



## MEMORANDUM

To: Denver Water Engineering Standards Users

From: Amy S. Turney, P.E. – Director of Engineering – Property & Distribution

CC: Stephen C. Reum, P.E. – Director of Engineering – Projects  
Jeremy M. Ross, P.E. – Assistant Director of Engineering – Projects

Date: March 11, 2019

RE: Denver Water Engineering Standards – 15<sup>th</sup> Edition  
Errata 1 - Notice of Corrections

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Revisions to the 15<sup>th</sup> Edition of the Engineering Standards are hereby published for immediate use.

### **ABBREVIATIONS – TECHNICAL SOCIETIES**

#### **DELETE:**

DIA

#### **SUBSTITUTE:**

DEN

### **ABBREVIATIONS – GENERAL ABBREVIATIONS AND ACRONYMS**

#### **ADD:**

AMI – Advanced Metering Infrastructure

#### **ADD:**

HMWPE – High Molecular Weight Polyethylene

### **CHAPTER 1 – GENERAL, SUBPARAGRAPH 1.06, PAGE 2:**

#### **ADD:**

**Advanced Metering Infrastructure:** An integrated system of smart meters, communication networks, and data management systems that enables two-way communication between utilities and customers.

**CHAPTER 1 – GENERAL, SUBPARAGRAPH 1.06, PAGE 3:**

**DELETE:**

**Automatic Meter Reading:** Also known as Advanced Metering Infrastructure. A system of electronic components that permit the collection of meter readings by wireless or wired electronic communication systems. Components thereof may be attached to and become part of a customer's water meter. Other components may include central data collection units, vehicle-mounted equipment, and data transmission systems.

**SUBSTITUTE:**

**Automatic Meter Reading:** A type of AMI. A system of electronic components that permit the collection of meter readings by wireless or wired electronic communication systems. Components thereof may be attached to and become part of a customer's water meter. Other components may include central data collection units, vehicle-mounted equipment, and data transmission systems.

**CHAPTER 2 – MAIN AND DISTRIBUTOR MAIN EXTENSIONS, SUBPARAGRAPH 2.05, SUBPARAGRAPH B, SUBPARAGRAPH 7, PAGE 13:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 2 – MAIN AND DISTRIBUTOR MAIN EXTENSIONS, SUBPARAGRAPH 2.06, FIRST PARAGRAPH, PAGE 13:**

**DELETE:**

Denver Water will perform engineering services on main extensions and DIA.

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES, SUBPARAGRAPH 3.02, SUBPARAGRAPH A, SECOND PARAGRAPH, PAGE 19:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.02, SUBPARAGRAPH A, THIRD PARAGRAPH, PAGE 20:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.09, SUBPARAGRAPH A, FIRST AND SECOND PARAGRAPHS, PAGE 24:**

**DELETE:**

Second and third paragraphs in their entirety.

**SUBSTITUTE:**

Taps and service lines shall be of a size that is adequate to supply the requirements of the property being served while not being so large as to cause inaccuracies in metering low flows. The minimum size allowable for a service line shall be 3/4 inch or the minimum recommended size resulting from a fixture count document, completed by the PE, utilizing an accredited fixture unit/count methodology or one standard diameter less than required by the fixture unit/count methodology adopted by the authority having jurisdiction for commercial and multi-family service line requests.

The tap, corporation stop, meter, and the portion of the service line between the corporation stop and 5 feet past the meter shall be the same size. The service line may only be increased one standard size to the next approved larger diameter beginning 5 feet downstream of the meter, including BFP. This is permitted to satisfy maximum pressure loss criteria; it is not for achieving greater flow using a smaller tap.

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.09, SUBPARAGRAPH E, SECOND SENTENCE, PAGE 25:**

**DELETE:**

Manifold service lines shall not be used for irrigation service lines or fire service lines, including those that meet NFPA 13D.

**SUBSTITUTE:**

Manifold service lines shall not be used for irrigation service lines or fire service lines, including those that meet NFPA 13D and those that serve a common area.

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.12, SUBPARAGRAPH A, SECOND PARAGRAPH, FIRST SENTENCE, PAGE  
26:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.12, SUBPARAGRAPH A, SECOND PARAGRAPH, LAST SENTENCE, PAGE  
26:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.12, SUBPARAGRAPH A, THIRD PARAGRAPH, LAST SENTENCE, PAGE  
26:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, PAGE 26:**

**DELETE:**

**3.13 Automatic Meter Reading Equipment**

**SUBSTITUTE:**

**3.13 AMR and AMI Equipment**

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, FIRST PARAGRAPH, FIRST SENTENCE, PAGE 26:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, FIRST PARAGRAPH, LAST SENTENCE, PAGE 26:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, SECOND PARAGRAPH, FIRST SENTENCE, PAGE 26:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, SECOND PARAGRAPH, THIRD SENTENCE, PAGE 27:**

**DELETE:**

In special circumstances identified by the Meter Inspector, a remote AMR device may be required at a distance of up to 150-feet of wire length from the meter pit to the vault and mounted on the outside of the building, on a post, or on another structure.

**SUBSTITUTE:**

In special circumstances identified by the Meter Inspector, AMI or a remote AMR device may be required at a distance of up to 150-feet of wire length from the meter pit to the vault and mounted on the outside of the building, on a post, or on another structure.

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, SUBPARAGRAPH A, PAGE 27:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, SUBPARAGRAPH B, FIRST SENTENCE, PAGE 27:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, SUBPARAGRAPH B, FOURTH SENTENCE, PAGE 27:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, SUBPARAGRAPH B, LAST SENTENCE, PAGE 27:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.13, SUBPARAGRAPH D, FIRST SENTENCE, PAGE 27:**

**DELETE:**

Where inside meter settings are approved in advance in writing by the Meter Inspection Supervisor, remote AMR devices shall be installed on the outside of the building as directed by Denver Water.

**SUBSTITUTE:**

Where inside meter settings are approved in advance in writing by the Meter Inspection Supervisor, AMI or remote AMR devices shall be installed on the outside of the building as directed by Denver Water.

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.15, THIRD PARAGRAPH, LAST SENTENCE, PAGE 28:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.15, SUBPARAGRAPH J, PAGE 29:**

**DELETE:**

One or more outdoor remote AMR devices are required for inside meter settings, the location of which will be determined during the review of the inside meter request.

**SUBSTITUTE:**

One or more indoor AMI devices or outdoor remote AMR devices are required for inside meter settings, the location of which will be determined during the review of the inside meter request.

**CHAPTER 3 – SERVICE LINES, FIRE SERVICE LINES, METERS, AND APPURTENANCES,  
SUBPARAGRAPH 3.18, SUBPARAGRAPH C, FIRST SENTENCE, PAGE 30:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 6 – MATERIALS, SUBPARAGRAPH 6.04, FIFTH PARAGRAPH, FIRST SENTENCE, PAGE 64:**

**DELETE:**

When water mains are to be constructed in soils that have a resistivity of less than 1,000 ohm-centimeters or where stray current corrosion is expected to be severe, an approved nonmetallic pipe system shall be selected.

**SUBSTITUTE:**

When water mains are to be constructed in soils that have a resistivity of less than 1,000 ohm-centimeters or where stray current corrosion is expected to be present, an approved nonmetallic pipe system shall be selected.

**CHAPTER 6 – MATERIALS, SUBPARAGRAPH 6.04, LAST PARAGRAPH, FIRST SENTENCE & LAST SENTENCE, PAGE 65:**

**DELETE:**

DIA

**SUBSTITUTE:**

DEN

**CHAPTER 6 – MATERIALS, SUBPARAGRAPH 6.16, SUBPARAGRAPH C, LAST SENTENCE, PAGE 71:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 6 – MATERIALS, SUBPARAGRAPH 6.16, SUBPARAGRAPH E, PAGE 71:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI



**CHAPTER 6 – MATERIALS, SUBPARAGRAPH 6.19, SUBPARAGRAPH C, FIRST SENTENCE, PAGE 71:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**CHAPTER 6 – MATERIALS, SUBPARAGRAPH 6.28, SUBPARAGRAPH B, PAGE 74:**

**DELETE:**

Insulators shall be installed at the outlet end of the corporation stop in accordance with [the Standard Drawings](#).

**SUBSTITUTE:**

Electrical isolation is required at dissimilar metal connections and at corporation stops in accordance with the [Standard Drawings](#). Electrical isolation is achieved by installing dielectric insulating gaskets, washers, and sleeves at couplings, flanges, and corporation stops. Full face, unsegmented gaskets are required for electrically insulated flanges.

**CHAPTER 6 – MATERIALS, SUBPARAGRAPH 6.28, SUBPARAGRAPH C, PAGE 74:**

**DELETE:**

In areas where the soil resistivity is 1,000 ohm-centimeters or less and metallic pipe needs to be used, joints shall be bonded with solid copper wire and be in accordance with the [Standard Drawings](#). Cadwelds shall be covered by an approved method.

**SUBSTITUTE:**

In areas where the soil resistivity is 1,000 ohm-centimeters or less and metallic pipe needs to be used, joints shall be bonded with HMWPE insulated stranded copper wire and be in accordance with the [Standard Drawings](#). Exothermic welds shall be covered by an approved weld cap.

**CHAPTER 7 – EARTHWORK, SUBPARAGRAPH 7.10, SUBPARAGRAPH B, PAGE 80:**

**DELETE:**

<b>Squeegee</b> (For use with 20-inch or smaller diameter mains)	
<b>Sieve Size</b>	<b>Total Percent Passing by Weight</b>
3/8-inch	100
No. 4	60 to 100
No. 50	2 to 30
No. 100	0 to 10
No. 200	0 to 3

**SUBSTITUTE:**

<b>Squeegee</b> (For use with 20-inch or smaller diameter mains)	
<b>Sieve Size</b>	<b>Total Percent Passing by Weight</b>
3/8-inch	100
No. 50	0 to 10
No. 100	0 to 5
No. 200	0 to 3

**CHAPTER 8 – PIPE INSTALLATION, SUBPARAGRAPH 8.23, SUBPARAGRAPH A, PAGE 94:**

**DELETE:**

Cathodic protection and insulation shall be installed as required by Denver Water. Care shall be taken to insulate between dissimilar materials and at service line connections to metallic water mains.

**SUBSTITUTE:**

Cathodic protection and electrical insulation shall be installed as required by Denver Water. Care shall be taken to electrically insulate between dissimilar materials and at service line connections to metallic water mains.

**CHAPTER 11 – RECYCLED WATER SYSTEM, SUBPARAGRAPH 11.09, SUBPARAGRAPH A, SECOND SENTENCE, PAGE 110:**

**DELETE:**

The valve body, including the operating nut, shall be coated with a factory-applied epoxy, Pantone 2577U in color.

**SUBSTITUTE:**

The valve bolts and operating nut shall be coated with a factory-applied epoxy, Pantone 2577U in color.

**CHAPTER 11 – RECYCLED WATER SYSTEM, SUBPARAGRAPH 11.14, SUBPARAGRAPH D, LAST SENTENCE, PAGE 113:**

**DELETE:**

If available from the Manufacturer, the meter register box and dial shall be intended for use with recycled water and purple.

**SUBSTITUTE:**

If available from the Manufacturer, the meter register box and dial or screen shall be intended for use with recycled water and purple.

**CHAPTER 11 – RECYCLED WATER SYSTEM, SUBPARAGRAPH 11.16, FIRST PARAGRAPH, PAGE 115:**

**DELETE:**

Dual supply systems are not allowed. Distribution mains, water systems, and private systems as defined in Section 1.05 of Denver Water’s Operating Rules shall not have dual water supplies. This includes the following:

**SUBSTITUTE:**

Distribution mains, water systems, and private systems as defined in Section 1.05 of Denver Water’s Operating Rules that have dual water supplies shall be in compliance with CDPHE Regulation 84, State Plumbing Board regulations, and codes under the regulatory authorities having jurisdiction. Dual water supply systems shall also comply with the following additional requirements:

The following Materials Specifications are hereby corrected and updated:

**Material Specification Index**

**DELETE:** MS-29 Mechanical Joint Restraint

**SUBSTITUTE:** MS-29 Joint Restraints

**Material Specification – 13 for Dry-Barrel Fire Hydrants, Subparagraph 9, Last Sentence, Page 2:**

**DELETE:**

NFPA No. 194

**SUBSTITUTE:**

NFPA No. 1963

**Material Specification – 13 for Dry-Barrel Fire Hydrants, Subparagraph 12, Last Paragraph, Page 2:**

**DELETE:**

AWWA C116

**SUBSTITUTE:**

AWWA C550

**Material Specification – 13 for Dry-Barrel Fire Hydrants, Page 3:**

**DELETE:**

**15. APPROVED MANUFACTURERS AND MODELS**

<b>CITY AND COUNTY OF DENVER AND TOTAL SERVICE CONTRACT AREAS</b>	
<b>Manufacturers</b>	<b>Models</b>
American Cast Iron Pipe/Waterous	Pacer WB-67-250
American AVK	Series 27
Kennedy	K-81DD
<b>DISTRIBUTOR CONTRACT AREAS</b>	
<b>Manufacturers</b>	<b>Models</b>
American Cast Iron Pipe/Waterous	Pacer WB-67-250
American AVK	Series 27
Clow	Medallion F-2545
Kennedy	K-81D, K-81DD
Mueller Company	Centurion Model A-423

**SUBSTITUTE:**

**15. APPROVED MANUFACTURERS AND MODELS**

<b>CITY AND COUNTY OF DENVER AND TOTAL SERVICE CONTRACT AREAS</b>	
<b>Manufacturers</b>	<b>Models</b>
American Cast Iron Pipe/Waterous	Pacer WB-67-250
Kennedy	K-81DD
Mueller Company	Centurion Model A-403
<b>DISTRIBUTOR CONTRACT AREAS</b>	
<b>Manufacturers</b>	<b>Models</b>
American Cast Iron Pipe/Waterous	Pacer WB-67-250
American AVK	Series 27
Clow	Medallion F-2545
Kennedy	K-81D, K-81DD
Mueller Company	Centurion Model A-403

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 1, First Sentence, Page 1:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 1, Last Sentence, Page 1:**

**ADD:**

The AMI System shall be Badger Orion Cellular LTE Endpoint.

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 2, First Paragraph, Page 1:**

**DELETE:**

Registers shall be electronic pulser or electronic digital encoder with a permanent potted wire connection for the ERT unit.

**SUBSTITUTE:**

Registers shall be electronic pulser or electronic digital encoder with a permanent potted wire connection for the AMI or ERT unit.

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 2, Second Paragraph, First Sentence, Page 1:**

**DELETE:**

Meters shall be factory-wired and potted to a 5-foot long minimum wiring harness with a female, watertight, quick-connect terminal approved by Itron.

**SUBSTITUTE:**

Registers shall be factory-wired and potted to a 5-foot long minimum wiring harness with a female, watertight, quick-connect terminal approved by Itron.

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 2, Third Paragraph, First Sentence, Page 1:**

**DELETE:**

Each register shall be delivered preprogrammed to provide electronic readings for 8 dials, as appropriate for the brand of meter.

**SUBSTITUTE:**

Each register shall be delivered preprogrammed to provide electronic readings for up to 9 digits, as appropriate for the brand of meter.

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 2, Last Paragraph, First Sentence, Page 1:**

**DELETE:**

The register shall be compatible with Itron Model 100W series ERTs using Itron WYSIWYG ROCLs.

**SUBSTITUTE:**

The register shall be compatible with both Itron Model 100W series ERTs using Itron WYSIWYG ROCLs and Badger Orion Cellular LTE Endpoint.

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 3, Page 1:**

**DELETE:**

**3. REGISTER DIALS**

**SUBSTITUTE:**

**3. MECHANICAL REGISTER DIALS**

**Material Specification – 15 for Meter Registers and Register Boxes, Subparagraph 3, First Sentence, Page 1:**

**DELETE:**

Register dials shall be in accordance with AWWA C700, Table 4.

**SUBSTITUTE:**

Meter register dials shall be in accordance with AWWA C700, Table 4.

**Material Specification – 15 for Meter Registers and Register Boxes, Page 2:**

**DELETE:**

**5. Approved Manufacturers and Models**

<b>Manufacturers</b>	<b>Models</b>
Badger Meter, Inc.	HR-E
Mueller Systems – Hersey	Translator Encoder Register
Neptune Technology Group	ProCoder

**SUBSTITUTE:**

**5. Approved Manufacturers and Models**

<b>Manufacturers</b>	<b>Models</b>
Badger Meter, Inc.	HR-E
	HR-E LCD
Mueller Systems – Hersey	Translator Encoder Register
Neptune Technology Group	ProCoder

**Material Specification – 23 for Brass and Bronze Goods, Subparagraph 3, Page 2:**

**DELETE:**

In its entirety.

**SUBSTITUTE:**

Meter yokes shall be as follows:

<b>Manufacturers</b>	<b>Models</b>	<b>Copper Meter Setter Size (Inch)</b>
A.Y. McDonald	737-3xxWXCC xx	3/4
	737-4xxWXCC xx	1
	720-B612WWxx 660	1 1/2, Bypass
	721-612WNxx 660	1 1/2, No Bypass – IRR Meters
	720-B712WWxx 770	2, Bypass
	721-712WNxx 770	2, No Bypass – IRR Meters
The Ford Meter Box Company	V83-xxW-22-xx-NL	3/4
	V84-xxW-22-xx-NL	1
	VBB76-12B-xx-xx-NL	1 1/2, Bypass
	VBB76-12-xx-xx-NL	1 1/2, No Bypass – IRR Meters
	VBB77-12B-xx-xx-NL	2, Bypass
	VBB77-12-xx-xx-NL	2, No Bypass – IRR Meters
Mueller Company	B-2489N	3/4
	B-2489N	1
	B-2423N	1 1/2 and 2, Bypass
	B-2422-00N	1 1/2 and 2, No Bypass – IRR Meters

**Material Specification – 25 for Meter Pits, Domes, and Lids, Subparagraph 3, Subparagraph A, Second Sentence, Page 2:**

**DELETE:**

AMR

**SUBSTITUTE:**

AMR/AMI



**Material Specification – 25 for Meter Pits, Domes, and Lids, Subparagraph 4, Page 2:**

**DELETE:**

<b>Manufacturers</b>	<b>Models</b>
<b>Concrete Meter Pits</b>	
Copeland Precast, Inc.	
Oldcastle Precast	
Forterra Precast	
<b>Plastic Meter Pit – Potable</b>	
Carson Industries (Oldcastle Enclosure Solutions)	0024-48B Body B-W 2 MsHI (Denver Water)
Sigma Corporation	RMP202448-FB-DW
<b>Plastic Meter Pit – Nonpotable</b>	
Carson Industries (Oldcastle Enclosure Solutions)	0024-48B Body B-P 2 MsHI (Denver Water)
Sigma Corporation	RMP202448-FB-DW

**SUBSTITUTE:**

<b>Manufacturers</b>	<b>Models</b>
<b>Concrete Meter Pits</b>	
Copeland Precast, Inc.	
Oldcastle Precast	
Forterra Precast	
<b>Plastic Meter Pit – Potable</b>	
Carson Industries (Oldcastle Enclosure Solutions)	0024-48B Body B-W 2 MsHL (Denver Water)
Sigma Corporation	RMP202448-FB-DW
<b>Plastic Meter Pit – Nonpotable</b>	
Carson Industries (Oldcastle Enclosure Solutions)	0024-48B Body B-P 2 MsHL (Denver Water)
Sigma Corporation	RMP202448-FB-DW

**Material Specification – 29 for Mechanical Joint Restraint, Page 1:**

**DELETE:**

**Mechanical Joint Restraint**

**SUBSTITUTE:**

**Joint Restraints**

**Material Specification – 29 for Mechanical Joint Restraint, Subparagraph 5, Page 1:**

**DELETE:**

Romac

**SUBSTITUTE:**

Romac Industries

**Material Specification – 29 for Mechanical Joint Restraint, Subparagraph 5, Page 2:**

**DELETE:**

<b>Bell-Spigot Restraint – PVC Pipe</b>		
<b>Manufacturers</b>	<b>Models</b>	<b>Size (Inch)</b>
Diamond Plastics Corporation	Diamond Lok-21	4 to 20
EBAA Iron, Inc.	Series 1500 TD	4 to 12
	Series 1500	4 to 12
The Ford Meter Box Company	Ford 1390	4 to 20
JM Eagle	Eagle Loc 900	4 to 16
North American Pipe	C900/RJ	4 to 20
	C900/RJIB Certalok	6 to 12
SIP Industries	EZ Grip PTP	4 to 20
Sigma Corporation	PV-Lok PWP	4 to 20
Star Pipe Products	Series 1100	4 to 20

**SUBSTITUTE:**

<b>Bell-Spigot Restraint – PVC Pipe</b>		
<b>Manufacturers</b>	<b>Models</b>	<b>Size (Inch)</b>
Diamond Plastics Corporation	Diamond Lok-21	4 to 20
EBAA Iron, Inc.	Series 1500 TD	4 to 12
	Series 1500	4 to 12
	Series 2800	14 to 20
The Ford Meter Box Company	Ford 1390	4 to 20
JM Eagle	Eagle Loc 900	4 to 16
North American Pipe	C900/RJ	4 to 20
	C900/RJIB Certalok	6 to 12
Romac Industries	ALPHA Coupling, Flange Coupling, and End Cap	4 to 12
SIP Industries	EZ Grip PTP	4 to 20
Sigma Corporation	PV-Lok PWP	4 to 20
Star Pipe Products	Series 1100	4 to 20

**Material Specification – 29 for Mechanical Joint Restraint, Subparagraph 5, Page 3:**

**DELETE:**

<b>Bell-Spigot Restraint – DI Pipe</b>		
<b>Manufacturers</b>	<b>Models</b>	<b>Size (Inch)</b>
American	Fast-Grip Gasket	4 to 20
	Flex-Ring Joint	4 to 20
EBAA Iron, Inc.	Megalug 1700 Series	4 to 20
	Series 1500 TD	4 to 12
The Ford Meter Box Company	UFR Series 1455	4 to 20
Gripper Gasket LLC	Boltless Restraint	3 to 20
McWane Ductile	Sure Stop 350	4 to 20
Sigma Corporation	One-Lok SLDEH Series	3 to 20
Star Pipe Products	StarGrip 3100P Series	3 to 20
U. S. Pipe and Foundry Company	Field Lok Gasket	4 to 20
	TR Flex	4 to 20

**SUBSTITUTE:**

<b>Bell-Spigot Restraint – DI Pipe</b>		
<b>Manufacturers</b>	<b>Models</b>	<b>Size (Inch)</b>
American	Fast-Grip Gasket	4 to 20
	Flex-Ring Joint	4 to 20
EBAA Iron, Inc.	Megalug 1700 Series	4 to 20
	Series 1500 TD	4 to 12
The Ford Meter Box Company	UFR Series 1455	4 to 20
Gripper Gasket LLC	Boltless Restraint	3 to 20
McWane Ductile	Sure Stop 350	4 to 20
Romac Industries	ALPHA Coupling, Flange Coupling, and End Cap	4 to 12
Sigma Corporation	One-Lok SLDEH Series	3 to 20
Star Pipe Products	StarGrip 3100P Series	3 to 20
U. S. Pipe and Foundry Company	Field Lok Gasket	4 to 20
	TR Flex	4 to 20

The administration of these Standards, including the interpretation, enforcement, revision, waiver, and variance thereof, is hereby delegated by the CEO/Manager to the Chief Engineering Officer or the Chief’s appointed representative.

A variance request must be submitted to the Sales Administration Section and forwarded to the Chief Engineering Officer, or the Chief’s appointed representative, for review.

A PDF version of the Errata 1 revisions can be found at:

<https://www.denverwater.org/contractors/construction-information/design-standards/engineering-standards/>

Please contact Maddie Spinner at Maddie.Spinner@denverwater.org with any questions regarding these changes.

End of Memorandum