Technical Bulletin

EPOXYTEC™

No. 25-130
September 2025

Subject

Surface Preparation Guidelines for Brick Masonry Manholes Prior to Epoxytec Lining Systems

Purpose

This technical bulletin provides comprehensive guidelines for the proper cleaning, preparation, and rehabilitation of brick masonry manholes to ensure effective application of lining systems, including CPP Trowel-Liner, CPP Sprayliner, Mortartec Ceramico, Mortartec Cladliner, and Mortartec Silicate. Preparation standards for brick masonry structures are defined in accordance with NASSCO's Brick Surface Preparation for Brick Masonry Manholes, as outlined in Appendix A of the revised August 2025 Manhole Rehabilitation PERFORMANCE SPECIFICATION GUIDELINE (PSG).

General

Background

Brick masonry manholes constructed from clay or shale brick with portland-cement mortar remain prevalent throughout North America's infrastructure. While these structures are typically historical, they frequently require rehabilitation due to biogenic sulfide corrosion that primarily affects the portland-cement mortar while leaving the ceramic brick material largely intact and suitable for structural rehabilitation.



Manhole bricks are ceramic products made from clay, shale, or similar materials and fired at high temperatures. While the bricks are relatively resistant to corrosion, the portland-cement mortar is susceptible to biogenic sulfide corrosion. In sewer headspace exposures, the mortar is typically corroded, leaving the bricks etched but mostly unaffected.

Scope and Application

These guidelines apply to brick masonry manholes requiring surface preparation before application of bonded protective linings. The procedures outlined herein are specifically developed for brick materials and differ from concrete surface preparation standards, which can cause damage to brick substrates.

Concrete surface preparation standards are often used, but can damage the brick materials.

Surface Preparation Requirements

Surface preparation includes cleaning to remove contaminants like fats, oils and grease (FOG), dirt, loose material, residues, and existing coatings. This exposes the brick texture for protective linings without damaging or significantly altering the surface profile of the brick.

Other necessary repairs include replacing missing bricks, repointing mortar joints, eliminating active water infiltration using fast-setting hydraulic cements or polyurethane injection grouts, and cutting existing manhole steps. These must be completed before applying bonded linings.

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General (continued)

High-Pressure Water Cleaning Procedures



High-pressure cleaning involves using a minimum of 5,000 psi (34.5 MPa) and four gallons per minute (15.1 L/min) through a rotating spray or fan nozzle. The spray tip should be kept 6-12 inches (15-30 cm) from the surface and held at an angle between 45° and 90°. Cleaning should start from the frame surface and progress down to the bench.

If the surface is especially dirty or has buildup of FOG, biodegradable cleaning agents or heated water (up to 210°F / 99°C)) can be used.

High-Pressure Water Slurry Blasting



High-pressure slurry blasting involves using a minimum of 4,000 psi (27.6 MPa) and four gallons per minute (15.1 L/min) and suction-fed sand injection into the water stream. Contact Tnemec Technical Service for recommended sand injection kit.

Quality Control and Surface Testing

After preparing the surface, check to make sure all contaminants are removed and the surface is clean. The surface should be free of debris, dust, dirt, FOG, and other contaminants. The brick surface should be clean, free of coatings, sound, and have a natural texture.

If there are any remaining contaminants or unsound areas, remove them with additional surface preparation. You can check the surface's soundness by lightly pushing a flathead screwdriver across it at a 30° angle. If the screwdriver slides over the surface without loosening any particles and leaves only a shiny mark, the surface is sound. If it gouges or removes loose material, the surface is not sound. You may need to use impact tools like chipping hammers to remove unsound mortar.

You can also test the surface pH to ensure it has been properly prepared. The pH should be at least 9 for all Epoxytec products.

Repair Procedures

Stop any active water infiltration using chemical injection grouts or hydraulic cement water stop materials. Remove any unreacted materials.

Replace any missing or displaced bricks and mortar. Use an approved material compatible with the lining or a repair mortar to fill the voids.

Pre-Application Requirements

Before applying the linings, make sure the surface is clean according to the NASCCO guideline. If the brick manhole has been exposed to sewer service after preparation, re-clean it to remove any contaminants.

Safety Requirements

When preparing brick masonry manholes for coating with cementitious and polymer linings, consider using proper personal protective equipment (PPE) such as eye/face protection, respiratory protection, hearing protection, gloves, proper footwear, hard hat, and Tyvek-type coveralls. Ensure proper ventilation and inspect tools and PPE before use. Employers should conduct a written risk assessment for each task to determine the appropriate PPE and confined space entry.

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REFERENCES

REFERENCE 1:

NASSCO. Brick Surface Preparation for Brick Masonry Manholes. In: Manhole Rehabilitation PERFORMANCE SPECIFICATION GUIDELINE (PSG), Appendix A. Revised August 2025. Available at: https://www.nassco.org/resources/nassco-specification-guidelines/

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