

# The City of Fair Oaks Ranch

## Material Standard Specifications for Water and Sanitary Sewer Construction



January 2019

## **MISSION STATEMENT**

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**THE MISSION OF THE CITY OF FAIR OAKS RANCH IS TO MAINTAIN AND ENHANCE THOSE QUALITY OF LIFE FACTORS WHICH INFLUENCED THE CITIZENS TO ESTABLISH A RESIDENCE WITHIN THE CITY, INCLUDING USE AND ACCESS TO WATER AND WATERSERVICES.**

THE STANDARD SPECIFICATIONS AND DRAWINGS ARE PROVIDED AS A TECHNICAL RESOURCE FOR ENGINEERING PROFESSIONALS FOR USE IN DESIGN AND CONSTRUCTION OF WATER AND WASTEWATER PROJECTS MANAGED AND CONTRACTED BY FAIR OAKS RANCH. AS DESIGN PROFESSIONALS, THEY ASSUME RESPONSIBILITY FOR SELECTION, REFERENCE, AND APPROPRIATE APPLICATION OF THESE RESOURCES. THE STANDARD SPECIFICATIONS AND STANDARD DRAWINGS OFFERED HERE CAN BE AUGMENTED BY SUPPLEMENTAL SPECIFICATIONS AND MODIFIED DETAILS PRODUCED BY THE ASSIGNED OR CONTRACTED DESIGN PROFESSIONAL AND APPROVED BY FAIR OAKS RANCH. FAIR OAKS RANCH ACCEPTS NO LIABILITY FOR USE OF THESE RESOURCES. ANY PERSON MAKING USE OF THE INFORMATION CONTAINED IN THESE FILES SHALL BE SOLELY RESPONSIBLE FOR THEIR USE. THESE FILES ARE NOT INTENDED AS A SUBSTITUTE FOR THE PROFESSIONAL JUDGEMENT OF A DESIGN PROFESSIONAL. FOR REFERENCE, WE HAVE INCLUDED UNEDITED SPECIFICATIONS FROM THE CITY OF SAN ANTONIO.

AT ANY TIME, THESE SPECIFICATIONS AND DRAWINGS MAY BE ALTERED OR SUPERSEDED BY THE GENERAL CONDITIONS, SPECIFIC CONDITIONS, OR DRAWINGS WITHIN THE BID DOCUMENTS ISSUED FOR EACH PROJECT.

**ALL “APPROVED EQUAL” PARTS AND MATERIALS SHALL BE DIRECTLY IN ACCORDANCE WITH FAIR OAKS RANCH’ MATERIAL SPECIFICATIONS. NO OUTSIDE MANUFACTURERS WILL BE USED UNLESS DIRECTLY SPECIFIED IN THE CONTRACT DOCUMENTS.**

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# **Fair Oaks Ranch Material Standard Specifications**

05-11A

## **SPECIFICATIONS FOR DUCTILE IRON PIPE**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers 3" through 64" ductile-iron pipe, centrifugally cast, for water or other liquids, with push-on or mechanical joints. All pipe furnished shall be in conformance with ANSI/AWWA Standard C151/A21.51.91, or latest revision thereof.

### **2. GENERAL REQUIREMENTS**

- a) All pipes shall conform to the following pressure classes, based upon Type 3 bedding conditions, a depth of bury of 6 feet, and a working pressure of 150 pounds per square inch:

|                 |         |
|-----------------|---------|
| 3" through 12"  | 350 psi |
| 16" and 20"     | 250 psi |
| 24"             | 200 psi |
| 30" through 64" | 150 psi |

- b) Dimensions and tolerances for each nominal pipe size shall be in accordance with Table 51.5 (push-on) or Table 51.5 (mechanical joint) of AWWA Standard C151 for pipe with a nominal laying length of 20 feet.
- c) All pipes shall have an interior cement mortar lining applied in accordance with ANSI/AWWA C104/A21.4, latest revision. No asphaltic coating will be required on the interior cement mortar lining. Air Piping shall not be lined. Ductile Iron pipe used for sanitary sewer applications must include interior lining per 05-11B.
- d) Exterior coating shall consist of a nominal one-mil thick asphaltic material applied to the outside of the pipe as described in Section 51.8 of AWWA C151.
- e) All rubber joint gaskets utilized on ductile-iron pipe shall be conformance with ANSI/AWWA C111/A21.11 Standard, latest revision.

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- f) Each length of pipe furnished shall bear identification markings in conformance with Sec. 51.10 of AWWA Standard C151.
  - g) The manufacturer shall take adequate measures during pipe production to assure compliance with AWWA C151 by performing quality-control tests and maintaining results of those tests as outlined in Sec 51.14 of that Standard.
- 3. The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject random lengths of pipe for testing by an independent laboratory for compliance with this specification. Any visible defects or failure to meet the quality standards herein will be grounds for rejecting the entire order.
- 4. The attached manufacturer product list identifies approved products.

### **APPROVED MANUFACTURERLIST**

American Griffin  
U.S. Pipe Company  
Clow Water Systems Company Atlantic  
States Cast Iron Pipe Company Pacific  
States Cast Iron Pipe Company McWane  
Cast Iron Pipe Company

### **PreviousSpecification**

SEPTEMBER 1999  
MARCH 2004  
DECEMBER 2011

## **Fair Oaks Ranch Material Standard Specifications**

05-11B

### **SPECIFICATIONS FOR SEWER DUCTILE IRON PIPE AND FITTINGS WITH CALCIUM ALUMINATE MORTAR LINING**

**REVISED JANUARY 2019**

#### **DESCRIPTION**

This item shall consist of Ductile Iron Pipe and fittings with calcium aluminate mortar lining sewer installation in accordance with these specifications and as directed by the Engineer.

#### **MATERIAL**

1. **Pipe**: The pipe shall ductile iron in accordance with AWWA C151 for forced main applications. The pipe shall be ductile iron in accordance with ASTM A 746 for gravity main applications.
2. **Joints and Fittings**:
  - a) **Joints**:  
Joints shall push-on joints or mechanical joints in accordance with AWWA C111.
  - b) **Fittings**: Fittings shall be ductile iron at least Class 54 thickness and in accordance with the requirements of AWWA C110. Joints for fittings shall be mechanical joints and shall conform to AWWA C111. Fittings shall be SewperCoat lined and coated with bituminous paint.
3. **Thickness**: The thickness of ductile iron pipe shall be determined by considering the trench load and internal pressure separately in accordance with AWWA C150.
4. **Approved Manufacture Linings**: All pipe and fittings shall be lined with SewperCoat as manufactured by Lafarge Calcium Aluminates, factory installed Protecto 401 Ceramic Epoxy Lining by Enduron or American Polybond Plus (fusion bonded epoxy and fusion bonded polyethylene) or approved equal.

SewperCoat is a calcium aluminate mortar made off used calcium aluminate cement and fused calcium aluminate aggregates. The thickness of the lining shall be as a minimum, double the on thickness of the standard thickness as identified AWWA C104, Sec. 4.8, paragraph 4.8.1. The lining thickness may taper to less than the specified minimum at the ends of the pipe per AWWA C104, Sec 4.8, paragraph 4.8.3. Cracks, other than closed hairline cracks and/or fine crazing, shall not be acceptable. Loose areas of cement lining

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are not allowable. A seal coat shall be applied to the lining as identified on AWWA C104, Sec. 4.11.

The use of Protecto 401 Ceramic Epoxy lining primers, applications, and thicknesses shall be in accordance with manufacturer's recommendations for sanitary sewer applications, but shall not be less than 40 mils.

5. **Coating**: All pipe and fittings shall be coated as identified below:

- a) **Outside Coating**: The outside coating shall be a minimum of 1 mil bituminous paint according to AWWA C151, Sec. 4.3. Prior to lining, the exterior and interior of the spigot end, including the spigot face, shall be coated with a minimum of 8 mils of epoxy.
- b) **Inside Coating**: Before lining, the inside of the socket, including a portion of the gasket cavity and a portion of the pipe barrel, shall be coated with a minimum of 8 mils of epoxy.

### **APPROVED MANUFACTURES LIST**

Griffin Pipe

### **Previous Specification Date:**

APRIL 1999

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

05-12

## **SPECIFICATIONS FOR C-900 POLYVINYL CHLORIDE (PVC)**

### **PRESSURE PIPE, 4-INCH THROUGH 36-INCH**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This product specification covers 4" through 36" diameter polyvinyl chloride (PVC) pressure pipe made from class 1245A or 1245B compounds as determined by ASTM Standard D1784 and providing for a hydrostatic test basis (HDB) of 4,000 psi. All pipe furnished shall be in conformance with AWWA Standard C900, or latest revision thereof.

Pipe shall be homogenous throughout. It shall be free from voids, cracks, inclusions, and other defects. It shall be as uniform as commercially practical in color, density, and other physical properties. Pipe surfaces shall be free from nicks and scratches. Joining surfaces of spigots and joints shall be free from gouges and imperfections that could cause leakage.

#### **2. DEFINITIONS**

All definitions are defined according to AWWA C900-16 Section 3.0 Definitions.

- a) Dimension Ratio (DR) – The ratio of a pipe's specified average OD to its specified minimum wall thickness.
- b) Pressure Class (PC) – The internal working pressure design capacity of a pipe, coupling or fitting, in pounds per square inch (psi) per Tables 1A and 1B in AWWA C900-16 Section 4.3, at sustained service temperatures of 73.4 degrees Fahrenheit (23 degrees Celsius) and lower. The method for determining PC is stated in AWWA C900-16 Section 4.7.1.

#### **3. GENERAL REQUIREMENTS**

- a) Except as noted on the plans or procurement specifications for specific jobs, all C900 PVC pipe shall be Class 165 (DR 25) having a sustained pressure requirement of 350 psi (ASTM D2241) and a minimum burst pressure of 535 psi (ASTM D1599). C900 PVC pipe installed in the High Pressure Zone shall be Class 305 (DR 14) having a sustained pressure requirement of 650 psi (ASTM D1598) and a minimum burst pressure of 985 psi (ASTM D1599).

## **Fair Oaks Ranch Material Standard Specifications**

- b) Dimensions and tolerances for each nominal pipe sizes shall be in accordance with Section 4.3, Table 1A and Table 1B of AWWA Standard C900.

PVC C909 pipe meeting requirements of AWWA C909-16 is acceptable in specific design scenarios such as tight spaces or high pressures where the larger ID of the C909 pipe prevents the need for a diameter upsize and will be reviewed/accepted by the City on a case-by-case basis.

- c) Pipe shall be furnished in standard laying lengths of 20 feet (plus or minus one inch) unless otherwise noted. Each pipe shall have an integral bell formed on the pipe end and be designed to be at least as strong as the pipe wall (ASTM D2472).
- d) An elastomeric gasket shall be designed with a retainer ring, which "locks" the gasket into integral bell groove and shall be installed at the point of manufacturer. The dimensions and design of the gasket joint provided for the PVC transmission pipe shall meet requirements provided in ASTM D3139 and ASTM D2122. Gasket shall be in conformance with ASTM F477.
- e) Each length of pipe furnished shall bear identification markings in conformance with Section 6.1 of AWWA Standard C900.
- f) Pipe shall be bundled in pallets for ease of handling and storage. Pipe bundles (units) shall be packaged to provide structural support to ensure that the weight of upper units shall not cause deformation to pipe in lower units. No pipes bundles shall be accepted which show evidence of ultraviolet radiation "sunburn" on exposed pipe as may be caused from extended unprotected storage conditions.
- g) The manufacturer shall take adequate measures during pipe production to assure compliance with AWWA C900 by performing quality-control tests and maintaining results of those tests as outlined in Section 5 of that Standard. Submission of product shall constitute certification of compliance with this standard.
- h) The pipe is intended for use as an underground, direct bury pressure pipe for transport of potable water. The expected life of the pipe system, after installation, is 25 to 50 years.
- i) A one-year warranty shall be provided for all materials sold and delivered for use and incorporated into the Fair Oaks Ranch water distribution system. Such warranty shall take effect on the date that the

## **Fair Oaks Ranch Material Standard Specifications**

pipe is received and accepted by an authorized representative of the City of Fair Oaks Ranch.

- j) User references and a claims history shall be provided for further investigation, prior to rendering a final decision on the acceptance of the product to be furnished.

### **4. TESTS**

The manufacturer shall pressure test all pipe, including the joint, that is marked with the designation number of AWWA C900-16 at 73.4 Deg. F. +/- 3.6 Deg. F. (23 Deg. C. +/- 2 Deg. C.). Each length of pipe shall be proof tested at twice the pressure class as listed in Table 2 Pressure-test Requirements of AWWA C900-16 Sec. 4.3.3 Physical properties.

### **5. RANDOM TESTS**

The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject random lengths of pipe to testing by an independent laboratory for compliance with this specification. Any visible defect of failure to meet the quality standards herein will be grounds for rejecting the entire order.

### **6. REFERENCES**

The documents listed below are referenced in this specification.

- a) AWWA C900-16; Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm)
- b) ASTM D1784; Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
- c) ASTM D2122; Standard Method of Determining Dimensions of Thermoplastic Pipe and Fittings.
- d) An elastomeric gasket shall be designed with a retainer ring, which "locks" the gasket into integral bell groove and shall be installed at the point of manufacturer. Gasket shall be in conformance with ASTM F477.
- e) ASTM D3139; Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
- f) ASTM F477; Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

## **Fair Oaks Ranch Material Standard Specifications**

### **7. APPROVED MANUFACTURERS**

The attached manufacturer's product list identifies approved products.

#### **APPROVED MANUFACTURER LIST**

##### **Manufacturer (4-12in pipe)**

|                                 |                     |
|---------------------------------|---------------------|
| PW Eagle                        | C900 PVC            |
| J-M Manufacturing Company       | C900 PVC            |
| CertainTeed Corporation         | C900 PVC            |
| Diamond Plastics Corporation    | C900 PVC Lok-21 PVC |
| North American Pipe Corporation | C900 PVC            |
| VinylTech Corporation           | C900 PVC            |
| JM Eagle                        | C900 PVC, C909 PVC  |
| Northern Pipe Products, Inc.    | C900 PVC            |
| Underground Solutions           | Fusible C900 PVC    |
| Pipeline Jet Stream             | C900 PVC            |

##### **Manufacturer (14-36in pipe)**

|                                 |                     |
|---------------------------------|---------------------|
| Diamond Plastics Corporation    | C900 PVC Lok-21 PVC |
| North American Pipe Corporation | C900 PVC            |
| JM Eagle                        | C900 PVC            |
| Northern Pipe Products, Inc.    | C900 PVC            |

#### **Previous Specification**

FEBRUARY 1999  
APRIL 2004  
OCTOBER 2005  
JANRUARY 2008  
DECEMBER 2011  
MARCH 2012

# **Fair Oaks Ranch Material Standard Specifications**

05-13

## **LARGE DIAMETER PIPE**

### **SPECIFICATION FOR CLOSED PROFILE PVE SEWER PIPE AND FITTINGS**

**REVISED JANUARY 2019**

#### **DESCRIPTION**

This item covers the requirements for PVC close profile sewer pipe and fittings with integral bell and elastomeric seal joints or plain end pipe with couplings in sizes 18-inch to 60-inch based on control inside diameter.

#### **MATERIAL**

1. **Pipe:** The pipe shall comply with all the minimum requirement of ASTM F 1803. The pipe shall be PVC plastic having a minimum cell classification of 12454C or 12364C as defined in ASTM D 1784.
2. **Joints and Connections:**
  - a) **Joints:**  
Elastomeric seals pipe joints shall conform to ASTM F 477.
  - b) **Connections:**  
Connecting secondary lines to the closed profile sewer pipe shall be by structure only. Connection to the structure shall be as recommended by the pipe manufacturer instructions.
  - c) **Field Cut Connections:**  
If the profile structure of the pipe is exposed during the cutting process, a Field Sealing Kit by the pipe manufacture shall be used.
3. **Fittings:** The fittings shall be PVC plastic having a minimum cell classification of 12454C or 12364C as defined in ASTM D 1784.
4. **Thickness:** The minimum wall thickness of pipe and fittings shall meet the requirements given in Table 1, ASTM F 1803 when measured in accordance to ASTM D 2122.
5. **Pipe Stiffness:** The pipe stiffness at 5% deflection datum in accordance with ASTM D 2412. The pipe stiffness shall equal or exceed 46psi.

## **Fair Oaks Ranch Material Standard Specifications**

### **CERTIFICATION**

1. As a basis of acceptance the manufacturer shall provide a independent certification which consist of a copy of the manufacturer's test report and accompanied by a copy of the test results that the pipe and fittings have been sampled, tested, and inspected in accordance with the provisions of the specification of ASTM D 1803 and meets all requirements.

### **FINAL ACCEPTANCE TESTING**

- a) The installation shall be tested for infiltration or exfiltration, and deflection as specified below:
- b) Infiltration or exfiltration shall be tested as specified in Fair Oaks Ranch Standard Specifications for Construction, Item No. 849, Air and Deflection Testing.
- c) Deflection testing shall be tested as specified in Fair Oaks Ranch Standard Specifications for Construction, Item No. 849, Air and Deflection Testing.

### **APPROVED MANUFACTURES LIST**

Lamson Vylon Pipe  
Vylon Pipe

### **Previous Specification**

MAY 1992  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

05-14

## **SPECIFICATIONS FOR LARGE DIAMETER CORRUGATED**

### **PVC SEWER PIPE & FITTINGS**

**REVISED JANUARY 2019**

#### **DESCRIPTION**

This item shall cover requirements for PVC corrugated profile sewer pipe with smooth interior and fittings with integral bell and elastomeric seals joints or plain end pipe with couplings in sizes 4-inch to 36-inch based on control inside diameter.

#### **MATERIAL**

1. Pipe: The pipe shall comply with all the minimum requirements of ASTM F 949. The pipe shall be PVC plastic having a minimum cell classification of 12454 or 13343 as defined in ASTM D 1784.
2. Fittings: The fittings shall comply with all the minimum requirements of ASTM F 949. The fittings shall be PVC plastic having a minimum cell classification of 12454 or 13343 as defined in ASTM D 1784.
- 2.1 Joints: Elastomeric seals pipe joints shall conform to ASTM F 477. Minimum joint tightness shall be 10.8 psi at 5% deflection datum in accordance with ASTM D 3212.
3. Thickness: The minimum wall thickness of pipe and fittings shall meet the requirements given in Table 1, ASTM F 949 when measured in accordance to ASTM D 2122.
4. Pipe Stiffness: The pipe stiffness at 5% deflection datum in accordance with ASTM D 2412 shall equal or exceed 46psi for pipe depths less than 14-feet. For sewer pipe 14-feet and deeper, the pipe stiffness at 5% deflection datum in accordance with ASTM D 2412 shall equal or exceed 115 psi.

#### **CERTIFICATION**

1. As a basis of acceptance, the manufacturer shall provide an independent certification which consists of a copy of the manufacturer's test report and accompanied by a copy of the independent test results that the pipe and fittings have been sampled, tested and inspected in accordance with provisions of the specifications of ASTM F 949 and meets all requirements.
2. Pipe specified is not to be used Edwards Aquifer Recharge Zone.

## **Fair Oaks Ranch Material Standard Specifications**

### **FINAL ACCEPTANCE TESTING**

1. The installation shall be tested for infiltration or exfiltration, and deflection as specified below.
2. Infiltration or exfiltration shall be tested as specified in Fair Oaks Ranch Standard Specifications for Construction, Item No. 849, Air and Deflection Testing.

### **APPROVED MANUFACTURERS LIST**

| <u>Manufacturer</u>                | <u>Model</u>                                |
|------------------------------------|---------------------------------------------|
| Contech Construction Products Inc. | A-2000 Pipe<br>A-2026 Pipe<br>A2 Liner Pipe |

### **Previous Specification Date:**

JUNE 2002  
AUGUST 2004  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

05-15

## **SPECIFICATIONS FOR SCHEDULE 80 POLYVINYL CHLORIDE**

### **(PVC) PRESSURE PIPE, 1/2-INCH THROUGH 3-INCH**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This product specification covers 1/2" through 3" diameter Schedule 80 polyvinyl chloride (PVC) pressure pipe conforming to ASTM D1785, Type 1, Grade 1, rigid, plasticized PVC, normal impact, bearing NSF seal.

Pipe shall be homogenous throughout. It shall be free from voids, cracks, inclusions, and other defects. It shall be as uniform as commercially practical in color, density, and other physical properties. Pipe surfaces shall be free from nicks and scratches. Joining surfaces of spigots and joints shall be free from gouges and imperfections that could cause leakage.

#### **2. GENERAL REQUIREMENTS**

- a) All schedule 80 pipe shall be ASTM D1785, Type 1, Grade 1, rigid, plasticized PVC, normal impact, bearing NSF seal.
- b) Fittings: 3-inch and larger shall be ductile iron and conforming to AWWA C110 or AWWA C153. Fittings for piping smaller than 3 inches shall be schedule 80 PVC in accordance with ASTM D2466.
- c) Domestic water piping shall be approved by the Underwriters Laboratory and shall be accepted by the State Fire Insurance Commission for use in water distribution systems. PVC water pipe shall bear the seal of approval (or "NSF" mark) of the National Sanitation Foundation Testing Laboratory for potable water pipe.
- d) The maximum allowable load for PVC pipe installations shall produce a maximum deflection of 4 percent.
- e) Make service connections in accordance with AWWA Manual M23 "PVC Pipe - Design and Installation" and the instructions from the Manufacturer. Use a service clamp or saddle to connect 2-inch and smaller services to PVC pipe sizes 4 to 12 inches. Use a ductile iron tapped tee to connect 3-inch service connections.
- f) For pipe 2 inches in diameter and smaller, joints shall be glued. For pipe larger than 2 inches in diameter, joints shall be bell and spigot

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push-on type as specified in ASTM D3139. An elastomeric gasket shall be designed with a retainer ring, which "locks" the gasket into integral bell groove and shall be installed at the point of manufacturer. The dimensions and design of the gasket joint provided for the PVC transmission pipe shall meet requirements provided in ASTM D3139 and ASTM D2122. Gasket shall be in conformance with ASTM F477.

- g) Pipe shall be bundled in pallets for ease of handling and storage. Pipe bundles (units) shall be packaged to provide structural support to ensure that the weight of upper units shall not cause deformation to pipe in lower units. No pipes bundles shall be accepted which show evidence of ultraviolet radiation "sunburn" on exposed pipe as may be caused from extended unprotected storage conditions.
- h) The pipe is intended for use as an underground, direct bury pressure pipe for transport of potable water (service connections only). The expected life of the pipe system, after installation, is 25 to 50 years.
- i) A one-year warranty shall be provided for all materials sold and delivered for use and incorporated into the Fair Oaks Ranch water distribution system. Such warranty shall take effect on the date that the pipe is received and accepted by an authorized representative of the City of Fair Oaks Ranch.
- j) User references and a claims history shall be provided for further investigation, prior to rendering a final decision on the acceptance of the product to be furnished.
- k) Schedule 80 PVC pipe shall follow the minimum design pressure and joint type listed below for the given application.

| Service                                         | Diameter<br>(in.) | Type     | Min. Design<br>Pressure | Joint Type |           |
|-------------------------------------------------|-------------------|----------|-------------------------|------------|-----------|
|                                                 |                   |          |                         | Buried     | Exposed   |
| Water, Wastewater,<br>or Sludge                 | 0-2               | Sched.80 | 300 psi                 | SW or THD  |           |
|                                                 | 2-1/2, 3          | Sched.80 | 300 psi                 | PO         | SW or THD |
| Chemicals                                       | 0-6               | Sched.80 | 250 psi                 | SW         | SW        |
| SW - Solvent Weld, THD – Threaded, PO - Push-On |                   |          |                         |            |           |

## **Fair Oaks Ranch Material Standard Specifications**

### **3. TESTS**

The manufacturer shall pressure test all pipe.

### **4. RANDOM TESTS**

The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject random lengths of pipe to testing by an independent laboratory for compliance with this specification. Any visible defect of failure to meet the quality standards herein will be grounds for rejecting the entire order.

### **5. REFERENCES / STANDARDS**

The documents/standards listed below are referenced in this specification. PVC piping and fittings shall be in full compliance with the applicable standards and specifications for each type of plastic pipe involved. Pipe may be rejected for failure to comply with any requirement of this Section.

- a) ASTM D1784; Standard Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
- b) ASTM D1785; Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, 120.
- c) ASTM D2464; Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- d) ASTM D2467; Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
- e) ASTM D2855; Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets
- f) An elastomeric gasket shall be designed with a retainer ring, which "locks" the gasket into integral bell groove and shall be installed at the point of manufacturer. Gasket shall be in conformance with ASTM F477.
- g) ASTM D3139; Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
- h) ASTM F477; Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

## **Fair Oaks Ranch Material Standard Specifications**

- i) ASTM F1674; Standard Test Method for Joint Restraint Products for Use with PVC Pipe

### **6. APPROVED MANUFACTURERS**

The attached manufacturer's product list identifies approved products.

#### **APPROVED MANUFACTURER LIST**

| <b><u>Manufacturer</u></b>      | <b><u>Type</u></b> |
|---------------------------------|--------------------|
| PW Eagle                        | Schedule 80 PVC    |
| J-M Manufacturing Company       | Schedule 80 PVC    |
| CertainTeed Corporation         | Schedule 80 PVC    |
| Diamond Plastics Corporation    | Schedule 80 PVC    |
| North American Pipe Corporation | Schedule 80 PVC    |
| VinylTech Corporation           | Schedule 80 PVC    |
| JM Eagle                        | Schedule 80 PVC    |
| Northern Pipe Products, Inc.    | Schedule 80 PVC    |
| Underground Solutions           | Schedule 80 PVC    |
| Pipeline Jet Stream             | Schedule 80 PVC    |

# **Fair Oaks Ranch Material Standard Specifications**

05-30

## **SPECIFICATION FOR STEEL WATERPIPE**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers steel pipe 4-inches and larger in size and manufactured for the purpose of conveying water.

### **2. GENERAL REQUIREMENTS**

#### **A. Quality Assurance**

Commercial Standards: (All manufacturing tolerances referenced in the below standards apply unless specifically excluded).

ANSI/AWWA C-200 Standard for Steel Water Pipe 6 Inches and Larger

ANSI/AWWA C-205 Standard for Cement-Mortar Protective Lining and Coating for Steel Water Pipe- 4 in. and Larger-Shop Applied

ANSI/AWWA C-206 Standard for Field Welding of Steel Water Pipe

ANSI/AWWA C-207 Standard for Steel Pipe Flanges for Water Works Service, 4" - 144"

ANSI/AWWA C-208 Standard for Dimensions for Fabricated Steel Water Pipe Fittings

ANSI/AWWA C-209 Standard for Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines

ANSI/AWWA C-210 Standard for Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines

ANSI/AWWA C-214 Standard for Tape Coating Systems for the Exterior of Steel Water Pipelines

ANSI/AWWA C-216 Standard for Heat -Shrinkable Cross-Linked Polyolefin Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines

ANSI/AWWA C-218 Standard for Coating the Exterior of Aboveground Steel Water Pipelines and Fittings

## **Fair Oaks Ranch Material Standard Specifications**

ANSI/AWWA C-219 Standard for Bolted Sleeve-Type Couplings for Plain-End Pipe

ANSI/AWWA C-222 Standard for Polyurethane Coatings for the Interior and Exterior of Steel Water Pipelines and Fittings

AWWA M-11 Steel Pipe - A guide for Design and Installation

ASTM A 106 Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.

ASTM A 53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless

ASTM E 165 Method for Liquid Penetrant Examination ASTM E 709 Guide for Magnetic Particle Examination ASME Section V Nondestructive Testing Examination ASME Section IX Welding and Brazing Qualification.

AWS B2.1 Standard for Welding Procedure and Welding Qualifications.

### **B. Qualifications**

1. Manufacturers who are fully experienced, reputable, and qualified in the manufacture of the products to be furnished shall furnish all Steel pipe and fittings. The pipe and fittings shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.
2. Pipe shall be the product of one manufacturer that has not less than five (5) years successful experience manufacturing pipe in the United States of the particular type and size indicated. All pipe manufacturing including cylinder production, lining, coating and fittings shall be produced by one manufacturer. The pipe manufacturer must have a certified quality assurance program. This certified program shall be ISO 9001: 2000 or other equivalent nationally recognized program.

## **2. MATERIALS**

### **A. Pipe**

1. Steel pipe with nominal diameters from 4-inch to 20-inch shall conform to ASTM A 106, A 53 Grade B or A 139 Grade B standard weight class as the minimum.
2. Steel Pipe greater than 20-inches shall conform to AWWA C200 and AWWA M-11 except as modified herein or as required by the engineer for special circumstances.

## **Fair Oaks Ranch Material Standard Specifications**

3. Pipe shall be designed for a minimum of 150 psi working pressure with an additional 50% of the working pressure allowance for surge pressure unless otherwise specified. Pipe design shall be in accordance with AWWA M-11.
4. Pipe shall be designed to cover conditions as shown on the plans. The design for deflection shall be in accordance with AWWA M-11.

Use of an enhanced /better soil backfill to limit deflection will be allowed with approval by the engineer. (Criteria will be based on AWWA M-11)

5. Pipe for use with sleeve-type couplings shall have plain ends at right angles to the axis.
6. Pipe is to be furnished in joint lengths up to 50 ft. net laying lengths with special lengths, field trim pieces and closure pieces as required by plan and profile for location of elbows, tees, reducers and other in- line fittings. The pipe fabricator shall prepare a pipe-laying schedule showing the location of each piece by mark number with station and invert elevation at each bell end.

### **B. Fittings**

1. Unless otherwise shown on the Plans, all specials and fittings shall conform to the dimensions of AWWA Standard C208. Pipe material used in fittings shall be of the same material and thickness as the pipe. The minimum radius of elbows shall be 2.5 times the pipe diameter and the maximum miter angle on each section of the elbow shall not exceed  $11\frac{1}{4}$  degrees (One cut elbow up to  $22\frac{1}{2}$  deg.). If elbow radius is less than  $2.5 \times$  pipe diameter, stresses shall be checked per AWWA M-11 and wall thickness or yield strength increased if necessary. Fittings shall be equal in pressure design strength. Specials and fittings, unless otherwise shown on the Plans, shall be made of segment ally welded sections from hydrostatically tested pipe, with ends compatible with the type of joint or coupling specified for the pipe. All welds made after hydrostatic testing of the straight sections of pipe shall be checked per the requirements of AWWA C-200 Section 5.2.2.1

### **C. Joints**

1. Rolled-Groove Rubber Gasket Joint: the standard joint shall be rolled-groove rubber gasket joint unless otherwise noted on the plans. Rolled-grooved rubber gasket joints shall conform to AWWA C200 Standard and as shown in Chapter 8 of AWWA M-11.

The o-ring rubber gasket shall have sufficient volume to approximately fill the area of the groove and shall conform to AWWA C200.

## **Fair Oaks Ranch Material Standard Specifications**

The joint shall be suitable for a safe working pressure equal to the class of pipe furnished and shall operate satisfactorily with a deflection angle, the tangent of which is not to exceed  $1.00/D$  where D is the outside diameter of the pipe in inches with a pull-out of 1 inch.

Rolled-Groove Rubber Gasket Joints may be furnished only by a manufacturer who has furnished pipe with joints of similar design for comparable working pressure. Pipe diameter, pipe length, and wall thickness that has been in successful service for a period of at least 5 years.

2. Lap weld: Lap field welded joints shall be used where tied joints are indicated on the plans. The standard bell shall provide for a 2 1/2-inch lap. The minimum lap shall be 1 inch. The design maximum joint deflection or offset shall be a 1" joint pull.
3. Mechanical Couplings: Mechanical couplings where indicated on the plans shall be Smith Blair Style 411, Baker Style 200, Brico Depend-O-Loc or equal. Insulating mechanical couplings where indicated on the plans shall be double insulated Smith Blair Style 416, Baker Style 216, or equal. Mechanical couplings shall be rated to meet or exceed the working pressures and surge pressure of the pipe.

Couplings for buried service shall have all metal parts painted with Epoxy paint and conform to AWWA C219.

Pipe ends for mechanical couplings shall conform to AWWA C200 and M-11. The shop applied outside coating shall be held back as required for field assembly of the mechanical coupling or to the harness lugs or rings. Harness lugs or rings and pipe ends shall be painted with one shop coat of epoxy conforming to AWWA C210. The inside lining shall be continuous to the end of the pipe.

### **D. Flanges**

1. Flanges shall be in accordance with AWWA C207 Class D for operating pressures to 175 psi on 4 inch through 12 inch diameter, and operating pressures to 150 psi on diameters over 12 inches; or Flanges shall be AWWA C207 Class E for operating pressures up to 275 psi; or Flanges shall be AWWA C207 Class F for pressures to 300 psi. (drilling matches ANSI B 16.5 Class 250) Shop lining and coating shall be continuous to the end of the pipe or back of the flange. Flange faces shall be shop coated with a soluble rust preventive compound.
2. Gaskets: Full face, 1/8-inch thick, cloth-inserted rubber, Garlock 3000, John Crane Co. Style 777 or equal.

## **Fair Oaks Ranch Material Standard Specifications**

### **3. Bolts and Nuts for Flanges**

- a) Bolts for flanges located indoors and in enclosed vaults and structures shall be carbon steel, ASTM A307, Grade B for class B and D flanges and nuts shall be ASTM A563, Grade A heavy hex. Bolts for class E and F flanges shall be ASTM A 193 grade B7 and nuts shall be ASTM A194, grade 2 H, heavy hex.
- b) Bolts for buried and submerged flanges and flanges located outdoors above ground or in open vaults in structures shall be TYPE 316 stainless steel conforming to ASTM A193, Grade B8M, Class 1 for class B and D Flanges with ASTM 194, Grade 8M nuts. For Class E and F flanges the bolts shall be ASTM A194 grade 2H nuts with bolt and nuts to be zinc plated in accordance with ASTM B633

### **E. Linings and Coatings**

#### **1. Polyethylene Tape Coating**

- a) Prefabricated Multi-layer Cold Applied Tape Coating - the coating system for straight-line pipe shall be in accordance with AWWA Standard C214. The system shall consist of three layers of polyethylene material with a nominal thickness of 80 mills when complete.
- b) Coating Repair - Coating repair shall be made using tape and primer conforming to AWWA Standard C209, Type II. The tape and primer shall be compatible with the tape system used for straight-line pipe.
- c) Coating of Fittings, Specials and Joints
  - 1. General – Fittings, specials and joints which cannot be machine coated in accordance with above, shall be coated in accordance with AWWA Standard C209. Prefabricated tape shall be Type II and shall be compatible with the tape system used for straight-line pipe. The system shall consist of 3 layers consisting of the following: Alternate coating methods for fittings specials and field joints would be Shrink sleeves per C- 216, or paint per C-210, C-218, or C-222. The field coating shall completely encapsulate the joint bonds on o-ring joints.

## **Fair Oaks Ranch Material Standard Specifications**

2. Coating Repair - Coating repair for fittings and specials shall be in accordance with the procedure described above for straight-line pipe and as recommended by the manufacturer.
2. Other Coating Systems if specified shall be governed by the appropriate American Water Works Association standard.
3. Cement Mortar per AWWAC205
  - a) Cement Mortar Lining of Steel Pipe
    1. Except as otherwise provided in AWWA Standard C205, interior surface of all steel pipe, fittings and specials shall be cleaned and lined in the shop with cement-mortar lining applied centrifugally in conformity with AWWA Standard C205.
    2. The pipe ends shall be left bare where field joints occur as shown on the Plans. Ends of the linings shall be left square and uniform. Feathered or uneven edges will not be permitted.
    3. Defective linings as identified in AWWA C- 205 shall be removed from the pipe wall and shall be replaced to the full thickness required. Defective linings shall be cut back to a square shoulder in order to avoid feather edged joints.
    4. Cement mortar lining shall be kept moist during storage and shipping.
  - b) Fittings
    1. Fittings shall be lined and coated per AWWAC205.

### **Previous Specification Date:**

MAY 1992

NOVEMBER 2006

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

05-31

## **SPECIFICATION FOR CASING INSULATORS**

**REVISED JANUARY 2019**

### **1. SCOPE**

This product specification covers casing spacers for use in water supply service. Casing spacers are used to facilitate installing a water pipe inside a casing pipe or tunnel. Casing spacers shall consist of two or more segments of circular steel that bolt together forming a shell around the carrier pipe(s). Casing spacers should protect the carrier pipe and any protective coating or wrapping from damage during the installation, and properly support and electrically isolate the carrier pipe(s) within the casing or tunnel. On occasion multiple carrier pipes may be installed in one casing or tunnel.

### **2. GENERAL REQUIREMENTS**

Fair Oaks Ranch reserves the right to limit the purchase of casing spacers from the manufacturers and to the models specified as shown in paragraph 4, providing such casing spacers conform to the provisions contained herein.

- a) Casing spacers shall be eight inches (8") long for carrier pipes up to 16- inch diameters and twelve inches (12") long for larger carrier pipe sizes. Manufacturer's approval in writing shall be required for installations exceeding 300 ft. in length, carrier pipes in excess of 48- inch diameter or multiple carrier pipes in one casing or tunnel.
- b) Casing spacers shall have a minimum 14-gauge steel band and 10- gauge steel riser when required. The band, risers and connecting studs shall be welded and cleaned at the factory before the application of a fluidized bed fusion bonded PVC coating. Stainless steel (type 304) casing spacer is an acceptable alternative.
- c) The fluidized bed fusion bonded PVC coating shall be between 10-16 mils thickness. The PVC coating shall provide good resistance to acids and alkalize and excellent resistance under ASTM B117 salt spray tests. The coating shall have a minimum 1380volts/mil per ASTM D149-61 short time 0.010" test and a Durometer-shore A@ (10 sec) of 80 per ASTM D1706-61T. Epoxy coatings are not an acceptable alternative.

### **Fair Oaks Ranch Material Standard Specifications**

- d) The spacers shall have a flexible PVC liner of 0.09-inch thickness with Durometer “A” 85-90 hardness and a minimum 58,000- volt dielectric strength (60,000-volt minimum Surge Test.) Moisture absorption shall not exceed 1%.
- e) The runners shall be of high pressure molded glass reinforced polyester with a minimum compressive strength of 18,000 psi per ASTM D695, flexural strength of 25, 300 psi per ASTM D790, tensile strength of 17,600 psi per ASTM D638 and Rockwell hardness (M) of 90 per ASTM D785. The riser shall be designed and fabricated to place the runner (skid) in full contact with the inside surface of the casing pipe. This evenly distributes the load force to all support members. The ends of all runners shall be shaped to resist hanging or sticking inside casing during installation of the carrier pipe. Polyethylene runners are not acceptable.
- f) Runners shall be a minimum of 1.0 inch in width and a minimum of 7 inches long for carrier pipes up to 16”, and a minimum of 2.0 inches in width and 11 inches long for larger carrier pipes. Bolts on runners are not acceptable. The runners shall be attached to the band or riser by 3/8 the wearing surface on the runner. The recess shall be filled with a corrosion inhibiting filler. There shall be four runners per casing spacer for carrier pipes up to 12” diameter, six runners for 14” through 36” and eight or more runners for carrier pipes over 36” diameter.
- g) The band section shall be bolted together with 5/16” cadmium-plated studs, nuts and washers. There shall be six sets per 8” long casing spacer and eight sets per 12” long spacer. Stainless steel casing spacers shall be furnished with stainless steel studs, nuts and washers.
- h) Casing spacers shall have ample riser height to limit vertical movement of the carrier pipe in the casing. A minimum of 1” to 2” clearance shall be provided between the top runner and the ID of the casing or tunnel.
- i) Continuous operating temperatures for the PVC Coated Casing Spacers should not exceed 150° F. Stainless steel casing shall be used in applications where continuous operating temperatures exceed 150°F.

## **Fair Oaks Ranch Material Standard Specifications**

- j) Unless noted otherwise, casing spacers shall be required on all carrier pipes installed in casing or tunnel applications.

### **3. Quality Assurance**

All casing spacers are to be manufactured in accordance to NACE International Recommend Practice RP 0286-97 (Isolation Spacers.) Each casing spacer shall be manufactured in the USA at a facility that has a Registered ISO 9002 Quality Management System or be in the process of achieving this certification by March 2005. Non-compliance to this registered commercial quality system requirement by March 2005 will result in removal of the manufacturer's product from paragraph 4 approved manufacturers.

If on receipt of casing spacers they are found to be non-compliant, the manufacturer shall replace the defective casing spacer with a casing spacer that meets Fair Oaks Ranch's specifications, at no charge to Fair Oaks Ranch.

If Fair Oaks Ranch audits, product inspection and performance data review in accordance to these specifications determine excessive casing spacer Noncompliance, the manufacturer will be subject to removal by the Products Standard Committee. Copy of the current ISO 9002 registration (or written documentation of being "in the process of achieving ISO registration," prior to March 2005) shall be provided with material submittal.

### **APPROVED MANUFACTURERLIST**

| <b><u>Manufacturers</u></b>      | <b><u>Locations</u></b> | <b><u>Model Numbers</u></b>         |
|----------------------------------|-------------------------|-------------------------------------|
| Pipeline Seal & Insulator, Inc.  | Houston, TX             | C8G-2 or SI8G-2                     |
| Pipeline Seal & Insulator, Inc.  | Houston, TX             | C12G-2 or SIIG-2                    |
| Advance Products & Systems, Inc. | Lafayette, LA           | APS S18-2<br>APS SS18-2             |
| Advance Products & Systems, Inc. | Lafayette, LA           | APS S112-2<br>APS SS112-2           |
| Advance Products & Systems, Inc. | Lafayette, LA           | SI8M-2<br>SI12M-2<br>(Carbon Steel) |

**Fair Oaks Ranch Material Standard Specifications**

| <b><u>Manufacturers</u></b>        | <b><u>Locations</u></b> | <b><u>Model Numbers</u></b>                               |
|------------------------------------|-------------------------|-----------------------------------------------------------|
| Power Seal Pipeline Products, Inc. | Wichita Falls, TX       | 4810 SS<br>(Stainless steel)<br>4810 CS<br>(Carbon steel) |
| J-Four Pipeline Products Inc       | Broken Arrow, Ok        | M59 CS/SS<br>M63 CS/SS                                    |
| CCI Pipeline Systems               | Breaux Bridge, La       | CSC 8" & 12" Wide<br>CSS 8" & 12" Wide<br>End Seals       |

**Previous Specification**

DECEMBER 2006

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

10-10

## **SPECIFICATIONS FOR GRAY-IRON AND DUCTILE IRON FITTINGS**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers ductile-iron fittings 3 inches through 48 inches in size designed and manufactured for use with gray-iron, ductile-iron, PVC C-900 or PVC C905 pipe. Standard, compact and anchor fittings included herein are of the following types of joints:

Flanged  
Mechanical Joint

### **2. GENERAL REQUIREMENTS**

- a) Except as otherwise modified or supplemented herein, the latest revision of AWWA Standard C110 for Gray-Iron and Ductile-Iron Fittings, 3 inch through 48 inch for Water and other Liquids and AWWA Standard C153 for Ductile-Iron Compact Fittings, shall govern the design, manufacture, and testing of all fittings under this specification.
- b) For 3 through 24-inch size range, the pressure rating of all fittings shall be a minimum of 250 psi. The working pressure for all fittings of size greater than 24 inches shall be a minimum of 150 psi unless a change in pressure rating is directed by purchase documents.
- c) Fittings shall be furnished with the types of end combination specified.
- d) Anchor fittings shall be furnished in size and type or length as specified.
- e) Flanged fittings shall be faced and drilled in accordance with ANSI Specification B16.1, Class 125.
- f) The exterior of all fittings shall be provided with a petroleum asphaltic coating in accordance with the latest revision of AWWA Standard C110. The interior of flanged fittings supplied under this specification shall be either cement-mortar lined in accordance with the latest revision of AWWA Standard C104 or lined with a petroleum asphaltic material in accordance with the latest revision of AWWA Standard as specified. The interior of all other fittings supplied under this specification shall be cement-mortar lined in accordance with the latest revision of AWWA Standard C104. Fittings in sanitary sewer application to be coated per 05-11B.
- g) Fittings for 2-inch size shall be manufacturers' standard design designed in accordance with applicable design standards of AWWA C110.

# **Fair Oaks Ranch Material Standard Specifications**

10-20

## **SPECIFICATIONS FOR VALVE BOXES**

**REVISED JANUARY 2019**

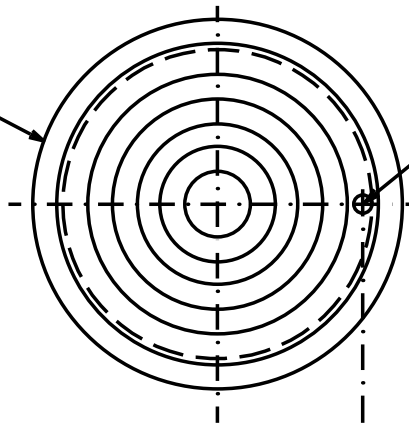
### **1. SCOPE**

This specification covers cast-iron valve box assemblies.

### **2. GENERAL REQUIREMENTS**

- a) Each valve box assembly shall be of cast-iron and shall consist of a base, top section, and lid as shown on Fair Oaks Ranch Standard Drawing No. DA-56-00.
- b) Valve boxes shall be of a single size with a nominal diameter of 6 inches.
- c) The valve box lid shall be labeled "water" and shall be so designed so that it will remain firmly seated in place when subjected to vehicular traffic.
- d) The valve box assembly shall be of sufficient toughness and strength to withstand impact loads and shock resulting from vehicular traffic.
- e) The valve box assembly shall be coated with a standard bituminous coating of either coal tar or asphalt basic applied to all inside and outside surfaces.

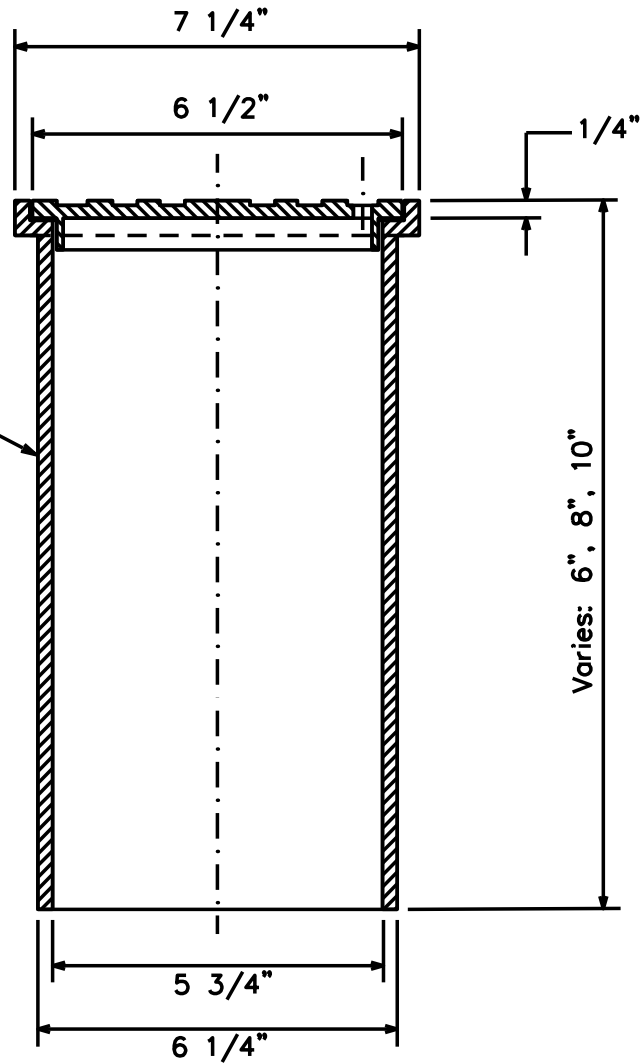
Cast Iron Lid



3/8" Pick Hole

LID DETAIL

Cast Iron Box



BOX DETAIL

PROPERTY OF  
THE CITY OF FAIR OAKS  
RANCH

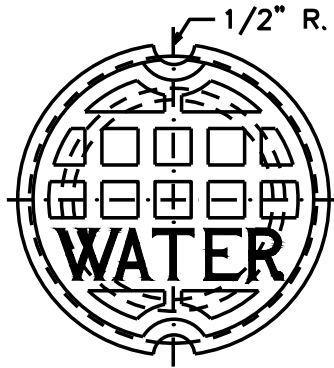
CUSTOMER CUT OFF  
VALVE BOX

APPROVED  
JANUARY 2019

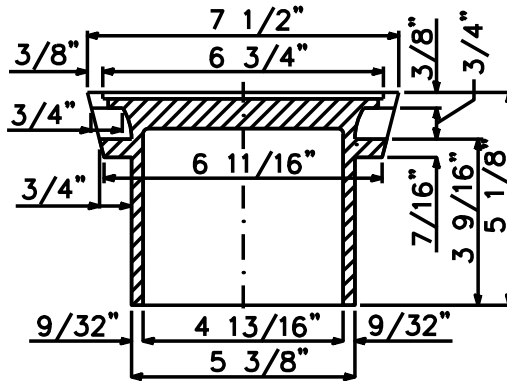
REVISED

DA-018-00

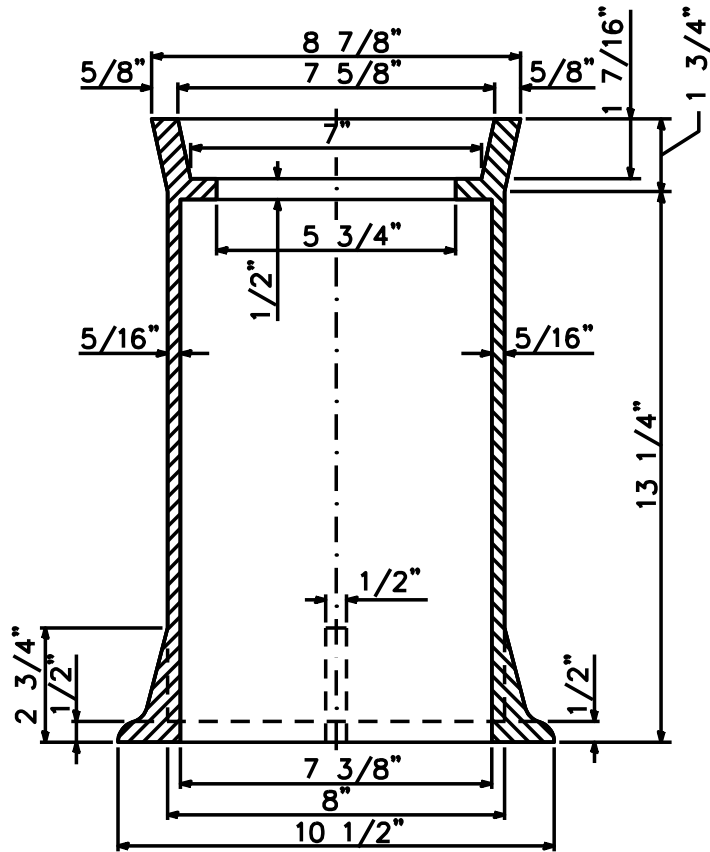
SHEET  
1 OF 1



PLAN VIEW OF TOP SECTION COVER



SIDE VIEW OF TOP SECTION COVER



SIDE VIEW OF TOP SECTION

PROPERTY OF  
THE CITY OF FAIR OAKS  
RANCH

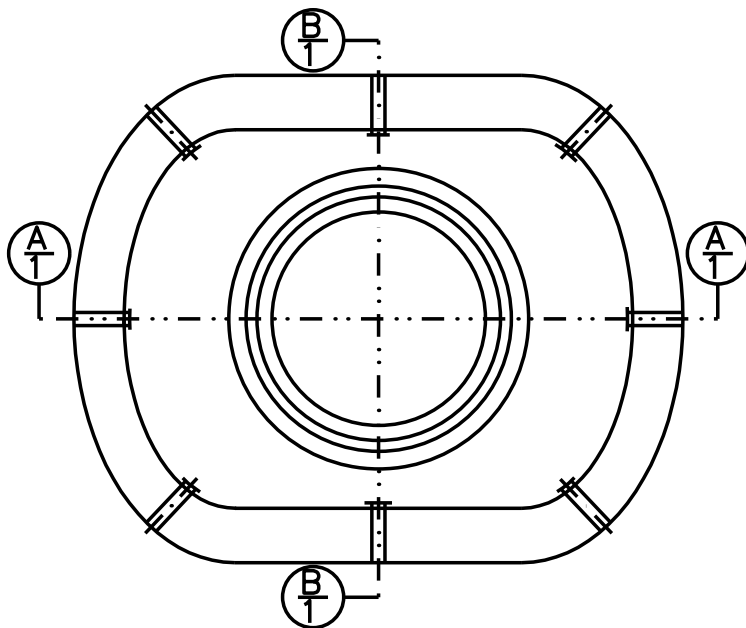
6" VALVE BOX  
ASSEMBLY

APPROVED  
JANUARY 2019

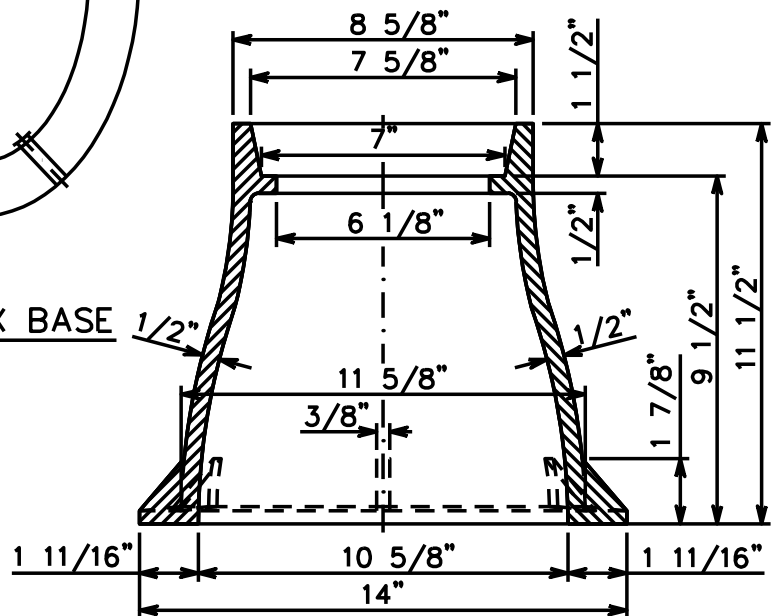
REVISED

DA-056-00

SHEET  
1 OF 2

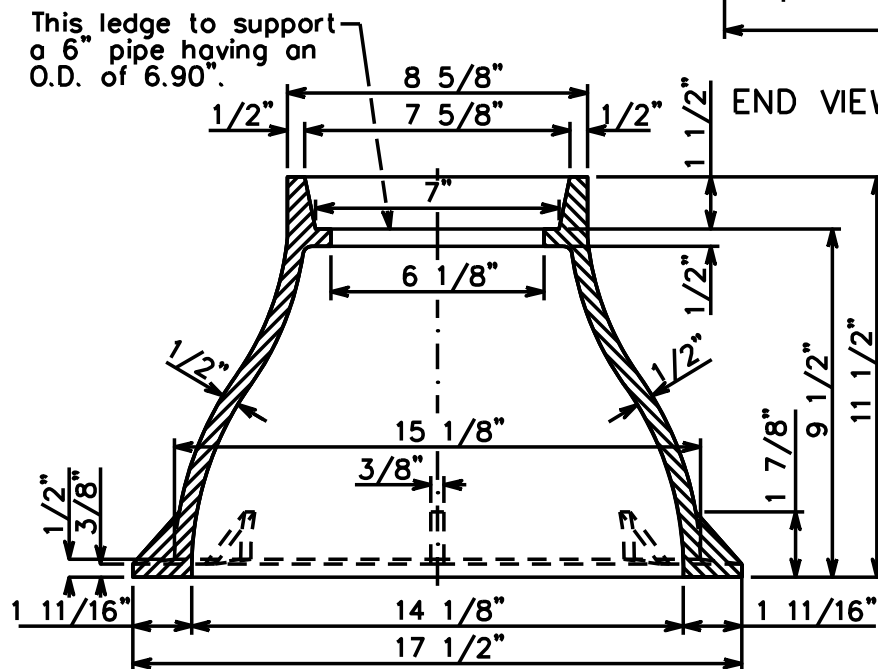


PLAN VIEW OF VALVE BOX BASE



SECTION - B

END VIEW OF VALVE BOX BASE



SECTION - A

SIDE VIEW OF VALVE BOX BASE

PROPERTY OF  
THE CITY OF FAIR OAKS  
RANCH

6" VALVE BOX  
ASSEMBLY

APPROVED

JANUARY 2019

REVISED

DA-056-00

SHEET  
2 OF 2

**SPECIFICATIONS FOR WATER METER BOXES**

**(5/8", 3/4", 1", 1-1/2" AND 2" METERS)**

**REVISED JANUARY 2019**

1. **SCOPE**

This specification covers meter boxes for 5/8", 3/4", 1", 1-1/2" and 2" meters.

2. **GENERAL REQUIREMENTS**

For non-traffic bearing locations, the meter box assembly for 5/8" through 1" meters shall be made from 100% high-quality recycling plastic. The meter box and lid shall be black and constructed out of modified polyethylene material for maximum durability and corrosion resistance. The black material is for maximum UV protection. The black material shall be uniform throughout the meter box and lid for maximum longevity and not have a foaming agent that creates air pockets within the plastic wall. The body and lid shall withstand 20,500 lbs loading in a non-deliberate and incidental traffic. All meters must be installed in non-traffic bearing locations.

3. **SPECIFIC REQUIREMENTS**

**Plastic Lid**

Plastic lid shall have the following:

- a) "Water Meter" molded into the lid.
- b) Seat securely and evenly inside the meter box and shall not overlap the top edge of the meter box.
- c) "Overlap" securely and evenly on the existing cast iron meter box with like dimensions.
- d) A diamond pattern for skid resistance and an AMR Slide Mount molded into the lid on the underneath side and off center for placement of an AMR transponder to help in the protection of the radio antenna.
- e) A brass worn gear lock that will secure to existing Fair Oaks Ranch cast iron meter box of like dimensions and secure to the plastic meter box. See specification drawing.
- f) A molded receptacle for placement of Fair Oaks Ranch key.

## **Fair Oaks Ranch Material Standard Specifications**

- g) One (1) piece of ½” rebar secured in lid. See specification drawing.

### **Plastic Body**

Plastic body shall have the following:

- a) A crush resistant ribbing along the outside of the box.
- b) A flange around the top opening to help prevent setting and aide in the adjustment to grade.
- c) Designed to accommodate all plastic lids.

### **4. QUALITY ASSURANCE**

If on receipt of meter box(s) or lid(s) they are found to be non-compliant, the manufacturer shall replace the defective box(s) or lid(s) with a replacement that meets the City of Fair Oaks Ranch’s specifications, at no charge to Fair Oaks Ranch. Any visible defect or failure to meet the quality standards herein will be ground for rejecting the entire order.

Product that is non-compliant will be returned to the manufacturer, freight collect and the manufacturer will replace the defective product, freight prepaid within thirty (30) days from receipt of the defective product.

### **APPROVED MANUFACTURER LIST**

#### **Manufacturers**

DFW Plastics Inc.

#### **Model Numbers**

DFW1218-11-1EWA

### **Previous Specification**

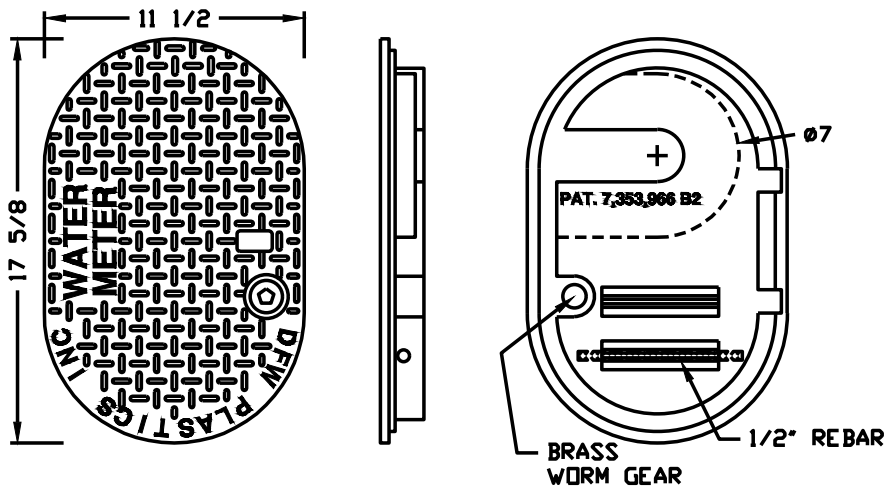
MAY 1992

DECEMBER 2006

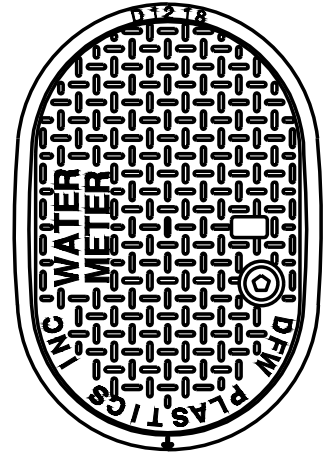
FEBRUARY 2000

DECEMBER 2007

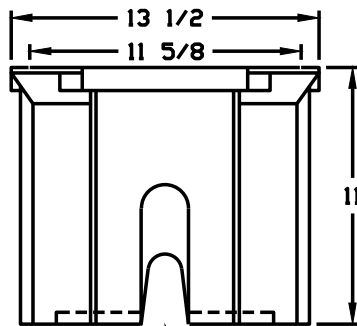
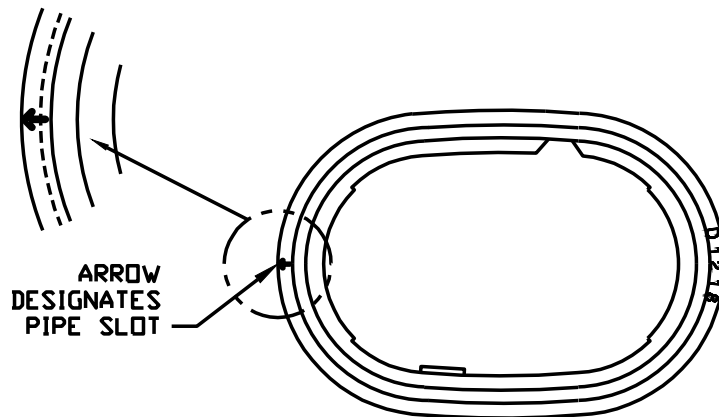
DECEMBER 2011



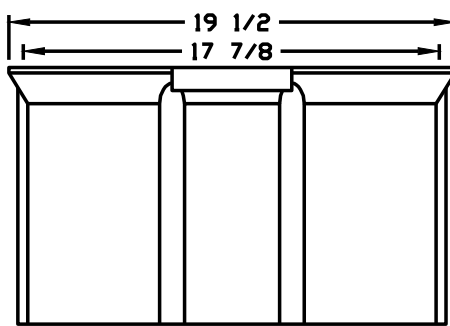
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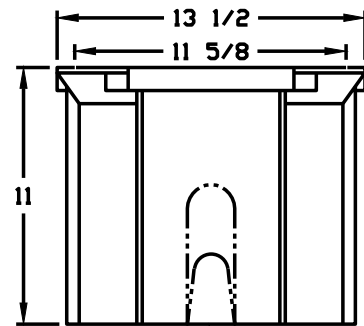
DFW1218-11-1EWA



PIPE SLOT AS  
DESIGNATED  
BY ARROW



DFW1218-11-BODY



OPTIONAL  
PIPE SLOT

**NOTES:**

- 1) DIM'S  $\pm 1/8$  U.N.D
- 2) SNAP LOCK POCKET WILL RECEIVE I-TRON ERT. SNAP LOCK SLOT IS  $1.80" \pm .015"$  TO ALLOW FOR A FINGER FORCE INSTALL. POCKET HEIGHT IS  $15/16$  FOR MIN  $1/8"$  AIR GAP.

PROPERTY OF  
THE CITY OF FAIR OAKS RANCH

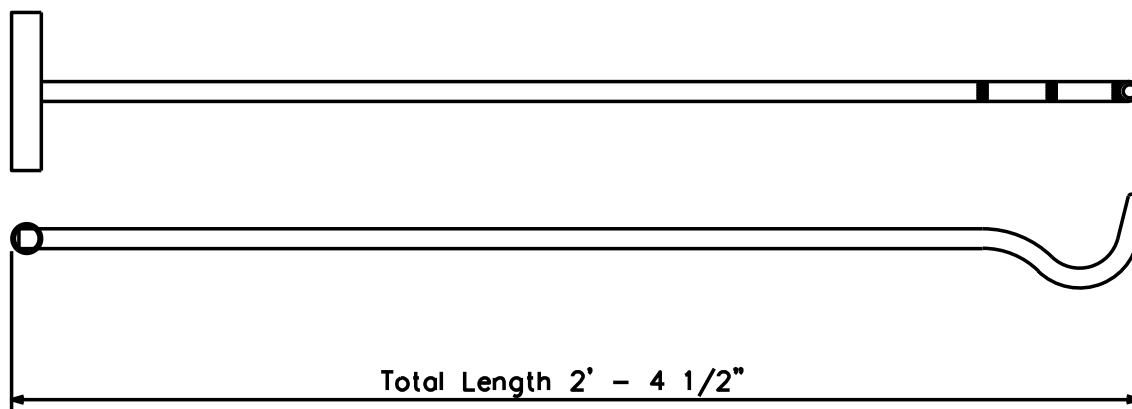
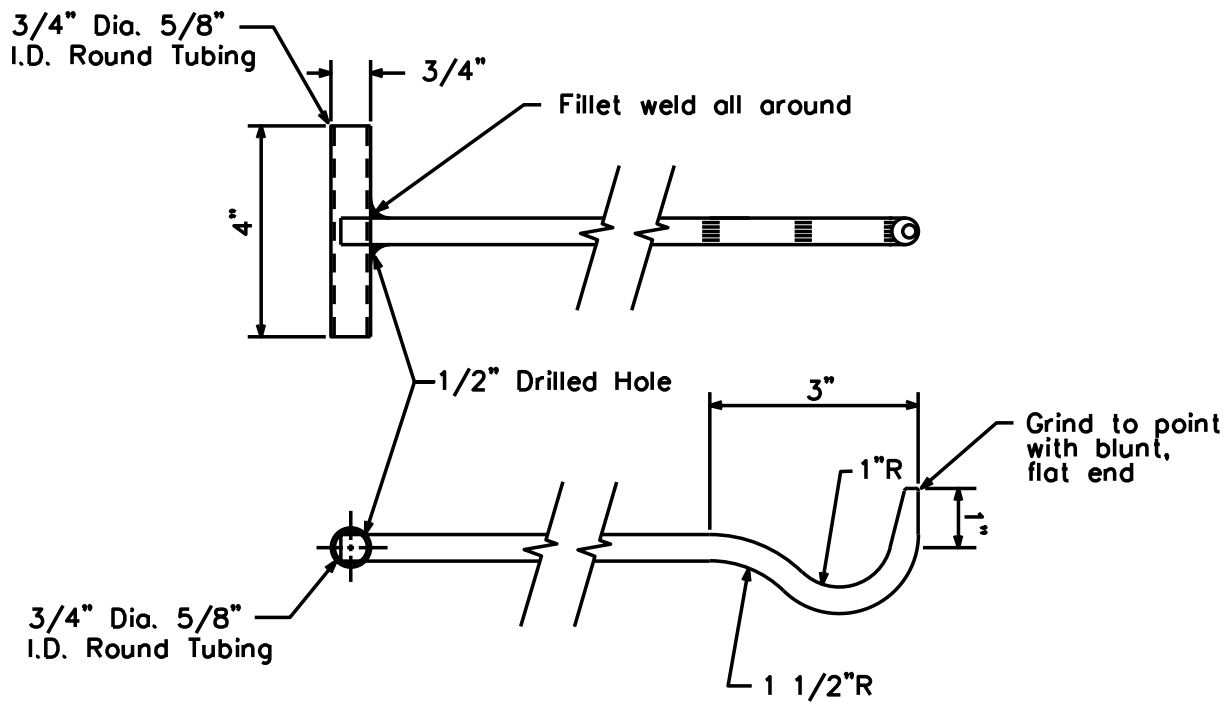
METER BOX ASSEMBLY FOR  
5/8", 3/4", 1" METERS

APPROVED  
JANUARY 2019

REVISED

DA-011-00

SHEET  
1 OF 1



# **Fair Oaks Ranch Material Standard Specifications**

15-40

## **SPECIFICATIONS FOR NO LEAD CONTENT WATERWORKS**

### **BRASS GOODS**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers waterworks brass goods, such as, corporation stops, curb stops, couplings, connectors, nipples, etc.

#### **2. GENERAL REQUIREMENTS**

- a. The brass composition shall conform to ASTM Specifications B-62, or latest revision thereof, fittings shall conform to ANSI/AWWA Specifications C-800, or latest revision thereof.
- b. All brass components in contact with potable water must be made from either CDA/UNS Brass Alloys C89520 in accordance with ASTM B584; or C89833 with a maximum lead content of .25% by weight. Brass saddles shall be made from CDA/UNS C83600.
- c. Any brass component not in contact with potable water shall be made of 85-5-5-5 brass as defined per ASTM B62, ASTM B584 and AWWA C-800.
- d. All service fittings shall be certified as suitable for contact with drinking water by an ANSI accredited organization in accordance with ANSI/NSF standard 61, Drinking Water Systems Components-Health effects section 8. Proof of certification is required. The lead content of the wetted components in contact with potable water shall also be verified by an ANSI accredited testing facility.
- e. All brass fittings and valves shall have the manufacturers name and/or trademark integrally stamped, or cast into it indicating that the product is manufactured from the low-lead alloy as specified. Another marking such as "NL", "EBII", "FD" or other commonly accepted identifier, indicating the alloy as "No-lead"; shall also be cast or stamped into the fitting or valve.
- f. Painting, printing, sticker, or decals attesting to the components "no-lead" certification shall not be permitted.
- g. All casting shall have a natural, clean uniform and smooth surface, and be free from internal porosity.
- h. All machining shall be done in a workmanlike manner and within the acceptable tolerances.

## **Fair Oaks Ranch Material Standard Specifications**

### **3. DESIGN CRITERIA FOR BALL TYPE CURB STOPS /ANGLE VALVES**

- a. All Curb Stop, Corporation and Angle valves shall be ball valves. "Inverted/Ground Key," type angle valves will not be accepted.
- b. Ball type valves will not have a stop.
- c. All ball valves, couplings and adapters will be pressure rated to 300 psi, and will be supplied with blowout proof stainless steel stems with double SBR, NBR or EPDM O-ring steam seal.
- d. Stem and cap assembly will be two-piece design and will withstand minimum 200 ft of torque.
- e. Ball seats will be made with unfilled Teflon or EPDM for resilience and minimal friction.
- f. Ball will be lead free cast brass or stainless design. Coated ball is not permitted.
- g. All fittings shall have a lifetime guarantee against lead leachate from the casting.
- h. The reduced port design not will be acceptable.
- i. Pack Joints will not be accepted.

### **APPROVED MANUFACTURER LIST**

#### **In Line FIP X FIP Approved Manufacturers and Models:**

##### **2-INCH FIP X FIP**

| <b><u>Manufacturer</u></b> | <b><u>Model</u></b> |
|----------------------------|---------------------|
| Ford Meter Box             | B11-777WR-NL        |
| A.Y. McDonald              | 76111W              |
| Mueller                    | B-20200-3N          |
| James Jones                | J1900-RN            |

**Fair Oaks Ranch Material Standard Specifications**

**Angle Curb Stop Meter Coupling x Compression Approved Manufacturers and Models:**

| <b><u>Manufacturer</u></b> | <b><u>3/4"</u></b> | <b><u>1"</u></b> | <b><u>1.5"</u></b> | <b><u>2"</u></b> |
|----------------------------|--------------------|------------------|--------------------|------------------|
| A.Y. McDonald              | 74652BQ & 74652BQ  | 74652BQ          | 74612BCS           | 74612BCS         |
| Ford Meter Box             | BA43-232WRQ-NL     | BA43-344WRQ-NL   | BFA43-666WRQ-NL    | BFA43-777WRQ-NL  |
| Mueller                    | B24258R-3N         | B24258R-3N       | B24276-3N          | B24276-3N        |
| James Jones                | J-1963WSG-N        | J-1963WSG-N      | J-1975WSGLS-N      | J-1975WSGLS-N    |

**F.I.P. X METER SWIVEL NUT/COUPLING Approved Manufacturers and Models:**

| <b><u>Manufacturer</u></b> | <b><u>3/4"</u></b> |
|----------------------------|--------------------|
| A.Y. McDonald              | 74654B             |
| Ford Meter Box             | BA13-232WR-NL      |
| Mueller                    | B24265-3N          |
| James Jones                | J-1966WLS-N        |

**Ball Corporation Valve Approved Manufacturers and Models:**

| <b><u>Manufacturer</u></b> | <b><u>CC X CMP</u></b> | <b><u>IP X CMP</u></b> |
|----------------------------|------------------------|------------------------|
| A.Y. Mc Donald             | 74701BQ                | 74704 BQ               |
| Mueller                    | B-25008N               | B-25028N               |
| James Jones                | J-1937 SG-N            | J-1935 SG-N            |
| Ford Meter Box             | FB-1000Q-NL            | FB-1100Q-NL            |

# **Fair Oaks Ranch Material Standard Specifications**

21-02

## **SPECIFICATIONS FOR RESILIENT-SEATED GATE AND TAPPING VALVES FOR WATER SUPPLY SERVICE**

### **ANSI/AWWA C509-01**

**3 IN., 4 IN., 6 IN., 8 IN., 10 IN., 12 IN., 16 IN., & 20 IN.**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This product specification covers resilient seated gate valves, with nominal diameters of 3 in., 4 in., 6 in., 8 in., 10 in., 12 in., 16 in., and 20 in. Sizes refer to the nominal diameter, in inches, of the waterway through the inlet and outlet connections and the closure area. All products furnished shall conform to the American National Standards Institute and American Water Works Association C509 Standard (ANSI/AWWA C509- 01) or latest revision thereof.

#### **2. DEFINITIONS**

All definitions are defined according to ANSI/AWWA C509-01.

- a. Cosmetic Defect: A blemish, which has no effect on the ability of the component to meet the structural design and production test requirements of this standard. Should the blemish or the activity of plugging, welding, grinding, or repairing of such blemish cause the component to fail these requirements, then the blemish shall be considered a structural defect.
- b. Flanged Joint: The flanged and bolted joint as described in ANSI/AWWA C110/A21.10.
- c. Mechanical Joint: The gasket and bolted joint as described in ANSI/AWWA C111/A21.11.
- d. Push-on Joint: The single rubber gasket joint as described in ANSI/AWWA C111/A21.11.
- e. Structural Defect: A flaw that causes the component to fail the structural design or test requirement of this standard. This includes, but is not limited to imperfections that result in leakage through the walls of a casting, failure to meet the minimum wall-thickness requirement, or failure to meet production tests.

## **Fair Oaks Ranch Material Standard Specifications**

- f. Tapping Valve: A special gate valve designed with end connections and an unobstructed waterway to provide proper alignment and positioning of a tapping sleeve, valve, and machine for tapping pipe dry or under pressure as described in AWWA C509 Section 1.2 Definitions and MSS SP-60.

### **3. GENERAL REQUIREMENTS**

- a. Except as otherwise modified or supplemented herein, AWWA Standard C509-01 or the latest revision thereof, shall govern the design, component materials, construction; manufacture and testing of all resilient seated gate valves. Valves shall be suitable for frequent operation as well as service involving long periods of inactivity. Valves shall be NSF-61 certified.
- b. The City of Fair Oaks Ranch reserves the right to limit the purchase of resilient seat gate valves from manufacturers and to the models specified, as shown on ATTACHMENT I, provided such resilient seat gate valves conform to the provision contained herein.
- c. The minimum design working water pressure for gate valves with nominal diameters of 3 in., 4 in., 6 in., 8 in., 10 in., and 12 in. shall be 200 psig unless otherwise specified.
- d. The minimum design working water pressure for gate valves with nominal diameters of 16 in., and 20 in. shall be 150 psig unless otherwise specified.
- e. Valves shall be resilient-seated types, bronze mounted with non-rising stems. The closure member shall be fully encapsulated by an elastomer without thin spots or voids. When open the valve shall have a clear, full- port, unobstructed waterway.
- f. Gray iron, ductile iron, steel, brass and bronze materials shall meet or exceed the material requirements of Section 2: Materials of AWWA C509-01.
- g. Gaskets, O-rings, Coatings, and elastomers shall meet or exceed the material requirements of Section 2: Materials of AWWA C509-01.
- h. The gate valves shall be designed and constructed for installation in either a horizontal or vertical position. Valves shall be designed for buried installation with stem in the vertical position and shall be furnished for mounting in a horizontal pipeline, unless otherwise specified.
- i. Valve components of brass or bronze shall be manufactured to ASTM recognized alloy specifications of low zinc content bronze, as shown in Table 1 of Section 2.2.4. of ANSI/AWWA Standard C509-01 or the latest revision thereof. Materials for the stem have minimum yield strength of 40,000 psi. A minimum elongation in 2 inches of 12% and shall be made of bronze per ASTM

## **Fair Oaks Ranch Material Standard Specifications**

B763, alloy number UNS C99500. A maximum zinc content of 2% as shown in Table 2 Chemical Requirements of ASTM B763-96 or the latest revision thereof. Stem nut material shall be ASTM B62 UNS C83600 or ASTM B584 UNS C84400. The stem shall have a visible external marking at the top to indicate low-zinc, high strength material. The marking shall include a red plastic or neoprene washer placed around the top of the stem under the operating nut.

- j. Valve ends shall be either flanged, tapping valve, mechanical joint, push-on joint or any combination thereof, as specified. All mechanical joint valves shall be supplied with glands, bolts, and gaskets. Valve body bolts and nuts shall meet the strength requirements of ASTM A307 with dimensions conforming to ANSI B18.2.1. The size of the bolt head shall be equal to the size of the nut and shall be stainless steel in accordance with ASTM 276.
- k. All gate valves shall open left (counter-clockwise).
- l. The following parts of the valve shall be made of either gray or ductile iron: bonnet, body, yoke, wrench nut, O-ring packing plate or seal plate, and gland follower. The gate may be made of gray or ductile iron.
- m. If glands and bushings are used for NRS valves they shall be made of ASTM B763 bronze UNS C99500. The stem shall be made of cast, forged, or rolled ASTM B763 bronze UNS C99500. The stem nut material shall be ASTM B62 bronze UNS C83600 or ASTM B584 bronze UNS C84400. The gate may be made of bronze ASTM B763 bronze UNS C99500. Stem seals shall be "O" ring type. The seals shall be designed for dynamic applications.

The design shall be such that the seal above the stem collar can be replaced with the valve under full pressure in the fully open position. Materials for the "O" ring packing plate shall be in accordance with Section 4.8.3 of the ANSI/AWWA C509-01 Standard or the latest revision thereof.

- n. Enclosed and buried valves shall be coated inside and outside with a fusion bonded epoxy having a nominal 8 mils dry film thickness, which meets or exceeds AWWA C550-01 and to the maximum extent possible shall be free of holidays. All coatings in contact with the potable water shall be approved for potable water immersion service per ANSI/NSF Standard 61.
- o. The bidder shall submit with his proposal three sets of certified drawings showing the principal dimensions, general construction and material specification of the valve proposed. The number of turns to open (close) shall be clearly noted in the valve information submitted with the proposal documents. The number of turns to open or close the valve shall be consistent for each valve size for each approved manufacturer.
- p. Valves furnished under this specification shall be supplied from Fair Oaks Ranch approved manufacturer list. To be included on the qualified product list, the manufacturer shall provide an Affidavit of Compliance in accordance with

## **Fair Oaks Ranch Material Standard Specifications**

the Section 1.5 of the ANSI/AWWA C509-01 Standard or latest revision thereof, to include compliance with Fair Oaks Ranch Specification No. 21-02. Records of all tests performed in accordance with Section 6.1 and Section 6.2 of the ANSI/AWWA C509-01 Standard or latest revision thereof will be made available or provided. These records will be representative test results for Section 6.1 and certificate of testing for Section 6.2. An affidavit of testing for the valve assembly as outlined in Section 6.2.2 of the ANSI/AWWA C509-01 Standard, (350 ft-lbs) will also be provided. A copy of the manufacturer's Quality Assurance Program will be submitted. Blueprints and parts list for the valve shall also be provided.

- q. All gate valve parts shall be designed to withstand the following two pressure requirements, without being structurally damaged. (1) An internal test pressure of twice the rated design working pressure of the valve. (2) The full rated internal working pressure when the closure member is cycled once from a fully open to a fully closed position against the full rated unbalanced working water pressure.  
In addition to these pressure requirements, the valve assembly and mechanism shall be capable of withstanding an input torque as follows: 200 ft.-lbs. for a 3-in. nominal diameter. 200 ft.-lbs. for a 4-in. nominal diameter. 300 ft.-lbs. for a 6-in. nominal diameter. 300 ft.-lbs. for an 8-in. nominal diameter. 300 ft.-lbs. for a 10-in. nominal diameter. And 300 ft.-lbs. for a 12-in. nominal diameter. For sizes larger than a 12 in. nominal diameter refer to the manufacturer's specifications.
- r. Resilient seats shall be applied to the gate and shall seat against a corrosion resistant surface. The non-metallic seating surface shall be applied in a manner to withstand the action of line fluids and the operation of the sealing gate under long-term service. A metallic surface shall have a corrosion resistance equivalent to or better than bronze. A non-metallic surface shall be in compliance with ANSI/AWWA C550. The gate must be fully encapsulated by an elastomer without thin spots or voids. Resilient seats shall be bonded. ASTM D429 either method A or method B shall prove the method used for bonding or vulcanizing. For method A, the minimum strength shall not be less than 250 psi. For method B, the peel strength shall be 75 lb./in.
- s. Flanged Ends: The end flanges of flanged valves shall conform to dimensions and drillings of ANSI/AWWA C110/A21.10 or ANSI B16.1, Class 125.
- t. Mechanical Joint Ends: Mechanical joint bell dimensions shall conform to ANSI/AWWA C111/A21.11.
- u. Push-on Joints: Push-on joints shall conform to the requirements of ANSI/AWWA C111/A21.11.
- v. The tapping valves shall be mechanical joints with tapping flange on the other end. The tapping valves shall be furnished complete with glands, bolts, and

## **Fair Oaks Ranch Material Standard Specifications**

gaskets. The tapping valve shall have a clear unobstructed waterway.

The seat rings shall be of a large diameter to the permit entry of the full diameter tapping machine cutters. The valve end which mates with the tapping sleeve shall have an alignment lip to fit the recess in the tapping sleeve flange for proper alignment. The lip will be dimensioned in accordance with MSS SP-60 for valves 20-inch nominal pipe size and smaller.

- w. All interchangeable parts shall conform to their required dimensions and shall be free from defects that could prevent proper functioning of the valve. When assembled, valves manufactured in accordance with this standard shall be well fitted and shall operate smoothly. All like parts of valves of the same model and size produced by the same manufacturer shall be interchangeable.
- x. All castings shall be clean and sound, without defects that will weaken their structure or impair their service. Plugging, welding, or repairing of cosmetic defects is allowed. Repairing of structural defects is not allowed. Repaired valves shall comply with the testing requirements of this specification after repairs have been made. Repairs within the bolt circle of any flange face are not allowed.
- y. All gate valves shall be hydrostatically tested with twice the specified rated pressure applied to one side of the gate and zero pressure applied to the other side. The test is to be made in each direction across the gate. All tests are to be performed at the manufacturer's plant.
- z. All gate valves shall be operated through a complete cycle in the position for which it was designed to ensure free and proper functioning of all parts in the intended manner. Any defects in workmanship shall be corrected and the test repeated until satisfactory performance is demonstrated. All tests are to be performed at the manufacturer's plant.
- aa. A hydrostatic test pressure equal to twice the rated working pressure of the valve shall be applied to all assembled valves with the gates in the open position. The test shall show no leakage through the metal, pressure containing joints, or stem seals. All tests are to be performed at the manufacturer's plant.
- bb. A test shall be made from each direction at rated working pressure to prove the sealing ability of each valve from both directions of flow. The test shall show no leakage through the metal, pressure containing joints, or past the seat. All tests are to be performed at the manufacturer's plant.
- cc. Markings shall be cast on the bonnet or body of each valve and shall show the manufacturer's name or mark, the year the valve casting was made, the size of the valve, and the designation of working water pressure, for example "200 W".
- dd. The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject

## **Fair Oaks Ranch Material Standard Specifications**

random valves to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order and removal of the manufacturer from the attached approval list.

- ee. The attached qualified product list identifies specified manufacturers that are approved.

### **4. WORKMANSHIP**

- a. All parts of the resilient seat gate valve shall be designed and manufactured to the tolerances specified in ANSI/AWWA C509-01 or latest revision thereof and this specification.
- b. All parts of the resilient seat gate valve manufactured by a given manufacturer shall be interchangeable with like parts from another resilient seat gate valve of the same model and size and by the same manufacturer.
- c. All interchangeable parts shall conform to their required dimensions and shall be free from defects that could prevent proper functioning of the valve.
- d. All castings shall be clean and sound, without defects that will weaken their structure or impair their service. Plugging, welding, or repairing of cosmetic defects is allowed. Repairing of structural defects is not allowed. Repaired valves shall comply with the testing requirements of this specification after repairs have been made. Repairs within the bolt circle of any flange face are not allowed.
- e. The resilient seat gate valves shall be well fitted.
- f. Operation of the resilient seat gate valve shall be smooth.
- g. All parts shall be free of structural defects.
- h. The resilient seat gate valve shall be watertight.

### **5. PAINTING**

- a. All exterior and interior surfaces of the valve shall be coated with epoxy, N.S.F. 61 certified. The epoxy shall have a nominal dry film thickness of 8 mils, and shall be in accordance with AWWA C550, latest revision.
- b. Coating shall be as close to holiday free as is technologically possible.

### **6. TESTING**

- a. Hydrostatic Test: Hydrostatic Test shall be performed on the valve in

## **Fair Oaks Ranch Material Standard Specifications**

accordance with Section 6.1 Proof of Design Testing of ANSI/AWWA C509-01 or latest revision thereof.

- b. Torque Test: Torque Test for prototype valves shall be performed on the valve in accordance with Section 6.1 Proof of Design Testing of ANSI/AWWA C509-01 or latest revision thereof.
- c. Leakage Test: Leakage Test shall be performed on the valve in accordance with Section 6.1 Proof of Design Testing of ANSI/AWWA C509-01 or latest revision thereof.
- d. Pressure Test: Pressure Test shall be performed on the valve in accordance with Section 6.1 Proof of Design Testing of ANSI/AWWA C509-01 or latest revision thereof.
- e. Operation Test: Operation Test shall be performed on the valve in accordance with Section 6.2 Production Testing of ANSI/AWWA C509-01 or latest revision thereof.
- f. Shell Test: Shell Test shall be performed on the valve in accordance with Section 6.2 Production Testing of ANSI/AWWA C509-01 or latest revision thereof.
- g. Seat Test: Seat Test shall be performed on the valve in accordance with Section 6.2 Production Testing of ANSI/AWWA C509-01 or latest revision thereof.
- h. An Affidavit of Compliance certifying that all required tests have been performed shall be provided in accordance with Section 6.3 Affidavit of Compliance of ANSI/AWWA C509-01.
- i. The Affidavit of Compliance, the results of ASTM testing procedures and requirements for materials, Manufacturer's Quality Assurance Program, and the records of all tests performed on the valve shall be kept and provided by the supplier/manufacturer in a single hard cover bound notebook with the bid or with the shipping documents and shall be approved by the City of Fair Oaks Ranch.

### **7. QUALITY ASSURANCE**

- a. Manufacturers shall have an ASME or I.S.O. 9001 registered commercial quality system or is in the process of achieving this certification by June 2001. Noncompliance to this registered commercial quality system requirement by June 2001 will result in removal of the manufacturer's product from Attachment I of this specification. If on receipt of resilient seat gate valves they are found to be non-compliant the manufacturer shall replace the defective resilient seat gate valves according to resilient seat gate valve size with a resilient seat gate valve that meets the City of Fair Oaks Ranch's specifications. The defective resilient seat gate valve will be returned to the manufacturer, freight collect, and the manufacturer shall replace the resilient seat gate valve, freight prepaid. If Fair Oaks Ranch audits, product inspection and performance data review in accordance with these

## **Fair Oaks Ranch Material Standard Specifications**

specifications determine excessive resilient seat gate valve non-compliance, the manufacturer will be subject to removal by the Products Standards Committee. If the resilient seat gate valve becomes defective during the manufacturer's specified warranty period a Fair Oaks Ranch quality assurance and manufacturer review will ensue. If the review determines manufacturing non-conformance the manufacturer shall replace the resilient seat gate valve according to size with a resilient seat gate valve that meets Fair Oaks Ranch's specifications. The defective resilient seat gate valve removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the resilient seat gate valve, freight prepaid. If the non-conformance product amounts are excessive and result in increased product replacement by Fair Oaks Ranch field staff the manufacturer may be subject to time and material charges.

### **8. REFERENCES**

- a. American National Standards Institute and American Water Works Association Standard C509-01 (ANSI/AWWA C509-01).
- b. Manufacturers Standardization Society MSS SP-60.

### **APPROVED MANUFACTURER LIST**

#### ***Sizes Three through Twelve Inch***

| <b><i>Manufacturer</i></b>           | <b><i>Model</i></b>    |
|--------------------------------------|------------------------|
| American Flow Control                | Series 500             |
| Clow Valve Company                   | 2640                   |
| Kennedy Valve                        | KS - FW                |
| M&H Valve Company                    | 4067                   |
| Mueller Company                      | 2360 Series Gate Valve |
| United States Pipe & Foundry Company | A-USPO                 |

#### ***Sizes Sixteen through Twenty-Four Inch***

| <b><i>Manufacturer</i></b>           | <b><i>Model</i></b> |
|--------------------------------------|---------------------|
| United States Pipe & Foundry Company | A-USPO              |

### **Previous Specification**

OCTOBER 2008  
AUGUST 2004  
APRIL 2000

# **Fair Oaks Ranch Material Standard Specifications**

21-10

## **SPECIFICATIONS FOR NO LEAD BRASS GATE VALVES**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers non-rising stem type no lead brass gate valves, in sizes through 2 inches, installed on potable water systems where full-open, full-closed, non-throttling control is required.

### **2. GENERAL REQUIREMENTS**

- a. The valve shall be manufactured in accordance with AWWA Standard C- 800, or the latest revision thereof. Valve shall comply with the NSF / ANSI Standard 61, Drinking Water Act and/or NSF/ ANSI Standard 372, Drinking Water Act. All brass components in contact with potable water must be made from either CDA/UNS Brass Alloys C89520 in accordance with ASTM B584; or C89833 with a maximum lead content of .25% by weight.
- b. The valve body shall be generously proportioned, heavy-duty type with screwed ends, in conformance with appropriate Federal Specifications for iron-pipe-sized threaded connections.
- c. The valve shall be 125 psi WSP, 200 psi WOG rated and appropriately identified on the valve body. Valve shall have the manufacturers name or trademark and the no lead (NL) permanently stamped or cast on the valve.
- d. The non-rising stem shall be equipped with a single-wedged disc and threaded bonnet designed for unrestricted flow in the full-opened position. The stem shall be manufactured of a no-lead brass meeting the requirements of the United States of America Safe Drinking Water Act and the U.S. Environmental Protection Agency.
- e. The packing shall be Teflon (non-asbestos containing) material approved for potable water service.
- f. The handwheel end of the stem shall have tapered milled flats, squared without serrations.
- g. The valve shall be equipped with a replaceable malleable iron handwheel, with a bronze or stainless steel nut. All 1-1/2" and 2" valve shall be furnished with a bronze handwheel, with bronze or stainless steel nut.
- h. All gate valves shall open left (counter-clockwise).

### **Fair Oaks Ranch Material Standard Specifications**

3. The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject random valves to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.
4. Valve submitted for consideration as an approve equal must conform to product specification criteria. Include all necessary information to evaluate the product for approval.

#### **APPROVED MANUFACTURER LIST**

Valves furnished under this specification shall be as manufactured by one of the following, or approved equal:

| <b><u>Approved Manufacturers<br/>Pending)</u></b> | <b><u>Models</u></b> | <b><u>(Models Numbers for NL</u></b> |
|---------------------------------------------------|----------------------|--------------------------------------|
| Grinnell Valve Company                            | 3000                 |                                      |
| Nibco Valve Company                               | T-113                |                                      |
| Stockham Valve Company                            | B-103                |                                      |
| Hammond Valve Company                             | IB-645               |                                      |
| Milwaukee                                         | 105                  |                                      |
| Kitz Corporation                                  | # 46                 |                                      |

#### **Previous Specification**

NOVEMBER 1994

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

21-25A

## **SPECIFICATIONS FOR BRONZE GLOBE VALVES**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers iron pipe bronze globe valves in sizes through 2 - inches.

### **2. GENERAL REQUIREMENTS**

- a) The metal composition and physical characteristics shall conform to ASTM Specifications B62 or the latest revision thereof.
- b) Valves furnished under this specification shall be as manufactured by one of the following, or approved equal:

|          |        |
|----------|--------|
| Stockham | B-13T  |
| Nibco    | T-211Y |
| Powell   | 650TD  |
| Crane    | 5TF    |

- c) Valves shall be 200 p.s.i. WOG, with bronze, Soft Seated Material (TFE) with rising stem. The valve shall have a screw -in bonnet.
- d) 1/4-inch through 2- inch valves shall be equipped with a replaceable handwheel.
- e) All globe valves shall open left (counter-clockwise).

### **3. TESTING**

The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject random valves to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.

## **Fair Oaks Ranch Material Standard Specifications**

21-25B

### **SPECIFICATIONS FOR NO LEAD BRONZE GLOBE VALVES**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers no lead bronze globe valves for iron pipe in sizes ¼” through 2- inches.

#### **2. GENERAL REQUIREMENTS**

- a. The valve shall be manufactured in accordance with AWWA Standard C- 800, or the latest revision thereof. Valve shall comply with the NSF / ANSI Standard 61, Drinking Water Act and/or NSF/ ANSI Standard 372, Drinking Water Act. All brass components in contact with potable water must be made from either CDA/UNS Brass Alloys C89520 in accordance with ASTM B584; or C89833 with a maximum lead content of .25% by weight.
- b. The valve shall be 200 psi WOG rated and appropriately identified on the valve body. Valve shall have the manufacturers name or trademark and the no lead (NL) permanently stamped or cast on the valve.
- c. The packing shall be Teflon (non-asbestos containing) material approved for potable water service.
- d. ¼-inch through 2-inch valves shall be equipped with a replaceable handwheel.
- e. All globe valves shall open left (counter-clockwise).

3. The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject random valves to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.
4. Valve submitted for consideration as an approve equal must conform to product specification criteria. Include all necessary information to evaluate the product for approval.

## **Fair Oaks Ranch Material Standard Specifications**

### **APPROVED MANUFACTURER LIST**

Valves furnished under this specification shall be as manufactured by one of the following, or approved equal:

#### **Approved Manufacturers**

Stockham  
Nibco  
Powell  
Crane  
Kitz

#### **Model Numbers(Model Numbers for NL Pending.)**

B-13T  
T-211Y  
650TD  
5TF  
# 09

### **Previous Specification**

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

21-30

## **SPECIFICATIONS FOR DRY-BARREL FIRE HYDRANTS**

### **ANSI/AWWA C502-05**

### **REVISED JANUARY 2019**

#### **1. SCOPE**

This product specification covers post-type, dry-barrel fire hydrants with compression shut off (opening against pressure) or gate shutoff for use in water supply service in all climates, including those where freezing occurs. All products furnished shall conform to the American National Standards Institute and American Water Works Association C502-05 Standard (ANSI/AWWA C502-05) or latest revision thereof and shall be UL approved.

#### **2. DEFINITIONS**

All definitions are defined according to ANSI/AWWA C502-05.

- a. Cosmetic Defect: A blemish that has no affect on the ability of a component to meet the structural design and production test requirements of this standard. Should the blemish or the activity of plugging, welding, grinding, or repairing such blemishes cause the component to fail these requirements, and then the blemish shall be considered a structural defect.
- b. Structural Defect: A flaw that causes a component to fail the structural design or test requirements of this standard. This includes but is not limited to imperfections that result in leakage through the walls of a casting, failure to meet minimum wall thickness requirements, or failure to meet production tests.
- c. Bury: The length of bury is the distance measured to the nearest ½ ft. from the bottom of the connecting pipe to the ground line of the hydrant.

#### **3. GENERAL REQUIREMENTS**

- a. The City of Fair Oaks Ranch reserves the right to limit the purchase of fire hydrants from manufacturers and to the models specified, as shown on Attachment I, provided such fire hydrants conform to the provision contained herein.
- b. Each hydrant shall be designed for a minimum working pressure of 200 psig.
- c. All parts of the hydrant shall be designed to withstand, without being functionally impaired or structurally damaged, a hydrostatic test of not less than 400 psig or twice the rated working pressure, whichever is greater, with the hydrant completely assembled and pressurized as follows:

## **Fair Oaks Ranch Material Standard Specifications**

- i. With the nozzle caps in place, the main valve open, the hydrant inlet capped, and the test pressure applied to the interior of the hydrant.
  - ii. With the main valve closed, the hydrant inlet capped, and the test pressure applied at the hydrant inlet.
  - iii. The design safety factor of the operating mechanism shall not be less than 5 and shall be based on the foot-pounds of torque required for the closing and opening of the hydrant at a working pressure of 200 psig. Hydrants shall be functional and capable of being opened or closed without difficulty following an application of an operating torque of 200 lbf-ft at the operating nut in the opening direction with the hydrant fully opened and the closing direction with the hydrant fully closed. The torque requirements apply only to hydrants of 5-ft bury or less.
- d. The length of bury shall be as specified.
  - e. The fire hydrant shall have 2 hose nozzles and 1 pumper nozzle.
  - f. The nominal inside diameter of the hose nozzle shall be 2 ½ inches.
  - g. The nominal inside diameter for the pumper nozzle shall be 4 inches.
  - h. The outlet-nozzle threads are to conform to the National Fire Protection Association (NFPA) 2003, Standard for Fire Hose Connections.
  - i. The nominal diameter of the main valve opening shall be 5 ¼ inches.
  - j. The hydrant shoe shall be provided with a 6 inches mechanical joint connection to fit the connecting pipe.
  - k. The fire hydrant shall open left (counter-clockwise).
  - l. The color of the finish paint above the ground line shall be red.
  - m. The fire hydrant shall have a non-rising stem.
  - n. No more than one 6" stem extension shall be provided if required to make the base of the fire hydrant grade level.
  - o. The bonnet section shall be designed so all bearing surfaces and stem threads are sealed in a lubricant reservoir. If oil is used as a lubricant, the reservoir shall be designed to allow for easy filling through a fitting or plug. Where grease is used as a lubricant, the reservoir will be sealed. The reservoir will be adequately sealed with "O" rings or other suitable sealing system approved by Fair Oaks Ranch.
  - p. The fire hydrant shall have a safety flange or breakaway flange at the ground line as stipulated in Section 3.1 General Design of ANSI/AWWA C502-05 or latest revision thereof.

## **Fair Oaks Ranch Material Standard Specifications**

- q. Fire hydrant nozzle cap chains shall be required and shall be attached permanently to the fire hydrant as stipulated in Section 3.2 Detailed Design of ANSI/AWWA C502-05 or latest revision thereof.
- r. Parts that require lubrication and come into contact with water shall be lubricated with a non-toxic food grade lubricant that does not pose a health hazard to the public if consumed.

### **4. WORKMANSHIP**

- a. All foundry and machine work shall be performed in accordance with good standard practice for the class of work involved and in conformance with accepted drawings, if required. When assembled, hydrants manufactured in accordance with this specification shall be well fitted and shall operate smoothly. The body and shaft shall be watertight.
- b. All parts shall conform to the required dimensions and shall be free from defects that could prevent proper functioning of the hydrant.
- c. All castings shall be clean and sound without defects that will weaken their structure or impair their service.

### **5. PAINT**

- a. The exterior surface of the hydrant shall be coated with a coating that shall meet or exceed the requirements of Federal Specification TT-C-494b. A second coat of water based or oil based enamel paint red in color will then be applied from the top of the hydrant to a point 18 to 20 inches below the center line of the pumper nozzle or down to the traffic safety flange connection at the ground line.
- b. All interior surfaces, machined surfaces, such as the threaded portion of the stem or stem nut, which must fit closely with the adjacent parts, shall be coated with a coating that shall meet or exceed Federal Specification TT-C- 494b. Stem surfaces contained within a lubricant reservoir and not in contact with potable water may be free of coating.
- c. The interior and exterior of the hydrant shoe shall be coated with a fusion- bonded epoxy having a nominal dry film thickness of 8 mils, conforming to ANSI/AWWA C550-05, and certified to NSF 61.
- d. Coating shall be as close to holiday free as is technologically possible.

### **6. TESTING AND INSPECTION**

- a. Each assembled hydrant shall be subjected to two shop tests under a hydrostatic pressure of 400 psig or twice the rated working pressure, whichever is greater. One test

## **Fair Oaks Ranch Material Standard Specifications**

shall be made with the entire interior of the hydrant under pressure and another test made with the main valve closed and the base under pressure from the inlet side. Under the test procedure, there shall be no leakage through the main valve or seals or through the castings or the joints of the assembled hydrant. Under the test conditions, the leakage through the drain valves shall not exceed 5 fl oz/min. Other leakage or other imperfections found in either test shall be corrected or the hydrant retested. The tests shall be conducted for a sufficient time to allow a check of all points of possible leakage and for a minimum of 30 seconds after all air has been exhausted.

- b. Each assembled hydrant shall be operated through a full open-close cycle when not under pressure. The torque required for performing this operation shall not exceed 20 lbf-ft.
- c. All fire hydrant tests and inspections shall conform to ANSI/AWWA C502 Section 5.1 Production Testing, ANSI/AWWA C502 Section 5.2 Prototype Testing, and ANSI/AWWA C502-05 Section 5.3 Inspection and Rejection.
- d. The manufacturer shall provide an Affidavit of Compliance conforming to Section 1.7 Affidavit of Compliance of ANSI/AWWA C502-05 or latest revision thereof.

### **7. QUALITY ASSURANCE**

- a. Manufacturers shall have an ASME or I.S.O. 9001 registered commercial quality system or is in the process of achieving this certification by June 2001. Noncompliance to this registered commercial quality system requirement by June 2001 will result in removal of the manufacturer's product from Attachment I of this specification. If on receipt of fire hydrants they are found to be noncompliant the manufacturer shall replace the defective fire hydrants according to fire hydrant size with a fire hydrant that meets Fair Oaks Ranch's specifications. The defective fire hydrants will be returned to the manufacturer, freight collect, and the manufacturer shall replace the fire hydrant, freight prepaid. If Fair Oaks Ranch audits, product inspection and performance data review in accordance with these specifications determine excessive fire hydrant non-compliance, the manufacturer will be subject to removal by the Products Standards Committee. If the fire hydrant becomes defective during the manufacturer's specified warranty period a Fair Oaks Ranch quality assurance and manufacturer review will ensue. If the review determines manufacturing non-conformance the manufacturer shall replace the fire hydrant according to size with a fire hydrant that meets Fair Oaks Ranch's specifications. The defective fire hydrant removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the fire hydrant, freight prepaid. If the non-conformance product amounts are excessive and result in increased product replacement by Fair Oaks Ranch field staff the manufacturer may be subject to time and material charges.

### **8. FIRE HYDRANT MAINTENANCE KITS**

The City of Fair Oaks Ranch will attempt to use fire hydrant maintenance kits in the repair of the approved hydrants. Attachment II of this specification provides the product model numbers.

## **Fair Oaks Ranch Material Standard Specifications**

### **9. REFERENCES**

- a. American National Standards Institute and American Water Works Association Standard C502-05 (ANSI/AWWA C502-05).
- b. American National Standards Institute and American Water Works Association Standard C550-05 (ANSI/AWWA C550-05).

## ATTACHMENT I

### APPROVED MANUFACTURERS LIST

The manufacturers listed below are approved by Fair Oaks Ranch:

| <u>Manufacturer</u>                     | <u>Model</u>                        |
|-----------------------------------------|-------------------------------------|
| a. American Darling                     | B84B 5-1/4" (w / metal weather cap) |
| b. Clow Valve Company                   | Medallion                           |
| c. Kennedy Valve Company                | Guardian                            |
| d. M & H Valve Company                  | Reliant Model 929                   |
| e. Mueller Company                      | Super Centurion 250                 |
| f. United States Pipe and Foundry, Inc. | Sentinel 250                        |
| g. Waterous                             | Pacer 100                           |
| h. American AVK Company                 | Model 2780 Dry                      |
| i. East Jordan Iron Works               | 5CD250                              |

## **ATTACHMENT II**

### **APPROVED FIRE HYDRANT MAINTENANCE KITS**

The fire hydrant maintenance kits listed are the reference product model numbers.

| <b><u>Manufacturer</u></b>              | <b><u>Model</u></b>                         |
|-----------------------------------------|---------------------------------------------|
| a. American Darling                     | B84B 5-1/4" (w / metal weather cap)         |
| b. Clow Valve Company                   | Medallion                                   |
| c. Kennedy Valve Company                | Guardian                                    |
| d. M & H Valve Company                  | Reliant Model 929                           |
| e. Mueller Company                      | Super Centurion 250                         |
| f. United States Pipe and Foundry, Inc. | Sentinel 250                                |
| g. Waterous                             | Pacer 100                                   |
| h. American AVK Company                 | Model 2780 Dry                              |
| i. East Jordan Iron Works               | Water Master Water Hydrant Model<br>#5CD250 |

### **Previous Specification**

DECEMBER 2011

MAY 2010

SEPTEMBER 2005

APRIL 2000

# **Fair Oaks Ranch Material Standard Specifications**

29-01

## **SPECIFICATIONS FOR AIR RELEASE, VACUUM & COMBINATION AIRVALVES FOR WATER SERVICE**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers automatic valves installed on water mains to vent accumulated air under system pressure, and to provide air exhaust during initial fill or to prevent a vacuum during draining or water column separation of the system.

### **2. GENERAL REQUIREMENTS**

- a) Valves furnished under this specification shall conform to ANSI/NSF Standard 60 for direct additives and ANSI/NSF Standard 61 for indirect additives. Cast Iron Valve Body and cover shall be in accordance with ASTM A48-35 or ASTM A126 class B. Non-Metallic Valve Body shall be fabricated from fiberglass reinforced nylon. Inlet sizes through 2 inches shall be screwed (NPT). Pipe sizes 3" and above shall have flanged inlets (125# ASNSI B 16.1). A protective hood or cowl shall be installed on the outlet of flange-bodied valves.
- b) Metallic Internal seat trim float arm and pivot pin shall be stainless steel type 303, 304 or 316. Metallic Floats shall be stainless steel ASTM A 240. Other stainless steel metal internal parts shall be stainless steel ASTM A240 or ASTM A276.
- c) Non-metallic floats shall be foamed polyethylene with stainless steel type 316 fasteners.
- d) Valves requiring Internal seats or orifice buttons shall be Buna-N rubber compounded for water service. For valves requiring cover gaskets, the cover gasket shall be composition type, equal to Armstrong CS-231, Garlock 3000, or Lexide NK-511. If an O-Ring is used to seal the cover, it shall be on NSF 61 certified rubber. Cover bolts shall be alloy steel. Rolling seals shall be furnished for non-metallic valves 2" and below.
- e) Valve body shall have a test pressure rating of 300 psi and working pressure rating of 150 psi.

## **Fair Oaks Ranch Material Standard Specifications**

### **3. GENERAL OPERATION REQUIREMENTS**

- a) The air release valve shall be designed to vent accumulated air automatically. The outlet orifice shall be properly sized to facilitate valve operation at pressures up to 150 psi. The air release valve shall be simple-lever, compound-lever, ball and orifice or rolling seal depending upon volume requirements and the design of the valve.
- b) The air and vacuum valve shall be designed with the inlet and outlet of equal cross-sectional area where applicable. The valve shall be capable or automatically allowing large quantities of air to be exhausted during the filling cycle and also capable of automatically allowing air to re-enter the system to prevent a negative pressure at water column separation or during the draining cycle. The float shall be guided to minimize premature closure by air and to provide proper alignment for normal closure by floating on the water surface.
- c) Combination air and vacuum relief valves shall provide for both automatic air release under system pressure and to allow air movement during filling or draining operations or water column separation. The combination valve may be housed in a single casting. The housing shall be designed to incorporate conventional or kinetic flow principles to properly vent the air without premature closure. Flanged sized (4 inch and larger) may be furnished in a dual housing. When dual casings are used a bronze manual isolation valve shall be installed if indicated by the manufacturer. This will allow the air release valve to be serviced when the system is under pressure. Field service of the valve may also be performed by closing the isolation valve between the air valve and the pipe connection.

### **4. TESTS**

Fair Oaks Ranch may, at no cost to the manufacturer, subject random valves to testing by an independent laboratory for compliance with these standards. Any visible defect or failures to meet the quality standards herein will be grounds for rejecting the entire order.

### **5. QUALITY ASSURANCE**

The manufacturers shall provide certification that products furnished under this specification are manufactured in an ISO 9001 certified facility or documentation from an accredited facility that ISO 9001 certification is in process.

## **Fair Oaks Ranch Material Standard Specifications**

### **APPROVED MANUFACTURERS LIST**

The following qualified products list identifies specific manufactured items by catalog number that are approved.

#### **Approved Manufacturers and Models:**

##### **A. Air Release Valves (Inlet x Orifice)**

| <u>Manufacturer</u>            | <u>1"NPT x 3/16"</u> | <u>2" NPT x 3/16"</u> |
|--------------------------------|----------------------|-----------------------|
| Apco Valve Company             | 200A                 | 200A                  |
| G.A. Industries, Inc. (Empire) | 920                  | 920                   |
| Multiplex Mfg. Co. (Crispin)   | PI-10                | PL-10A                |
| Val-Matic Mfg. Co.             | 38                   | 38                    |
| PowerSeal Corporation          | 5401-D               | 5401-E                |
| ARI Flow control               | S-050 1T             | D-040 2T              |

##### **B. Air & Vacuum Valves (Inlet x Orifice)**

| <u>Manufacturer</u>            | <u>2" NPT x 3/16"</u> | <u>4" flg. with cowl</u> |
|--------------------------------|-----------------------|--------------------------|
| Apco Valve Company             | 144                   | 152                      |
| G.A. Industries, Inc. (Empire) | 930                   | 930-C                    |
| Multiplex Mfg. Co. (Crispin)   | AL20                  | AL41                     |
| Val-Matic Mfg. Co.             | 102                   | 104                      |
| PowerSeal Corporation          | 5402-B                | 5402-D                   |
| ARI Flow Control               | D-040 2T              | K060 C-HF                |

**Fair Oaks Ranch Material Standard Specifications**

**Approved Manufacturers and Models:**

C. Combination Air Valves (Inlet x Orifice)

| <u>Manufacturer</u>            | <u>1"NPT<br/>x 5/64"</u> | <u>2" NPT<br/>x 3/32"</u> | <u>4"flg.<br/>x 3/32 w/ cowl</u> |
|--------------------------------|--------------------------|---------------------------|----------------------------------|
| Apco Valve Company             | 143C                     | 145C                      | 149C                             |
| G.A. Industries, Inc. (Empire) | 945 (1" NPT)             | 945                       | 960C                             |
| Multiplex Mfg. Co. (Crispin)   | U10                      | UL20 (1/4")               | UL41 (1/4")                      |
| Val-Matic Mfg. Co.             | 201C                     | 202C                      | 204C                             |
| PowerSeal Corporation          | 5403-A                   | 5403-B                    | 5403-D                           |
| ARI Flow Control               | D-040 2T                 | D-040<br>D-060 C-HF       | D-060 C-HF                       |

## **Fair Oaks Ranch Material Standard Specifications**

### D. Air and Vacuum Valves

**Manufacturer:** Vent-O-Mat

**Series:** RBX (water)

| <u>1" NPT</u> | <u>2" NPT</u> | <u>3" Flange</u> | <u>4" Flange</u> | <u>6" Flange</u> | <u>8" Flange</u> |
|---------------|---------------|------------------|------------------|------------------|------------------|
| RBX 2521      | RBX 2521      | RBX 1631         | RBX 1631         | RBX 1631         | RBX 1631         |
| RBX 4021      | RBX 4021      | RBX 2531         | RBX 2531         | RBX 2531         | RBX 2531         |
| RBXb 2521     | RBXb 2521     | RBX 4031         | RBX 4031         | RBX 4031         | RBX 4031         |
| RBXb 4021     | RBXb 4021     | RBXb 1631        | RBXb 1631        | RBXb 1631        | RBXb 1631        |
| RBXv 2521     | RBXv 2521     | RBXb 2531        | RBXb 2531        | RBXb 2531        | RBXb 2531        |
| RBXv 4021     | RBXv 4021     | RBXb 4031        | RBXb 4031        | RBXb 4031        | RBXb 4031        |
|               |               | RBXv 1631        | RBXv 1631        | RBXv 1631        | RBXv 1631        |
|               |               | RBXv 2531        | RBXv 2531        | RBXv 2531        | RBXv 2531        |
|               |               | RBXv 4031        | RBXv 4031        | RBXv 4031        | RBXv 4031        |

## **Fair Oaks Ranch Material Standard Specifications**

**Manufacturer:** Vent-O-Mat

**Series:** RGX (sewage)

| <u>2" NPT Flange</u> | <u>3" Flange</u> | <u>4" Flange</u> | <u>6" Flange</u> | <u>8" Flange</u> |
|----------------------|------------------|------------------|------------------|------------------|
| RGX 1021             | RGX 1021         | RGX 1021         | RGX 1031         | RGX 1031         |
| RGX 1031             | RGX 1031         | RGX 1031         | RGX 1631         | RGX 1631         |
| RGX 1621             | RGX 1621         | RGX 1621         | RGXb1031         | RGXb 1031        |
| RGX 1631             | RGX 1631         | RGX 1631         | RGXb 1631        | RGXb 1631        |
| RGXb 1021            | RGXb 1021        | RGXb 1021        | RGXv 1031        | RGXv 1031        |
| RGXb 1031            | RGXb 1031        | RGXb 1031        | RGXv 1631        | RGXv 1631        |
| RGXb 1621            | RGXb 1621        | RGXb 1621        |                  |                  |
| RGXb 1631            | RGXb 1631        | RGXb 1631        |                  |                  |
| RGXv 1021            | RGXv 1021        | RGXv 1021        |                  |                  |
| RGXv 1031            | RGXv 1031        | RGXv 1031        |                  |                  |
| RGXv 1621            | RGXv 1621        | RGXv 1621        |                  |                  |
| RGXv 1631            | RGXv 1631        | RGXv 1631        |                  |                  |

**Previous Specification Date:**

JANRUARY 1991

AUGUST 1992

DECEMBER 2005

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

29-02

## **SPECIFICATIONS FOR CHECK VALVES, DUAL-PLATE WAFER**

### **STYLE**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers check valve of the water tight, wafer style body with flangeless bodies in sizes of 2 inch through 48 inch.

#### **2. GENERAL REQUIREMENTS**

- a) The manufacturers on our approved manufacturer list shall manufacture valves furnished under this specification.
- b) Valves shall be A.N.S.I. class 150 lb. (unless otherwise noted).
- c) The double door check valve shall be compact wafer design, to fit between flanges.
- d) The check valve doors shall be spring loaded, NORMALLY closed, by means of one or more heavy duty stainless steel torsion springs, flow from the pump shall cause the doors to open and upon pump shut down, the torsion spring will shut the doors before reverse flow starts and at a point of zero velocity for non-slam closure. The valve spring shall be a standard torque spring specifically designed for this style valve.
- e) The valve body will be short face-to-face, dimension to ANSI standards.
- f) Seating shall be resilient and water tight; the seating element shall be buna-n- molded to the body casting.
- g) Valves 5" and larger shall be fitted with a lifting eye bolt for installation purposes.
- h) Studs and nuts shall be included. They shall be grade B7 with quantity two (2) 2H nuts.
- i) The approved products must be certified by a manufacturer's registered professional engineer that they meet this specification and the referenced A.S.T.M. Standards.

### **Fair Oaks Ranch Material Standard Specifications**

|       |                            |                                                                                                          |
|-------|----------------------------|----------------------------------------------------------------------------------------------------------|
| Body  | All Accepted and Approved  | Ductile Iron ASTM A536<br>Cast Steel ASTM A216 WCB<br>Cast Iron ASTM A126 GR.B<br>Ductile Iron ASTM A536 |
| Doors | Both Accepted and Approved | Cast Steel ASTM A216 WCB<br>Al. Bronze ASTM B148 C95200                                                  |

- j) Sealing Element Buna-N
- k) Torsion Spring T316 Stainless Steel
- l) Hinge Shaft T316 Stainless Steel
- m) Stop Shaft - T316 Stainless Steel
- n) Exterior Paint - Epoxy Primer

### **3. SUBMITTAL REQUIREMENTS**

The bidders shall submit with the Purchasing material specification bid three sets of certified drawings showing the principal dimensions, general construction and material specification for each valve proposed

Please refer to the bid documents for additional product requirements. Submittals for construction contracts will be specified separately.

### **APPROVED MANUFACTURERS LIST**

Crane Duo Check  
II Style G Gulf  
Wafer Check  
APCO Style 9000

### **Previous Specification**

JANRUARY 2000  
DECEMBER 2011

## **Fair Oaks Ranch Material Standard Specifications**

29-03

### **SPECIFICATION FOR PRESSURE REDUCING VALVES**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers pressure reducing valves of the water tight, globe style bodies with flange bodies in sizes of 1- inch through 36- inch. Pressure ranges will be noted on the project plans or in purchase orders.

#### **2. GENERAL REQUIREMENTS**

- a) Valves furnished under this specification shall be manufactured by one of the following or approved equal.

Cla-Val

GA Industries Watts Singer Bermad 720

- b) Valves shall be class 150 lb. (unless otherwise noted).
- c) The valve furnished shall be cast iron globe body. Material for the valve body shall be in accordance with ASTM A-126B.
- d) The valve shall have flanged ends. Flanges shall be faced and drilled in accordance with the latest revision of ASTM B16.1.
- e) The main valve seat shall be provided with v-notch port sections.
- f) All internal removable working parts shall be bronze.
- g) The valve shall be repairable without removing the valve body from the line.
- h) Valves shall be solenoid controlled or diaphragm operated, hydraulically actuated and shall be heavy-duty waterproof construction in a NEMA IV enclosure.
- i) The valve shall have an indicator rod that is an integral part of the valve to show the position of the diaphragm within the valve body. Valves shall be equipped with speed controls for regulation the speed of opening and closing.
- j) The valve shall have a SPDT limit for both open and closed positions to perform the functions as indicated on the electrical plans or as otherwise

## **Fair Oaks Ranch Material Standard Specifications**

indicated on the drawing.

- k) All materials of construction must be certified in writing to A.S.T.M. Specifications as follows:

|       |                            |                                                                                                         |
|-------|----------------------------|---------------------------------------------------------------------------------------------------------|
| Body  | All Accepted and Approved  | Ductile Iron ASTM A536<br>Cast Steel ASTM A216WCB<br>Cast Iron ASTM A136 GR.B<br>Ductile Iron ASTM A538 |
| Doors | Both Accepted and Approved | Cast Steel ASTM A 216 WCB<br>Al. Bronze ASTM B148 C95200                                                |

- l) Sealing Element Buna-N
- m) Torsion Spring T316 stainless Steel
- n) Hinge Shaft T316 Stainless Steel
- o) Stop Shaft- T316 Stainless Steel
- p) Exterior Paint – Epoxy Primer

Valves shall be ANSI/NSF Standard 61 certified.

The bidders shall submit with the proposal three sets of certified drawings showing the principal dimensions, general construction and material specification for each valve proposed.

### **Previous Specification**

MAY 1999

FEBRUARY 2003

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

29-04

## **SPECIFICATIONS FOR REDUCED-WALL, RESILIENT-SEATED GATE AND TAPPING VALVES FOR WATER SUPPLY SERVICE**

### **4 IN. THROUGH 48 IN. ANSI/AWWA C515-01**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This product specification covers reduced wall resilient seated gate valves, with nominal diameters of 4 in. through 48 in. Sizes refer to the nominal diameter, in inches, of the waterway through the inlet and outlet connections and the closure area. All products furnished shall conform to the American National Standards Institute and American Water Works Association C515-01 Standard (ANSI/AWWA C515-01) or latest revision thereof and Manufacturers Standardization Society Standard Practice for Connecting Flange Joint Between Tapping Sleeves and Tapping Valves MSS SP-60 or latest revision thereof.

#### **2. DEFINITIONS**

All definitions are defined according to ANSI/AWWA C515-01.

- a. Cosmetic Defect: A blemish, which has no effect on the ability of the component to meet the structural design and production test requirements of this standard. Should the activity of plugging, welding, grinding, or repairing of such blemish cause the component to fail these requirements, and then the blemish shall be considered a structural defect.
- b. Flanged Joint: The flanged and bolted joint as described in ANSI/AWWA C110/A21.10 or ANSI B16.1, Class 125.
- c. Mechanical Joint: The gasketed and bolted joint as described in ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11, or ANSI/AWWA C153/21.53.
- d. Push-on Joint: The single rubber gasket joint as described in ANSI/AWWA C111/A21.11.
- e. Structural Defect: Flaws that cause the component to fail the structural design or test requirements of this standard. This includes but is not limited to imperfections that result in leakage through the walls of a casting, failure to meet the minimum wall- thickness requirement, or failure to meet production tests.
- f. Tapping Valve: A special gate valve designed with end connections and an unobstructed waterway to provide proper alignment and positioning of a tapping sleeve, valve, and machine for tapping pipe dry or under

## **Fair Oaks Ranch Material Standard Specifications**

pressure.

### **3. GENERAL REQUIREMENTS**

- a. Except as otherwise modified or supplemented herein, ANSI/AWWA Standard C515-01 or the latest revision thereof, shall govern the design, component materials, construction; manufacture and testing of all reduced wall resilient seated gate valves. Valves shall be suitable for frequent operation as well as service involving long periods of inactivity. Valves shall be NSF- 61 certified.
- b. Fair Oaks Ranch reserves the right to limit the purchase of reduced wall resilient seat gate valves from manufacturers and to the models specified, as shown on Attachment I, provided such reduced wall resilient seat gate valves conform to the provision contained herein.
- c. The minimum design working water pressure for gate valves with nominal diameters of 4 in., 6 in., 8 in., 10 in., 12 in., 14 in. and 16 in. shall be 200 psig unless otherwise specified.
- d. The maximum fluid velocity for flow through the valve in full open position shall be 16 ft/s.
- e. Valves shall be reduced wall, resilient-seated types, bronze mounted with non-rising stems. The closure member shall be fully encapsulated by an elastomer without thin spots or voids. When open the valve shall have a clear, full-port, unobstructed waterway.
- f. Gray iron, ductile iron, steel, brass and bronze materials shall meet or exceed the material requirements of Section 4.2: Materials of AWWA C515-01 and the table below.

| <b>Material</b>             | <b>Standard</b>                             |
|-----------------------------|---------------------------------------------|
| Gray Iron                   | ASTM A126, Class B                          |
| Ductile iron                | ASTM A536 no more than .08% phosphorous     |
| Steel                       | SAE Grade 2, ASTM A307, and zinc plated     |
| Bronze                      | ASTM B763 UNS C99500                        |
| Bronze<br>Stem Nuts<br>Only | ASTM B62 UNS C83600<br>ASTM B584 UNS C84400 |

- g. Gaskets, O-rings, Coatings, and elastomers shall meet or exceed the material requirements of Section 4.2 Materials of AWWA C515-01.
- h. The gate valves shall be designed and constructed for installation in either a horizontal or vertical position. Valves designed for buried installation shall

## **Fair Oaks Ranch Material Standard Specifications**

have a stem in the vertical position and shall be furnished for mounting in a horizontal pipeline, unless otherwise specified.

- i. Valve components of brass or bronze shall be manufactured to ASTM recognized alloy specifications of low zinc content bronze, as shown in Section 4.2 Materials ANSI/AWWA Standard C515- 01 or the latest revision thereof. Material for the stem shall have minimum yield strength of 40,000 psi. A minimum elongation in 2 inches of 12% and shall be made of bronze per ASTM B763, alloy number UNS C99500. A maximum zinc content of 2% as shown in Table 2 Chemical Requirements of ASTM B763-96 or the latest revision thereof. Stem nut material shall comply with the requirements shown in 3f above. The stem shall have a visible external marking at the top to indicate low-zinc, high strength material. The marking shall include a red plastic or neoprene washer placed around the top of the stem under the operating nut.
- j. Valve ends shall be either flanged, tapping valve, mechanical joint, push-on joint or any combination thereof, as specified. All mechanical joint valves shall be supplied with glands, bolts, and gaskets. Valve body bolts and nuts shall meet the strength requirements of ASTM A307 with dimensions conforming to ANSI B18.2.1. The size of the bolt head shall be equal to the size of the nut and shall be stainless steel in accordance with ASTM 276.
- k. All gate valves shall open left (counter-clockwise).
- l. The following parts of the valve shall be made of ductile iron: bonnet and body. Shell thickness shall meet the minimum thickness requirements of Table 1 Minimum Thickness of Body and Bonnet of Section 4.4 Detailed Design of ANSI/AWWA C515-01. Valves larger than sixteen-inch shall meet the performance requirements of Fair Oaks Ranch resilient seat reduced gate valve specification.
- m. If glands and bushings are used for the valves shall be made of ASTM B763 bronze UNS C99500. The stem shall be made of cast, forged, or rolled ASTM B763 bronze UNS C99500. The gate may be made of bronze ASTM B763 UNS C99500. Stem seals shall be "O" ring type. The seals shall be designed for dynamic applications. The design shall be such that the seal above the stem collar can be replaced with the valve under full pressure in the fully open position. Materials for the "O" ring packing plate shall be in accordance with Section 4.4.6 Stem Sealing of the ANSI/AWWA C515-01 Standard or the latest revision thereof.
- n. Enclosed and buried valves shall be coated inside and outside with a fusion bonded epoxy having a nominal 8 mils dry film thickness, which meets or exceeds AWWA C550-01 and to the maximum extent possible shall be free of holidays. All coatings in contact with the potable water shall be approved for potable water immersion service per ANSI/NSF Standard 61.

### **Fair Oaks Ranch Material Standard Specifications**

- o. The bidder shall submit with his proposal three sets of certified drawings showing the principal dimensions, general construction and material specification of the valve proposed. The number of turns to open (close) shall be clearly noted in the valve information submitted with the proposal documents. The number of turns to open or close the valve shall be consistent for each valve size for each approved manufacturer.
- p. Valves furnished under this specification shall be supplied from Fair Oaks Ranch approved manufacturer list.
- q. All gate valve parts shall be designed to withstand the following two pressure requirements, without being structurally damaged. (1) An internal test pressure of twice the rated design working pressure of the valve. In no case shall the pressure be less than 500 psi without any visual deformation. (2) The full rated internal working pressure when the closure member is cycled once from a fully open to a fully closed position against the full rated unbalanced working water pressure. In addition to these pressure requirements, the valve assembly and mechanism shall be capable of withstanding an input torque as follows: 200 ft.-lbs. for a 4-in. nominal diameter. 300 ft.-lbs. for a 6-in. nominal diameter. 300 ft.-lbs. for an 8-in. nominal diameter. 300 ft.-lbs. for a 10-in. nominal diameter. 300 ft.-lbs. for a 12-in. nominal diameter. 400 ft.-lbs. for a 14-inch through 20-inch nominal diameter. 600 ft.-lbs. for a 24-inch nominal diameter.
- r. Resilient seats shall be applied to the gate and shall seat against a corrosion resistant surface. The non-metallic seating surface shall be applied in a manner to withstand the action of line fluids and the operation of the sealing gate under long-term service. A metallic surface shall have a corrosion resistance equivalent to or better than bronze. A non-metallic surface shall be in compliance with ANSI/AWWA C550. The gate must be fully encapsulated by an elastomer without thin spots or voids. Resilient seats shall be bonded. ASTM D429 either method A or method B shall prove the method used for bonding or vulcanizing. For method A, the minimum strength shall not be less than 250 psi. For method B, the peel strength shall be 75 lb./in.
- s. Flanged Ends: The end flanges of flanged valves shall conform to dimensions and drillings of ANSI/AWWA C110/A21.10 or ANSI B16.1, Class 125.
- t. Mechanical Joint Ends: Mechanical joint bell dimensions shall conform to ANSI/AWWA C111/A21.11.
- u. Push-on Joints: Push-on joints shall conform to the requirements of ANSI/AWWA C111/A21.11.

## **Fair Oaks Ranch Material Standard Specifications**

- v. Markings shall be cast on the bonnet or body of each valve and shall show the manufacturer's name or mark, the year the valve casting was made, the size of the valve, the letters "C515", and the designation of working water pressure, for example "200 W". Markings shall conform to Section 6.1 Marking of ANSI/AWWA C515-01 or latest revision thereof.
- w. Fair Oaks Ranch may, at no cost to the manufacturer, subject random valves to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order and removal of the manufacturer from the attached approval list.
- x. The attached qualified product list identifies specified manufacturers that are approved.
- y. The tapping valves shall be configured with a mechanical joint on one end and a tapping flange on the other end. The tapping valves shall be furnished complete with glands, bolts, and gaskets. The tapping valve shall have a clear unobstructed waterway. The seat rings shall be of a large diameter to permit the entry of the full diameter tapping machine cutters. The valve end which mates with the tapping sleeve shall have an alignment lip to fit the recess in the tapping sleeve flange for proper alignment. The lip will be dimensioned in accordance with MSS SP-60 for valves 20-inch nominal pipe size and smaller.

### **4. WORKMANSHIP**

- a. All parts of the reduced wall resilient seat gate valve shall be designed and manufactured to the tolerances specified in ANSI/AWWA C515-01 or latest revision thereof and this specification.
- b. All parts of the reduced wall resilient seat gate valve manufactured by a given manufacturer shall be interchangeable with like parts from another reduced wall resilient seat gate valve of the same model and size and by the same manufacturer.
- c. All interchangeable parts shall conform to their required dimensions and shall be free from defects that could prevent proper functioning of the valve.
- d. All castings shall be clean and sound, without defects that will weaken their structure or impair their service. Plugging, welding, or repairing of cosmetic defects is allowed. Repairing of structural defects is not allowed. Repaired valves shall comply with the testing requirements of this specification after repairs have been made. Repairs within the bolt circle of any flange face are not allowed.

## **Fair Oaks Ranch Material Standard Specifications**

- e. The reduced wall resilient seat gate valve shall be well fitted.
- f. Operation of the reduced wall resilient seat gate valve shall be smooth.
- g. All parts shall be free of structural defects.
- h. The reduced wall resilient seat gate valve shall be watertight.

### **5. PAINTING**

- a. All exterior and interior surfaces of the valve shall be coated with epoxy, N.S.F. 61 certified. The epoxy shall have a nominal dry film thickness of 8 mils, and shall be in accordance with AWWA C550, latest revision.
- b. Coating shall be as close to holiday free as is technologically possible.

### **6. TESTING**

- a. Hydrostatic Gate Test: Hydrostatic Gate Test shall be performed on the valve in accordance with Section 5.1 Testing of ANSI/AWWA C515-01 or latest revision thereof.
- b. Torque Test: Torque Test for prototype valves shall be performed on the valve in accordance with Section 5.1 Testing of ANSI/AWWA C515-01 or latest revision thereof. Prototype valves larger than sixteen-inch shall meet the torque requirements of section 3q above.
- c. Leakage Test: Leakage Test shall be performed on the valve in accordance with Section 5.1 Testing of ANSI/AWWA C515-01 or latest revision thereof.
- d. Hydrostatic Shell Test: Hydrostatic Shell Test shall be performed on the valve in accordance with Section 5.1 Testing of ANSI/AWWA C515-01 or latest revision thereof. Valves larger than sixteen-inch shall be shell tested at twice the rated working pressure but no less than 500 psi.
- e. Production Test: Production Test shall be performed on the valve in accordance with Section 5.1 Testing of ANSI/AWWA C515-01 or latest revision thereof. This same test shall apply to valves larger than sixteen inch.
- f. Operation Test: Operation Test shall be performed on the valve in accordance with Section 5.1 Testing of ANSI/AWWA C515-01 or latest revision thereof.
- g. Seat Test. Seat Test shall be performed on the valve in accordance with

## **Fair Oaks Ranch Material Standard Specifications**

Section 5.1 Testing of ANSI/AWWA C515-01 or latest revision thereof.

- h. An Affidavit of Compliance certifying that all required tests have been performed shall be provided in accordance with Section 6.3 Affidavit of Compliance of ANSI/AWWA C515-01.
- i. The Affidavit of Compliance, the results of ASTM testing procedures and requirements for materials, Manufacturer's Quality Assurance Program, and the records of all tests performed on the valve shall be kept and provided by the supplier/manufacturer in a single hard cover bound notebook with the bid or with the shipping documents and shall be approved by Fair Oaks Ranch.

### **7. QUALITY ASSURANCE**

- a. Manufacturers shall have an ASME or I.S.O. 9001 registered commercial quality system. If on receipt of reduced wall resilient seated gate valves they are found to be non-compliant the manufacturer shall replace the defective reduced wall resilient seated gate valves according to reduced wall resilient seated gate valve size with a reduced wall resilient seated gate valve that meets Fair Oaks Ranch's specifications. The defective reduced wall resilient seated gate valve will be returned to the manufacturer, freight collect, and the manufacturer shall replace the reduced wall resilient seated gate valve, freight prepaid. If Fair Oaks Ranch audits, product inspection and data review in accordance with these specifications determine excessive reduced wall resilient seated gate valve non-compliance, the manufacturer will be subject to removal by the Products Standards Committee. If the reduced wall resilient seated gate valve becomes defective during the manufacturer's specified warranty period a Fair Oaks Ranch quality assurance and manufacturer review will ensue. If the review determines manufacturing non-conformance the manufacturer shall replace the reduced wall resilient seated gate valve according to size with a reduced wall resilient seated gate valve that meets Fair Oaks Ranch's specifications. The defective reduced wall resilient seated gate valve removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the reduced wall resilient seated gate valve, freight prepaid. If the non-conformance product amounts are excessive and result in increased product replacement by Fair Oaks Ranch field staff the manufacturer may be subject to time and material charges.

### **8. REFERENCES**

- a. American National standards Institute and American Water Works Association Standard C509-01 (ANSI/AWWA C509-01).
- b. Manufacturers Standardization Society MSS SP-60.

## **Fair Oaks Ranch Material Standard Specifications**

### **APPROVED MANUFACTURER LIST**

#### **Sizes Four through Sixteen Inch**

| <b><u>Manufacturer</u></b>            | <b><u>Model</u></b>         |
|---------------------------------------|-----------------------------|
| American Flow Control                 | 2500                        |
| Mueller Company                       | A2361                       |
| United States Pipe & Foundry Company  | Reduced Wall Metroseal Clow |
| Valve Company                         | 2638                        |
| FlowMaster Resilient Wedge Gate Valve |                             |

#### **Sizes Eighteen Inch through Twenty-Four Inch**

| <b><u>Manufacturer</u></b>           | <b><u>Model</u></b>         |
|--------------------------------------|-----------------------------|
| American Flow Control                | 2500                        |
| Mueller Company                      | A2361                       |
| United States Pipe & Foundry Company | Reduced Wall Metroseal Clow |
| Valve Company                        | 2638                        |

#### **Sizes Thirty Inch And Thirty-Six Inch**

| <b><u>Manufacturer</u></b> | <b><u>Model</u></b> |
|----------------------------|---------------------|
| American Flow Control      | 2500                |
| Clow Valve Company         | 2638                |

#### **Sizes Forty-Two Inch And Forty-Eight Inch**

| <b><u>Manufacturer</u></b> | <b><u>Model</u></b> |
|----------------------------|---------------------|
| American Flow Control      | 2500                |

### **Previous Specification**

APRIL 2000

AUGUST 2004

# **Fair Oaks Ranch Material Standard Specifications**

29-05

## **SPECIFICATIONS FOR RUBBER-SEATED BUTTERFLY**

### **VALVES 3 INCHES THROUGH 72 INCHES**

#### **ANSI/AWWA C504 Class 150/250**

#### **REVISED JANUARY 2019**

## **1. SCOPE**

This product specification covers class 150/250 rubber-seated butterfly valves, 4 inches through 54 inches. All products furnished shall be in conformance with the American National Standards Institute and American Water Works Association C504 (ANSI/AWWA C504) or latest revision thereof; however, the body construction of the valve shall exceed the ANSI/AWWA C504 by the values specified herein. All coatings in contact with potable water shall be certified to N.S.F. 61. A proof of design certification shall be provided upon request.

## **2. DEFINITIONS**

All definitions are defined according to ANSI/AWWA C504.

- a. Actuator: A device attached to the valve for the purpose of rotating the valve disc to an open, closed, or intermediate position; preventing disc over travel; and maintaining the disc in any position.
- b. Butterfly Valve: A valve that uses a disc rotatable through an angle of approximately 90 degrees as a closure member. The valve is closed when the disc is perpendicular to the flow way, open when parallel to the flow way, or used for throttling when positioned between open and closed.
- c. Disc: The closure member that is positioned in the flow stream to permit flow or to obstruct flow (depending on closure position) and that rotates through an angle of 90 degrees from full open to full shutoff.
- d. Rubber Seat: A rubber ring around the inside of the valve body to affect a seal against the metal seating surface when the disc is closed or resilient seats shall be located on the valve disc and shall provide a 360 degrees continuous, uninterrupted seating surface. Seats shall be mechanically retained with a stainless steel retaining ring and stainless steel Nylok cap screws, which shall pass through both the resilient seat and the retaining ring.

The resilient seat's mating surface shall be to a 360 degrees continuous, uninterrupted stainless steel body seat ring. The retaining ring shall be continuous or investment cast with overlapping sections serrated grooves, and shoulders.

## **Fair Oaks Ranch Material Standard Specifications**

### **3. GENERAL REQUIREMENTS**

- a. Except as otherwise modified or supplemented herein, AWWA Standard C504 or the latest revision thereof, shall govern the design, component material construction, manufacture and testing of all butterfly valves.
- b. Fair Oaks Ranch reserves the right to limit the purchase of butterfly valves from manufacturers and to the models specified, as shown on Attachment I, provided such butterfly valves conform to the provisions contained herein.
- c. Valves shall be Class 150/250 of the short-body type with a 150/250 psig bi-directional shut-off rating, a 500 psig hydrostatic body shell test and a maximum upstream line velocity rating according to the table listed below unless specified otherwise.

| <u>Diameter</u>         | <u>Velocity</u>    |
|-------------------------|--------------------|
| 3 inch through 20 inch  | 16 feet per second |
| 24 inch through 72 inch | 8 feet per second  |

- d. Valve shall be in the same alignment as a horizontal pipe and shall be for buried service, unless otherwise specified. Valve shall be configured with a horizontal valve shaft and a vertical actuator shaft with standard 2" AWWA operating nut. The actuator shall be side mounted.
- e. Valve body shall be of cast iron conforming to ASTM Specification A- 26, Class B, or Ductile Iron ASTM A536, grade 65-45-12.

Valve body ends shall be flat-faced flanged in accordance with ANSI B16.1, Class 150/250. All cast iron valves shall exceed minimum body shell thickness AWWA C504 Class 150B/250B, Table 2 of Section 3.1 Valve Bodies, Laying lengths for flanged and wafer valves and minimum body shell thickness for all body types by the following: Sizes 3" through 10" - 15% or greater, Sizes 12" through 24" - 20% or greater, and Sizes 30" through 54" - 50% or greater. Ductile iron valve body thicknesses shall conform to the table below. Ductile iron and cast iron laying lengths shall be as specified in the table below unless otherwise specified.

**Fair Oaks Ranch Material Standard Specifications**

| <u>Ductile Iron Valve<br/>Diameter Inch</u> | <u>Ductile Iron<br/>Thickness Inch</u> | <u>Ductile Iron<br/>Laying<br/>Lengths Inch</u> |
|---------------------------------------------|----------------------------------------|-------------------------------------------------|
| 3                                           | .37                                    | 5                                               |
| 4                                           | .40                                    | 5                                               |
| 6                                           | .43                                    | 5                                               |
| 8                                           | .46                                    | 6                                               |
| 10                                          | .54                                    | 8                                               |
| 12                                          | .58                                    | 8                                               |
| 14                                          | .63                                    | 8                                               |
| 16                                          | .68                                    | 8                                               |
| 18                                          | .79                                    | 8                                               |
| 20                                          | .83                                    | 8                                               |
| 24                                          | .93                                    | 8                                               |
| 30                                          | 1.10                                   | 12                                              |
| 36                                          | 1.22                                   | 12                                              |
| 42                                          | 1.35                                   | 12                                              |
| 48                                          | 1.48                                   | 15                                              |
| 54                                          | 1.63                                   | 15                                              |
| 60                                          | 1.89                                   | 15                                              |
| 66                                          | 2.00                                   | 18                                              |
| 72                                          | 2.375                                  | 18                                              |

| <u>Valve Diameter<br/>Cast Iron</u> | <u>Thickness<br/>Cast Iron</u> | <u>Laying Length<br/>Cast Iron Inch</u> |
|-------------------------------------|--------------------------------|-----------------------------------------|
| 6 Inch                              | Per specification              | 6                                       |
| 8 Inch through 12 inch              | Per specification              | 8                                       |
| 14 Inch through 30 inch             | Per specification              | 12                                      |
| 36 Inch through 54 Inch             | Per specification              | 15                                      |

- f. Valve shall be of such design that the disc will seat at 90 degrees with the pipe axis.
- g. Valve shall be of such design that the disc will not flutter or vibrate when operated in a throttled position.
- h. Valves disc shall be of Cast Iron A-48, class 40 Cast Iron A-126, class B or Ductile Iron ASTM A-536, grade 65-45-12 and shall be of disc design to provide 360 degree uninterrupted seating.
- i. The valve seat shall be natural or synthetic rubber applied integrally to the body or disc. For valves 24 inches or larger, the rubber seat shall be capable of mechanical adjustment in the field and shall be field replaceable. Special tools required for seat adjustment shall be provided with the valve. Special tools required for seat replacement shall be furnished with the replacement seat. Mechanical adjustment

### **Fair Oaks Ranch Material Standard Specifications**

or attachment of the seat and seat ring does not include welding. The mating seat surface shall be type 304 or type 316 stainless steel, ni-chrome or monel. Sprayed or plate mating seat surfaces are not acceptable.

- j. Valve shafts shall be type 630 stainless steel conforming to ASTM A-564 condition H-1100 and shall have a diameter equal to or greater than that shown for Class 150B in Table 3 of AWWA C504. Shafts shall conform to the requirements of Section 3.3, Valves Shaft of AWWA C504 for one- piece or stub shaft types. Connection between the shaft and disc shall be dowel, taper pins, or torque plugs, which are mechanically secured.
- k. The valve assembly shall be furnished with a factory-set, non-adjustable disc shaft thrust bearing that insures the valve disc is centered within the valve body seat at all times.
- m. Valve shaft bearings shall be permanent, self-lubricated, bearings which continuous, low-friction maintenance-free operation. Shaft bearing shall be contained in integral hubs of the valve body.
- n. Valve shaft seal shall consist of O-ring, V-type, or U-cup type packing where the shaft projects through the valve body for the actuator connection.
- o. The valve shall be provided with a fully enclosed, permanently lubricated actuator of the traveling nut or worm gear design. The actuator shall be connected to the valve shaft by means of a key and keyway connection.
- p. All actuators shall have adjustable, mechanical stop limits in accordance with AWWA C504 Section 3.8.2. All 4" - 54" valve actuators shall be capable of withstanding 450 ft-lbs of input torque against the open or closed stops without damage.
- q. Valves for below ground applications shall be provided with an AWWA wrench nut. The wrench nut shall have an arrow cast thereon, indicating the direction on of opening. The wrench nut shall be suitably fastened to the actuator input shaft. If the shaft is smooth, the wrench nut shall be fastened to the input shaft by means of a minimum 5/16" diameter steel pin passing entirely through the shaft and the wrench nut. Key with keyway will be acceptable. If the shaft is splined, the wrench nut shall be formed to fit the splined shaft. The actuator shall be designed to produce the specified torque with a maximum input of 150 ft-lbs applied to the wrench nut.
- r. Valves for aboveground applications shall be provided with a handwheel. The handwheel shall have an arrow thereon, indicating the direction of the opening. The handwheel shall be suitably fastened to the actuator input shaft. Actuators equipped with handwheels shall be designed to produce the specified torque with a maximum pull of 80 pounds of the handwheel rim.
- s. The requirement for either wrench nut or handwheel and the direction of opening

## **Fair Oaks Ranch Material Standard Specifications**

will be specified on each purchase order.

- t. The bidder shall submit with his proposal three sets of certified drawings showing the principal dimensions, general construction and material specification of the valve proposed. The number of turns to open (close) shall be clearly noted in the valve information submitted with the proposal documents.
- u. The supplier/manufacturer shall provide Affidavit of Compliance with applicable sections of AWWA C504 and/or Fair Oaks Ranch Specification 21-05 to include the following: Results of ASTM testing procedures and requirements for materials will be provided to the Owner upon request, Manufacturer's Quality Assurance Program, leak-tightness testing and proof of design testing of representative actuators in accordance with AWWA C504 Section 3.8.5.2 as modified herein (450 ft.- lbs.). Compliance assurance will be required in accordance with AWWA C504 Section 5.1.2, Affidavits. Results of performance tests, proof of design test, AWWA C504 Section 5.2.4, hydrostatic test, leakage test, and Affidavit of Compliance shall be provided with the bid or with the shipping documents and shall be approved by Fair Oaks Ranch.
- v. Valves furnished under this specification shall be supplied by our approved manufacturer list.
- w. All butterfly valves shall open left (counter-clockwise).

### **4. WORKMANSHIP**

- a. All parts of the butterfly valve shall be designed and manufactured to the tolerances specified in ANSI/AWWA C509 or latest revision thereof and this specification.
- b. All parts of the butterfly valve manufactured by a given manufacturer shall be interchangeable with like parts from another butterfly valve of the same model and size and by the same manufacturer.

### **5. PAINTING**

- a. All interior and exterior ferrous surfaces of the valve, including the disc, shall be coated with epoxy, N.S.F. 61 certified or fusion bonded epoxy, N.S.F.61 certified. The epoxy (or fusion bonded epoxy) shall have a nominal thickness of 8 mils, and shall be in accordance with AWWA C550, latest revision.
- b. Coating shall be as close to holiday free as is technologically possible.

### **6. TESTING AND INSPECTION**

- a. Performance Tests: Performance tests shall be performed on each valve in accordance with Section 5.2.1 Testing of ANSI/AWWA C504 or latest revision thereof.

## **Fair Oaks Ranch Material Standard Specifications**

- b. Leakage Tests: Leakage tests shall be performed on each valve in accordance with Section 5.2.2 Testing of ANSI/AWWA C504 or latest revision thereof.
- c. Hydrostatic Tests: Hydrostatic tests shall be performed on each valve in accordance with Section 5.2.3 Testing of ANSI/AWWA C504 or latest revision thereof.
- d. Proof-of-Design Tests: Proof-of-Design tests shall be performed on each valve in accordance with Section 5.2.4 Testing of ANSI/AWWA C504 or latest revision thereof.
- e. An Affidavit of Compliance certifying that all required tests have been performed shall be provided.
- f. The Affidavit of Compliance and the records of all tests performed on the valves shall be kept and provided in a single hard cover bound notebook.

### **7. QUALITY ASSURANCE**

- a. Manufacturers shall have an ASME or I.S.O. 9001 registered commercial quality system. If on receipt of butterfly valves they are found to be non-compliant the manufacturer shall replace the defective butterfly valves according to butterfly valve size with a butterfly valve that meets Fair Oaks Ranch's specifications. The defective butterfly valves will be returned to the manufacturer, freight collect, and the manufacturer shall replace the butterfly valve, freight prepaid.

If Fair Oaks Ranch audits, product inspection and performance data review in accordance with these specifications determine excessive butterfly valve non-compliance, the manufacturer will be subject to removal by the Products Standards Committee. If the butterfly valve becomes defective during the manufacturer's specified warranty period a Fair Oaks Ranch quality assurance and manufacturer review will ensue. If the review determines manufacturing non-conformance the manufacturer shall replace the butterfly valve according to size with a butterfly valve that meets Fair Oaks Ranch's specifications. The defective butterfly valve removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the butterfly valve, freight prepaid. If the nonconformance product amounts are excessive and result in increased product replacement by Fair Oaks Ranch field staff the manufacturer may be subject to time and material charges.

### **8. REFERENCES**

- a. American National Standards Institute and American Water Works Association Standard C504 (ANSI/AWWA C504).

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### **APPROVED MANUFACTURER LIST**

#### **Manufacture**

Mueller  
(above ground)  
Pratt (below ground)  
Henry Pratt (above ground)  
Henry Pratt (below ground)  
DeZurik  
Crispin Multiplex  
Val-Matic

#### **Product**

Linseal XP/Lineseal III/Linseal XP II Henry Pratt  
2FII (3" thru 20") and XR-70 (24" thru 72") Henry  
Ground hog (3" thru 72")  
HP-250  
HP-250  
BAW  
K-Flo Model 504 and K-Flo Model 47  
Series 2000

### **Previous Specification**

FEBRUARY 2011  
DECEMBER 2012

# **Fair Oaks Ranch Material Standard Specifications**

29-06

## **SPECIFICATIONS FOR HYDRAULIC CONTROL VALVES 2 INCHES**

### **THROUGH 36 INCHES**

### **ANSI/AWWA CLASS 150 AND DRILLED TO ANSI B16.42**

### **REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers Hydraulic Control Valves with water tight Globe/Angle style bodies with Flanged end connections in sizes 2 inch through 36 inch. Valves shall be either of the flat or rolling diaphragm design and shall provide smooth frictionless motion of the inner valve assembly. All valves shall be ANSI/NSF-61 certified.

#### **2. DEFINITIONS**

- a) Valves shall be hydraulically operated. The inner valve assembly shall be top and bottom guided by means of bearing bushings. The inner valve assembly shall be the only moving part and shall be securely mounted on an ANSI 316 Stainless Steel stem.
- b) All pressure containing components shall be constructed from ASTM A536-65/45/12 Ductile iron. The flanges shall be designed to ANSI Class 150 standards. Flange drilling to ANSI shall be standard.
- c) Valves shall have a protective Fusion Bond epoxy coating internally and externally. The Fusion Bond epoxy coating shall conform to the ANSI/AWWA C116/A21.16 specification. No machining of any external parts after final coating will be acceptable.
- d) Valves shall have an integral ANSI 316 Stainless Steel seat held in place with Stainless Steel screws.
- e) Valves shall have a Bronze or 316 Stainless Steel top and bottom guide bushings. Material selection based on operating conditions.
- f) The valve shall form a drip tight seal between the stationary Stainless Steel seat ring and a rectangular cross sectioned resilient disc. This Resilient disc shall clamp on 3 1/2 sides and shall be constructed of Buna N or EPDM.

## **Fair Oaks Ranch Material Standard Specifications**

- g) All external fasteners shall be ANSI 18-8 Stainless Steel with 18-8 Stainless Steel washers.
- h) Diaphragms shall be constructed of either Buna N or EPDM and shall be constructed of Nylon fabric with bonded synthetic rubber.
- i) All repairs and maintenance shall be possible without removing the Valve from the line. Valve stems should be vertical when mounted in a horizontal line.
- j) Valves shall be either pilot or solenoid controlled.
- k) All valves shall have stem mounted Stainless Steel position indicators, Stainless steel isolation valves at all pilot tubing connections to the valve main body, Stainless Steel pilot strainer, Braided Stainless Steel pilot tubing and Stainless Steel speed control. Pilots and/or Solenoid controls shall be either Bronze or Stainless Steel as per specific application conditions and as noted on project plans or purchase orders.
- l) All valves shall open left (counter-clockwise).

### **Previous Specification**

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

30-01

## **SPECIFICATIONS FOR COLD WATER METERS**

### **DISPLACEMENT TYPE**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers cold-water displacement meters one and one-half inches (1-1/2") and smaller in size designed for waterworks service.

#### **2. GENERAL DESCRIPTION**

Water meters to be furnished shall be magnetic drive, sealed register, disc or piston type meters more specifically described in other parts of this specification.

#### **3. GENERAL REQUIREMENTS**

- a. Except as otherwise modified or supplemented herein, the latest revision of AWWA Standard C700, "AWWA Standard for Cold-Water Meters - "Displacement Type" shall govern the material, design, manufacture, and testing of all meters furnished under this specification.
- b. Fair Oaks Ranch reserves the right to limit purchase of meters one and one half inches (1-1/2") or smaller in size to the manufacturers and to the models specified, shown on Attachment I, latest revision, provided such meters conform to the provision contained herein.

#### **4. SPECIFIC REQUIREMENTS**

##### **a. Meter Case**

The main case shall be solid with removable top or bottom design and will be manufactured of bronze. **All meters must meet NSF Standard 61 Certification (internal coating will not be allowed) and carry the NSF 61 mark molded on the housing.** In either case, the top or bottom shall be bolted to the housing. The register box and register cover shall be bronze and sidewalk mounted. The meter shall be so constructed that the main case (including meter spuds) will withstand internal pressure and external stress to eliminate distortion, cracking and breaking, which will cause leakage, damage to other components, or interfere with the proper operation of the meter in general.

## **Fair Oaks Ranch Material Standard Specifications**

### **b. Serial Number**

The serial number of the meter shall be clearly imprinted on the outer case as well as on the register box cover.

### **c. Meter Registers**

The meter register shall be a "Sealed Register" type with straight reading indicator with a minimum of six numbered wheels (dials) and shall indicate in cubic feet. All digits shall be black on white background except the right two digits. The right digits shall be white numerals on black background (dials or fixed digits). There shall be a test index circle, which shall be divided into 100 equal parts, each tenth numbered. The index circle shall be located on the outer periphery of the face, equipped with a center sweep test hand. The month the register is manufactured, by year, and size or model shall be stamped or printed clearly on the register face with Arabic numerals. The register shall also have a "low flow" indicator. Registers for given manufacturer, size and like model shall be interchangeable.

As used in these specifications, the term "Sealed Register" shall mean a register that is tamper-proof, factory sealed, non-shop repairable, hermetically sealed against fogging, moisture and corrosion and mechanically disconnected from the measuring components. If the sealed register becomes defective or vandalized, the register will be returned to the manufacturer for repairs or replacement. The manufacturer will hermetically seal all registers repaired or replaced.

The lens shall be of a high strength heat tested glass or impact-resistant glass designed to minimize breakage.

The register shall be secured to the meter case with a tamper-resistant locking device.

### **d. Measuring Chamber Assembly**

The measuring chamber shall be made of a suitable polymeric material. All shafts or spindles attached to the disc or piston within measuring chamber shall be made of series 316 stainless steel. The maximum allowed disc nutation or piston oscillations per cubic feet as shown below:

| <u>Size</u> | <u>Maximum Nutation/Oscillations</u> |
|-------------|--------------------------------------|
| 5/8"        | 435                                  |
| 3/4"        | 250                                  |
| 1"          | 115                                  |
| 1-1/2"      | 50                                   |

## **Fair Oaks Ranch Material Standard Specifications**

### **e. Strainers**

Each meter shall be provided with a stainless steel strainer or strainer of a suitable non-corrosive material. It shall fit snugly in the casing and shall be rigid and easy to remove.

### **f. Length**

| <u>Size</u> | <u>Length – Inches</u> |
|-------------|------------------------|
| 5/8"        | 7-1/2                  |
| 3/4"        | 9                      |
| 1"          | 10-3/4                 |
| 1-1/2"      | 13                     |

## **5. ACCURACY**

The manufacturer shall guarantee that all new meters will test at least ninety-eight point five percent (98.5%) accurate at the "low flow" rate and conform to AWWA Manual M6 for accuracy at intermediate and high flow rates on a meter size for size basis.

## **6. TESTS**

- a. Fair Oaks Ranch reserved the option to test all meters in accordance with AWWA Manual M6. The water temperatures for test purpose will be approximately seventy-seven degrees (77F) and the pressure will be approximately seventy-five (75) psi. All new meters tested on the low flow of 1/4 gpm for 5/8 inch, 1/2 gpm for 3/4 inch, 3/4 gpm for 1 inch, and 1-1/2 gpm for 1-1/2 inch shall test at least ninety- eight point five percent (98.5%) accurate. If three percent (3%) of the meters tested in each shipment do not meet these quality standards herein will be grounds for rejecting the entire shipment. The manufacturer shall reimburse Fair Oaks Ranch \$7.50 for each meter that fails this test only. All meters that fail this test, along with the rejected shipment, will be returned to the manufacturer, freight collect and the manufacturer will replace the defective meter(s) with new meter(s), freight prepaid within thirty (30) days from receipt of the defective meter(s).
- b. A tag indicating the factory accuracy test results of the meter on low, intermediate and high flows shall accompany all meters.

## **Fair Oaks Ranch Material Standard Specifications**

### **7. GUARANTEES**

- a. The manufacturer shall unconditionally guarantee the 5/8", 3/4" and 1" meters as follows:

The "Sealed Register" unit will operate accurately for a period of fifteen (15) years from the date of receipt.

That the new water meters will perform to new meter accuracy standards of ninety-eight-point five percent (98.5%) at low flow for a period of at least one (1) year from date of receipt

That after one (1) year in service the new meter will meet repaired meter accuracy standards, AWWA Manual M6, latest revision for an additional fourteen (14) years or the following quantities of cubic feet, whichever occurs first:

| <u>Meter Size</u> | <u>Registration</u> |
|-------------------|---------------------|
| 5/8"              | 200,000 cubic feet  |
| 3/4"              | 300,000 cubic feet  |
| 1"                | 400,000 cubic feet  |

- b. The manufacturer shall unconditionally guarantee the one and one-half inch (1-1/2") meter as follows:

That the "Sealed Register" unit will operate accurately for a period of fifteen (15) years from date of receipt.

That the new water meters will perform to new meter accuracy standards under the provisions of AWWA Manual M6, latest revision, for a period of at least one (1) year from date of receipt.

That after one (1) year in service the new meters will meet repaired meter accuracy standards, AWWA Manual M6, latest revision, for an additional nine (9) years or 500,000 cubic feet, whichever occurs first.

- c. Damage caused by vandalism, acts of God or willful or negligent means will be borne by Fair Oaks Ranch.
- d. If the meter becomes defective (excluding foreign debris causing measuring chamber breakdown) within the time specified in paragraph 7.a and 7.b above, the manufacturer shall reimburse Fair Oaks Ranch \$14.00 per 5/8", 3/4" & 1" meter and \$46.00 per 1-1/2" meter labor cost to remove the meter from the field. The manufacturer will repair or replace the defective meter according to meter size with a meter that meets Fair Oaks Ranch's specifications. The defective meter removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the

## **Fair Oaks Ranch Material Standard Specifications**

meter, freight prepaid within thirty (30) days from receipt of the defective meters.

- e. Certified results will be furnished with all returned meters.

### **8. QUALITY SYSTEM**

Manufacturers shall have an I.S.O. 9001: 2000 registered quality systems. If on receipt of meters they are found to be non-compliant the manufacturer shall replace the defective meters according to meter size with a meter that meets Fair Oaks Ranch's specifications. The defective meters will be returned to the manufacturer, freight collect, and the manufacturer shall replace the meter, freight prepaid within thirty (30) days from receipt of the defective meter. If Fair Oaks Ranch audits, product inspection and performance data review in accordance with these specifications determine excessive meter non-compliance (in excess of 3% annually), the manufacturer will be subject to removal by the Products Standards Committee.

**Fair Oaks Ranch Material Standard Specifications**

**Attachment I**

**APPROVED MANUFACTURERS LIST:**

| <b><u>Approved Meter Manufacturer</u></b> | <b><u>Model</u></b> | <b><u>Size</u></b> |
|-------------------------------------------|---------------------|--------------------|
| Sensus                                    | iPerl AMR           | 5/8", 3/4", 1"     |
| Sensus                                    | Omni AMR            | 1-1/2"             |

**Previous Specification Date:**

DECEMBER 2011

MARCH 07

JULY 06

JANUARY 05

MARCH 2003

APRIL 2000

JUNE 1999

OCTOBER 1995

# **Fair Oaks Ranch Material Standard Specifications**

30-20

## **SPECIFICATIONS FOR COLD WATER METERS - COMPOUND**

### **TYPE**

**REVISED JANUARY 2019**

#### 1. **SCOPE**

This specification covers compound type cold-water meters in sizes 1-1/2 inches through 10 inches inclusive designed for waterworks service.

#### 2. **GENERAL REQUIREMENTS**

- a) Except as otherwise modified or supplemented herein AWWA Standard C702-47, "AWWA Standard for Cold-Water Meters - "Compound Type" or the latest revision thereof shall govern the materials, design, manufacture, and testing of all meters furnished under this specification.
- b) The City of Fair Oaks Ranch reserves the right to limit purchase of compound meters to those manufactured by Sensus.
- c) The outer case shall be of a bronze composition.
- d) Meters shall indicate in cubic feet and have "round-reading" registers.
- e) Serial number shall be clearly stamped on the case as well as on the lid.
- f) Pinion and gear spindles shall be of monel metal, stainless steel, or bronze.
- g) The measuring chambers of displacement elements shall be of bronze, compatible with that specified in section "c" above.
- h) The impeller shaft shall be of monel metal, bronze, or stainless steel.
- i) Strainers of stainless steel, monel metal, or nickel alloy shall be provided in the displacement element of the meter.
- j) The check valve shaft shall be of monel metal, stainless steel, or bronze.
- k) Meters shall be furnished less flanges.

**Fair Oaks Ranch Material Standard Specifications**

**APPROVED MANUFACTURER LIST:**

| <b><u>Approved Meter Manufacturer</u></b> | <b><u>Model</u></b>                 | <b><u>Size</u></b>                 |
|-------------------------------------------|-------------------------------------|------------------------------------|
| Sensus                                    | Omni Compound (C <sup>2</sup> ) AMR | 1-1/2", 2", 3",<br>4", 6", 8", 10" |

**Previous Specification Date:**

MAY 1993  
DECEMBER 2011

## **Fair Oaks Ranch Material Standard Specifications**

30-30

### **SPECIFICATIONS FOR COLD-WATER METERS FIRE- SERVICE TYPE REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers cold water fire-service type meters in sizes 3-inch (3") and larger designed for water works service.

#### **2. GENERAL REQUIREMENTS**

- a) Except as otherwise modified or supplemented herein, AWWA Standard C703, AWWA for cold-water fire-service type meters or the latest revision thereof shall govern the materials, design, manufacture, and testing of all meters furnished under this specification.
- b) Fair Oaks Ranch reserves the right to limit the purchase of fire-service type meters from manufacturers who provide meters conforming to the provisions contained herein.
- c) The manufacturer that the meter furnished complies with the requirements of this specification shall furnish Affidavit of Compliance.
- d) A certificate of testing certifying the accuracy and the capacity of meter shall be furnished. The meter shall have an operating pressure of 150 psi and the accuracy of meter shall be 100 percent, plus or minus 3 percent.

#### **3. SPECIFIC REQUIREMENTS**

- a) A fire-service type meter shall consist of a combination of a main line meter for measuring high flow rates and bypass meter for measuring low flow rates. A detector check valve shall direct the flow from the bypass meter to the mainline meter as flow rates increase and back to the bypass meter as flow rates decrease.
- b) Meters not complying with all requirements of Fair Oaks Ranch specifications shall be rejected.
- c) All meters shall be Factory Mutual approved and be UL listed.
- d) Bypass meters must meet NSF Standard 61 Certification (internal coating will not be allowed) and carry the NSF 61 mark on the

## **Fair Oaks Ranch Material Standard Specifications**

housing. The bypass meter may be up to one-half the size of the mainline meter as per the following size chart:

|             |       |        |
|-------------|-------|--------|
| 12 x 10 x 6 | 8 x 4 | 6 x 3  |
| 12 x 10 x 2 | 8 x 2 | 10 x 2 |

### **4. MATERIAL REQUIREMENTS**

#### **a) Bypass/Mainline Casings**

Casings shall be either of epoxy-coated steel or epoxy-coated cast iron that is protected by a corrosion-resistant coating.

#### **b) Laying Length**

The laying length of meters shall not exceed the following:

| <b><u>METER SIZE</u></b> | <b><u>LAYING LENGTH</u></b> |
|--------------------------|-----------------------------|
| 4"                       | 33"                         |
| 6"                       | 45"                         |
| 8"                       | 53"                         |
| 10"                      | 68"                         |

#### **c) Register**

Register shall be "Sealed Register" type with a straight reading with a minimum of six numbered wheels (dials) and shall indicate in cubic feet. All digits shall be black on white background except the right two digits. The right digits shall be white numerals on black background (dials or fixed digits). There shall be a test index circle, which shall be divided into 100 equal parts, each tenth numbered. The index circle shall be located on the outer periphery of the face, equipped with a center sweep test hand.

The date the register is manufactured, by month and year, and size or model shall be standard or printed on the register face with Arabic numerals. Registers for given manufacturer, size and like model shall be interchangeable.

The term "Seal Register" shall mean a register that is tamper proof, factory sealed, non-stop repairable, hermetically sealed against fogging, moisture and corrosion and mechanically disconnected from the measuring components. If the sealed register becomes defective, the register will be returned to the manufacturer for repairs or replacement.

## **Fair Oaks Ranch Material Standard Specifications**

The manufacturer will hermetically seal all repaired or replaced registers.

The lens shall be of a high strength heat tested glass to minimize breakage. The register shall be secured to the meter case with a tamper-resistant locking device. The serial number shall be clearly stamped on the case as well as on the register cover.

### **d) Fire Service Strainers**

All water meters using turbine-type (high velocity) main- meters shall include fire service type strainers. Strainers shall have a minimum straining area of least four times the open area of the pipeline. Strainer shall be NFPA and FM approved and is UL listed. Maximum loss of head across the strainer shall be 4 psi (28 kPa) at the safe maximum rated capacity. Strainers supplied under this standard shall operate without leakage at a working pressure of 175 psi (1200 kPa).

## **5. GUARANTEES:**

The manufacturer shall unconditionally guarantee the meters as follows:

- d) That the “sealed Register” unit will operate accurately for a period of fifteen (15) years from the date receipt.
- e) The mainline water meters shall perform to new meter accuracy standards of ninety-seven (97%) percent of low flow for a period of at least one (1) year from date of receipt. Whereas, the bypass water shall perform to new meter accuracy standard of 98.5% of low flow for a period of at least one (1) year.
- f) That after one (1) year in active service, each of the new meters will meet repaired meter accuracy standards, AWWA Manual M6, latest revisions, for an additional four (4) years or the following quantities of cubic feet, whichever occur first:

| <b><u>MAINLINE METER SIZE</u></b> | <b><u>REGISTRATION</u></b> |
|-----------------------------------|----------------------------|
| 6"                                | 6,000,000                  |
| 8"                                | 10,000,000                 |
| 10"                               | 10,000,000                 |

| <b><u>BYPASS METER SIZE</u></b> | <b><u>REGISTRATION</u></b> |
|---------------------------------|----------------------------|
| 3"                              | 5,000,000                  |
| 4"                              | 10,000,000                 |
| 6"                              | 10,000,000                 |

## **Fair Oaks Ranch Material Standard Specifications**

- g) If the meter becomes defective (excluding foreign debris causing measuring chamber breakdown) within the time specified paragraphs 5.a, 5.b, and 5.d, the manufacturer shall reimburse Fair Oaks Ranch \$500 per meter for labor cost to remove the meter from active service. The manufacturer will repair or replace the defective meter with a meter that meets Fair Oaks Ranch's specifications. The defective meter removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall repair or replace the meter, freight prepaid.
- h) Certified test results will be furnished with all returned meters.

### **6. TESTS:**

- a) Fair Oaks Ranch reserves the option to test all meters in accordance with AWWA Manual M6. The water temperatures for test purposes, the water temperature shall not be less than 77 degrees Fahrenheit, and the water pressure shall not exceed 150 pounds per square inch (psi). All meters tested at the low flow volume shall record between 97%-100% of the actual delivered volume. If the meter tested does not meet these specifications, the manufacturer shall reimburse Fair Oaks Ranch \$200 for failing this test and the meter will be returned to the manufacturer, freight collect, and the manufacturer will replace the defective meter(s) with new meter(s), freight prepaid.
- b) A tag indicating the factory accuracy test results of the meter on low, intermediate and high flows shall accompany all meters.

### **7. QUALITY SYSTEM**

Manufacturers shall have an I.S.O. 9001 registered quality systems. If on receipt of meters they are found to be non-compliant the manufacturer shall replace the defective meters according to meter size with a meter that meets Fair Oaks Ranch's specifications. The defective meters will be returned to the manufacturer, freight collect, and the manufacturer shall replace the meter, freight prepaid within thirty (30) days from receipt of the defective meter.

**Fair Oaks Ranch Material Standard Specifications**

**APPROVED MANUFACTURER LIST**

**Manufacturer**

**Model**

Sensus

Omni Fireline (F2) AMR Sizes 4", 6", 8", 10"

**Previous Specification**

AUGUST 1997

JANRUARY 1999

APRIL 2005

DECEMBER 2007

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

30-35

## **SPECIFICATIONS FOR COLD WATER DETECTOR CHECK** **AND DETECTOR CHECK VALVE** **REVISED JANUARY 2019**

### 1. **SCOPE**

This specification covers cold water detector checks and detector check valves in sizes of 6, 8, and 10 inches designed for water works service.

### 2. **GENERAL REQUIREMENTS**

- a) Except as otherwise modified or supplemented herein, the latest revision of AWWA Standard C703-79, Standard for Cold Water Meters - Fire Service Type and AWWA C701-78 Standard for Cold Water Meters - Turbine Type for Customer Service or the latest revision, shall govern the design, component materials, manufacture and testing of all detector checks and detector check valves.
- b) The above AWWA Specification C703-79 and C701-78 are not specifically written for the design of detector checks and detector check valves; however, these specifications shall apply wherever the operation, design component materials, manufacture and testing are identical or similar in its use and operation.

### 3. **DESIGN REQUIREMENTS**

- a) The detector check device shall operate in a manner to detect leakage or unauthorized use of water from fire systems and prevent loss of water for fire services or "wet pipe" sprinkler systems.
- b) The detector check valve shall consist of a mainline valve with a bypass line equipped with a check valve and a magnetic turbine meter.
- c) With mainline valve closed, low rates of flow are to be registered through the bypass turbine meter. When low flows create a pressure loss of about 1.5 psi through the bypass line, the mainline valve shall open automatically allowing unrestricted flow. The flow through the mainline valve will not be registered.
- d) The following features shall be incorporated into the design of the detector check and detector check valve:
  - 1. Economical design
  - 2. Light weight

### **Fair Oaks Ranch Material Standard Specifications**

3. Compact
  4. Low pressure loss
  5. Easily maintained without special tools
  6. Counterbalanced lever or spring action on the mainline valve to provide quick opening and closing.
  7. Bronze or resilient material for seats.
  8. Stainless steel shaft
  9. Bronze clapper arm
  10. Unobstructed flow through mainline
  11. Galvanized cast iron or steel body in one piece; steel to be furnished with epoxy coating
  12. Body to be tapped on both sides to provide flexibility for tight installations
  13. An eye bolt shall be placed on body to facilitate installation
  14. Air vent screw shall be placed on cover
  15. Maximum working pressure - 175 psi
  16. The bypass line shall be elevated about center line of mainline and equipped with a shutoff valve, swing check and a magnetic turbine meter
  17. The meter register shall read in cubic feet
  18. The warranty by manufacturer shall include a guarantee against defective parts and workmanship for a period of ten years from date of shipment.
- e) Fair Oaks Ranch may, at no cost to the manufacturer, subject random valves to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.
- f) The attached qualified products list identifies specific manufacturers that are approved.

## **Fair Oaks Ranch Material Standard Specifications**

### **APPROVED MANUFACTURER LIST**

Hersey Products, Inc. Model EDC III Sizes 4", 6", 8" and 10"  
Kennedy Valve Model 1371-B2 Sizes 6", 8" and 10"  
Mueller Company  
Ames Company  
Febco  
Watts 07F

### **Previous Specification**

MAY 1992  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

30-40

## **SPECIFICATIONS FOR TURBINE-TYPE WATERMETERS**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers cold water turbine-type meters in sizes 1-1/2 inch and larger designed for waterworks service.

### **2. GENERAL DESCRIPTION**

Turbine water meters to be furnished shall be magnetic gear drive with sealed register of the current type more specifically described in other parts of this specification.

### **3. GENERAL REQUIREMENTS**

- a. Except as otherwise modified or supplemented herein, AWWA Standard C701, AWWA Standard for Cold-Water Meters, Turbine-Type for Customer Service or the latest revision thereof shall govern the materials, design, manufacture, and testing of all meters furnished under this specification.
- b. Fair Oaks Ranch reserves the right to limit purchase of turbine-type meters from manufacturers and to the models specified, shown on Attachment I, latest revision, provided such meters conform to the provision contained herein.

### **4. SPECIFIC REQUIREMENTS**

#### **a. Meter Case**

The main case shall be solid with removable top design and will be manufactured of bronze. **All meters must meet NSF Standard 61 Certification (internal coating will not be allowed) and carry the NSF 61 mark on the housing.** The register box and register cover shall be bronze and sidewalk mounted. The size, model and arrows indication direction of flow shall be cast in raised characters on the main case or cover.

#### **b. Serial Number**

The serial number of the meter shall be clearly imprinted on the outer case as well as on the box cover.

#### **c. Meter Registers**

The meter register shall be a "Sealed Register" type with straight reading indicator

## **Fair Oaks Ranch Material Standard Specifications**

with a minimum of six numbered wheels (dials) and shall indicate in cubic feet. All digits shall be black on white background except the right two digits. The right digits shall be white numerals on black background (dials or fixed digits). There shall be a test index circle, which shall be divided into 100 equal parts, each tenth numbered. The index circle shall be located on the outer periphery of the face, equipped with a center sweep test hand. The month the register is manufactured, by year, and size or model shall be stamped or printed clearly on the register face with Arabic numerals. The register shall also have a "low flow" indicator. Registers for given manufacturer, size and like model shall be interchangeable.

As used in these specifications, the term "Sealed Register" shall mean a register that is tamper-proof, factory sealed, non-shop repairable, hermetically sealed against fogging, moisture and corrosion and mechanically disconnected from the measuring components. If the sealed register becomes defective or vandalized, the register will be returned to the manufacturer for repairs or replacement. The manufacturer will hermetically seal all registers repaired or replaced.

The lens shall be of a high strength heat tested glass or impact-resistant glass designed to minimize breakage.

The register shall be secured to the meter case with a tamper-resistant locking device.

- d. Meter laying lengths will conform to the following table:

| <b><u>Meter Size</u></b> | <b><u>Meter Laying Length</u></b> |
|--------------------------|-----------------------------------|
| 1-1/2 inch               | 13 inches                         |
| 2 inch                   | 17 inches                         |
| 3 inch                   | 19 inches                         |
| 4 inch                   | 23 inches                         |
| 6 inch                   | 27 inches                         |
| 8 inch                   | 30-1/8 inches                     |
| 10 inch                  | 41-1/8 inches                     |

In order to satisfy specified laying length meter may be furnished with appropriate spacer, which is securely mounted and will not conflict with attachment to strainer or associated service line piping.

## **5. TESTS**

- a. Fair Oaks Ranch reserves the option to test all meters in accordance with AWWA Manual M6. If one percent (1%) of the meters tested in each shipment does not meet these quality standards herein will be grounds for rejecting the entire shipment. All meters that fail this test, along with the rejected shipment, will be returned to the manufacturer, freight collect and the manufacturer will replace the defective meter(s) with new meter(s), freight prepaid within thirty

## **Fair Oaks Ranch Material Standard Specifications**

(30) days from receipt of the defective meter(s).

- b. A tag indicating the factory accuracy test results of the meter on low, intermediate and high flows shall accompany all meters.

### **6. GUARANTEES**

- a. The manufacturer shall unconditionally guarantee the 1-1/2" thru 10" meters as follows:

That the "Sealed Register" unit will operate accurately for a period of fifteen (15) years from date of receipt.

That the new water meters will perform to new meter accuracy standards under the provisions of AWWA Manual M6, latest revision, for a period of at least one (1) year from date of receipt.

That after one (1) year in service the new meters will meet repaired meter accuracy standards according to AWWA Manual M6, or the latest revision.

- b. Damage caused by vandalism, acts of God or willful or negligent means will be borne by Fair Oaks Ranch.
- c. If the meter becomes defective (excluding foreign debris causing measuring chamber breakdown) the manufacturer will repair or replace the defective meter according to meter size with a meter that meets Fair Oaks Ranch's specifications. The defective meter removed from the field will be returned to the manufacturer, freight collect, and the manufacturer shall replace the meter, freight prepaid within thirty (30) days from receipt of the defective meters.
- d. Certified results will be furnished with all returned meters.

### **7. QUALITY SYSTEM**

Manufacturers shall have an I.S.O. 9001: 2000 registered quality systems. If on receipt of meters they are found to be non-compliant the manufacturer shall replace the defective meters according to meter size with a meter that meets Fair Oaks Ranch's specifications. The defective meters will be returned to the manufacturer, freight collect, and the manufacturer shall replace the meter, freight prepaid within thirty (30) days from receipt of the defective meter. If Fair Oaks Ranch audits, product inspection and performance data review in accordance with these specifications determine excessive meter non-compliance (in excess of 1% annually), the manufacturer will be subject to removal by the Products Standards Committee.

## **Attachment I**

### **APPROVED MANUFACTURER LIST**

#### **Manufacturer**

#### **Model**

#### **Size**

Sensus

Omni Turbo (T<sup>2</sup>) AMR

1-1/2", 2", 3", 4", 6",  
8" 10"

### **Previous Specification**

MAY 1992

JUNE 2001

APRIL 2005

MARCH 2011

DECEMBER 2011

30-45

**SPECIFICATIONS FOR WATER METER STRAINERS**

**REVISED JANUARY 2019**

**1. SCOPE**

This specification covers plate type strainers for use with water meters 2 inches and larger to block or strain objects greater than 3/16" diameter. The strainer is to be mounted to the inlet side of the meter to prevent objects such as stones and pebbles from entering the meter and causing physical damage.

**2. GENERAL REQUIREMENTS**

- a. The strainer shall comply with the lead-free provisions of the Safe Drinking Water Act. Strainer shall be certified to NSF/ANSI Standards 61/ 372 and carry the NSF-61 on the structure. Manufacturers shall have an I.S.O. 9001 registered quality systems.
- b. The strainer should be designed for minimum weight and pressure loss.
- c. The screen shall be made of perforated stainless steel plate and shaped to give maximum rigidity against the flow stream forces.
- d. The effective straining area shall be at least double that of the meter main case inlets.
- e. An access cover plate shall be provided.
- f. The two (2) inch strainer shall be furnished with dual elliptical flanged connections, which are faced and drilled. Strainers three (3) inches and larger shall be furnished with dual round-type flanged connections which are faced and drilled. Bolt circle, length and diameters shall be compatible with meter connection dimensions as contained in ANSI/AWWA C701-02 or latest revision thereof.
- g. The housing and cover for 2 inch thru 6 inch strainers shall be cast lead-free bronze and for 8 inch and 10 inch, cast iron. Raised letters indicating the flow direction will be clearly visible.
- h. The screen shall be non-corrosive stainless steel.
- i. Casing bolts, nuts, screws and washers shall be made of stainless steel.
- j. Head loss at maximum meter flows as contained in AWWA C701- 02 shall not exceed 3.0 psi.
- k. Head gaskets shall be of a suitable synthetic polymer.

## **Fair Oaks Ranch Material Standard Specifications**

- I. Strainer laying lengths will conform to the following table:

| <b><u>Strainer Size</u></b> | <b><u>Strainer Laying Length</u></b> |
|-----------------------------|--------------------------------------|
| 2 inch                      | 7 inches                             |
| 3 inch                      | 7 inches                             |
| 4 inch                      | 9 inches                             |
| 6 inch                      | 9 inches                             |
| 8 inch                      | 14 inches                            |
| 10 inch                     | 16 inches                            |

3. In order to satisfy specified laying length strainer may be furnished with appropriate spacer, which is securely mounted and will not conflict with attachment to meter or associated service line piping.

### **Previous Specifications**

JANUARY 1998  
NOVEMBER 2006  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

30-50

## **SPECIFICATIONS FOR RECLAIMED WATER METER TYPE** **REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers reclaimed water meters 5/8" and larger in size designed for waterworks service.

### **2. GENERAL REQUIREMENTS**

- a) Except as otherwise modified or supplemented herein, the latest revision of AWWA Standard C700, C701, C702, C708, and C712, the reclaimed water meters shall be magnetic drive and comply with all requirements of the water meters in this specification including sizing and accuracy with the exception of being properly marked for non-potable water applications.
- b) The City of Fair Oaks Ranch reserves the right to limit purchase of meters one and one-half inches (1-1/2") or larger in size from manufacturers whose meter conforms to the provisions contained herein.

### **3. SPECIFIC REQUIREMENTS**

#### **a) Meter Case**

The main case shall be solid with removable top or bottom design and will be manufactured of bronze. In either case, the top or bottom shall be bolted to the housing. The register box and register cover shall be bronze. The meter shall be so constructed that the main case will withstand internal pressure and external stress to eliminate distortion, cracking and breaking, which will cause leakage, damage to other components, or interfere with the proper operation of the meter in general.

#### **b) Serial Number**

The serial number of the meter shall be clearly imprinted on the outer case as well as on the register box cover.

## **Fair Oaks Ranch Material Standard Specifications**

### **c) Meter Registers**

The meter register shall be a "Sealed Register" type with straight reading indicator with a minimum of six numbered wheels (dials) and shall indicate in cubic feet. All digits shall be black on white background except the right two digits. The right digits shall be white numerals on black background (dials or fixed digits). There shall be a test index circle, which shall be divided into 100 equal parts, each tenth numbered. The index circle shall be located on the outer periphery of the face, equipped with a center sweep test hand. The month the register is manufactured, by year, and size or model shall be stamped or printed clearly on the register face with Arabic numerals. The register shall also have a "low flow" indicator. Registers for given manufacturer, size and like model shall be interchangeable.

As used in these specifications, the term "Sealed Register" shall mean a register that is tamper proof, factory sealed, non-shop repairable, hermetically sealed against fogging, moisture and corrosion and mechanically disconnected from the measuring components. If the sealed register becomes defective or vandalized, the register will be returned to the manufacturer for repairs or replacement. The manufacturer will hermetically seal all registers repaired or replaced.

The lens shall be of a high strength heat tested glass or impact-resistant glass designed to minimize breakage.

The register shall be secured to the meter case with a temper-resistant locking device.

### **d) Reclaimed Water Meter Requirements**

The reclaimed water meters shall be appropriately marked for reclaimed water application. The reclaimed water meters shall have lavender colored lid, shroud and register dial face with the word "RECLAIMED" engraved or cast on the meter housing and chamber and clearly printed on the register dial face and lid. The non-potable water symbol shall be on the register lid.

### **e) Strainers**

If required each meter shall be provided with an internal stainless steel strainer or strainer of a suitable non-corrosive material. It shall fit snugly in the casing and shall be rigid and easy to remove.

## **Fair Oaks Ranch Material Standard Specifications**

### **4. ACCURACY**

The manufacturer shall guarantee that all new meters will conform to AWWA Manual M6 for accuracy at low, intermediate and high flow rates on a meter size for size basis.

### **5. TESTS**

- a) Fair Oaks Ranch reserved the option to test all meters in accordance with AWWA Manual M6. Meters that fail this test will be returned to the manufacturer, freight collect and the manufacturer will replace the defective meter(s) with new meter(s), freight prepaid within thirty (30) days from receipt of the defective meter(s).
- b) A tag indicating the factory accuracy test results of the meter on low, intermediate and high flows shall accompany all meters.

### **6. GUARANTEES**

- a) The manufacturer shall unconditionally guarantee the 5/8" and larger meter as follows:

That the "Sealed Register" unit will operate accurately for a period of fifteen (15) years from date of receipt.

That the new reclaimed water meters will perform to new meter accuracy standards under the provisions of AWWA Manual M6, latest revision, for a period of at least one (1) year from date of receipt.

Reclaimed water meter shall be free from defects in materials and workmanship for a period of one (1) year from date of receipt. Meter shall not be affected by sand or small debris in line.

That after one (1) year in service the new meters will meet repaired meter accuracy standards, AWWA Manual M6.

- b) Damage caused by vandalism, acts of God or willful or negligent means will be borne by Fair Oaks Ranch.
- c) Certified results will be furnished with all returned meters.

## **Fair Oaks Ranch Material Standard Specifications**

### **7. QUALITY SYSTEM**

Manufacturers shall have an I.S.O. 9001: 2000 registered quality systems. If on receipt of meters they are found to be non-compliant the manufacturer shall replace the defective meters according to meter size with a meter that meets Fair Oaks Ranch's specifications. The defective meters will be returned to the manufacturer, freight collect, and the manufacturer shall replace the meter, freight prepaid within thirty (30) days from receipt of the defective meter.

### **APPROVED MANUFACTURER LIST:**

| <b><u>Approved Meter Manufacturer</u></b> | <b><u>Model</u></b> | <b><u>Size</u></b>                 |
|-------------------------------------------|---------------------|------------------------------------|
| Sensus                                    | iPerl AMR           | 5/8", 3/4", 1"                     |
| Sensus                                    | Omni AMR            | 1-1/2", 2", 3", 4",<br>6", 8", 10" |

### **Previous Specification**

JUNE 2005  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

95-10

## **SPECIFICATIONS FOR PIPE JOINT RESTRAINT SYSTEMS**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers pipe joint restraint systems to be used on domestic water mains for PVC C-900 pipe sizes 4-inch through 24-inch diameter and for Ductile Iron pipe sizes from 4-inch through 24-inch diameter. Joint restraint systems are classified as “compression”, “mechanical joint” or “non- metallic restrained joint” for the specific type of pipe joint to be restrained.

### **2. GENERAL REQUIREMENTS**

- a) Underwriter Laboratories (U.L) and Factory Mutual (FM) certifications are required on all restraint systems.
- b) Unless otherwise noted, restraint systems to be used on PVC C-900 pipe shall meet or exceed A.S.T.M. Standard F1674-96, “Standard Test Methods for Joint Restraint Products for Use with PVC Pipe,” or the latest revision thereof. Restraint systems used on ductile pipe shall meet or exceed U.L. Standard 194
- c) Non-metallic restrained joint pipe and couplings shall be utilized specifically for C-900 PVC pipe and fittings in sizes 4”-12”.
- d) Each restraint system shall be packaged individually and include installation instructions.

### **3. SPECIFIC REQUIREMENTS**

- a) Restrainer for PVC C-900 & Ductile Iron Push-on Type Connections:
  - 1. Pipe restraints shall be utilized to prevent movement for push-on D.I. or PVC (C900) (compression type) bell and spigot pipe connections or where a flexible coupling has been used to join two sections of plain- end pipe D.I. or PVC (C900). The restrainer may be adapted to connect a plain end D.I. or PVC pipe to a ductile iron mechanical joint (MJ) bell fitting. The restrainer must not be directionally sensitive.

## **Fair Oaks Ranch Material Standard Specifications**

2. The pipe shall be restrained by a split retainer band. The band shall be cast ductile iron, meeting or exceeding ASTM A536-80, Grade 65-45-12. The inside face or contact surface of the band shall be of sufficient width to incorporate cast or machined non-directionally sensitive serration to grip the outside circumference of the pipe. The serration shall provide full (360 degrees) contact and maintain pipe roundness and avoid any localized points of stress. The split band casting shall be designed to “bottom-out” before clamping bolt forces (110ft-lb minimum torque) can over-stress the pipe but will provide full non-directionally sensitive restraint at the rated pressures.
3. Bolts and nuts used to attach the split retainer ring shall comply with ANSI B 18.2/18.2.2, SAE Grade 5. Tee-bolts, nuts and restraining rods shall be fabricated from high-strength, low-alloy steel per AWWA C111-90.
4. The split ring type non-directionally sensitive restrainer system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D and be for both D.I. and/or PVC C900.
5. Restraint systems sizes six through twelve inches shall be capable of use for both ductile iron and/or PVC C900.
6. The restraint system may consist of two types: the two split retainer rings and for new construction use only the one split and one solid cast backup ring.

### **b) Compression Ring Fitting Restrainer for Ductile Iron Pipe & PVC C-900.**

1. Compression ring with follower gland type of restrainer may be utilized in conjunction with Mechanical Joint (MJ) bell end ductile iron pipe fittings for restraining PVC C-900 and ductile iron pipe.
2. The system shall utilize a standard MJ gasket with a color-coded compression ring and replacement gland conforming to ASTM A 536-80, Grade 65-45-12.
3. Standard MJ fitting Tee-bolts and nuts shall be fabricated from high strength steel conforming to AWWA C111/A21.11-90 and AWWA C153/A21.53-88.

## **Fair Oaks Ranch Material Standard Specifications**

4. Standard MJ gasket shall be virgin SBR meeting ASTM D-2000 3 BA 715 or 3 BA 515.

5. The restraint system shall be capable of a test pressure twice the maximum sustained working pressure listed in section D.

c) Non-metallic restrained joint pipe and couplings for PVC C-900  
Type Connections:

1. Gasketed restrained coupling connections shall join two sections of factory grooved PVC (C900) pipe. The restrainer coupling or must not be directionally sensitive.

2. The coupling shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F-477 and shall be DR-14 Class 200 C-900 PVC in all applications, meeting or exceeding the performance requirements of AWWA C-900, latest revision. The inside face or contact surface of the coupling connection shall be of sufficient width to incorporate a factory machined non-directionally sensitive groove in both pipe and coupling to grip the outside circumference of the pipe. The couplings shall provide full (360 degrees) contact and maintain pipe roundness and avoid and localized points of stress. The coupling shall be designed with an internal stop to align the precision-machined grooves in the coupling and pipe prior to installation of a non-metallic thermoplastic restraint spleen, and will provide full non-directionally sensitive restraint at the rated pressures.

3. High-strength flexible thermoplastic spleens shall be inserted into mating precision –machined grooves in the pipe and coupling to provide full non-directional restraint with evenly distributed loading.

4. The non-metallic restrained joint pipe and couplings for PVC C-900 type non-directionally sensitive restrainer system shall be capable of a test pressure twice the maximum sustained working pressure listed in Section D and be for PVC (C900) pipe sizes four through thirty-six inch.

5. Non-metallic restrained joint pipe and couplings for PVC C-900 restrained systems sizes four through twelve inches shall be capable of use for DR25, DR 18 and DR 14 PVC C900 pipe.

## **Fair Oaks Ranch Material Standard Specifications**

6. The non-metallic restrained joint pipe and couplings for PVC C-900 restraint system shall consist of a pipe and couplings system produced by the same manufacturer meeting the performance qualifications of Factory Mutual (FM) and Underwriters Lab (UL).

### **d) Fitting Restraint for Ductile Iron Pipe (Only):**

1. Radial bolt type restrainer systems shall be limited to ductile iron pipe in conjunction with Mechanical Joint (MJ) bell end pipe or fittings. The system shall utilize a standard MJ gasket with a ductile iron replacement gland conforming to ASTM A 536-80. The gland dimensions shall conform to Standard MJ bolt circle criteria.

2. Individual wedge restrainers shall be ductile iron heat treated to a minimum hardness of 370 BHN. The wedge screws shall be compressed to the outside wall of the pipe using a shoulder bolt and twist-off nuts to insure proper actuating of the restraining system.

3. Standard MJ fitting Tee-bolts and nuts shall be high strength steel conforming to AWWA C111/A21.11-90 and C153/A21.53-88.

4. Standard MJ gasket shall be virgin SBR meeting ASTM D-2000 3 BA 715 or 3 BA 515.

### **e) Maximum Sustained Working Pressure Requirements:**

| <b><u>Nominal Diameter</u></b> | <b><u>PVC C-900</u></b> | <b><u>Ductile Iron</u></b> |
|--------------------------------|-------------------------|----------------------------|
| 4 & 6 inch                     | 200 p.s.i               | 350 p.s.i                  |
| 8 inch                         | 200 p.s.i               | 250 p.s.i                  |
| 10 & 12 inch                   | 200 p.s.i               | 200 p.s.i                  |
| 14 & 16 inch                   | 200 p.s.i               | 200 p.s.i                  |
| 20 & 24 inch                   | 200 p.s.i               | 200 p.s.i                  |

## **4. TESTS:**

Fair Oaks Ranch may, at no cost to the manufacturer, subject random joint restraint system products to testing by an independent laboratory for compliance with these standards. Any visible defect of failure to meet the quality standards herein will be ground for rejecting the entire order.

## **Fair Oaks Ranch Material Standard Specifications**

### 5. **PRODUCT LIST:**

The attached qualified product list identifies specified manufacturers models approved for installation in Fair Oaks Ranch water distribution s y s t e m s .

#### **APPROVED MANUFACTURERS LIST**

##### A. Slip on Joint System

| <b><u>Manufacturer/Slip on Joint System</u></b> | <b><u>PVC C-900</u></b> | <b><u>Ductile Iron</u></b> | <b><u>D.I. 16" and Above</u></b> |
|-------------------------------------------------|-------------------------|----------------------------|----------------------------------|
| Ford/Uni-Flange                                 | 1390C                   | 1390C                      | 1390C                            |
| EBBA Iron Sales, Inc                            | 1500                    | 1700                       | 1700                             |
| Romac Industries, Inc. 4-8-inch                 | Model 611               | Model 611                  | 470SJ                            |
| Star Pipe Products                              | 1100                    | 1100                       | 1100                             |
| Tyler Union                                     | 3000                    | 3000                       | 3000                             |
| Sigma Corporation                               | PV-LOK                  | PV-LOK                     | SLDH                             |
|                                                 | (PVP)/PTP               | (PVP)/PTP/SLDG             |                                  |

##### B. Compression Rib System

| <b><u>Compression Ring Systems</u></b> | <b><u>PVC C-900</u></b> | <b><u>Ductile Iron</u></b> |
|----------------------------------------|-------------------------|----------------------------|
| Romac Industries, Inc.                 | GripRing-D1             | GripRing-D1                |
| Tyler Corporation                      | MJR Gland               | MJR Gland                  |
| Star Pipe Products                     | Ring Lock 3500 Series   |                            |

##### C. Non-Metallic Restrained Joint Pipe and Couplings for PVC C-900 RJ Type Connections:

|                          |                           |
|--------------------------|---------------------------|
| Certain Teed Corporation | <u>Certa-Lok C-900/RJ</u> |
|                          | 4" – 12" DR-25            |
|                          | 4" – 12" DR-18            |
|                          | 4" – 8" DR-14             |

## **Fair Oaks Ranch Material Standard Specifications**

### D. Fitting Restraint (MJ):

| <b><u>Manufacturer</u></b> | <b><u>PVC C-900</u></b> | <b><u>Ductile Iron</u></b> |
|----------------------------|-------------------------|----------------------------|
| EBBA Iron Sales, Inc.      | 2000 PV                 | Megalug1100                |
| Romac Industries, Inc.     | Not Approved            | Not Approved               |
| Ford/Uni-Flange            | UFR-1500-C 4"-24"       | Series 1400                |
| StarPipe Products          | Stargrip 4000           | Stargrip 4000              |
| Sigma Corporation          | One Lok SLC             | One Lok SLD                |
| Tyler Union                | TUFGRIP 2000 F          | TUFGRIP 1000F              |

### E. Restrained Flange Adapters:

| <b><u>Manufacturer</u></b> | <b><u>PVC C-900</u></b> | <b><u>Ductile Iron</u></b> |
|----------------------------|-------------------------|----------------------------|
| EBBA Iron Sales, Inc       | 2100 Megaflange         | 2100 Megaflange            |
| Ford/Uni-Flange            | 900                     | 200,400,420                |

### **Previous Specification:**

JANRUARY 1998  
APRIL 2002  
FEBRUARY 2004  
APRIL 2004  
AUGUST 2004  
MARCH 2005  
OCTOCER 2005  
OCTOBER 2006  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-10

## **SPECIFICATIONS FOR PORTLAND CEMENT**

**REVISED JANUARY 2019**

1. **SCOPE**

This specification covers Portland Cement.

2. **GENERAL REQUIREMENTS**

- a) Portland cement shall be Type I conforming to ASTM Specification C105-05, or latest revision thereof.
- b) Cement shall be furnished in moisture resistant container having a net weight of 93 pounds each.
- c) Broken bags shall not exceed two percent of the total bags in any one shipment.

**Previous Specification:**

FEBRUARY 2007

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-20

## **SPECIFICATION FOR LIQUID CHLORINE**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers liquid chlorine.

### **2. GENERAL REQUIREMENTS**

- a) Liquid chlorine shall conform to AWWA Specification B301-04, or latest revision thereof.
- b) Liquid chlorine shall be furnished in 150 pound or 2,000 pound containers, as specified.

#### **Previous Specification Date:**

OCTOBER 1992

MARCH 2007

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-30

## **SPECIFICATIONS FOR SERVICE SADDLES**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers band and strap-mounted service saddles with iron pipe (NPT) tapped outlet for installation on water mains of the nominal O.D. Pipe size ranges noted. This specification does not cover saddles to be used on concrete steel cylinder pipe.

### **2. GENERAL REQUIREMENTS**

- a) Saddle casting or body shall be of the double strap/bale or double and single band with minimum four studs/bolts on the single band type and shall be cast bronze of the size and application specified. Material shall be in accordance with ASTM B62 and B584 (85-5-5-5) requirements and fabricated to ANCI/AWWAC800, latest revision. Saddles for PVC pipe shall be pre-formed to AWWA C900 and C905 outside diameter dimensions and so stamped or otherwise identified by a permanent inked marking that will not smear or wash off on the body of the saddle. C900 formed saddles can be used on ductile iron pipe from sizes four through sixteen inches.
- b) Saddle casting or body of asbestos clay, ductile iron, cast iron and C905 pipe in sizes above 16" sixteen-inch may be ductile iron and shall be of the double or triple band stainless steel type of the size and application specified. Material shall be in accordance with ASTM A-536 requirements and fabricated to ANCI/ AWWA C800, latest revision. The saddle casting or body shall be coated with a fusion-bonded epoxy or high-density polyethylene. The body shall be NSF 61 approved. The coating shall be NSF 61 or U.L approved to the NSF 61 standard.
- c) Saddles for PVC water pipe shall conform to the design requirements of the Uni-Bell Handbook of PVC Pipe and AWWA Manual No. M23. The saddle shall provide full support around the circumference of the pipe. Provide a bearing area of sufficient width along the axis of the pipe, 2-inch minimum, ensuring that the pipe will not be distorted when the saddle is tightened.
- d) Straps for asbestos cement (AC) pipe shall be bronze bale or stainless steel band types. Polyvinyl chloride pipe (PVC) shall be furnished only with stainless steel band type straps. Bronze straps, bolts and nuts shall be silicon bronze conforming to ASTM B98, or waterworks bronze conforming to ASTM B584. Stainless steel bands, bolts and nuts shall

## **Fair Oaks Ranch Material Standard Specifications**

conform to ASTM A240, type 304 (18-8). Straps of either the bale or band type shall be fabricated to the outside diameter pipe dimensions of the appropriate AWWA Specifications.

- e) The minimum width of double stainless steel bands for saddles to be installed on 12 inch or smaller water main pipe diameters shall measure one and one half inches each. The minimum width for single stainless steel bands shall measure three inches (3").
- f) The minimum width for double stainless steel bands on 16 inch and larger pipe diameters shall measure two inches each. The minimum width for single stainless bands shall measure four inches (4").
- g) The minimum gauge of the stainless steel bands shall be eighteen gauge. In order to prevent deformation, the minimum gauge of the stainless steel side bars shall be ten gauge. All welds shall be fully passivated for enhanced corrosion resistance. The bolts/studs shall be 5/8" UNC roll thread with heavy gauge flat hex nuts.

All Stainless nuts shall be coated to prevent galling.

- h) Gaskets shall be virgin rubber, NSF 61 approved, meet ASTM D-2000 and be NBR or SBR compounded to produce permanence and resistance to set after installation and deterioration during storage.
- i) Quality control procedures shall be employed to ensure that the bronze saddle casting, straps (bronze bale or stainless steel band), and gasket are manufactured to be free of any visible defects. Each saddle shall have a working pressure rating not less than the following:

| <u>Pipe Size (inches)</u> | <u>Minimum Working Pressure Rating (psi)</u> |
|---------------------------|----------------------------------------------|
| 12 and smaller            | 175                                          |
| 16 and larger             | 150                                          |

## **Fair Oaks Ranch Material Standard Specifications**

### **3. SERVICE SADDLE RANGES (minimum):**

| <u>Nominal Dia.</u>                                  | <u>O.D. Range*</u>                       |
|------------------------------------------------------|------------------------------------------|
| <b>4" x <math>\frac{3}{4}</math>, 1, 1½, 2" NPT</b>  | A. 4.80"-5.40"                           |
| <b>6" x <math>\frac{3}{4}</math>, 1, 1½, 2" NPT</b>  | A. 6.80"-7.35"<br>B. 6.90 -7.45          |
| <b>8" x <math>\frac{3}{4}</math>, 1, 1½, 2" NPT</b>  | A. 9.00"-9.56"<br>B. 9.05 -9.61          |
| <b>10" x <math>\frac{3}{4}</math>, 1, 1½, 2" NPT</b> | A. 11.05"-12.00"                         |
| <b>12" x <math>\frac{3}{4}</math>, 1, 1½, 2" NPT</b> | A. 13.10"-14.16"<br>B. 13.20 -14.58      |
| <b>16" x <math>\frac{3}{4}</math>, 1, 1½, 2" NPT</b> | A. 17.35" - 18.35"<br>B. 17.40 - 19.19   |
| <b>20" x 1, 1½, 2" NPT</b>                           | A. 21.33" - 22.33"<br>B. 23.09" - 24.09" |
| <b>24" x 1½, 2" NPT</b>                              | A. 25.54" - 26.54"<br>B. 27.77" - 28.77" |

\*Ranges may be broadened, but not narrowed.

The range shall be ink stamped or permanently identified on the stainless steel band.

4. Fair Oaks Ranch may, at no cost to the manufacturer, subject random service saddles to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.
5. The attached qualified products list identifies specific manufactured items by catalog number that are approved.

## **Fair Oaks Ranch Material Standard Specifications**

### **APPROVED MANUFACTURER LIST**

| <u>Manufacturer</u>      | <u>A-range Model (C900, DI)</u> | <u>B-Range Model(AC)</u>    |
|--------------------------|---------------------------------|-----------------------------|
| AY McDonald              | 3846                            | 3826/3846                   |
| Romac Industries, Inc.   | 202BS                           | 202BS                       |
| Smith-Blair, Inc.        | 323 W/Wide Strap 304SS          | 323/ 323/W/Wide Strap 304SS |
| Ford Meter Box Co., Inc. | 202BS                           | 202B/202BS                  |
| James Jones Co.          | J969                            | J979/J969                   |
| Mueller Co.              | BR2S                            | BR2B/BR2S                   |

C900, Ductile/Cast Iron, and AC Pipe Sizes Above 16"

| <u>Manufacturer</u>                                      | <u>Model</u>  |
|----------------------------------------------------------|---------------|
| Smith Blair Epoxy Coated Stainless Bands A-range         | 366 W/Special |
| Strap 304SS JCM Ductile Iron Double Strap Saddle A-range | 406           |

NOTE: PVC Model shall have "C900" stamped or marked with permanent ink on the saddle.

### **Previous Specification**

JUNE 1999

NOVEMBER 1998

FEBRUARY 2000

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-32

## **SPECIFICATIONS FOR STANDARD / WIDE RANGE REPAIR**

### **AND TAP CLAMPS**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers single and multiple band full circle clamps to repair full circumferential breaks, holes, cracks, or other damage on cast iron, ductile iron, asbestos cement, steel and other types of pipe.

#### **2. GENERAL REQUIREMENTS**

##### **Standard Repair and Tap Clamps**

- a. Band or shell shall be of the O.D. size range and length specified. Band shall be of Type 304 stainless steel.
- b. Lugs shall be of high strength ductile iron per ASTM A536, and securely attached to the band or shell. Each lug shall be so designed to allow, "Drop in bolts" and stabilizing "fingers" to provide maximum torquing of the bolts. Lugs are to be shop-coated with an oil-modified urethane corrosion-resistant paint.
- c. Gasket shall provide a 360° sealing surface and of such size and shape to provide an adequate compressive force against the pipe after assembly to affect a positive seal under all combinations of joint and gasket tolerances. Materials used shall be vulcanized natural or vulcanized synthetic rubber with antioxidant and antiozinant ingredients to resist set after installation. No reclaimed rubber shall be used. A heavy gauge Type 304 stainless armor plate shall be vulcanized into the gasket to span the lug area.
- d. Bolts shall be of high strength, low alloy steel with semi-finished hexagon nuts and washers in accordance with AWWA/ANSI C111/A21.11.

##### **Pipe Size (inches)**

##### **Minimum Working Pressure Rating (psi)**

|                |     |
|----------------|-----|
| 12 and smaller | 200 |
| 16 thru 20     | 100 |
| 24             | 75  |

- e. The bolt and lug design shall be closed on one side.

## **Fair Oaks Ranch Material Standard Specifications**

### 3. **STANDARD CLAMP RANGES (Single Band):**

| <b><u>Nominal Dia. x Min. Band Width</u></b> | <b><u>O.D. Range*</u></b> |
|----------------------------------------------|---------------------------|
| 6" x 7½"                                     | 6.84" - 7.24"             |
| 8" x 7½"                                     | 8.99" - 9.39"             |
| 12" x 7½"                                    | 13.70" - 14.10"           |

\*Ranges may be broadened but not narrowed.

### 4. **STANDARD CLAMPS RANGES (Multiple Band):**

|              |                 |
|--------------|-----------------|
| A. 4" x 12½" | 4.74" - 5.57"   |
| A. 6" x 15"  | 6.62" - 7.42"   |
| B. 6" x 15"  | 7.20" - 8.00"   |
| A. 8" x 15"  | 8.50" - 9.27"   |
| B. 8" x 15"  | 9.25" - 10.05"  |
| A. 10" x 15" | 11.04" - 12.24" |
| A. 12" x 15" | 13.14" - 14.34" |
| B. 12" x 15" | 13.65" - 14.85" |
| A. 16" x 10" | 18.08" - 18.84" |
| B. 16" x 20" | 17.15" - 17.90" |
| C. 16" x 20" | 18.46" - 19.21" |
| A. 20" x 10" | 22.90" - 23.65" |
| B. 20" x 20" | 21.52" - 22.27" |
| C. 20" x 20" | 23.21" - 23.97" |
| A. 24" x 10" | 27.28" - 28.34" |
| B. 24" x 20" | 25.70" - 26.80" |
| C. 24" x 20" | 27.72" - 28.82" |

**NOTE:** Band Widths shall not vary more than +1 inch.

5. Where 2, 1½, 1 and ¾ inch tapped repair clamps are specified, they shall be multiple band in the sizes specified in paragraph (4) above.

## **Fair Oaks Ranch Material Standard Specifications**

### **6. WIDE RANGE REPAIR AND TAP CLAMPS REQUIREMENTS**

Wide range repair clamps shall be of the full circle split band super range design consisting of either two half circle body sections and two sets of nuts, bolts, and lugs, or of the single band expanded range design consisting of one extended range band and one set of nuts, bolts, and lugs.

- a. Band or Shell shall be O.D. size wide range and length specified. Band shall be 18-8 type 304-stainless steel and shall maintain a minimum thickness of between 1.0 - 1.5 millimeters.
- b. Bolt retainer assembly or lugs shall be of a type 304 stainless steel and of a non-welded design. Lugs may be cast, forged or cold formed of type 304 stainless steel, and may include a high impact polycarbonate plastic, non-corrosive retainer. Lug design shall be such that the band fully compresses the gasket to the complete working width of the repair clamp without deformation of the band.
- c. All nuts and bolts shall be 304-stainless steel and coated with an anti-seize coating such as a non-seize zinc coating or a baked in place Xylon coating to prevent galling.
- d. Gasket shall be vulcanized natural or vulcanized synthetic rubber with antioxidant and antiozinant ingredients to resist set after installation. No reclaimed rubber shall be used.

Gasket must provide a 360° sealing surface and shall be a lap-type with a waffle gridded pattern and may be equipped with pressure assisted sealing banks. Gasket shall be bonded to the body section by gluing or mechanical attachment method that allows the matched tapered ends to properly overlap for installations.

- e. Spanner plate (gap bridging shim) shall be of 18-8 type 304 stainless steel and vulcanized into the gasket to span the lug area to ensure uniform compression against the pipe or mechanically attached to the clamp band, so as not to cause a leak at its leading edge.
- f. The repair tapped clamps shall have an 18-8 type 304 stainless steel outlet TIG welded to ban. All welds and bare metal surfaces shall be chemically passivated.

#### **Pipe Size (inches)**

#### **Minimum Working Pressure Rating (psi)**

12" and smaller

200

## **Fair Oaks Ranch Material Standard Specifications**

### **Wide Range Repair and Tap Clamp Ranges**

| <b><u>Nominal Dia. x Band Width</u></b> | <b><u>O.D. Range</u></b> |
|-----------------------------------------|--------------------------|
| 4" x 15"                                | 4.80 - 5.60              |
| 6" x 15"                                | 6.84 - 7.64              |
| 8" x 15"                                | 9.00 - 9.80              |
| 10" x 15"                               | 11.35 - 12.15            |
| 12" x 15"                               | 13.60 - 14.40            |

7. Quality control procedures shall be employed to ensure that the gasket, band, and lug are properly fabricated and free of any visible defects.
8. Unless otherwise specified, each clamp shall be stenciled or coated in a satisfactory manner to identify the pipe size, clamp range and type of pipe. The markings shall be permanent type, water resistant, and will not smear or become illegible.
9. Fair Oaks Ranch may, at no cost to the manufacturer, subject random repair clamps to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.
10. The attached qualified products list identifies specific manufactured items by catalog number that are approved.

| <b><u>Manufacturer</u></b>       | <b><u>Repair Clamp Model</u></b> | <b><u>Tap Clamp Model</u></b> |
|----------------------------------|----------------------------------|-------------------------------|
| Dresser Piping Specialties       | 360                              | 360                           |
| JCM Industries, Inc.             | 101, 102                         | 103, 133 Romac                |
| Industries, Inc.                 | CL1, CL2, CL3                    | CL1, CL2, CL3                 |
| Smith-Blair, Inc.                | 226, 227, 228                    | 238, 239                      |
| The Ford Meter Box Co., Inc.     | F1, F2, F3                       | F1, F2, F3                    |
| PowerSeal Products Corp.         | 3121, 3122, 3123                 | 3131, 3132                    |
| Cascade Waterworks Manufacturing | CDR1 Ductile Lug Only            |                               |

## **Fair Oaks Ranch Material Standard Specifications**

### **Wide Range Repair and Tap Clamps**

|                        |                                                                                                                      |
|------------------------|----------------------------------------------------------------------------------------------------------------------|
| Total Piping Solutions | EZ-Max Plus Series 4000                                                                                              |
| Total Piping Solutions | Quick Cam Rapid Seal Repair Clamp<br>Series QCRS-SS (Water Main) 4" thru 12"<br>Single panel, 16" thru 24" two-panel |

### **Previous Specification:**

NOVEMBER 2016  
APRIL 2004  
APRIL 2001  
APRIL 1999  
JUNE 1998  
MAY 1992

# **Fair Oaks Ranch Material Standard Specifications**

100-34

## **SPECIFICATIONS FOR STANDARD/WIDE RANGEDUCTILE IRON COUPLINGS REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers ductile iron couplings for use in connection of smooth end joints of cast iron, ductile iron, asbestos cement, steel, PVC or other types of pipe. The couplings must be capable of fitting this variety of pipes with one set of follower flanges or endrings.

### **2. GENERAL REQUIREMENTS**

- a) Sleeve or center ring shall be nominal O.D. size range and length specified. Sleeve shall be of Ductile Iron ASTM A536. Ends shall have a smooth inside taper to provide uniform gasket seal. Sleeve shall be given a shop coat of oil-modified urethanes, corrosion- resistant paint, or epoxy coating.
- b) Follower flanges or end rings shall be of the thickness determined by the coupling size, and shall be ductile iron, ASTM-536. Flanges shall be identified by a color-coded shop coat finish as described in Item 2a.
- c) Gaskets shall be compression – type, formed with Virgin Styrene Butadiene Rubber (SBR) ASTM D2000 3 BA715, and compounded with ingredients to produce permanence and resistance to set after installation. O.D. range shall be imprinted/molded on the gasket in permanent ink (Minimum.)
- d) Bolts and Nuts shall be of high-strength, low-alloy steel, with nominal coarse thread, and hex nuts with black finish. Dimensions and minimum stress values shall be in accordance with AWWA/ANSI C111/A21.11.
- e) Where specification states a cast transition or reducing coupling in place of a straight coupling, the sleeve and follower flange shall be of the same manufacturer and compatible for the specific use intended.
- f) Quality control procedures shall be employed to ensure that the sleeve, follower flanges and gaskets are properly fabricated and free of any visible defects. Each coupling shall have a working- pressure rating not less than the following:

### **Fair Oaks Ranch Material Standard Specifications**

| <u>Pipe Size (Inches)</u> | <u>Minimum Working Pressure<br/>Rating (PSI)</u> |
|---------------------------|--------------------------------------------------|
| 16 and smaller            | 175                                              |
| 20                        | 150                                              |
| 24                        | 150                                              |

#### **3. STRAIGHT COUPLING RANGES:**

| <u>Nominal Diameter x Minimum Length</u> |     | <u>O.D. Range*</u>                   |
|------------------------------------------|-----|--------------------------------------|
| 4"                                       | 6"  | A. 4.80" – 5.10"                     |
| 6"                                       | 6"  | A. 6.90" – 7.22"                     |
| 8"                                       | 6"  | A. 9.05" – 9.45"                     |
| 10"                                      | 6"  | A. 11.10"-11.60"                     |
| 12"                                      | 6"  | A. 13.20"-13.50"<br>B. 13.78"-14.38" |
| 16"                                      | 6"  | A. 17.40"-17.80"<br>B. 18.46"-19.00" |
| 20"                                      | 7"  | A. 21.35"-21.75"<br>B. 21.75"-22.25" |
| 24"                                      | 10" | A. 25.00"-25.80"<br>B. 26.10"-26.32" |

\*Ranges may be broadened, but not narrowed.

## **Fair Oaks Ranch Material Standard Specifications**

### **4. WIDE RANGE COUPLING**

| <u>Coupling Size</u> | <u>O.D. Range</u> |
|----------------------|-------------------|
| 3"                   | 3.40"-4.20"       |
| 4"                   | 4.20"-5.33"       |
| 6"                   | 6.25"-7.45"       |
| 8"                   | 8.40"-9.79"       |
| 10"                  | 10.70"-12.12"     |
| 12"                  | 12.75"-14.38"     |

5. Fair Oaks Ranch may, at no cost to the manufacturer, subject random couplings to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.
6. The attached qualified products list identifies specific manufactured items by catalog number that are approved.

## **Fair Oaks Ranch Material Standard Specifications**

### **APPROVED MANUFACTURERS LIST**

#### **Approved Manufacturers and Models for Straight Couplings:**

| <u>Manufacturer</u>          | <u>Model</u>  |
|------------------------------|---------------|
| JCM Industries               | 210           |
| Romac Industries, Inc.       | 501           |
| Smith-Blair, Inc.            | 441           |
| The Ford Meter Box Co., Inc. | FC1 PowerSeal |
| Pipeline Products Corp.      | 3501 Cascade  |
| Waterworks Mfg. Co.          | CDC & CTC     |
| Dresser                      | 253           |

#### **Approved Manufacturers and Models for Wide Range Couplings:**

| <u>Manufacturer</u>              | <u>Model</u> |
|----------------------------------|--------------|
| PowerSeal Pipeline Products Corp | 3506 The     |
| Ford Meter Box Company, Inc      | FC2W         |

#### **Previous Specification Date:**

APRIL 2002  
AUGUST 2003  
FEBRUARY 2008  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-35

## **SPECIFICAITONS FOR TAPPING SLEEVES** **(4" AND LARGER NOMINAL PIPE DIAMETER)** **REVISED JANUARY 2019**

### **1. SCOPE**

These specifications cover-tapping sleeves installed on pipe from 4" and larger nominal pipe diameter.

### **2. GENERAL REQUIREMENTS**

The band shall conform to the minimum OD size ranges and lengths specified in paragraph 3. The Flange shall be manufactured in compliance with AWWA C207, Class D ANSI B.16.1 drilling, recessed for tapping valve MSS-SP60. Or Mechanical Joint tapping sleeve outlet shall meet or exceed all material specifications as listed below and be suitable for use with standard mechanical joint x mechanical joint resilient wedge gate valves per ANSI/AWWA C509-94.

- a) Tapping sleeves from 4" through 12" nominal pipe diameter shall meet the following minimum requirements.
  1. The entire fitting shall be stainless steel type 304 (18-8). The body, lug, and gasket armor plate shall be in compliance with ASTM A240. The Flange shall be cast stainless steel in compliance with ASTM A743. The MJ outlet shall be one-piece casting made of stainless steel. The test plug shall be ¾" NPT in compliance with ANSI B2.1 and shall be lubricated or coated to prevent galling. All metal surfaces shall be passivated after fabrication in compliance with ASTM A-380.
  2. The gasket shall provide a 360-sealing surface of such size and shape to provide an adequate compressive force against the pipe after assembly, to affect a positive seal under the combinations of joint and gasket tolerances. The materials used shall be vulcanized natural or vulcanized synthetic rubber with antioxidant and antioxidant ingredients to resist set after installation. No reclaimed rubber shall be used. A heavy-gauge-type 304-stainless armor plate shall be vulcanized into the gasket to span the lug area.
  3. The lugs shall be heliarc welded (GMAW) to the shell. The lug shall have a pass-through-bolt design to avoid alignment problems and allow tightening from either side of the main. Bolts shall NOT BE integrally welded to the sleeve. Finger Lug designs are not approved; it is the intent of these specifications to allow a tapping sleeve that has a lug design similar to the approved models.

### **Fair Oaks Ranch Material Standard Specifications**

4. Bolts and nuts shall be type 304 (18-8) stainless steel and lubricated or Teflon coated to prevent galling or seizing. Bent or damaged unite will be rejected.
  5. Quality control procedures shall be employed to ensure that the shell, Lug, (4" and Larger Nominal Pipe Diameter) armor plate, gasket and related hardware are manufactured to be free of any visible defects. Each unit, after proper installation, shall have a working-pressure rating up to 200 psi, and a test pressure of 250 psi.
  6. The sleeve construction shall provide a positive means of preventing gasket cold flow and/or extrusion.
  7. Each sleeve shall be stenciled, coded or marked in a satisfactory manner to identify the size range. The markings shall be permanent type, water resistant, that will not smear or become illegible.
- b) Tapping sleeves from 16" and larger nominal pipe diameter shall meet the following minimum requirements:
1. The body shall be in compliance with ASTM A285, Grade C or ASTM A36. The test plug shall be ¾" NPT conforming to ANSI B2.1.
  2. The gasket shall provide a watertight sealing surface of such size and shape to provide an adequate compressive force against the pipe. After assembly, the gasket will insure a positive seal under all combinations of joint and gasket tolerances. Gaskets shall be formed from vulcanized natural or vulcanized synthetic rubber with antioxidant ingredients to resist set after installation. No reclaimed rubber shall be used.
  3. Bolts and nuts shall be high strength, corrosion resistant, low alloy, pre AWWAC111, ANSI A21.11.
  4. Quality control procedures shall be employed to ensure that the shell, gaskets, and related hardware area are manufactured to be free of visible defects. Each unit, after proper installation, shall have a working-pressure rating up to 150 psi and a maximum test pressure of 200 psi.
  5. Unless otherwise noted, unit shall be protected by fusion Epoxy 8- 10 mil line and cost process per AWWA C213.
  6. Units for concrete, steel cylinder pipe shall be furnished with load

### **Fair Oaks Ranch Material Standard Specifications**

bearing setscrews on the gland flange to transfer loads on the outlet away from the steel cylinder and onto the sleeve. Epoxy –coated tapping sleeves do not require grout seal cavity (AWWA M-9 Manual).

7. Each Sleeve shall be stenciled, coded or marked in a satisfactory manner to identify the size range. The marking shall be permanent type, water resistant, that will not smear or become illegible.

#### **3. STANDARD RANGES: (4" – 30" NOMINAL PIPE DIAMETER)**

| <b><u>Nominal Dia.x Min<br/>Length</u></b> | <b><u>Flg. Outlet</u></b> | <b><u>Range</u></b> | <b><u>Minimum OD<br/>Range**</u></b> |
|--------------------------------------------|---------------------------|---------------------|--------------------------------------|
| 4" x 16                                    | 4"                        | A                   | 4.75" – 4.95"                        |
|                                            |                           | B                   | 4.90" – 5.10"                        |
| 6" x 16"                                   | 4"                        | A                   | 6.70" – 7.10"                        |
|                                            |                           | B                   | 7.00" – 7.40"                        |
|                                            |                           | C                   | 7.35" – 7.75"                        |
| 6" x 16"                                   | 6"                        | A                   | 6.80" – 7.15"                        |
|                                            |                           | B                   | 7.05" – 7.40"                        |
|                                            |                           | C                   | 7.40" – 7.75"                        |

**Fair Oaks Ranch Material Standard Specifications**

**STANDARD RANGES:(continued)**

| <b><u>Nominal Dia.x Min<br/>Length</u></b> | <b><u>Flg. Outlet</u></b> | <b><u>Range</u></b> | <b><u>Minimum OD<br/>Range**</u></b> |
|--------------------------------------------|---------------------------|---------------------|--------------------------------------|
| 8" x 16"                                   | 4" & 6"                   | A                   | 9.00" – 9.45"                        |
|                                            |                           | B                   | 9.35" – 9.70"                        |
|                                            |                           | C                   | 9.70" – 10.10"                       |
| 8" x 20"                                   | 8"                        | A                   | 9.00" – 9.35"                        |
|                                            |                           | B                   | 9.35" – 9.70"                        |
|                                            |                           | C                   | 9.70" – 10.00"                       |
| 10" x 16"                                  | 4" & 6"                   | A                   | 11.03" – 11.47"                      |
| 10" x 20"                                  | 8"                        | B                   | 11.60" – 12.00"                      |
| 10" x 24"                                  | 10"                       |                     |                                      |
| 12" x 16"                                  | 4" & 6"                   | A                   | 13.00" – 13.40"                      |
| 12" x 20"                                  | 8"                        | B                   | 13.40" – 13.80"                      |
| 12" x 24"                                  | 10"                       | C                   | 14.10" – 14.50"                      |
| 12" x 32"                                  | 12"                       |                     |                                      |
| 16" x 12"                                  | 4" & 6"                   |                     | 17.33" – 17.87"                      |
| 16" x 16"                                  | 8"                        |                     | 18.62" – 19.19"                      |
| 16" x 20"                                  | 10"                       |                     |                                      |
| 16" x 24"                                  | 12"                       |                     |                                      |
| 16" x 36"                                  | 16"*                      |                     |                                      |
| 20" x 12"                                  | 4" & 6"                   | A                   | 21.51" – 22.15"                      |
| 20" x 16"                                  | 8"                        | B                   | 23.46" – 24.16"                      |
| 20" x 20"                                  | 10"                       |                     |                                      |
| 20" x 24"                                  | 12"                       |                     |                                      |
| 20" x 36"                                  | 16"*                      |                     |                                      |
| 20" x 40"                                  | 20"*                      |                     |                                      |

**Fair Oaks Ranch Material Standard Specifications**

**STANDARD RANGES:(continued)**

| <b><u>Nominal Dia.x Min<br/>Length</u></b> | <b><u>Flg. Outlet</u></b> | <b><u>Range</u></b> | <b><u>Minimum OD<br/>Range**</u></b> |
|--------------------------------------------|---------------------------|---------------------|--------------------------------------|
| 24" x 12"                                  | 4" & 6"                   | A                   | 25.71" – 26.41"                      |
| 24" x 16"                                  | 8"                        | B                   | 28.14" – 28.84"                      |
| 24" x 20"                                  | 10"                       |                     |                                      |
| 24" x 24"                                  | 12"                       |                     |                                      |
| 24" x 36"                                  | 16"*                      |                     |                                      |
| 24" x 40"                                  | 20"*                      |                     |                                      |
| 24" x 48"                                  | 24"*                      |                     |                                      |
| 30" x 12"                                  | 4" & 6"                   | A                   | 29.78" – 30.48"                      |
| 30" x 16"                                  | 8"                        | B                   | 31.52" – 32.22"                      |
| 30" x 20"                                  | 10"                       |                     |                                      |
| 30" x 24"                                  | 12"                       |                     |                                      |
| 30" x 36"                                  | 16"*                      |                     |                                      |
| 30" x 48"                                  | 20"*                      |                     |                                      |
| 30" x 48"                                  | 24" x 30"*                |                     |                                      |

\* Range to be specified on order.

\*\* Ranges may be broadened, but not narrowed. For concrete steel cylinder pipe, the OD of the pipe and cylinder shall be supplied with the order.

4. For pipe larger than 30" nominal diameter, tapping sleeves shall be custom-fabricated to fit non-standard ranges, in conformance with the intent of these specifications.
5. Fair Oaks Ranch may, at no cost to the manufacturer, subject random units to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be ground for rejecting the entire order.
6. The attached qualified products list identifies specific manufactured items by catalog number that are approved.

## **Fair Oaks Ranch Material Standard Specifications**

### **APPROVED MANUFACTURER LIST**

#### **4" – 12"**

#### **Models**

|                  |                     |
|------------------|---------------------|
| JCM Industries   | #432                |
| PowerSeal        | #3490AS or 3490MJSS |
| Cascade          | CST-1               |
| Ford Meter Box   | FTSS                |
| Romac Industries | SST III             |
| Dresser          | Style 610/630       |

#### **16" and larger**

|                  |                    |
|------------------|--------------------|
| Smith-Blair      | #622               |
| JCM Industries   | #412               |
| Romac Industries | SST III Ford Meter |
| Ford Meter Box   | FTS                |
| PowerSeal        | 3490MJSS Dresser   |
| Dresser          | Style 610/630      |

#### **Previous Specification:**

MARCH 2002

MARCH 2004

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-40

## **SPECIFICATIONS FOR PRESSURE SENSITIVE POLYVINYL**

### **TAPE**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers pressure sensitive polyvinyl tape, suitable for corrosion prevention of exterior surfaces of metal pipe.

#### **2. GENERAL REQUIREMENTS**

- a) Except as otherwise stated, all tape furnished for use by Fair Oaks Ranch shall consist of an elastomeric film backing of either polyethylene or plasticize polyvinyl chloride, coated on one side with a homogenous pressure-sensitive adhesive. The tape shall conform to Federal Specifications L-T-1512A, and applicable sections of AWWA C209.

- b) Typical Properties: (ASTM D1000 Test Method unless noted)

- |                                                                        |                 |
|------------------------------------------------------------------------|-----------------|
| 1. Total Thickness,                                                    | mils 10 (+1)    |
| 2. Width, deviation, inches,                                           | max. .01        |
| 3. Tensile Strength, lb/inch width,                                    | min. 20         |
| 4. Elongation, percent,                                                | min. 150        |
| 5. Adhesion to steel, oz/inch width,                                   | min. 20         |
| 6. Water-vapor transmission rate,<br>gm/100 square inches/24 hrs, max. | 1.3 ASTM-D3833) |
| 7. Dielectric Strength,                                                | volts 7,000     |
| 8. Puncture Resistance, lbs,                                           | min. 10         |

- c) Unless otherwise stated, all tape shall be furnished with black film and black adhesive.
- d) The rolls shall be furnished in the widths and lengths specified.
- e) All tape shall be individually packaged to prevent adherence to the packaging material or the container. **The containers shall be plainly marked with the name of the manufacturer, type of material, batch or lot number, and information as required by federal and state laws.**
- f) Materials supplied shall meet the provisions of the standard. Materials that fail to conform to this standard herein will be grounds for rejection the entire order.

## **Fair Oaks Ranch Material Standard Specifications**

### **3. QUALITY ASSURANCE PROVISIONS**

- a) Unless otherwise specified, the supplier is responsible for the performance of all inspection requirements as specified herein.
- b) Fair Oaks Ranch reserves the right to retain an independent laboratory to perform any of the inspections set forth in these specifications where such inspections are deemed necessary to assure that supplies and services conform to the prescribed requirements.

### **APPROVED MANUFACTURER LIST**

| <b><u>Manufacturer</u></b> | <b><u>Item No.</u></b> |
|----------------------------|------------------------|
| Scotchrap All-Weather Tape | 50                     |
| Trantex Pipeline Tape      | VID-10                 |
| Winmore Pipe Wrap Tape     | 413                    |

### **Previous Specification:**

JULY 1993

NOVEMBER 2005

DECEMBER 2011

**SPECIFICATION FOR WIDE RANGE TRANSITION COUPLINGS**

**REVISED JANUARY 2019**

1. **SCOPE**

This specification covers wide range ductile iron or fabricated carbon steel couplings stab-on sleeve type design for use in connection of smooth end joints of cast iron, ductile iron, asbestos cement, steel, PVC or other types of pipe. The couplings must be capable of fitting this variety of pipes with one set of follower flanges or compression endrings.

2. **GENERAL REQUIREMENTS**

- a) Sleeve or center ring shall be nominal O.D. size range and length specified. Sleeve shall be of Ductile Iron ASTM A536 or fabricated of high strength carbon steel tubing equivalent to ANSI/AWWA C200. Ends shall have a smooth inside taper to provide uniform gasket seal.
- b) Follower flanges shall be one flange design and shall be ductile iron, ASTM-536 or compression end rings. Compression end rings shall have a stainless steel spanner per end and be a one bolt design, per end size ranges of 4" thru 12 inches and a two bolts design per end from size ranges 16" thru 24" nominal diameter coupling.
- c) Gaskets shall be compression-type, formed with Virgin Styrene Butadiene Rubber (SBR,) ASTM D2000, chloramine resistant and meets NSF-61 standards. Reclaimed rubber shall not be used. Gasket shall be of a transition design or a two-layered design to allow for maximum transitional capability.
- d) Bolts and Nuts shall be of high-strength, low-alloy steel, with nominal coarse thread and hex nuts with black finish. Dimensions and minimum stress values shall be in accordance with AWWA/ANSI C111/A21.11 or ANSI 304 Grade Stainless Steel and coated with an anti-seizetype coating to prevent galling.
- e) Couplings interior and exterior coating shall meet or exceed the NSF-61 standards. Instructions shall be supplied for proper assembly and bolt torque. Each coupling shall be stenciled or label in a satisfactory manner to identify the size, range and type of pipe. The markings shall be permanent type, water resistant, and will not smear or become illegible.

### **Fair Oaks Ranch Material Standard Specifications**

- f) Quality control procedures shall be employed to ensure that the sleeve, follower flanges and gaskets are properly fabricated and free of any visible defects. Each coupling shall have a working- pressure rating not less than the following:

| <u>Pipe Size (Inches)</u> | <u>Minimum Working Pressure Rating (PSI)</u> |
|---------------------------|----------------------------------------------|
| 4" and Larger             | 200                                          |

#### **3. WIDE RANGE COUPLING RANGES:**

| <u>Nominal Diameter x Minimum Length</u> |     | <u>O.D. Range</u> |
|------------------------------------------|-----|-------------------|
| 4"                                       | 6"  | 4.25 - 5.63       |
| 6"                                       | 6"  | 6.42 - 7.68       |
| 8"                                       | 6"  | 8.54 - 9.84       |
| 10"                                      | 6"  | 10.70 - 12.00     |
| 12"                                      | 6"  | 13.15 - 14.41     |
| 16"                                      | 6"  | 17.10 - 19.20     |
| 20"                                      | 7"  | 21.50 - 23.60     |
| 24"                                      | 10" | 24.60 - 26.70     |

4. Fair Oaks Ranch may, at no cost to the manufacturer, subject random couplings to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.
5. The attached qualified products list identifies specific manufactured items by catalog number that are approved.

**Fair Oaks Ranch Material Standard Specifications**

**APPROVED MANUFACTURER LIST**

Approved Manufacturers and Models for Wide Range Couplings:

Manufacturer

Model

Total Piping Solutions, Inc

Hymax -2000

**Previous Specification**

JUNE 2007

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-70

## **4 MIL POLYETHYLENE WRAPPING MATERIAL**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers polyethylene-wrapping material for use in encapsulating ductile and cast iron pipe.

### **2. GENERAL REQUIREMENTS**

- a) Polyethylene wrapping for ductile and cast iron water mains shall consist of a 4 mil thick tubular section of cross-laminated high-density polyethylene, having a high dielectric and tensile strength, for use in protecting and insulating cast iron and cast iron and ductile iron pipe from the electrolytic action encountered in highly active soils.
- b) Polyethylene wrapping shall consist of an opaque cross-laminated high-density polyethylene sheet continuously thermally bonded to form a tubular section. The tubes may be supplied in bulk length on rolls or in individual pre-cut lengths. See the attached size and length chart, in accordance with AWWA C105-99 (Table 1) for minimum requirements; greater widths and lengths can be used in lieu of the minimal list. When supplied for specified pipe lengths, the tubes shall contain a minimum of four feet additional material over the actual pipe length to allow for overlap.
- c) The sheet of polyethylene film utilized for the tubular wrapping shall be produced from virgin resins meeting raw material and physical properties Of ASTM D-1248 and ANSI/AWWA C105, latest edition. The material shall be 4-mil cross-laminated high-density polyethylene. The film shall be free of imperfections such as pinholes, tears, etc., after being thermally seamed into tubular form. The finished product will have a nominal thickness of 4 mils, with a tolerance of minus ten percent.
- d) The polyethylene wrapping material shall have no volatile constituents, the loss of which may affect ductility. The material shall also have the Following properties

## **Fair Oaks Ranch Material Standard Specifications**

1.     **Mechanical:**   The polyethylene film shall have a tensile strength per latest ASTM D-882 test, of 6300psi min.  
The film shall have an elongation of not less than 100% of the test strip minimum per latest ASTM D-882 test. The film shall have an impact resistance 800 gram min. per (ATM D1709 Method B) The film shall have a propagation tear resistance of 250 gf, minimum in machine and transverse direction (ASTMD1922).
2.     **Dielectric:**    The film shall have a dielectric strength of 800 volts per mil of thickness per latest ASTM D-149.

### **e) Inspection and Certification by Manufacturer**

Quality control and inspection. The manufacturer shall establish the necessary quality control and inspection practice to ensure compliance with this standard.

Manufacturer's statement. The manufacturer shall, provide a sworn statement on each lot purchased that the inspection and all applicable material requirements of Section 4.1 have been met and that all results comply with the requirements of this standard.

Freedom from defects. All polyethylene film shall be clean, sound, and without defects that could impair service.

### **3. MARKING REQUIREMENTS**

The polyethylene film supplied shall be clearly marked, at a minimum of every 2-ft along its length, containing the following information.

- a. Manufacturer's name or trademark
  - b. Year of manufacture
  - c. ANSI/AWWA C105/A21.5
  - d. Minimum film thickness and material type.
  - e. Applicable range of nominal pipe diameter size(s).
  - f. Warning-Corrosion Protection-Repair any Damage.
4. Fair Oaks Ranch may at no cost to the manufacturer, subject Random testing by an independent laboratory for compliance with this Specification. Any

## **Fair Oaks Ranch Material Standard Specifications**

visible defect of failure to meet the quality standards Herein will be grounds for rejecting the entire order.

### **4 MIL POLYETHYLENE WRAPPING MATERIAL**

SIZE & LENGTH (All sizes lay flat size)

| <u>Pipe Size</u> | <u>Product Size</u><br><u>Width x Length</u> |
|------------------|----------------------------------------------|
| 4", 6" & 8"      | 20" x 200/500                                |
| 8", 10" & 12"    | 27" x 200/500                                |
| 16" & 18"        | 37" x 200/500                                |
| 20"              | 41" x 200/500                                |
| 24"              | 54" x 200/500                                |
| 30"              | 67" x 140/500                                |
| 36"              | 81" x 120/500                                |
| 48"              | 95" x 100/500                                |
| 54"              | 108" x 100/500                               |

### **APPROVED MANUFACTURER LIST**

#### Manufacturer

Van Leer Flexibles Inc.  
Manufactured Plastics and Distribution Inc.

#### Product

Valeron  
Cross Tuff 450 Black

### **Previous Specification:**

MAY 1998  
NOVEMBER 2002  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-80

## **SPECIFICATIONS FOR PUMP PACKING MATERIAL**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers packing material used in pumps for potable water supply.

### **2. GENERAL REQUIREMENTS**

- a) The packing material shall be 100% GFO PTFE Fiber, braided graphite impregnated.
- b) Pump packing material shall be ASBESTOS FREE.
- c) Packing shall be furnished in the following sizes:  
  
1 1/16", 9/16", 7/16", 5/16", 1/8", 5/8", 3/8", 1/4", 3/4" and 1/2".
- d) The material shall be square shaped, uniform in dimension, non-hardening, easily installed/easily cut and form easily with no fraying.
- e) The packing shall be suitable for use in high speed pumps (4,000 fpm).
- f) Packing materials shall operate in a temperature range -400 degrees F, to 550 degrees F, pH-14 and chemically resistant.
- g) At the request of the City of Fair Oaks Ranch the manufacturer's label and product information shall be attached to the packing  
(Not added by Marker). As a minimum the Manufacturer shall be identified, type of material, style number, size of packing and lbs./box.
- h) MSDS information shall be furnished with the first delivery.  
Failure to provide documental and failure to label packaging will be considered sufficient reason to reject the material.

**Fair Oaks Ranch Material Standard Specifications**

3. The attached qualified products list identifies manufacturers that have been approved for installation in Fair Oaks Ranch Mechanical maintenance system.

**APPROVED MANUFACTURER LIST**

| A. | <u>Manufacturer</u> | <u>Style #</u> |
|----|---------------------|----------------|
|    | UTEX                | 210            |
|    | SEPCO               | ML400          |

**Previous Specification:**

JANRUARY 1997  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-90

## **SPECIFICATIONS FOR DOUBLE CHECK DETECTOR**

### **ASSEMBLY VAULTS**

**REVISED JANUARY 2019**

#### **1. SCOPE**

This specification covers vault construction for double check detector assemblies in sizes 6", 8" and 10" for coldwater service.

#### **2. GENERAL REQUIREMENTS**

- a) Except as otherwise modified or supplemented herein, all vaults utilized for double check detector assemblies shall be traffic bearing and the standards for such loading shall apply in the manufacture and installation of the vaults. All vaults will be manufactured in a plant especially designed for the purpose. Vault construction shall be done under strict plant controlled supervision and testing.
- b) These specifications are not specifically written for the design and installation of the vaults, however, the specifications shall apply towards the overall construction of the vaults.

#### **3. DESIGN REQUIREMENTS**

- a) Vault walls, lids and floors shall be constructed for traffic bearing situations with design loads consisting of dead load, live load, impact and loads due to water table and any other loads that may be imposed upon the vault. Live loads shall be for HS-20 per A.A.S.H.T.O kips.
- b) The vault shall be of concrete with a minimum strength of 4,500 psi in 28 days. The vault walls, floor and lid shall be a minimum of 6" thickness.
- c) Reinforcing steel shall comply with ASTM A615 Grade 60, A706 Grade 60 or Grade 70. Bar bending and placement shall comply with the latest ACI standards.
- d) A 6" drain hole shall be included within the vault floor and be placed at one end of the vault in accordance with STD. Drawing DD-35-08 and DD-35-09.

## **Fair Oaks Ranch Material Standard Specifications**

- e) Vault lids will be provided with spring assisted opening.
- f) Lids shall be provided with a bolt down mechanism in accordance with STD.DWG.DD-40-39.

### **APPROVED MANUFACTURER LIST**

American Industrial Pre-Cast  
Dalworth Concrete Products  
Park Equipment Company  
Hill Country Concrete Products  
Capital Precast

### **Previous Specification**

JUNE 1997  
JANUARY 1998  
DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

100-95

## **SPECIFICATIONS FOR TYPE I PLASTIC BARRICADE**

**REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers plastic polyethylene barricades in accordance with Texas Department of Transportation Barricade and Construction Standards BC Notes –97 or the latest revision thereof.

### **2. GENERAL REQUIREMENTS**

- a) Barricades shall be manufactured in a blow-molded fashion from UV stabilized polyethylene.
- b) Barricade unit furnished shall be 24” wide with 8-inch wide reflective high specific intensity sheeting panel in accordance with TXDOT Barricade and Construction Standards BC (4) – 97 Reflective Sheeting or the latest revision thereof.
- c) Barricade shall have “Fair Oaks Ranch” permanently fusion-baked or molded permanently into the outside bottom panels and be clearly visible.
- d) Barricade design shall incorporate modular design with individual replacement parts.
- e) If a barricade sand fillable panel design is used it shall have a 1-1/2” fill hole or be permanently ballasted.
- f) Barricade shall have an integrated mounting hole to be used to attach a standard battery powered light.
- g) Product shall consist of recyclable plastic.
- h) Barricade shall be tested, accepted and comply with the Federal Highway Administration NCHRP 350 Report Mandate for being crash worthy.

**Fair Oaks Ranch Material Standard Specifications**

**APPROVED MANUFACTURE LIST**

| <b>Manufacturer</b> | <b>Model</b>             |
|---------------------|--------------------------|
| Traffix Devices     | 37208-HI-SF              |
| Plasticade Products | Fibercade 101-T8-C8-B3HI |

**Previous Specification**

MAY 2002

DECEMBER 2011

# **Fair Oaks Ranch Material Standard Specifications**

113-02

## **SPECIFICATIONS DUCTILE-IRON RESTRAINED JOINT FITTINGS FOR USE ON DUCTILE IRON AND POLY-VINYL CHLORIDE PIPE REVISED JANUARY 2019**

### **1. SCOPE**

This specification covers ductile- iron restrained joint fittings 4 inches through 12 inches in size designed and manufactured for use with ductile-iron or poly -vinyl chloride (PVC) pipe.

### **2. GENERAL REQUIREMENTS**

- a) Ductile iron restrained joint fittings shall be designed with the restraint system as an integral part of the fitting and shall be for use interchangeably on ductile iron pipe conforming to ANSI/AWWA C151/A21.51 and PVC pipe conforming to AWWA C900.
- b) Fittings shall be manufactured of ductile iron conforming to the requirements of ASTM A 536 grade 65 -45-12.
- c) Gaskets shall in all respects conform to the requirements of ASTM F 477 and Table 8 of ANSI/AWWA C111/A21.11.
- d) Fittings shall be fusion-bonded epoxy coated inside and outside meeting all of the requirements of AWWA C116.
- e) Fittings, including the joints and restraint systems, shall have a minimum pressure rating of 250 psi. Unless a change in pressure rating is directed by purchase.
- f) The joint shall be tested on both ductile iron and PVC pipe using the procedures found in ASTM F 1674, including a short term high pressure test, a sustained pressure test, a cyclic surge test and shall be capable of being assembled without beveling a cut pipe.
- g) Joint dimensions and weight shall be standard and as shown in the One-Bolt, Inc. bulletins entitled "One Bolt, Fittings," or approved equal.

## **Fair Oaks Ranch Material Standard Specifications**

### **3. TESTS**

The City of Fair Oaks Ranch may, at no cost to the manufacturer, subject random joint restraint system products to testing by an independent laboratory for compliance with these standards. Any visible defect or failure to meet the quality standards here in will be ground for rejecting the entire order.

### **4. PRODUCT LIST**

The attached qualified product list identifies specified manufacturers models approved for installation in Fair Oaks Ranch water distribution systems.

### **APPROVED MANUFACTURERS LIST**

One-Bolt, Inc.

### **Previous Specification:**

APRIL 2002

DECEMBER 2011