



# Sewer Collection System

Approved Materials

# Metro Water Services

## Approved Materials

The Metropolitan Government of Nashville and Davidson County, through its Department of Water Services, presents this manual listing the approved manufacturers and distributors of various materials that may be used for the construction of Sewer Collection System lines and appurtenances.

Standard details and specification information is also available at <http://www.nashville.gov/Water-Services/Developers/Water-and-Sewer.aspx> as a guide to architects and engineers in the preparation of detailed plans and specifications.

Private contractors are encouraged to use the manual for the purchase of materials to be installed in the Sewer Collection System.

*We encourage users to notify Metro Water Services of any inaccuracies, problems with performance of materials, or any changes or modifications necessary for the proper function of MWS facilities.*

## Approved Materials - Sewer

Manufacturers claiming equal status with listed organizations should apply to:

Metro Water Services  
1600 2<sup>nd</sup> Avenue North  
Nashville, TN 37208

ATTN: Steve Nunley  
Phone: (615) 862-4534  
E-mail:  
[steve.nunley@nashville.gov](mailto:steve.nunley@nashville.gov)

# Table of Contents

<b>Section</b>	<b>Page(s)</b>
<b>33 05 16.17 Valve Boxes, Meter Boxes, and Vaults</b>	
• 33 05 16.17 Concrete Valve Box and Footing Blocks	1.1
• Valve Box Frame and Cover	1.2
• Sewer Cleanout Protection	1.3
<b>33 31 00 Gravity Sewer Mains</b>	
• 33 11 00.11 Polyvinyl Chloride (PVC) Pipe and Fittings	2.1
• 33 11 13.13 Ductile Iron Pipe and Fittings	2.2
• 33 31 13.17 Reinforced Concrete Pipe and Fittings	2.3
• Fiberglass-Reinforced, Polymer Mortar Pipe	2.4
• Fusible Polyvinyl Chloride Pipe	2.5
<b>33 33 00 Low Pressure Sanitary Sewers</b>	
• 33 11 00.11 Polyvinyl Chloride (PVC) Pipe and Fittings	3.1
• 33 33 13 Grinder Pumps	3.2
<b>33 34 00 Sewer Force Mains</b>	
• 33 11 13.13 Ductile Iron Pipe and Fittings	4.1
• 33 12 16.19 Air Release and Vacuum Relief Valves	4.2
• Ball Valves	4.3
<b>33 39 13 Manholes</b>	
• 33 39 13 Manholes	5.1
• Doghouse Manholes	5.2
• Frames and Covers	5.3
• Joint Sealant	5.4
• Pipe Connections to Manhole	5.5
• Steps	5.6
• Vent Pipes	5.7
• Adjustment Rings	5.8
• Inserts	5.9
<b>Saddles for Tapping Existing Sewer</b>	6.1
<b>Sewer Rehabilitation Products</b>	
• Manhole Chimney Seal	7.1
• Polymeric Lining Systems	7.2
• CIPP Felt Liner and Resin	7.3
• Manhole Lining – Cementitious	7.4
• Manhole Lining – Epoxy, Polyurea and Urethane Based Resin Liner	7.5
• CIPP Service Lateral Liners	7.6
<b>Sewer Repair Materials</b>	
• Couplings and Adapters	8.1
• Mortar Repair Materials	8.2
<b>Corrosion Proof Structures</b>	
• Polymer Concrete Manholes	9.1

**Deviation from approved materials list(s) may occur on a case by case basis at the sole discretion of MWS and will be as indicated on the construction plans and in the special provisions of the project specifications.**

## Revisions/Additions 2019

<b>Date</b>	<b>Description</b>	<b>Page(s)</b>
Oct/2019	33 05 16.17 Concrete Valve Boxes and Footing Blocks 1. Updated Materials Description to include <b>4" thick</b> valve boxes 2. Updated Approved Manufacturers to include the following: <b>Holton Concrete Products, LLC.</b>	1.1
Oct/2019	33 05 16.17 Concrete Valve Boxes and Footing Blocks 1. Updated the Section by adding a new page for <b>Sewer Cleanout Protection</b> Approved Manufacturer: <b>Utility Defender</b>	1.3
Oct/2019	33 31 00 Gravity Sewer Mains: 33 11 13.13 Ductile Iron Pipe and Fittings 1. Updated Materials Description to include <b>Permax CTF™</b>	2.2
Oct/2019	33 34 00 Sewer Force Mains 33 11 13.13 Ductile Iron Pipe and Fittings 1. Updated Materials Description to include <b>Permax CTF™</b>	4.1
Oct/2019	33 34 00 Sewer Force Mains 1. Updated the Section by adding a new page for Ball Valves: Approved Manufacturer: <b>Sharpe® Valves, a Division of Smith-Cooper International</b> – Model/Series: <b>Series 50M76</b>	4.3
Oct/2019	33 39 13 Manholes 1. Updated Materials Description to include <b>Xypex BIO San C-500 NF Red, Xypex Admis C-500NF Red or Penetron Admix RP (Red Pigment).</b> 2. Updated Approved Manufactures to include the following: <b>Holton Concrete Products, LLC.</b>	5.1
Oct/2019	33 39 13 Manholes – Doghouse Manholes 1. Updated Approved Manufactures to include the following: <b>Holton Concrete Products, LLC.</b>	5.2
Oct/2019	33 39 13 Manholes 1. Updated the Section by adding a new page for <b>Inserts</b> : Approved Manufacturer: <b>Rainstopper</b> - Model/Series: <b>Rainstopper Manhole Insert – HDPE; Stainless Steel</b>	5.9
Oct/2019	Saddles for Tapping Existing Sewer 1. Updated Approved Manufacturers and Model/Series to include the following: • <b>Mueller Co. - H-13000 Series Bronze; 2-piece; 4"-8" mains; 1-1/2" or 2" tapping</b>	6.1
Oct/2019	Sewer Rehabilitation Products – Manhole Lining – Cementitious 1. Updated Approved Manufacturers and Model/Series to include the following: <b>Raven Lining System - Raven 405</b>	7.4
Oct/2019	Sewer Rehabilitation Products – Manhole Lining – Epoxy, Polyurea and Urethane Based Resin Liner 1. Updated Approved Manufacturers and Model/Series to include the following: <b>Rainstopper - SG Mastic 2-part Epoxy</b>	7.5
Oct/2019	Sewer Repair Materials – Mortar Repair Materials 1. Updated the Section by adding a new page for <b>Mortar Repair Materials</b> . Approved Manufacturers and Model/Series: • <b>ConShield Technologies, Inc. ConShield JointSet</b> • <b>Rainstopper (structural) CMS 10K Cementitious Mortar</b>	8.2

## Revisions/Additions 2019

<b>Date</b>	<b>Description</b>	<b>Page(s)</b>
Oct/2019	Updated the Sewer Collection System Approved Materials by adding a new Section 9: <b><i>Corrosion Proof Structures</i></b>	
Oct/2019	Added a page to Corrosion Proof Structures: <ul style="list-style-type: none"> <li>• <b><i>Polymer Concrete Manholes</i></b>: Approved Manufacturer: <b><i>Armorock</i></b></li> </ul>	9.1
Nov/2019	33 31 00 Gravity Sewer Mains: 33 11 13.13 Ductile Iron Pipe and Fittings 1. Updated Materials Description to include Series <b>401 and 431</b> Perma-Shield PL	2.2
Nov/2019	33 34 00 Sewer Force Mains 33 11 13.13 Ductile Iron Pipe and Fittings 1. Updated Materials Description to include Series <b>401 and 431</b> Perma-Shield PL	4.1
Nov/2019	33 39 13 Manholes 1. Updated Approved Manufacturers to include the following: <b>Jarrett Concrete Products</b>	5.1
Nov/2019	33 39 13 Manholes – Doghouse Manholes 1. Updated Approved Manufacturers to include the following: <b>Jarrett Concrete Products</b>	5.2
Jan/2020	Sewer Rehabilitation Products 1. Updated Approved Manufacturer name from <b>Layne Inliner, Inc.</b> to <b>Granite Inliner, LLC.</b>	7.3

## **33 05 16.17 Valve Boxes, Meter Boxes, and Vaults**

## 33 05 16.17 Concrete Valve Boxes and Footing Blocks

### Materials Description

Valve Boxes <http://www.nashville.gov/Water-Services/Developers/Water-and-Sewer.aspx>:

Precast concrete sections; 12" to 18" deep; 11" x 13-1/4" inside dimensions; 3" and 4" thick; No. 2 reinforcing rods; 4" adjustment risers.

Valve box shall be a minimum 4000 psi, 28-day compressive strength precast concrete sections to support vehicle loading.

Footing Blocks <http://www.nashville.gov/Water-Services/Developers/Water-and-Sewer.aspx>:

Concrete blocks 12" x 12" x 4"; 1:2:4 mixture; no reinforcing

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

ASTM C-150 Type 1  
AASHTO H-20 Loading



*Picture is for illustrative purposes only*

### Application

For use in sewer collection systems

### Approved Manufacturers

Holton Concrete Products, LLC

Hula Concrete Products, Inc.

Jarrett Concrete Products

Oldcastle Precast

### Model/Series

## Valve Box Frame and Cover

### Materials Description

Frame and cover shall be 195 pounds minimum weight. Dimensions shall be as follows:

Frame 17" x 19-1/4" x 6-1/2"

Cover 11-3/4" x 14" x 1"

Cover shall be cast labeled with "SEWER" in the checked pattern top of the cover.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

AASHTO H-20 Loading

ASTM A48, Class 30

### Application

For use in sewer collection systems



*Picture is for illustrative purposes only*

### Approved Manufacturers

John Bouchard & Sons Co.

Neenah Enterprises, Inc.

SIP Industries

### Model/Series

8006



# Sewer Cleanout Protection

## Materials Description

Heavy duty, high visibility marker and cover to provide maximum protection for sanitary sewer service cleanout. Cap shall be locatable. Collar extender shall be adjustable, and removable. The arm shall be of a break-away design. Caps, collars, and shroud shall be HDPE. Poles shall be high impact PVC with a 360 degree pivot hinge.

**Product shall be used for Lay & Deed projects only.**

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

### Application

For use in sewer collection systems



*Picture is for illustrative purposes only*

## Approved Manufacturers

Utility Defender

## Model/Series

## **33 31 00 Gravity Sewer Mains**

## 33 11 00.11 Polyvinyl Chloride (PVC) Pipe and Fittings

### Materials Description

Pipe, fittings, and cleanouts shall be SDR 35 or SDR 26 PVC full body injection molded or factory fabricated. Pipe jointing shall be accomplished by the use of flexible elastomer gaskets. Pipe lengths shall be 14 or 20 feet and shall be clearly marked with diameter, manufacturer's name or trademark, pressure pipe type, grade, and class.

Acceptance of all PVC pipe and fittings shall in part be based on the receipt of a written certification consisting of a copy of the manufacturer's test report indicating that the material has been sampled, tested, and inspected in accordance with the provisions of applicable ASTM standards.

When required, sewer service check valves shall be Oatey PVC Backwater Valves or approved equal.

**These products are to be approved on a project by project basis.**

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

15" and smaller - ASTM D3034; D3212, D3412

18" and larger - ASTM F679; D3212, D3412

SBR Gaskets – ASTM F477

Cell Classification 12454 A or B – ASTM D1784

Green Type P Solvent – ASTM D2546

### Application

Gravity sewer mains



*Picture is for illustrative purposes only*

### Approved Manufacturers

PVC (6" - 15"): no set approval list of manufacturers. Pipe approval is based on meeting ASTM D3034 for SDR 35/26.

PVC (18" and above):

Advanced Drainage Systems, Inc.

Contech

JM Eagle

### Model/Series

SaniTite HP Sizes: 30" – 60"

A 2000

Ultra Corr Sizes: 24", 27", 30" and 36"

## 33 11 13.13 Ductile Iron Pipe and Fittings

### Materials Description

Pipe shall be pressure class 350. Pressure class must be cast or stamped on the outside of the pipe in a permanent and visible manner. The manufacturer shall also mark the year in which the pipe was produced. The letters "DI" or "Ductile" shall be cast or stamped on the pipe. Standard lengths shall be 18 or 20 feet.

Pipe shall be coated on interior with 40 mil dry film thickness Series 401 and 431 Perma-Shield PL, Permox CTF™, or "approved equal" and on exterior with a 1-mil asphaltic seal coating. For sizes 24" and below, push-on type single joints shall be 350 psi. For sizes above 24", push-on type single joints shall be 240 psi.

**Ductile iron gravity sewers shall not be connected to concrete or clay gravity sewers except by means of a manhole or by other methods approved by Metro Water Services.**

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

C110, C111, C150, C151, C153  
ASTM E 96 Method A, B 117, G 95, G8, G210  
NACE TM 0174



*Picture is for illustrative purposes only*

### Application

Gravity sewer mains

### Approved Manufacturers

American Cast Iron Pipe

McWane Ductile

U.S. Pipe, a Forterra company

### Model/Series

## 33 11 13.17 Reinforced Concrete Pipe and Fittings

### Materials Description

Pipe shall be 4000 psi concrete strength, Wall B or Wall C, Class III, Class IV, or Class V with inside Xypex C1000 or approved equivalent corrosion resistant additive. Pipe shall be standard length with steel end ring type joints with extruded or molded and cured rubber gaskets. Pipe shall have a mechanically cast lining material system, either a minimum 0.065-inch thick PVC or a minimum 80 mils dry film thickness HDPE.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

C361  
ASTM C76, A82, A185, C496, C497, C443  
C1103 – 30" and larger



*Picture is for illustrative purposes only*

### Application

Gravity sewer mains

### Approved Manufacturers

Foley Products Company

### Model/Series

# Fiberglass-Reinforced, Polymer Mortar Pipe and Fittings

## Materials Description

Pipes shall be manufactured by the centrifugal casting or advancing mandrel process to result in a dense, non-porous, corrosion-resistant, consistent composite structure.

Flanges, elbows, reducers, tees, wyes, laterals and other fittings shall be capable of withstanding all operating conditions when installed. They may be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced coatings.

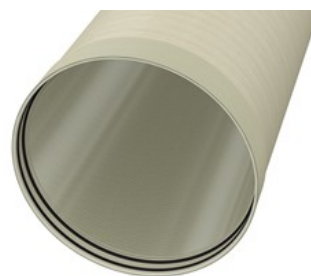
*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTMD 3262, 4161, 2412

## Application

Gravity sewer mains



*Picture is for illustrative purposes only*

## Approved Manufacturers

HOBAS Pipe USA

U.S. Composite Pipe South, LLC

## Model/Series

HOBAS (CCFRPM)

Flowtite GRP

# Fusible Polyvinyl Chloride Pipe

## Materials Description

Pipe shall be used as manufactured under the trade names Fusible C-900®, Fusible C-905®, and FPVC™ as patented by Underground Solutions, Inc. Acceptable fittings for use with fusible polyvinylchloride pipe shall include standard ductile iron fittings, gasketed PVC, push-on type couplings, or fusible PVC fittings.

All fusion processes, unloading, handling, installation and all other manipulation of the pipe during fusion and installation shall be per the manufacturer's recommendations and instructions. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) affixed to the fusion machine. Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process.

**These products are to be approved on a project by project basis.**

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

C900, C905  
ASTM D2241, D3034, F679

## Application

Gravity sewer mains



*Picture is for illustrative purposes only*

## Approved Manufacturers

AEGION/Underground Solutions

## Model/Series

Fusible C-900®, Fusible C-905®, and FPVC™

## **33 33 00 Low Pressure Sanitary Sewers**



## 33 11 00.11 Polyvinyl Chloride (PVC) Pipe and Fittings

### Materials Description

Pipe and fittings shall be SDR 21 with fittings at the same pressure rating. For sizes less than 1 ¼", pipe shall have belled ends with tapered sockets to create an interference type fit. For sizes greater than 1 ¼", joints shall be single rubber gasket push-on (bell and spigot). Pipe lengths shall be 20 feet and shall be clearly marked with diameter, manufacturer's name or trademark, pressure pipe type, grade, and class.

Acceptance of all PVC pipe and fittings shall in part be based on the receipt of a written certification consisting of a copy of the manufacturer's test report indicating that the material has been sampled, tested, and inspected in accordance with the provisions of applicable ASTM standards.

**These products are to be approved on a project by project basis.**

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

ASTM D2241, D3139, D2672  
SBR Gaskets – ASTM F477  
Cell Classification 12454 A or B – ASTM D1784  
Green Type P Solvent – ASTM D2546

### Application

Low pressure sewer mains



*Picture is for illustrative purposes only*

### Approved Manufacturers

No set approval list for manufacturers. Pipe approval is based on meeting ASTM D2241 for SDR 21.

Spears Twist-Lock Repair Coupling

### Model/Series

Standard Coupling: S118 Series 1 ¼" – 4"

## 33 33 13 Grinder Pumps

### Materials Description

Grinder pump shall be a complete unit that includes: the grinder pump, redundant check valve, HDPE (high density polyethylene) tank, controls, and alarm panel.

<https://eone.com/sewer-systems/products/grinder-pumps/d/dh071>

The connector from the grinder pump to the outgoing service force main must be the Flexline MxF 1-1/4" SS Flex Connector supplied by Wascon. *See specifications on the following page.*

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

#### Application

Low pressure sewer mains



*Picture is for illustrative purposes only*

#### Approved Manufacturers

Environment One, Inc.

Wascon

#### Model/Series

E/One Model DH071

MxF 1-1/4" SS Flex Connector

## **33 34 00 Sewer Force Mains**

## 33 11 13.13 Ductile Iron Pipe and Fittings

### Materials Description

Pipe shall be pressure class 350. Pressure class must be cast or stamped on the outside of the pipe in a permanent and visible manner. The manufacturer shall also mark the year in which the pipe was produced. The letters "DI" or "Ductile" shall be cast or stamped on the pipe. Standard lengths shall be 18 or 20 feet.

Pipe shall be coated on interior with 40 mil dry film thickness Series 401 and 431 Perma Shield 431 PL, Permox CTF™, or "approved equal" and on exterior with a 1-mil asphaltic seal coating. An approved restrained joint shall be provided for each piece of pipe.

For sizes 24" and below, push-on type single joints shall be 350 psi. For sizes above 24", push-on type single joints shall be 240 psi.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

C110, C111, C150, C151, C153  
ASTM E 96 Method A, B 117, G 95, G 8, G210  
NACE TM 0174



*Picture is for illustrative purposes only*

### Application

Sewer force mains

### Approved Manufacturers

American Cast Iron Pipe

McWane Ductile

U.S. Pipe, a Forterra company

### Model/Series

## 33 12 16.19 Air Release and Vacuum Relief Valves

### Materials Description

Air release and vacuum relief valve shall be float operated, having a large discharge orifice equal in size to the valves inlet. Ductile iron bodies shall be pressure class 300. Cast, grade 316Ti stainless steel, and fusion bonded epoxy steel body valves shall be pressure class 250.

Valves shall have a special long-body sewerage air release, complete with top and bottom flushing connections and hoses.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

C512  
A536, A126  
ASME B1.20.1; B16.42

### Application

Sewer force mains: Allows great volumes of air to be exhausted from or admitted into a system as it is filled or drained.



*Picture is for illustrative purposes only*

### Approved Manufacturers

APCO, a DeZURIK company  
  
A.R.I. Optimal Flow Solutions

### Model/Series

Series 200A, 400 SARV  
  
D-020, D-025

# Ball Valves

## Materials Description

Ball valves shall be used for the sewer force main tapping process. Taps are to be made by Metro Water Services Personnel ONLY.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM-A351, ASME B16.11, ASME B16.34

## Application

For use in sewer collection systems



*Picture is for illustrative purposes only*

## Approved Manufacturers

Sharpe® Valves, a Division of Smith-Cooper International

## Model/Series

Series 50M76

## 33 39 13 Manholes

## 33 39 13 Manholes

### Materials Description

Manholes shall be concentric with steps. Concrete manhole components may be precast or poured-in-place. Concrete shall have a minimum compressive strength at 28 days of 4,000 psi. The manufacturer shall clearly mark the date and their name or trademark on the inside of the manhole barrel. The manhole shall have the waterproofing admixture Xypex C-1000 Red, Xypex BIO San C-500 NF Red, Xypex Admix C-500NF Red, BASF Master Life 300D, or Penetron Admix RP (Red Pigment).

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

ASTM C478, C913, C990  
AASHTO H-20

### Application

For use in sewer collection systems



*Picture is for illustrative purposes only*

### Approved Manufacturers

Foley Products Company  
  
Holton Concrete Products, LLC  
  
Jarrett Concrete Products  
  
Oldcastle Precast  
  
VANHOUSECO

### Model/Series

48" Precast only



# Doghouse Manholes

## Materials Description

Dog house manholes shall meet the requirements as indicated in 33 39 13 Manholes.

**Dog house manholes shall be used only with MWS approval.**

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM C498, C913  
Epoxy & urethane resins – ASTM D695, D638, D790,  
D2240, D4541

## Application

For use in sewer collection systems.

The doghouse manhole is commonly used to connect a lateral pipeline to an existing pipe.



*Picture is for illustrative purposes only*

## Approved Manufacturers

Foley Products Company

Holton Concrete Products, LLC

Jarrett Concrete Products

Oldcastle Precast

VANHOUSECO

## Model/Series

# Frames and Covers

## Materials Description

Manhole frames, grates, rings, and covers shall be made of cast iron. All castings shall be made accurately to the required dimensions with logos and shall be sound, smooth, clean and free from blisters and other defects. Frames and covers shall be machined so that covers rest securely in the frames with no rocking. Covers shall be in contact with frames for the entire perimeter of the contact surface.

On all 24" opening manholes, castings shall bear the name or ID of approved manufacturer and part number on both frame and cover. 24" clean opening manhole frame and cover must be used on all new construction unless directed otherwise by Metro Water Services. **Frames and covers larger than 24" require Metro Water Services approval.**

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM A48, Class 30  
AASHTO H-20

## Application

For use in sewer collection systems.



*Picture is for illustrative purposes only*

## Approved Manufacturers

John Bouchard & Sons Co.

Pipeline Components SIGMA Corporation

Star Pipe Products, Inc.

Vulcan Engineering Co.

## Model/Series

1150 (Standard), 1123 (Watertight)

Larger than 24": 1125, 1312

MH Nash 725 (Standard)

MH-0027, MH-0028

#V-1550 (Standard)

## Joint Sealant

### Materials Description

Manholes shall be double sealed with an external rubber sleeve of flexible bitumastic joint sealant. The seal shall be made of a stretchable, self-shrinking, intra-curing halogenated based rubber with a minimum thickness of 30 mils. The back side of each unit shall be coated with a cross-linked re-enforced butyl adhesive. The butyl adhesive shall be non-hardening sealant with a minimum thickness of 30 mils. The seal shall be designed to stretch around the joint and then overlapped creating a cross-link and fused bond between the rubber and butyl adhesive.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

ASTM D2240, D412, D395, D746, D624, D573, D471, D518

### Application

For use in sewer collection systems.



*Picture is for illustrative purposes only*

### Approved Manufacturers

Sealing Systems, Inc.

### Model/Series

Infi-Shield Gator Wrap®  
Flex-Seal Utility Sealant®

# Pipe Connections to Manhole

## Materials Description

Resilient connectors shall be Kor-N-Seal®, A-LOK, or an approved equal. Connectors between the manhole and pipes shall be installed in the precast manhole or cored opening in the manhole sidewall. Sealing material shall be installed in the precast or cored opening. An external bond made entirely of corrosion resistant stainless steel shall be used to affect the seal around the pipe.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM C923

## Application

For use in sewer collection systems.



*Picture is for illustrative purposes only*

## Approved Manufacturers

A-LOK Products, Inc.

Trelleborg

## Model/Series

A-LOK Premium™

Kor-N-Seal® I 106/406 Series, Kor-N- Seal® II 206 Series

# Steps

## Materials Description

Manhole steps shall be inserted and securely embedded in the manhole sidewall. Steps shall be non-skid design, plastic coated steel or aluminum alloy.

Aluminum alloy manhole steps shall be aluminum-magnesium silicide type alloy conforming, or approved equal. Plastic coated steel manhole steps shall be constructed of 1/2" steel reinforcing rods encapsulated in polypropylene plastic or approved equal.

Steps shall support a 1,000 pound load.

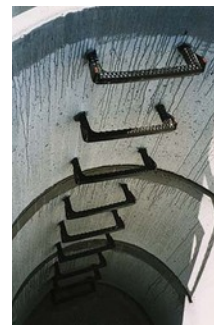
*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

Federal Specifications QQ-A-200/8

## Application

For use in sewer collection systems.



*Picture is for illustrative purposes only*

## Approved Manufacturers

No set approval list of manufacturers

## Model/Series

## Vent Pipes

### Materials Description

Vent pipes shall be 4" diameter class 350 ductile iron. Pipes shall have two coats of aluminum epoxy at a thickness of 5.0 millimeters and a top coat of dark green asphaltic polyurethane at 3.0 to 5.0 millimeters to the exposed vent pipe.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

C151/A21.51

### Application

For use in sewer collection systems.



*Picture is for illustrative purposes only*

### Approved Manufacturers

No set approval list of manufacturers

### Model/Series

## Adjustment Rings

### Materials Description

Adjustment rings may be manufactured from Expanded Polyethylene (EPP) or approved equal. Installation shall be per manufacturer's recommendations. Rings may be used in traffic and non-traffic applications.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

ASTM D-4976  
Traffic Rated AASHTO HS-20

### Application

For use in sewer collection systems to adjust manhole castings to grade.



*Picture is for illustrative purposes only*

### Approved Manufacturers

Cretex Specialty Products

### Model/Series

PRO-RING™

## Inserts

### Materials Description

HDPE or stainless steel manhole inserts may be used on a case by case basis as specified by engineer.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

### Application

For use in sewer collection systems to eliminate inflow, reduce infiltration of street level contaminants, control the escape of undesirable sewage odor, and minimize traffic related manhole noise and cover displacement.



*Picture is for illustrative purposes only*

### Approved Manufacturers

Rainstopper

### Model/Series

Rainstopper Manhole Insert – HDPE; Stainless Steel



## **Saddles for Tapping Existing Sewer**

# Saddles for Tapping Existing Sewer

## Materials Description

**CASTING:** Saddle body shall be cast from ductile (nodular) iron and protected with a yellow shop coat.

**GASKET:** Gasket shall be virgin Styrene Butadiene Rubber (SBR) compounded for water and sewer service.

**ADJUSTABLE STRAP:** Strap shall be stainless steel, 3 1/2 inches wide to spread out clamping forces on the pipe. Strap shall have M.I.G. and T.I.G welds. Passivated for corrosion resistance.

**BOLTS AND NUTS:** Bolts and nuts shall be stainless steel, passivated for resistance to corrosion, 1/2" UNC rolled thread. Nuts shall be coated to prevent galling.

**WASHERS:** Stainless steel washers shall be used to reduce friction.

**On all new construction of large PVC lines, molded fittings shall be installed. For larger PVC sewer 18" – 36", tapping saddles will follow manufacturer recommendations and shall be approved by Metro Water Services.**

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM A536, Grade 65-45-12  
ASTM D2000 MBA 710  
ASTM A240, Type 304, 316  
ASTM A193, Type 304, 316  
ASTM A194, Type 304, 316  
C900  
NSF 61

## Application

For use in sewer force main connections.



*Picture is for illustrative purposes only*

## Approved Manufacturers

Mueller Co.

Romac Industries, Inc.

## Model/Series

H-13000 Series Bronze; 2-piece; 4"-8" mains; 1-1/2" or 2" tapping

Style CB

# **Sewer Rehabilitation Products**

# Manhole Chimney Seal

## Materials Description

Internal machine chimney seals shall consist of a flexible internal rubber sleeve, interlocking extensions, and stainless steel compression bands. The seal shall remain flexible throughout a 25-year design life, allowing repeated vertical movement of the frame of not less than two (2) inches and repeated horizontal movement of the frame of not less than one-half (1/2) inch. The sleeve portion of the seal shall be a minimum double pleated with a minimum unexpanded vertical height of 8, 10, or 13 inches, respectively. The sleeve and extension shall have a minimum thickness of three-sixteenths (3/16) inches and shall be made from a high quality rubber compound with a minimum 1500 psi tensile strength, a maximum 18% compression set, and a hardness (durometer) of  $48 \pm 5$ . The area of the seal that compresses against the manhole frame/casting and the chimney/cone shall provide a watertight seal. The bands shall be fabricated from 16 gauge stainless steel with no welded attachments and shall have a minimum adjustment range of two (2) diameter inches. Any screws, bolts, or nuts used to lock the band in place shall be stainless steel.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM C923

## Application

For use in sewer collection systems.



*Picture is for illustrative purposes only*

## Approved Manufacturers

Cretex Specialty Products

Sealing Systems, Inc.

TRELLEBORG

## Model/Series

LSS Internal

Infi-Shield Gator Wrap®  
Flex-Seal Utility Sealant®

FLexRib

# Polymeric Lining Systems

## Materials Description

Materials shall be designed and manufactured to withstand the severe effects of hydrogen sulfide in a wastewater environment. The lining system shall be a multi-component stress skin panel exhibiting the following characteristics: sprayable; solvent free; low viscosity; flame retardant; two-compound polymeric; and specifically developed for a corrosive wastewater environment with a total minimum thickness of 500 mils.

Installation equipment shall be of a high quality grade and as recommended by the manufacturer. Hydro blasting equipment shall be able to produce 3000 psi to remove corroded materials from the existing concrete/brick surface.

**The manufacturer and/or applicator of the liner system shall be fully qualified in design, manufacture, and installation of corrosion protection systems. The applicator shall be completely trained in leak repair, surface preparation, and corrosion materials application.**

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM D1638, D1621, D1622, 1940, C273

## Application

For use in sewer collection systems to restore the inside wall of manholes to near original surface levels, eliminate water infiltration, eliminate water exfiltration, and provide corrosion resistance to prevent further deterioration.



*Picture is for illustrative purposes only*

## Approved Manufacturers

SpectraTech, LLC

Sprayroq, Inc.

Warren Environmental, Inc.

## Model/Series

SpectraShield

SprayWall

501-01

# CIPP Felt Liner and Resin

## Materials Description

The CIPP liner shall have tubing material with one or more layers of a flexible non-woven polyester felt with or without additives such as woven fiberglass or other fibers. The CIPP liner's felt content shall not exceed 15 percent of the total impregnated liner volume. The fabric tube shall be able to absorb and carry resins, be constructed to withstand installation pressures and curing temperatures, and have sufficient strength to bridge missing pipe segments and stretch to fit irregular pipe sections. The CIPP liner tube may be single or multiple layer construction with any layer not less than 1.5 mm thick. The wet-out fabric tube shall have a uniform thickness and excess resin distribution which, when compressed at installation pressures, will meet or exceed the design thickness after cure.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM F1216, F1743, D5813, D2990

## Application

For use in sewer collection systems to restore the structural integrity of the inside wall of pipes, eliminate water infiltration and exfiltration and provide corrosion resistance to prevent further deterioration



*Picture is for illustrative purposes only*

## Approved Manufacturers

American Infrastructures Technologies

Insituform Technologies, Inc.

Inverta A Pipe Liner

Granite Inliner, LLC.

Moore Construction Co.

SAK Construction, LLC

## Model/Series

CIPP Corporation Liner

Insituform

Inland Pipe Rehabilitation (IPR Southeast)

Inliner Technologies

MooreLiner

Pipenology Liner

# Manhole Lining – Cementitious

## Materials Description

The Portland-based cementitious liner product shall be used to form a structural monolithic liner covering all interior substrate surfaces.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM C109, C496, C293, C596, C882, C666

## Application

For use in sewer collection system manholes to restore the structural integrity of the inside wall of pipes, eliminate water infiltration and exfiltration



*Picture is for illustrative purposes only*

## Approved Manufacturers

Mainstay

Permacast

Quadex

Raven Lining System

Standard Cement

The Strong Company

## Model/Series

ML-72

MS-10,000

QM-15

Raven 405

Reliner MSP®

MS-2A

# Manhole Lining – Epoxy, Polyurea and Urethane Based Resin Liner

## Materials Description

The base coating shall be a calcium aluminate, acid resistant cementitious profiling product used for building back deteriorated substrates to original dimensions, providing structural restoration, corrosion protection, eliminating infiltration, and providing a smooth surface for applying an epoxy or urethane coating.

The final coating shall be an epoxy resin or urethane system formulated for application within a sanitary sewer environment. The resin will exhibit suitable corrosion resistance and enhance the existing manhole's structural integrity.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

See specific job specifications

## Application

For use in sewer collection system manholes to restore the structural integrity of the inside wall of pipes, eliminate water infiltration and exfiltration and provide corrosion resistance to prevent further deterioration



*Picture is for illustrative purposes only*

## Approved Manufacturers

Rainstopper  
SpectraTech, LLC  
Sprayroq, Inc.  
Warren Environmental Systems

## Model/Series

SG Mastic 2-part Epoxy  
SpectraShield  
SprayWall  
S 301



## CIPP Service Lateral Liners

### Materials Description

The service lateral lining shall be a seamless, corrosion-resistant, cured-in-place pipe lining product that seals the service lateral pipe and the junction between the service lateral pipe and main sewer. The portion of the service lateral lining system that connects to the main/lateral interface shall be a full-wrap connection type for pipe sizes 18 inches in diameter and smaller. The tube shall be able to conform to bends, offset joints, bells, and disfigured pipe sections.

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

ASTM D790, F1216, F2561, F1743, D2990

### Application

For use in sewer collection systems to restore the structural integrity of the inside wall of service connections, eliminate water infiltration and exfiltration and provide corrosion resistance to prevent further deterioration



*Picture is for illustrative purposes only*

### Approved Manufacturers

BLD Services, LLC

LMK Technologies

Trelleborg Sealing Solutions Millford, Inc.

### Model/Series

SCS+L

T-Liner®

epros® DrainMtH system

# Sewer Repair Materials

## Couplings and Adaptors

### Materials Description

**These fittings are to be used by Metro Water Services Personnel ONLY.**

*For detailed information, see referenced Specification Section*

### National Standards – AWWA/ANSI

ASTM C1173, D5926

### Application

For use in sewer collection systems



*Picture is for illustrative purposes only*

### Approved Manufacturers

Fernco

Gripper Gasket LLC

### Model/Series

MAXADAPTOR®

# Mortar Repair Materials

## Materials Description

For use in concrete structural repairs on a case by case basis as specified by engineer.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM C309, C266, C109, C496, C672, C1042, C157

## Application

For use in sewer collection systems

*Picture is for illustrative purposes only*

## Approved Manufacturers

ConShield Technologies, Inc.

Rainstopper (structural)

## Model/Series

ConShield JointSet

CMS 10K Cementitious Mortar



## **Corrosion Proof Structures**

# Polymer Concrete Manholes

## Materials Description

Polymer concrete manholes may be used on a case by case basis as specified by engineer.

*For detailed information, see referenced Specification Section*

## National Standards – AWWA/ANSI

ASTM C478, C579, C443, C580, C857, D648, D6783, D2584, C990,

AASHTO HS-20, HS-93

## Application

For use in sewer collection systems



*Picture is for illustrative purposes only*

## Approved Manufacturers

Armorock

## Model/Series