Environmental Protection and Section 803.2 of this code.

1002.2 Design of traps. Fixture 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.
3. Crown-vented traps.
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]~~ Drum traps used as solids interceptors and drum traps serving chemical waste systems shall ~~[not]~~ be ~~[prohibited]~~ permitted.

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.]~~

1002.4.1 Trap seal protection. Trap seals of emergency floor drain traps and trap seals subject to evaporation shall be protected by one of the methods in Sections 1002.4.1.1 through 1002.4.1.3.

1002.4.1.1 Potable water-supplied trap seal primer valve. A potable water-supplied trap seal primer valve shall supply water to the trap. Water-supplied trap seal primer valves shall conform to ASSE 1018. The discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal on the inlet side of the trap.

1002.4.1.2 Reclaimed or gray water-supplied trap seal primer valve. A reclaimed or gray water-supplied trap seal primer valve shall supply water to the trap. Water-supplied trap seal primer valves shall conform to ASSE 1018. The quality of reclaimed or gray water supplied to trap seal primer valves shall be in accordance with the requirements of the manufacturer of the trap seal primer valve and this code. The discharge pipe from the trap seal primer valve shall connect to the trap above the trap seal, on the inlet side of the trap.

1002.4.1.3 Manual water-supplied trap priming. A hose bib or similar manually operated plumbing fixture shall be provided within the same room and within a horizontal distance not to exceed 25 feet (7620 mm) and not more than 3 feet (914 mm) above the floor.

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.]~~ 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 drain connected thereto and shall be provided with a fresh air inlet in accordance with Section 703.7.1.

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]~~ 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~~] 1003.3.6.

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~~] drainage from fixtures and equipment with [~~grease laden~~] waste containing fats, oils, or grease 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, scraper 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] and shall be in accordance 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 [~~allows~~] 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 in

accordance with the sizing requirements of the Department of Environmental Protection. Ready access shall be provided for inspection and maintenance.

1003.3.6 Direct connection. The discharge piping from a grease interceptor shall be directly connected to the sanitary drainage system.

1003.4 Oil separators required. At repair garages where floor or trench drains are provided, car washing facilities with engine or undercarriage cleaning capability, ~~and at~~ factories where oily and flammable liquid wastes are produced~~;~~ and hydraulic elevator pits, oil separators shall be installed into which ~~all~~ oil-bearing, grease-bearing or flammable wastes shall be discharged before emptying ~~in~~ into 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. Such systems shall not terminate the operation of pumps utilized to maintain emergency operation of the elevator by fire fighters.

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 listed and labeled, or 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 not less than 6 cubic feet [(0.17 m³)] (0.168 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 (152 mm).

1003.6 ~~[Laundries]~~ Clothes washer discharge interceptor. ~~[Laundry facilities not installed within an individual dwelling unit or intended for individual family use shall be equipped with~~ ~~an]~~ Clothes washers shall discharge through an interceptor that is provided with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½ inch (12.7 mm) or larger in size, string, rags, buttons or other materials detrimental to the public sewage system.

Exceptions:

1. Clothes washers in individual dwelling units shall not be required to discharge through an interceptor.

2. A single clothes washer designed for use in individual dwelling units and installed in a location other than an individual dwelling unit shall not be required to discharge through an interceptor.

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]~~ Interceptors and separators shall be vented [where subject to a loss of trap seal] in accordance with one of the methods in Chapter 9.

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]of the piping[-system]~~.

PART K

CHAPTER 11

§1. Chapter 11 of the New York city plumbing code is REPEALED and a new chapter 11 is added to read as follows:

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 a place of disposal approved by

the commissioner and 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 safe location subject to the approval of the commissioner and the Department of Environmental Protection. See Section 107.6.2 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 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 or retention system.

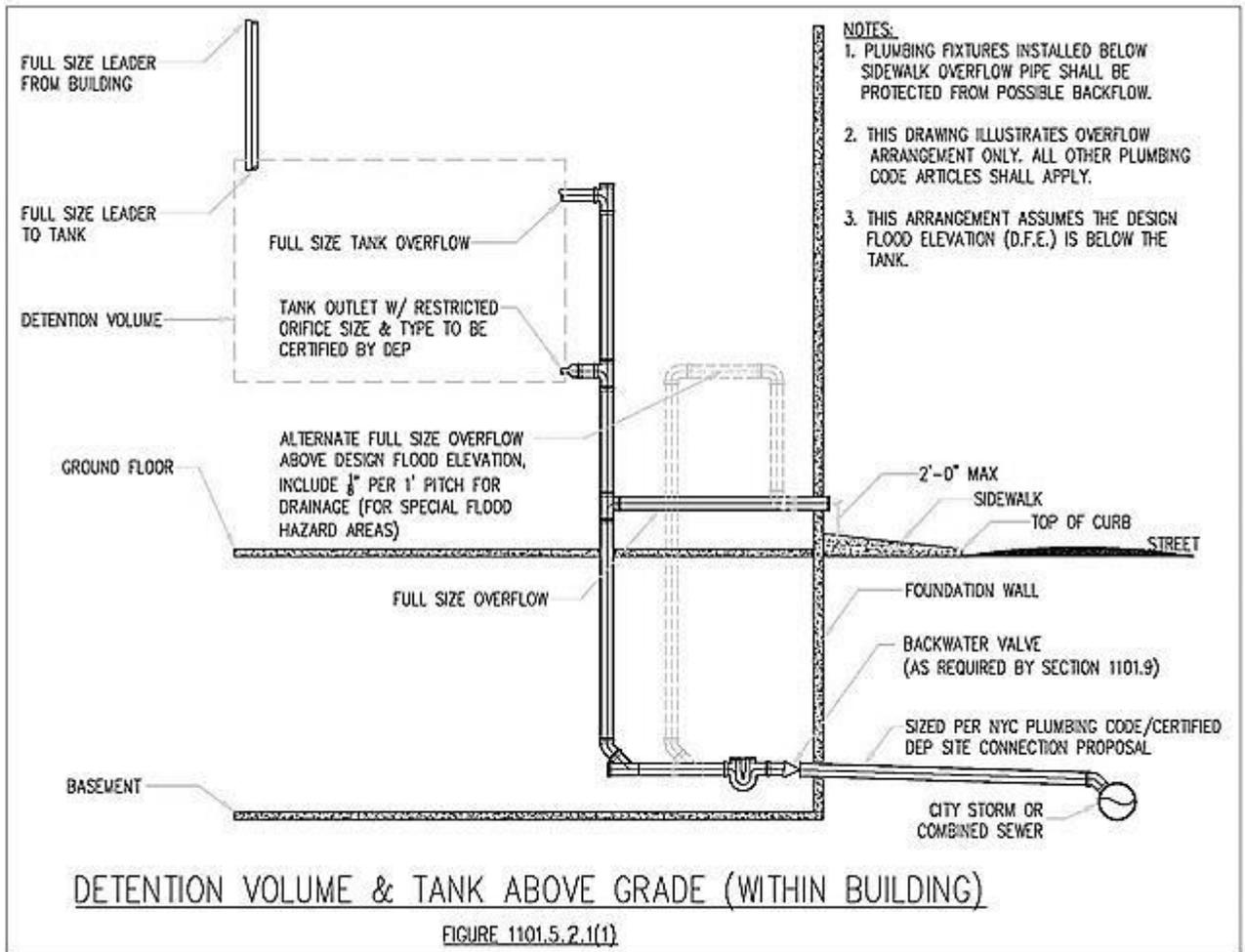
1101.5.1 Detention systems. Where a detention system is provided, the pipe leaving the detention tank shall be permitted to be reduced to the flow allowed by the Department of Environmental Protection, provided, however, that an emergency overflow shall be provided to protect the building from internal flooding.

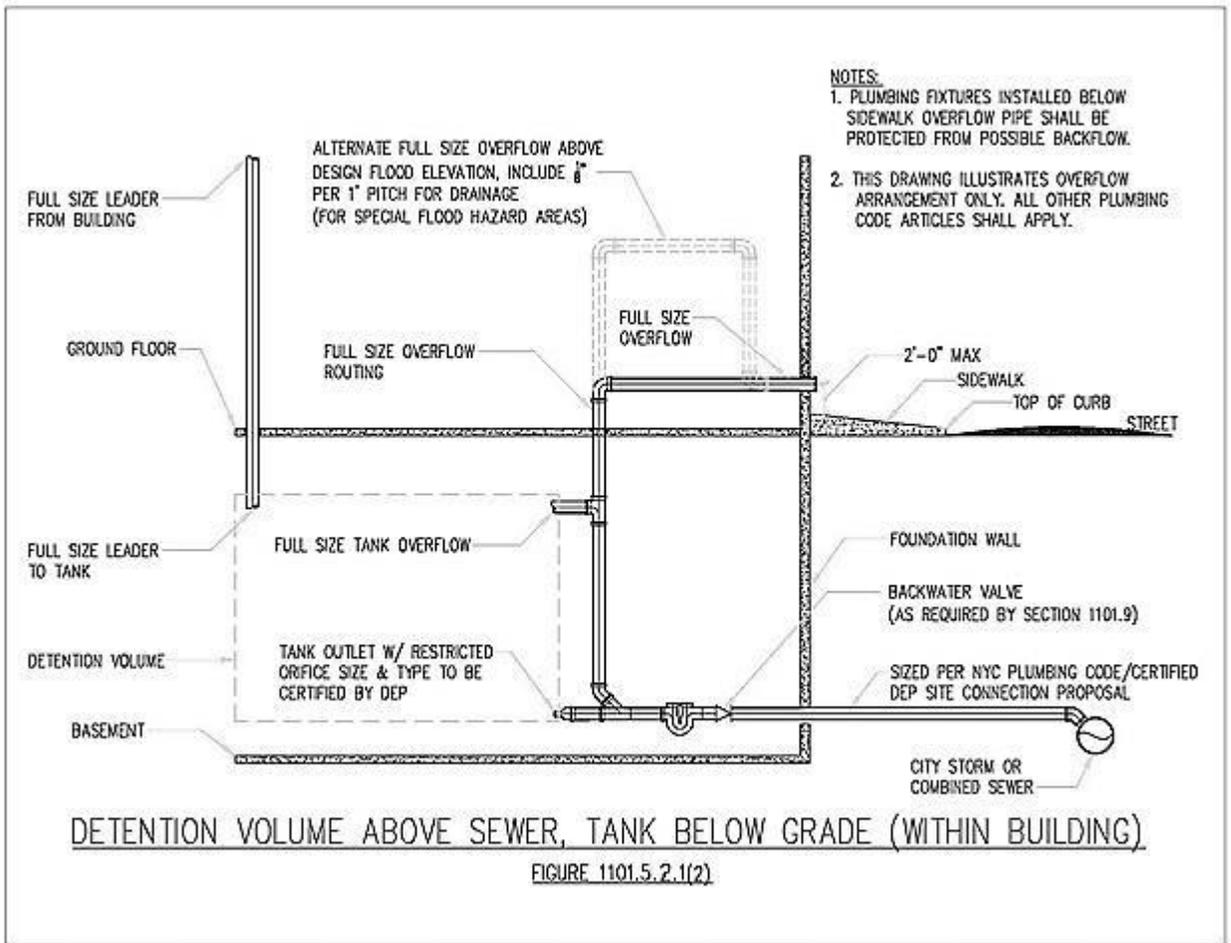
1101.5.2 Detention and retention tanks. Detention and retention tanks located within buildings in flood hazard areas shall be located above the design flood elevation or shall be designed and constructed to withstand the static pressure conditions the system will experience in the event of a flood condition.

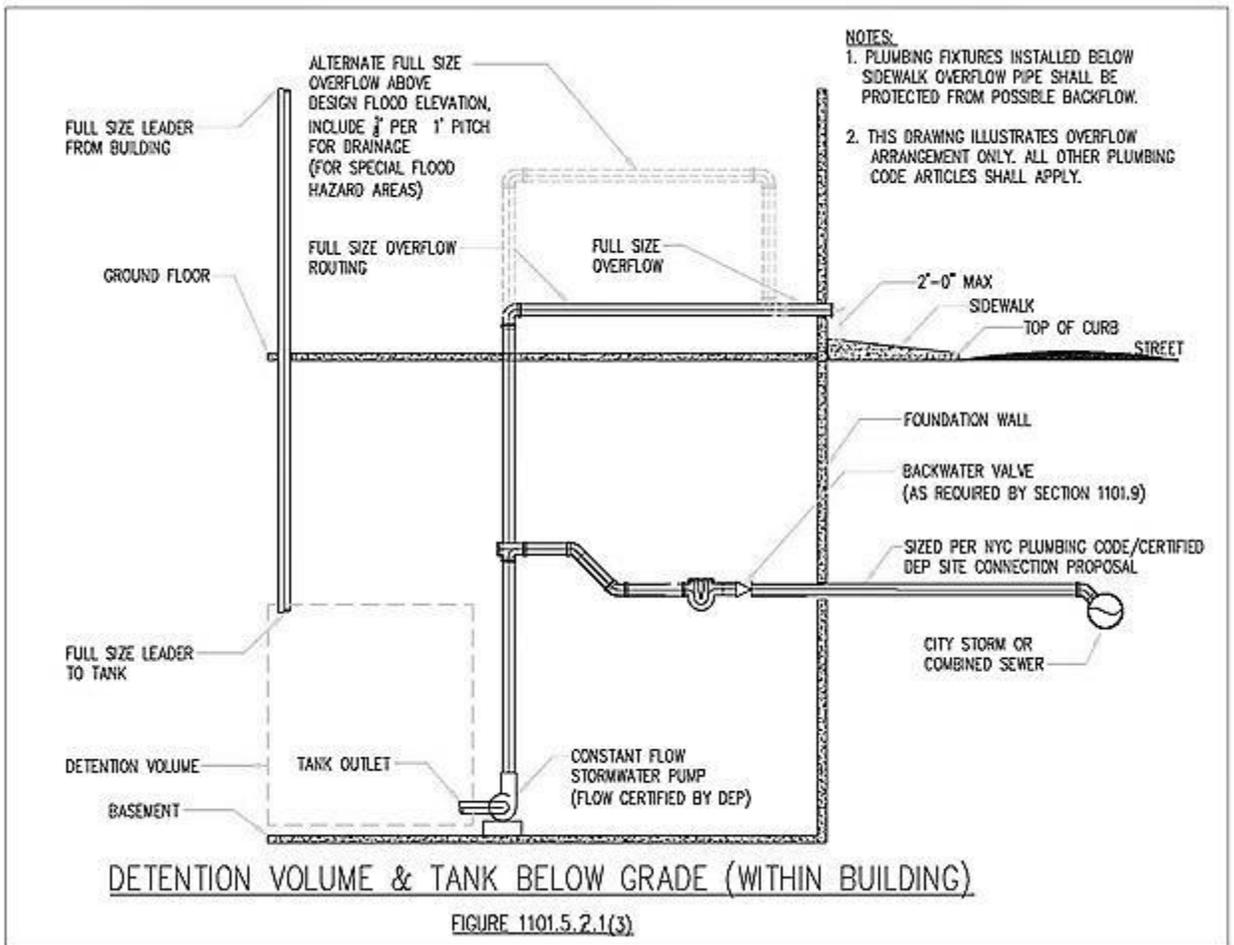
1101.5.2.1 Emergency overflow. Emergency overflow piping shall equal the full size of the incoming storm water flow. Emergency overflows and vent terminations for buildings located

in flood hazard areas shall be located above the design flood elevation. 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 See Figures 1101.5.2.1(1), 1101.5.2.1(2) and 1101.5.2.1(3).







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 drainage means shall be assumed to be blocked. The maximum possible depth of water on the roof shall include the height of the water required above the inlet of the secondary roof drainage means to achieve the required flow rate of the secondary drainage means to accommodate the design rainfall rate as required by Section 1106.

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 715.

1101.9.1 Backwater valves in flood hazard areas. Backwater valves for all buildings located in flood hazard areas shall be installed in storm drainage systems in accordance with the requirements of this code and the additional requirements of Section 7.3.4 of ASCE 24 as modified by Appendix G of the *New York City Building Code*.

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 and corrugated polypropylene 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 Cured-in-place pipe. Cured-in-place pipe (CIPP) and epoxy spray pipe lining systems shall not be used.

1101.12 Site grading. Except as otherwise permitted by this code, no person shall perform site grading or land contour work, as defined in Section 19-137 of the *Administrative Code*, that would cause storm water to flow across sidewalks or onto an adjacent property. Site grading or land contour work performed on the site of a covered development project shall comply with the rules of the Department of Environmental Protection and this code.

SECTION PC 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 Storm drainage conductors and leaders. Storm drainage conductors and leaders shall conform to Sections 1102.2.1 and 1102.2.2.

1102.2.1 Inside storm drainage conductors. Inside storm drainage conductors installed above ground shall conform to one of the standards listed in Table 702.1.

1102.2.2 Exterior storm drainage leaders. Exterior storm drainage leaders installed above ground shall conform to one of the standards listed in Table 702.1.

Exception: Exterior storm drainage leaders installed above ground for buildings in occupancy group R-3 and bulkheads draining to other roof surfaces.

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

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Cast-iron pipe</u>	<u>ASTM A 74; ASTM A 888; CISPI 301</u>
<u>Chlorinated polyvinyl chloride (CPVC) plastic^b</u>	<u>ASTM F 437; ASTM F 438; ASTM F 439</u>
<u>Concrete pipe</u>	<u>ASTM C 14; ASTM C 76; CSA A257.1M; CSA A257.2M</u>
<u>Copper or copper-alloy tubing (Type K or L)</u>	<u>ASTM B 75; ASTM B 88; ASTM B 251</u>
<u>Ductile-iron pipe</u>	<u>AWWA C151</u>
<u>Galvanized steel pipe</u>	<u>ASTM A 53; ASTM A 123</u>
<u>High density polyethylene pipe (HDPE)^a</u>	<u>ASTM D 3350</u>
<u>Polyvinyl chloride (PVC) plastic pipe (Type DWV, SDR26, SDR35, SDR41, PS50 or PS100)^b</u>	<u>ASTM D 2665; ASTM D 3034; ASTM F 891; CSA B182.4; CSA B181.2; CSA B182.2</u>
<u>Stainless steel drainage systems, Type 316L</u>	<u>ASME A112.3.1</u>
<u>Vitrified clay pipe</u>	<u>ASTM C 4; ASTM C 700</u>

a. Approved plastic sewer for piping 12 inches and larger in accordance with Section 1101.10, Exception 2.
b. Limited to residential buildings five stories or less in height.

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

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Cast-iron pipe</u>	<u>ASTM A 74; ASTM A 888; CISPI 301</u>
<u>Polyethylene (PE) plastic pipe</u>	<u>ASTM F 405; CSA B182.1; CSA B182.6; CSA B182.8</u>
<u>Polypropylene (PP) plastic pipe</u>	<u>ASTM F 2764; ASTM F 3219</u>
<u>Polyvinyl chloride (PVC) Plastic pipe (type sewer pipe, SDR35, PS25, PS50 or PS100)^a</u>	<u>ASTM D 2729; ASTM D 3034; ASTM F 891; CSA B182.2; CSA B182.4</u>
<u>Porous concrete pipe</u>	<u>ASTM C 654</u>
<u>Stainless steel drainage systems, Type 316L</u>	<u>ASME A112.3.1</u>
<u>Vitrified clay pipe</u>	<u>ASTM C 4; ASTM C 700</u>

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

1102.6 Roof drains. Roof drains shall conform to ASME A112.6.4 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

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Acrylonitrile butadiene styrene (ABS) plastic pipe in IPS diameters^a</u>	<u>ASTM D 2661; ASTM F 628; CSA B181.1</u>
<u>Acrylonitrile butadiene styrene (ABS) plastic pipe in sewer and drain diameters</u>	<u>ASTM D 2751</u>
<u>Brass</u>	<u>ASTM B 62</u>
<u>Cast-iron</u>	<u>ASME B16.4; ASME B16.12; ASTM A 888; CISPI 301; ASTM A 74</u>

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Chlorinated polyvinyl chloride (CPVC) plastic^a</u>	<u>ASTM F 437; ASTM F 438; ASTM F 439</u>
<u>Copper or copper-alloy tubing (Type K, L)</u>	<u>ASTM B 75; ASTM B 88; ASTM B 251</u>
<u>Ductile iron</u>	<u>AWWA C110</u>
<u>Galvanized steel</u>	<u>ASTM A 153; ASME B16.3</u>
<u>High-density polyethylene (HDPE)</u>	<u>ASTM D 3350</u>
<u>Malleable iron</u>	<u>ASME B16.3</u>
<u>Polyethylene (PE) plastic pipe^a</u>	<u>ASTM F 2306/F 2306M</u>
<u>Polyolefin^a</u>	<u>CSA B 181.3; ASTM F 1412; ASTM D 2657</u>
<u>Polypropylene (PP) plastic pipe^a</u>	<u>ASTM F 2764; ASTM F 3219</u>
<u>Polyvinyl chloride (PVC) plastic^a</u>	<u>ASTM D 2464; ASTM D 2466; ASTM D 2467; CSA B137.2; ASTM D 2665; ASTM D 3311; ASTM F 1866</u>
<u>Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters^a</u>	<u>ASTM D 3034</u>
<u>Polyvinylidene fluoride (PVDF) plastic pipe^a</u>	<u>ASTM F 1673; CSA B181.3</u>
<u>Stainless steel drainage systems, Type 316L</u>	<u>ASME A112.3.1</u>
<u>Vitrified clay</u>	<u>ASTM C 425</u>

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

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 public sewer.

1103.2 Material. Storm water traps shall be of an approved material in accordance with Table 1102.7.

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 Floor drains. Floor drains shall not be connected to a storm drain.

1104.3 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 building drain 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 drain downstream of building (house) trap.

1104.4 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.

1104.5 Parking garage floor drains. Floor drains provided in open or enclosed parking garages shall drain to the storm drainage system.

Exception: Where the storm drainage system discharges to a dedicated storm sewer, parking garage floor drains shall be connected to the sanitary drainage system.

SECTION PC 1105 **ROOF DRAINS**

1105.1 General. Roof drains shall be installed in accordance with the manufacturer's instructions. The inside opening for the roof drain shall not be obstructed by the roofing membrane material.

1105.2 Roof drain flow rate. The published roof drain flow rate, based on the head of water above the roof drain, shall be used to size the storm drainage system in accordance with Section 1106. The flow rate used for sizing the storm drainage piping shall be based on the maximum anticipated ponding at the roof drain.

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 1108.

1106.2 Size of storm drain piping. Vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain. The flow rate in storm drain piping shall not exceed that specified in Table 1106.2.

TABLE 1106.2
STORM DRAIN PIPE SIZING

<u>PIPE SIZE</u> <u>(inches)</u>	<u>CAPACITY (gpm)</u>				
	<u>VERTICAL</u> <u>DRAIN</u>	<u>SLOPE OF HORIZONTAL DRAIN</u>			
		<u>1/16 inch per</u> <u>foot</u>	<u>1/8 inch per</u> <u>foot</u>	<u>1/4 inch per</u> <u>foot</u>	<u>1/2 inch per</u> <u>foot</u>
<u>2</u>	<u>34</u>	<u>15</u>	<u>22</u>	<u>31</u>	<u>44</u>
<u>3</u>	<u>87</u>	<u>39</u>	<u>55</u>	<u>79</u>	<u>111</u>
<u>4</u>	<u>180</u>	<u>81</u>	<u>115</u>	<u>163</u>	<u>231</u>
<u>5</u>	<u>311</u>	<u>117</u>	<u>165</u>	<u>234</u>	<u>331</u>
<u>6</u>	<u>538</u>	<u>243</u>	<u>344</u>	<u>487</u>	<u>689</u>
<u>8</u>	<u>1,117</u>	<u>505</u>	<u>714</u>	<u>1,010</u>	<u>1,429</u>
<u>10</u>	<u>2,050</u>	<u>927</u>	<u>1,311</u>	<u>1,855</u>	<u>2,623</u>
<u>12</u>	<u>3,272</u>	<u>1,480</u>	<u>2,093</u>	<u>2,960</u>	<u>4,187</u>
<u>14</u>	<u>4,204</u>	<u>1,312</u>	<u>1,856</u>	<u>2,621</u>	<u>3,713</u>
<u>15</u>	<u>5,543</u>	<u>2,508</u>	<u>3,546</u>	<u>5,016</u>	<u>7,093</u>
<u>16</u>	<u>5,543</u>	<u>2,508</u>	<u>3,546</u>	<u>5,016</u>	<u>7,093</u>
<u>18</u>	<u>8,218</u>	<u>3,100</u>	<u>4,386</u>	<u>6,192</u>	<u>8,773</u>

1106.2.1 Values for continuous flow. 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.

1106.3 Vertical leader sizing. Vertical leaders shall be sized based on the flow rate from horizontal gutters or the maximum flow rate through roof drains. The flow rate through vertical leaders shall not exceed that specified in Table 1106.3.

TABLE 1106.3
VERTICAL LEADER SIZING

<u>SIZE OF LEADER</u> <u>(inches)</u>	<u>CAPACITY</u> <u>(gpm)</u>
<u>2</u>	<u>30</u>
<u>2 × 2</u>	<u>30</u>
<u>1½ × 2½</u>	<u>30</u>
<u>2½</u>	<u>54</u>
<u>2½ × 2½</u>	<u>54</u>
<u>3</u>	<u>92</u>
<u>2 × 4</u>	<u>92</u>
<u>2½ × 3</u>	<u>92</u>
<u>4</u>	<u>192</u>
<u>3 × 4¼</u>	<u>192</u>
<u>3½ × 4</u>	<u>192</u>
<u>5</u>	<u>360</u>
<u>4 × 5</u>	<u>360</u>
<u>4½ × 4½</u>	<u>360</u>
<u>6</u>	<u>563</u>
<u>5 × 6</u>	<u>563</u>
<u>5½ × 5½</u>	<u>563</u>
<u>8</u>	<u>1208</u>
<u>6 × 8</u>	<u>1208</u>

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

1106.4 Vertical walls. In sizing roof drains and storm drainage piping, one-fourth of the area of any vertical wall that diverts rainwater to the roof or the setback roof of a building shall be added to the projected roof area for inclusion in calculating the required size of vertical conductors, leaders and horizontal storm drainage piping.

Exceptions:

1. Where vertical conductors or leaders and downstream piping has been sized for secondary roof drainage in accordance with Section 1108, the contribution from vertical walls need not be added to the projected roof area.

2. Section 1106.4 shall not be applicable to vertical walls fronting a public right-of-way.

1106.5 Parapet wall scupper location. Parapet wall roof drainage scupper and overflow scupper location shall comply with the requirements of Section 1503.4 of the *New York City Building Code*.

1106.6 Size of roof gutters. Horizontal gutters shall be sized based on the flow rate from the roof surface. The flow rate in horizontal gutters shall not exceed that specified in Table 1106.6.

TABLE 1106.6
HORIZONTAL GUTTER SIZING

<u>GUTTER DIMENSIONS^a</u> <u>(inches)</u>	<u>SLOPE</u> <u>(inch per foot)</u>	<u>CAPACITY</u> <u>(gpm)</u>
<u>1¹/₂ × 2¹/₂</u>	<u>1¹/₄</u>	<u>26</u>
<u>1¹/₂ × 2¹/₂</u>	<u>1¹/₂</u>	<u>40</u>
<u>4</u>	<u>1¹/₈</u>	<u>39</u>
<u>2¹/₄ × 3</u>	<u>1¹/₄</u>	<u>55</u>
<u>2¹/₄ × 3</u>	<u>1¹/₂</u>	<u>87</u>
<u>5</u>	<u>1¹/₈</u>	<u>74</u>
<u>4 × 2¹/₂</u>	<u>1¹/₄</u>	<u>106</u>
<u>3 × 3¹/₂</u>	<u>1¹/₂</u>	<u>156</u>
<u>6</u>	<u>1¹/₈</u>	<u>110</u>
<u>3 × 5</u>	<u>1¹/₄</u>	<u>157</u>
<u>3 × 5</u>	<u>1¹/₂</u>	<u>225</u>
<u>8</u>	<u>1¹/₁₆</u>	<u>172</u>
<u>8</u>	<u>1¹/₈</u>	<u>247</u>
<u>4¹/₂ × 6</u>	<u>1¹/₄</u>	<u>348</u>
<u>4¹/₂ × 6</u>	<u>1¹/₂</u>	<u>494</u>
<u>10</u>	<u>1¹/₁₆</u>	<u>331</u>
<u>10</u>	<u>1¹/₈</u>	<u>472</u>
<u>5 × 8</u>	<u>1¹/₄</u>	<u>651</u>
<u>4 × 10</u>	<u>1¹/₂</u>	<u>1055</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 3.785 L/m, 1 inch per foot = 83.3 mm/m.
a. Dimensions are width by depth for rectangular shapes. Single dimensions are diameters of a semicircle.

SECTION PC 1107
SIPHONIC ROOF DRAINAGE SYSTEMS

1107.1 General. Siphonic roof drains and drainage systems shall be designed in accordance with ASME A112.6.9 and ASPE 45.

SECTION PC 1108
SECONDARY (EMERGENCY) ROOF DRAINS

1108.1 Secondary (emergency overflow) drains or scuppers. Where roof drains are required, secondary (emergency overflow) 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. Where primary and secondary roof drains are manufactured as a single assembly, the inlet and outlet for each drain shall be independent.

1108.2 Separate systems required. Secondary roof drain systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade, in a location that would normally be observed by the building occupants or maintenance personnel.

Exception: Secondary drainage system may tie into the primary drainage system in the vertical conductors where separate systems are impractical or to prevent water from flowing over sidewalk or pedestrian walkways.

1108.3 Sizing of secondary drains. Secondary (emergency) roof drain systems shall be sized in accordance with Section 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 have an opening dimension of not less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.

Exception: 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.

SECTION PC 1109
COMBINED SANITARY AND STORM SYSTEM

1109.1 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 located in accordance with the applicable requirements of the Department of Environmental Protection. 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. 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.

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 controlled flow as allowed by the Department of Environmental Protection.

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. Subsoil drainage discharged into a public sewer shall be approved by the Department of Environmental Protection. 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 PC 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 be not less than 18 inches (457 mm) in diameter and not less than 24 inches (610 mm) in depth, 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, the 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 PC 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 107.6.2.2, 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 107.6.2.2, 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 107.6.2.1, Item 1;
4. For enlargements less than 1000 square feet (93 m²) in accordance with Section 107.6.2, 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 department and the New York City Department of Environmental Protection.

1114.1.3 Minimum setbacks. On-site stormwater disposal systems shall be located at least 5 feet (1524 mm) from all lot lines except where the lot line abuts a public right of way 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 on-site stormwater disposal system. Systems shall be located 20 feet (6096 mm) from disposal fields and 20 feet (6096 mm) from seepage pits. On-site stormwater disposal systems shall not be located within the building footprint.

1114.2 Field investigation. The size of an on-site 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 on-site 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 on-site stormwater disposal system. Soil borings and sampling procedures shall 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 ½ inch (12.7 mm) per hour, private on-site 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 holes 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. Thereupon, 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 hold 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. Thereupon, 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 on-site 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 shall be calculated using Equation 11-2 and shall incorporate the different combinations of surfaces using the C values listed below.

$$Q = C_w \times I \times A \quad \text{(Equation 11-1)}$$

where:

$Q =$ developed flow, cubic feet per second

$C_w =$ weighted runoff coefficient

$I =$ the rainfall intensity value, 5.95 in/hr

$A =$ the total site area, acres (ac)

$$C_w = (1/A) \sum (A_k \times C_k) \quad \text{(Equation 11-2)}$$

where:

$C_w =$ weighted runoff coefficient

$A =$ The total site area, acres (ac)

$A_k =$ The area of each surface coverage type, acres (ac)

$C_k =$ The runoff coefficient associated with each surface coverage type

The following C -values shall be used for calculating a sites weighted runoff coefficient:

.95 = roof/concrete

.85 = asphalt

.7 = porous asphalt/concrete or permeable pavers

.7 = green roof with four or more inches of growing media

.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 on-site 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. Unless otherwise approved by the New York City Department of Environmental Protection, the storage volume of the on-site stormwater disposal system shall accommodate the total stormwater volume calculated in this section. The stormwater volume shall be calculated as follows:

1. Compute the runoff rate using Equations 11-1 and 11-2.
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 retention volume using Equation 11-6.

$$Q_{inf} = (FA_{min} \times i_{soil})/43,200 \quad \text{(Equation 11-3)}$$

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

$$Q_o = C_{WT} \times i \times A_T \quad \text{(Equation 11-4)}$$

where:

Q_o = the average outflow rate in cubic feet per second during the rainfall event

C_{WT} = the weighted runoff coefficient for the tributary area

i = the average rainfall intensity in inches per hour for the event

A_T = the area tributary to the detention facility in acres

$$t_V = 0.27 \times (C_{WT} \times A_T / Q_{DRR})^{0.5} - 15 \quad \text{(Equation 11-5)}$$

where:

t_V = the duration of the storm in minutes, with a 10 year return frequency, requiring the maximum detention volume with a variable outflow

C_{WT} = the weighted runoff coefficient for the area tributary to the detention facility

A_T = the area tributary to the detention facility in square feet

Q_{DRR} = the detention facility maximum release rate in cubic feet per second

$$V_V = (0.19 \times C_{WT} \times A_T / (t_V + 15) - 40 \times Q_{DRR}) \times t_V \quad \text{(Equation 11-6)}$$

where:

V_V = the maximum required detention volume in cubic feet with a variable outflow

C_{WT} = the weighted runoff coefficient for the area tributary to the detention facility

A_T = the area tributary to the detention facility in square feet

t_V = the duration of the storm in minutes, with a 10 year return frequency, requiring the maximum detention volume with a variable outflow

Q_{DRR} = the detention facility maximum release rate in cubic feet per second

1114.4 Required components. On-site 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.

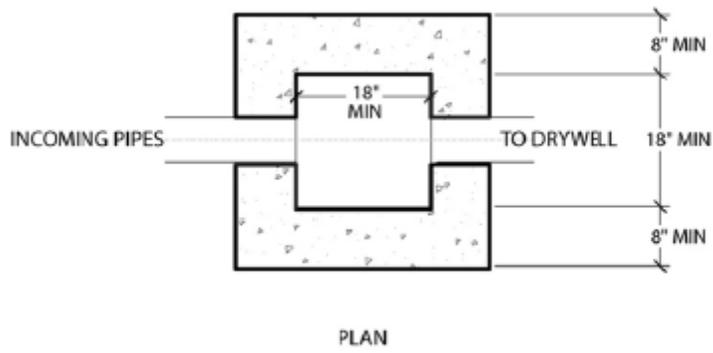
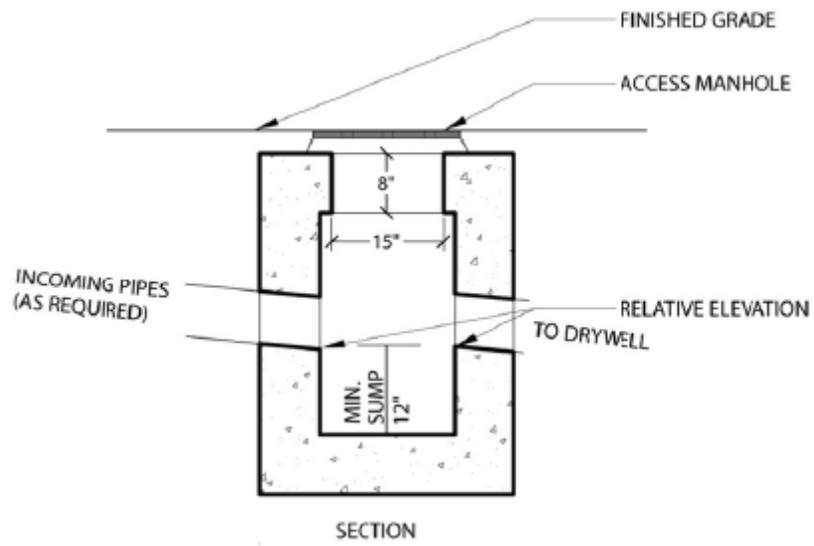


FIGURE 1114.4(1): GRIT CHAMBER

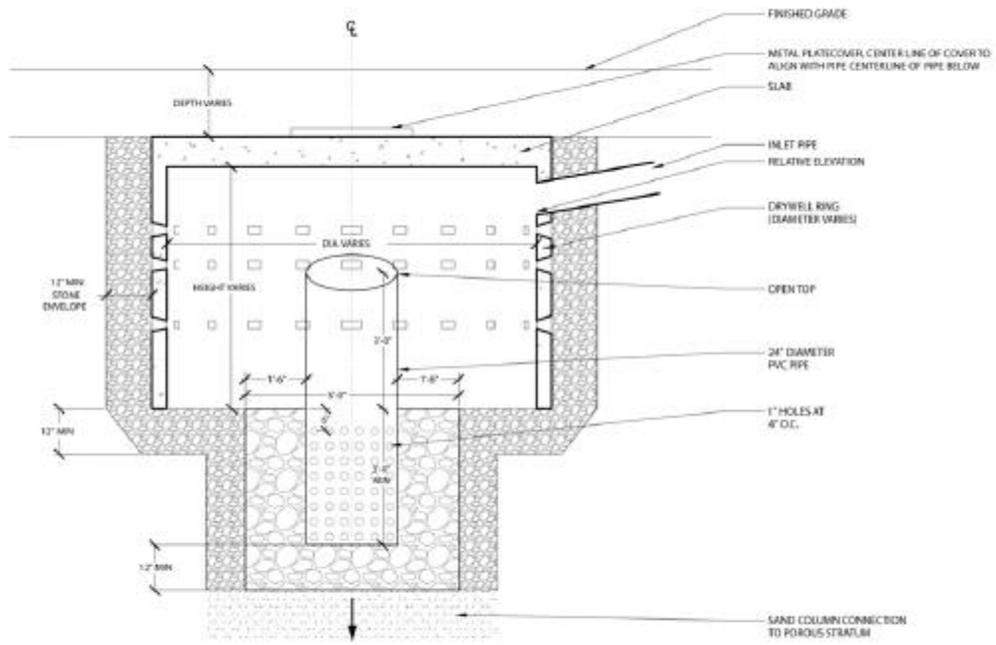


FIGURE 1114.4(2)
DETAIL OF DRYWELL WITH SAND COLUMN

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 inches (450 mm) or two 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 four times the largest inlet pipe diameter whichever is greater.

1114.4.2 Reserved.

1114.5 On-site stormwater disposal system installation. On-site 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 on-site 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 on-site 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 on-site stormwater disposal system prior to final approval.

1114.6 Special inspection. The installation of on-site 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 on-site 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 ON-SITE STORMWATER DISPOSAL SYSTEM IS LOCATED ON THIS PROPERTY FOR STORMWATER DISPOSAL. INSPECTION AND MAINTENANCE OF THIS ON-SITE 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. A post-construction stormwater management facility that is

constructed as part of a covered development project shall be designed, installed and maintained in accordance with the rules of the Department of Environmental Protection and this code.

PART L

CHAPTER 12

§1. Chapter 12 of the New York city plumbing code, as added by local law number 99 for the year 2005, section 1202.1 and, section 1204.1, as amended by local law number 141 for the year 2013, is amended to read as follows:

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~~] gas systems. [~~All maintenance and operations of such systems shall be in accordance with the *New York City Fire Code*.~~]

1201.2 Storage, handling, and use. The storage, handling, and use of medical and nonmedical gases shall be in accordance with the *New York City Fire Code*.

SECTION PC 1202 MEDICAL AND NONMEDICAL GASES

1202.1 Nonflammable medical and nonmedical gases. Nonflammable medical and nonmedical 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 NONMEDICAL 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 [~~;~~] and 1203 [~~and the *New York City Fire Code*].~~

1204.2 Storage, handling, and use. Storage, handling, and use of cryogenic gases and fluids shall be in accordance with the *New York City Fire Code*.

PART M

CHAPTER 13

§1. Chapter 13 of the New York city plumbing code is REPEALED and a new chapter 13 is added to read as follow:

CHAPTER 13 **NONPOTABLE WATER SYSTEMS** **SECTION PC 1301** **GENERAL**

1301.1 Scope. The provisions of Chapter 13 shall govern the materials, design, construction and installation of systems for the collection, storage, treatment and conveyance of nonpotable water. The use and application of nonpotable water shall comply with the New York City Construction Codes, and all applicable laws, and rules, including but not limited to those of the Department of Environmental Protection and the Department of Health and Mental Hygiene. Water from nonpotable systems shall be collected, stored, treated, conveyed and used on the same tax lot unless otherwise approved by the commissioner. The following water recycling uses are not addressed in this chapter:

1. Rainwater collected utilizing a retention system through rain barrels complying with the requirements of the Department of Environmental Protection;
2. Commercial car washing facilities; and
3. 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.

1301.1.1 Uses of nonpotable water. Nonpotable water end use applications shall be in accordance with the requirements established by the Department of Health and Mental Hygiene.

1301.2 Water quality. Nonpotable water for each end use application shall meet the minimum water quality and treatment standards and requirements established by the Department of Health and Mental Hygiene.

1301.3 Identification required. Conveyance piping shall be identified as containing nonpotable water. Piping identification shall be in accordance with Section 608.8.

1301.3.1 Spigots and hose bibs. Spigots and hose bibs dispensing nonpotable water shall be secured from unauthorized use by a locking mechanism.

1301.3.2 Signage required. Nonpotable water outlets such as hose connections, open ended pipes and faucets shall be identified at the point of use for each outlet with signage that reads as follows: “Nonpotable water is utilized for [application name]. CAUTION: NONPOTABLE WATER – DO NOT DRINK.” The words shall be legibly and indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inch (12.7 mm) in height and in colors in contrast to the background on which they are applied. In addition to the required wordage, the pictograph shown in Figure 1301.3 shall appear on the signage required by this section.



FIGURE 1301.3
PICTOGRAPH—DO NOT DRINK

1301.4 Permits. Permits shall be required for the construction, installation, and alteration of nonpotable water systems, and shall be required by the Department of Health and Mental Hygiene for review, commissioning and operation of nonpotable water systems.

Exception: Work outlined in Article 105.4 of Chapter 1 of Title 28 of the *Administrative Code*.

1301.5 Potable water connections. Where a potable system is connected to a nonpotable water system, the potable water supply shall be protected against backflow by an air gap.

1301.6 Approved components and materials. Piping, plumbing components and materials used in collection and conveyance systems shall be manufactured of material approved for the intended application and compatible with any disinfection and treatment systems used. Components and material shall comply with Sections 1301.6.1 through 1301.6.3.

1301.6.1 Above-ground piping. Above-ground drain, waste and vent piping for nonpotable water systems shall conform to one of the standards listed in Table 702.1.

1301.6.2 Underground piping. Underground building drainage and vent piping for nonpotable water systems shall conform to one of the standards listed in Table 702.2.

1301.6.3 Conveyance piping. Conveyance piping for nonpotable water systems shall conform to one of the standards listed in Table 1301.6 and shall be purple in color, either manufactured, painted, or covered in a purple jacket and labeled in accordance with Section 1301.3.

TABLE 1301.6
CONVEYANCE PIPE

<u>MATERIAL</u>	<u>STANDARD</u>
Brass pipe	ASTM B 43
Chlorinated Polyvinyl Chloride (CPVC) ^a	ASTM D 2846
Copper or copper-alloy pipe	ASTM B 42; ASTM B 302

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Copper or copper-alloy tubing (Type K, L)</u>	<u>ASTM B 75; ASTM B 88; ASTM B 251; ASTM B 447</u>
<u>Polypropylene^a</u>	<u>ASTM F 2389</u>
<u>Stainless steel pipe (Type 304/304L)</u>	<u>ASTM A 312; ASTM A 778</u>
<u>Stainless steel pipe (Type 316/316L)</u>	<u>ASTM A 312; ASTM A 778</u>

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

1301.7 Insect and vermin control. The system shall be protected to prevent the entrance of insects and vermin into storage tanks and piping systems. Screen materials shall be compatible with contacting system components and shall not accelerate the corrosion of system components.

1301.8 Freeze protection. Where installations are subject to freezing temperatures, provisions shall be made to keep storage tanks and the related piping from freezing.

1301.9 Nonpotable water storage tanks. Nonpotable water storage tanks shall comply with Sections 1301.9.1 through 1301.9.11. Nonpotable water storage tanks receiving multiple sources shall also comply with requirements established by the Department of Environmental Protection and the Department of Health and Mental Hygiene.

1301.9.1 Sizing. The holding capacity of the storage tank shall be sized in accordance with the anticipated demand.

Exception: Storage tanks also used for rainwater detention may be sized for the combined volume of detained water and the anticipated demand.

1301.9.2 Location. Storage tanks shall be installed above or below grade. Above-grade storage tanks shall be protected from direct sunlight and shall be constructed using opaque, UV-resistant materials such as, but not limited to, heavily tinted plastic, fiberglass, lined metal, concrete, wood, or painted to prevent algae growth, or shall have specially constructed sun barriers including, but not limited to, installation in garages, crawl spaces or sheds. Storage tanks and their manholes shall not be located directly under soil piping, waste piping or any source of contamination.

1301.9.2.1 Separate nonpotable water storage tanks from multiple sources. Separate collection tanks or compartments shall be provided for influent wastewater and rainwater sources.

1301.9.3 Materials. Where collected on site, water shall be collected in an approved tank constructed of durable, nonabsorbent and corrosion-resistant materials. The storage tank shall be constructed of materials compatible with any disinfection systems used to treat water upstream of the tank and with any systems used to maintain water quality in the tank. Wooden storage tanks that are not equipped with a makeup water source shall be provided with a flexible liner.

1301.9.4 Foundation and supports. Storage tanks shall be supported on a firm base capable of withstanding the weight of the storage tank when filled to capacity. Storage tanks shall be supported in accordance with the *New York City Building Code*. Tanks within an area of special flood hazard shall be designed, constructed and installed in accordance with Appendix G of the *New York City Building Code*.

1301.9.4.1 Ballast. Where the soil can become saturated, an underground storage tank shall be ballasted, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down ballast shall meet or exceed the buoyancy force of the tank. Where the installation requires a foundation, the foundation shall be flat and shall be designed to support the weight of the storage tank when full, consistent with the bearing capability of adjacent soil.

1301.9.4.2 Structural support. Where installed below grade, storage tank installations shall be designed to withstand earth and surface structural loads without damage and with minimal deformation when empty or filled with water.

1301.9.5 Makeup water. Where an uninterrupted supply is required for the intended application, potable water shall be provided as a source of makeup water for the storage tank. The makeup water supply shall be protected against backflow by an airgap. A full-open valve located on the makeup water supply line to the storage tank shall be provided. Inlets to the storage tank shall be controlled by fill valves or other automatic supply valves installed to prevent the tank from overflowing and to prevent the water level from dropping below a predetermined point. Where makeup water is provided, the water level shall not be permitted to drop below the source water inlet or the intake of any attached pump.

Exception: Makeup water shall not be required for drip or subsurface landscape irrigation systems.

1301.9.6 Overflow. The storage tank shall be equipped with an overflow pipe having a diameter not less than that shown in Table 606.5.4. The overflow pipe shall be protected from insects or vermin. The overflow pipe shall be connected to the appropriate building drainage system in accordance with this code and the requirements of the Department of Environmental Protection. Overflow from a stormwater storage tank shall not discharge to the sanitary drainage system. Drainage from overflow pipes shall be directed to prevent freezing on roof walkways. The overflow drain shall not be equipped with a shutoff valve. A cleanout shall be provided on each overflow pipe in accordance with Section 708.

1301.9.7 Access. Not less than one access opening shall be provided to allow inspection and cleaning of the tank interior. Access openings shall have an approved locking device or other approved method of securing access. Below-grade storage tanks, located outside of the building, shall be provided with a manhole either not less than 24 inches (610 mm) square or with an inside diameter not less than 24 inches (610 mm). Manholes shall extend not less than 4 inches (102 mm) above ground or shall be designed to prevent water infiltration. Finished grade shall be sloped away from the manhole to divert surface water. Manhole covers shall be secured to prevent unauthorized access. Service ports in manhole covers shall be not less than 8 inches (203 mm) in diameter and shall be not less than 4 inches (102 mm) above the finished grade level. The service port shall be secured to prevent unauthorized access.

Exception: Storage tanks less than 800 gallons (3028L) in volume and installed below grade shall not be required to be equipped with a manhole, but shall have a service port not less than 8 inches (203 mm) in diameter.

1301.9.7.1 Tanks accessed from within buildings. Where access to a storage tank is provided from within a building, the tank access opening shall be gasketed and gas-tight.

1301.9.8 Venting. Storage tanks shall be provided with a vent sized in accordance with Chapter 9 and based on the aggregate diameter of all tank influent pipes. The reservoir vent shall not be connected to sanitary drainage system vents. Vents shall be protected from contamination by means of an approved cap or U-bend installed with the opening directed downward. Vent outlets shall extend not less than 4 inches (102 mm) above grade or as necessary to prevent surface water from entering the storage tank. Vent openings shall be protected against the entrance of vermin and insects in accordance with the requirements of Section 1301.7.

1301.9.9 Draining of tanks. Where tanks require draining for service or cleaning, tanks shall be drained by using a pump or by a drain located at the lowest point in the tank. The tank drain pipe shall be indirectly connected to the appropriate building drainage system and discharge as required for overflow pipes and shall not be smaller in size than specified in Table 606.5.7. Not less than one cleanout shall be provided on each drain pipe in accordance with Section 708.

1301.9.10 Marking and signage. Each nonpotable water storage tank shall be labeled with its rated capacity. The contents of storage tanks shall be identified with the words “CAUTION: NONPOTABLE WATER – DO NOT DRINK.” Where an opening is provided that could allow the entry of personnel, the opening shall be marked with the words, “DANGER – CONFINED SPACE.” Markings shall be indelibly printed on the tank or on a tag or sign constructed of corrosion-resistant waterproof material that is mounted on the tank. The letters of the words shall be not less than 0.5 inch (12.7 mm) in height and shall be of a color in contrast with the background on which they are applied.

1301.9.11 Storage tank tests. Storage tanks shall be tested in accordance with the following:

Storage tanks shall be filled with water to the overflow line prior to and during inspection. All seams and joints shall be left exposed and the tank shall remain water tight without leakage for a period of 24 hours.

1. After 24 hours, supplemental water shall be introduced for a period of 15 minutes to verify proper drainage of the overflow system and that there are no leaks.
2. The tank drain shall be observed for proper operation.
3. The makeup water system shall be observed for proper operation and successful automatic shutoff of the system at the refill threshold shall be verified.

1301.10 System abandonment. If the owner of an on-site nonpotable water reuse system or rainwater collection and conveyance system elects to cease use of, or fails to properly maintain such system and is so ordered by the Department of Health and Mental Hygiene, the system shall be abandoned and shall comply with the following:

1. The conveyance piping system shall be replaced with an approved potable water supply piping system.

Exception: Where an existing conveyance pipe system is already in place, the fixtures may remain connected to the existing piping and supplied by the potable water system, in accordance with all of the following requirements:

1. The piping material, design and size comply with the requirements of Chapter 6.

2. The piping system is disinfected in accordance with the requirements of Chapter 6.
3. All piping connections between the potable and conveyance piping system shall be protected against backflow by an approved method in accordance with Chapter 6.
4. The piping identification required by Section 1301.6.3 shall be maintained to identify the piping as nonpotable.
5. All piping connections to the abandoned components of the collection and treatment system shall be permanently disabled by removing a section of pipe.
2. The storage tank shall be secured from accidental access by sealing or locking tank inlets and access points, or filling with sand or equivalent.
3. Notification shall be provided to the Department and to the Department of Health and Mental Hygiene.

1301.11 Trenching requirements for nonpotable water piping. Nonpotable water collection and conveyance piping shall be separated from the building sewer and potable water piping underground by 5 feet (1524 mm) of undisturbed or compacted earth. Nonpotable water collection and conveyance piping shall not be located in, under or above cesspools, septic tanks, septic tank drainage fields or seepage pits. Buried nonpotable water piping shall comply with the requirements of Section 306.

Exceptions:

1. The required separation distance shall not apply where the bottom of the nonpotable water pipe within 5 feet (1524 mm) of the sewer is not less than 12 inches (305 mm) above the top of the highest point of the sewer and the pipe materials conform to Table 702.3.
2. The required separation distance shall not apply where the bottom of the potable water service pipe within 5 feet (1524 mm) of the nonpotable water pipe is a minimum of 12 inches (305 mm) above the top of the highest point of the nonpotable water pipe and the pipe materials comply with the requirements of Table 605.4.
3. Nonpotable water pipe is permitted to be located in the same trench with a building sewer, provided that such sewer is constructed of materials that comply with the requirements of Table 702.2.
4. The required separation distance shall not apply where a nonpotable water pipe crosses a sewer pipe, provided that the pipe is sleeved to at least 5 feet (1524 mm) horizontally from the sewer pipe centerline on both sides of such crossing, with pipe materials that comply with Table 702.2.
5. The required separation distance shall not apply where a potable water service pipe crosses a nonpotable water pipe, provided that the potable water service pipe is sleeved for a distance of at least 5 feet (1524 mm) horizontally from the centerline of the nonpotable pipe on both sides of such crossing, with pipe materials that comply with Table 702.2.
6. Irrigation piping located outside of a building and downstream of the backflow preventer is not required to meet the trenching requirements where nonpotable water is used for outdoor applications.

1301.12 Outdoor outlet access. Sillcocks, hose bibbs, wall hydrants, yard hydrants and other outdoor outlets supplied by nonpotable water shall be located in a locked vault and shall also be operable only by means of a removable key. Such outlets shall comply with Section 1301.3.

SECTION PC 1302
ON-SITE NONPOTABLE WATER REUSE SYSTEMS

1302.1 General. The provisions of Section 1302 shall govern the construction, installation, alteration and repair of on-site nonpotable water reuse systems for the collection, storage, treatment conveyance and application of on-site sources of nonpotable water as permitted by the New York City Construction Codes, and all applicable laws, and rules, including but not limited to those of the Department of Environmental Protection and the Department of Health and Mental Hygiene.

1302.2 Sources. On-site nonpotable water reuse systems shall be permitted to collect waste discharge from only the allowed sources as established by the Department of Health and Mental Hygiene.

1302.3 Traps. Traps serving fixtures and devices discharging waste water to on-site nonpotable water reuse systems shall comply with Section 1002.4.

1302.4 Collection pipe. On-site nonpotable water reuse systems shall utilize drainage piping approved for use in plumbing drainage systems to collect and convey untreated water for reuse. Vent piping approved for use in plumbing venting systems shall be utilized for vents in the nonpotable system. Collection and vent piping materials shall comply with Section 702, Table 702.1 and Table 702.2.

1302.4.1 Installation. Collection piping conveying untreated water for reuse shall be installed in accordance with Section 704.

1302.4.2 Joints. Collection piping conveying untreated water for reuse shall utilize joints approved for use with the conveyance piping and appropriate for the intended applications as specified in Section 705.

1302.4.3 Size. Collection piping conveying untreated water for reuse shall be sized in accordance with drainage sizing requirements specified in Section 710.

1302.4.4 Labeling and marking. Additional marking of collection piping containing untreated water for reuse shall be identified in accordance with Section 704.7.

1302.5 Filtration. Untreated water collected for reuse shall be filtered as required for the intended nonpotable end use as established by the Department of Health and Mental Hygiene. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gauge or other approved method to provide indication when a filter requires servicing or replacement. Filters shall be installed with shutoff valves immediately upstream and downstream to allow for isolation during maintenance.

1302.5.1 Filtration required. Nonpotable water utilized for water closet and urinal flushing applications shall be filtered by a 100-micron or finer filter.

1302.6 Disinfection and treatment. Untreated water collected for reuse shall be disinfected and treated as required for the intended nonpotable end use as established by the Department of Health and Mental Hygiene.

1302.7 Storage tanks. Storage tanks utilized in on-site nonpotable water reuse systems shall comply with Sections 1301.9 and 1302.7.1 through 1302.7.4.

1302.7.1 Location. Storage tanks shall be located with a minimum horizontal distance between various elements as indicated in Table 1302.7.1.

**TABLE 1302.7.1
LOCATION OF NONPOTABLE WATER REUSE STORAGE TANKS**

<u>ELEMENT</u>	<u>MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (feet)</u>
<u>Critical root zone (CRZ) of protected trees</u>	<u>2</u>
<u>Lot line adjoining private lots</u>	<u>5</u>
<u>Seepage pits</u>	<u>5</u>
<u>Septic tanks</u>	<u>5</u>
<u>Water wells</u>	<u>50</u>
<u>Streams and lakes</u>	<u>50</u>
<u>Water service</u>	<u>5</u>
<u>Public water main</u>	<u>10</u>

For SI: 1 foot = 304.8 mm.

1302.7.2. Design and construction. Storage tanks shall be designed and constructed in accordance with Chapters 16 through 22 of the *New York City Building Code* and in accordance with the following standards, as appropriate for the material of the storage tank: AWWA D100, AWWA D115, AWWA D120, UL 58, UL 1746, UL 1316, UL 142, API 12F or API 12D.

1302.7.3 Inlets. Storage tank inlets shall be designed to introduce collected water into the tank with minimum turbulence, and shall be located and designed to avoid agitating the contents of the storage tank.

1302.7.4 Outlets. Outlets shall be located not less than 4 inches (102 mm) above the bottom of the storage tank and shall not skim water from the surface.

1302.8 Valves. Valves shall be provided in accordance with Sections 1302.8.1 through 1302.8.3.

1302.8.1 Collection piping bypass valve. One full-size three-way diverter valve shall be installed on collection piping upstream of each storage tank, or drainfield, as applicable, to divert untreated on-site reuse sources to the sanitary sewer to allow servicing and inspection of the system. Bypass valves shall be installed downstream of fixture traps and vent connections. Bypass valves shall be marked to indicate the direction of flow, connection and storage tank or drainfield connection. Bypass valves shall be installed in accessible locations. Two shutoff valves shall not be installed to serve as a bypass valve.

1302.8.2 Backwater valve. One or more backwater valves shall be installed on each overflow and tank drain pipe. Backwater valves shall be in accordance with Section 715.

1302.8.3 Conveyance piping bypass valve. One full-size three-way diverter valve shall be installed on the conveyance piping system upstream and downstream of all treated storage tanks, as applicable, to divert treated on-site nonpotable reuse water to the sanitary sewer to allow system testing, commissioning and bypass conditions.

1302.9 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be easily accessible and removable in order to perform repair, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall be appropriate for the application and in accordance with Section 604.

1302.10 Water pressure-reducing valve or regulator. Where the water pressure supplied by the pumping system exceeds 85 psi (587 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the nonpotable water conveyance system piping to 85 psi (587 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8.

1302.11 Conveyance pipe. Conveyance piping utilized in on-site nonpotable water reuse systems shall comply with Sections 1302.11.1 through 1302.11.3.

Exception: Irrigation piping located outside of the building and downstream of a backflow preventer.

1302.11.1 Materials, joints and connections. Conveyance piping shall conform to the standards and requirements specified in Section 1301.6.

1302.11.2 Design. On-site nonpotable water reuse conveyance piping systems shall be designed and sized in accordance with Section 604 for the intended application.

1302.11.3 Marking. On-site nonpotable water conveyance piping labeling and marking shall comply with Section 1301.6.

1302.12 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 108, 312, and Sections 1302.12.1 through 1302.12.7. Special inspections of the nonpotable water systems shall be conducted in accordance with Chapter 17 of the *New York City Building Code*.

1302.12.1 Collection pipe and vent test. Drain, waste and vent piping used for on-site water reuse systems shall be tested in accordance with Section 312.

1302.12.2 Storage tank test. Storage tanks shall be tested in accordance with Section 1301.9.11.

1302.12.3 Water supply system test. The testing of makeup water supply piping and conveyance piping shall be conducted in accordance with Section 312.5.

1302.12.4 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers and backwater valves shall be conducted in accordance with Section 312.10.

1302.12.5 Inspection of vermin and insect protection. Inlets and vents to the system shall be inspected to verify that each is protected to prevent the entrance of insects and vermin into the storage tank and piping systems in accordance with Section 1301.7.

1302.12.6 Water quality test. Water quality testing and monitoring shall be conducted in accordance with requirements of the Department of Health and Mental Hygiene.

1302.12.7 Inspection and testing of cross connection control. Cross connection control inspection and testing shall be conducted in accordance with the requirements of the Department of Health and Mental Hygiene.

1302.13 Operation and maintenance manuals. Operation and maintenance materials shall be supplied with nonpotable on-site water reuse systems in accordance with Sections 1302.13.1 through 1302.13.4 and in accordance with the requirements of the Department of Health and Mental Hygiene.

1302.13.1 Manual. A detailed operations and maintenance manual shall be supplied in hardcopy form with all systems.

1302.13.2 Schematics. The manual shall include a detailed system schematic, and the locations and a list of all system components, including manufacturer and model number.

1302.13.3 Maintenance procedures. The manual shall provide a schedule and procedures for all system components requiring periodic maintenance. Consumable parts, including filters, shall be noted along with part numbers.

1302.13.4 Operations procedures. The manual shall include system startup and shutdown procedures. The manual shall include detailed operating procedures for the system.

SECTION PC 1303 **NONPOTABLE RAINWATER COLLECTION AND** **CONVEYANCE SYSTEMS**

1303.1 General. The provisions of Section 1303 shall govern the construction, installation, alteration and repair of rainwater collection and conveyance systems for the collection, storage, treatment and conveyance of rainwater for nonpotable applications, as permitted by the New York City Construction Codes, and all applicable laws, and rules, including but not limited to those of the Department of Environmental Protection and the Department of Health and Mental Hygiene.

1303.2 Collection surface. Rainwater shall be collected only from above-ground impervious roofing surfaces constructed from approved materials. Collection of water from vehicular parking or pedestrian surfaces shall be prohibited except where the water is used exclusively for landscape irrigation.

1303.2.1 Prohibited sources. Roof mounted appliances and equipment including but not limited to evaporative coolers, cooling towers, water heaters, and solar water heaters shall not discharge onto rainwater collection surfaces.

1303.3 Debris excluders. Downspouts and leaders shall be connected to a roof washer and shall be equipped with a debris excluder or equivalent device to prevent the contamination of collected rainwater with leaves, sticks, pine needles and similar material. Debris excluders and equivalent devices shall be self-cleaning.

1303.4 Roof washer. A sufficient amount of rainwater shall be diverted at the beginning of each rain event, and not allowed to enter the storage tank, to wash accumulated debris from the collection surface. The amount of rainfall to be diverted shall be field adjustable as necessary to minimize storage tank water contamination. The roof washer shall not rely on manually operated valves or devices, and shall operate automatically. Diverted rainwater shall not be drained to the roof surface, and shall be discharged in a manner consistent with the storm water runoff

requirements of the Department of Environmental Protection and this code. Roof washers shall be accessible for maintenance and service.

1303.5 Roof gutters and downspouts. Gutters and downspouts shall be constructed of materials that are compatible with the collection surface and the rainwater quality for the desired end use. Joints shall be water tight.

1303.5.1 Slope. Roof gutters, leaders and rainwater collection piping shall slope continuously toward collection inlets. Gutters and downspouts shall have a slope of not less than 1/8 inch per foot (10.4 mm/m) along their entire length, and shall not permit the collection or pooling of water at any point.

Exception: Siphonic drainage systems installed in accordance with the manufacturer's instructions shall not be required to have a slope.

1303.5.2 Size. Gutters and downspouts shall be installed and sized in accordance with Section 1106.

1303.5.3 Cleanouts. Cleanouts shall be provided in accordance with Chapter 11 of this code in the water conveyance system and to allow access to all filters, flushes, pipes and downspouts.

1303.6 Drainage. Water drained from the roof washer or debris excluder shall not be drained to the sanitary sewer. Such water shall be diverted from the storage tank and discharge in a location that will not cause erosion or damage to property in accordance with the *New York City Building Code*. Roof washers and debris excluders shall be provided with an automatic means of self-draining between rain events, and shall not drain onto roof surfaces.

1303.7 Collection pipe. Rainwater collection and conveyance systems shall utilize drainage piping approved for use within plumbing drainage systems to collect and convey captured rainwater. Vent piping approved for use within plumbing venting systems shall be utilized for vents within the rainwater system. Collection and vent piping materials shall comply with Section 1102.

1303.7.1 Installation. Collection piping conveying captured rainwater shall be installed in accordance with Chapter 11.

1303.7.2 Joints. Collection piping conveying captured rainwater shall utilize joints approved for use with the piping and appropriate for the intended applications as specified in Chapter 11.

1303.7.3 Size. Collection piping conveying captured rainwater shall be sized in accordance with drainage sizing requirements specified in Section 1106.

1303.7.4 Labeling and marking. Additional marking of collection piping containing captured rainwater for reuse shall be identified in accordance with Section 704.7.

1303.8 Filtration. Untreated rainwater collected for reuse shall be filtered as required for the intended nonpotable end use as established by the Department of Health and Mental Hygiene. Filters shall be accessible for inspection and maintenance. Filters shall utilize a pressure gauge or other approved method to provide indication when a filter requires servicing or replacement. Filters shall be installed with shutoff valves installed immediately upstream and downstream to allow for isolation during maintenance.

1303.8.1 Filtration required. Nonpotable water utilized for water closet and urinal flushing applications shall be filtered by a 100-micron or finer filter.

1303.9 Disinfection. Untreated rainwater collected for reuse shall be disinfected and treated as required for the intended nonpotable end use as established by the Department of Health and Mental Hygiene.

1303.10 Storage tanks. Storage tanks utilized in nonpotable rainwater collection and conveyance systems shall comply with Sections 1301.9 and 1303.10.1 through 1303.10.4.

1303.10.1 Location. Storage tanks shall be located with a minimum horizontal distance between various elements as indicated in Table 1303.10.1.

TABLE 1303.10.1
LOCATION OF RAINWATER STORAGE TANKS

<u>ELEMENT</u>	<u>MINIMUM HORIZONTAL DISTANCE FROM STORAGE TANK (feet)</u>
<u>Critical root zone (CRZ) of protected trees</u>	<u>2</u>
<u>Lot line adjoining private lots</u>	<u>5</u>
<u>Seepage pits</u>	<u>5</u>
<u>Septic tanks</u>	<u>5</u>

For SI: 1 foot = 304.8 mm.

1303.10.2. Design and construction. Storage tanks shall be designed and constructed in accordance with Chapters 16 through 22 of the *New York City Building Code* and in accordance with the following standards, as appropriate for the material of the storage tank: AWWA D100, AWWA D115, AWWA D120, UL 58, UL 1746, UL 1316, UL 142, API 12F or API 12D.

1303.10.3 Inlets. Storage tank inlets shall be designed to introduce collected rainwater into the tank with minimum turbulence, and shall be located and designed to avoid agitating the contents of the storage tank.

1303.10.4 Outlets. Outlets shall be located at least 4 inches (102 mm) above the bottom of the storage tank and shall not skim water from the surface.

1303.11 Valves. Valves shall be provided in accordance with Sections 1303.11.1 through 1303.11.3.

1303.11.1 Collection piping bypass valve. One full-size three-way diverter valve shall be installed on collection piping upstream of each storage tank, or drainfield, as applicable, to divert untreated rainwater to the storm or combined sewer to allow servicing and inspection of the system. Bypass valves shall be marked to indicate the direction of flow, connection and storage tank or drainfield connection. Bypass valves shall be installed in accessible locations. Two shutoff valves shall not be installed to serve as a bypass valve.

1303.11.2 Backwater valve. One or more backwater valves shall be installed on each overflow and tank drain pipe. Backwater valves shall be in accordance with Section 1101.

1303.11.3 Conveyance piping bypass valve. One full-size three-way diverter valve shall be installed on the conveyance piping system upstream and downstream of all treated storage tanks, as applicable, to divert treated on-site nonpotable reuse water to the sanitary sewer to allow system testing, commissioning and bypass conditions.

1303.12 Pumping and control system. Mechanical equipment including pumps, valves and filters shall be easily accessible and removable in order to perform repair, maintenance and cleaning. The minimum flow rate and flow pressure delivered by the pumping system shall be appropriate for the application and in accordance with Section 604.

1303.13 Water pressure-reducing valve or regulator. Where the water pressure supplied by the pumping system exceeds 85 psi (587 kPa) static, a pressure-reducing valve shall be installed to reduce the pressure in the rainwater conveyance system piping to 85 psi (587 kPa) static or less. Pressure-reducing valves shall be specified and installed in accordance with Section 604.8.

1303.14 Conveyance pipe. Conveyance piping utilized in rainwater collection and conveyance systems shall comply with Sections 1303.14.1 through 1303.14.3.

Exception: Irrigation piping located outside of the building and downstream of a backflow preventer.

1303.14.1 Materials, joints and connections. Conveyance piping shall conform to the standards and requirements specified in Section 1301.6.

1303.14.2 Design. Rainwater reuse conveyance piping systems shall be designed and sized in accordance with Section 604 for the intended application.

1303.14.3 Marking. Nonpotable rainwater conveyance piping labeling and marking shall comply with Section 1301.6.

1303.15 Tests and inspections. Tests and inspections shall be performed in accordance with Sections 108, 312, and Sections 1303.15.1 through 1303.15.9. Special inspections of the nonpotable water systems shall be conducted in accordance with Chapter 17 of the *New York City Building Code*.

1303.15.1 Reserved.

1303.15.2 Roofwasher test. Roofwashers shall be tested by introducing water into the gutters. Proper diversion of the first quantity of water in accordance with the requirements of Section 1303.4 shall be verified.

1303.15.3 Collection pipe and vent test. Drain, waste and vent piping used for rainwater collection and conveyance systems shall be tested in accordance with Section 312.

1303.15.4 Storage tank test. Storage tanks shall be tested in accordance with Section 1301.9.11.

1303.15.5 Water supply system test. The testing of makeup water supply piping and conveyance piping shall be conducted in accordance with Section 312.5.

1303.15.6 Inspection and testing of backflow prevention assemblies. The testing of backflow preventers and backwater valves shall be conducted in accordance with Section 312.10.

1303.15.7 Inspection of vermin and insect protection. Inlets and vents to the system shall be inspected to verify that each is protected to prevent the entrance of insects and vermin into the storage tank and piping systems in accordance with Section 1301.7.

1303.15.8 Water quality test. Water quality testing and monitoring shall be conducted in accordance with requirements of the Department of Health and Mental Hygiene.

1303.15.9 Inspection and testing of cross connection control. Cross connection control inspection and testing shall be conducted in accordance with the requirements of the Department of Health and Mental Hygiene.

1303.16 Operation and maintenance manuals. Operation and maintenance manuals shall be supplied with rainwater collection and conveyance systems in accordance with Sections 1303.16.1 through 1303.16.4.

1303.16.1 Manual. A detailed operations and maintenance manual shall be supplied in hardcopy form with all systems.

1303.16.2 Schematics. The manual shall include a detailed system schematic, and locations and a list of all system components, including manufacturer and model number.

1303.16.3 Maintenance procedures. The manual shall provide a maintenance schedule and procedures for all system components requiring periodic maintenance. Consumable parts, including filters, shall be noted along with part numbers.

1303.16.4 Operations procedures. The manual shall include system startup and shutdown procedures. The manual shall include detailed operating procedures for the system.

SECTION PC 1304

RESERVED

PART N

CHAPTER 14

§1. The New York city plumbing code is amended by adding a new chapter 14 to read as follows:

CHAPTER 14

SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

SECTION PC 1401

GENERAL

1401.1 Scope. The provisions of Chapter 14 shall govern the materials, design, construction and installation of subsurface landscape irrigation systems connected to nonpotable water from on-site water reuse systems.

1401.2 Materials. Above-ground drain, waste and vent piping for subsurface landscape irrigation systems shall conform to one of the standards listed in Table 702.1. Subsurface landscape irrigation, underground building drainage and vent pipe shall conform to one of the standards listed in Table 702.2.

1401.3 Tests. Drain, waste and vent piping for subsurface landscape irrigation systems shall be tested in accordance with Section 312.

1401.4 Inspections. Subsurface landscape irrigation systems shall be inspected in accordance with Section 107.

1401.5 Disinfection. Disinfection shall not be required for on-site nonpotable water reuse for subsurface landscape irrigation systems.

1401.6 Coloring. On-site nonpotable water reuse for subsurface landscape irrigation systems shall not be required to be dyed.

SECTION PC 1402

SYSTEM DESIGN AND SIZING

1402.1 Sizing. The system shall be sized in accordance with the sum of the output of all water sources connected to the subsurface irrigation system. Where gray water collection piping is

connected to subsurface landscape irrigation systems, gray water output shall be calculated according to the gallons-per-day-per-occupant number based on the type of fixtures connected. The gray water discharge shall be calculated by the following equation:

$$C = A \times B \quad \textbf{(Equation 14-1)}$$

where:

A = Number of occupants:

Residential – Number of occupants shall be determined by the actual number of occupants, but not less than two occupants for one bedroom and one occupant for each additional bedroom.

Commercial – Number of occupants shall be determined by the *New York City Building Code*.

B = Estimated flow demands for each occupant*:

Residential – 25 gallons per day (94.6 lpd) per occupant for showers, bathtubs and lavatories and 15 gallons per day (56.7 lpd) per occupant for clothes washers or laundry trays.

Commercial – Based on type of fixture or water use records minus the discharge of fixtures other than those discharging gray water.

*Alternative estimated flow demands for each occupant shall be permitted based on actual calculated water usage for the building.

C = Estimated gray water discharge based on the total number of occupants.

1402.2 Percolation tests. The permeability of the soil in the proposed absorption system shall be determined by percolation tests or permeability evaluation.

1402.2.1 Percolation tests and procedures. At least three percolation tests in each system area shall be conducted. The holes 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.

1402.2.1.1 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.

1402.2.1.2 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. Thereupon, 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 1 minute per inch (2.4 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 1402.2.1.3.

1402.2.1.3 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. Thereupon, 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.

1402.2.1.4 Mechanical test equipment. Mechanical percolation test equipment shall be of an approved type.

1402.2.2 Permeability evaluation. Soil shall be evaluated for estimated percolation based on structure and texture in accordance with accepted soil evaluation practices. Borings shall be made in accordance with Section 1402.2.1.1 for evaluating the soil.

1402.3 Subsurface landscape irrigation site location. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining lot. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table 1402.3. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.

TABLE 1402.3
LOCATION OF SUBSURFACE IRRIGATION SYSTEM

<u>ELEMENT</u>	<u>MINIMUM HORIZONTAL DISTANCE</u>	
	<u>Storage tank (feet)</u>	<u>Irrigation disposal field (feet)</u>
<u>Buildings</u>	<u>5</u>	<u>10</u>

<u>ELEMENT</u>	<u>MINIMUM HORIZONTAL DISTANCE</u>	
	<u>Storage tank (feet)</u>	<u>Irrigation disposal field (feet)</u>
<u>Lot line adjoining private property</u>	<u>5</u>	<u>5</u>
<u>Water wells</u>	<u>50</u>	<u>100</u>
<u>Streams and lakes</u>	<u>50</u>	<u>50</u>
<u>Seepage pits</u>	<u>5</u>	<u>20</u>
<u>Septic tanks</u>	<u>0</u>	<u>5</u>
<u>Water service</u>	<u>5</u>	<u>5</u>
<u>Public water main</u>	<u>10</u>	<u>10</u>

For SI: 1 foot = 304.8 mm.

SECTION PC 1403
INSTALLATION

1403.1 Installation. Absorption systems shall be installed in accordance with Sections 1403.1.1 through 1403.1.5 to provide landscape irrigation without surfacing of water.

1403.1.1 Absorption area. The total absorption area required shall be computed from the estimated daily gray water discharge and the design-loading rate based on the percolation rate for the site. The required absorption area equals the estimated gray water discharge divided by the design-loading rate from Table 1403.1.1.

TABLE 1403.1.1
DESIGN LOADING RATE

<u>PERCOLATION RATE (minutes per inch)</u>	<u>DESIGN LOADING FACTOR (gallons per square foot per day)</u>
<u>< 1</u>	<u>Not suitable</u>
<u>1-5</u>	<u>1.20</u>
<u>6-7</u>	<u>1.00</u>
<u>8-10</u>	<u>0.90</u>
<u>11-15</u>	<u>0.80</u>
<u>16-20</u>	<u>0.70</u>

<u>PERCOLATION RATE (minutes per inch)</u>	<u>DESIGN LOADING FACTOR (gallons per square foot per day)</u>
<u>21-30</u>	<u>0.60</u>
<u>31-45</u>	<u>0.50</u>
<u>46-60</u>	<u>0.45</u>
<u>61-120</u>	<u>0.20</u>
<u>> 120</u>	<u>Not Suitable</u>

For SI: 1 minute per inch = min/25.4 mm, 1 gallon per square foot = 40.7 L/m².

1403.1.2 Seepage trench excavations. Seepage trench excavations shall be not less than 1 foot (304 mm) in width and not greater than 5 feet (1524 mm) in width. Trench excavations shall be spaced not less than 2 feet (610 mm) apart. The soil absorption area of a seepage trench shall be computed by using the bottom of the trench area (width) multiplied by the length of pipe. Individual seepage trenches shall be not greater than 100 feet (30 480 mm) in developed length.

1403.1.3 Seepage bed excavations. Seepage bed excavations shall be not less than 5 feet (1524 mm) in width and have more than one distribution pipe. The absorption area of a seepage bed shall be computed by using the bottom of the trench area. Distribution piping in a seepage bed shall be uniformly spaced not greater than 5 feet (1524 mm) and not less than 3 feet (914 mm) apart, and greater than 3 feet (914 mm) and not less than 1 foot (305 mm) from the sidewall or headwall.

1403.1.4 Excavation and construction. The bottom of a trench or bed excavation shall be level. Seepage trenches or beds shall not be excavated where the soil is so wet that such material rolled between the hands forms a soil wire. All smeared or compacted soil surfaces in the sidewalls or bottom of seepage trench or bed excavations shall be scarified to the depth of smearing or compaction and the loose material removed. Where rain falls on an open excavation, the soil shall be left until sufficiently dry so a soil wire will not form when soil from the excavation bottom is rolled between the hands. The bottom area shall then be scarified and loose material removed.

1403.1.5 Aggregate and backfill. Not less than 6 inches in depth of aggregate, ranging in size from ½ to 2 ½ inches (12.7 mm to 64 mm), shall be laid into the trench below the distribution piping elevation. The aggregate shall be evenly distributed not less than 2 inches (51 mm) in depth over the top of the distribution pipe. The aggregate shall be covered with approved synthetic materials or 9 inches (229 mm) of uncompacted marsh hay or straw. Building paper shall not be used to cover the aggregate. Not less than 9 inches (229 mm) of soil backfill shall be provided above the covering.

1403.2 Distribution piping. Distribution piping shall be not less than 3 inches (76 mm) in diameter. Materials shall comply with Table 1403.2. The top of the distribution pipe shall be not less than 4 inches (100 mm) or greater than 12 inches (300 mm) below the original surface. The

slope of the distribution pipes shall be not less than 2 inches (51 mm) and not greater than 4 inches (102 mm) per 100 feet (30 480 mm).

TABLE 1403.2
DISTRIBUTION PIPE

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Polypropylene (PP) pipe</u>	<u>ASTM F 2389</u>
<u>Polyethylene (PE) plastic pipe</u>	<u>ASTM F 405</u>
<u>Polyvinyl chloride (PVC) plastic pipe^a</u>	<u>ASTM D 2729</u>
<u>Polyvinyl chloride (PVC) plastic pipe with a 3.5-inch O.D. and solid cellular core or composite wall^a</u>	<u>ASTM F 1488</u>

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

1403.2.1 Joints and fittings. Joints and fittings in distribution pipe shall be made in accordance with Table 1403.2.1.

TABLE 1403.2.1
JOINTS AND FITTINGS

<u>MATERIAL</u>	<u>STANDARD</u>
<u>Polyethylene (PE) plastic pipe</u>	<u>ASTM F 405</u>
<u>Polypropylene (PP) pipe</u>	<u>ASTM F 2389</u>
<u>Polyvinyl chloride (PVC) plastic in IPS diameters^a</u>	<u>ASTM D 2665; ASTM F 1866</u>
<u>Polyvinyl chloride (PVC) plastic pipe in sewer and drain diameters^a</u>	<u>ASTM D 3034</u>
<u>Polyvinyl chloride (PVC) plastic pipe with a 3.25-inch O.D.^a</u>	<u>ASTM D 2949</u>

For SI: 1 inch = 25.4 mm.

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

1403.2.2 Diversion valves. Systems shall include a diversion valve to divert gray water to the building sanitary system when soils are saturated or frozen, there is a blockage or backup in the system, the maximum allowed gallons per day is reached, or when system maintenance is necessary.

1403.2.3 Overflow connection. Systems shall have a piped connection to the building drainage system to accommodate tank overflow.

PART O

CHAPTER 15

§1. The New York city plumbing code is amended by adding a new chapter 15 to read as follows:

CHAPTER 15

REFERENCED STANDARDS

SECTION PC 1501

GENERAL

1501.1 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.

1501.2 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*.

1501.3 Applicability. The application of the referenced standards shall be as specified in Section 102.8.

SECTION PC 1502

STANDARDS

<u>AHRI</u>	<u>Air-Conditioning, Heating, & Refrigeration Institute 4100 North Fairfax Drive, Suite 200 Arlington, VA 22203</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>1010—02</u>	<u>Self-contained, Mechanically Refrigerated Drinking-Water Coolers</u>	<u>410.1</u>
<u>810—16 Addendum 1</u>	<u>Performance Rating of Automatic Commercial Ice-makers</u>	<u>428.1.1</u>

<u>ANSI</u>	<u>American National Standards Institute</u> <u>25 West 43rd Street, Fourth Floor</u> <u>New York, NY 10036</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A118.10—99</u>	<u>Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin Set Ceramic Tile and Dimension Stone Installation</u>	<u>417.5.2.5,</u> <u>417.5.2.6</u>
<u>Z4.3—95</u>	<u>Minimum Requirements for Nonsewered Waste-disposal Systems</u>	<u>311.1</u>
<u>Z21.22—99</u> <u>(R2003)</u>	<u>Relief Valves for Hot Water Supply Systems with Addenda Z21.22a—2000 (R2003) and Z21.22b—2001 (R2003)</u>	<u>504.2, 504.4,</u> <u>504.4.1</u>
<u>CSA B45.5—11/</u> <u>IAPMO Z124—</u> <u>11</u>	<u>Plastic Plumbing Fixtures</u>	<u>407.1, 415.1,</u> <u>416.1, 416.2,</u> <u>417.1, 418.1,</u> <u>419.1, 420.1</u>

<u>API</u>	<u>American Petroleum Institute</u> <u>1220 L Street NW</u> <u>Washington, DC 20005-4070</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>12D – 2008</u>	<u>Specification for Field Welded Tanks for Storage of Production Liquids, effective April 1, 2009</u>	<u>1302.7.2,</u> <u>1303.10.2</u>
<u>12F – 2008</u>	<u>Specification for Shop Welded Tanks for Storage of Production Liquids, effective April 1, 2009</u>	<u>1302.7.2,</u> <u>1303.10.2</u>

<u>ASCE/SEI</u>	<u>American Society of Civil Engineers</u> <u>Structural Engineering Institute</u> <u>1801 Alexander Bell Drive</u> <u>Reston, VA 20191-4400</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>24—14</u>	<u>Flood Resistant Design and Construction</u>	<u>715.1, 1101.9.1</u>

<u>ASME</u>	<u>American Society of Mechanical Engineers</u> <u>Three Park Avenue</u> <u>New York, NY 10016-5990</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A112.1.2—2004</u>	<u>Air Gaps in Plumbing Systems</u>	<u>406.1, 409.2, Table 608.1, 608.13.1</u>
<u>A112.1.3—2000 (R2011)</u>	<u>Air Gap Fittings for Use with Plumbing Fixtures, Appliances and Appurtenances</u>	<u>406.1, 409.2, Table 608.1, 608.13.1</u>
<u>A112.3.1—2007</u>	<u>Stainless Steel Drainage Systems for Sanitary, DWV, Storm and Vacuum Applications Above and Below Ground</u>	<u>412.1, Table 702.1, Table 702.2, Table 702.3, Table 702.4, Table 1102.4, 1102.6, Table 1102.7</u>
<u>ASME A112.3.4—2013/CSA B45.9—2013</u>	<u>Macerating Toilet Systems and Related Components</u>	<u>712.4.1</u>
<u>A112.4.1—2009</u>	<u>Water Heater Relief Valve Drain Tubes</u>	<u>504.6</u>

<u>ASME</u>	<u>American Society of Mechanical Engineers</u> <u>Three Park Avenue</u> <u>New York, NY 10016-5990</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A112.4.2—2009</u>	<u>Water Closet Personal Hygiene Devices</u>	<u>424.9</u>
<u>A112.4.3—1999 (R2010)</u>	<u>Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System</u>	<u>405.4</u>
<u>A112.4.14—2004 (R2010)</u>	<u>Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems</u>	<u>Table 605.7</u>
<u>A112.6.1M—1997 (R2008)</u>	<u>Floor-affixed Supports for Off-the-floor Plumbing Fixtures for Public Use</u>	<u>405.4.3</u>
<u>A112.6.2—2000 (R2010)</u>	<u>Framing-affixed Supports for Off-the-floor Water Closets with Concealed Tanks</u>	<u>405.4.3</u>
<u>A112.6.3—2001 (R2007)</u>	<u>Floor and Trench Drains</u>	<u>412.1</u>
<u>A112.6.4—2003 (R2008)</u>	<u>Roof, Deck, and Balcony Drains</u>	<u>1102.6</u>
<u>A112.6.7—2010</u>	<u>Enameled and Epoxy-coated Cast-iron and PVC Plastic Sanitary Floor Sinks</u>	<u>427.1</u>
<u>A112.6.9—2005 (R2010)</u>	<u>Siphonic Roof Drains</u>	<u>1107.1</u>
<u>A112.14.1—2003</u>	<u>Backwater Valves</u>	<u>715.2</u>
<u>A112.14.3—2000</u>	<u>Grease Interceptors</u>	<u>1003.3.4</u>
<u>A112.14.4—2001 (Reaffirmed 2007)</u>	<u>Grease Removal Devices</u>	<u>1003.3.4</u>

<u>ASME</u>	<u>American Society of Mechanical Engineers</u> <u>Three Park Avenue</u> <u>New York, NY 10016-5990</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A112.18.1—2012/CSA B125.1—2012</u>	<u>Plumbing Supply Fittings</u>	<u>424.1, 424.2, 424.3, 424.4, 424.6, 424.8, Table 605.7, 607.4, 608.2</u>
<u>A112.18.2—2011/CSA B125.2—2011</u>	<u>Plumbing Waste Fittings</u>	<u>424.1.2</u>
<u>A112.18.3—2002 (Reaffirmed 2008)</u>	<u>Performance Requirements for Backflow Protection Devices and Systems in Plumbing Fixture Fittings</u>	<u>424.2, 424.6</u>
<u>A112.18.6/CSA B125.6—2009</u>	<u>Flexible Water Connectors</u>	<u>605.6</u>
<u>A112.18.9—2011</u>	<u>Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures</u>	<u>404.3</u>
<u>A112.19.1—2013/CSA B45.2—2013</u>	<u>Enameled Cast Iron and Enameled Steel Plumbing Fixtures</u>	<u>407.1, 410.1, 415.1, 416.1, 418.1</u>
<u>A112.19.2—2013/CSA B45.1—13</u>	<u>Ceramic Plumbing Fixtures</u>	<u>401.2, 405.9, 407.1, 408.1, 410.1, 415.1, 416.1, 417.1, 418.1, 419.1, 420.1</u>

<u>ASME</u>	<u>American Society of Mechanical Engineers</u> <u>Three Park Avenue</u> <u>New York, NY 10016-5990</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A112.19.3—</u> <u>2008/</u> <u>CSA B45.4—</u> <u>08(R2013)</u>	<u>Stainless Steel Plumbing Fixtures</u>	<u>405.9, 407.1,</u> <u>415.1, 416.1,</u> <u>418.1, 420.1</u>
<u>A112.19.5—</u> <u>2011/</u> <u>CSA B45.15—</u> <u>2011</u>	<u>Flush Valves and Spuds for Water-closets, Urinals, and Tanks</u>	<u>425.4</u>
<u>A112.19.7M—</u> <u>2012/</u> <u>CSA B45.10—</u> <u>2012</u>	<u>Hydromassage Bathtub Systems</u>	<u>421.1, 421.4</u>
<u>A112.19.12—</u> <u>2006</u>	<u>Wall Mounted and Pedestal Mounted, Adjustable, Elevating, Tilting and Pivoting Lavatory, Sink and Shampoo Bowl Carrier Systems and Drain Systems</u>	<u>416.4, 418.3</u>
<u>A112.19.14-</u> <u>2006(R2011)</u>	<u>Six-Liter Water Closets Equipped with a Dual Flushing Device</u>	<u>420.1</u>
<u>A112.19.15—</u> <u>2005</u>	<u>Bathtub/Whirlpool Bathtubs with Pressure Sealed Doors</u>	<u>407.4, 421.6</u>
<u>A112.19.19—</u> <u>2006</u>	<u>Vitreous China Nonwater Urinals</u>	<u>419.1</u>
<u>A112.21.3-</u> <u>1985(R2007)</u>	<u>Hydrants for Utility and Maintenance Use</u>	<u>Table 608.1,</u> <u>608.13.6</u>
<u>A112.36.2M—</u> <u>1991 (R2008)</u>	<u>Cleanouts</u>	<u>709.1.10.2</u>

<u>ASME</u>	<u>American Society of Mechanical Engineers</u> <u>Three Park Avenue</u> <u>New York, NY 10016-5990</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>ASSE 1016/ ASME A112.1016/ CSA B125.16-2011</u>	<u>Performance Requirements for Individual Thermostatic, Pressure Balancing and Combination Control Valves for Individual Fixture Fittings</u>	<u>424.3, 424.4, 607.4</u>
<u>B1.20.1—1983(R2006)</u>	<u>Pipe Threads, General Purpose (inch)</u>	<u>605.11.3, 605.13.4, 705.2.3, 705.3.3, 705.6.4, 705.9.1, 705.11.3, 803.3.4.1.3</u>
<u>B16.3—2011</u>	<u>Malleable Iron Threaded Fittings Classes 150 and 300</u>	<u>Table 702.4, Table 1102.7</u>
<u>B16.4—2011</u>	<u>Gray Iron Threaded Fittings Classes 125 and 250</u>	<u>Table 605.5, Table 702.4, Table 1102.7</u>
<u>B16.12—2009</u>	<u>Cast-iron Threaded Drainage Fittings</u>	<u>Table 702.4, Table 1102.7</u>
<u>B16.15—2011</u>	<u>Cast Bronze Threaded Fittings</u>	<u>Table 605.5, Table 702.4</u>
<u>B16.18—2012</u>	<u>Cast Copper Alloy Solder Joint Pressure Fittings</u>	<u>Table 605.5, Table 702.4</u>
<u>B16.22—2001 (R2010)</u>	<u>Wrought Copper and Copper Alloy Solder Joint Pressure Fittings</u>	<u>Table 605.5, Table 702.4</u>

<u>ASME</u>	<u>American Society of Mechanical Engineers</u> <u>Three Park Avenue</u> <u>New York, NY 10016-5990</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>B16.23—2011</u>	<u>Cast Copper Alloy Solder Joint Drainage Fittings (DWV)</u>	<u>Table 702.4</u>
<u>B16.26—2011</u>	<u>Cast Copper Alloy Fittings for Flared Copper Tubes</u>	<u>Table 605.5,</u> <u>Table 702.4</u>
<u>B16.29—2012</u>	<u>Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings (DWV)</u>	<u>Table 702.4</u>
<u>B31.9 — 2017</u>	<u>Building Services Piping</u>	<u>605.23.2</u>
<u>BPVC—2010</u>	<u>Boiler and Pressure Vessel Code</u>	<u>312.11.1, 501.2</u>

<u>ASPE</u>	<u>American Society of Plumbing Engineers</u> <u>8614 Catalpa Avenue, Suite 1007</u> <u>Chicago, IL 60656-1116</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>45—2013</u>	<u>Siphonic Roof Drainage Systems</u>	<u>1107.1</u>

<u>ASSE</u>	<u>American Society of Sanitary Engineering</u> 901 Canterbury Road, Suite A Westlake, OH 44145	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>1001—08</u>	<u>Performance Requirements for Atmospheric Type Vacuum Breakers</u>	<u>425.2, Table 608.1, 608.13.6, 608.16.4.1</u>
<u>1002—08</u>	<u>Performance Requirements for Antisiphon Fill Valves (Ballcocks) for Gravity Water Closet Flush Tanks</u>	<u>425.3.1, Table 608.1</u>
<u>1003—09</u>	<u>Performance Requirements for Water Pressure Reducing Valves</u>	<u>604.8</u>
<u>1004—08</u>	<u>Performance Requirements for Backflow Prevention Requirements for Commercial Dishwashing Machines</u>	<u>409.1</u>
<u>1008—06</u>	<u>Performance Requirements for Plumbing Aspects of Food Waste Disposer Units</u>	<u>413.1</u>
<u>1010—04</u>	<u>Performance Requirements for Water Hammer Arresters</u>	<u>604.9</u>
<u>1011—04</u>	<u>Performance Requirements for Hose Connection Vacuum Breakers</u>	<u>Table 608.1, 608.13.6</u>
<u>1012—09</u>	<u>Performance Requirements for Backflow Preventers with Intermediate Atmospheric Vent</u>	<u>Table 608.1, 608.13.3, 608.16.2</u>
<u>1013—09</u>	<u>Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers</u>	<u>Table 608.1, 608.13.2, 608.16.2</u>
<u>1015—09</u>	<u>Performance Requirements for Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies</u>	<u>Table 608.1, 608.13.7</u>

<u>ASSE</u>	<u>American Society of Sanitary Engineering</u> 901 Canterbury Road, Suite A Westlake, OH 44145	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>ASSE 1016/ ASME A112.1016/ CSA B125.16—2011</u>	<u>Performance Requirements for Individual Thermostatic, Pressure Balancing and Combination Control Valves for Individual Fixture Fittings</u>	<u>424.3, 424.4, 607.4, 613.1</u>
<u>1017—2010</u>	<u>Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems</u>	<u>501.2.3, 613.1</u>
<u>1018—2010</u>	<u>Performance Requirements for Trap Seal Primer Valves; Potable Water Supplied</u>	<u>1002.4.1.1, 1002.4.1.2</u>
<u>1019—2010</u>	<u>Performance Requirements for Vacuum Breaker Wall Hydrants, Freeze Resistant, Automatic Draining Type</u>	<u>Table 608.1, 608.13.6,</u>
<u>1020—04</u>	<u>Performance Requirements for Pressure Vacuum Breaker Assembly</u>	<u>Table 608.1, 608.13.5</u>
<u>1022—03</u>	<u>Performance Requirements for Backflow Preventer for Beverage Dispensing Equipment</u>	<u>Table 608.1, 608.16.1, 608.16.10</u>
<u>1024—04</u>	<u>Performance Requirements for Dual Check Valve Type Backflow Preventers (for Residential Supply Service or Individual Outlets)</u>	<u>Table 608.1, 608.13.10</u>
<u>1035—08</u>	<u>Performance Requirements for Laboratory Faucet Backflow Preventers</u>	<u>Table 608.1, 608.13.6</u>
<u>1037—90</u>	<u>Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures</u>	<u>425.2</u>
<u>1047—2009</u>	<u>Performance Requirements for Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies</u>	<u>Table 608.1, 608.13.2</u>

<u>ASSE</u>	<u>American Society of Sanitary Engineering</u> 901 Canterbury Road, Suite A Westlake, OH 44145	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>1048—2009</u>	<u>Performance Requirements for Double Check Detector Fire Protection Backflow Prevention Assemblies</u>	<u>Table 608.1, 608.13.7</u>
<u>1052—04</u>	<u>Performance Requirements for Hose Connection Backflow Preventers</u>	<u>Table 608.1, 608.13.6</u>
<u>1055—2009</u>	<u>Performance Requirements for Chemical Dispensing Systems</u>	<u>608.13.9</u>
<u>1056—2010</u>	<u>Performance Requirements for Spill Resistant Vacuum Breaker</u>	<u>Table 608.1, 608.13.5, 608.13.8</u>
<u>1060—2006</u>	<u>Performance Requirements for Outdoor Enclosures for Fluid Conveying Components</u>	<u>608.14.1</u>
<u>1061—2010</u>	<u>Performance Requirements for Removable and Nonremovable Push Fit Fittings</u>	<u>Table 605.5, 605.14.4</u>
<u>1062—2006</u>	<u>Performance Requirements for Temperature Actuated, Flow Reduction Valves to Individual Supply Fittings</u>	<u>424.7</u>
<u>1066—2009</u>	<u>Performance Requirements for Individual Pressure Balancing In-line Valves for Individual Fixture Fittings</u>	<u>604.11</u>
<u>1069—05</u>	<u>Performance Requirements for Automatic Temperature Control Mixing Valves</u>	<u>424.4</u>
<u>1070—04</u>	<u>Performance Requirements for Water-temperature Limiting Devices</u>	<u>408.3, 416.5, 423.3, 424.5, 607.1.2</u>
<u>1079—2005</u>	<u>Performance Requirements for Dielectric Pipe Unions</u>	<u>605.24.1, 605.24.3</u>

<u>ASSE</u>	<u>American Society of Sanitary Engineering</u> 901 Canterbury Road, Suite A Westlake, OH 44145	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>5013—2009</u>	<u>Performance Requirements for Testing Reduced Pressure Principle Backflow Prevention Assembly (RPA) and Reduced Pressure Fire Protection Backflow Preventers (RFP)</u>	<u>312.10.2</u>
<u>5015—2009</u>	<u>Performance Requirements for Testing Double Check Valve Backflow Prevention Assemblies (DC) and Double Check Fire Protection Backflow Prevention Assemblies (DCF)</u>	<u>312.10.2</u>
<u>5020—2009</u>	<u>Performance Requirements for Testing Pressure Vacuum Breaker Assemblies (PVBA)</u>	<u>312.10.2</u>
<u>5047—98</u>	<u>Performance Requirements for Testing Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies (RPDA)</u>	<u>312.10.2</u>
<u>5048—2009</u>	<u>Performance Requirements for Testing Double Check Valve Detector Assembly (DCDA)</u>	<u>312.10.2</u>
<u>5052—98</u>	<u>Performance Requirements for Testing Hose Connection Backflow Preventers</u>	<u>312.10.2</u>
<u>5056—98</u>	<u>Performance Requirements for Testing Spill Resistant Vacuum Breaker (SRVB)</u>	<u>312.10.2</u>

<u>ASTM</u>	<u>ASTM International</u> 100 Barr Harbor Drive West Conshohocken, PA 19428-2959	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A 53/A 53M—12</u>	<u>Specification for Pipe, Steel, Black and Hot-dipped, Zinc-coated Welded and Seamless</u>	<u>Table 702.1, Table 702.3, Table 1102.4</u>
<u>A 74—13A</u>	<u>Specification for Cast-iron Soil Pipe and Fittings</u>	<u>Table 702.1, Table 702.2, Table 702.3, Table 702.4, 708.1.6, Table 1102.4, Table 1102.5, Table 1102.7</u>
<u>A 123 – 12</u>	<u>Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products</u>	<u>Table 702.3, Table 1102.4</u>
<u>A 153/A 153M—16a</u>	<u>Specifications for Zinc Coating (Hot Dip) on Iron and Steel Hardware</u>	<u>Table 702.4, Table 1102.7</u>
<u>A 312/A 312M—13a</u>	<u>Specification for Seamless, Welded, And Heavily Cold Worked Austenitic Stainless Steel Pipes</u>	<u>Table 605.4, Table 605.4.1, Table 605.5, Table 1301.6</u>
<u>A 403/A 403M—11</u>	<u>Specification for Wrought Austenitic Stainless Steel Piping Fittings</u>	<u>Table 605.5, Table 605.8</u>
<u>A 518/A 518M—99 (2012)</u>	<u>Standard Specification for Corrosion-Resistant High-Silicon Iron Castings</u>	<u>Table 803.3.1</u>
<u>A 778—01(2009)e1</u>	<u>Specification for Welded Unannealed Austenitic Stainless Steel Tubular Products</u>	<u>Table 605.4, Table 605.4.1, Table 605.5, Table 1301.6</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A 861—04 (2017)</u>	<u>Standard Specification for High-Silicon Iron Pipe and Fittings</u>	<u>Table 803.3.2</u>
<u>A 888—13A</u>	<u>Specification for Hubless Cast-iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Application</u>	<u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 702.4,</u> <u>Table 1102.4,</u> <u>Table 1102.5,</u> <u>Table 1102.7</u>
<u>B 32—08</u>	<u>Specification for Solder Metal</u>	<u>605.14.6,</u> <u>705.6.3, 705.7.3</u>
<u>B 42—10</u>	<u>Specification for Seamless Copper Pipe, Standard Sizes</u>	<u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 702.1,</u> <u>Table 1301.6</u>
<u>B 43—09</u>	<u>Specification for Seamless Red Brass Pipe, Standard Sizes</u>	<u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 702.1,</u> <u>Table 1301.6</u>
<u>B 62—17</u>	<u>Specification for Composition Bronze or Ounce Metal Castings</u>	<u>Table 605.5,</u> <u>Table 702.4,</u> <u>Table 1102.7</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>B 75—11</u>	<u>Specification for Seamless Copper Tube</u>	<u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 1102.4,</u> <u>Table 1102.7,</u> <u>Table 1301.6</u>
<u>B 88—09</u>	<u>Specification for Seamless Copper Water Tube</u>	<u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 1102.4,</u> <u>Table 1102.7,</u> <u>Table 1301.6,</u> <u>Figure E103.3(2),</u> <u>Figure E103.3(3)</u>
<u>B 152/B 152M—13</u>	<u>Specification for Copper Sheet, Strip Plate and Rolled Bar</u>	<u>402.3, 417.5.2.4,</u> <u>425.3.3, 902.2</u>
<u>B 251—10</u>	<u>Specification for General Requirements for Wrought Seamless Copper and Copper-alloy Tube</u>	<u>Table 605.3,</u> <u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 1102.4,</u> <u>Table 1102.7,</u> <u>Table 1301.6</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>B 302—12</u>	<u>Specification for Threadless Copper Pipe, Standard Sizes</u>	<u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 702.1,</u> <u>Table 1301.6</u>
<u>B 447—12a</u>	<u>Specification for Welded Copper Tube</u>	<u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 1301.6</u>
<u>B 687— (2011)</u>	<u>Specification for Brass, Copper and Chromium-plated Pipe Nipples</u>	<u>Table 605.8</u>
<u>B 813—10</u>	<u>Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube</u>	<u>605.14.6,</u> <u>705.6.3, 705.7.3</u>
<u>B 828—02(2010)</u>	<u>Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings</u>	<u>605.14.6,</u> <u>705.6.3, 705.7.3</u>
<u>C 4—04(2009)</u>	<u>Specification for Clay Drain Tile and Perforated Clay Drain Tile</u>	<u>Table 702.3,</u> <u>Table 1102.4,</u> <u>Table 1102.5</u>
<u>C 14—11</u>	<u>Specification for Nonreinforced Concrete Sewer, Storm Drain and Culvert Pipe</u>	<u>Table 702.3,</u> <u>Table 1102.4</u>
<u>C 76—13a</u>	<u>Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe</u>	<u>Table 702.3,</u> <u>Table 1102.4</u>
<u>C 425—04(2009)</u>	<u>Specification for Compression Joints for Vitrified Clay Pipe and Fittings</u>	<u>Table 702.4,</u> <u>705.12, 705.16,</u> <u>Table 1102.7</u>
<u>C 443—12</u>	<u>Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets</u>	<u>705.5, 705.16</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>C 564—12</u>	<u>Specification for Rubber Gaskets for Cast-iron Soil Pipe and Fittings</u>	<u>705.4.2, 705.4.3, 705.16</u>
<u>C 654—15</u>	<u>Standard Specification for Porous Concrete Pipe</u>	<u>Table 1102.5</u>
<u>C 700—13</u>	<u>Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated</u>	<u>Table 702.3, Table 702.4, Table 1102.4, Table 1102.5</u>
<u>C 1053—00 (2010)</u>	<u>Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications</u>	<u>Table 803.3.1, Table 803.3.2</u>
<u>C 1173—10e1</u>	<u>Specification for Flexible Transition Couplings for Underground Piping System</u>	<u>705.2.1, 705.5, 705.11.1, 705.12, 705.13.2, 705.16,</u>
<u>C 1277—12</u>	<u>Specification for Shielded Coupling Joining Hubless Cast-iron Soil Pipe and Fittings</u>	<u>705.4.3</u>
<u>C 1440—08</u>	<u>Specification for Thermoplastic Elastomeric (TPE) Gasket Materials for Drain, Waste, and Vent (DWV), Sewer, Sanitary and Storm Plumbing Systems</u>	<u>705.16</u>
<u>C 1460—08</u>	<u>Specification for Shielded Transition Couplings for Use with Dissimilar DWV Pipe and Fittings Above Ground</u>	<u>705.16</u>
<u>C 1461—08</u>	<u>Specification for Mechanical Couplings Using Thermoplastic Elastomeric (TPE) Gaskets for Joining Drain, Waste and Vent (DWV) Sewer, Sanitary and Storm Plumbing Systems for Above and Below Ground Use</u>	<u>705.16</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>C 1540—11</u>	<u>Specification for Heavy Duty Shielded Couplings Joining Hubless Cast-iron Soil Pipe and Fittings</u>	<u>705.4.3</u>
<u>C 1563—13</u>	<u>Standard Test Method for Gaskets for Use in Connection with Hub and Spigot Cast Iron Soil Pipe and Fittings for Sanitary Drain, Waste, Vent and Storm Piping Applications</u>	<u>705.4.2</u>
<u>D 1586—11</u>	<u>Standard Test Method for Standard Penetration Test (SPT) and Split-barrel Sampling of Soils</u>	<u>1114.2.1</u>
<u>D 1587—15</u>	<u>Standard Practice for Thin-walled Tube Sampling of Soils for Geotechnical Purposes</u>	<u>1114.2.1</u>
<u>D 2235—04(2011)</u>	<u>Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings</u>	<u>705.2.2</u>
<u>D 2464—15</u>	<u>Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80</u>	<u>Table 1102.7</u>
<u>D 2466—17</u>	<u>Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40</u>	<u>Table 1102.7</u>
<u>D 2467—15</u>	<u>Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80</u>	<u>Table 1102.7</u>
<u>D 2564—12</u>	<u>Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems</u>	<u>705.11.2</u>
<u>D 2657—07</u>	<u>Practice for Heat Fusion-joining of Polyolefin Pipe and Fitting Waste, and Vent Pipe and Fittings</u>	<u>705.13.1, Table 1102.7</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>D 2661—11</u>	<u>Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings</u>	<u>Table 702.1,</u> <u>Table 702.4,</u> <u>705.2.2, Table</u> <u>1102.7</u>
<u>D 2665—12</u>	<u>Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings</u>	<u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 702.4,</u> <u>Table 1102.4,</u> <u>Table 1102.7,</u> <u>Table 1403.2.1</u>
<u>D 2729—11</u>	<u>Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings</u>	<u>Table 1102.5,</u> <u>Table 1403.2</u>
<u>D 2751—05</u>	<u>Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings</u>	<u>Table 702.4,</u> <u>Table 1102.7</u>
<u>D 2846 – 09be1</u>	<u>Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot and Cold Water Distribution Systems</u>	<u>Table 1301.6</u>
<u>D 2855—96 (2010)</u>	<u>Standard Practice for Making Solvent-cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings</u>	<u>705.11.2</u>
<u>D 2949—10</u>	<u>Specification for 3.25-in Outside Diameter Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings</u>	<u>Table 702.1,</u> <u>Table 702.4,</u> <u>Table 1403.2.1</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>D 3034—08</u>	<u>Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings</u>	<u>Table 702.3,</u> <u>Table 702.4,</u> <u>Table 1102.4,</u> <u>Table 1102.5,</u> <u>Table 1102.7,</u> <u>Table 1403.2.1</u>
<u>D 3212—07</u>	<u>Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals</u>	<u>705.2.1,</u> <u>705.11.1,</u> <u>705.13.2</u>
<u>D 3311—11</u>	<u>Specification for Drain, Waste and Vent (DWV) Plastic Fittings Patterns</u>	<u>Table 1102.7</u>
<u>D 3350—14</u>	<u>Specification for High Density Polyethylene Pipe (HPDE)</u>	<u>Table 1102.4,</u> <u>Table 1102.7</u>
<u>D 4068—09</u>	<u>Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-containment Membrane</u>	<u>417.5.2.2</u>
<u>D 4551— 12</u>	<u>Specification for Poly (Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-containment Membrane</u>	<u>417.5.2.1</u>
<u>F 405—05</u>	<u>Specification for Corrugated Polyethylene (PE) Pipe and Fittings</u>	<u>Table 1102.5,</u> <u>Table 1403.2,</u> <u>Table 1403.2.1</u>
<u>F 409—12</u>	<u>Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings</u>	<u>424.1.2</u>
<u>F 437—15</u>	<u>Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80</u>	<u>Table 702.3,</u> <u>Table 702.4,</u> <u>Table 1102.4,</u> <u>Table 1102.7</u>

<u>ASTM</u>	<u>ASTM International</u> <u>100 Barr Harbor Drive</u> <u>West Conshohocken, PA 19428-2959</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>F 438—17</u>	<u>Specification for Socket-type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40</u>	<u>Table 702.3,</u> <u>Table 702.4,</u> <u>Table 1102.4,</u> <u>Table 1102.7</u>
<u>F 439—13</u>	<u>Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80</u>	<u>Table 702.3,</u> <u>Table 702.4,</u> <u>Table 1102.4,</u> <u>Table 1102.7</u>
<u>F 477—10</u>	<u>Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe</u>	<u>705.16</u>
<u>F 628—08</u>	<u>Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core</u>	<u>Table 702.1,</u> <u>Table 702.4,</u> <u>705.2.2, Table</u> <u>1102.7</u>
<u>F 656—10</u>	<u>Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings</u>	<u>705.11.2</u>
<u>F 891—10</u>	<u>Specification for Coextruded Poly (Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core</u>	<u>Table 702.1</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 1102.4,</u> <u>Table 1102.5</u>
<u>F 1412—09</u>	<u>Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage</u>	<u>Table 702.2,</u> <u>Table 803.3.1,</u> <u>Table 803.3.2,</u> <u>803.3.4.4.1,</u> <u>803.3.4.5.1,</u> <u>Table 1102.7</u>

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<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>F 1488—09e1</u>	<u>Specification for Coextruded Composite Pipe</u>	<u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 1403.2</u>
<u>F 1673—10</u>	<u>Polyvinylidene Fluoride (PVDF) Corrosive Waste Drainage Systems</u>	<u>Table 803.3.1,</u> <u>Table 803.3.2,</u> <u>803.3.4.6.1,</u> <u>Table 1102.7</u>
<u>F 1866—07</u>	<u>Specification for Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings</u>	<u>Table 702.4,</u> <u>Table 1102.7,</u> <u>Table 1403.2.1</u>
<u>F 2306/F 2306M—13</u>	<u>12" to 60" Annular Corrugated Profile-wall Polyethylene (PE) Pipe and Fittings for Gravity Flow Storm Sewer and Subsurface Drainage Applications</u>	<u>Table 702.4,</u> <u>Table 1102.7</u>
<u>F 2389—10</u>	<u>Specification for Pressure-rated Polypropylene (PP) Piping Systems</u>	<u>Table 1301.6,</u> <u>Table 1403.2,</u> <u>Table 1403.2.1</u>
<u>F 2618 —15</u>	<u>Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems</u>	<u>Table 803.3.1,</u> <u>Table 803.3.2,</u> <u>803.3.4.1.2</u>
<u>F 2764 —17e1</u>	<u>Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe</u>	<u>Table 1102.5</u>
<u>F 3219 —17</u>	<u>Standard Specification for 3 to 30 in. (75 To 750 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Fittings</u>	<u>Table 1102.5</u>

<u>AWS</u>	<u>American Welding Society</u> 8669 NW 36 Street, #130 Doral, FL 33166	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A5.8 M/A5.8—2011</u>	<u>Specifications for Filler Metals for Brazing and Braze Welding</u>	<u>605.11.1,</u> <u>605.13.1,</u> <u>605.14.1,</u> <u>705.3.1, 705.6.1,</u> <u>705.7.1,</u>

<u>AWWA</u>	<u>American Water Works Association</u> 6666 West Quincy Avenue Denver, CO 80235	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>C110/A21.10—12</u>	<u>Ductile-iron and Gray-iron Fittings</u>	<u>Table 605.5,</u> <u>Table 702.4,</u> <u>Table 1102.7</u>
<u>C111/A21.11-12</u>	<u>Rubber-gasket Joints for Ductile-iron Pressure Pipe and Fittings</u>	<u>605.12</u>
<u>C115/A21.15—11</u>	<u>Flanged Ductile-iron Pipe with Ductile-iron or Gray-iron Threaded Flanges</u>	<u>Table 605.4,</u> <u>Table 605.4.1</u>
<u>C151/A21.51—02</u>	<u>Standard for Ductile-iron Pipe, Centrifugally Cast for Water</u>	<u>Table 605.4,</u> <u>Table 605.4.1,</u> <u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 1102.4</u>
<u>C153—00/A21.53—11</u>	<u>Ductile-iron Compact Fittings for Water Service</u>	<u>Table 605.5</u>

<u>AWWA</u>	<u>American Water Works Association</u> <u>6666 West Quincy Avenue</u> <u>Denver, CO 80235</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>C500—09</u>	<u>Standard for Metal-Seated Gate Valves for Water Supply Service</u>	<u>Table 605.7</u>
<u>C504—10</u>	<u>Standard for Rubber-Seated Butterfly Valves</u>	<u>Table 605.7</u>
<u>C507—11</u>	<u>Standard for Ball Valves, 6 In. Through 60 In</u>	<u>Table 605.7</u>
<u>C510—07</u>	<u>Double Check Valve Backflow Prevention Assembly</u>	<u>Table 608.1, 608.13.7</u>
<u>C511—07</u>	<u>Reduced-pressure Principle Backflow Prevention Assembly</u>	<u>Table 608.1, 608.13.2, 608.16.2</u>
<u>C651—05</u>	<u>Disinfecting Water Mains</u>	<u>610.1</u>
<u>C652—11</u>	<u>Disinfection of Water-storage Facilities</u>	<u>610.1</u>
<u>D100 – 2005</u>	<u>Standard for Welded Carbon Steel Tanks for Water Storage</u>	<u>1302.7.2, 1303.10.2</u>
<u>D115 – 2006</u>	<u>Standard for Tendon Prestressed-Concrete Water Tanks</u>	<u>1302.7.2, 1303.10.2</u>
<u>D120 – 2009</u>	<u>Standard for Thermosetting Fiberglass Reinforced Plastic Tanks</u>	<u>1302.7.2, 1303.10.2</u>

<u>CISPI</u>	<u>Cast Iron Soil Pipe Institute</u> <u>5959 Shallowford Road, Suite 419</u> <u>Chattanooga, TN 37421</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>301—04a</u>	<u>Specification for Hubless Cast-iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications</u>	<u>Table 702.1,</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>Table 702.4,</u> <u>Table 1102.4,</u> <u>Table 1102.5,</u> <u>Table 1102.7</u>
<u>310—11</u>	<u>Specification for Coupling for Use in Connection with Hubless Cast-iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications</u>	<u>308.5.1, 308.6.1,</u> <u>705.4.3</u>

<u>CSA</u>	<u>CSA Group</u> <u>8501 East Pleasant Valley</u> <u>Cleveland, OH 44131-5516</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A257.1M—2009</u>	<u>Circular Concrete Culvert, Storm Drain, Sewer Pipe and Fittings</u>	<u>Table 702.3,</u> <u>Table 1102.4</u>
<u>A257.2M—2009</u>	<u>Reinforced Circular Concrete Culvert, Storm Drain, Sewer Pipe and Fittings</u>	<u>Table 702.3,</u> <u>Table 1102.4</u>
<u>A257.3M—2009</u>	<u>Joints for Circular Concrete Sewer and Culvert Pipe, Manhole Sections and Fittings Using Rubber Gaskets</u>	<u>705.5, 705.16</u>
<u>ASME A112.3.4—2013/</u> <u>CSA B45.9—2013</u>	<u>Macerating Systems and Related Components</u>	<u>712.4.1</u>

<u>CSA</u>	<u>CSA Group</u> 8501 East Pleasant Valley Cleveland, OH 44131-5516	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>ASME A112.18.1—2012/</u> <u>CSA B125.1—2012</u>	<u>Plumbing Supply Fittings</u>	<u>424.1, 424.2,</u> <u>424.3, 424.4,</u> <u>424.6, 424.8,</u> <u>Table 605.7,</u> <u>607.4, 608.2</u>
<u>ASME A112.18.2—2011/</u> <u>CSA B125.2—2011</u>	<u>Plumbing Waste Fittings</u>	<u>424.1.2</u>
<u>ASME A112.19.1—2013/</u> <u>CSA B45.2—2013</u>	<u>Enameled Cast-iron and Enameled Steel Plumbing Fixtures</u>	<u>407.1, 410.1,</u> <u>415.1, 416.1,</u> <u>418.1</u>
<u>ASME A112.19.2—2013/</u> <u>CSA B45.1—2013</u>	<u>Ceramic Plumbing Fixtures</u>	<u>401.2, 405.9,</u> <u>407.1, 408.1,</u> <u>410.1, 415.1,</u> <u>416.1, 417.1,</u> <u>418.1, 419.1,</u> <u>420.1</u>
<u>ASME A112.19.3—2008/</u> <u>CSA B45.4—08(R2013)</u>	<u>Stainless-steel Plumbing Fixtures</u>	<u>405.9, 407.1,</u> <u>415.1, 416.1,</u> <u>418.1, 420.1</u>
<u>ASME A112.19.5—2011/</u> <u>CSA B45.15—2011</u>	<u>Flush Valves and Spuds for Water-closets, Urinals and Tanks</u>	<u>425.4</u>
<u>ASME A112.19.7—2012/</u> <u>CSA B45.10—2012</u>	<u>Hydromassage Bathtub Systems</u>	<u>421.1, 421.4</u>

<u>CSA</u>	<u>CSA Group</u> <u>8501 East Pleasant Valley</u> <u>Cleveland, OH 44131-5516</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>ASSE 1016/</u> <u>ASME A112.1016/</u> <u>CSA B125.16—</u> <u>2011</u>	<u>Performance Requirements for Individual</u> <u>Thermostatic, Pressure Balancing and</u> <u>Combination Control Valves for Individual Fixture</u> <u>Fittings</u>	<u>424.3, 424.4,</u> <u>607.4</u>
<u>CSA B45.5—11/</u> <u>IAPMO Z124-2011</u>	<u>Plastic Plumbing Fixtures</u>	<u>407.1, 415.1,</u> <u>416.1, 416.2,</u> <u>417.1, 418.1,</u> <u>419.1, 420.1</u>
<u>B64.1.1—11</u>	<u>Vacuum Breakers, Atmospheric Type (AVB)</u>	<u>425.2, Table</u> <u>608.1,</u> <u>608.13.6,</u> <u>608.16.4.1</u>
<u>B64.1.2—11</u>	<u>Pressure Vacuum Breakers, (PVB)</u>	<u>Table 608.1,</u> <u>608.13.5</u>
<u>B64.1.3—11</u>	<u>Spill Resistant Pressure Vacuum Breaks (SRPVB)</u>	<u>608.13.8</u>
<u>B64.2—11</u>	<u>Vacuum Breakers, Hose Connection Type (HCVB)</u>	<u>Table 608.1,</u> <u>608.13.6</u>
<u>B64.2.1—11</u>	<u>Vacuum Breakers, Hose Connection (HCVB) with</u> <u>Manual Draining Feature</u>	<u>Table 608.1,</u> <u>608.13.6</u>
<u>B64.2.1.1—11</u>	<u>Hose Connection Dual Check Vacuum Breakers,</u> <u>(HCDVB)</u>	<u>Table 608.1,</u> <u>608.13.6</u>
<u>B64.2.2—11</u>	<u>Vacuum Breakers, Hose Connection Type (HCVB)</u> <u>with Automatic Draining Feature</u>	<u>Table 608.1,</u> <u>608.13.6</u>
<u>B64.3—11</u>	<u>Backflow Preventers, Dual Check Valve Type with</u> <u>Atmospheric Port (DCAP)</u>	<u>Table 608.1,</u> <u>608.13.3,</u> <u>608.16.2</u>

<u>CSA</u>	<u>CSA Group</u> <u>8501 East Pleasant Valley</u> <u>Cleveland, OH 44131-5516</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>B64.4—11</u>	<u>Backflow Preventers, Reduced Pressure Principle Type (RP)</u>	<u>Table 608.1, 608.13.2</u>
<u>B64.4.1—11</u>	<u>Reduced Pressure Principle for Fire Sprinklers (RPF)</u>	<u>Table 608.1, 608.13.2</u>
<u>B64.5—11</u>	<u>Double Check Backflow Preventers (DCVA)</u>	<u>Table 608.1, 608.13.7</u>
<u>B64.5.1—11</u>	<u>Double Check Valve Backflow Preventer for Fire Systems (DCVAF)</u>	<u>Table 608.1 608.13.7</u>
<u>B64.6—11</u>	<u>Dual Check Backflow Preventers Valve (DuC)</u>	<u>Table 608.1, 608.13.10</u>
<u>B64.7—11</u>	<u>Laboratory Faucet Vacuum Breakers (LFVB)</u>	<u>Table 608.1, 608.13.6</u>
<u>B64.10—11</u>	<u>Manual for the Selection and Installation of Backflow Prevention Devices</u>	<u>312.10.2</u>
<u>B64.10.1—11</u>	<u>Maintenance and Field Testing of Backflow Preventers</u>	<u>312.10.2</u>
<u>B79— 08(R2013)</u>	<u>Commercial and Residential Drains, and Cleanouts</u>	<u>412.1</u>
<u>B125.3—2012</u>	<u>Plumbing Fittings</u>	<u>408.3, 423.3, 424.4, 424.5, 425.2, 425.3.1, Table 605.7</u>
<u>B137.2—02</u>	<u>PVC Injection-Moulded Gasketed Fittings for Pressure Applications</u>	<u>Table 1102.7</u>
<u>B137.3—13</u>	<u>Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications</u>	<u>705.11.2</u>

<u>CSA</u>	<u>CSA Group</u> <u>8501 East Pleasant Valley</u> <u>Cleveland, OH 44131-5516</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>B181.1—11</u>	<u>Acrylonitrile-butadiene-styrene ABS Drain, Waste and Vent Pipe and Pipe Fittings</u>	<u>Table 702.1,</u> <u>Table 702.4,</u> <u>705.2.2, 715.2,</u> <u>Table 1102.7</u>
<u>B181.2—11</u>	<u>Polyvinylchloride PVC and chlorinated polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings</u>	<u>Table 702.1</u> <u>Table 702.2,</u> <u>Table 702.3,</u> <u>705.11.2,</u> <u>715.2, Table</u> <u>1102.4</u>
<u>B181.3—11</u>	<u>Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems</u>	<u>Table 803.3.1,</u> <u>Table 803.3.2,</u> <u>803.3.4.4.1,</u> <u>Table 1102.7</u>
<u>B182.1—11</u>	<u>Plastic Drain and Sewer Pipe and Pipe Fittings</u>	<u>705.11.2,</u> <u>Table 1102.5</u>
<u>B182.2—11</u>	<u>PSM Type Polyvinylchloride PVC Sewer Pipe and Fittings</u>	<u>Table 702.3,</u> <u>Table 1102.4,</u> <u>Table 1102.5</u>
<u>B182.4—11</u>	<u>Profile Polyvinylchloride PVC Sewer Pipe and Fittings</u>	<u>Table 702.3,</u> <u>Table 1102.4,</u> <u>Table 1102.5</u>
<u>B182.6—11</u>	<u>Profile Polyethylene (PE) Sewer Pipe and Fittings for Leak-proof Sewer Applications</u>	<u>Table 1102.5</u>
<u>B182.8—11</u>	<u>Profile Polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings</u>	<u>Table 1102.5</u>
<u>B356—10</u>	<u>Water Pressure Reducing Valves for Domestic Water Systems</u>	<u>604.8</u>

<u>CSA</u>	<u>CSA Group</u> 8501 East Pleasant Valley Cleveland, OH 44131-5516	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>B483.1—14</u>	<u>Drinking Water Treatment Units</u>	<u>611.1, 611.2</u>
<u>B602—10</u>	<u>Mechanical Couplings for Drain, Waste and Vent Pipe and Sewer Pipe</u>	<u>705.2.1,</u> <u>705.4.3, 705.5,</u> <u>705.11.1,</u> <u>705.12,</u> <u>705.13.2,</u> <u>705.16</u>

<u>IAPMO</u>	<u>IAPMO Group</u> 4755 E. Philadelphia Ontario, CA 91761	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>PS 117—08</u>	<u>Copper and Copper Allow Tubing System Incorporating Press-type or Nail-type Connections</u>	<u>605.14.4</u>
<u>CSA B45.5—11/ IAPMO Z124-2011</u>	<u>Plastic Plumbing Fixtures</u>	<u>407.1, 415.1,</u> <u>416.1, 416.2,</u> <u>417.1, 418.1,</u> <u>419.1, 420.1</u>

<u>ICC</u>	<u>International Code Council, Inc.</u> <u>500 New Jersey Ave. NW</u> <u>6th Floor</u> <u>Washington, DC 20001</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>A117.1—2009</u>	<u>Accessible and Usable Buildings and Facilities</u>	<u>404.2, 410.1</u>

<u>ISEA</u>	<u>International Safety Equipment Association</u> <u>1901 N. Moore Street, Suite 808</u> <u>Arlington, VA 22209</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>ANSI/ISEA Z358.1—2009</u>	<u>Emergency Eyewash and Shower Equipment</u>	<u>411.1</u>

<u>MSS</u>	<u>Manufacturers Standardization Society Of the Valve and Fittings Industry, Inc.</u> <u>127 Park St. NE</u> <u>Vienna, VA 22180-4602</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>SP-67—2011</u>	<u>Butterfly Valves</u>	<u>Table 605.7</u>
<u>SP-70—2011</u>	<u>Gray Iron Gate Valves, Flanged and Threaded Ends</u>	<u>Table 605.7</u>
<u>SP-71—2011</u>	<u>Gray Iron Swing Check Valves, Flanged and Threaded Ends</u>	<u>Table 605.7</u>
<u>SP-72—2010</u>	<u>Ball Valves with Flanged or Butt-Welding Ends for General Service</u>	<u>Table 605.7</u>
<u>SP-78—2011</u>	<u>Cast Iron Plug Valves, Flanged and Threaded Ends</u>	<u>Table 605.7</u>

<u>MSS</u>	<u>Manufacturers Standardization Society Of the Valve and Fittings Industry, Inc.</u> <u>127 Park St. NE</u> <u>Vienna, VA 22180-4602</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>SP-80—2008</u>	<u>Bronze Gate, Globe, Angle and Check Valves</u>	<u>Table 605.7</u>
<u>SP-110—2010</u>	<u>Ball Valves, Threaded, Socket Welded, Solder Joint, Grooved and Flared Ends</u>	<u>Table 605.7</u>

<u>NFPA</u>	<u>National Fire Protection Association</u> <u>1 Batterymarch Park</u> <u>Quincy, MA 02169-7471</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>51—13</u>	<u>Design and Installation of Oxygen-fuel Gas Systems for Welding, Cutting and Allied Processes</u>	<u>1201.1, 1203.1</u>
<u>55—13</u>	<u>Compressed Gases and Cryogenic Fluids Code</u>	<u>1201.1, 1203.1</u>
<u>99—15</u>	<u>Health Care Facilities Code</u>	<u>1201.1, 1202.1</u>

<u>NSF</u>	<u>NSF International</u> <u>789 Dixboro Road</u> <u>Ann Arbor, MI 48105</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>3—2010</u>	<u>Commercial Warewashing Equipment</u>	<u>409.1</u>
<u>14—2011</u>	<u>Plastic Piping System Components and Related Materials</u>	<u>303.3, 611.3</u>

<u>NSF</u>	<u>NSF International</u> <u>789 Dixboro Road</u> <u>Ann Arbor, MI 48105</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>18—2012</u>	<u>Manual Food and Beverage Dispensing Equipment</u>	<u>426.1</u>
<u>42—2011</u>	<u>Drinking Water Treatment Units-Aesthetic Effects</u>	<u>611.1, 611.3</u>
<u>44—2012</u>	<u>Residential Cation Exchange Water Softeners</u>	<u>611.1, 611.3</u>
<u>53—2011a</u>	<u>Drinking Water Treatment Units—Health Effects</u>	<u>611.1, 611.3</u>
<u>58—2012</u>	<u>Reverse Osmosis Drinking Water Treatment Systems</u>	<u>611.2, 611.3</u>
<u>61—2012</u>	<u>Drinking Water System Components—Health Effects</u>	<u>410.1, 424.1, 605.4, 605.4.1, 605.5, 605.7, 606.5.4.2, 611.3</u>
<u>62—2012</u>	<u>Drinking Water Distillation Systems</u>	<u>611.1</u>
<u>372—2010</u>	<u>Drinking Water Systems Components—Lead Content</u>	<u>605.2</u>

<u>PDI</u>	<u>Plumbing and Drainage Institute</u> <u>800 Turnpike Street, Suite 300</u> <u>North Andover, MA 01845</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>G101 (2012)</u>	<u>Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data</u>	<u>1003.3.4</u>

<u>UL</u>	<u>UL LLC</u> <u>333 Pfingsten Road</u> <u>Northbrook, IL 60062-2096</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>58 – 1996</u>	<u>Steel Underground Tanks for Flammable and Combustible Liquids-with revisions through July 27, 1998</u>	<u>1302.7.2,</u> <u>1303.10.2</u>
<u>142 – 2006</u>	<u>Steel Aboveground Tanks for Flammable and Combustible Liquids-with revisions through February 12, 2010</u>	<u>1302.7.2,</u> <u>1303.10.2</u>
<u>174—2004</u>	<u>Household Electric Storage Tank Water Heaters—with revisions through September 2012</u>	<u>502.1</u>
<u>430—2009</u>	<u>Waste Disposers—with revisions through March 23, 2011</u>	<u>413.1</u>
<u>732—1995</u>	<u>Oil-fired Storage Tank Water Heaters—with revisions through April 2010</u>	<u>502.1</u>
<u>921—2004</u>	<u>Integral gas fired heating commercial dishwashers</u>	<u>409.1</u>
<u>1316 – 1994</u>	<u>Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols and Alcohol Gasoline Mixtures-with revisions through May 12, 2006</u>	<u>1302.7.2,</u> <u>1303.10.2</u>
<u>1453—2004</u>	<u>Electric Booster and Commercial Storage Tank Water Heaters—with revisions through July 2011</u>	<u>502.1</u>
<u>1746 – 2007</u>	<u>External Corrosion Protection Systems for Steel Underground Storage Tanks</u>	<u>1302.7.2,</u> <u>1303.10.2</u>
<u>1795—2009</u>	<u>Hydromassage Bathtubs including revisions through August 23, 2011</u>	<u>421.1</u>

<u>WaterSense</u>	<u>WaterSense U.S. Environmental Protection Agency Office of Wastewater Management (4204M) 1200 Pennsylvania Avenue, N.W. Washington, D.C. 20460</u>	
<u>Standard reference number</u>	<u>Title</u>	<u>Referenced in code section number</u>
<u>v.1.0—October 1, 2007</u>	<u>High-efficiency Lavatory Faucet Specifications</u>	<u>604.4.1</u>
<u>v.1.0—October 8, 2009</u>	<u>WaterSense Specification for Flushing Urinals</u>	<u>604.4.1</u>
<u>v.1.0—December 17, 2015</u>	<u>WaterSense Specification for Flushometer-Valve Water Closets</u>	<u>604.4.1</u>
<u>v.1.1—July 26, 2018</u>	<u>WaterSense Specification for Showerheads</u>	<u>604.4.1</u>
<u>v.1.2—June 2, 2014</u>	<u>WaterSense Specification for Tank-Type Toilets</u>	<u>604.4.1</u>

PART P

APPENDICES

§1. The title of appendix A of the New York city plumbing code, as added by local law number 99 for the year 2005, is amended to read as follows:

APPENDIX A
[~~PLUMBING PERMIT FEE SCHEDULE~~]

RESERVED

§2. The title of appendix B of the New York city plumbing code, as added by local law number 99 for the year 2005, is amended to read as follows:

APPENDIX B
[~~RATES OF RAINFALL FOR VARIOUS CITIES~~]

RESERVED

§3. Appendix C of the New York city plumbing code is REPEALED and a new appendix C is added to read as follows:

APPENDIX C
STRUCTURAL SAFETY
SECTION PC C101
CUTTING, NOTCHING AND BORING

C101.1 Cutting, notching and boring in wood members. The cutting, notching and boring of wood members shall comply with Sections C101.1.1 through C101.1.5.

C101.1.1 Engineered wood products. Cuts, notches and holes bored in trusses, structural composite lumber, structural glued-laminated members or I-joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a registered design professional.

C101.1.2 Solid non-engineered joist notches and holes. Notches on the ends of the solid non-engineered joists shall not exceed one-fourth the joist depth. Notches in the top or bottom of joists shall not exceed one-sixth the depth, shall not be longer than one-third the depth and shall not be located in the middle third of the span. Holes bored in joists shall not be within 2 inches (51 mm) of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third of the depth of the joist. Holes bored in the middle third of the span shall be located at the center of the joist depth. Clear distance between holes and notches shall be a minimum of 2 inches (51 mm). See Figure 2308.5.8 of the *New York City Building Code*.

C101.1.3 Stud cutting and notching. In exterior walls and bearing partitions, wood studs are permitted to be cut or notched to a depth not exceeding 25 percent of the width of the stud. Cutting or notching of studs to a depth not greater than 40 percent of the width of the stud is permitted in nonbearing partitions supporting no loads other than the weight of the partition. See Figure 2308.5.8 of the *New York City Building Code*.

C101.1.4 Bored holes in studs. Bored holes not greater than 40 percent of the stud width are permitted to be bored in any wood stud. Bored holes not greater than 60 percent of the stud width are permitted in nonbearing partitions or in any wall where each bored stud is doubled, provided not more than two such successive doubled studs are so bored. In no case shall the edge of the bored hole be nearer than $\frac{5}{8}$ inch (15.9 mm) to the edge of the stud. Bored holes shall not be located at the same section of stud as a cut or notch. See Figure 2308.5.8 of the *New York City Building Code*.

C101.1.5 Drilling and notching of top plate. When piping is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie not less than 0.054 inch thick (1.37 mm) (16 ga) and 1½ inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 10d (0.148 inch diameter) nails having a minimum length of 1½ inches (38 mm) at each side or equivalent. The metal tie must extend a minimum of 6 inches past the opening. See Figure 2308.5.8 of the *New York City Building Code*.

Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing, additional fastening is not required.

C101.2 Cutting, notching and boring in steel members. The cutting, notching and boring of steel members shall comply with Sections C101.2.1 through C101.2.4.

C101.2.1 Structural steel framing. The cutting, notching and boring of holes in structural steel framing members shall be as prescribed by the registered design professional.

C101.2.2 Cold-formed steel framing. Flanges and lips of load-bearing, cold-formed steel framing members shall not be cut or notched. Holes in webs of load-bearing, cold-formed steel framing members shall be permitted along the centerline of the web of the framing member and shall not exceed the dimensional limitations, penetration spacing or minimum hole edge distance as prescribed by the registered design professional.

C101.2.3 Nonstructural cold-formed steel wall framing. Flanges and lips of nonstructural cold-formed steel wall studs shall be permitted along the centerline of the web of the framing member, shall not exceed 1½ inches (38 mm) in width or 4 inches (102 mm) in length, and the holes shall not be spaced less than 24 inches (610 mm) center to center from another hole or less than 10 inches (254 mm) from the bearing end.

C101.2.4 Steel floor and roof decking. Cutting, notching and boring holes in steel floor and roof decking shall be as prescribed by the registered design professional.

C101.3 Cutting, notching and coring into concrete. The cutting, notching or coring of concrete must comply with provisions of Chapter 19 of the *New York City Building Code* and is not permitted without prior approval of the registered design professional.

§4. The title to appendix D of the New York city plumbing code, as added by local law number 99 for the year 2005, is amended to read as follows:

APPENDIX D

~~**[DEGREE DAY AND DESIGN TEMPERATURES]**~~

RESERVED

§5. Appendix E of the New York city plumbing code, as added by local law number 99 for the year 2005, section E101.1.1, “Line B” of “Step 2” of section E103.3, “Step 7 Column 6” of section E103.3, “Example E103.3(1)” following “Step 7 Column 6” of section E103.3, “Step 10 Column 9” of section E103.3, “Example E103.3(2)” following “Step 10 Column 9” of section E103.3, and the title of Figure E103.3(7) as amended by local law number 41 for the year 2012, section E103.2.2 and item 3.7 of section E103.3 as amended by local law number 141 for the year 2013, and Figure E 103.3(1) and section E202 as added by local law number 41 for the year 2012, is amended to read as follows:

APPENDIX E
SIZING OF WATER PIPING SYSTEM
SECTION PC E101
GENERAL

E101.1 Scope.

E101.1.1 This appendix outlines [~~two procedures which~~] the procedure that may be utilized for sizing a water piping system (see Section E103.3). The design [~~procedures are~~] procedure is 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.

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 most 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 E103.3(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~~] flushometer valves, the pressure for the group should be not [~~be~~] less than 15 [~~psi~~] pounds per square inch (psi) (103.4 kPa) flowing. For flush tank supplies, the available pressure should be not [~~be~~] less than 8 psi (55.2 kPa) flowing, except blowout action fixtures must be 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~~] Sections 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 20 feet by 0.433 psi/foot (6096 mm by 9.8 kPa/m), equaling 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~~] 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~~] Calculation of the friction loss through each length of the pipe.
- [~~Based on a system~~] Evaluation 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 water 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 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.
 - 2.1. 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 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~~] Sections 604.3 and 604.5.
- 3.2. Static pressure loss or gain (~~[due to]~~ because of 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)]~~ (see Tables E103.3(5) and E103.3(6)).
- 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 manufacturers' tables and velocity recommendations. Before attempting to size any water supply system, it is necessary to gather preliminary information [~~which~~] that includes available pressure, piping material, select design velocity, elevation differences and developed length to most remote fixture. The water supply system is divided 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 hot and cold water supply system which includes the corresponding water supply fixture unit and conversion to gallons per minute (L/m) 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 and 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 with a maximum pressure drop of 9 psi (621 kPa) are to be installed. The system is shown by Figure E103.3(1). To be determined are the pipe sizes for the service main and the cold and hot water distribution pipes.

Solution: A tabular arrangement such as shown 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] Columns 1 through 10 and [lines] 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. Column 1 of Table E103.3(1) provides a line-by-line 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] elevation between the water supply source and the highest water supply outlet, 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 result 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 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. Two hose bibbs \times 5 gpm demand = 10 gpm. Total gpm rating = 48.0 gpm + 10 gpm = 58.0 gpm demand.

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 most remote fixture outlet is 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 meter size given or assumed. The total water flow from the main through the service as determined in Step 1 will serve to aid in the meter selected. There are three common types of water meters; the 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] is based on the total gallon-per-minute flow rate and size of the tap.

Line E: Determine the difference in elevation between the main and source of supply and the highest fixture on the system. Multiply this figure, expressed in feet, by 0.43 psi (2.9 kPa). Enter the resulting psi loss on Line E. The difference in elevation between the water supply source and the highest water supply outlet 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~~] that 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 pressure losses can range from 8 psi to 30 psi.

Step 3 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 pipes to each fixture. This force can be used as an average pressure loss, as long as the pressure available for friction is not exceeded. Saving 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 4 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 loss 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 \times 0.433 = loss in psi caused by elevation differences.

Step 5 Column 4: 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 6 Column 5: 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~~ flushometer valve or temperature controlled shower at the ~~top-most~~ topmost floors the developed length would be from the water meter to the most remote ~~flush~~ flushometer 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:

~~Line J~~ **Line J:** (Pressure available to overcome pipe friction) \times 100/equivalent length of run total developed length to most remote fixture \times percentage factor of 1.5 (note: a percentage factor is used only as an estimate for friction losses imposed for fittings for initial trial pipe size) = psi (average pressure drops per 100 feet of pipe).

For trial pipe size, see Figure ~~E-103.3(3)~~ E103.3(3) (Type L copper) based on 2.77 psi and a 108 gpm = 2½ inches. To determine the equivalent length of run to the most remote outlet, the developed length is determined and added to the friction losses for fittings and valves. The developed lengths of the designated pipe sections are as follows:

- A - B 54 feet
- B - C 8 feet
- C - D 13 feet
- D - E 150 feet

Total developed length = 225 feet

The equivalent length of the friction loss in fittings and valves must be added to the developed length (most remote outlet). Where the size of fittings and valves is not known, the added friction loss should be approximated. A general rule that has been used is to add 50 percent of the developed length to allow for fittings and valves. For example, the equivalent length of run equals the developed length of run (225 ft \times 1.5 = ~~338 feet~~ 338 ft). The total equivalent length of run for determining a trial pipe size is 338 feet.

Example: 9.36 (pressure available to overcome pipe friction) \times 100/338 (equivalent length of run = 225 \times 1.5) = 2.77 psi (average pressure drop per 100 feet of pipe).

Step 7 Column 6: Select from Table E103.3(6) the equivalent lengths for the trial pipe size of fittings and valves on each pipe section. Enter the sum for each section in Column 6. (The number of fittings to be used in this example must be an estimate.) The equivalent length of piping is the developed length plus the equivalent lengths of pipe corresponding to friction head losses for fittings and valves. Where the size of fittings and valves is not known, the added friction head losses must be approximated. An estimate for this example is found in ~~Example E103.3(1):~~ Table E.1.

[EXAMPLE E103.3(1)] TABLE E.1

COLD WATER PIPE SECTION	FITTINGS/ VALVES	PRESSURE LOSS EXPRESSED AS EQUIVALENT LENGTH OF TUBE (FEET)	HOT WATER PIPE SECTION	FITTINGS/ VALVES	PRESSURE LOSS EXPRESSED AS EQUIVALENT OF TUBE (FEET)
A-B	3-2 ¹ / ₂ " Gate valves	3	A-B	3-2 ¹ / ₂ " Gate valves	3
	1-2 ¹ / ₂ " Side branch tee	12		1-2 ¹ / ₂ " Side branch tee	12
B-C	1-2 ¹ / ₂ " Straight run tee	0.5	B-C	1-2" Straight run tee	7
				1-2" 90-degree ell	0.5
C-F	1-2 ¹ / ₂ " Side branch tee	12	C-F	1-1 ¹ / ₂ " Side branch tee	7
C-D	1-2 ¹ / ₂ " 90-degree ell	7	C-D	1-1 ¹ / ₂ " 90-degree ell	4
D-E	1-2 ¹ / ₂ " Side branch tee	12	D-E	1-1 ¹ / ₂ " Side branch tee	7

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^[7] 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]~~ that produces the required velocity.

Step 10 Column 9: Multiply the figures in Columns 7 and 8 for each section and enter in Column 9.

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]~~ Section C-F should be considered in the total pipe friction losses only if greater loss occurs in ~~[section]~~ Section C-F than in pipe ~~[section]~~ Section D-E. ~~[section]~~ Section C-F is not

considered in the total developed length. Total friction loss in equivalent length is determined in [Example E103.3(2)] Table E.2.

[EXAMPLE E103.3(2)] TABLE E.2

PIPE SECTIONS	FRICTION LOSS EQUIVALENT LENGTH (feet)	
	Cold Water	Hot Water
A-B	$0.69 \times 3.2 = 2.21$	$0.69 \times 3.2 = 2.21$
B-C	$0.085 \times 3.1 = 0.26$	$0.16 \times 1.4 = 0.22$
C-D	$0.20 \times 1.9 = 0.38$	$0.17 \times 3.2 = 0.54$
D-E	$1.62 \times 1.9 = 3.08$	$1.57 \times 3.2 = 5.02$
Total pipe friction losses (Line K)	5.93	7.99

For SI: 1 foot = 304.8 mm, 1 gpm = 3.785 L/m.

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] Section A-B) in determining the hot water pipe sizes.

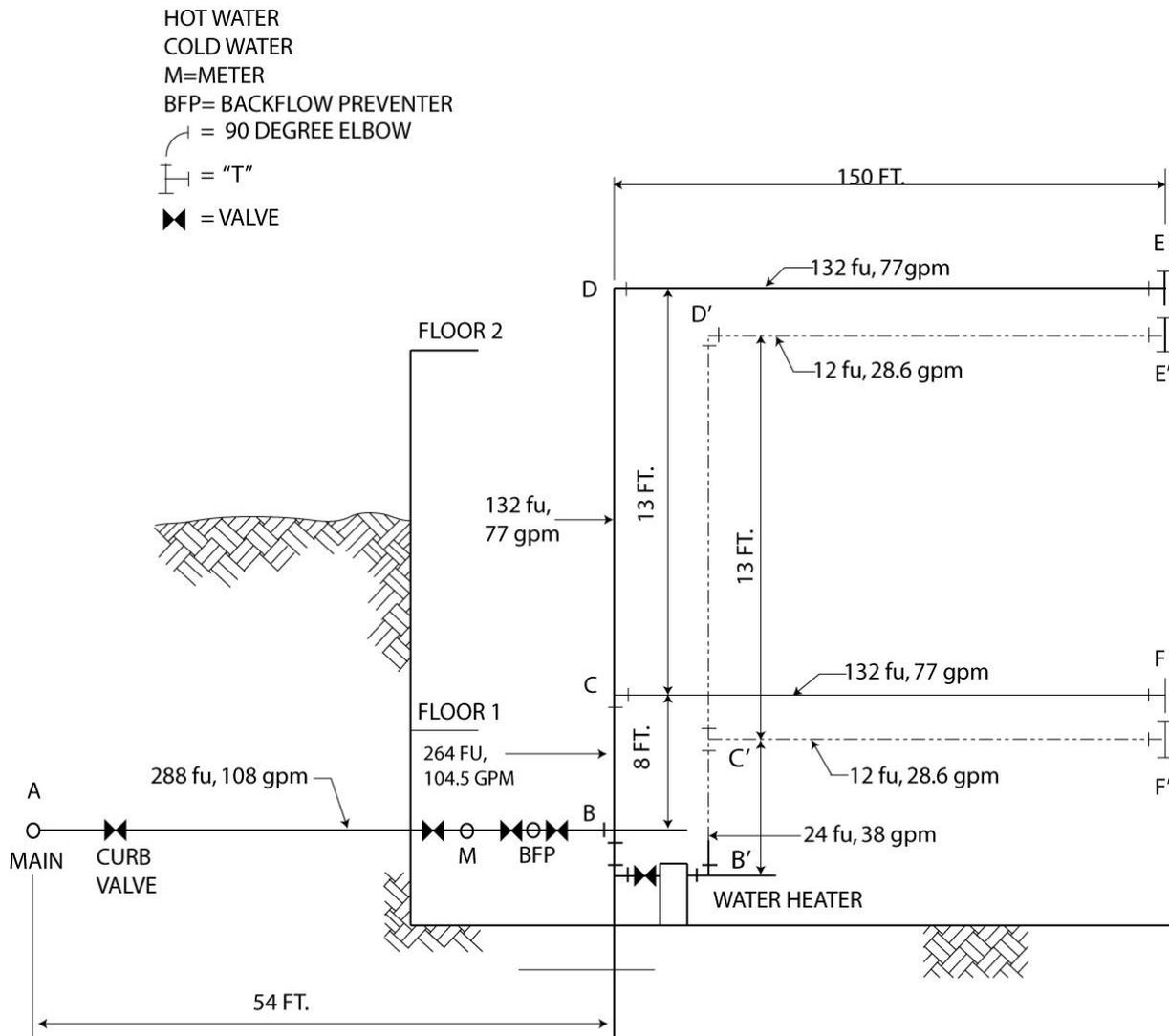


FIGURE E103.3(1)
EXAMPLE-SIZING

For SI: 1 foot = 304.8 mm, 1 gpm = 3.785 L/m.

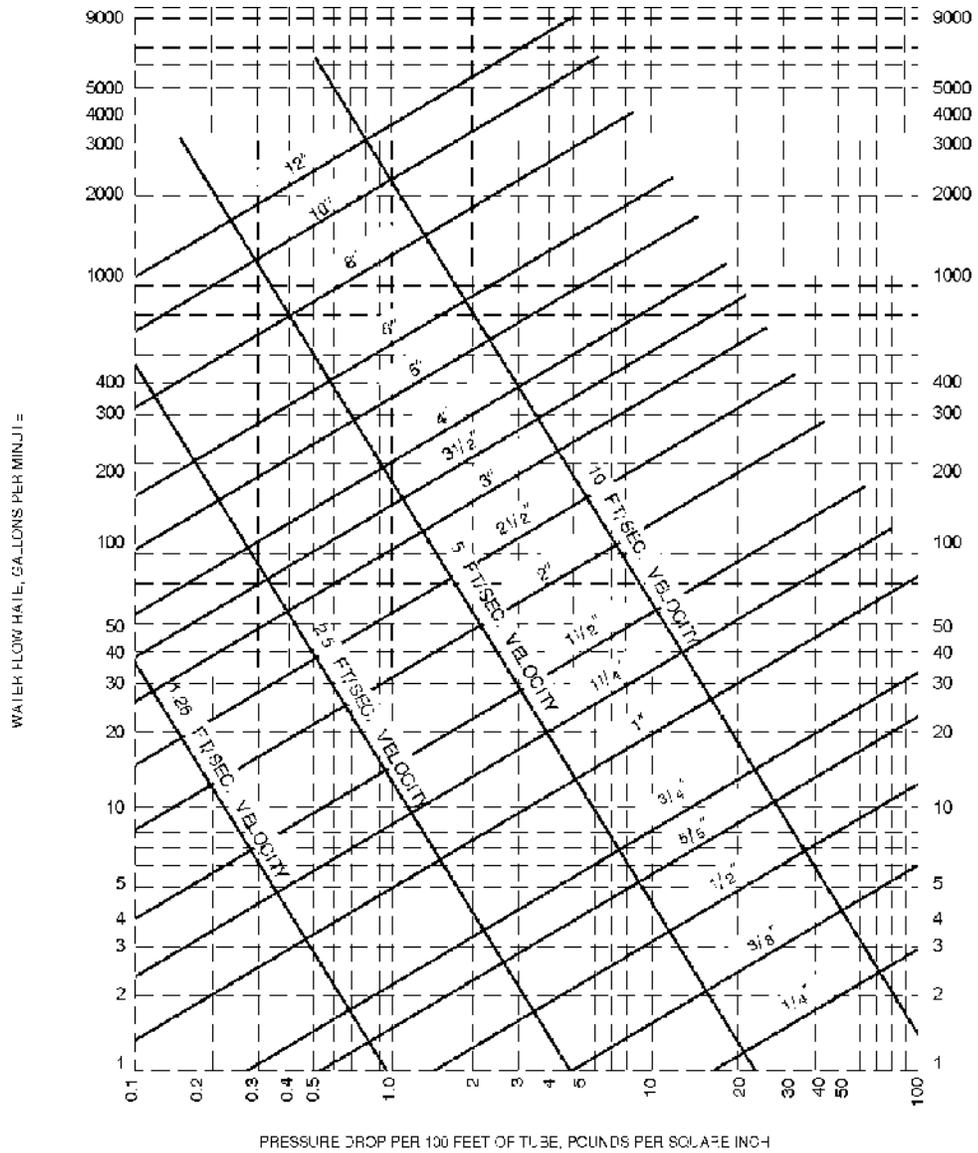
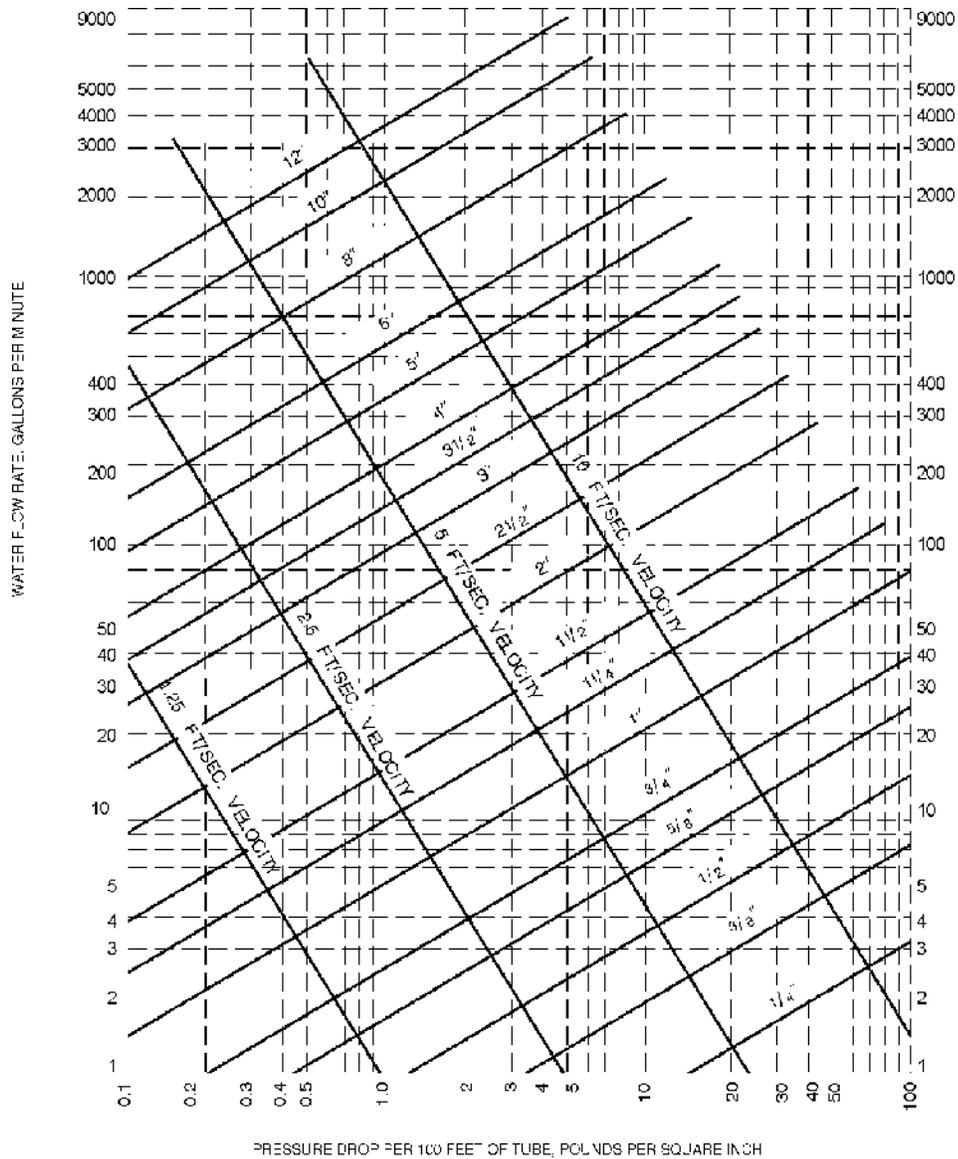


FIGURE E103.3(2)
FRICTION LOSS IN SMOOTH PIPE^a (TYPE K, ASTM B 88 COPPER TUBING)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 L/m, 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.



Note: Fluid velocities in excess of 5 to 8 feet/second are not usually recommended.

FIGURE E103.3(3)
FRICTION LOSS IN SMOOTH PIPE^a (TYPE L, ASTM B 88 COPPER TUBING)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 L/m, 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.

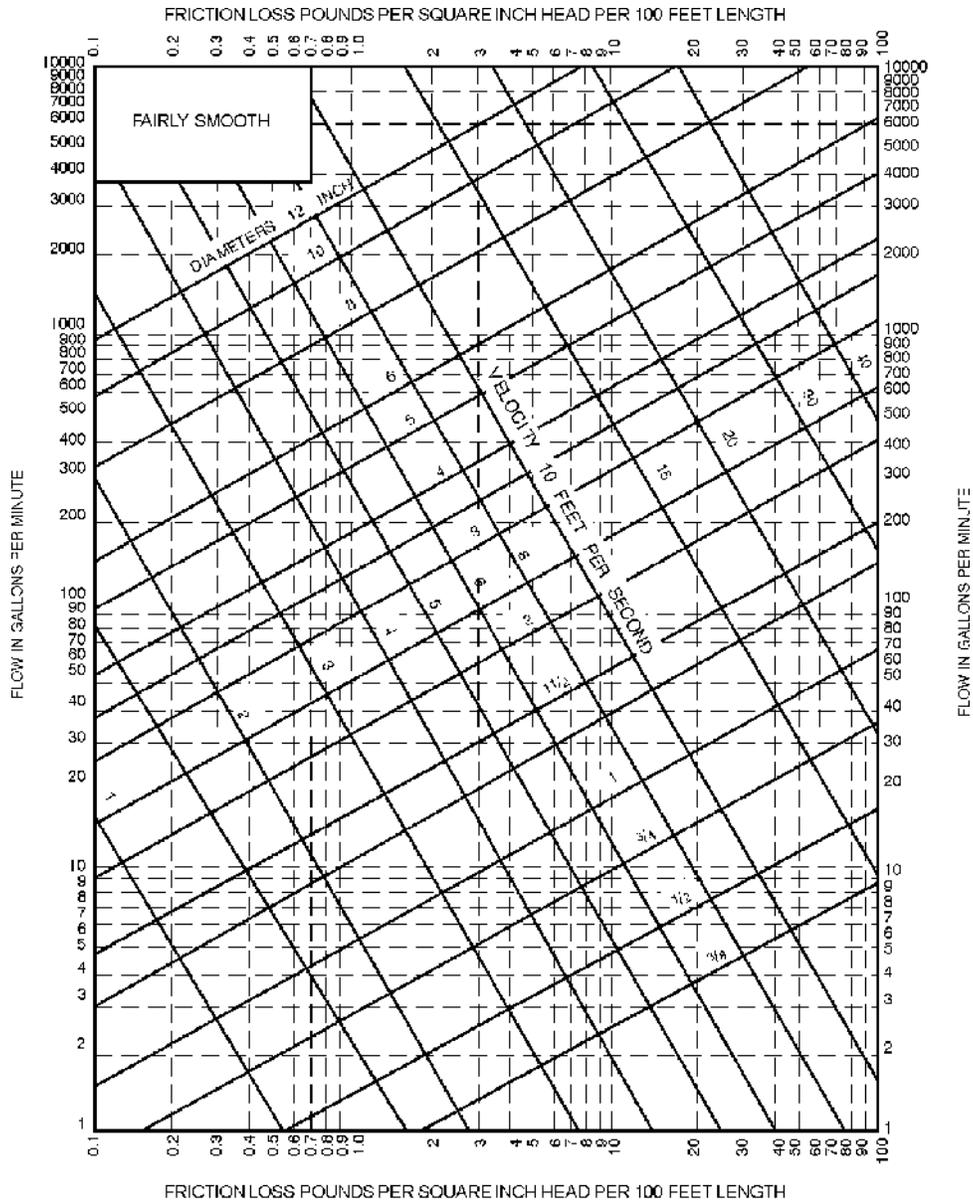


FIGURE E103.3(5)
FRICTION LOSS IN FAIRLY SMOOTH PIPE^a

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 L/m, 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.

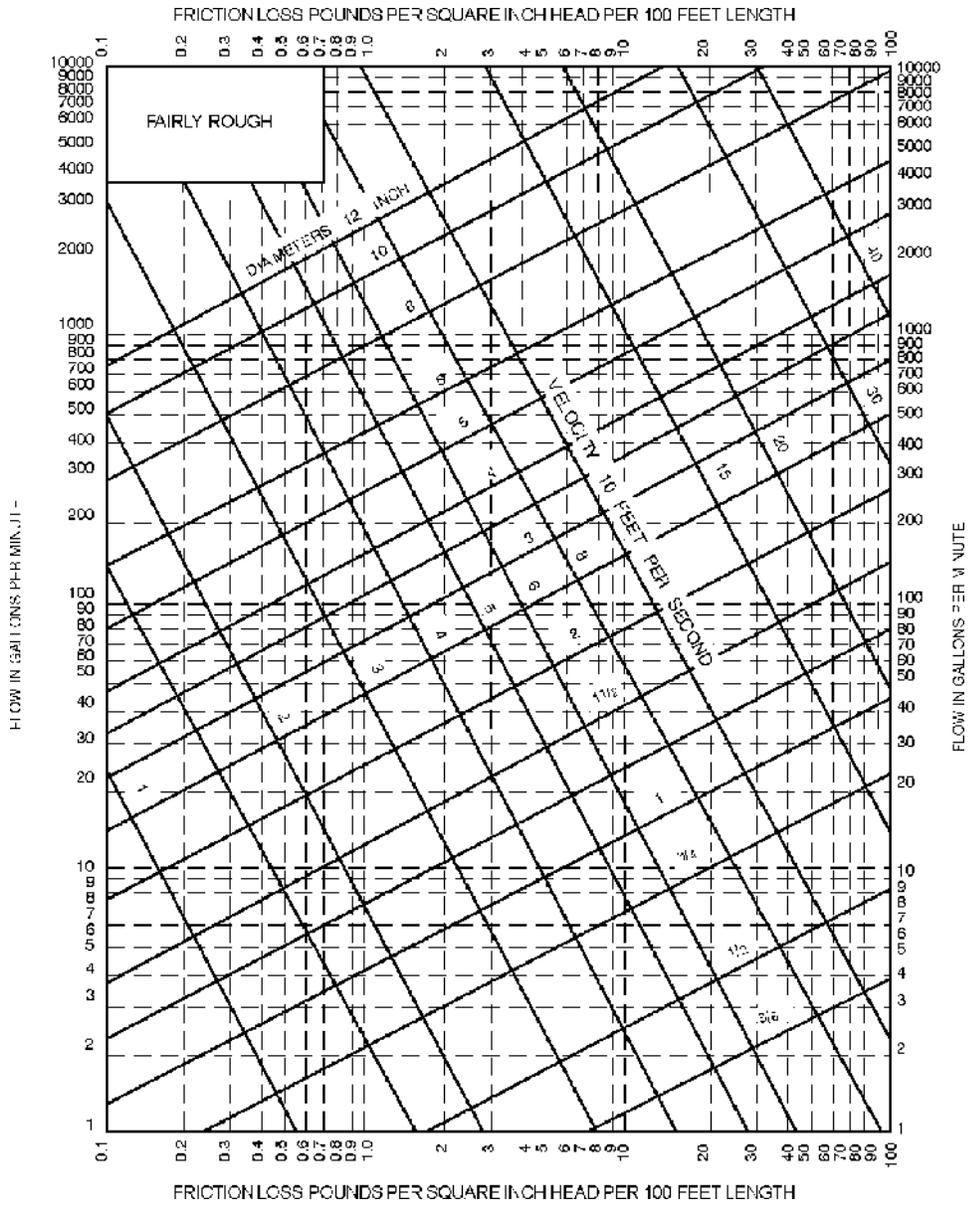


FIGURE E103.3(6)
FRICITION LOSS IN FAIRLY ROUGH PIPE^a

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 L/m, 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.

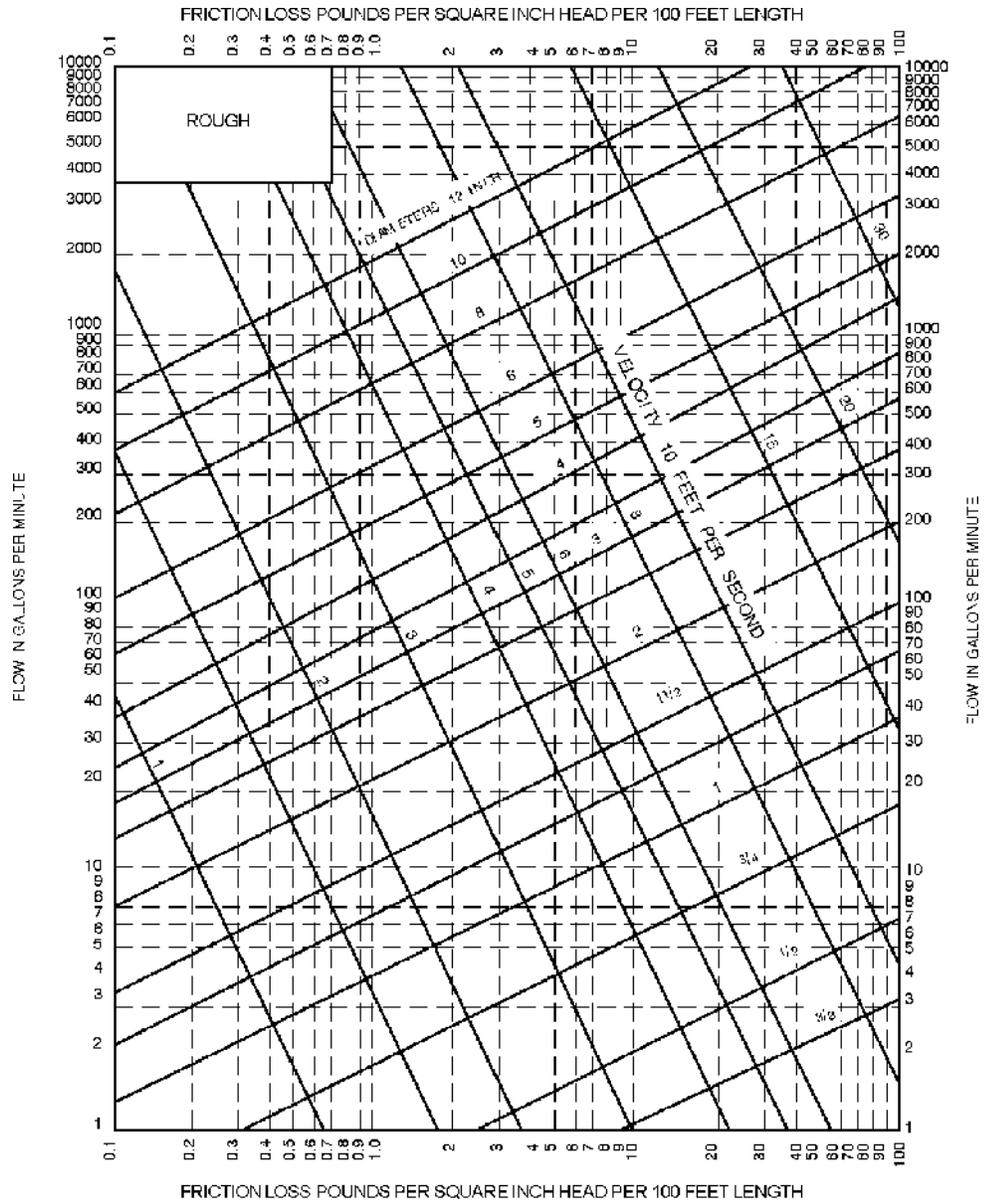


FIGURE E103.3(7)
FRICION LOSS IN ROUGH PIPE^a

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gpm = 3.785 L/m, 1 psi = 6.895 kPa, 1 foot per second = 0.305 m/s.

- a. This chart applies to very rough pipe and existing pipe and to their actual diameters.

TABLE E103.3(1)
RECOMMENDED TABULAR ARRANGEMENT FOR USE IN SOLVING PIPE SIZING PROBLEMS

COLUMN	1	2	3	4	5	6	7	8	9	10
Line	Description	Lb per square inch (psi)	Gal. per min through section	Length of section (feet)	Trial pipe size (inches)	Equivalent length of fittings and valves (feet)	Total equivalent length col. 4 and col. 6 (100 feet)	Friction loss per 100 feet of trial size pipe (psi)	Friction loss in equivalent length col. 8 × col. 7 (psi)	Excess pressure over friction losses (psi)
A	Service and cold water distribution piping ^a	Minimum pressure available at main	55.00							
B		Highest pressures required at a fixture (Section Table 604.3)	15.00							
C		Meter loss 2" meter	11.00							
D		Tap in main loss 2" tap (Table E103A) (Table E103.3(4))	1.61							
E		Static head loss 21 × 43 psi	9.03							
F		Special fixture loss backflow preventer	9.00							
G		Special fixture loss – Filter	0.00							
H		Special fixture loss – Other	0.00							
I		Total overall losses and requirements (Sum of Lines B through H)	45.64							

COLUMN	1	2	3	4	5	6	7	8	9	10	
Line	Description		Lb per square inch (psi)	Gal. per min through section	Length of section (feet)	Trial pipe size (inches)	Equivalent length of fittings and valves (feet)	Total equivalent length col. 4 and col. 6 (100 feet)	Friction loss per 100 feet of trial size pipe (psi)	Friction loss in equivalent length col. 8 × col. 7 (psi)	Excess pressure over friction losses (psi)
J	Pressure available to overcome pipe friction (Line A minus Lines B to H)		9.36								
	DESIGNATION	<u>FU.....</u>	<u>[FU]</u> <u>264</u>								
	Pipe section (from diagram)	AB.....	288	108.0	54	2½	15.00	0.69	3.2	2.21	--
	Cold water	BC.....	264	104.5	8	2½	0.5	0.85	3.1	0.26	--
	Distribution piping	CD.....	132	77.0	13	2½	7.00	0.20	1.9	0.38	--
		CF ^b	132	77.0	150	2½	12.00	1.62	1.9	3.08	--
		DE ^b	132	77.0	150	2½	12.00	1.62	1.9	3.08	--
K	Total pipe friction losses (cold)			--	--	--	--	--	--	5.93	--
L	Difference (Line J minus Line K)			--	--	--	--	--	--	--	3.43
	Pipe section (from diagram)	A'B'.....	288	108.0	54	2½	12.00	0.69	3.3	2.21	--
	Diagram	B'C'.....	24	38.0	8	2	7.5	0.16	1.4	0.22	--
	Hot water	C'D'.....	12	28.6	13	1½	4.0	0.17	3.2	0.54	--

COLUMN	1		2	3	4	5	6	7	8	9	10
Line	Description		Lb per square inch (psi)	Gal. per min through section	Length of section (feet)	Trial pipe size (inches)	Equivalent length of fittings and valves (feet)	Total equivalent length col. 4 and col. 6 (100 feet)	Friction loss per 100 feet of trial size pipe (psi)	Friction loss in equivalent length col. 8 × col. 7 (psi)	Excess pressure over friction losses (psi)
	Distribution	C'F ^b	12	28.6	150	1½	7.00	1.57	3.2	5.02	--
	Piping	D'E ^b	12	28.6	150	1½	7.00	1.57	3.2	5.02	--
K	Total pipe friction losses (hot)			--	--	--	--	--	--	7.99	--
L	Difference (line) minus Line K			--	--	--	--	--	--	--	1.37

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^a

FIXTURE	OCCUPANCY	TYPE OF SUPPLY CONTROL	LOAD VALUES, IN WATER SUPPLY		
			Cold	Hot	Total
Bathroom group	Private	Flush tank	2.7	1.5	3.6
Bathroom group	Private	[Flush] Flushometer valve	6.0	3.0	8.0
Bath tub	Private	Faucet	1.0	1.0	1.4
Bath tub	Public	Faucet	3.0	3.0	4.0
Bidet	Private	Faucet	1.5	1.5	2.0
Combination fixture	Private	Faucet	2.25	2.25	3.0
Dishwashing machine	Private	Automatic	—	1.4	1.4
Drinking fountain	Offices, etc.	³ / ₈ " valve	0.25	—	0.25
Kitchen sink	Private	Faucet	1.0	1.0	1.4
Kitchen sink	Hotel, restaurant	Faucet	3.0	3.0	4.0
Laundry trays (1 to 3)	Private	Faucet	1.0	1.0	1.4
Lavatory	Private	Faucet	0.5	0.5	0.7
Lavatory	Public	Faucet	1.5	1.5	2.0
Service sink	Offices, etc.	Faucet	2.25	2.25	3.0
Shower head	Public	Mixing valve	3.0	3.0	4.0
Shower head	Private	Mixing valve	1.0	1.0	1.4
Urinal	Public	1" [flush] flushometer valve	10.0	—	10.0

FIXTURE	OCCUPANCY	TYPE OF SUPPLY CONTROL	LOAD VALUES, IN WATER SUPPLY		
			Cold	Hot	Total
Urinal	Public	³ / ₄ " [Flush] <u>flushometer</u> valve	5.0	—	5.0
Urinal	Public	Flush tank	3.0	—	3.0
Washing machine (8 lb)	Private	Automatic	1.0	1.0	1.4
Washing machine (8 lb)	Public	Automatic	2.25	2.25	3.0
Washing machine (15 lb)	Public	Automatic	3.0	3.0	4.0
Water closet	Private	[Flush] <u>Flushometer</u> valve	6.0	—	6.0
Water closet	Private	Flush tank	2.2	—	2.2
Water closet	Public	[Flush] <u>Flushometer</u> valve	10.0	—	10.0
Water closet	Public	Flush tank	5.0	—	5.0
Water closet	Public or private	Flushometer tank	2.0	—	2.0

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

- 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.

TABLE E103.3(3)
TABLE FOR ESTIMATING DEMAND

SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH FIXTURES			SUPPLY SYSTEMS PREDOMINANTLY FOR [FLUSH] <u>FLUSHOMETER</u> VALVES		
Load	Demand		Load	Demand	
(Water supply fixture units)	(Gallons per minute)	(Cubic feet per minute)	(Water supply fixture units)	(Gallons per minute)	(Cubic feet per minute)
1	3.0	0.04104	—	—	—
2	5.0	0.0684	—	—	—
3	6.5	0.86892	—	—	—
4	8.0	1.06944	—	—	—
5	9.4	1.256592	5	15.0	2.0052
6	10.7	1.430376	6	17.4	2.326032
7	11.8	1.577424	7	19.8	2.646364
8	12.8	1.711104	8	22.2	2.967696
9	13.7	1.831416	9	24.6	3.288528
10	14.6	1.951728	10	27.0	3.60936
11	15.4	2.058672	11	27.8	3.716304
12	16.0	2.13888	12	28.6	3.823248
13	16.5	2.20572	13	29.4	3.930192
14	17.0	2.27256	14	30.2	4.037136
15	17.5	2.3394	15	31.0	4.14408
16	18.0	2.90624	16	31.8	4.241024
17	18.4	2.459712	17	32.6	4.357968
18	18.8	2.513184	18	33.4	4.464912
19	19.2	2.566656	19	34.2	4.571856
20	19.6	2.620128	20	35.0	4.6788
25	21.5	2.87412	25	38.0	5.07984
30	23.3	3.114744	30	42.0	5.61356
35	24.9	3.328632	35	44.0	5.88192

SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH TANKS			SUPPLY SYSTEMS PREDOMINANTLY FOR [FLUSH] <u>FLUSHOMETER</u> VALVES		
Load	Demand		Load	Demand	
(Water supply fixture units)	(Gallons per minute)	(Cubic feet per minute)	(Water supply fixture units)	(Gallons per minute)	(Cubic feet per minute)
40	26.3	3.515784	40	46.0	6.14928
45	27.7	3.702936	45	48.0	6.41664
50	29.1	3.890088	50	50.0	6.684
60	32.0	4.27776	60	54.0	7.21872
70	35.0	4.6788	70	58.0	7.75344
80	38.0	5.07984	80	61.2	8.181216
90	41.0	5.48088	90	64.3	8.595624
100	43.5	5.81508	100	67.5	9.0234
120	48.0	6.41664	120	73.0	9.75864
140	52.5	7.0182	140	77.0	10.29336
160	57.0	7.61976	160	81.0	10.82808
180	61.0	8.15448	180	85.5	11.42964
200	65.0	8.6892	200	90.0	12.0312
225	70.0	9.3576	225	95.5	12.76644
250	75.0	10.026	250	101.0	13.50168
275	80.0	10.6944	275	104.5	13.96956
300	85.0	11.3628	300	108.0	14.43744
400	105.0	14.0364	400	127.0	16.97736
500	124.0	16.57632	500	143.0	19.11624
750	170.0	22.7256	750	177.0	23.66136
1,000	208.0	27.80544	1,000	208.0	27.80544
1,250	239.0	31.94952	1,250	239.0	31.94952
1,500	269.0	35.95992	1,500	269.0	35.95992
1,750	297.0	39.70296	1,750	297.0	39.70296
2,000	325.0	43.446	2,000	325.0	43.446

SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH FAUCETS			SUPPLY SYSTEMS PREDOMINANTLY FOR [FLUSH] <u>FLUSHOMETER</u> VALVES		
Load	Demand		Load	Demand	
(Water supply fixture units)	(Gallons per minute)	(Cubic feet per minute)	(Water supply fixture units)	(Gallons per minute)	(Cubic feet per minute)
2,500	380.0	50.7984	2,500	380.0	50.7984
3,000	433.0	57.88344	3,000	433.0	57.88344
4,000	535.0	70.182	4,000	525.0	70.182
5,000	593.0	79.27224	5,000	593.0	79.27224

TABLE E103.3(4)
LOSS OF PRESSURE THROUGH TAPS AND TEES IN POUNDS PER SQUARE INCH
(psi)

GALLONS PER MINUTE	SIZE OF TAP OR TEE (inches)						
	$\frac{5}{8}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	3
10	1.35	0.64	0.18	0.08	—	—	—
20	5.38	2.54	0.77	0.31	0.14	—	—
30	12.10	5.72	1.62	0.69	0.33	0.10	—
40	—	10.20	3.07	1.23	0.58	0.18	—
50	—	15.90	4.49	1.92	0.91	0.28	—
60	—	—	6.46	2.76	1.31	0.40	—
70	—	—	8.79	3.76	1.78	0.55	0.10
80	—	—	11.50	4.90	2.32	0.72	0.13
90	—	—	14.50	6.21	2.94	0.91	0.16
100	—	—	17.94	7.67	3.63	1.12	0.21
120	—	—	25.80	11.00	5.23	1.61	0.30
140	—	—	35.20	15.00	7.12	2.20	0.41
150	—	—	—	17.20	8.16	2.52	0.47
160	—	—	—	19.60	9.30	2.92	0.54
180	—	—	—	24.80	11.80	3.62	0.68
200	—	—	—	30.70	14.50	4.48	0.84
225	—	—	—	38.80	18.40	5.60	1.06
250	—	—	—	47.90	22.70	7.00	1.31
275	—	—	—	—	27.40	7.70	1.59
300	—	—	—	—	32.60	10.10	1.88

For SI: 1 inch = 25.4 mm, 1 pound per square inch = 6.895 kpa, 1 gallon per minute = 3.785 L/m.

TABLE E103.3(5)
ALLOWANCE IN EQUIVALENT LENGTHS OF PIPE FOR FRICTION LOSS IN
VALVES AND THREADED FITTINGS (feet)

FITTING OR VALVE	PIPE SIZE (inches)							
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
45-degree elbow	1.2	1.5	1.8	2.4	3.0	4.0	5.0	6.0
90-degree elbow	2.0	2.5	3.0	4.0	5.0	7.0	8.0	10.0
Tee, run	0.6	0.8	0.9	1.2	1.5	2.0	2.5	3.0
Tee, branch	3.0	4.0	5.0	6.0	7.0	10.0	12.0	15.0
Gate valve	0.4	0.5	0.6	0.8	1.0	1.3	1.6	2.0
Balancing valve	0.8	1.1	1.5	1.9	2.2	3.0	3.7	4.5
Plug-type cock	0.8	1.1	1.5	1.9	2.2	3.0	3.7	4.5
Check valve, swing	5.6	8.4	11.2	14.0	16.8	22.4	28.0	33.6
Globe valve	15.0	20.0	25.0	35.0	45.0	55.0	65.0	80.0
Angle valve	8.0	12.0	15.0	18.0	22.0	28.0	34.0	40.0

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.0175 rad.

TABLE E103.3(6)
PRESSURE LOSS IN FITTINGS AND VALVES EXPRESSED AS EQUIVALENT
LENGTH OF TUBE^a (feet)

NOMINAL OR STANDARD SIZE (inches)	FITTINGS				Coupling	VALVES			
	Standard Ell		90-Degree Tee			Ball	Gate	Butterfly	Check
	90 Degree	45 Degree	Side Branch	Straight Run					
3/8	0.5	—	1.5	—	—	—	—	—	1.5
1/2	1	0.5	2	—	—	—	—	—	2
5/8	1.5	0.5	2	—	—	—	—	—	2.5
3/4	2	0.5	3	—	—	—	—	—	3
1	2.5	1	4.5	—	—	0.5	—	—	4.5
1 1/4	3	1	5.5	0.5	0.5	0.5	—	—	5.5
1 1/2	4	1.5	7	0.5	0.5	0.5	—	—	6.5
2	5.5	2	9	0.5	0.5	0.5	0.5	7.5	9
2 1/2	7	2.5	12	0.5	0.5	—	1	10	11.5
3	9	3.5	15	1	1	—	1.5	15.5	14.5
3 1/2	9	3.5	14	1	1	—	2	—	12.5
4	12.5	5	21	1	1	—	2	16	18.5
5	16	6	27	1.5	1.5	—	3	11.5	23.5
6	19	7	34	2	2	—	3.5	13.5	26.5
8	29	11	50	3	3	—	5	12.5	39

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.01745 rad.

- a. Allowances are for streamlined soldered fittings and recessed threaded fittings. For threaded fittings, double the allowances shown in the table. The equivalent lengths presented above are based on a C factor of 150 in the Hazen-Williams friction loss formula. The lengths shown are rounded to the nearest half-foot.

SECTION PC E201
[SELECTION OF PIPE SIZE]
RESERVED

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

OUNCES OF WATER PER FOOT OF TUBE			
Size Nominal, Inch	[Copper Type M]	Copper Type L	Copper Type K
$\frac{3}{8}$	[1.06]	0.97	0.84
$\frac{1}{2}$	[1.69]	1.55	1.45
$\frac{3}{4}$	[3.43]	3.22	2.90
1	[5.81]	5.49	5.17
1 $\frac{1}{4}$	[8.70]	8.36	8.09
1 $\frac{1}{2}$	[12.18]	11.83	11.45
2	[21.08]	20.58	20.04

For SI: 1 ounce = 0.030 liter.

§6. Appendix F of the New York city plumbing code is REPEALED.

§7. Appendix G of the New York city plumbing code is REPEALED.

§3. Notwithstanding any other law or rule tables, figures or equations in graphic or PDF format to be added to the New York city plumbing code pursuant to this local law need not be underlined to denote new matter being added. The absence of underlining to denote new matter being added shall not affect the validity of such tables, figures or equations.

§4. This local law shall take effect on the same date as the effective date of a local law amending the administrative code of the city of New York in relation to bringing the New York city building code up to date with the 2015 edition of the International Building Code published by the International Code Council.

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