SECTION 3240 - DUCTILE IRON GRAVITY SEWER AND FORCE MAIN LINING

PART 1 - GENERAL

1.1 SCOPE OF WORK:

Provide all labor, materials, equipment and services required for furnishing and installing special linings for ductile iron pipe and appurtenances specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Trench Excavation for Sewer Force Mains: Section 3725

B. Bedding and Backfill for Sewer Force Mains: Section 3735

C. Ductile Iron Sewer Force Main: Section 3210

D. Trench Excavation: Section 3720

E. Bedding and Backfill: Section 3730

1.3 GENERAL INFORMATION

A. All ductile iron pipe and fittings shall be lined on the interior with polyurethane, or epoxy.

B. Linings shall cover all exposed surfaces of pipe and fittings subject to contact with sewer liquid or gas. The lining of the pipe barrel shall extend from spigot end through the socket to the edge of the gasket sealing area or recess for pipe using push-on gaskets, and to the edge of the gasket seat for mechanical joints. The lining shall also cover the exterior of the spigot end from the end of the pipe to beyond the gasket sealing area. The lining in fittings shall cover the interior surfaces including the socket areas as defined above. All linings shall be hermetically sealed at the ends.

PART 2 - PRODUCTS

2.1 LINING MATERIALS:

A. Polyurethane lining material shall consist of a two-part polyurethane coating system conforming to ASTM D-16 Type V, consisting of a polyisocynate resin and a polyol resin. Polyurethane for pipe barrel and fittings shall be Corropipe II Wasteliner as manufactured by Madison Chemical Industries, Inc. Polyurethane lining material for exterior of spigot and interior of socket shall be equal to Corropipe 'S' as manufactured by Madison Chemical Industries, Inc. Polyurethane lining system shall be equal to U.S. Pipe Polythane.

B. Epoxy lining material shall be Protecto 401 Ceramic Epoxy, a two component, modified epoxy formulated for corrosion control with the following minimum requirements or NovoPipe SP-2000W by Superior Environmental Products:

1. A permeability rating of 0.0 perm when measured by ASTM E 96, Procedure A. Duration of test shall be 6 weeks.

2. A direct impact resistance of 125 inch-pounds with no cracking when measured by ASTM 2794.

3. The ability to build at least 50 mils dry in one coat.

4. The material shall be recoatable with itself for at least seven days with no additional surface preparation when exposed to direct summer sun and a temperature of 90 degrees F.

5. The material shall contain at least 20 percent by volume of ceramic quartz pigment.

6. A test and service history demonstrating the ability of the material to withstand the service expected.

7. Possess a minimum solids volume content of 88 percent, plus or minus one percent.

8. Possess a maximum drying time to allow recoating as follows: 50 degrees F – 72 hours; 75 degrees F – 18 hours; 90 degrees F – 8 hours. If recoating cannot be accomplished within seven days, a light brush blast shall be performed to improve intercoat adhesion.

C. All surfaces to be lined with polyurethane shall be blast cleaned equal to the requirements of SSPC-SP10. All surfaces to be lined with epoxy shall be blasted and cleaned to remove all loose laitance, scale, or other loose material. No lining shall take place over grease, oil, etc., that would be detrimental to the adhesion of the compound to the substrate.

PART 3 – APPLICATION

A. Lining of pipe barrel and fittings shall be 40 mils nominal thickness; minimum-lining thickness shall be 30 mils. Lining thickness for exterior of spigot and interior socket shall be 8 to 10 mils.

B. The lining shall be applied using a centrifugal lance applicator by applicators certified by the lining manufacturer. The workers shall be experienced and competent in the surface preparation, application and inspection of the lining to be applied. The compound shall not be applied when the substrate temperature is below 40 degrees F or in adverse atmospheric conditions that will cause detrimental blistering, pinholing or porosity of the film.

C. All pipe and fitting linings shall be tested for pinholes in accordance with ASTM G 62, Method B and shall be holiday free.

D. All pipe linings shall be checked for thickness using a magnetic film thickness gauge.

E. Each pipe joint and fitting shall be marked with the date of application of the lining system and with the numerical sequence of application of that date.

PART 4 - BASIS OF PAYMENT

Ductile iron gravity sewer and force main lining is <u>not</u> a pay item. The cost of the lining shall be included as part of the pay item for ductile iron gravity sewer or force main.

END OF SECTION