What is Manhole Rehabilitation? Benefits, Process & Application

DID YOU KNOW?

Manholes are critical parts of underground sewage infrastructure for municipalities, industrial properties, and commercial facilities across the country. They serve as essential access points and must be kept in good condition so workers can safely use them to assess, maintain, and repair components of the wastewater system.

Unfortunately, many manholes have deteriorated to the point of becoming unsafe, and even more are at risk of falling into disrepair. Left unchecked, these manholes can lead to blockages, collapses, safety concerns, and costly litigation.

There are two options for addressing deteriorating manholes: replacing the manhole entirely or rehabilitating the existing structure.

What is Manhole Rehabilitation?

Manhole rehabilitation is the process of restoring aging manholes and reinforcing the structure to avoid needing to fully replace the manhole. While replacement may be the only option for manholes that are damaged beyond repair, sewer manhole rehabilitation is ideal for situations in which the manhole can be restored through trenchless methods.

The Benefits of Sewer Manhole Rehabilitation

Commercial properties, industrial facilities, and municipalities can benefit from manhole rehabilitation. Trenchless manhole rehabilitation products and methods can revitalize existing infrastructure, prevent disasters, and restore the integrity of the system for years to come.

Extends Lifespan

Manhole lining systems protect the substrate from daily wear and tear as well as chemical attacks, corrosion, and other damage, extending the lifespan of the manhole regardless of shape, condition, or material.

Solves & Prevents Inflow & Infiltration Issues

Damaged manholes are vulnerable to inflow and infiltration issues caused by excess water from storms or the ground seeping through holes or cracks in the manhole system. If left unaddressed, these issues lower the capacity of the sewer system, increase operational costs, and damage the infrastructure. Protective linings, in conjunction with chemical grouts, solve existing inflow and infiltration issues as well as prevent the development of future challenges.

Prevents Corrosion

Corrosion caused by hydrogen sulfide (H2S), microbes, or environmental conditions damages the structure of concrete manholes or the mortar joints of [illegible] me, this corrosion leads to serious deterioration of the

manhole infrastructure. Installing an anti-corrosive manhole rehabilitation product prevents or slows the development of corrosion in the structure.

Increases Cost Savings

Replacing a manhole is expensive—not only the initial digging but also the rebuilding that follows. Alternatively, a manhole rehabilitation project provides significant cost savings because there is no digging, building, or downtime required.

Reduces Downtime

Manhole replacement requires facilities and municipalities to halt operations while crews and their equipment work. The manhole rehabilitation process, on the other hand, does not require any digging and does not disrupt daily operations. In most cases, sewer manhole rehabilitation crews can finish the job in 12 hours or less.

The Process of Manhole Rahabilitation: 3 Common Applications

There are many technologies that can assist with sewer manhole rehabilitation without the need for additional excavation. Products like cured-in-place (CIPM) manhole liners, cementitious lining systems, and polymer coating and lining systems help stop leakage, prevent corrosion, enhance the structure, and extend the service life of the manhole.

1. Cured-in-Place Manhole (CIPM) Liners

CIPM liners are tubes made of a variety of resins and other materials that are inserted into the manhole and inflated until it is tightly secured to the interior.

As the tube is inflated, the resin hardens and provides strong, long-term chemical resistance.

The use of a CIPM liner requires that the manhole is large enough for the inflated tube to fit into. If the manhole chimney is not wide enough, it may need to be removed so the CIPM liner can be placed into the widest part of the pipe. Additionally, the bottom of the manhole must be designed with a seal that will ensure nothing gets between the liner and the substrate while it is being inflated.

Installing CIPM liners often requires more equipment and larger crews than other manhole rehabilitation methods. However, they can be an effective and affordable option for rehabilitating traditional, cylindrical manholes.

2. Cementitious Lining Systems

Cementitious mortar lining systems are specially formulated to provide a permanent seal on the interior of the manhole corridor. They are applied with a low pressure spray or a trowel and can be installed quickly, with less downtime.

These liners act as a protective shield and are often reinforced with fibers to provide extra crack resistance and tensile strength. Unfortunately, their chemical resistance is not as strong as polymer-based lining systems, so they are not ideal for corrosive environments.

3. Polymer Coating & Lining Systems

Polymer coating and lining systems include products made from epoxies or polyurethanes. These systems are applied by hand with a trowel or via a pressure sprayer and are designed to protect the structure of the manhole from corrosion, chemical attacks, wear and tear, and impacts.

When polymer liners are installed correctly, they provide protection and support the structure for years. If the manhole is already corroded, use cementitious mortar liners to build the manhole back to its original shape. Then, after the polyurethane or epoxy liner is applied to the interior of the manhole corridor, it fully seals to the substrate. The result is an impermeable, durable, chemically resistant, anti-corrosive, environmentally safe shield that cures quickly and provides long-term protection.

Epoxy or polyurethane liners are the ideal sewer manhole rehabilitation

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CASE STUDY

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