

## 1 General

### 1.1 RELATED REQUIREMENTS

- .1 Section 09 91 23 – Painting: Painting of piping.

### 1.2 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI).
  - .1 ANSI/ASME B16.15-1985, Cast Bronze Threaded Fittings, Classes 125 and 250.
  - .2 ANSI B16.18-1984, Cast Copper Alloy Solder Joint Pressure Fittings.
  - .3 ANSI/ASME B16.22-1989, Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.
  - .4 ANSI B16.24-1979, Bronze Pipe Flanges and Fittings, Class 150 and 300.
  - .5 ANSI/AWWA C111/A21.11-85, Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
  - .6 NSF/ANSI 61-2008, Drinking Water System Components – Health Effects.
- .2 American Society for Testing and Materials (ASTM).
  - .1 ASTM A307-89, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
  - .2 ASTM B88M-89, Specification for Seamless Copper Water Tube (Metric).
  - .3 ASTM B32-89, Specification for Solder Metal.
  - .4 ASTM B306-88, Specification for Copper Drainage Tube (DWV).
  - .5 ASTM C564-88, Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
  - .6 ASTM D2235-89, Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
  - .7 ASTM D2564-88, Specification for Solvent Cements for Poly (Vinyl-chloride) (PVC) Plastic Pipe and Fittings.
- .3 Canadian Standards Association (CSA).
  - .1 CSA B67-1972, Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories.
  - .2 CAN/CSA-B70-M91, Cast Iron Soil Pipe, Fittings and Means of Joining.
  - .3 CAN/CSA-B125-M89, Plumbing Fittings.
  - .4 CAN/CSA-B181.1-M90, ABS Drain, Waste and Vent Pipe and Pipe Fittings.
  - .5 CAN/CSA-B181.2-M90, PVC Drain, Waste and Vent Pipe and Pipe Fittings.
  - .6 CAN/CSA-B182.1-M87, Plastic Drain and Sewer Pipe and Pipe Fittings.
- .4 Manufacturers Standardization Society (MSS).
  - .1 MSS-SP-67-1990, Butterfly Valves.
  - .2 MSS-SP-70-1984, Cast Iron Gate Valves, Flanged and Threaded Ends.
  - .3 MSS-SP-71-1984, Cast Iron Swing Check Valves, Flanged and Threaded Ends.
  - .4 MSS-SP-80-1987, Bronze Gate, Globe, Angle and Check Valves.

### 1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit data for following: valves.

### 1.4 MAINTENANCE DATA

- .1 Provide maintenance data for incorporation into manual specified in Section 01 10 01 – General Requirements.

## 2 Products

### 2.1 RIVER/WELL WATER PIPING AND FITTINGS

#### .1 Materials:

- .1 Pipe clamps to be fabricated 10mm x 64mm (3/8" x 2 1/2") flat bar with hot dipped galvanized finish. Size to match ductile iron pipe outside diameter.
- .2 Anchors for pipe clamps shall be KWIC bolt 3 wedge type galvanized construction as manufactured by Hilti. use 16mm dia (5/8") for both 200mm (8") and 350mm (14").

#### .2 Joints:

- .1 Bolts: to ASTM A193/A193M, Grade B7; ANSI/ASME B18.2.1; galvanized finish.
- .2 Nuts: to ASTM A194/A194M, Grade G2; ANSI/ASME B18.2.2; galvanized finish.
- .3 Quantity/size: Assume 32 bolts, 22 mm  $\varnothing$  x 165 mm lg (7/8"  $\varnothing$  x 6-1/2" lg). Actual dimension to be confirmed on site.

### 2.2 BRANCH PIPING AND FITTINGS: 25 – 200 (1" – 8") POLYVINYL CHLORIDE (PVC)

- .1 Materials: PVC, grey, potable water, type 1, or class 12454-B, D1785, and D2467 schedule 80 unless noted otherwise.
- .2 Fitting: Socket and threaded type to ASTM D2467 and D2466 to match pipe. Flanges shall be 125 lb standard with hole pattern to ANSI B16.1, ASTM D4024 and conforming to pipe and fittings standards as specified above. One piece molded socket flat-face type.
- .3 Joints: socket welded by use of solvent-based cements except where connecting to valves and components with threaded or flanged connections and at unions, unless noted otherwise. Gaskets shall be EPDM FDA approved, ANSI class 150, full-face type for plastic flanges of equal. When mating raised face flanges, provide filler gasket between O.D. of raised face to O.D. of flange. Flange bolts, nuts and washers shall be galvanized carbon steel, grade 8, to ASTM A307 and ASTM A563, heavy hex head series, and size, number and length as shown in AWWA C110 and C115 for plain flange connections. Primer and solvent-based cement to ASTM 2564 and manufacturer's recommended listed by NSF for potable water applications. Thread lubricant shall be Teflon tape.

### 2.3 BUTTERFLY VALVES

- .1 Lined, wafer butterfly valve, body material shall be ductile iron ASTM A395 epoxy coated, disc undercut shall be ductile iron nylon 11 coated, seal/liner material shall be one piece food grade EDPM with integral raised face sealing surface, liner to totally isolate flowing media from body and stem. Shaft shall be 304 or 316 stainless steel. Actuator shall be multi-position lever lock. Pressure rating to be 345 kPa (50 psi), actual operating pressure 103 kPa (15 psi). Ends and wafer to be class 125.

## 3 Execution

### 3.1 INSTALLATION

- .1 Install in accordance with National Plumbing Code 2010 and Departmental Representative except where specified otherwise.
- .2 Cut square, ream and clean tubing and tube ends, clean recesses of fittings and assemble without binding.

- .3 Assemble all piping using fittings manufactured to ANSI standards.
- .4 Install piping and tubing parallel and close to building structure to minimize furring, conserve headroom and space. Group exposed piping and run parallel to walls.
- .5 Connect to fixtures and equipment in accordance with manufacturer's instructions unless otherwise indicated.
- .6 Buried piping:
  - .1 Install buried pipe on 150 mm of washed clean sand, shaped to accommodate hubs and fittings. Install piping to line and grade as indicated.
  - .2 Backfill to 150 mm above top of pipe with washed clean sand.
  - .3 Bedding preparation and backfilling required to carry out this work shall be by this trade.
- .7 Vent sanitary sewer in accordance with the National Plumbing Code.

### 3.2 VALVES

- .1 Isolate domestic water system equipment, fixtures and branches with ball valves.
- .2 Balance domestic hot water recirculation systems using balance valves provided. Mark settings and record drawings on completion.

### 3.3 DISINFECTION OF RIVER AND WELL WATER SYSTEMS

- .1 Flush out and clean all potable water piping systems as per the following;
  - .1 Prior to flushing, remove all screens from faucets and strainers and flush until all dirt or other contaminants have been thoroughly removed. Screens of faucets and strainers should not be reinstalled until after completion of the flushing process.
  - .2 Disinfection should be done with river water only.
  - .3 All sectional valves should be open during flushing. All outlets should be fully opened at least twice during flushing.
  - .4 The contractor shall submit three (3) copies of final report to Departmental Representative.
  - .5 Under no circumstances is any portion of the river and well water system is to be used until flushed and accepted by the Departmental Representative.

### 3.4 BALANCING

- .1 Refer to Section 20 05 00 – Mechanical General Requirements.

### 3.5 TESTING

- .1 Test piping system before concealing. Contractor to conduct a ball test on all buried drainage piping systems including documentation witnessed by Departmental Representative. Notify the Departmental Representative 24 hours prior to testing. Test to National Plumbing Code.

END OF SECTION

1 General

1.1 REFERENCE STANDARDS

- .1 American Society for Testing and Materials (ASTM).
  - .1 ASTM A126-84, Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
  - .2 ASTM B62-90, Specification for Composition Bronze or Ounce Metal Castings.
- .2 American Water Works Association (AWWA).
  - .1 ANSI/AWWA C700-77, Cold Water Meters - Displacement Type.
  - .2 ANSI/AWWA C7011-88, Cold Water Meters - Turbine Type for Customer Service.
  - .3 ANSI/AWWA C702-86, Cold Water Meters - Compound Type.
- .3 Canadian Standards Association (CSA).
  - .1 CAN/CSA-B64 Series-M88, Backflow Preventers and Vacuum Breakers.
  - .2 CAN/CSA-B64.10-M88, Backflow Prevention Devices - Selection, Installation Maintenance and Field Testing.
  - .3 CAN3-B79-M79, Floor Drains and Trench Drains.
- .4 Plumbing & Drainage Institute (PDI).
  - .1 PDI-WH201-77, Water Hammer Arrestors.

1.2 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate dimensions, construction details and materials for following.

1.3 MAINTENANCE DATA

- .1 Provide maintenance data for incorporation into manual specified in Section 01 10 01 - General Requirements.
- .2 Data to include:
  - .1 Description of plumbing specialties and accessories, giving manufacturers name, supplier's name and address, type, model, year and capacity.
  - .2 Details of operation, servicing and maintenance.
  - .3 Recommended spare parts list.

2 Products

2.1 RIVER WATER AERATION TROUGH

- .1 Materials: Existing aeration trough to be reused
- .2 Fasteners: 304 stainless steel, ASTM A193, grade B5 bolts, self-locking nuts and flat washers.

## 2.2 RIVER WATER FLOW METER

- .1 Ultrasonic clamp-on flowmeter, consisting of a combination of two (2) sensors (large version) and one (1) ultrasonic signal converter, stainless steel sensors, remote readout up to 30 meters from meter and installation wizard for immediate start-up, suitable for 120 volt/1 phase power supply.
- .2 Acceptable Materials: KROHNE "Optisonic" Model 6300 c/w remote reading capability.

## 2.3 GEARBOX

- .1 Gearbox to be right-angle gearbox, Class 1 service, 1:1 ratio, 500 in-lbs output @ 100 rpm input (for hand-driven input), aluminum housing, 20mm (3/4") shaft diameters, mounted in vertical position with both vertical and horizontal shafts clockwise rotation, drilled and tapped mounting holes in housing suitable for mounting on existing steel angle bracket with same orientation as existing arrangement.
- .2 Install in accordance with manufacturer's instructions.

## 2.4 WHEEL HANDLE

- .1 Aluminum solid wheel handle, 3 spokes, dished wheel handle style, 20mm (3/4") diameter hole with keyway and set screw, 305mm (12") diameter wheel, and dull polished finish.

## 2.5 STEEL SHAFT

- .1 Mild steel solid round rod, 20mm (3/4") outside diameter and zinc plated for corrosion resistance.

## 2.6 SHAFT COUPLING

- .1 Stainless steel rigid shaft coupling, 1 piece clamp style with set screws, 20mm (3/4") bore diameter with keyway and set screw, and plain finish.
- .2 Install in accordance with manufacturer's instructions.

## 3 Execution

### 3.1 INSTALLATION

- .1 Install in accordance with National Plumbing Code and local Departmental Representative except where specified otherwise.
- .2 Install in accordance with manufacturer's instructions and as specified.

### 3.2 COMMISSIONING

- .1 After start-up, test, adjust and prove operation of all equipment and accessories to suit site conditions.

END OF SECTION