

Rehabilitation Method For Laterals

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Abstract

Infiltration and inflow (I/I) bring excess water and backfill into the sewer, which can lead to loss of capacity and/or collapse of the pipe. ♦ Methods of reducing or eliminating I/I are presented, along with a discussion of the major forms of rehabilitation for sewer pipes, manholes, and laterals. ♦ It is the lateral and the reconnection of the lateral after pipe lining that is the major focus of this paper. ♦ Some of the methods used for mainline rehabilitation are also used for laterals. ♦ Methods of sealing the lateral connection to the main, with and without lining, are presented. ♦ Methods no longer in use are discussed as well. ♦

I. ♦ ♦ Overview

Sewer systems receive I/I through main lines, service lines, and manholes. ♦ ♦ To the extent soil is brought in with the water, the pipelines and structures can lose the bedding needed to support and protect them from collapse. ♦ Conceptually, the potential for I/I is less in shallow sections of the pipe or the manhole, because there is less water-bearing soil above. ♦ However, the footage of sewers on private property (the laterals) is estimated to equal the footage of mainline sewers.

II. ♦ Remove and Replace ♦

The traditional way to solve leaky sewer problems was to dig it up and replace it with new. ♦ This applies to pipe, manholes, and laterals, which are the main focus of this paper. ♦ The problems with Remove and Replace are:

- A. ♦ No guarantee of improvement,
- B. Expensive, and
- C. Not trenchless, i.e., this option is disruptive to the sewer system and the neighborhood.

III. Methods of Rehabilitation

A. ♦ Manholes

Coatings for manholes are used primarily to beautify and protect the manhole from corrosive atmospheres. ♦ Linings are less often used, but serve the same functions. ♦ Generally, most of the leaks have to be stopped first, especially in the case of coatings. Most coatings of epoxies, urethanes, and cement formulations need a clean and fairly dry surface for good adhesion. Running water leaks must be stopped before the coating can be successfully applied. ♦ Grouting is used to stop leaks prior to coating, placing a liner, or building a new manhole inside the old structure. ♦ Grouting is also used very effectively to stop water leaks without any further rehabilitation.

Point repairs are possible on manholes. ♦ The use of ♦ chimney seals ♦ and manhole lid plugs can stop I/I through the walls and lid of a manhole.

B. ♦ Mainline Sewers

Mainline sewers can be repaired by grouting, lining, or point repairs. ♦ Grouting is accomplished by the use of a combination television/grouting rig consisting of a camera, packer, hoses and pumps, controls, etc. ♦ Its aim is to place an impermeable material outside the defective joint or pipe, blocking any further leaks into the system. ♦ A video of the inside of the pipe during grouting illustrates the leaks to be sealed, the packer, and the effective water shut-off that is obtained.

Liners are very popular for rehabilitation of cracked and broken sewers. The major types are CIPP, Fold and Form, Deform and Reform, and Sliplining. All liners have an annular space, so leakage of I/I into the sewer at a lateral connection is very common.

Point repairs are used in mainlines to provide structural support and to stop I/I. The segmental type point repair device used in conjunction with chemical grouting can stop I/I and provide long-term structural strength. Some point repairs have designed accommodations for lateral connections to a mainline.

C. Laterals

Laterals can be repaired using liners and grouting, as is the case for mainlines; but the pipes are smaller and usually not as straight as the mains. Grouting of laterals has been done by flooding the lateral and removing the excess grout from the pipe after cure. Also, as with mainline grouting, small cameras and packers have been used to test and seal each joint from the house cleanout to the mainline. But the most popular use of grout today is with the lateral packer, which allows grouting of the connection and a specified number of feet up into the lateral from the mainline. Even though this method does not address all of the joints in the lateral, it is still widely used because it addresses the deepest and presumably worst section of the lateral, and it does not require access to private property.

Liners used in laterals are one of three types: The type that is blown into the lateral by air pressure, the Fold and Form type, and the inverted CIPP liner installed from the main. The first type and the Fold and Form type typically end a short distance from the main; no provision is made in the liner to seal the connection of the lateral to the mainline. At least two inverted liners use a Top Hat design to seal the connection as well as the pipe.

Connection seals are available from at least two suppliers. There is a Top Hat design involving the cure of a resin with ultraviolet light. The resin-saturated material is loaded onto a launcher that is pulled into position in the mainline. The launcher expands, placing the resin/fabric into the lateral opening. The ultraviolet light inside the launcher cures the resin, leaving a smooth surface throughout its surface.

The other seal is a PVC insert which is mechanically placed into the lateral opening. A seal is obtained by the use of heat-cured epoxy mastic on the saddle and an elastomeric swelling gasket on the barrel section of the insert. The launching device contains a heater for curing the epoxy-mastic.

To the best of our knowledge, the wax grouting technique is no longer in use; and the Sanipor method of flood grouting with sodium silicate is also no longer used in the USA.

If you have any questions, please contact [Dr. C.Vipulanandan](#)

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