

City of Harrisonburg, Virginia
Public Utilities Department

Public Utilities Product Manual

(Latest Revision January, 2020)

Introduction

The City of Harrisonburg's "Public Utilities Product Manual" is intended for the benefit of Developers, Engineers and Contractors to identify products approved by the City for use within the water and sanitary sewer distribution and collection systems. The manual identifies specifications for products and materials approved for use within the City. Products approved by the Public Utilities Department "Product Review Committee" shall be listed in the product manual. The City of Harrisonburg has established the Committee to review products proposed for use within the City's water and sewer systems. The manual also outlines the procedures for submitting new products for consideration for use within the City's systems.

The Product Review Committee is committed to meeting to review specific products. The products under review shall be prioritized as deemed necessary by the committee to meet the City's needs. The Committee intends to review products based on price, availability, vendor history, stock space, shelf life, reliability, durability, ease of installation, compatibility, simplicity, initial cost, life-cycle cost, conformance with standards, vendor service and technical assistance and references.

The City reserves the right to accept or reject any product and to change material specifications as deemed appropriate and in the best interest of the City. Products reviewed by the committee will be determined to be either, accepted, rejected or accepted for probationary use. The City reserves the right to change the status of any product at any time to protect the City's interest.

A product given an approved status is accepted for installation into the City's system. A product given a probationary status may only be installed by City forces. A product given a rejected status may not be installed in the City's system.

Products having a probationary status may be resubmitted to the Committee for consideration for accepted status pending proper documentation of resolutions of those deficiencies which caused the probationary status. Such resubmittals may be considered partial reviews by the Committee and may waive formalities. Products given a rejected status by the Committee may be resubmitted as a new product with documentation specifically addressing those deficiencies which caused the rejected status.

Product Submittal Forms shall be attached with each submittal to the Product Review Committee. Copies of the form may be obtained through the City's Warehouse Manager who can be reached at (540) 437-4400.

The manual includes a copy of the Product Review Process, which outlines the proper steps for submittal and review of new products. The product manual also contains the specifications which approved products must meet, and also a list of those products which have been approved for use within the City's water and sanitary sewer distribution and collection systems.

The product manual will be updated as products are added or removed from approved status. The Public Utilities Department will attempt to notify those who hold a copy of the manual of all updates, however, it is the responsibility of the persons holding a copy of the manual to ensure the accuracy of their copy.

Any questions concerning the submittal or review process shall be addressed to the Public Utilities engineering department at (540) 434-9959.

Approved Product Specifications

All products approved for use within the City's water and sanitary sewer systems shall meet the following technical criteria as well as any additional requirements determined applicable by the City's Department of Public Utilities.

1.0 Water Distribution

(1.1) Pipe

(1.1.1) Ductile Iron Pipe Class 52 (Class 51 and or pressure class pipe permitted for sizes greater than 12" pending approval by the Director) Pipe shall be centrifugally cast conforming to ANSI/AWWA, C 151/A21.51. Pipe interior shall be cement-lined with bituminous seal coating conforming to ANSI/AWWA, C 104/A21.4. Pipe fittings shall be mechanical joint type conforming to ANSI/AWWA, C 110/A21.10. Compact fittings shall be ductile iron mechanical joint type conforming to ANSI/AWWA, C 153/A21.53. Joints used for ductile iron pipe and fittings shall be rubber gasketed conforming to ANSI/AWWA, C 111/A21.11. Gaskets shall be plain rubber, of heavy section and high durometer, single molded. The lubricant shall be non-toxic, tasteless, odorless grease that will not support bacteria and shall meet or exceed AWWA standards and/or those of the National Sanitation Foundation. The exterior pipe and fitting coating shall be a bituminous coating conforming to ANSI/AWWA, C 151/A21.51.

Mechanical joint, flexible restrained joint, rigid restrained joint, 15 degree deflection joint pipe and/or compact fittings may be approved for specific application as required by the Director.

(1.1.2) Pipe Restraints

(1.1.2.1) Mechanical pipe restraints shall be constructed of grade 65-45-12 ductile iron meeting ASTM A536 and shall come equipped with torque limiting twist off nuts. The follower gland and gasket shall meet the applicable requirements of ANSI/AWWA, C 110/A21.10 and ANSI/AWWA, C 111/A21.11. Glands shall be fusion bonded epoxy coated or approved equal.

(1.1.2.2) Non-mechanical pipe restraints shall require case-by-case review.

(1.1.3) Polyethylene Encasement – Polyethylene encasement shall be V-BIO polyethylene liner per AWWA C105. The liner shall be a combined thickness of not less than 8 mil.

(1.2) Valves

(1.2.1) Valves shall be counterclockwise-open with a 2” operating nut, non-rising stem and epoxy interior. Valve trim hardware (such as nuts and bolts, excluding T-head bolts) on buried water valves shall be stainless steel.

(1.2.2) Gate Valves – Resilient-seated gate valves shall conform to AWWA C 509. Metal-seated gate valves shall conform to AWWA C 500 and be used only where approved by the Director. Gate valves 16” and larger shall require submittal to the Director for approval.

(1.2.3) Tapping Valves - Resilient-seated tapping valves shall conform to AWWA C 509. Metal-seated tapping valves shall conform to AWWA C 500 and be used only where approved by the Director. Tapping valves 16” and larger shall require submittal to the Director for approval.

(1.2.4) Butterfly Valves – shall conform to AWWA C 504. Butterfly valves shall require submittal to the Director for approval.

(1.2.5) Check Valves – shall conform to AWWA C 508.

(1.2.6) Air/Vacuum Valves - Air/vacuum valves and combination valves shall conform to AWWA C 512.

(1.2.7) Epoxy Coatings – shall conform to AWWA C 550

(1.2.8) Power Actuators – shall conform to AWWA C 540

(1.3) Hydrants

(1.3.1) Fire hydrants shall meet AWWA C-502 with dry barrel and breakaway top. Hydrants shall be red as provided by each approved manufacturer. Hardware (such as nuts and bolts) below ground shall be stainless steel.

(1.4) Tapping Sleeves – shall be ductile iron with outlet flange dimensions and drilling that comply with ANSI-B16.1, Class 125, and with MSS SP-60 and certified to ANSI/NSF 61.

(1.5) Valve Boxes – shall be cast iron conforming to ASTM A-48 – sliding type ONLY.

(1.6) Pipe Couplings

(1.6.1) Straight couplings shall fit the outside pipe diameter as applicable. Contractors are advised of the City’s inventory of cast iron pipe.

- (1.6.2) Sleeve shall be ductile iron meeting ASTM A 536. Ends shall have smooth inside taper for uniform gasket seating.
- (1.6.3) Gasket shall be grade 30, standard.
- (1.6.4) Follower flanges shall be ductile iron meeting ASTM A 536.
- (1.6.5) Nuts and bolts shall, at a minimum, be high strength low alloy steel with heavy, semi-finished hexagon nuts meeting ANSI/AWWA, C 111/A-21.11.
- (1.6.6) Finish to be shopcoated enamel.
- (1.7) Water Services 2" and smaller

This section addresses materials and products acceptable for use in public rights-of-way and easements only. Construction on private property, beyond these limits, is governed by the Virginia Uniform Statewide Building Code.

- (1.7.1) Allowable pipe and appurtenance sizes – 3/4", 1" and 2"
- (1.7.2) Service lines shall be type "K" copper tubing conforming to ASTM B 88.
- (1.7.3) Pipe nipples shall be threaded brass meeting ASTM B 687.
- (1.7.4) Underground service line valves and fittings shall conform to ANSI/AWWA C 800 and ASTM B 62 or ASTM B 584 and shall be manufactured from UNS Copper Alloy C83600. Products shall be certified ANSI/NSF Standard 61 approved.
- Valves and fittings shall be 85-5-5-5 brass.
 - Valves shall be ball type.
 - Field joints to be flared or threaded.
 - Double meter branch fitting shall be 1"x3/4"x3/4" with either 6 1/2" or 7 1/2" width.
 - Angle check valve to be double check type.
- (1.7.5) Setters
- (1.7.5.1) 3/4" and 1" yokes – shall be iron
- (1.7.5.2) 2" vertical setters shall:
- be constructed of 85-5-5-5 brass (AWWA C 800) and copper tubing (ASTM B 88)

- be built and pressure tested by the manufacturer prior to shipment
- provide 16" vertical rise of 2" line with approved mechanism to prevent overturning
- accommodate 17" meter laying length with ability to adjust setter length for shorter meters
- include an integral 1" bypass line with a lockable ball valve
- have 2" female iron pipe thread inlet and outlet connections
- have an inlet valve which is 2" flanged angle ball valve, lockable
- have a 2" flanged angle check valve adjacent to the meter outlet
- have inlet and check valves designed to support the meter during bolting
- have a 2" outlet ball valve with handle located in line between the check valve and the setter outlet
- have a plugged test port located between the meter and the outlet ball valve
- be used for the installation of 1-1/2" and 2" meters

(1.7.5.3) 2" horizontal setters may be permitted provided that they include similar components and meet the intended function accommodated by the 2" vertical setters

(1.8) Water Services Larger than 2"

This section addresses materials and products acceptable for use in public rights-of-way and easements only. Construction on private property, beyond these limits, is governed by the Virginia Uniform Statewide Building Code.

(1.8.1) Water pipe and fittings shall be ductile iron conforming to standards established above for water mains and appurtenances.

(1.9) Water Meters

(1.9.1) Positive Displacement meters – shall conform to AWWA C 700.

(1.9.2) Turbine meters – shall conform to AWWA C 701.

(1.9.3) Compound meters - shall conform to AWWA C 702.

(1.9.4) Fire Service meters - shall conform to AWWA C 703.

(1.9.5) Registration systems - shall conform to AWWA C 706 or C 707.

(1.9.6) Single Jet meters - shall conform to AWWA C 712.

- (1.9.7) Water meters for use in Fire Services:
- A. Shall meet the requirements of AWWA C703
 - B. Shall be UL Listed
 - C. Shall meet NFPA 13 and/or 13R
 - D. Shall be approved by the Fire Marshal
 - E. Shall be either:
 - Turbine
 - Single Jet
 - Multi-Jet
 - F. Positive Displacement Meters shall NOT be used for fire service applications.

(1.10) Meter boxes and vaults shall be designed:

- for HS 20 traffic load rating. Light traffic designs may be considered where the specific application insures the absence of vehicular loading.
- to withstand dead loads such as earth pressure on the sides.
- to withstand hydraulic pressures on the interior and/or exterior
- to prevent freezing of the contents
- of corrosion-resistant materials and/or protected by factory applied corrosion-control coatings.
- to accommodate the use of confined space equipment.
- to provide adequate access for maintenance and normal operations as defined by the Director.
- with an open bottom to prevent flotation and allow drainage.
- to accommodate the installation of meter touch-read pads.
- to indicate “Water” on the cover.
- to generally conform to typical details provided in Chapter 7 of the Design and Construction Standards Manual.

2.0 Sanitary Sewer

(2.1) Gravity Sanitary Sewers (12” and less)

(2.1.1) Ductile Iron Pipe Class 51 – Pipe and fittings shall be centrifugally cast conforming to ANSI/AWWA, C-151/A21.51 and ANSI/AWWA, C-110/A21.10, respectively. Pipe interior shall be cement-lined with bituminous seal coating conforming to ANSI/AWWA, C104/A21.4. Joints used for ductile iron pipe shall be rubber gasket push-on type (slip joint) conforming to ANSI/AWWA, C110/A21.11 or mechanical joint conforming to ANSI/AWWA C-111/A21.11 (mechanical and restrained joint). Gaskets shall be plain rubber, of heavy section and high durometer, single molded. The lubricant shall be non-toxic, tasteless, odorless grease that will not support

bacteria and shall meet or exceed AWWA standards and/or those of the National Sanitation Foundation. The exterior coating shall be a bituminous coating conforming to ANSI/AWWA, C-151/A21.5.

Restrained joint ductile iron pipe shall utilize a low alloy, high strength steel ring, factory-welded onto plain end of pipe to provide positive restraint against joint separation when retaining ring and lock ring are in place.

(2.1.2) Polyvinyl Chloride (PVC) – SDR 35

PVC plastic sewer pipe and fittings shall meet the requirement of ASTM D3034 and Uni-Bell Uni-B4. The standard dimension ratio (SDR) of all pipe and fittings shall not exceed SDR 35 unless otherwise specified. All joints shall be of the bell and spigot type and conform to ASTM D3212 and/or Uni-Bell Uni-B-1. Gaskets shall be in accordance with ASTM F477. All bells shall be formed integrally with the pipe and shall contain a factory installed elastomeric gasket.

(2.1.3) Polyvinyl Chloride (PVC) SDR 26

PVC plastic sewer pipe and fittings shall meet the requirement of ASTM D3034 and Uni-Bell Uni-B4. The standard dimension ratio (SDR) of all pipe and fittings shall not exceed SDR 26 unless otherwise specified. All joints shall be of the bell and spigot type and conform to ASTM D3212 and/or Uni-Bell Uni-B-1. Gaskets shall be in accordance with ASTM F477. All bells shall be formed integrally with the pipe and shall contain a factory installed elastomeric gasket.

(2.1.4) HDPE (High Density Polyethylene)

Polyethylene plastic pipe shall be high-density polyethylene pipe and meet the applicable requirements of ASTM F714 or AWWA C906. Pipe and fitting materials shall conform to ASTM D3350. Dimension ratio shall be approved on a case by case basis for each project. Pipe joints shall be heat fused in accordance with ASTM D2657.

(2.2) Gravity Sanitary Sewers (larger than 12")

(2.2.1) Ductile Iron pipe shall comply with specifications for 12" and less sewer pipe above.

(2.2.2) Reinforced Concrete Pipe (RCP)

Reinforced concrete pipe (RCP) shall meet requirements of ASTM C76. Pipe end shall have O-ring gasket groove provided during manufacturing process. Rubber gasket and joints shall meet requirements of ASTM C443. Gaskets

shall be O-ring type. Pipe shall have an interior protective coating of an approved coal tar solution. The strength class design will be reviewed on a case-by-case basis.

(2.2.3) PVC – Large Diameter

Case-by-case review.

(2.2.4) HDPE (High Density Polyethylene)

Polyethylene plastic pipe shall comply with specifications for 12” and less sewer pipe above.

(2.3) Force Main Pressure Pipe – Ductile iron force main pressure pipes shall meet water main specifications. PVC and HDPE pressure pipe may be considered on a case-by-case basis.

(2.4) Manholes and related accessories

(2.4.1) Units shall be pre-cast concrete of 4,000 PSI minimum strength with manhole conforming to ASTM specifications C 478. Sections shall have gaskets meeting ASTM C 443. All reinforcing shall meet ASTM C 478.

(2.4.2) Protective coating for concrete manhole section exterior shall be two coats of an approved blend of asphalt, gilsonite and petroleum spirits. Product shall not contain any materials listed by OSHA, NTP or IARC as carcinogens.

(2.4.3) Manhole steps shall be grade 60 steel reinforcing bar (1/2” diameter minimum) encapsulated with copolymer polypropylene. Steps shall meet or exceed ASTM C 478. Steel bar shall conform to ASTM C 615. Copolymer polypropylene shall conform to ASTM D 4104. Horizontal pull out force shall exceed 1,500 lbf.

(2.4.4) Manhole frame and cover castings shall be of Gray Cast Iron meeting requirements of ASTM A-48, Class 30, and shall meet VDOT 16,000 wheel load requirements. Castings shall be free from holes and shrinkage, which lessen the appearance or design. Castings shall be manufactured with a tolerance of no greater than 1/16 of one inch. Bearing surfaces of frames and covers shall be machined to ensure proper fit and prevent rattling. Manhole frames shall have a 24” diameter clear opening. Each cover shall have cast or embossed on it in letters not less than 1 inch high “SANITARY SEWER”.

(2.4.4.1) Manhole inflow protector covers to prevent significant infiltration and inflow from entering the sanitary sewer shall be manufactured from corrosion proof material suitable for atmospheres containing hydrogen

sulfide and diluted sulfuric acid as well as any other gasses associated with wastewater collection systems. The inflow protector shall be manufactured to fit the manhole frame rim upon which the manhole cover rests. The inflow protector shall be equipped with a seat gasket, lift strap and a relief valve. The relief valve shall be designed to relieve sewer gases at a pressure of 0.5 to 1.5 pounds and shall have a leak down rate not exceeding 10 gallons / 24 hours to prevent ponding of water over the manhole cover.

(2.4.5) Flexible pipe connectors shall be designed to meet or exceed requirements of ASTM C 923. Pipe to manhole connection shall be sealed with a flexible boot, gasket, sleeve, or as detailed on drawings. The flexible boot shall be a 3/8 inch thick neoprene compound meeting ASTM C443 specifications. The boot shall be secured to the port with an internal aluminum expanding band and to the pipe with a nonmagnetic, corrosion resistant steel external band. When a gasket is used, the gasket shall be a rubber pressed wedge gasket cast into the manhole with a maximum deflection of 15 degrees. When a sleeve is used, the sleeve shall be a flexible rubber sleeve cast into the manhole complete with stainless steel strap.

(2.5) Sanitary sewer lateral pipe and fittings

This section addresses materials and products acceptable for use in public rights-of-way and easements only. Construction on private property, beyond these limits, is governed by the Virginia Uniform Statewide Building Code.

(2.5.1) 4" and 6" lateral materials:

- PVC SDR 26 meeting the standards for mains as outlined above
- Ductile Iron meeting the standards for mains as outlined above
- Cast Iron Soil Pipe in conformance with CISPI 301

(2.5.2) Materials for laterals larger than 6"

- Laterals larger than 6" shall conform to material specifications for sanitary sewer mains.

(2.5.3) Cleanout Plug - 4-inch with cast iron countersunk brass plug. Plastic plugs are *NOT* permitted.

(2.5.4) Frame and lid to protect cleanout plugs in traffic areas – shall meet the casting and load requirements specified under manhole frame and covers. Dimensions of the frame and cover shall conform to the "Heavy Duty Sanitary Lateral Clean-out" detail in Chapter 7 of the Design and Construction Standards Manual.