

ITEM 924

LIFT STATION WET WELL REHABILITATION

924.1 DESCRIPTION

This section shall govern the provisions for the work, materials and equipment for the application of a monolithic, cementitious liner for restoring structural integrity, eliminating water infiltration and exfiltration and the application of a high build epoxy coating to provide corrosion protection in existing lift station wet well chambers.

924.2 REFERENCE STANDARDS

This Specification references the following American Society for Testing and Materials (ASTM) Standard Specifications and its reference standards, which are made a part hereof by such reference and shall be the latest edition and revision thereof. All work shall comply with the following reference standards unless specifically stated otherwise in this Specification.

ASTM C 150 – Standard Specification for Portland Cement

ASTM C 595 – Standard Specification for Blended Hydraulic Cements

ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

ASTM C 496 – Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens

ASTM C 78 – Standard Test Method for Flexural Strength of Concrete; Using Simple Beam with Third Point Loading

ASTM C 267 – Standard Test Method for Determining the Chemical Resistance of Grouts and Mortars

AASHTO T277 – Rapid Determination of the Chlorine Permeability of Concrete

ASTM D 4541 – Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester

ASTM C 33 – Standard Specification for Concrete Aggregates

ASTM C 494 – Standard Specification for Chemical Admixtures for Concrete

ASTM C 260 – Specification for Air-Entraining Admixtures for Concrete

ACI 201.2R - Guide for Durable Concrete

924.3 SUBMITTALS

Technical product data, including brand name and manufacturer for each product. Provide laboratory test results verifying the cement's 28-day compressive strength in accordance with ASTM C 39 or ACI 318.

The manufacturer shall provide satisfactory test results that demonstrate conformance to ASTM C 267, Chemical Resistance of Mortars, Grouts and Monolithic Surfaces.

Product Certification stating the chlorine ion content of the cement material.

Provide a list of similar Lift Station Wet Well rehabilitation projects with five years of history. Include the Owner and Engineer's name and the project date.

Material Safety Data Sheets (MSDS) for each product to be used.

Manufacturer's recommended installation instructions.

Qualifications of applicator including certification by the product manufacturer that the applicator is trained in the handling, mixing and application of product.

924.4 MATERIALS

Use the monolithic cement liner to repair, fill voids, and provide structural integrity, eliminating water infiltration and exfiltration. Use high build epoxy coating system to provide corrosion protection. The repair materials must be compatible with the specified epoxy coating.

Cement Liner: Use Strong Seal MS-2C, Reliner MSP Cement, Quadex QM-1S, or other approved equal.

Epoxy Coating: Use a 100% solids, solvent-less two component, high strength epoxy coating system with increased bond strength and broad range chemical resistance. It shall protect concrete, steel, masonry and fiberglass structures in moist and damp environments. Use a maximum of 40 mils in two applications over a smooth horizontal, vertical or overhead surface. The protective epoxy coating manufacturer shall make all recommendations for accelerated epoxy coating applications, use LG 68 Heavy Duty Concrete Cleaner to etch the concrete or new cement liner.

Protective Coating Application Equipment: Use a plural component spray pump designed specifically for this purpose. Spray apply the mixed epoxy coating to the specified thickness.

Delivery, Storage and Handling: Contractor shall keep materials dry, protected from weather and stored under cover until used for application. Epoxy lining compounds shall be stored and handled in accordance with instructions of MSDS.

Warranty: The applicator shall guarantee the work to be free of defects in material and workmanship for one-year period, unless otherwise stated, after completion and acceptance of the work.

Safety: Contractor/applicator shall comply with all local, state and OSHA confined space entry requirements.

Sewerage Flow Control: Contractor shall provide for maintaining flow in the sewer lines during surface preparation, application and curing of lining materials. All flows shall be maintained through the sewer during the Work unless prior approval for interruption of flow or by-passing of flow is obtained by Contractor from Owner. Contractor shall coordinate all his efforts in maintaining sewer flow or by-passing with Lift Station Operator/Supervisor. See applicable specification item governing by-pass pumping

924.5 EXECUTION

Clean Lift Station Wet Well: The Sewer Lift Station Wet Well Chamber Rehabilitation System requires a suitable, clean and sound surface. Use a high-pressure water washing or wet abrasive sand blasting, use 3500-psi water pressure. Remove dirt, oil, loose concrete, any previously applied coatings or other deleterious materials. Continue the cleaning process until a uniform and sound profile is obtained. The wet well may require part of the following: cleaning, inspection, proper replacement or preparation of steel reinforcement, structural crack repair, stopping water leaks and joint treatment. Remove all corroded cement mortar. The cleaned surface profile shall be restored using the specified and approved cement reliner material. For active water leaks, use a rapid setting hydraulic cement product specifically designed for that purpose. For fill or repair of voids and irregularities, use fast setting cement patcher recommended by liner manufacturer.

Mixing of Rehabilitation Materials: Mix all materials in accordance to manufacturer's printed recommendations.

Application of Cement Liner: Dampen the repair areas, but allow no running water. Spray apply the cement liner to a minimum of 1-inch thickness. Compact the cement into all remaining voids and crevices. Measure cement liner depth to insure that desired thickness has been applied. Finish with a stainless steel trowel to a smooth or brush finish surface. Spray apply cement liner in such a manner so as to produce an even surface. Produce a cove finish at the wall to the ceiling and floor interface. No application shall be made when ambient temperatures are less than 40 degrees F and when freezing temperature is expected within 24 hours. If ambient temperature is in excess of 90 degrees F; precautions shall be taken to keep mixing water below 85 degrees F. Use ice if necessary.

A. Application of Protective Epoxy Coating System:

1. The protective epoxy coating system shall be applied by a trained certified applicator. The applicator shall furnish all labor, equipment, materials and application as required by the manufacturer.
2. Coat the specified surface with a moist tolerant, solvent-less, 100% solids, self-priming epoxy protective coating as described herein. Spray apply the mixed epoxy coating material to a nominal wet film thickness range of 40 mils, DFT. Apply epoxy coating of cement liner as soon as possible. Avoid damage to the uncured epoxy coating by keeping all pipe penetrations plugged for a minimum of 4 to 8 hours after coating installation. Allow the finished process to cure 8 to 24 hours before being subjected to active flow. Follow the manufacturer's recommendations.

924.6 TESTING AND INSPECTION

Sampling: Use three 2-inch by 2-inch diameter cubes for testing compressive strength. Take 3 sets of cube molds from each day's work. Label each cube with date, location, project, and product batch number. Product batch numbers shall be located on each cement bag. Testing shall be according to ASTM C 39. Send cylinders to a certified lab, assigned by the Engineer. Test the mortar for 7 and 28-day compression test. Retain one sample for further instructions should the others fail to meet the 28-day test requirement.

Inspection: Each structure will be visually inspected the same day following the application of the repair liner and epoxy coating.

924.7 BASIS OF PAYMENT

Payment shall be based on the Contract Unit Price per structure coated as indicated in the proposal. The Contract Unit Price shall be payment in full for performing the work and for furnishing all labor, supervision, materials, equipment and all the testing necessary to complete the work.

END OF ITEM 924