PADUCAH WATER
MATERIALS SPECIFICATIONS

Note: All AWWA standards are the latest edition unless otherwise stated.

Ductile Iron Pipe Class 51 and Pressure Class 350

All ductile iron pipe shall be designed in accordance with AWWA/ANSI C151/A21.51. Ductile iron pipe class 51 shall be manufactured with thickness, diameter, and weight in accordance with AWWA C151, Table 3 and Table 4. All ductile iron pipe shall have a rating of not less than 300 psi. Ductile iron pipe exterior surface shall have an asphaltic coating, minimum thickness of 1 mil., in accordance with AWWA C151.. Ductile iron pipe shall be cement lined in accordance with AWWA/ANSI C104/A21.4. Cement lining shall be standard thickness with a thickness tolerance of plus 1.8 inch. The pressure rating, metal thickness class, net weight of pipe without lining of pipe, and name of manufacturer shall be clearly marked on each length of pipe. Joints shall be Fastite, Bell-Tite, or Tyton as specified. Where restrained joint is specified, it shall be Tyton joint pipe with Tyton-Loc gasket by U. S. Pipe & Foundry Company, Inc., or approved equal. All joints, 4 inch through 12 inch, shall be adaptable for locking gaskets. All ductile iron pipe shall be manufactured in the United States unless otherwise approved by PW.

Polyvinyl Chloride (PVC) Pipe (AWWA C900)

All PVC pipe ≥ 4" and ≤ 12" shall be designed in accordance with ANSI/AWWA C900. Pressure class shall be 200 psi.

Polyethylene (PE) Pipe

All PE pipe shall be designed in accordance with ANSI/AWWA C906. Pressure class will be determined on a case by case basis, but shall not be less than 160 psi (DR 11), based on the use of material with a hydrostatic design basis of 1,600 psi.

Cut-In Valves

Cut-in valves shall be of iron body and iron rubber encapsulated, with an iron gate. They shall be AWWA resilient seated gate valves, conforming to AWWA Standard C509 and be UL listed - FM approved. They shall have a non-rising bronze stem with two (2) inch square wrench nut, "O" ring packing, and mechanical joint ends complete with bolts, nuts, glands, and duck-tipped gaskets. The inside and outside of the body and bonnet shall be coated with an epoxy coating to meet the AWWA C550 Standard. They shall have a working pressure of 200 psi, and a test pressure of 400 psi, opening left. They shall be identified as a cut-in valve by lettering on the

casting of the valve or by a tag affixed to valve in such a way that it will not come off in transit. Cut-in valves shall be the American-Darling-Waterous Series 2500 valve, or approved equal.

Butterfly Valves

Butterfly valves shall be direct bury with mechanical joint ends complete with bolts, nuts, glands, and rubber gaskets. They shall have a two (2) inch operating nut and be rubber seated. They shall have a working pressure of 150 psi and test pressure of 300 psi, and be Class 150B. They shall conform to the specifications of AWWA C504. Butterfly valves shall be Allis-Chalmers Code 22 Streamsal, or approved equal

Gate Valves

Gate valves shall have an iron body and iron rubber encapsulated with an iron gate. They shall be AWWA resilient seated gate valve conforming to AWWA Standard C509 and be UL listed - FM approved. They shall have a non-rising bronze stem with two (2) inch square wrench nut and "O" ring packing. The inside and outside of the body and bonnet shall be coated with an epoxy coating to meet the AWWA C550 Standard. They shall have mechanical joint ends, complete with bolts, nuts, and rubber gaskets. They shall have a working pressure of 200 psi and a test pressure of 400 psi, opening left. Gate valves shall be the American-Darling-Waterous Series 2500 valve, or approved equal.

Tapping Valves

Tapping valves shall be iron body and iron rubber encapsulated, with an iron gate. They shall be AWWA resilient seated gate valves, conforming to AWWA Standard C509 and be UL listed - FM approved. They shall have a non-rising bronze stem with two (2) inch square wrench nut and "O" ring packing. The inside and outside of the body and bonnet shall be coated with an epoxy coating to meet the AWWA C550 Standard. The internal design shall provide for the passing of full size cutters and tapping machine bits. The valve connection shall be Class 125, flanged for tapping sleeve, opening left. They shall have a mechanical joint for branch pipe connection, complete with bolts, nuts, and gaskets. Tapping valves shall be American-Darling-Waterous Series 500 valve, or approved equal.

Locked Hydrant Tee

Locked hydrant tee shall be standard mechanical joint with a split ductile iron rotating gland on the branch. They shall be American Cast Iron Pipe Company, No. A10180; U.S. Pipe & Foundry Company, Trim Tyte ductile iron mechanical Joint fittings; or approved equal.

Locked Hydrant Adapter

Locked hydrant adapter shall be Class 250 and shall have an integrally cast standard mechanical joint on one end and a split ductile iron rotating gland on the other. The lengths shall be as specified in the Bidder's Proposal. They shall be American Cast Iron Pipe Company, No. A108954, or approved equal.

Fittings

Fittings shall be cast from ductile iron grade 70-50-05 with a minimum tensile strength of 70,000 psi. All aspects of the fitting shall be in accordance with ANSI/AWWA A21.53/C153. Rubber gasket joints shall be in accordance with ANSI/AWWA A21.11/ C111. Working pressure rating shall be 350 psi for ductile iron fittings. Fittings shall have an outside coating in accordance with ANSI/AWWA A21.53/C153. Fittings shall be cement lined and seal coated with asphaltic material in accordance with ANSI/AWWA A21.4/C104. Fittings shall be Trim Tyte ductile iron mechanical joint as manufactured by the U.S. Pipe and Foundry Company, or approved equal. All ductile iron fittings shall be manufactured in the United States.

Valve Boxes

Valve boxes shall be constructed of cast iron in two-piece sections with heavy-duty lids. Valve boxes shall be of the screw type, adjustable, and with a five and one-quarter (5 ¼) inch shaft. The lengths of the boxes shall be specified in the Bidder's Proposal. Valve boxes shall be as manufactured by the Tyler/Union Corporation, or approved equal. No foreign box will be accepted.

Steel Casing

Steel casing shall have a minimum yield strength of 35,000 psi. The minimum wall thickness shall be 0.250 inch for casing diameter of 16 inches and less; 0.312 inch for casing diameters of 18, 20, and 22 inches; 0.344 inch for 24 inch casing; and 0.469 inch for 36 inch casing diameter. Casing shall be solid rolled steel and shall not be spiral-welded steel. Casing shall have an approved exterior coating. Laying lengths shall be 20 feet ± 1 inch. Sizes of casing shall be as specified in the Bidder's Proposal.

Skids

Skids are to have heavy-duty stainless steel band (14" gauge/.074" thickness) with rust-resisting coating, flange bolts, insulating liner. Heavy-duty skids, minimum of four (4) skids (standard skid size is 1-1/2' wide and 1-1/4" high), are required on each insulator for pipe size six (6) through fourteen (14) inch. Six (6) skids are required for pipe size of sixteen (16) inch through thirty-six (36) inch. The number of skids per joint of pipe is to be recommended by the manufacturer and approved by PW (see material specifications).

Copper Tubing

Copper tubing is to be first line materials and shall conform to AWWA Standard C800 (Appendix A), ASTM Specifications B-88, and Federal Specification WW-T-799. Copper tubing 3/4 inch and 1 inch shall be Type K, soft, 60 or 100 foot coils. Copper tubing 1-1/2 inch and 2 inch shall be Type K, hard, tempered, 20 foot lengths. Sizes shall be as specified in the Bidder's Proposal.

Service Saddles – Standard PVC Pipe

The brass service saddles covered by this specification are used to connect corporation stops to PVC water mains. Both upper and lower halves of the saddle shall be cast of 85-5-5-5 water works red brass. The upper half of the saddle shall be tapped for a corporation stop with AWWA tapered threads. Both halves shall be properly shaped to fit snugly over the PVC main. The saddle shall be permanently hinged with a No. 316 solid stainless steel hinge pin to facilitate installation and eliminate loose parts. The clamp screw shall be of silicon bronze and shall be 5/16 inch diameter or larger. Each saddle shall include a Buna-N "O" ring seal attached to an enclosed groove with a suitable adhesive. The saddle shall fit the size of corporation stops and PVC as specified in the Bidder's Proposal. Brass saddles shall be of the S70 and S71 series as manufactured by the Ford Meter Box Company, or approved equal.

Service Saddles - Cast Iron and Cast Iron-Sized PVC Pipe

The service saddles covered by this specification are used to connect the corporation stop to cast iron and C900 PVC water main. The upper half of the saddle shall be certified 85-5-5-5 water works brass conforming to the AWWA C-800 Standard. Each saddle shall include a Buna-N "O" ring grooved to conform to the pipe surface and bonded in place for easy installation. The straps shall be high quality silicon bronze flattened to provide a wide bearing surface against the pipe. The strap shall have 5/8" thread with heavy hex nuts. The tap thread shall be AWWA tapered thread unless otherwise specified. Service saddles with 3/4" and 1" tap shall be of the 101B style, and the 1 1/2" and 2" shall be of the 202B style as manufactured by the Ford Meter Box Company or approved equal.

Meter Box Covers and Lids

This specification describes round meter box covers of cast iron construction designed to fit 15 inch, 18 inch, or 20 inch inside diameter as specified and having a lid opening of 11 1/2 inches. The cover shall be constructed of high quality cast iron with a coating of asphalt-based black paint. The cover shall have a heavy lid of the overlapping style and shall be supplied with a large pentagon bolt locking device, which activates a lifter worm lock. There shall be a copper washer between the lock and lid. The pentagon bolt shall be of forged silicon bronze of the larger size that shall attach itself to a meter box key so the key can be used as a handle to lift the lid from the cover. Meter box covers shall be of the A-31, A-32, A-3-LB, and A-4-LB styles as manufactured by the Ford Meter Box Company, Inc., or approved equal.

The lids shall be heavy and of the overlapping style and shall be supplied with a pentagon bolt locking device which activates a lifter worm lock. There shall be a copper washer between the lock and lid. The pentagon bolt shall be of forged silicon bronze of the large size that shall attach itself to a meter box key so the key can be

used as a handle to lift the lid from the cove. Lids shall be of C3L-LB style as manufactured by the Ford Meter Box Company or approved equal.

Lids for electronic meter reading shall meet the above standard in addition to having a 1-¾"hole for an electronic meter reading device. The lid shall be of the C3L-T-LB style as manufactured by the Ford Meter Box Company or approved equal.

Monitor Covers

This specification covers rectangular meter pit covers of cast iron construction designed to fit a meter pit 2 feet by 3 feet. The cover shall be constructed of high quality cast iron with a coating of asphalt-based black paint. The cover shall consist of a ring mounted on the frame and a 20 inch top lid. The top lid shall be supplied with a pentagon bolt locking device that activates a lifter worm lock. The pentagon bolt shall be of forged silicon bronze of the standard size that shall attach itself to the top so the key can be used as a handle to lift the lid from the cover. The depth of the assembled cover shall be 9 inches. Meter pit covers shall be of the RM-1 style as manufactured by the Ford Meter Box Company, Inc., or approved equal.

This specification describes round meter pit covers for larger meters of cast iron construction designed to fit 24" and 30" inside diameter. The cover shall be constructed of high quality cast iron with a coating of asphalt-based black paint. The cover shall consist of a ring mounted on the frame and a 20 inch top lid. The top lid shall be supplied with a large pentagon bolt locking device that activates a lifter worm lock. The pentagon bolt shall be of forged silicon bronze of the standard size that shall attach itself to the top so the key can be used as a handle to lift the lid from the cover. The depth of the assembled cover shall be 7 1/2 inches. Meter pit covers shall be of the MC-24-LB and MC-30-LB style as manufactured by the Ford Meter Box Company, Inc., or approved equal.

Extension Plates

Extension plates shall be of the XP style as manufactured by the Ford Meter Box Company, Inc., or approved equal.

Bonnets

Bonnets shall be of the C3-LB style as manufactured by the Ford Meter Box Company, Inc. or approved equal.

Stainless Steel Repair Clamps - CI, PVC, & AC Pipe

This specification shall cover repair clamps of all stainless steel construction for repair of water distribution mains. All metal parts of the repair clamp shall be 18-8 stainless steel, and the gasket shall be of virgin SBR rubber compound for water ser-

vice. The armor shall be bonded to the gasket, and gaskets shall be full thickness between armor and pipe. The armor shall have full length bushings at each edge so as to offset any sharp differential of pressure against the pipe. The lugs shall be welded (mig weld) to the top side bar and then fully passivated. Side bars shall be heliarc welded (tig weld) to the shell and then fully passivated. The bolts shall be rolled national coarse thread and shall be Teflon coated. The bolts shall be welded (mig weld) to form a permanent fusion with the bottom side bar. The weld area then shall be fully passivated. Passification shall mean the weld areas of the clamp shall be chemically treated and the residue removed so as to return the welded stainless steel to its original chromium state. All stainless steel repair clamps shall be provided with a lifter bar of 18-8 stainless steel, designed to slide up the profile of the receiver lugs to hold position under the bar while tightening nuts. The clamp for cast iron shall be of the SS1 style as manufactured by Romac Industries, Inc., or approved equal. The clamp for PVC shall also be of the SS1 style with an outside diameter range of 6.56 to 6.96 as manufactured by the Romac Industries, Inc., or approved equal. The clamp for AC shall be of the SS1 style with an outside diameter range of 4.97 to 5.27 as manufactured by the Romac Industries, Inc., or approved equal.

Meter Yokes, Ball Meter Valves, Yoke Ells, and Angle Dual Check Valves with Test Valves for Meter Yokes

Meter yokes shall be of the riser type with inlet and outlet connections for 3/4 inch grip joint and 1 inch grip joint copper tubing. Yokes shall be constructed to hold the meter and piping rigidly in such a way that piping is undisturbed when the meter is installed or removed. All brass castings shall be of 85-5-5-5 water works red brass, and the yoke piece shall be of high quality cast iron.

The inlet angle valve shall be the ball type on 3/4 inch, and 1 inch, with an "O" ring in the upper portion of the valve key to prevent water leakage when opening or closing the valve. The test valve screw shall have the standard water works pentagon head.

Iron yoke pieces shall be of the Y502 and Y504 styles as manufactured by the Ford Meter Box Company, Inc., or approved equal. The inlet angle ball valves shall be of the BA94-323W-G style for the 3/4 inch, BA94-444W-G for the 1 inch, all as manufactured by the Ford Meter Box Company, Inc., or approved equal. The angle dual check valves shall be of the HHCA94-323 for 5/8 x 3/4 inch and HHCA94-444 style for the 1 inch as manufactured by the Ford Meter Box Company, Inc., or approved equal.

Coppersetters for 1-1/2" and 2" Flanged Meters

Coppersetters shall be of the riser type with inlet and outlet connections for 1-1/2" and 2". Coppersetters with horizontal inlet and outlet shall have grip nut connections. Coppersetters with vertical inlet and horizontal outlet shall have Female Iron

Pipe thread connections. The coppersetter shall be constructed using flange angle ball valve on the inlet side and a flange angle dual check valve on the outlet side. The coppersetter shall be constructed with a high bypass that contains a ball valve with padlock wings. The coppersetter shall be 12" high. The coppersetter shall be constructed from 85-5-5-5 brass and copper tube.

The coppersetters for 1-1/2" flanged meter shall be of the VBHH76-12HB-44-66G and the VBHH76-86-12HB-11-66 styles as manufactured by the Ford Meter Box Company, Inc., or approved equal. The coppersetters for 2" flanged meters shall be of the VBHH77-12HB-44-77G and the VBHH77-87-12HB-11-77 styles as manufactured by the Ford Meter Box Company, Inc., or approved equal.

Stainless Steel Tapping Sleeves

This specification covers tapping sleeves of all stainless steel construction. All metal parts of the tapping sleeve shall be of 304 stainless steel, and the gaskets shall be of virgin SBR rubber compound for water service. The gasket shall have a full circumferential seal. The shell and neck of the sleeve shall be of 304 stainless steel. The neck shall be mig welded to the shell to form a strong permanent fusion with the shell. The welded areas then shall be fully passivated. Passification shall mean the weld areas of the sleeve shall be chemically treated and the residue removed so as to return the welded stainless steel to its original state and produce a highly corrosion resistant coating. The sleeve shall have heavy hex nuts, and the bolts shall be rolled national coarse thread of 304 stainless steel and shall be Teflon coated. It shall have a plastic lubricating washer. The armors shall be heavy gauge 304 stainless steel, and the lifter bar shall be of 304 stainless steel with a lip curve to hold position while tightening. The flange shall be 304 stainless steel with standard square head for pressure testing before tapping pipe. The tapping sleeve shall be of the SST style as manufactured by Romac Industries, Inc., or approved equal.

Branch Pieces

Branch pieces are to be constructed of 85-5-5-5 water works red brass. The branch pieces shall have a spacing of 7 1/2 inches and shall have the inlet as grip joint, and the outlet connections shall be male iron pipe threads. Size shall be as specified in the Bidder's Proposal. Branch pieces shall be of the U28-33-G and U28-43-G styles as manufactured by the Ford Meter Box Company, Inc., or approved equal.

Corporation Stops

Corporation stops are to be manufactured in accordance with AWWA Standard C800. Inlet threads are to be AWWA standard tapered thread, outlet shall be grip joint, size as specified in the Bidder's Proposal. Corporation stops shall be of the FB-1000 for 1 1/2" and 2" taps and F-1000 series for 3/4" and 1" taps as manufactured by the Ford Meter Box Company, Inc., or approved equal.

Brass Pipe Couplings

Brass pipe couplings are to have inlet threads of female iron pipe, male iron pipe, pack joint, or grip joint as specified in the Bidder's Proposal. Outlet connection shall be pack joint or grip joint type. Brass pipe couplings shall be of the type as manufactured by the Ford Meter Box Company, Inc. or approved equal.

Fire Hydrants

Fire hydrants shall meet or exceed AWWA C502, latest revision. Working pressure shall be 200 psig, test pressure shall be 400 psi. The main valve enclosure shall be of the compression type, opening against the pressure and closing with the pressure. Traffic feature shall be designed for easy 360 degree rotation of nozzle section during field installation. There shall be a sealed lubrication chamber with triple O-rings to seal operating threads from the waterway and accommodate an anti-friction thrust washer. The main valve opening shall not be less than 5-1/4" and be designed so that removal of all working parts can be accomplished without excavating. The bronze seat shall be threaded into mating threads of bronze for easy field repair.

The draining system of the hydrant shall be bronze and be positively activated by the main operating rod. Hydrant drains shall close completely after no more than three (3) turns of the operating nut. There shall be a minimum of three (3) internal parts and four (4) drain port outlets to the exterior of the hydrant. Drain shutoff to be by direct compression closure. Friction loss shall not exceed 3.5 psig at 1,000 gpm through 4-1/2" pumper nozzle.

Hydrants shall be American Flow Control's American-Darling B-62-B fire hydrant.

Buried Water Main Location Signs

The buried water main sign shall be a type single curve flexible marker blue in color with a height of six (6) feet and a width of 3.75 inches. It shall be as manufactured by Formtech Enterprise, Inc., phone number 1-800-438-4733. The logo shall have a height of 15 inches and a width of 3.5 inches. It shall read: CAUTION WATER MAIN BELOW, CALL BUD BEFORE DIGGING 1-800-752-6007, PADUCAH WATER.