



**SPECIAL PROVISIONS
FOR
PRE-INSULATED WATER MAIN AND APPURTENANCES**

**Black Hawk County
BRM-CHBP-8155(771)--NB-07**

**Effective Date
September 21, 2021**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 GENERAL

1.1 SUMMARY

This Section of the Specification includes all labor, materials, equipment, and testing required to furnish and install all pre-insulated water main and appurtenances.

1.2 RELATED REQUIREMENTS

Refer to Section 2554 of the Standard Specifications for requirements pertaining to furnishing, installing, disinfecting, and testing water mains and fittings to be pre-insulated.

1.3 QUALITY ASSURANCE

- A. Steel pipe hangers and supports shall have the manufacturer's name, part number, and applicable size stamped in the part itself for identification.
- B. Hangers and supports shall be designed and manufactured in conformance with ANSI/ MSS SP 58-2018.

1.4 SUBMITTALS

- A. Product data on all hanger and support devices, including shields and attachment methods. Product data to include, but not be limited to materials, finishes, approvals, load ratings, and dimensional information for proposed hanger configuration. If the hanger provided is different than detailed in the plans, the design of the hangers shall be provided and sealed by a Professional Engineer licensed in the State of Iowa.
- B. Product data on pipe insulation system, including factory installed insulation, field joints, and all field installed insulation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: All materials shall be clearly marked and undamaged when they are delivered to the site.
- B. Storage and Handling: All materials shall be stored on pallets or supports so that no materials are in direct contact with the ground and in accordance with manufacturer's recommendations. All materials should be handled to protect them from damage and contamination. All materials shall be in working condition and free of contaminants when installed.

PART 2 PRODUCTS

2.1 PIPE INSULATION

- A. Service pipe insulation shall be spray applied 0.18 k-factor and nominal 2 pounds per cubic foot density, polyurethane foam for straight sections and flexible polyurethane foam for all fittings. To ensure no voids are present, all insulation shall be inspected by one of the following two methods:
 - 1. Visually checked prior to application of the protective jacket.
 - 2. Infrared inspection of the entire length 24 hours after foaming is complete.
- B. Insulation shall be applied to the minimum thickness of 3.0 inches.
- C. Insulation shall be provided by Perma-Pipe.

2.2 PIPE HANGERS

- A. Pipe hangers shall consist of two adjustable steel yoke pipe rollers with rod hangers.
- B. Hanger rods shall be threaded both ends or continuous threaded rods of circular cross section. Use adjusting locknuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.
- C. Hangers and strut shall be hot dip galvanized after fabrication in accordance with ASTM A 123. All hanger hardware shall be hot dip galvanized or stainless steel. Zinc plated hardware is not acceptable for outdoor or corrosive use.
- D. Pipe Hanger assembly, including concrete deck inserts, shall meet the minimum load requirements specified in the design plans.

2.3 PROTECTIVE JACKET

- A. Straight sections of the pre-insulated piping system shall be filament wound resin/fiberglass reinforcement composite directly applied on the insulating foam. The manufacturer shall filament wind fiberglass directly onto the polyurethane foam and taper the jacket down onto the ductile iron to seal each section of pipe.
- B. The projective jacket shall have a minimum thickness of 100 mils of FRP.
- C. Thermoplastic casing materials are not allowed.
- D. Protective jacket shall be as manufactured by Perma-Pipe.

2.4 Pipe Rollers

- A. Pipe Rollers should be provided on top and bottom of insulated water main on the bridge at each pipe hanger location.
- B. Pipe Rollers shall extend around the top and bottom of the insulated pipe for 120 degrees and be placed between the protective jacket and rollers.
- C. Pipe rollers shall be constructed of galvanized carbon steel.
- D. Length of the Pipe rollers shall be between 12 and 18 inches. Exact length shall be determined by contractor and shall be submitted for review by the Engineer.

2.5 FIELD JOINTS

- A. Buried field joint locations shall be a flexible foam insulation banded in place over the bell of the ductile iron pipe and the tapered end of the protective jacket and then sealed with a shrink sleeve.
- B. Field joints for the water main on the bridge shall be flexible foam insulation banded in place over the bell of the ductile iron pipe and the tapered end of the protective jacket and then sealed with a shrink sleeve.
- C. Apply FRP rock shield over buried and exposed field joint locations for added protection.

2.6 FIELD INSULATION FOR FITTINGS

Insulation of fittings shall consist of a flexible foam insulation banded in place over the ductile iron pipe fitting and then sealed with a shrink sleeve.

2.7 FLEXIBLE EXPANSION JOINTS

- A. Provide force balanced flexible expansion joints where indicated in the plans.
- B. Pressure rating: 350 psi.
- C. Manufacture of ductile iron conforming to material requirements of ASTM A 536 and ANSI/AWWA C153/A21.53.
- D. Joints: Flanged.
- E. Manufacturer: EBAA Iron, Inc., Force Balanced "Flex-Tend."

2.8 COMBINATION AIR VALVE ASSEMBLY

- A. Provide combination air valve assembly as shown on plans.
- B. Manhole cover above air valve assembly shall be bolted and gasketed and labeled 'WATER'.
- C. Manufacturer: Val-Matic 201C.2, APCO 143C, or equal.

PART 3 EXECUTION

3.1 PIPE INSTALLATION

- A. Factory-trained field technical assistance shall be provided for critical periods of installation; unloading, field joint instruction, and testing.
- B. Hydrostatically test pipe prior to installation of insulation on field joints or fittings.
- C. Follow manufacturer's recommendations for installation of insulated piping system.

3.2 HANGER INSTALLATION

- A. Pipe shall be adequately supported by pipe hanger and supports. Hangers for insulated pipe shall be sized to accommodate insulation thickness.
- B. Do not support piping from other pipes, intermediate diaphragms, or other equipment that is not the bridge structure.
- C. Hanger rods shall be set after the concrete deck inserts have been installed and the deck concrete has reached the design compressive strength of 4000 psi.

3.3 FLEXIBLE EXPANSION JOINT INSTALLATION

- A. Install flexible expansion joints in accordance with manufacturer's recommendations.
- B. Do not insulate flexible expansion joints.

3.4 COMBINATION AIR VALVE ASSEMBLY

Install combination air valve, heat tracing system, and insulation in accordance with manufacturer's recommendations.

3.5 TESTING AND DISINFECTION

Test and disinfect water main in accordance with Section 2554 of the Standard Specifications.

PART 4 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

4.1 METHOD OF MEASUREMENT

- A. Water Main on Bridge, Pre-insulated: Measurement for each type and size of pre-insulated pipe installed on bridge will be in linear feet along the centerline of the pipe, including the length through the fittings.
- B. Water Main, Trenched, Pre-insulated: Measurement for each type and size of pre-insulated pipe installed in an open trench will be in linear feet along the centerline of the pipe, including the length through the fittings.
- C. Flexible Expansion Joints: Measurement for each type and size of flexible expansion joint installed as specified will be counted.
- D. Combination Air Valve Assembly: Each combination air valve assembly will be counted.

4.2 BASIS OF PAYMENT

- A. Water Main on Bridge, Pre-insulated:
 - 1. Payment will be the contract unit price per linear foot for each type and size of pipe.
 - 2. Payment is full compensation for furnishing and installing pre-insulated pipe and fittings, saddle supports, pipe hangers, and field joint insulation.

- B. Water Main, Trenched, Pre-insulated:
 - 1. Payment will be the contract unit price per linear foot for each type and size of pipe.
 - 2. Payment is full compensation for trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, tracer system, testing, disinfection, and polyethylene wrap for ductile iron pipe and ductile iron fittings.

- C. Flexible Expansion Joints:
 - 1. Payment will be the contract unit price for each size of flexible expansion joint.
 - 2. Payment is full compensation for furnishing, installing, and testing for flexible expansion joint.

- D. Combination Air Valve Assembly.
 - 1. Payment will be at the contract unit price for each combination air valve assembly.
 - 2. Payment is full compensation for combination air valve assembly, including piping, associated valves, associated heat tracing system, insulation, and access cover.