THE UNDERGROUND UTILITIES EVENT
Underground Construction Technology | Jan. 29-31, 2019 | Fort Worth, TX

MANHOLE RENEWAL

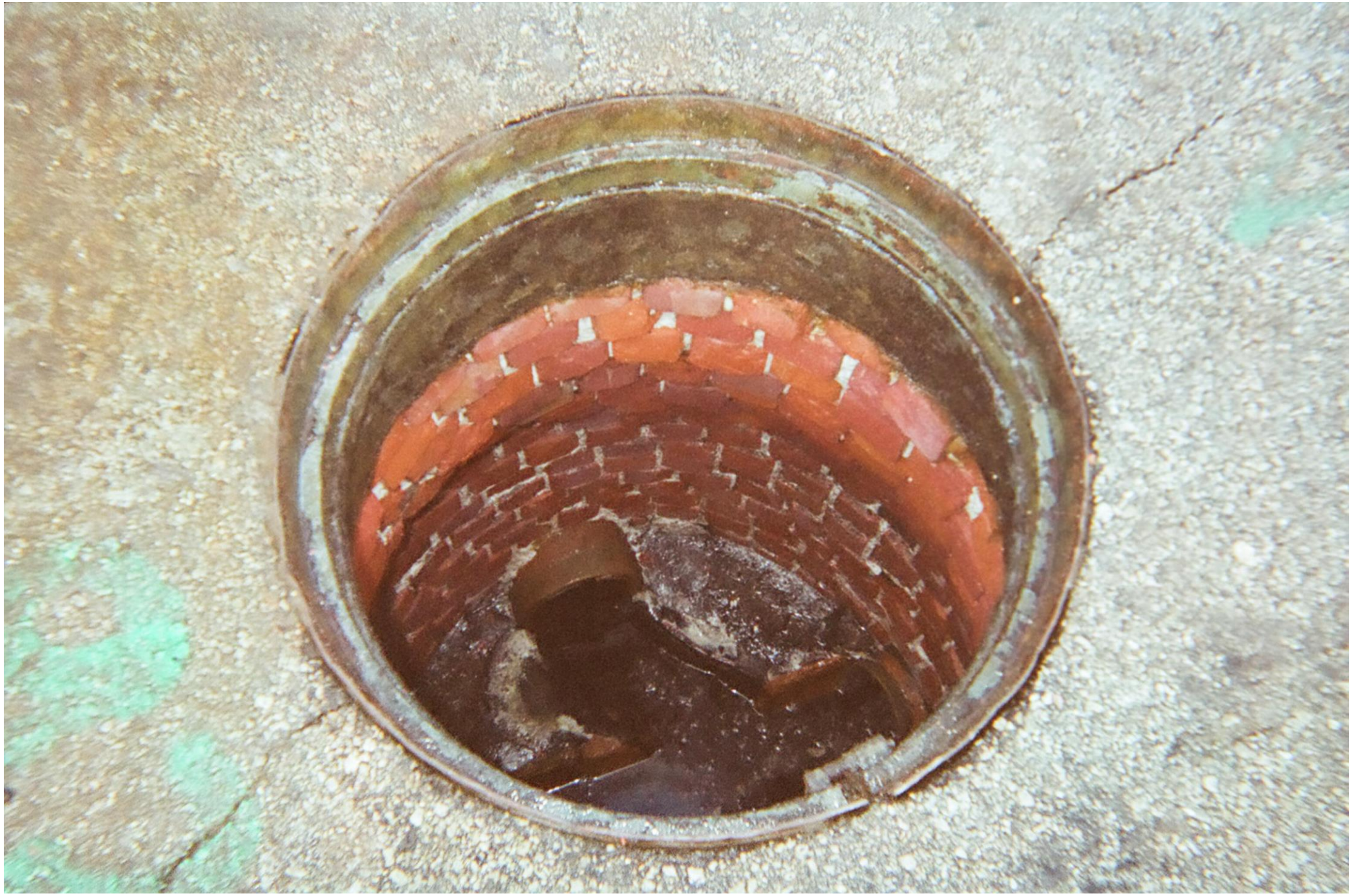
CEMENTITIOUS LINING

Bill Shook APM PERMAFORM

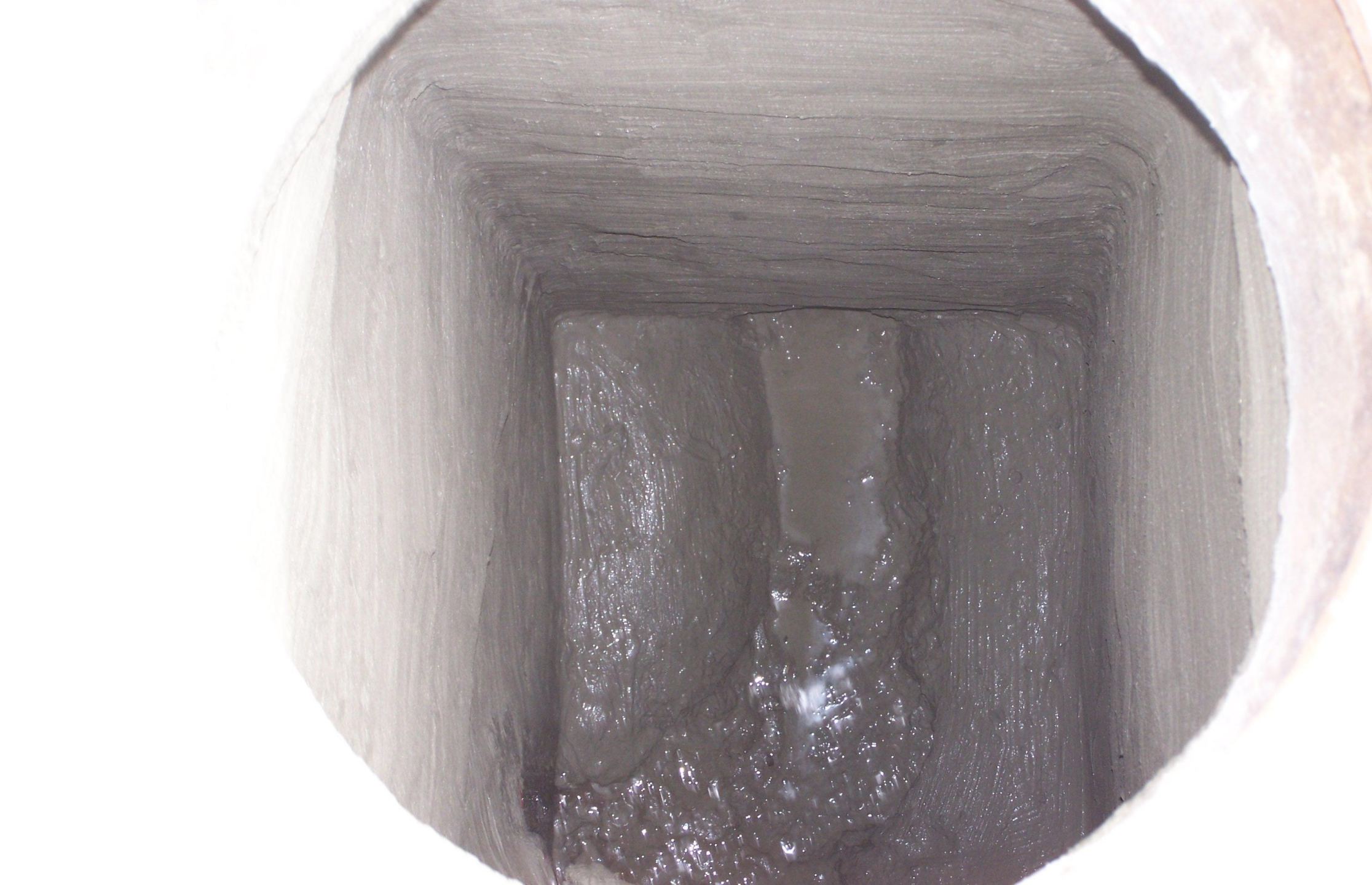
What happens if you choose not to renew?


DEETER FOUNDRY
LINCOLN NE


10/18/2006




08/03/2009 13:09
183010



ADVANTAGES

- ***QUICK*** – 3 man crew averages 4 to 8 manholes per day in just one set up
- ***WATER TIGHT*** – seamless shell withstands ground water pressures >100’
- ***STRUCTURAL*** – combination of strength and thickness restores full value
- ***COST EFFECTIVE*** – $1,000 to $1,500 per average manhole
- ***VERSATILE*** – low tech hand spray-trowel or high tech precision placement with spincaster
- ***EASY TO INSPECT*** – wet gage thickness and C-109 cube test
- ***CORROSION RESISTANT*** – coating, specialty cement or MIC additive
- ***EASE OF ACCESS*** – equipment easily transported to remote sites
- ***ADAPTIVE*** – *any diameter * any depth * any shape
- ***SMALL FOOTPRINT*** – compact equipment in one traffic lane
- ***NON-DISRUPTIVE*** – sewer flows can be active or internally diverted
- ***PREPARATION*** – pressure wash (444) and surface can remain wet

Designation: F 2551 – 09

Standard Practice for Installing a Protective Cementitious Liner System in Sanitary Sewer Manholes[1]

This standard is issued under the fixed designation F 2551; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

A sanitary sewer manhole may be repaired or rehabilitated by applying a prepackaged cementitious liner to the interior surface after it has been properly prepared and cleaned. Sanitary sewer manholes can be damaged by dynamic loading, abrasion, erosion, and corrosion.

1. Scope

1.1 This specification describes all the work required to structurally reinforce, seal, and protect sanitary sewer manholes. Applications include applying a prepackaged cementitious liner that can function as a full depth restoration or a partial depth repair. A uniform high-strength, fiber-reinforced cementitious mortar should be manually sprayed and hand troweled or centrifugally cast in a uniform, prescribed thickness to all cleaned, interior surfaces from the bottom of the frame to the bench. The cementitious liner may be applied to manholes constructed of brick, concrete, block, and various other materials.

1.2 A manufacturer's approved applicator shall furnish the complete application of the protective, prepackaged cementitious liner material. All of the cleaning, preparation, and application procedures shall be in accordance with the manufacturer's recommendations.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Manholes are permit required confined spaces in accordance with OSHA definition and should be treated as such, requiring confined space entry permits, appropriate monitoring equipment, and the associated personal protective equipment.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C 39/C 39M Test Method for Compressive Strength of Cylindrical Concrete Specimens
C 109/C 109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
C 309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete
C 494/C 494M Specification for Chemical Admixtures for Concrete
C 969 Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines
C 1140 Practice for Preparing and Testing Specimens from Shotcrete Test Panels
C 1244 Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill
C 1315 Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete
F 2414 Practice for Sealing Sewer Manholes Using Chemical Grouting

2.2 *ACI Standards:*[3]

ACI 301-05 Specifications for Structural Concrete
ACI 305R-99 Hot Weather Concreting
ACI 306R-88 Cold Weather Concreting
ACI 308R Practice for Curing Concrete
ACI 506R Guide to Shotcrete

[1] This practice is under the jurisdiction of ASTM Committee F36 on Technology and Underground Utilities and is the direct responsibility of Subcommittee F36.20 on Inspection and Renewal of Water and Wastewater Infrastructure.
Current edition approved May 1, 2009. Published June 2009.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333-9094, http://www.concrete.org.


630-627-6163

For more information:

APM PERMAFORM

800-662-6465

Bill Shook