

## 2015 PLUMBING CODE ORDINANCE

### Section ~~150.301~~ ~~121.001~~. **Plumbing Code** Adopted.

The *Uniform Plumbing Code*, ~~2015-2009~~ edition, including Appendix A—Recommended Rules for Sizing the Water Supply System; Appendix B—Explanatory Notes on Combination Waste and Vent Systems; ~~Appendix C—Alternate Plumbing Systems~~; Appendix D—Sizing Storm Water Drainage Systems; Appendix E—Manufactured/Mobile Home Parks and Recreational Vehicle Parks; Appendix I—Installation Standards; Appendix K—Private Sewage Disposal Systems; ~~and the Green Plumbing & Mechanical Code Supplement which is deemed to be a non-mandatory referenced standard and is applicable only when plumbing systems or installation methods are not referenced in the 2015 Uniform Plumbing Code~~, published by the International Association of Plumbing and Mechanical Officials and amendments and additions thereto as provided in this chapter, are hereby adopted by the city for regulating and controlling design, construction, quality of materials, erection, installation, alteration, repair, location, relocation, replacement, addition to, use, or maintenance of any plumbing and providing for the performance of inspections and collection of fees therefore.

A printed copy of the code as amended is on file with the city clerk.

### Sec. 150.302. Amendments to code.

~~The following sections and subsection of the plumbing code adopted in this chapter shall be amended or added as follows. All other sections or subsection of the plumbing code as published shall remain the same.~~

**102.1 Conflicts Between Codes.** ~~Where the requirements within the jurisdiction of this plumbing code conflict with the requirements of the mechanical code, this code shall prevail.~~ In instances where this code, applicable standards, or the manufacturer's installation instructions conflict, the more stringent provisions shall prevail. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall prevail.

*Commentary—City: This eliminates the language that makes the plumbing code prevail with the intention that where there are conflicts with other codes, the most restrictive provision of either code prevails. This is necessary because of the differences between the IAPMO published Uniform Plumbing Code and the ICC published International Mechanical and Fuel Gas Codes.*

**102.4 Additions, Alterations, Renovations, or Repairs.** Additions, alterations, renovations, or repairs shall conform to that required for a new system without requiring the existing plumbing system to be in accordance with the requirements of this code. Additions, alterations, renovations, or repairs shall not cause an existing system to become unsafe, insanitary, or overloaded.

Additions, alterations, renovations, or repairs to existing plumbing installations shall comply with the provisions for new construction ~~and the International Existing Building Code~~, unless

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such deviations are found to be necessary and are first approved by the Authority Having Jurisdiction.

**102.6 Changes in Building Occupancy.** Plumbing systems that are a part of a building or structure undergoing a change in use or occupancy, as defined in the building code, shall be in accordance with the requirements of this code and the *International Existing Building Code* that are applicable to the new use or occupancy.

**102.7 Moved Structures.** Parts of the plumbing system of a building or part thereof that is moved from one foundation to another, or from one location to another, shall be in accordance with the provisions of this code and the *International Existing Plumbing Code* for new installations and completely tested as prescribed elsewhere in this section for new work, except that walls or floors need not be removed during such test where other equivalent means of inspection acceptable to the Authority Having Jurisdiction are provided.

*Commentary—City: For consistency, this ties the scoping provisions for additions, alterations and renovations, changes of occupancy, and moved buildings into the International Existing Building Code which is applied to building, mechanical, electrical, and plumbing systems in existing buildings that are within the city. The state eliminated the reference to repair in Section 102.4 because minor repairs are not inspected by the state or the City.*

**103.2 Liability.** The Authority Having Jurisdiction charged with the enforcement of this code, acting in good faith and without malice in the discharge of the Authority Having Jurisdiction's duties, shall not thereby be rendered personally liable for damage that accrues to persons or property as a result of an act or by reason of an act or omission in the discharge of duties. A suit brought against the Authority Having Jurisdiction or employee because of such act or omission performed in the enforcement of provisions of this code shall be afforded all of the protection provided by the city's insurance pool, immunities, and defenses provided by other applicable state and federal laws and be defended by legal counsel provided by this jurisdiction until final termination of such proceedings.

This code shall not be construed to relieve or lessen the responsibility of any person owning, operating, or controlling any building or structure for any damages to persons or property caused by defects, nor shall the city, its officers and employees, be held as assuming any such liability by reason of the inspections authorized by this code or any permits or certificates issued under this code.

*Commentary—City: For consistency, this mirrors the same administrative provisions concerning liability that already exists for building, mechanical, and electrical ordinances into the plumbing code.*

**104.1 Permits Required.** It shall be unlawful for a homeowner, person, firm, or corporation to make an installation, alteration, repair, replacement, or remodel a plumbing system regulated by this code except as permitted in Section 104.2, or to cause the same to be done without first obtaining a separate plumbing permit for each separate building or structure. Any regulation herein referring to permits shall also apply to inspections.

*Commentary—City: This inserts “homeowners” for the permits that are issued to owner-occupied dwelling owners who do their own work and obtain an actual plumbing permit. For licensed contractors, an actual inspection is referred to as a plumbing permit for billing purposes.*

**104.3.2 Plan Review Fees.** Where a plan or other data is required to be submitted in accordance with SDCL 36-18 or when the building official requires the submittal of plans, computations, or specifications in accordance with Section 104.3.1, a plan review fee shall be paid at the time of submitting construction documents for review.

The plan review fees for plumbing work shall be 25 percent of the building permit fee in Table 1-B in Section 150.017 of the Revised Ordinances of Sioux Falls, South Dakota review fees specified in this subsection are separate fees from the permit fees specified in Table 104.5.

Where plans are incomplete or changed so as to require additional review, a fee shall be charged at the rate shown in Table 104.5.

*Commentary—City. This inserts the charged fee for a plumbing plan review to be consistent with the same fees charged for building, mechanical, and electrical plan reviews.*

**106.3 Penalties.** If the notice of violation is not complied with promptly, the plumbing official is authorized to utilize the administrative provisions of the code enforcement system, or request the legal counsel of the jurisdiction to deem the violation as a strict liability offense and institute the appropriate proceeding at law or in equity to restrain, correct, or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.

~~A person, firm, or corporation violating a provision of this code shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punishable by a fine, imprisonment, or both set forth by the governing laws of the jurisdiction. Each separate day or portion thereof, during which a violation of this code occurs or continues, shall be deemed to constitute a separate offense.~~

**107.1 General.** In order to hear and decide appeals of orders, decisions, or determinations made by the Authority Having Jurisdiction relative to the application and interpretations of this code, to review all prospective changes to the respective codes and to submit recommendations to the responsible official and the city council, and to examine applicants for licensing and to investigate matters brought before the board, there shall be and is hereby created a Plumbing Board of Appeals consisting of members who are qualified by experience and training to pass upon matters pertaining to plumbing design, construction, and maintenance and the public health aspects of plumbing systems and who are not employees of the jurisdiction. The Authority Having Jurisdiction shall be an ex-officio member and shall act as secretary to said board but shall have no vote upon a matter before the board. Members shall be appointed by the mayor with the advice and consent of the city council and shall hold office for a term of three years. The

~~board shall adopt rules and procedures for conducting its business. All decisions and findings shall be provided in writing to the appellant with a duplicate copy provided to the building services department. The Plumbing Board of Appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business and shall render decisions and findings in writing to the appellant with a duplicate copy to the Authority Having Jurisdiction.~~

**107.2 Limitations of Authority.** The Plumbing Board of Appeals shall have no authority relative to interpretation of the administrative provisions of this code, nor shall the board be empowered to waive requirements of this code.

*Commentary—City: The administrative chapter of the Uniform Plumbing Code has no provision for an appeals process. For consistency, this inserts into ordinance the same language that establishes the Building, Mechanical, Electrical and Property Maintenance Boards of Appeals and Examiners for the Plumbing Board of Appeals and Examiners.*

**TABLE 104.5  
PLUMBING PERMIT FEES**

**Permit Issuance**

1. <del>For issuing each Homeowner's permit</del> .....	<del>\$20.00</del>
<del>2. For issuing each supplemental permit</del> .....	<del>* .....</del>
1. For each plumbing fixture on one trap or a set of fixtures on one trap (including water, drainage piping, and backflow protection therefore) .....	<u>\$4.00</u>
2. For each building sewer and each trailer park sewer .....	<u>\$40.00</u>
3. Rainwater systems—per drain (inside building) .....	<u>\$7.00</u>
<del>4. For each cesspool (where permitted)</del> .....	<del>* .....</del>
<del>5-6.</del> For each water heater, vent, or both .....	<u>\$7.00</u>
<del>6-7.</del> For each gas piping system of one to five outlets .....	<u>\$5.00</u>
<del>7-8.</del> For each additional gas piping system outlet, per outlet .....	<u>\$1.00</u>
<del>8-9.</del> For each industrial waste pretreatment interceptor, including its trap and vent, except kitchen-type grease interceptors functioning as fixture traps .....	<u>\$7.00</u>
<del>9-10</del> For each installation, alteration, or repair of water piping, or both .....	<u>\$7.00</u>

<del>1011</del> For each repair or alteration of drainage or vent piping, each fixture .....	<u>\$4.00</u>
<del>1112</del> For each lawn sprinkler system on one meter including backflow protection devices therefore .....	<u>\$4.00</u>
<del>1213</del> For atmospheric-type vacuum breakers not referenced in Item 12:	
One to 5 .....	<u>\$5.00</u>
Over 5, each .....	<u>\$1.00</u>
<del>1314</del> For each backflow protective device other than atmospheric-type vacuum breakers:	
Two inches (50 mm) in diameter and smaller .....	<u>\$4.00</u>
Over 2 inches (50 mm) in diameter .....	<u>\$15.00</u>
<del>1415</del> For each gray water system .....	<u>\$20.00</u>
<del>1516</del> For initial installation and testing for a reclaimed water system .....	<u>\$7.00</u>
<del>1617</del> For each annual cross-connection testing of a reclaimed water system (excluding initial test) .....	<u>\$7.00</u>
<del>1718</del> *For each medical gas piping system serving one to five inlet(s)/outlet(s) for a specific gas .....	<u>\$20.00</u>
<del>1819</del> *For each additional medical gas inlet(s)/outlet(s) .....	<u>\$4.00</u>
<del>19</del> <u>Minimum inspection fee</u> .....	<u>\$19.00</u>

**Other Inspections and Fees**

1. Inspections outside of normal business hours ..... \$70.00
2. Reinspection fee ..... \$70.00
3. Inspections for which no fee is specifically indicated ..... \$70.00
4. Additional plan review required by changes, additions, or revisions to approved plans (minimum charge—1/2 hour) ..... \$70.00
5. Appeals. Before any action is taken by the board, the party or parties requesting such hearing shall deposit with the secretary of the board or his authorized agent, the sum of \$65.00 to cover the approximate cost of the procedure. Under no condition shall such sum or any portion thereof be refunded for failure of said request to be approved.

- 6. Delinquent accounts. The administrative authority may refuse to issue permits or conduct inspections for any plumbing contractor whose account is delinquent.
- 7. Bond claims. An administrative fee shall be charged to cover the administrative cost of filing a claim ..... \$150.00
- 8. Examination fees per examination ..... \$75.00
- 9. Fee for late corrections. A \$100.00 administrative fee may be charged for failure to correct violations within the time specified on a contractor's correction report.
- 10. Fee for failure to request a required inspection. Where plumbing work is completed without a request for an inspection, an administrative fee of \$250.00 may be charged.

\*Or the total hourly cost to the city, whichever is greater. This cost shall include supervision, overhead, equipment, hourly wages, and fringe benefits of the employees involved.

*Commentary—City: This table defines the fees charged for plumbing inspections and permits. Most of the plumbing fees remained the same except for Items 14 through 18 which are new types of inspections referenced in the 2015 UPC.*

**Section 221.0 S** Add the following definition:

**Strict Liability Offense.** An offense in which the prosecution in a legal proceeding is not required to prove criminal intent as a part of its case. It is enough to prove that the defendant either did an act which was prohibited or failed to do an act which the defendant was legally required to do.

*Commentary—City: For consistency, again this brings the plumbing ordinance in line with current legal terminology in regard to the prosecution of violations. With this terminology, a prosecutor is not required to prove that code violations were intended by a defendant or were ever due to negligence. It is difficult to prove such an intention or negligence in a court of law.*

**312.13 Exposed ABS Piping.** Not adopted by state. ~~ABS piping shall not be exposed to direct sunlight.~~

**312.14 Exposed PVC Piping.** Not adopted by state. ~~PVC piping shall not be exposed to direct sunlight.~~

*Commentary—State. This new provision would require that any PVC or ABS that is exposed to the outside be ultraviolet resistant. This mandates the status quo for sewer vents exposed to the outside.*

**312.6 Freezing Protection.** No ~~water~~, soil or waste pipe shall be installed or permitted outside of building, in attics or crawl spaces, or in an exterior wall unless, where necessary, adequate provision is made to protect such pipe from freezing.

No water piping shall be installed in an exterior wall or unheated attic. An exterior wall includes any wall between a heated space and an unheated space. Water service piping must be installed with a minimum earth cover of 72 inches. Building sewers must be installed with a minimum earth cover of 42 inches. Building sewers on septic systems may be installed at any depth that will accommodate the burial depth of the septic tank. If the building sewer is installed at a depth less than 30 inches, the pipe shall be protected from freezing with a minimum of 3 inches of foam insulation above and below the pipe.

*Commentary—State: To eliminate water lines from freezing in exterior walls, this defines that water lines are not allowed in an exterior wall located between a heated and unheated space or in an unheated attic. This also defines minimum earth coverings for water service piping, sewer lines, and sewer lines served by septic systems.*

**312.10 Sleeves.** Sleeves shall be provided to protect piping through concrete and masonry walls and concrete floors.

**Exception:** Sleeves shall not be required where openings are drilled or wrapped or bored.

*Commentary—State. This includes wrapped piping from being exempted from being sleeved.*

**312.12.2 ~~Metal~~ Collars.** In or on buildings where openings have been made in walls, floors, or ceilings for the passage of pipes, such openings shall be closed and protected by the installation of approved ~~metal~~ collars ~~securely fastened to the adjoining structure~~.

*Commentary—State. This is intended to allow alternate materials other than metal only as an approved collar for rat proofing.*

**317.1 General.** Food or drink shall not be stored, prepared, or displayed beneath soil or drain pipes, unless those areas are protected against leakage or condensation from such pipes reaching the food or drink as described below. Where building design requires that soil or drain pipes be located over such areas, the installation shall be made with the least possible number of joints and shall be installed so as to connect to the nearest adequately sized vertical stack with the provisions as follows:

- (1) Openings through floors over such areas shall be sealed watertight to the floor construction.
- (2) Floor and shower drains installed above such areas shall be equipped with integral seepage pans.

- (3) Soil or drain pipes shall be of an approved material as listed in Table 1701.1 and Section 701.2. Materials shall comply with established standards. Cleanouts shall be extended through the floor construction above.
- (4) Piping subject to operation at temperatures that will form condensation on the exterior of the pipe shall be thermally insulated.

**Commentary—State:** *This code provision eliminated by the state would have otherwise eliminated any type of piping to be installed above a hard lid kitchen ceiling.*

**321.0 Boilers and pressure vessels.** The following provisions shall govern the installation, alteration, and repair of boilers and pressure vessels:

Chapter 10 Boilers of the *International Mechanical Code*

Section 631 Boilers of the *International Fuel Gas Code*

Part V-Mechanical, Section M2001 Boilers and Part VI-Fuel Gas, Section G2452 Boilers of the *International Residential Code*

**322 Hydronic piping.** The following provisions shall govern the installation, alteration, and repair of hydronic piping:

Chapter 12 Hydronic Piping of the *International Mechanical Code*

Part V-Mechanical, Chapter 21 of the *International Residential Code*

**Commentary—City:** *The Uniform Plumbing Code does not have specific minimum standards for the installation of boilers or hydronic piping. Said standards are found in the International Mechanical, Fuel Gas, and the mechanical and fuel gas provisions of the International Residential Code as it relates to such installations in one- and two-family dwellings. Typically, it is the plumbing trade that installs boilers and hydronic piping. This is to reference a plumbing contractor which installs boilers and hydronic piping to the mechanical and fuel gas provisions that actually regulates the installations of such piping and equipment, based on the fact that the UPC has no guidance.*

**402.6.1 Closet Rings (Closet Flanges).** Closet rings (closet flanges) for water closets or similar fixtures shall be of an approved type and shall be copper alloy, copper, hard lead, cast-iron, galvanized malleable iron, ABS, PVC, or other approved materials. Each such closet ring (closet flange) shall be approximately 7 inches (178 mm) in diameter and, where installed, shall, together with the soil pipe, present a 1 1/2-inch (38 mm) wide flange or face to receive the fixture gasket or closet seal.

Caulked-on closet rings (closet flanges) shall be not less than 1/4 of an inch (6.4 mm) thick and not less than 2 inches (51 mm) in overall depth.

Closet rings (closet flanges) shall be burned or soldered to lead bends or stubs, shall be caulked to cast-iron soil pipe, shall be solvent cemented to ABS and PVC, and shall be screwed or fastened in an approved manner to other materials.

The top of the closet flange shall be installed above the finished floor not to exceed 3/8". Closet

Closet rings (closet flanges) shall be adequately designed and secured to support fixtures connected thereto.

*Commentary—City: This defines a maximum height of 3/8 inch above the floor for a water closet flange to prevent rocking of the water closet.*

**407.3 Limitation of Hot Water Temperature for Public Lavatories.** Hot water delivered from public use lavatories including hair salon and pedicure sinks shall be limited to a maximum temperature of 120°F (49°C) by a device that is in accordance with ASSE 1070 or CSA B125.3. The water heater thermostat shall not be considered a control for meeting this provision.

*\*Commentary—City: In addition to public use lavatories, hair salon and pedicure sinks has been added to assure that tempered water is provided to prevent scalding in hair salons and pedicure areas.*

**407.4 Transient Public Lavatories.** Self-closing or metering faucets may shall be installed on lavatories intended to serve the transient public, such as those in, but not limited to, service stations, train stations, airports, restaurants, and convention halls.

*Commentary—State: This takes away the mandatory requirement for self-closing or self-metering faucets, but will still allow hand closing manual faucets.*

**418.3 Location of Floor Drains.** Floor drains shall be installed in the following areas:

- (1) Toilet rooms containing two or more water closets or a combination of one water closet and one urinal, except in a dwelling unit.
- (2) Commercial kitchens and in accordance with Section 704.3.
- (3) Laundry rooms in commercial buildings and common laundry facilities in multi-family dwelling buildings and in all mechanical rooms or the lowest level of a structure.
- (4) Boiler rooms.

*Commentary—State: This provision additionally requires floor drains in mechanical rooms, due to condensate lines, and additionally at the lowest elevation of any structure.*

**422.1 Fixture Count.** Plumbing fixtures shall be provided for the type of building occupancy and in the minimum number in accordance with Chapter 29 and Table 2902.1 of the

~~*International Building Code* shown in Table 422.1. The total occupant load and occupancy determined in accordance with the building code. *Occupancy classification not shown in Table*~~

The minimum number of fixtures shall be calculated at 50 percent male and 50 percent female based on the total occupant load. Where information submitted indicates a difference in distribution of the sexes, such information shall be used in order to determine the number of fixtures for each sex. Once the occupancy load and occupancy are determined, ~~Table 2902.1 of the *International Building Code* 422.1 shall be applied to determine the minimum number of fixtures required. *Where applying the fixture ratios in Table 422.1 results in fractional numbers,*~~

**422.2 Separate Facilities.** ~~*Not adopted by city. Separate toilet facilities shall be provided for each sex.*~~

~~**Exceptions:** (1) Residential installations.~~

**422.3 Fixture Requirements for Special Occupancies.** ~~*Not adopted by city. Additional fixtures shall be permitted to be required where unusual environmental conditions or referenced activities are encountered. In food preparation areas, fixture requirements shall be permitted to be dictated by health codes.*~~

**422.4 Toilet Facilities Serving Employees and Customers.** ~~*Not adopted by city. Each building or structure shall be provided with toilet facilities for employees and customers. Requirements for customers and employees shall be permitted to be met with a single set of restrooms accessible to both groups.*~~

**422.4.1 Access to Toilet Facilities.** ~~*Not adopted by city. In multi-story buildings, accessibility to the required toilet facilities shall not exceed one vertical story. Access to the required toilet facilities for customers shall not pass through areas designated as for employee use only such as kitchens, food preparation areas, storage rooms, closets, or similar spaces. Toilet facilities accessible only to private offices shall not be counted to determine compliance with this section.*~~

**422.5 Toilet Facilities for Workers.** ~~*Not adopted by city. Toilet facilities shall be provided and maintained in a sanitary condition for the use of workers during construction.*~~

*Commentary—City: Chapter 4 of the Uniform Plumbing Code defines the required number of plumbing fixtures based on occupant load and occupancy. The table in the UPC is more restrictive and is not consistent with Chapter 29 and Table 29-A-Minimum Number of Required Plumbing Fixtures of the International Building Code. These ordinance modifications are intended to eliminate the fixture table in the UPC. Ordinarily, a mechanical engineer or a plumber does not define the minimum number of plumbing fixtures, the architect or the building designer does, and references the building code, not the plumbing code to determine numbers of fixtures.*

**506.4.3 Alternate combustion air sizing (IFGC)** ~~*Outdoor combustion air shall be provided through opening(s) to the outdoors. The minimum dimension of air openings shall be not less than 3 inches (76 mm).*~~

**Exception:** When all air is taken from the outdoors for appliances and the total input of the appliances is less than 300,000 Btu/hr (1,704,000 W/ meters squared K), one outside air duct may be used and shall terminate below the draft hood. An exterior opening may be used in place of a duct provided that it is located at least one foot below the draft hood.

As an alternate to the above-referenced combustion air openings, the net free area of openings, ducts, or plenums supplying air to an area containing gas-burning appliances shall be as specified in Table 7-B.

**Table No. 7-B—Combustion Air Requirements for Appliances Requiring an Outside Air Opening in Areas with 5,000 degrees Fahrenheit (2,777 degrees Celsius) or Greater Heating Degree Days**

<b><u>Total Input of Appliances<sup>1</sup></u></b> <b><u>Thousand of Btu/h</u></b>	<b><u>Required Free Area of Air Supply</u></b> <b><u>Opening or Duct, Square Inches<sup>2</sup></u></b>
<u>25 (26.4 KJ/h)</u>	<u>7 (4,516 mm<sup>2</sup>)</u>
<u>50 (52.8 KJ/h)</u>	<u>7 (4,516 mm<sup>2</sup>)</u>
<u>75 (79.1 KJ/h)</u>	<u>11 (7,097 mm<sup>2</sup>)</u>
<u>100 (106 KJ/h)</u>	<u>14 (9,032 mm<sup>2</sup>)</u>
<u>125 (132 KJ/h)</u>	<u>18 (11,610 mm<sup>2</sup>)</u>
<u>150 (158 KJ/h)</u>	<u>22 (14,190 mm<sup>2</sup>)</u>
<u>175 (185 KJ/h)</u>	<u>25 (16,130 mm<sup>2</sup>)</u>
<u>200 (211 KJ/h)</u>	<u>29 (18,710 mm<sup>2</sup>)</u>
<u>225 (237 KJ/h)</u>	<u>32 (20,650 mm<sup>2</sup>)</u>
<u>250 (264 KJ/h)</u>	<u>36 (23,230 mm<sup>2</sup>)</u>
<u>275 (290 KJ/h)</u>	<u>40 (25,810 mm<sup>2</sup>)</u>
<u>300 (317 KJ/h)</u>	<u>43 (27,740 mm<sup>2</sup>)</u>

1. For total inputs that fall between the listing figures, use the next largest listed input.
2. These figures are based on the maximum equivalent duct length of 20 feet (6.1 m). For equivalent duct lengths in excess of 20 feet (6.1 m) to and including a maximum of 50 feet (15.2 m), increase the round duct diameter by one size. A square or rectangular duct may be considered only where the required duct size is 9 inches<sup>2</sup> (5,800 mm<sup>2</sup>) or larger and the smaller dimension must be not less than 3 inches (76.2 mm).
3. The combustion air duct is required to be upsized one diameter size when a dryer is installed in the same room as the combustion air.

**Commentary—City:** *This inserts the same alternative sizing method for combustion air for plumbers. This is consistent with what is in the mechanical and fuel gas ordinance.*

**506.9 Combustion Air Ducts.** Combustion air ducts shall comply with the following [NFPA 54:9.3.8]:

- (1) Ducts shall be constructed of galvanized steel or a material having equivalent corrosion resistance, strength, and rigidity.

**Exception:** Within dwelling units, unobstructed stud and joist spaces shall not be prohibited from conveying combustion air, provided that not more than one fireblock is removed. [NFPA 54:9.3.8.1]

- (2) Ducts shall terminate in an unobstructed space, allowing free movement of combustion air to the appliances. [NFPA 54:9.3.8.2]
- (3) Ducts shall serve a single space. [NFPA 54:9.3.8.3]
- (4) Ducts shall not service both upper and lower combustion air openings where both such openings are used. The separation between ducts serving upper and lower combustion air openings shall be maintained to the source of combustion air. [NFPA 54:9.3.8.4]
- (5) Ducts shall not be screened where terminating in an attic space. [NFPA 54:9.3.8.5]
- (6) Combustion air intake openings located on the exterior of the building shall have the lowest side of the combustion air intake openings located not less than 12 inches (305 mm) vertically from the adjoining finished ground level. [NFPA 54:9.3.8.8]
- (7) Horizontal upper combustion air ducts shall not slope downward toward the source of combustion air. [NFPA 54:9.3.8.6]
- (8) The remaining space surrounding a chimney liner, gas vent, special gas vent, or plastic piping installed within a masonry, metal, or factory-built chimney shall not be used to supply combustion air.

**Exception:** Direct-vent appliances designed for installation in a solid-fuel-burning fireplace where installed in accordance with the manufacturer's installation instructions. [NFPA 54:9.3.8.7]

9. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3,048 mm) from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots, and loading docks, except as specified in Item 3 or Section 501.2.1.

**Commentary—City:** *For consistency with the mechanical and fuel gas codes, this local amendment defines that combustion air is required to be located a certain distance from certain hazardous or noxious contaminant sources.*

**602.3 Backflow Prevention.** No plumbing fixture, device, or construction shall be installed or maintained, or shall be connected to a municipal potable domestic water supply, where such installation or connection provides a possibility of polluting such water supply or cross-connection between a distributing system of water for drinking and domestic purposes and water that becomes contaminated by such plumbing fixture, device, or construction unless there is provided a backflow prevention device approved for the potential hazard. A backflow preventer shall be installed immediately downstream of the water meter and before any branch piping leading off of the water service line. The protection level required will be determined by the hazard level and water use in the facility as outlined in the City of Sioux Falls Cross Connection Control Manual.

*Commentary—State: This provision clarifies that the backflow preventer is required to be located immediately downstream of the water meter and before any branch piping from the service line. It also clarifies that The City of Sioux Falls Cross Control Manual is the referenced standard for containment backflow protection.*

**603.2 Approval of Devices or Assemblies.** Before a device or an assembly is installed for the prevention of backflow, it shall first have been approved by the Authority having Jurisdiction. The City of Sioux Falls Cross Connection Control Manual shall be referenced for containment backflow protection.

Devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. Such device or assembly shall be tested at the time of installation, repair, or relocation and not less than on an annual schedule thereafter, or more often where required by the Authority Having Jurisdiction. Where found to be defective or inoperative, the device or assembly shall be repaired or replaced. No device or assembly shall be removed from use or relocated or other device or assembly substituted, without the approval of the Authority Having Jurisdiction.

*Commentary-City: This clarifies that the City of Sioux Falls Cross Connection Control Manual is the referenced standard for containment backflow protection.*

**603.4.2 Testing.** The premise owner or responsible person shall have the backflow prevention assembly tested by a certified backflow assembly tester at the time of installation, repair, or relocation and not less than on an annual schedule thereafter, or more often where required by the Authority Having Jurisdiction. The periodic testing shall be performed in accordance with the procedures ~~referenced in ASSE Series 5000 by a tester qualified in accordance with those standards,~~ listed in the City of Sioux Falls Cross Connection Control manual by a tester certified in the approved procedures. Copies of the initial installation assembly test report and copies of the annual assembly test reports shall be sent to the water supplier. A testable assembly is an assembly with properly located, resiliently seated test cocks and tightly closing resiliently seated shut off valves at each end of the assembly.

*Commentary—State: This specifies that assembly test reports of containment backflow devices are required to be completed by a certified tester, the test results are required to be sent to the*

*water supplier, and it also defines the testable assemblies, which are all in accordance with the City of Sioux Falls Cross Connection Control Manual.*

**603.5.4 Heat Exchangers.** Heat exchangers used for heat transfer, heat recovery, or solar heating shall protect the potable water system from being contaminated by the heat transfer medium. Single-wall heat exchangers used in indirect-fired water heaters shall meet the requirements of Section C302.0 to C302.3 inclusive ~~505.4.1~~. Double-wall heat exchangers shall separate the potable water from the heat transfer medium by providing a space between the two walls that are vented to the atmosphere. Water-to-water heat exchangers that return the water back to the public system of waterworks shall not be allowed on a public water system unless approved by the authority having jurisdiction.

*Commentary—State: The provisions concerning indirect-fired water heaters are referenced back to Appendix L, Alternative Plumbing Systems to Sections L3.0 to 3.3, Water Heater Exchangers. This also clarifies that if any water-to-water heat exchangers return water back to the public water system, that such approval is required from the water supplier.*

**603.5.17 Potable Water Outlets and Valves.** Potable water outlets, freeze-proof yard hydrants, combination stop-and-waste valves, or other fixtures that incorporate a stop and waste feature that drains into the ground shall not be installed underground unless they are installed above the known groundwater table, they are installed at least 10 feet away from any sewer line, or any other source of contamination.

*Commentary—State: This allows stop and waste valves or cocks for water supply protection to be located underground under certain conditions. The previous reference to seasonal use facilities has been eliminated.*

**604.3 Copper or Copper Alloy Tube.** Copper or copper alloy tube for water piping shall have a weight of not less than Type L.

**Exception:** Type M copper or copper alloy tubing shall be permitted to be used for water piping where piping is aboveground in, or on, a building ~~or underground outside of structures.~~

*Commentary—State: The state eliminated the use of Type M Copper or copper alloy tubing to extend underground outside of a structure. Type M is not thick enough for underground and is not recommended for underground locations*

**604.13 Water Heater Connectors.** Flexible metallic (copper and stainless steel), reinforced flexible, braided stainless steel, or polymer braided with EPDM core connectors that connect a water heater to the piping system shall be in accordance with ASME A112.18.6/CSA B125.6. Copper, copper alloy, or stainless steel flexible connectors shall not exceed 24 inches (610 mm). PEX, PEX-AL-PEX, PE-AL-PE, or PE-RT tubing shall not be installed within the first 18 inches (457 mm) of piping connected to a water heater. This does not apply to electric water heaters.

*Commentary—City: PEX piping is not allowed within 18 inches of the connection to the water heater due to the discharge of the heat of the flue is too hot for the PEX piping. This clarifies that PEX piping is allowed within 18 inches of an electric water heater.*

**605.12.2 Solvent Cement Joints.** Solvent cement joints for PVC pipe and fittings shall be clean from dirt and moisture. Pipe shall be cut square and pipe shall be deburred. Where surfaces to be joined are cleaned and free of dirt, moisture, oil, and other foreign material, apply primer purple or un-purple in color in accordance with ASTM F656. Primer shall be applied until the surface of the pipe and fitting is softened. Solvent cements in accordance with ASTM D2564 shall be applied to all joint surfaces. Joints shall be made while both the inside socket surface and outside surface of pipe are wet with solvent cement. Hold joint in place and undisturbed for one minute after assembly.

*Commentary—State: Instead of only a purple primer, other colors are allowable as long as the primer is recognizable.*

**606.5 Control Valve.** A control valve shall be installed immediately ahead of each water-supplied appliance and immediately ahead of each slip joint or appliance supply. Parallel water distribution systems shall provide a control valve either immediately ahead of each fixture being supplied or installed at the manifold, and shall be identified with the fixture being supplied. Where parallel water distribution system manifolds are located in attics, crawl spaces, or other locations not readily accessible, a separate shutoff valve shall be required immediately ahead of each individual fixture or appliance served.

Individual shutoff valves shall be installed on each plumbing fixture and each exterior hose bib.

Exception: In single-family dwellings, individual valves are not required on tub valves, shower valves, and exterior hose bibs.

*Commentary—State: Individual shut-off valves are required on exterior hose bibs for every occupancy other than single-family dwellings.*

**608.2 Excessive Water Pressure.** Where static water pressure in the water supply piping is exceeding 80 psi (552 kPa), an approved-type pressure regulator preceded by an adequate strainer shall be installed and the static pressure reduced to 80 psi (552 kPa) or less. Pressure regulator(s) equal to or exceeding 1 1/2 inches (40 mm) shall not require a strainer. Such regulator(s) shall control the pressure to water outlets in the building unless otherwise approved by the Authority Having Jurisdiction. Each such regulator and strainer shall be accessibly located aboveground or in a vault equipped with a properly sized and sloped boresighted drain to daylight, shall be protected from freezing, and shall have the strainer readily accessible for cleaning without removing the regulator or strainer body or disconnecting the supply piping. Pipe size determinations shall be based on 80 percent of the reduced pressure where using Table 610.4. An approved expansion tank shall be installed in the cold water distribution piping downstream of each such regulator to prevent excessive pressure from developing due to thermal expansion and to maintain the pressure setting of the regulator. Expansion tanks used in potable water systems intended to supply drinking water shall be in accordance with NSF 61. The

expansion tank shall be properly sized and installed in accordance with the manufacturer's installation instructions and listing. Systems designed by registered design professionals shall be permitted to use approved pressure relief valves in lieu of expansion tanks, provided such relief valves have a maximum pressure relief setting of 100 psi (689 kPa) or less.

All expansion tanks must be marked with a permanent marker with the date installed and the set pressure written on the tank by the installer. Tanks installed in the horizontal position shall be adequately supported.

*\*Commentary—City. The plumbing inspector needs to know when the tank was installed and what the pressure was when installed in order to inspect for pressures in the water distribution system.*

**609.1 Installation.** Water piping shall be adequately supported in accordance with Table 313.3. Burred ends shall be reamed to the full bore of the pipe or tube. Changes in direction shall be made by the appropriate use of fittings, except that changes in direction in copper or copper alloy tubing shall be permitted to be made with bends, provided that such bends are made with bending equipment that does not deform or create a loss in the cross-sectional area of the tubing. Changes in direction are allowed with flexible pipe and tubing without fittings in accordance with the manufacturer's instructions. Provisions shall be made for expansion in hot water piping. Piping, equipment, appurtenances, and devices shall be installed in a workmanlike manner in accordance with the provisions and intent of the code. ~~Building supply yard piping shall be not less than 12 inches (305 mm) below the average local frost depth. The cover shall be not less than 12 inches (305 mm) below finish grade.~~

*Commentary—State: This eliminates the requirement for sprinkler yard piping from being located 12 inches below the frost line based on the fact that sprinkler lines are blown out in the fall.*

**609.2 Trenches.** Water pipes shall not be run or laid in the same trench as building sewer or drainage piping constructed of clay or materials that are not approved for use within a building unless both of the following conditions are met:

- (1) The bottom of the water pipe shall be not less than 12 inches (305 mm) above the top of the sewer or drain line.
- (2) The water pipe shall be placed on a solid shelf excavated at one side of the common trench with a clear horizontal distance of not less than 12 inches (305 mm) from the sewer or drain line.

Water pipes crossing sewer or drainage piping constructed of clay or materials that are not approved for use within a building shall be laid not less than 12 inches (305 mm) above the sewer or drain pipe.

Potable water service piping shall not be located in, under, or above cesspools, septic tanks, septic tank drainage fields, or drainage pits. A separation of 25 feet shall be maintained from such systems, except for livestock confinement facilities which may be 3 feet.

*Commentary—State: This clarifies that the proper location of potable water service piping has to be located minimum distances from drainage piping.*

**609.4 Testing.** Upon completion of a section or of the entire hot and cold water supply system, it shall be tested and proved tight under a water pressure not less than the working pressure under which it is to be used. The water used for tests shall be obtained from a potable source of supply. ~~Except for plastic piping, a  $\Delta$  50 psi (345 kPa) air pressure shall be permitted to be substituted for the water test. In either method of test, the piping shall withstand the test without leaking for a period of not less than 15 minutes.~~

*Commentary—State: A fifty-pound air test is allowable for plastic pipe as an alternative to water pressure testing.*

**609.5 Unions.** ~~Not adopted by state. Unions shall be installed in the water supply piping not more than 12 inches (305 mm) of regulating equipment, water heating, conditioning tanks, and similar equipment that requires service by removal or replacement in a manner that will facilitate its ready removal.~~

*Commentary—State: Unions have a tendency for leaking and therefore are not allowed in concealed spaces.*

**609.11.1 Insulation Requirements.** ~~Not adopted by state. Domestic hot water piping shall be insulated.~~

*Commentary—State: Insulating hot water piping will remain as an option instead of a mandate on all systems.*

**609.11.2 Pipe Insulation Wall Thickness.** ~~Not adopted by state. Hot water pipe insulation shall have a minimum wall thickness of not less than the diameter of the pipe for a pipe up to 2 inches (50 mm) in diameter. Insulation wall thickness shall be not less than 2 inches (51 mm) for a pipe of 2 inches (50 mm) or more in diameter.~~

*Commentary—State: Insulating hot water piping will remain as an option instead of a mandate on all systems.*

**610.1 Size.** The size of each water meter and each potable water supply pipe from the meter or other source of supply to the fixture supply branches, risers, fixtures, connections, outlets, or other uses shall be based on the total demand and shall be determined according to the methods and procedures outlined in this section. Water piping systems shall be designed to ensure that the maximum velocities allowed by the code and the applicable standard are not exceeded. The minimum size water service allowed is one (1) inch (25.4 mm) except to travel trailer or mobile

home sites, which shall be not less than three quarter (3/4) inch (19.1 mm).

**Commentary—State:** *Simply a clarification that the minimum size of water service allowed is 1 inch except for travel trailer and mobile home sites.*

**701.2 Drainage Piping.** Materials for drainage piping shall be in accordance with one of the referenced standards in Table 701.2 except that:

- (1) No galvanized wrought-iron or galvanized steel pipe shall be used underground and shall be kept not less than 6 inches (152 mm) aboveground. Plastic pipe and fittings installed underground outside of buildings may be SDR 35 ASTM 3034 or heavier.
- (2) ABS and PVC DWV piping installations shall be installed in accordance with applicable standards referenced in Table 1701.1 and ~~Chapter 14 “Firestop Protection.”~~the building code. Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50, where tested in accordance with ASTM E84 or UL 723.
- (3) No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a pump or ejector. They shall be kept not less than 12 inches (305 mm) belowground.
- (4) Copper or copper alloy tube for drainage and vent piping shall have a weight of not less than that of copper or copper alloy drainage tube type DWV.
- (5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground.
- (6) Cast-iron soil pipe and fittings shall be listed and tested in accordance with standards referenced in Table 1701.1. Such pipe and fittings shall be marked with the country of origin and identification of the original manufacturer in addition to markings required by referenced standards.

**Commentary—State/City:** *The state allows SDR35 ASTM 3034 of heavier plastic pipe and fittings to be installed underground and outside of buildings. Whereas the state took out fire-stop provisions, this inserts back that the building code is the reference for fire-stops by the City.*

**701.4 Continuous Wastes.** Continuous wastes and fixture tailpieces shall be constructed from the materials specified in Section 701.2 for drainage piping, provided, however, that such connections where exposed or accessible shall be permitted to be of seamless drawn brass not less than No. 20 B & S Gauge (0.032 inches) (0.8 mm) tubular PVC or tubular ABS.

**Commentary—State:** *Tubular PVC and ABS as additionally allowed for continuous wastes and fixture tailpieces.*

**703.1 Minimum Size.** The minimum sizes of vertical, horizontal, or both drainage piping shall be determined from the total of fixture units connected thereto, and additionally, in the case of vertical drainage pipes, in accordance with their length.

Underground drains are required to be a minimum of 2 inches inside diameter.

*\*Commentary—City: This will allow the adding or switching of fixtures such as changing a tub to a shower to drain to a proper sized pipe and will eliminate the removal of flooring to accommodate a larger drain pipe where a 1 1/2-inch drain is installed.*

**TABLE 703.2  
MAXIMUM UNIT LOADING AND MAXIMUM LENGTH OF DRAINAGE AND VENT PIPING**

SIZE OF PIPE (inches)	1¼	1½	2	3	4	5	6	8	10	12
<b>Maximum Units</b>										
Drainage Piping <sup>1</sup>										
Vertical	1	2 <sup>2</sup>	16 <sup>3</sup>	48 <sup>4</sup>	256	600	1380	3600	5600	8400
Horizontal	1	1	8 <sup>3</sup>	35 <sup>4</sup>	216 <sup>5</sup>	428 <sup>5</sup>	720 <sup>5</sup>	2640 <sup>5</sup>	4680 <sup>5</sup>	8200 <sup>5</sup>
<b>Maximum Length</b>										
Drainage Piping										
Vertical, (feet)										
Horizontal (unlimited)	45	65	85	212	300	390	510	750	—	—
<b>Vent Piping</b>										
Horizontal and Vertical <sup>6</sup>										
Maximum Units	1	8 <sup>3</sup>	24	84	256	600	1380	3600	—	—
Maximum Lengths, (feet)	45	60	120	212	300	390	510	750		

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm

**Notes:**

- 1 Excluding trap arm.
- 2 Except sinks, urinals, and dishwashers—exceeding 1 fixture unit.
- 3 Except six-unit traps or water closets.
- 4 Only four water closets or six-unit traps allowed on a vertical pipe or stack; and not to exceed three water closets or six-unit traps on a horizontal branch or drain.
- 5 Based on 1/4 inch per foot (20.8 mm/m) slope. For 1/8 of an inch per foot (10.4 mm/m) slope, multiply horizontal fixture units by a factor of 0.8.
- 6 The diameter of an individual vent shall be not less than 1 1/4 inches (32 mm) nor less than one-half the diameter of the drain to which it is connected. Fixture unit load values for drainage and vent piping shall be computed from Table 702.1 and Table 702.2(2). ~~Not to exceed one-third of the total permitted length of a vent shall be permitted to be installed in a horizontal position.~~ Where vents are increased one pipe size for their entire length, the maximum length limitations specified in this table do not apply. This table is in accordance with the requirements of Section 901.3.

*Commentary—State: This eliminates the restriction of not allowing more than 1/3 of the length of a drain to be located in a horizontal position. Venting is not compromised by increasing the 1/3 horizontal distance.*

**705.5.2 Solvent Cement Joints.** Solvent cement joints for PVC pipe and fittings shall be clean from dirt and moisture. Pipe shall be cut square and pipe shall be deburred. Where surfaces to be

joined are cleaned and free of dirt, moisture, oil, and other foreign material, apply primer purple or un-purple in color in accordance with ASTM F656. Primer shall be applied until the surface of the pipe and fitting is softened. Solvent cements in accordance with ASTM D2564 shall be applied to all joint surfaces. Joints shall be made while both the inside socket surface and outside surface of pipe are wet with solvent cement. Hold joint in place and undisturbed for one minute after assembly.

All underground PVC piping must be provided with a purple primer.

*\*Commentary—State/City: This simply requires that the solvent be recognizable as being applied instead of only a purple color. Purple primer is required for underground installations to be able to identify that a primer was used.*

**706.1 Approved Fittings.** Changes in direction of drainage piping shall be made by the appropriate use of approved fittings and shall be of the angles presented by a one-sixteenth bend, one-eighth bend, or one-sixth bend, or other approved fittings of equivalent sweep.

Exception: One-quarter (1/4) bends may be used on individual fixture drains, horizontal to vertical changes in direction of drainage piping, and vertical to horizontal changes in directions for more than one fixture.

*Commentary—State: For cost-effective purposes, this allows a 1/4 bend for individual fixture drains if going from horizontal to vertical, and vertical to horizontal changes in direction.*

**707.4 Location.** Each horizontal drainage pipe shall be provided with a cleanout at its upper terminal, and each run of piping, that is more than 100 feet (30,480 mm) in total developed length, shall be provided with a cleanout for each 100 feet (30,480 mm), or fraction thereof, in length of such piping. An additional cleanout shall be provided in a drainage line for each aggregate horizontal change in direction exceeding 135 degrees (2.36 rad). A cleanout shall be installed above the fixture connection fitting, serving each urinal, regardless of the location of the urinal in the building.

**Exceptions:**

- (1) Cleanouts shall be permitted to be omitted on a horizontal drain line less than 5 feet (1,524 mm) in length unless such line is serving sinks or urinals.
- (2) Cleanouts shall be permitted to be omitted on a horizontal drainage pipe installed on a slope of 72 degrees (1.26 rad) or less from the vertical angle (one-fifth bend).
- (3) Excepting the building drain, its horizontal branches, and urinals, a cleanout shall not be required on a pipe or piping that is above the floor level of the lowest floor of the building.
- (4) An approved type of two-way cleanout fitting, installed inside the building wall near the connection between the building drain and the building sewer or installed outside of a

building at the lower end of a building drain and extended to grade, shall be permitted to be substituted for an upper terminal cleanout.

(5) Where the piping is concealed, a fixture trap or a fixture with integral trap, readily removable without disturbing concealed roughing work, shall be accepted as a cleanout equivalent.

*Commentary—State: This allows an accessible fixture trap or a fixture with an integral trap opening to be accepted as a cleanout.*

**710.1 Backflow Protection.** Whenever required by the administrative authority, Fixtures installed on a floor level that is lower than the next upstream manhole cover of the public or private sewer shall be protected from backflow of sewage by installing an approved type of backwater valve. Fixtures on such floor level that are not below the next upstream manhole cover shall not be required to be protected by a backwater valve. Fixtures on floor levels above such elevation shall not discharge through the backwater valve. Cleanouts for drains that pass through a backwater valve shall be clearly identified with a permanent label stating “backwater valve downstream.”

*Commentary—State/City: The state eliminates the mandatory requirement for backwater valves in all cases where a fixture on a floor level is installed lower than the next upstream manhole cover. The City inserted the provision back in to be able to require sewer backflow devices in those areas that have a higher likelihood of sewer backup such as in a floodplain location.*

**710.3 Sewage Ejector and Pumps.** A sewage ejector or sewage pump receiving the discharge of water closets or urinals:

- (1) Shall have a discharge capacity of not less than 20 gpm (1.26 L/s).
- (2) In single dwelling units, the ejector or pump shall be capable of passing a 1 1/2 inch (38 mm) diameter solid ball, and the discharge piping of each ejector or pump shall have a backwater valve ~~and gate valve,~~ and be not less than 2 inches (50 mm) in diameter.
- (3) In other than single-dwelling units, the ejector or pump shall be capable of passing a 2-inch (51 mm) diameter solid ball, and the discharge piping of each ejector or pump shall have a backwater valve ~~and gate valve,~~ and full port valve and be not less than 3 inches (80 mm) in diameter.

*\*Commentary—State/City: This simply eliminates the use of a gate valve for a sewage pump or ejector in single-family dwellings consistent with the state. For commercial uses, a full port valve will allow full flow through the valve and will eliminate flow restriction.*

**710.14 Subsoil drainage systems.** When subsoil drainage systems are installed, such systems shall be discharged into an approved sump or receiving tank and shall be discharged in a manner satisfactory to the authority having jurisdiction.

The sump pit shall be at least 15 inches (381 mm) in diameter, 18 inches (457 mm) in depth, and provided with a fitted cover. A one and one-half-inch (38 mm) diameter rigid line within 36 inches (914 mm) of the sump pit shall be installed with the opposite end terminating to the outside.

**Commentary—City:** *This clarifies that subsoil drainage shall be discharged per the water reclamation standards and defines the size of the sump pit and the size of piping serving the sump.*

**712.1 Media.** The piping of the plumbing, drainage, and venting systems shall be tested with water or air ~~except that plastic pipe shall not be tested with air.~~ The Authority Having Jurisdiction shall be permitted to require the removal of cleanouts, etc., to ascertain whether the pressure has reached all parts of the system. ~~After the plumbing fixtures have been set and their traps filled with water, they shall be submitted to a final test.~~

Where the administrative authority, due to practical difficulties or hardships, finds that a water or air test cannot be performed, a smoke or peppermint test shall be substituted in lieu thereof. A smoke test shall be made by introducing into the entire system a pungent, thick smoke proceeded by one or more smoke machines. When the smoke appears at stack openings on the roof, they shall be closed and at a pressure equivalent to a 1-inch water column shall be developed and maintained for the period of the inspection. A peppermint test shall be conducted by the introduction of two ounces of oil of peppermint into the roof terminal of every line or stack to be tested. The oil of peppermint shall be followed at once by 10 quarts of hot water whereupon all roof vent terminals shall be sealed. A positive test which reveals leakage shall be the detection of the odor of peppermint at any trap or other point on the system. Oil of peppermint of persons whose person or clothes have come in contact with oil of peppermint shall be excluded from the test area.

**Commentary—State:** *This will allow the testing of piping, drain, and venting to be accomplished by for plastic plumbing systems by air and provides for an alternative form of testing for waste and venting.*

**713.6 Lot.** On every lot or premises hereafter connected to a public sewer, plumbing and drainage systems or parts thereof on such lot or premises shall be connected with such public sewer where the public sewer is within 200 feet of the structure.

**Commentary—State:** *This mandates that a dwelling on a private sewage disposal system is mandated to connect into the public sewer and the provision for 200 feet is inserted for clarification.*

**801.4 Bar and Fountain Sink Traps.** Where the sink in a bar, soda fountain, or counter is so located that the trap serving the sink cannot be vented, the sink drain shall discharge through an air gap or air break (see Section 801.3.3) into an approved receptor that is vented. The developed length from the fixture outlet to the receptor shall not exceed 15 5-feet (4,572-1524 mm).

*Commentary—State: This increased the developed length from 5 feet to 15 feet to accommodate venting in bar areas.*

**801.7 Drip or Drainage Outlets.** Appliances, devices, or apparatus not regularly classified as plumbing fixtures, but which have drip or drainage outlets, shall be permitted to be drained by indirect waste pipes discharging into an open receptor through either an air gap or air break (see Section 801.3.1).

Drip pans shall be installed under storage-type water heaters to prevent tank leakage from causing property damage.

**Exceptions:**

1. The lowest level of buildings provided that the floor is concrete or other material that will not be damaged or deteriorated by water leakage by the tank;
2. Crawl spaces;
3. Spaces having floor drainage that will collect leakage from the tank; and
4. Locations where tank leakage will damage the building or its contents.

Drip pans shall be watertight and constructed of corrosive-resistant materials. Metallic pans shall be 24 gauge minimum. Nonmetallic pans shall be .0625 inch minimum thickness. Pans shall be not less than 1 1/2 inches deep and shall be of sufficient size to hold the heater without interfering with drain valves, burners, controls, and any required access. High-impact plastic pans shall be permitted under gas-fired water heaters where the heater is listed for zero clearance for combustible floors and the application is recommended by the pan manufacturer. Drip pans shall have drain outlets not less than 1 inch size, with indirect drain pipes extending to an approved point of discharge.

*Commentary—State: This provision has been added to clarify that drip pans are required under storage-type water heaters, but then lists those allowable exceptions for a drip pan for water heaters. This goes further to define the materials acceptable for drip pans.*

**807.3 Domestic Dishwashing Machine.** The discharge from a residential kitchen sink and dishwasher may discharge through a single 1 1/2-inch trap. The discharge line from the dishwasher shall be not less than 1/2-inch nominal size and shall either be looped up and securely fastened to the underside of the counter or be connected to a deck-mounted dishwasher air gap fitting. The discharge shall then be connected to a wye fitting between the sink waste outlet and the trap inlet or to the disposal.

*Commentary—State: Clarifies drainage systems for residential dishwashers and eliminates the otherwise mandatory air gap fittings for dishwashers.*

**811.5 Permanent Record.** ~~Not adopted by state. The owner shall make and keep a permanent~~

*Commentary—State: Records requiring an owner to keep records of the location of venting and piping carrying chemical wastes have not been enforced by either the city or the state.*

**903.1 Applicable Standards.** Vent pipe and fittings shall comply with the applicable standards referenced in Table 701.2, except that:

- (1) No galvanized steel or 304 stainless steel pipe shall be installed underground and shall be not less than 6 inches (152 mm) aboveground.
- (2) ABS and PVC DWV piping installations shall be in accordance with the applicable standards referenced in the Building Code, Residential Code, and Table 1701.1, and Chapter 14 “Firestop Protection.” Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50 where tested in accordance with ASTM E84 or UL 723.

*Commentary—City: The state eliminated fire-stop provisions. This inserts back into the plumbing code that the building and/or residential code is the reference for fire-stop provisions.*

**904.2 Length.** ~~Not adopted by the city. Not more than one third of the total permitted length, in~~

*Commentary—State: This again allows a horizontal vent to exceed more than 1/3 the distance.*

**906.7 Frost or Snow Closure.** ~~Each vent extension through a roof shall be at least 3 inches in diameter except kitchen sink vents in single-family dwellings, which shall be at least 2 inches in diameter. The change in diameter shall be made inside the building at least 1 foot below the roof with an approved fitting.~~

~~Where frost or snow closure is likely to occur in locations having minimum design temperature below 0°F (-17.8°C), vent terminals shall be not less than 2 inches (50 mm) in diameter, but in no event smaller than the required vent pipe. The change in diameter shall be made inside the building not less than 1 foot (305 mm) below the roof in an insulated space and terminate not less than 10 inches (254 mm) above the roof, or in accordance with the Authority Having Jurisdiction.~~

**909.1 General.** Traps for island sinks and similar equipment shall be roughed in above the floor and shall be permitted to be vented by extending the vent as high as possible, but not less than the drain board height and then returning it downward and connecting it to the horizontal sink drain immediately downstream from the vertical fixture drain. The return vent shall be connected to the horizontal drain through a wye-branch fitting and shall, in addition, be provided with a foot vent taken off the vertical fixture vent by means of a wye branch immediately below the floor and extending to the nearest partition and then through the roof to the open air, or shall be

permitted to be connected to other vents at a point not less than 6 inches (152 mm) above the flood-level rim of the fixtures served. Drainage fittings shall be used on the vent below the floor level, and a slope of not less than 1/4 inch per foot (20.8 mm/m) back to the drain shall be maintained. The return bend used under the drain board shall be a one piece fitting or an assembly of a 45-degree (0.79 rad), a 90-degree (1.57 rad), and a 45-degree (0.79 rad) elbow in the order named. Pipe sizing shall be as elsewhere required in this code. The island sink drain, upstream of the returned vent, shall serve no other fixtures. An accessible cleanout shall be installed in the vertical portion of the foot vent.

Alternate island sink installations require a minimum of a 3-inch diameter drain undiminished in size which shall rise up through the sink cabinet and capped off as high as possible. The vent shall connect no further than 15 feet from the vertical section of the drain and shall be a minimum of 1 1/2 inches in diameter. A 3- x 3- x 1 1/2-inch sanitary tee is required for connection to the trap.

*Commentary—State: This reverts alternate venting for island sink installation back to the 2003 UPC provisions and maintains the status quo.*

**910.1 Where Permitted.** Combination waste and vent systems shall be permitted where structural conditions preclude the installation of conventional systems as otherwise prescribed by this code.

Exception: In single-family dwellings, the maximum length for a floor drain connected to a uniformly sized building drain vented on both the upstream and downstream side of the connection to the floor drain is 15 feet. The minimum trap seal shall be 4 inches.

*Commentary—State: This allows a 15-foot floor drain in single-family dwellings instead of 5 feet otherwise required by the UPC.*

**1003.1 General Requirements.** Each trap, except for traps within an interceptor or similar device, shall be self-cleaning. Traps for bathtubs, showers, lavatories, sinks, laundry tubs, floor drains, urinals, drinking fountains, dental units, and similar fixtures shall be of standard design, weight, and shall be of ABS, cast-brass, cast-iron, lead, PP, PVC, or other approved material. An exposed and readily accessible drawn-copper alloy tubing trap, not less than ~~20 B&S Gauge~~ ~~17-B & S Gauge~~ (0.045 inch) (1.143 mm), shall be permitted to be used on fixtures discharging domestic sewage.

**Exception:** Drawn-copper alloy tubing traps shall not be used for urinals. Each trap shall have the manufacturer's name stamped legibly in the metal of the trap, and each tubing trap shall have the gauge of the tubing in addition to the manufacturer's name. A trap shall have a smooth and uniform interior waterway.

*Commentary—State: Allows 20 gauge in lieu of 17 gauge for drawn brass tubing traps.*

**1003.2 Slip Joint Fittings.** A maximum of one approved slip joint fitting shall be permitted to be used on the outlet side of a trap, and no tubing trap shall be installed without a listed tubing trap

adapter. Listed plastic trap adapters shall be permitted to be used to connect listed metal tubing traps. Slip joint extensions with 45-degree slip joint offsets are allowed.

*Commentary—State: Allows slip joint offsets with a 45-degree slip joint to accommodate drainage connections.*

**1003.3 Size.** The size (nominal diameter) of a trap for a given fixture shall be sufficient to drain the fixture rapidly, but in no case less than nor more than one pipe size larger than given in Table 702.1. ~~The trap shall be the same size as the trap arm to which it is connected.~~

*Commentary—State: Eliminates the requirement for the trap to be the same size of the trap arm.*

**1016.3 Construction and Size.** Sand interceptors shall be built of brick or concrete, prefabricated coated steel, or other watertight material. The interceptor shall have an interior baffle for full separation of the interceptor into two sections. The outlet pipe shall be the same size as the inlet pipe of the sand interceptor, the minimum being 3 inches (80 mm), and the baffle shall have two openings of the same diameter as the outlet pipe and at the same invert as the outlet pipe. These openings shall be staggered so that there cannot be a straight line flow between the inlet pipe and the outlet pipe. The invert of the inlet pipe shall be no lower than the invert of the outlet pipe.

The sand interceptor shall have a minimum dimension of 2 square feet (0.2 m<sup>2</sup>) for the net free opening of the inlet section and a minimum depth under the invert of the outlet pipe of 2 feet (610 mm).

For each 5 gpm (0.3 L/s) flow or fraction thereof over 20 gpm (1.26 L/s), the area of the sand interceptor inlet section is to be increased by 1 square foot (0.09 m<sup>2</sup>). The outlet section shall at all times have a minimum area of 50 percent of the inlet section.

The outlet section shall be covered by a solid removable cover, set flush with the finished floor, and the inlet section shall have an open grating, set flush with the finished floor and suitable for the traffic in the area in which it is located.

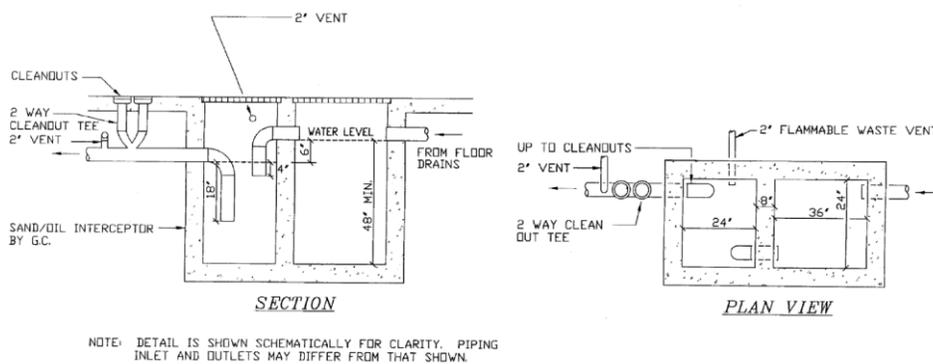
Floor drains in garages serving dwelling units for parking purposes that are connected to a building sanitary sewer shall have a means of collecting sediment and shall be provided with a water trap seal.

*Commentary—State: This allows a water trap seal instead of a double trap compartment in garages serving dwelling units.*

### **1018.0 Combination Sand and Oil Separator**

**\*1018.1** The following illustration provides minimum dimensions for a combination oil and sand interceptor which are required where floor drains are provided in commercial open and closed parking garages, motor vehicle repair garages, or other uses deemed necessary by the Authority

Having Jurisdiction to protect the sanitary sewer system. Piping serving a sand and oil separator shall be a minimum of 3 inches in diameter. The sewer side of the trap is required to be sealed.



**COMBINATION SAND AND OIL INTERCEPTOR**  
NO SCALE

*\*Commentary—City: This inserts the minimum standard dimensions for a combination sand and oil interceptor which has been approved by Public Works and additionally clarifies that combination oil and sand interceptors are required where floor drains are provided in motor vehicle parking and repair garages.*

**1101.4 Material Uses.** Pipe, tube, and fittings conveying rainwater shall be of such materials and design as to perform their intended function to the satisfaction of the Authority Having Jurisdiction. Conductors within a vent or shaft shall be of cast-iron, galvanized steel, wrought iron, copper, copper alloy, lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, stainless steel 304 or 316L [stainless steel 304 pipe and fittings shall not be installed underground and shall be kept not less than 6 inches (152 mm) aboveground], or other approved materials, and changes in direction shall be in accordance with the requirements of Section 706.0. ABS and PVC DWV piping installations shall be installed in accordance with the building code and Chapter 14 “Firestop Protection.” Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 50, where tested in accordance with ASTM E84 or UL 723.

*Commentary—State/City: This inserts the reference to the building code for fire-stop protection. The state eliminated any reference to fire-stops.*

**1101.15 Traps on Storm Drains and Leaders.** Leaders and storm drains are required to be attached to the storm drain or shall be discharged to the outside. ~~where connected to a combined sewer, shall be trapped. Floor and area drains connected to a storm drain shall be trapped.~~

**1101.15.1 Where Not Required.** Not adopted by the city. No trap shall be required for leaders or conductors that are connected to a sewer carrying storm water exclusively.

**1101.15.2 Trap Size.** ~~Not adopted by the city. Traps, where installed for individual conductors, shall be the same size as the horizontal drain to which they are connected.~~

**1101.15.3 Method of Installation of Combined Sewer.** ~~Not adopted by the city. Individual storm water traps shall be installed on the stormwater drain branch serving each stormwater inlet, or a single trap shall be installed in the main storm drain just before its connection with the combined building sewer. Such traps shall be provided with an accessible cleanout on the outlet side of the trap.~~

**1101.16.2 Combining Storm with Sanitary Drainage.** The sanitary and storm drainage system of a building shall be entirely separate, ~~except where a combined sewer is used, in which case the building storm drain shall be connected in the same horizontal plane through a single wye fitting to the combined building sewer not less than 10 feet (3048 mm) downstream from a soil stack.~~

*Commentary—City: These modifications clarifies that any storm drains on a building are required to discharge to the outside or to an approved storm drain sewer.*

**1106.2 Methods of Testing Storm Drainage Systems.** Except for outside leaders and perforated or open-jointed drain tile, the piping of storm drain systems shall be tested upon completion of the rough piping installation by water or air, ~~except that plastic pipe shall not be tested with air,~~ and proved tight. The Authority Having Jurisdiction shall be permitted to require the removal of cleanout plugs to ascertain whether the pressure has reached parts of the system. One of the following test methods shall be used in accordance with Section 1106.2.1 through Section 1106.2.3.

*Commentary—City: This will continue to allow plastic rain leaders to be tested with air.*

**1208.2 Provision for Location of Point of Delivery.** The location of the point of delivery shall be acceptable to the serving gas supplier. [NFPA 54:5.2]

~~The piping located on the exterior extending from the gas meter to the inside of the structure shall be a metallic pipe in compliance with Section 1209.5.2. The entrance into the structure shall be provided with the appropriate transition flange where an alternate gas piping material is utilized on the inside of the structure.~~

*Commentary—City: The state eliminated any reference to fuel gas piping. This mandates hard piping from the meter to the entrance to the structure and eliminates CSST at this location which is more susceptible to breakage.*

**\*1210.2.3.1 Gas Piping Located on a Roof.** All outside gas piping located on a roof must be black iron pipe.

*Commentary—City: This intends to eliminate the use of CSST gas piping and to mandate a more rigid black iron pipe where such gas piping is located on a roof.*

**Table C304.2  
Building Drains and Building Sewers<sup>1</sup>**

Diameter of Pipe, in. (mm)	Maximum Number of Drainage Fixture Units for Sanitary Building Drains and Runouts From Stacks			
	Slope, in./ft (mm/m)			
	1/16 (5.2)	1/8 (10.4)	1/4 (20.8)	1/2 (41.6)
2 (50)			21	26
2 1/2 (65)			24	31
3 (80)		<del>29</del>	42 <sup>2</sup>	50 <sup>2</sup>
4 (100)		180	216	250
5 (125)		390	480	575
6 (150)		700	840	1,000
8 (200)	1400	1600	1,920	2,300
10 (250)	2500	2900	3,500	4,200
12 (300)	2900	4600	5,600	6,700
15 (380)	7000	8300	10,000	12,000

For SI units: 1 inch = 25 mm, 1 inch per foot = 83.3 mm/m

**Notes:**

- 1 On-site sewers that serve more than one building shall be permitted to be sized according to the current standards and specifications of the administrative authority for public sewers.
- 2 A maximum of two water closets or two bathroom groups, except in single-family dwellings, where a maximum of three water closets or three bathroom groups shall be permitted to be installed.

**TABLE C 401.1 SIZE AND LENGTH OF VENTS of APPENDIX C. Not adopted by state.**

***Commentary: This follows the state which eliminated the size and length of vents referenced in Table C401.1 of Appendix C-Alternate Plumbing Systems***