



**SPECIAL PROVISIONS
FOR
SANITARY SEWER MANHOLE LINER**

**Scott County
BRM-1827(689)--8N-82**

**Effective Date
August 18, 2026**

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

236074.01 DESCRIPTION.

The work of this section includes the lining of interior manhole surfaces (from invert to manhole top) exposed to wastewater immersion and sewer gases, including hydrogen sulfide (H₂S), in municipal wastewater with 100% solids, fiber-reinforced epoxy linings.

236074.02 MATERIALS.

A. Materials.

1. The fiber-reinforced epoxy lining shall be of 100% solids polyamine epoxy system consisting of:
 - a. Primer/Resurfacer.
 - b. Finish Coat.
 - c. Glaze Coat
2. Subject to compliance with the contract documents the following systems are acceptable for lining concrete surfaces:
 - a. **Perma-Shield (Tnemec)**
 - Primer/Resurfacer: Tnemec Series N218 MortarClad at 1/16 inch to 1/8 inch dry film thickness (dft)
 - Finish Coat: Tnemec Series G436 Perma-Shield FR at 100 to 125 mils dft
 - Glaze Coat: Tnemec Series G435 Perma-Glaze at 15 to 20 mils dft
 - b. Approved equal – submit manufacturer qualifications and literature for each product giving:
 - Product name, generic type, and descriptive information.
 - Solids by volume.
 - Recommended dft.
 - List of five projects where each product has been used and rendered satisfactory service.

3. Steel surfaces (except for stainless steel) shall be lined with 100% solids epoxy system providing equivalent H₂S protection as concrete liner.

B. Quality Assurance.

1. Manufacturer Qualifications: Provide products from a company specializing in manufacture of high-performance epoxy coatings with a minimum 10 years experience.
 - a. Materials shall be products of a single manufacturer or items standard with manufacture of specified coating materials.
 - b. Submit manufacturer's certification that coatings comply with specified requirements and are suitable for intended application.
2. Applicator's Qualifications: Engage a single installer approved by the manufacturer with a minimum of 3 years experience performing this type of lining installation and with documented skill and successful experience.
 - a. Submit name and qualifications.
 - b. Submit proof of acceptability of applicator by manufacturer.

236074.03 CONSTRUCTION.

A. General.

1. Materials shall be brought to the job site in original sealed containers and stored per manufacturer recommendations.
2. Cleaning and surface preparation shall be in accordance with manufacturer recommendations.
3. New concrete shall cure minimum 28 days prior to coating.
4. Liner shall be installed prior to high strength mortar and stainless steel gates.

B. Application.

1. Installation shall be per manufacturer recommendations including details of liner termination, joints, penetrations, and transitions as applicable.
2. Liner components may be trowel or spray applied as recommended by the manufacturer.
3. Installation and curing shall be completed in ambient air and surface temperatures as recommended by the manufacturer. No additional measurement or payment will be made for temperature control (i.e. heating) of structures.
4. Do not apply liner in direct sunlight and/or with rising surface temperatures as this may result in blistering of the materials due to expansion of entrapped air or moisture in the concrete (induced outgassing). In such cases, postpone the application until later in the day when the temperature of the substrate is falling. Concrete surfaces that have been in direct sunlight should be shaded for at least 24 hours prior to application. Consult the manufacturer for application schedule guidelines specific to temperature conditions and possible primer or sealer application recommendations to reduce outgassing.
5. Where two or more coats of coating or paint are specified, where possible, the first coat shall contain sufficient approved color additive to act as an indicator of coverage, or the subsequent coats must be of contrasting color.
6. At the completion of work, removal all materials and debris associated with the work of this section.

7. Clean all surfaces not designated to receive protective liner coating. Restore all other work in a manner acceptable to Engineer.
8. All finished protective liner coating shall be protected from damage until acceptance of the work. Damaged protective liner coating shall be repaired at the discretion of Engineer at no additional cost to City.

C. Quality Control, Inspection, and Testing.

Contractor shall conduct quality control tests and submit reports to Engineer for parameters per this specification and any additional tests per manufacturer recommendation. Areas which do not pass testing or meet specifications shall be corrected and retested at no cost to the City.

1. Surface pH testing: Measure pH of concrete substrate using pH indicating papers or pH meter once every 50 square feet. Acceptable pH values shall be a minimum of 9.0.
2. Surface Profile: Inspect and record substrate profile (anchor pattern) at least once every 5 vertical feet or every 100 square feet. Surfaces shall be profiled, at a minimum, equal to the CSP roughness as recommended by the coating manufacturer in accordance with ICRI Guideline 310.2 and SSPC-SP13/NACE No. 6.
3. Ambient Temperature: Measure and record ambient air temperature once every two hours during of each work shift.
4. Relative Humidity: Measure and record relative humidity and dew point temperature every two hours of each work shift.
5. Provide verification of correct mixing of coating materials in accordance with manufacturer's recommendations.
6. Inspect and record the "pot life" of coating materials is not exceeded during installation.
7. Verify curing of the coating materials in accordance with manufacturer's recommendations.
8. Dry Film Thickness:
 - Wet film thickness shall be taken every 2 vertical feet or every 25 square feet in accordance with ASTM D 4414 and recorded.
 - dft can be determined using a surface area calculation for material consumption.
9. High-Voltage Holiday (Spark) Testing: Upon full cure, the installed lining system shall be checked by high voltage spark detection in accordance with NACE SP0188 and the manufacturer's printed application guide to verify a pinhole-free surface.

236074.04 METHOD OF MEASUREMENT.

This work is considered incidental to sanitary sewer manhole bid items, no additional measurement will be made.

236074.05 BASIS OF PAYMENT.

This work is considered incidental to sanitary sewer manhole bid items, no additional payment will be made.