

Section 2578

Wet Well Coatings and Rehabilitation

PART 1: General

- 1.1 *Section Includes* – Sanitary sewer wet well lining including:
- 1.1.1 Environmental Protection and leak-proofing of wet wells by the application of a 100% solids high build epoxy coating designed for the corrosion protection of concrete and steel in wastewater treatment facilities.
 - 1.1.2 The inspection and testing of the various types of work to insure compliance.
- 1.2 *Lining Systems on Old Concrete (Rehab Project)*–
- 1.2.1 The lining system used shall result in a monolithic structure to the shape and contour of the interior of the wet well. The lining system shall be a multilayer system comprised of a structural seal coat (after surface preparation), an initial coating of the finished coat and a final coat. The structural seal coat shall be Sherwin Williams StealSeam FT910 or approved equal – 1/8” dry film thickness. The coating system shall be completely water tight and free of any joints or openings other than pipe inlets, pipe outlets and the access frame/hatch opening. The junction of the lining material with the pipe material at the inlet and outlets, all conduit and other liner penetrations shall be watertight.
 - 1.2.2 The epoxy coating system shall be suitable for atmospheres containing hydrogen sulphide and dilute sulfuric acid as well as other gases associated with the wastewater collection systems. The coating shall be “CORE-COTE SC PLUS” manufactured by The Sherwin-Williams Company, 101 Prospect Ave., Cleveland, Ohio 44115-1075, Phone: (216) 566-2200 or an approved equal.
- 1.3 *Lining Systems on New Concrete/Grout* –
- 1.3.1 Preparation shall be per the International Concrete Repair Institute (ICRI) CSP-3 minimum, unless otherwise specified. Concrete additives are required to minimize cure time and off-gassing prior to and at time of the application of an epoxy coating system. A pre-installation meeting including the contractor, the installation subcontractor, the coating representative, and the owner’s representative shall be held, once conditions are determined and understood, to discuss and clarify the need for specific additives. At a minimum, new concrete / grout to be used shall be a standard concrete ready-mix with chemical additive Silatec Microsilica (A.W. Cook Cement Products) or approved equal – to allow coating and loading times of one or two days.
 - 1.3.2 See Section 1.2 above for information / detail concerning the required structural seal coat and epoxy coating system.
- 1.4 *Submittals* – Submit the following as required in the Special Conditions of Contract Documents:
- 1.4.1 Coating system specifications including preparation requirements, materials to be used, application methods and constraints, MSDS data sheets for all materials and test

procedures. A certification of the proposed coating system signed by an authorized agent of the system supplier/manufacturer. The certification shall list all materials furnished under this section. Installation of the coating system shall not begin until a satisfactory certification has been reviewed by ECUA.

- 1.4.2 Certified copies of test reports of factory tests required by the applicable standards, the manufacturer, and this Section.
- 1.4.3 Manufacturer's handling, storage, and installation instructions and procedures.
- 1.4.4 Warranty: Prior to installation, the coating system's manufacturer or the manufacturer's certified installation contractor shall provide a written warranty for the coating against defects for at least five years for materials and two years for labor after the date of acceptance by ECUA. Defects are defined as blistering, cracking, delaminating, pinholing, diminished adhesion, or leaking. The warranty shall require the manufacturer to supply all necessary labor, materials and equipment to repair defects to the satisfaction of ECUA. The contractor and/or manufacturer shall not make any exemption or exception to the above stated.

PART 2: Products

2.1 General –

- 2.1.1 The materials used shall be designed, manufactured and intended for sewer wet well lining and the specific application in which they are used. The materials shall have a documented history of long term performance in exposure to municipal wastewater. All materials shall be stored and handled in accordance with recommendations of the manufacturer. All materials shall be applied in accordance with the manufacturer's written instructions.
 - 2.1.1.1 *100% High Solids High Build Epoxy Coating* – The epoxy used shall be a commercial grade epoxy such as Cor-Cote SC Plus or approved equal.
 - 2.1.1.2 *Surface Preparation* – If significant spalling or other detrimental surface condition (exposed aggregate, deep holes, sharp edges, etc.) is found, areas to receive multiple coating layers of structural seal coat - in accordance with the coating Manufacturer's written instructions.
- 2.1.2 The Contractor shall warrant and hold harmless the Owner and his Engineer against all claims for patent infringement and any loss thereof.
- 2.1.3 Handle and store all materials and dispose of all wastes in accordance with applicable regulations.
- 2.1.4 Each coating system shall be project specific designed for application over cast in place and pre-cast concrete surfaces without degradation of the final product and/or the bond between the Product(s) installed and the existing concrete surfaces.

PART 3: Application

- 3.1 *Preparation* – The wet well surface shall be cleaned and dried, removing all oil, dust, grease, dirt and loose foreign material to ensure adequate adhesion. The contractor shall follow the specific preparation instructions of the coating manufacturer.
- 3.2 *Application* – The layers of structural seal coat and epoxy coating system shall comply with manufacturer guidelines and written recommendations for the specific installation. Cure times and humidity/temperature limits for the coating shall be monitored and controlled as specified by the Manufacturer.
- 3.3 *Defects Not Permitted* –
- 3.3.1 *Exposed Concrete* – surface not wet out with primer or coating.
 - 3.3.2 *Coating Runs* – visible runs of the coating on the surface.
 - 3.3.3 *Dry Areas* – areas with concrete surface not wet out with primer or coating.
 - 3.3.4 *Delamination* – separation of the coating from the concrete.
 - 3.3.5 *Blisters* – no visible signs of blistering allowed.
 - 3.3.6 *Crazing* – cracks in the finished product caused by sharp objects.
 - 3.3.7 *Pin Holing* – small holes resulting from off gassing.

PART 4: Test Methods

- 4.1 *General* – Tests shall be performed as specified in ASTM-F1869 to check for calcium chloride levels. Do not proceed with MVE greater than 3 pounds.

PART 5: Execution

- 5.1 *Preparation* –
- 5.1.1 *Safety* – The Contractor shall perform all work in strict accordance with all applicable OSHA, and manufacturer's safety standards. Each method of wet well coating in this Section requires confined space entry by workers. Particular attention is drawn to those safety requirements regarding confined space entry, wastewater exposure, explosive and lack of oxygen environments, respiratory protection from airborne particulate materials during cutting, cleaning and product mixing and application.
 - 5.1.2 *Cleaning* – All concrete and masonry surfaces to be coated shall be cleaned in accordance with SSPC-SP 13/NACE 6-4.3.1 OR 4.3.2, OR ICRI No. 310.2, according to the manufacturer's requirements. All grease, oil, laitance, coatings, unsound concrete and other foreign materials shall be completely removed. Water blasting utilizing a 210 steam unit or high pressure water wash with proper nozzles shall be the primary method of cleaning; however, other methods such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface.

All surfaces on which these methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products. Debris resulting from cleaning shall be removed from the wet well.

- 5.1.3 *Pumping and Bypassing* – When pumping and bypassing is required, the Contractor shall supply the pumps, piping, hoses and other equipment to divert the flow of sewage around the manhole in which work is to be performed. Contractor shall ensure that all piping and hose connections and couplings are water pressure tight. Contractor shall disinfect all areas of piping or hose leakage with powdered chlorine or lime. The bypass system shall be of sufficient capacity to handle existing flow plus additional flow that may occur during a rainstorm. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. If pumping is required on a 24 hour basis, all engines shall be equipped to keep noise to a minimum, within local noise abatement regulation with residential-critical mufflers, sound deadening enclosures, and other means.
- 5.1.4 *Flow Control Precautions* – When flow in a sewer line is plugged, blocked, or bypassed; sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to insure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.

5.2 *Installation* –

- 5.2.1 Remove pumps, and all internal equipment and install new top slab with stub outs and hatch openings as shown in the construction drawings to permit installation of coating onto the interior surfaces of the wet well. Install a plug in the main incoming line and install permanent caps/plugs on incoming lines that are being eliminated.
- 5.2.2 Prepare interior surfaces according to coating system's Manufacturer's recommendations. See 5.1.2 above.
- 5.2.3 Install coating system according to Manufacturer's application instructions.
- 5.2.4 Caulk all joints in the concrete after application of the primer/coating.

5.3 *Acceptance* –

- 5.3.1 Test installed coating using the SSPC PA-2, "Procedure for Determining Conformance to Dry Coating Thickness Requirements" test method to confirm finished film thickness. , following the Manufacturer's recommendations for proper and safe procedures, ASTM Standard D-149 and NACE Standard SP0188-2006, latest edition. Spark testing of structures shall be performed after curing of coatings. Any visible leakage in the structure, before, during, or after the test shall be repaired regardless of the test results. The ECUA Inspector shall inspect each layer after application and each repair. Repairs to the initial coat (layer) shall not exceed 5% of the total surface area. Repairs shall be made as a patch no larger than 4"x4". Each patch should be taped off for uniform appearance - not just random surface applied. The final coat shall also be tested. Repairs to the final coat (layer) not to exceed ten 4"x4" areas in/on 500 sf area.
- 5.3.2 If repairs exceed 5% of the total surface area on Initial coat or exceed ten 4"x4" areas in/on 500 square foot area on Final coat, interior will have to be cleaned and process

started over. The Contractor shall complete repairs and repeat the test procedures until satisfactory results are obtained. If the coating fails at any point after the second repair attempt at any location, the coating will be considered unacceptable and a complete rework will be required.

- 5.3.3 The finished surface shall be free of blisters or other indications of improper installation. No evidence of visible leaks shall be allowed. In addition, at the Owner's request, the Contractor shall be required within two years to spark and visually inspect the structure. Any work that has become defective within the two year period shall be repaired by the Contractor at no additional expense to the Owner.