

## SECTION 3420 - MANHOLE PROTECTIVE COATING (LINING INTERIOR OF MANHOLE)

### PART 1 - GENERAL

#### 1.1 SCOPE OF WORK:

Provide all labor, materials, equipment and services required to completely install a protective coating inside manholes where shown on the plans or instructed by the ENGINEER according to this specification.

#### 1.2 SUBMITTALS:

- A. Descriptive literature and catalog cuts clearly indicating all materials and application procedures shall be submitted on all items specified herein to the ENGINEER for review before ordering. Comply with provisions of Section 1010.
- B. At the time of submission, the CONTRACTOR shall, in writing, call ENGINEER's attention to any deviations that the submittals may have from the requirements of the ENGINEER's Contract drawings and specifications.

### PART 2 - PRODUCTS

#### 2.1 MANHOLE PROTECTIVE COATING:

- A. All manholes (proposed or existing) with force mains (proposed or existing) discharging into them shall be coated according to this specification. Manholes for automatic air (or air/vacuum) release valves on sewer force mains shall also be coated according to this specification. Other manholes shall be coated as shown on the plans or directed by the ENGINEER.
- B. Quality of Material for structural rehabilitation of existing manholes – Quadex QM-1s RESTORE cementitious coating as distributed by Quadex, Inc., North Little Rock, Arkansas, U.S.A. is specified as the standard of quality. Other coating material of equal or better quality, as determined by the ENGINEER, may be used instead.

The material shall be a high strength, cement based polypropylene fiber reinforced shrinkage compensated mortar enhanced with NSG (nepheline synte granite). The material shall have high early and ultimate compressive, flexural, and bond strengths. The material shall have proven resistance to a broad range of corrosive chemicals, including sulfuric acid created by hydrogen sulfide gas as well as other chemicals typically found in sanitary sewers. The material shall also have a low permeability.

Quality of Material for protective coating of new manholes – Sauereisen SewerGard polymer lining as distributed by Sauereisen, Pittsburgh, Pennsylvania, U.S.A. is specified as the standard of quality. Other polymer coating systems of equal or better quality, as determined by the ENGINEER and approved by the OWNER, may be used instead.

The material shall be an impermeable, high strength, corrosion-resistant, fiber-filled or aggregate-filled epoxy material specifically designed to protect concrete surfaces of municipal wastewater treatment structures and collection systems from chemical attack and physical abuse. The material shall prohibit water infiltration and shall have proven resistance to a broad range of corrosive chemicals, including sulfuric acid created by hydrogen sulfide gas as well as other chemicals typically found in sanitary sewers. The material shall be suitable for application over damp or dry concrete surfaces without the use of a primer. The material shall have a non-sagging consistency to permit application on vertical and overhead surfaces.

- C. Manufacturer & Installer - Coating materials shall be as manufactured by Quadex, Inc., Sauereisen, or approved equal. Installation shall be performed by an installer approved by the material's manufacturer using workers experienced in the application of the coating to be used.
- D. General Objective - The objective of this specification is to provide the material and workmanship

necessary to produce excellent results. All work shall be performed in a manner satisfactory to the ENGINEER, consistent with strict adherence to Manufacturer's instructions regarding surface preparation and coating application, together with correct and safe handling and storage of the materials.

- E. Preparation of Concrete – The material shall be placed on a clean, damp surface to allow for a good mechanical bond. All surfaces shall be cleaned using high pressure water blasting to remove any unsound concrete, loose mortar, bricks, deteriorated steps, or other foreign material. The manhole shall be cleaned from the top to the bottom.

Water infiltration must be stopped prior to application by using a quick setting (60 seconds or less) material such as Sauereisen InstaPlug No. F-180 or Hydroactive Urethane Grout No. F-370, cement based mortar water plugging compound conforming to ASTM C 150 and ASTM C 144, or other material as approved and specified by the manufacturer. Voids in concrete surface shall be filled with Sauereisen Filler Compound No. 209 or other material approved by the coating manufacturer. Applicator should contact the coating manufacturer to determine suitable brand name products.

- F. Application of Coating – The coating shall be applied per the manufacturer's instructions to the vertical and overhead surfaces of the concrete and masonry structures. The material may be trowel or spray applied as recommended by the manufacturer. If a cementitious coating is to be used it should be applied as a monolithic one pass application with a minimum thickness of one inch. The coating shall be placed by low pressure spraying (guniting process) to the vertical and overhead surfaces of the concrete and masonry structures.

- G. Safety - Safety of the workers shall be a top priority during application. All procedures and precautions recommended by the manufacturer shall be strictly adhered to.

- H. Interior of manhole frames and covers shall also be coated with Sauereisen SewerGard spray applied No. 210S or an epoxy paint or another corrosion-resistant product approved by the ENGINEER. The frames and covers shall be properly prepared for this coating by the CONTRACTOR. This shall include removing all rust, dirt, moisture, etc.

## **2.2 BYPASS PUMPING**

If bypass pumping is necessary to perform the work included in this specification, the CONTRACTOR shall provide such pumping according to Section 3930 of these specifications. All costs for this additional work shall be included in the bid price for lining interior of manholes.

## **PART 3 - BASIS OF PAYMENT**

Payment for lining interior of manholes in accordance with this specification will be made at the Contract unit price per vertical foot measured from the invert of the outlet sewer to the top of the manhole casting for each manhole coated. This price shall include application to the interior top and bottom of the manhole as well as the sides.

END OF SECTION