

**Installation Standard
For
NON-METALLIC BUILDING SEWERS**

IAPMO IS 1-2003

1.0 SCOPE

1.1 Installation and material of nonmetallic building sewer piping shall comply with this standard and the current edition of the Uniform Plumbing Code [UPC]TM published by the International Association of Plumbing and Mechanical Officials.

Note: The following sections of the 2003 Uniform Plumbing Code apply to non-metallic building sewer piping. The standard may include section numbers or may omit section numbers which pertain to non-metallic sewers.

- 301.1 Minimum Standards
- 310.0 Workmanship
- 311.0 Prohibited Fittings and Practices
- 313.0 Protection of Piping Materials and Structures
- 315.0 Trenching, Excavation and Backfill
- 723.0 Building Sewer Test
- 705.1 Types of Joints
- 705.2 Use of Joints
- 316.2.3 Plastic Pipe to Other Materials
- 316.4 Prohibited Joints and Connections
- 317.0 Increases and Reducers
- Chapter 7 Sanitary Drainage

2.0 GENERAL REQUIREMENTS

2.1 After inspection of the sewer pipe, carefully backfill the trench as prescribed by Sections 314.0 and 315.0 of the Uniform Plumbing Code.

2.2 The same water test procedure shall apply to all non-metallic house sewer materials as required in Section 723.0 of the Uniform Plumbing Code.

Before laying non-metallic sewer pipe, prepare the bottom trench so that the piping shall lay on a firm bed throughout its entire length as required by Section 718.0 of the Uniform Plumbing Code.

3.0 PRODUCT REQUIREMENTS

3.1 ABS OR PVC-DWV PIPE

3.1.1 Minimum Standards

ABS or PVC Schedule 40 DWV pipe for use in domestic sewage, excluding special waste, shall be installed in accordance with IAPMO Standards IS 5 and IS 9 (latest

edition), whichever is applicable. ABS or PVC Schedule 40 DWV pipe, IAPMO listed, may be used in sizes 2 inch (51 mm) and larger. [UPC 301.1]

3.1.2 Markings

3.1.2.1 ABS Pipe. ABS pipe markings shall be in accordance with D 2661 or F 628. [UPC 716.0]

3.1.2.2 ABS Fittings. ABS fittings markings shall be in accordance with D 2661. [UPC 716.0]

3.1.2.3 PVC Pipe. PVC pipe markings shall be in accordance with D 2665. [UPC 716.0]

3.1.2.4 PVC Fittings. PVC fittings markings shall be in accordance with F 2135. [UPC 716.0]

3.1.3 Protection of Building Sewers

ABS or PVC Schedule 40 pipe shall be installed a minimum of 1 foot (305 mm) below the surface of the finished grade. Underground installation of thermoplastic sewer pipe shall be in accordance with ASTM D 2321. [UPC 718.0]

3.1.4 Cleanouts

Cleanouts, extended to within 1 foot (305 mm) of grade, shall be of materials listed for that use. [UPC 719.0]

3.2 PVC SEWER PIPE

3.2.1 Minimum Standards

3.2.1.1 Pipe

PVC, PSM, SDR 35, ASTM D 3034 and PVC, PS-46, ASTM F 789 Non-Pressure Pipe may be used in sizes four (4) inches (102 mm) and larger. [UPC 301.1]

3.2.1.2 Fittings

All fittings shall be PVC or other listed non-metallic materials having equivalent durability and equal or greater strengths. [UPC 301.1]

3.2.2 Types of Joints

PVC sewer pipe shall be joined by using compression joints or by other methods recognized in the UPC. Pipe and fitting ends shall be lubricated with an approved soap jelly or soap solution to permit easy assembly. [UPC 705.1]

3.2.2.1 Use of Joints

PVC sewer pipe shall be installed using the same type of jointing throughout, except when connecting to existing piping, piping

of other materials, in line repairs and manholes. Transition connections to other materials shall be made by adapter fittings or a one-piece molded rubber coupling with appropriate bushings for the respective material. [UPC 705.1]

3.2.3 Markings

3.2.3.1 PSM PVC pipe markings shall be in accordance with D 3034. [UPC 716.0]

3.2.3.2 PSM PVC fitting markings shall be in accordance with D 3034. [UPC 716.0]

3.2.3.3 PS 46 PVC pipe markings shall be in accordance with F 789. [UPC 716.0]

3.2.3.4 PS 46 PVC fitting markings shall be in accordance with F 789. [UPC 716.0]

3.2.4 PVC sewer pipe shall not be installed less than 1 foot (305 mm) below the surface of the finished grade and closer than twenty-four (24) inches (610 mm) from a building. Underground installation of thermoplastic sewer pipe shall be in accordance with ASTM D 2321. [UPC 718.0]

3.2.5 Cleanouts

Cleanouts, extended to within 1 foot (305 mm) of grade, shall be of materials listed for such use. [UPC 719.0]

3.3 HIGH DENSITY POLYETHYLENE PIPE

3.3.1 Minimum Standards

3.3.1.1 Polyethylene pipe shall be manufactured in accordance with ASTM F 714 and installed in accordance with IAPMO IS 26. [UPC 301.1]

3.3.2 Types of Joints

3.3.2.1 HDPE joints shall be made using the following method:

a) Heat Fusion made in accordance with ASTM D 2657 or D 3261. [UPC 705.1]

3.3.3 Markings

3.3.3.1 Markings shall be in accordance with F 714. [UPC 716.0]

3.4 POLY VINYL CHLORIDE (PVC) CORRUGATED SEWER PIPE WITH A SMOOTH INTERIOR AND FITTINGS

3.4.1 Minimum Standards

3.4.1.1 Pipe. Corrugated PVC sewer pipe may be used in sizes four (4) (102 mm), six (6) (152 mm), eight (8) (203 mm), and ten (10) (254 mm) diameters and shall conform to ASTM F 949. [UPC 301.1]

The profile wall pipe corrugated PVC sewer pipe as intended for underground use in non pressure applications for sanitary sewers, storm sewer, and perforated and unperforated pipes for subdrainage. [UPC 301.1]

3.4.1.2 Fittings shall be PVC or other fittings having equivalent durability or equal or greater strengths in accordance with ASTM F 949. [UPC 301.1]

3.4.2 Types and Use of Joints. Corrugated PVC sewer pipe shall be joined by Molded or Elastomeric Compression Joints or by other approved methods. Elastomeric seals (gaskets) shall meet the requirements of ASTM F 477. The lubricant used for assembly shall be as recommended by the seller and shall have no detrimental affect on the gasket or on the pipe and fittings.

The PVC cement shall comply with ASTM D 2564 and shall be used in conjunction with a primer in compliance with ASTM F 656. The solvent cement shall be used only for bushings in accordance with ASTM D 2855. [UPC 316.1, 705.1, 705.3]

3.4.3 Markings

3.4.3.1 Corrugated PVC sewer pipe markings shall be in accordance with F 949. [UPC 716.0]

3.4.3.2 Corrugated PVC fittings markings shall be in accordance with F 949. [UPC 716.0]

3.4.4 Protection of Building Sewer. Corrugated PVC sewer pipe shall not be installed less than 1 foot (305 mm) below the surface of the finished grade and closer than twenty-four (24) inches (610 mm) from a building. Underground installation of thermoplastic sewer pipe shall be in accordance with ASTM D 2321. [UPC 718.3]

3.4.5 Cleanouts. Cleanouts, extended to within 1 foot (305 mm) of grade, shall be of materials listed for such use. [UPC 719.0]

3.5 ASBESTOS CEMENT SEWER PIPE

3.5.1 Minimum Standards

Asbestos cement sewer pipe shall be Type II only and may be used only in sizes four (4) inches (102 mm) and larger. Its use is limited to domestic sewage. [UPC 301.1]

3.5.2 All fittings used with asbestos cement sewer pipe shall be asbestos cement or other approved non-metallic materials having equivalent durability and providing fittings with equal or greater strengths. [UPC 705.0]

3.5.3 Asbestos cement sewer pipe and male end fittings shall be joined by means of a sleeve coupling and two rubber sealing rings suitable for the particular size of the pipe and fittings for which they will be used. The rubber sealing rings shall be positioned in interior grooves in the coupling.

The assembled joint shall provide the necessary compression of the rubber sealing rings to make a watertight joint. The crush

- strength across the assembled joint shall be equivalent to the crush strength of the pipe with which it will be used. [UPC 705.1]
- 3.5.3.1** The use of unmachined field-cut asbestos cement sewer pipe is permitted for necessary length adjustments and at points of connection to other piping materials. These adaptations shall be made with either a one-piece molded rubber coupling with appropriate bushings or listed adapter fittings. [UPC 705.1]
- 3.5.3.2** Approved female fittings shall be provided with interior grooves in the bell ends in which rubber sealing rings, suitable for the particular size of pipe with which the fittings will be used, are placed. The compressed rubber sealing ring in the joined female (bell) fitting end shall provide a watertight joint. [UPC 705.1]
- 3.5.3.3** Pipe and fitting ends shall be lubricated with an approved jelly or soap solution to permit easy assembly. [UPC 705.1]
- 3.5.3.4** A listed one-piece molded rubber coupling with appropriate bushings may be used as an alternate means of connecting asbestos cement pipe and male end fittings. [UPC 705.1]
- 3.5.3.5** Transition from asbestos cement sewer pipe to another material shall be made by listed adapter fittings, or a one-piece molded coupling with appropriate bushings for the respective material. [UPC 705.1]
- 3.5.4 Markings**
- 3.5.4.1** Asbestos cement sewer pipe markings shall be in accordance with C 428. [UPC 716.0]
- 3.5.4.2** Each coupling sleeve of fitting markings shall be in accordance with C 428. [UPC 716.0]
- 3.5.5** No asbestos cement sewer pipe shall be installed less than 1 foot (305 mm) below the surface of the ground or closer than two (2) feet (610 mm) to a building. [UPC 718.3]
- 3.5.6** Cleanouts shall be asbestos cement or other approved materials of plug or cap type installed with rubber ring compression joints. Cleanouts, extended to within 1 foot (305 mm) of the surface, shall be of materials approved for such use. [UPC 719.0]
- 3.6 CONCRETE SEWER PIPE**
- 3.6.1 Minimum Standards**
- 3.6.1.1 Pipe and Fittings**
Concrete sewer pipe may be used in sizes four (4) inches (102 mm) and larger. Concrete sewer pipe shall conform to ASTM C 14, Class 2. Transition to other types or sizes of pipe may be made with listed concrete pipe adapter fittings or listed one-piece molded rubber coupling with appropriate bushings or increasers. [UPC 301.1]
- 3.6.2 Types of Joints**
Concrete sewer pipe and fittings shall be joined by means of flexible rubber sealing rings, compressed to provide water-tight joints conforming to ASTM C 443, or by listed one-piece molded rubber couplings, or hot-poured joints of listed hot-pour compounds. Portland cement joints are prohibited except for repairs or connections to existing lines constructed with such joints. concrete sewer pipe shall be joined by gaskets furnished by the pipe manufacturer and installed according to the manufacturer's instructions. Approved lubricant shall be used when required for the type of joint furnished. [UPC 705.1]
- 3.6.3 Use of Joints**
Except for points of connection to existing piping at either end of the sewer, concrete sewer pipe shall be laid using the same type of jointing throughout. [UPC 705.2]
- 3.6.4 Markings**
- 3.6.4.1** Concrete sewer pipe and fittings markings shall be in accordance with C 14. [UPC 716.0]
- 3.6.5 Grade, Support and Protection of Building Sewers**
Concrete sewer pipe shall be installed not less than 1 foot (305 mm) below the ground and not closer than two (2) feet (610 mm) to a building. [UPC 718.0]
- 3.6.6 Cleanouts**
Cleanouts shall conform to type of jointing used and cleanouts extended to within 1 foot (305 mm) of grade, shall be of materials listed for that use. [UPC 719.0]
- 3.7 VITRIFIED CLAY PIPE**
- 3.7.1 Minimum Standards**
- 3.7.1.1 Materials.** Materials shall comply with the appropriate standard in Table 14-1 of the UPC. Vitrified clay sewer pipe, extra strength only, may be used in sizes three (3) inches (76 mm) and larger. [UPC 301.1]
- 3.7.2 Types of Joints**
Vitrified clay sewer pipe and fittings shall be joined by means of preformed flexible compression joints or listed one-piece molded rubber couplings. [UPC 705.1]
- 3.7.2.1** Except at point of connection to existing piping at either end of the sewer, vitrified clay sewer piping shall be laid using the same type of jointing throughout. [UPC 705.1]

- 3.7.2.2** When installing clay pipe with flexible compression joints, the mating surfaces shall be wiped clean of dirt and foreign matter. An approved lubricant shall be applied to the joint surfaces. Spigot shall then be seated full depth into the bell. [UPC 705.1]
- 3.7.2.3** Listed one-piece molded rubber couplings shall be permitted for use on vitrified clay pipe and fittings, sizes three (3) inches (76 mm) through 1 foot (305 mm). [UPC 705.1]
- 3.7.2.4** Transition to other types of materials or sizes may be made with the use of listed one-piece molded, rubber couplings with appropriate bushings or increasers. [UPC 705.1]
- 3.7.3 Markings**
- 3.7.3.1** Vitrified clay sewer pipe and fittings markings shall be in accordance with C 700. [UPC 716.0]
- 3.7.4** No vitrified clay sewer pipe shall be installed less than 1 foot (305 mm) below the surface of the ground. [UPC 718.3]
- 3.7.5 Cleanouts**
- Cleanouts shall conform to the type of jointing used and cleanouts extended to within 1 foot (305 mm) of grade shall be of materials approved for their use. [UPC 719.0]

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