MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**WATER MAIN MATERIALS AND CONSTRUCTION**

UTL:CJD 1 of 3 APPR:RPB:DBP:11-09-23

**a. Description.** This work consists of installing the following materials as part of the City of Flint water system. Unless otherwise noted below, ensure all work, materials, construction requirements, and methods of measurement and payment are in accordance with the standard specifications.

**b. Submittals**. Submit PDF product data consisting of shop drawings and manufacturer’s literature to the Engineer and the City of Flint for approval at least 10 working days prior to construction.

Submit a general work plan outlining the procedure and schedule to be used for installation of the water main.

**c. Materials.** Furnish the listed materials below in accordance with current *AWWA* standards and the standard specifications. The specific items listed conform to City of Flint water system requirements and no substitutions are permitted.

1. Pipe and Fittings. Furnish zinc-coated Class 52 or 54 DI pipe in accordance with *ANSI/AWWA C150/A21.50-81* and *ANSI/NSF Standard 61.* Ensure DI pipe is cement-mortar lined in accordance with *ANSI/AWWA C104/A21.4*. Ensure the exterior of the DI pipe is coated with a layer of arc-sprayed zinc per *ISO 8179*. Ensure the mass of the zinc applied is 200 g/m2 of pipe surface area. Apply a finishing layer topcoat to the zinc. The coating system must conform in every respect to *ISO 8179-1* “*Ductile iron pipes - External zinc-based coating - Part 1: Metallic zinc with finishing layer*”.

Furnish DI mechanical joint or push-on type fittings as follows: DI fittings must meet *ANSI A21.11/AWWA C111, ANSI/AWWA A21.53/C153* and be Class 350. Ensure fittings are cement-lined in accordance with *ANSI A21.4/AWWA C104.* Rubber gasket joints must meet *ANSI A21.11/AWWA C111*. Furnish electrical conductivity at each joint.

2. Restrained Joints. Furnish restrained mechanical joints from EBAA Iron, Inc. Megalug 1100 Series, Ford Meter Box Uni-Flange Series 1400, or Engineer approved equal. Ensure restrained push-on joint pipe is American Fast-Grip or Field Flex-Ring, US Pipe Tyton Field-Lok, or Engineer approved equal. Ensure joints are in accordance with *ANSI A21.11/AWWA C111*. Ensure all bolts for mechanical joints are made of low-alloy weathering steel in accordance with *ANSI A21.11/AWWA C111*.

3. Gate Valves. Furnish EJ Flowmaster, Mueller 2361 Series or Engineer approved gate valve. Ensure valves meet *AWWA C509* or *C515* and are resilient wedge with DI body. Ensure surfaces are epoxy coated per *AWWA C550* inside and outside. Valves must have a bronze non-rising stem (NRS), National Thread Standard (NST), two-inch square nut, fully encapsulated DI wedge per *ASTM D429*, with protective wedge guide covers for all sizes four inches and above. Ensure all wedges, four inches and above, are DI and fully encapsulated with ethylene propylene diene monomer (EPDM) rubber. Ensure valve stems are sealed with three O-rings that are replaceable under full pressure. Gate valves must have a clear waterway equivalent in area, when fully open equal to that of the connecting pipe. Ensure valves are made to open when turned to the right, or clockwise. Furnish gate valve joints with mechanical joints in accordance with *ANSI/AWWA C110/A21.10*, *ANSI/AWWA C111/A21.11,* or *ANSI/AWWA C153/A21.53*.

4. Valve Boxes. Ensure valve boxes comply with *AWWA M44* for cast-iron valve boxes. Include a screw type top section, an adjustable extension length as required for depth of burial of the valve, and a plug with lettering “WATER”. Also, provide a bottom section with a base of adequate size to fit over the valve and an approximately five-inch diameter barrel. Furnish boxes manufactured by Tyler Union 6860 series (manufactured in the United States), Bingham & Taylor Figure No. 4906, or Engineer approved equal.

5. Hydrants. Furnish a 5¼ inch, EJ Model 5BR250, Mueller Super Centurion, or Engineer approved equal traffic model fire hydrant in accordance with *AWWA C502* and *UL 246*, meeting the City of Flint requirements, with 4½-inch pumper nozzle, two 2½-inch hose nozzles, National Standard Thread (NST), 7/8-inch square operating nut and with mechanical joint (MJ) inlet, painted City of Flint standard of Yellow at the factory with primer and two coats. Ensure the barrel length is properly sized, so the centerline of the pumper nozzle is 21-inches to 27-inches above grade at the specified depth of cover over the pipe. Furnish hydrant extensions that are 36-inch maximum, limited to one per hydrant. Install between breakaway flange and top of hydrant lower section. Ensure hydrant drains are plugged. Ensure hydrants open to the right (clockwise).

**d. Construction.** Ensure construction is in accordance with the current *AWWA* standards, the standard specifications, City of Flint standards and as detailed on the plans. Construct water main with a minimum of 5.5 feet of cover.

1. Coordinate with the City of Flint to have a representative onsite to visually observe all water main installation.

2. Mechanical Restraints for Pipe Smaller than 12-inch. All tees, bends, dead ends, reducers, valves, hydrant watch valves, and hydrants for water main smaller than 12 inches and are to be restrained by mechanical joint retainer glands, bell restraint harnesses, or locking gaskets. Ensure restrained lengths are a minimum of two pipe lengths on either end of all appurtenances and as detailed on the joint restraint schedule on the plans.

3. Thrust Blocks for Pipe 12-inch and larger. All tees, bends, and dead ends for water main 12 inch and larger are to be restrained by thrust blocks. Provide blocking or other Engineer approved method of temporary restraint during construction as necessary until final restraint is installed and backfill operations are complete.

4. Final Connections to Existing Mains. Ensure water mains and appurtenances are completely installed, flushed, disinfected, and have satisfactory bacteriological sample results received before permanent connections are made to the active distribution system. Install a drainage marker post or other Engineer approved method of identification to mark each end of main within the jacked in place casing.

5. Furnish as-built plans in accordance with subsection 823.03.W except provide one additional set in both hard copy and PDF format to the City of Flint. Call the City of Flint Service Center at 810-766-7202 to obtain information on plan distribution address.

**e. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price in accordance with subsection 823.04 of the Standard Specifications for Construction.