

**MATERIAL SPECIFICATION**  
**MASTER MANUAL**  
**FOR**  
**SHIPPENSBURG BOROUGH AUTHORITY**  
**SHIPPENSBURG, PENNSYLVANIA**

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## **MATERIALS**

### **A. DUCTILE IRON PIPE**

1. Ductile iron pipe shall be centrifugally cast, annealed ductile iron manufactured in accordance with ANSI A21.51, and conform to AWWA Standard C151
2. Joints on ductile iron pipe shall be push-on of mechanical joint and shall conform to ANSI A21.11 and AWWA Standard C111. All joints shall be furnished with the appropriate accessories.
3. All ductile iron-pipe shall be class 52 unless otherwise specified, and shall conform to AWWA Standards C150.
4. All ductile iron pipe shall have a concrete mortar lining in accordance with ANSI A21.4 and AWWA Standard C104
5. Paint seal coating on all ductile iron pipe shall conform to ANSI 21.4
6. Pressure rating shall be 250 psi of grater as specified

### **B. STEEL CASING PIPE**

1. Large Diameter Casing Pipe
  - a. Smooth steel well casing pipe conforming to ASTM A-252 Grade 2, minimum plate thickness ½ inch.
  - b. Pipe to be coated with two coats coal tar epoxy system as manufactured by Glidden, or equal. Apply coating in accordance with coating manufacture's recommendations.
  - c. Submit manufacture's certification in accordance with division 1 general requirements.

### **C. COPPER PIPE**

1. Copper pipe shall be of ASTM B88 type "K" annealed.
2. Copper pipe shall be supplied in 60' or 100' roll lengths.

## D. DUCTILE IRON FITTINGS

1. Ductile iron fittings shall be compact unless otherwise specified and conform to AWWA Standard C-153. Fittings shall also meet ANSI 21.10, 250 psi rating.
2. Joints on fittings shall be mechanical joint type in accordance with ANSI 21.11 and AWWA Standard C111.
3. Furnish the fittings with the required accessories as specified.

## E. SERVICE LINE FITTINGS

All brass fittings shall meet or exceed the AWWA Standard C800-89. The metal alloy shall be Red Brass of 85-5-5 content.

### 1. Corporation Stop

- a. The corporation stop shall be of a square design to allow maximum grip of flat wrenches on the center part of the corporation stop. Corporation stop shall be the conventional plug type design. Thread shall be AWWA taper thread (CC) on inlet side and Grip Joint or Quick Joint on the outlet depending on size.
- b. Manufacture shall be Ford Meter Corp. model FB1000-3G for 3/4", FB1000-4G for 1", FB1000-6Q for 1-1/2", FB1000-7Q for 2" and there are **no substitutes allowed.**

### 2. Curb Stops

- a. The curb stop shall be of a full flow ball valve design. They shall have the standard tee head design and the body permits only a 90-degree turn on and off. All curb stops shall meet or exceed the AWWA Standard C800. The end design shall be of the grip joint type by using a grip joint nut to compress a Buna-N beveled gasket to make a watertight seal around the pipe. A bronze split ring is drawn down when the nut is tightened providing the mechanical seal and lock on the pipe.
- b. Manufacture shall be Ford Meter Corp. model B44-xxx-Q and there are **no substitutes allowed.**

### 3. Swivel Eight Bend Coupling

- a. All Swivel Joint Couplings shall meet or exceed the AWWA Standard C800. They shall have a female copper thread swivel nut inlet and a quick joint nut on outlet.
- b. Manufacture shall be Ford Meter Corp. model LA04-xxSI-Q and there are **no substitutes allowed.**

- c. All Swivel Joint Couplings shall have Ford Meter Corp. Ring Adapters model RA42-xx used between the corporation stop and the swivel bend coupling no substitutes allowed.

#### 4. **Coppers setters**

- a. All coppers setters shall be made using lead free solder. They will have a dual angle check valve on the outlet side. The check valve shall be spring loaded, of brass, plastic and stainless steel construction and have a removable cap for in-line servicing. The connection to the meter shall be with saddle nut ends. The inlet valve shall be an angle ball valve and have pad lock wings. The water line connections shall be of the grip joint type. The setter shall be for a 5/8"x3/4" meter and be 24" in height.
- b. Manufacture shall be Ford Meter Corp model VBHC72-24-44-33Q only **no substitutes allowed**.

#### 5. **Water Meter Boxes**

- a. The meter box shall be a molded one piece plastic, with the middle of the wall formulated to provide excellent insulating properties, as well as high rigidity and strength. The typical wall thickness exceeds 1/2" and freestanding vertical loads of 20,000 lbs. The interior surface shall be bright white to provide easy reading. There shall be an anti-settling flange on the bottom of the box. The material shall be modified polyethylene with a UV degradation protectant. The exterior shall be black with 100% color retention. The box shall exceed ASTM D-746 brittleness standards. The wall textures shall be smooth. There shall be a 4" horseshoe opening in the bottom of the box to allow the waterline to pass through.
- b. Manufacture of the meter box is Mid-States 18" x 36" with notches on bottom for waterline.
- c. Meter Box Covers

Water Meter Box cover shall be manufactured by Ford Meter Corp. model A32-T, and shall meet ASTM A48-92, Class 25 along with a E-coating finish.

#### 6. **Curb Boxes**

- a. All curb stop boxes shall be 3-piece, gray-cast iron and conform to AWWA Standard C110, ANSI A21.10-82, ASTM A438-62 and ASTM A48-76. They shall be adjustable and have integrally cast male threads. The top of the box shall be marked WATER.
- b. The base of the curb box shall have a inside diameter of 2 1/4" and accommodate a curb stop up to 1 1/4". The wall thickness shall be 1/4". The height shall be adjustable and specified by job instructions, however it is incumbent on the

contractor to provide the correct height. The bottom shall have feet to allow support with an opening that is 2 ¾" x 3 11/16" horseshoe type. The lid shall have a pentagonal bolt that has sides of ½" with an overall dimension of 13/16".

- c. Manufacture shall be Tyler Pipe, Model 93D with the following part numbers 144946, 145028, and 145325, substitutions allowed but not without prior approval of the OWNER

## F. VALVES 3" AND ABOVE

1. Gate valves 3" and larger shall be resilient seated and meet or exceed AWWA C509. The gate valve shall be made of ductile iron as to conform to ASTM A536 with a minimum tensile strength of 65,000 pounds, and have a working pressure rating of 250 PSI. Gate valve shall have zero leakage at rated working pressure. The valve shall have a clear and unobstructed waterway with no pockets. The shell shall be tested and certified to 500 PSI. Valves shall be listed by Underwriters Laboratories, INC, and shall conform to UL262. Factory Mutual Research (FM), Approval Class Numbers 1120 and 1130, shall approve the valve. All internal and external ferrous surfaces of the valve shall have a fusion bonded epoxy coating, complying with ANSI and AWWA C550, applied electrostatically prior to assembly. The exterior of the valve wedge shall be fully encapsulated with nitrile rubber. The wedge shall be symmetrical and seat equally well with flow in either direction. The thickness of the nitrile rubber shall be at least ¼". The stem shall be bronze in full compliance with Section 4.7 of AWWA C509, and be removable without removing the bonnet. The wedge shall engage the stem by use of a stem nut independent of the wedge. The stem shall be sealed with three o-rings. The top two o-rings shall be replaceable with the valve fully open and while subject to rated pressure. All exterior bolting shall be made of 316 stainless steel. The valve shall have thrust washers located above and below the thrust collar for easy operation. The valve shall be suitable for buried applications.
  - a. Valve shall open when turned to the left.
  - b. The valve shall have a 2' square operating nut.
  - c. The flanges on the valve shall be mechanical joint unless otherwise specified.
  - d. Manufactures American Darling series 2500, or approved equal. All approved equal must be submitted at least 7 days prior to the opening of any bids for review.
  - e. Valves 16" and larger shall have a bypass valve attached.
4. Tapping valve shall meet all of the above standards with the exception that they will have flanged inlets and mechanical joint outlet. They shall conform to AWWA Standard C500 applicable section.

## **G. TAPPING SLEEVES**

1. The Contractor shall verify the type and size of the existing waterline before ordering any tapping sleeve. He shall measure and provide to the Owner/Inspector or designated representative the outside diameter. The sleeve shall conform to the applicable section of AWWA Standard C500.
2. The tapping sleeve shall be manufactured from gray cast iron meeting or exceeding ASTM A126 Grade B. The sleeve shall be lightweight compact type with the seal to be effected by a single rectangular gasket used inside the sleeve. The sleeve shall be made in two halves, which can be bolted around the main. Gaskets shall extend the entire length of the sleeve to form a watertight joint when the sideblots are properly tightened.
3. Coating of the tapping sleeve shall be inside with asphaltic varnish per federal specification TT-V-51, Military specification MIL C-450, or equal. The coating on the outside of the tapping sleeve shall be of two (2) coats of bituminous coating in accordance with AWWA specifications.
4. The Contractor shall furnish manufacture's certified shop drawings, in accordance with Section 01340 of these specifications. In addition, the manufacture shall furnish an affidavit that the tapping sleeve conforms with the applicable provisions of AWWA Standard C500.
5. Manufacture (no substitutes allowed)
  - a. American Darling
  - b. Mueller

## **H. SUBMERISABLE PUMPS**

1. Construction: Cast Iron shell with cooling fins, Class F insulation, permanently lubricated double seal ball bearings, cast iron impeller keyed to stainless steel shaft, cast iron pedestal and mechanical seal moisture sensor.
2. Controls: Differential type mercury float switch with "pump off", "high water mark".
3. Control Panel: NEMA-1 enclosure with circuit breakers, contractors, control transformer and fuse, test-off-auto selector switch, and pilot lights.
4. Type: Simplex
5. Manufactures: Weil Pump Co. Model 1400 or equal.

## **I. AIR RELEASE VALVES**

1. The air release valve shall close drip tight, incorporating an adjustable Buna-N orifice button. All internal parts shall be of stainless steel. The float shall be of stainless steel and be capable of withstanding a test pressure of 1,000 PSIG. The linkage/lever mechanism shall be able to be removed from the valve without disassembly of the mechanism, and shall be designed to prevent jamming.
2. The body and cover shall be cast iron conforming to ASTM A126, Class B and shall be designed to withstand a test pressure of 450 PSIG.
3. The air release valve shall be manufactured by G.A. Industries, INC., Mars, Pa (no substitutes).

**J. BLOW OFF HYDRANTS**

1. Blow-off hydrant shall a 3-inch DIP barrel, 2 ½ inch NST nozzle with cap and chain, inlet shall be 2-inch and have a cast iron box with locking device.
2. Manufacture: The Kupferle Foundry Company, St. Louis, Mo. Or approved equal.

**K. DETECTION TAPE**

1. Detection tape shall be a metal detectable reinforced underground utility marking tape with a 50 gauge (0.0005”) solid aluminum core with permanent printing under mylar.
2. The detection tape shall consist of a aluminum 9.0 mill (0.0009”) overall thickness, coated and colored cross-woven polyethylene, with no less than 2,500 lbs of tensile strength per 12” width and color coded suitable for direct burial.
3. Detection tape shall be 2-inch width minimum.

**L. MISCELLANEOUS VALVES**

1. Lever operated ball valves shall be bronze suitable for 225 pounds services. Valves shall be one piece body design, blowout proof stem, reinforced Teflon seats and seals, threaded ends and lever operated. Valve shall be manufactured by Stockham, NIBCO, or Crane.

**M. MECHANICAL JOINT COUPLINGS**

1. Ductile Iron mechanical couplings of the gasketed, sleeve type shall be furnished and installed as required. The coupling shall be of the proper diameter to make a tight joint. The coupling shall have no stops. All couplings shall be for a minimum of 150 psi working pressure.
2. Each coupling shall conform to AWWA C153 specification and shall have a middle ring of appropriate length suitable for the application. There shall be tow

(2) follower glands and two (2) rubber compound wedge section gaskets and sufficient trackhead bolts to properly compress the gaskets.

3. Couplings to be buried shall be coated inside and outside with two coats of asphaltic varnish in accordance with federal specification TT-V-51c.
4. Manufacturers:
  - a. Dresser Manufacturing Division
  - b. Rockwell
  - c. Griffin Pipe
  - d. Approved Equal

#### **N. REPAIR CLAMPS 2" AND LARGER**

All repair clamps used in this system shall be made of all stainless steel design for lightweight and easy handling in all leak conditions, and have 360° gasket coverage. The fixed bolt position provides uniform Bolt control and fewer parts to fall in to the trench. The sliding lifter bar is retained on the bolts by the heavy hex nuts and facilitates the installation by serving as a handle to hold while installing the clamp.

1. Band: the band shall be made out of 18-8 Type 304 Stainless Steel.
2. Bolts and Heavy Hex Nuts: Bolts shall be made out of 18-8 Type 304 Stainless Steel. Nuts threads are fluorocarbon coated to prevent galling. Bolts are permanently attached to the sidebar by means of a Metal Inert Gas (MIG) weld.
3. Lugs: shall be made out of 18-8 Type 304 heavy gauge Stainless Steel, MIG welded to clamp sidebar.
4. Sidebars: Constructed of 18-8 Type 304 heavy gauge Stainless Steel Tungsten Inert Gas (TIG) welded to form a strong, permanent fusion with the repair clamp band.
5. Lifter Bar: Shall be constructed out of 18-8 Type 304 heavy gauge Stainless Steel. Lip curve holds bolts in position while tightening and serves as a bearing surface for nuts.
6. Gasket: Gridded virgin Styrene Butadene Rubber (SBR) compounded for water service, ASTM D2000. Gasket ends are tapered for a dependable seal. SBR is suitable for temperatures of 150°F constant, 180°F intermittent. The minimum thickness of gasket shall be .206 in the ungridded portion of the gasket.

7. Armor: Armor shall be constructed of 18-8 Type 304 heavy gauge Stainless Steel Vulcanized and recessed into the gasket to ensure uniform compression against the pipe.
8. Passivated: All welds are fully passivated by means of a chemical technique which restores the corrosion resistant characteristics of the stainless steel.

Ford Style FS1 or equal if approved by the Authority at least seven (7) days prior to bid opening.

**O. TAPPED REPAIR CLAMPS**

Tapped repair clamps shall be constructed as described above in section "M" with these exceptions:

1. The tapped outlet is constructed of 18-8 stainless steel and is "fused" to the clamp band by a fully passivated TIG weld.
2. The outlet thread design shall be CC as specified by AWWA.

Ford Style FS1 or equal if approved by the Authority at least seven (7) days prior to bid opening.

**P. REPAIR CLAMPS 2" AND SMALLER**

All repair clamps used in this size range shall have a stainless steel shell design for lightweight and easy handling in all leak conditions, and have 360° gasket coverage.

1. Shell: The shell shall be constructed of 18-8 Type 304 stainless steel.
2. Lugs: The lugs shall be constructed of Ductile Iron per ASTM A536.
3. Finish: Black shop coating.
4. Gasket: The gasket shall be made of Buna-N rubber with a smooth face armored gasket for 360° coverage.
5. Bolts: Shall be constructed as follows, AISI C1018 steel, 3/8" and/or 7/16" electrogalvanized with di-chromate seal.
6. Armor: Armor shall be constructed of 18-8 Type 304 heavy gauge Stainless Steel Vulcanized and recessed into the gasket to ensure uniform compression against the pipe. Also there shall be raised surfaces to indicate the position of the armor in the clamp for proper alignment on installation.

Ford Style FSC or equal if approved by the Authority at least seven (7) days prior to bid opening.

**Q. PRESSURE GAUGES**

1. Pressure Gauges shall be 4" inch dial size, with range suitable for line pressure, glycerin filled, gauges shall be furnished with shut-off valve and diaphragm seals to protect gauges from surges and solids. Gauges shall be as manufactured by, Ashcroft, H.O. Trice, and Pollard.

**R. Fire Hydrants**

There will be no substitution from the type of fire hydrants specified in these specification only American Darling B-62-B hydrants will be used.

1. Fire hydrant shall be compression type with a 5 ¼" main valve opening, and a 6" mechanical joint shoe inlet.
2. The hydrant shall have two (2) 2 ½" hose nozzles, and one (1) 4 ½" pumper nozzle, complete with nozzle caps and chains.
3. The hydrant shall be traffic type with break-a-way safety flange and stem coupling and shall open counter clockwise.
4. The hydrant shall have a hexagon operating nut with a 1 ½" diagonal measurement, and shall be provided with National Standard Threads on hose and steamer nozzle.
5. Hydrants shall conform to AWWA C502 and shall be leak proof at the design pressure.
6. Hydrants shall be Model B-62-B, chrome yellow, Traffic Type, as manufactured by American Darling Valve a division of American Flow Control (no substitution allowed).