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Standard Practice for Sealing Lateral Connections and lines from the mainline Sewer Systems by the Lateral Packer Method, Using Chemical Grouting[1]

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INTRODUCTION

The infiltration of water in sanitary sewer systems through the lateral service connection and the first few joints of the lateral below the groundwater table is a major problem for collection system owners. The combined length of the lateral services often exceeds the length of the mainline sewers. Often, the lateral services have been built with little or no supervision and little or no above-ground access for monitoring and inspection.

1. Scope

1.1 This practice covers the procedures for testing and sealing sewer lateral connections and lateral lines from the mainline sewer with appropriate chemical grouts using the lateral packer method. Chemical grouting is used to stop infiltration of ground water and exfiltration of sewage in gravity flow sewer systems that are structurally sound.

1.2 This practice applies to mainline sewer diameters of 6 in. to 24 in. with 4 in., 5 in., or 6 in. diameter laterals. Larger diameter pipes with lateral connections and lines can be grouted with special packers or man-entry methods. The mainline and lateral pipes must be structurally adequate to create an effective seal.

1.3 Worker safety training should include reviewing the biohazards and gases from sewage, confined spaces, pumping equipment, and related apparatus. Additional safety considerations including proper handling, mixing, and transporting of chemical grouts should be provided by the chemical grout manufacturer or supplier, or both. Their safe operating practices and procedures should describe in detail appropriate personal protective equipment (PPE) for the various grouting operations. Operations covered should include the proper storage, transportation, mixing, and disposal of chemical grouts, additives, and their associated containers.

1.4 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.

1.5 *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, health, and environmental practices and to determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F2304 Practice for Sealing of Sewers Using Chemical Grouting

2.2 *NASSCO Standard:*[3]

NASSCO Specification Guidelines Wastewater Collection System Maintenance and Rehabilitation, 2003

[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.

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[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 National Association of Sewer Service Companies (NASSCO), Inc., 5285 Westview Drive, Suite 202, Frederick, MD 21703, http://www.nassco.org.

3. Significance and Use

3.1 The inspection, testing, and repair of lateral connections for sanitary sewers are regular practice necessary for the maintenance and optimal performance of the system. It is important to identify methods that use the most current compounds and technology to ensure the reduction of infiltration and exfiltration. It is important to minimize disruption to traffic and lessen the environmental impacts for both the municipal and private owners.

3.2 This practice serves as a means to inspect, test, and seal sewer lateral connections and a predetermined portion of the lateral lines from the mainline sewer, having selected the appropriate chemical grouts using the lateral packer method. Television (or optical) inspection and sewer lateral connection testing are used to assess the condition and document any repairs.

3.3 This practice should not be used where mainline and lateral connections are found with longitudinally cracked pipe, structurally unsound pipe, or flattened or out of round pipe.

4. Contract Responsibilities

4.1 The lateral connection sealing contracts should define or affix responsibility for, or make provisions for, the following items:

4.1.1 *Notice of Client/Owner Requirements,* which are relevant to, and within the scope of, work to be performed under the contract.

4.1.2 *Municipal and Other Licenses and Permits,* (see Practice F2304) and assistance in obtaining approvals or consent from utilities or carriers or other persons or organizations upon whose property or authority might be impinged by the performance of work under the contract; or a written release from responsibility for the performance of work under the contract if and to the extent that such work is precluded by the inability to obtain approvals or consent. If working on private property permission from the owner's representative, the sewer line owner and the building department.

4.1.3 *Access to Site of Work,* to be provided to the extent that the owner is legally able to do so, if unable to, a written release from responsibility for the performance of work at sites where access cannot be made available.

4.1.4 *Clearances of Blockages or Obstructions,* in the sewer system, if any, if such clearance is required for performance of work under the contract and if such clearance is not otherwise provided for within the contract.

4.1.5 *Location and Exposure of All Manholes,* unless otherwise provided for in the technical specifications of the contract.

4.1.6 *A Manhole Numbering System,* for all areas of the project, and accurate manhole invert elevations when required for performance of the work.

4.1.7 *The Shutdown or Manual Operation of Certain Pump Stations,* if such becomes necessary for performance of the work.

4.1.8 *Water,* necessary for performance of work under the contract, with permission to use water from fire hydrants at the site of work, or other suitable designated sources within a reasonable distance from work areas.

4.1.9 *Disposal Area,* for all materials removed from the sewers during the performance of the work and the unencumbered right of the contractor to transport and expeditiously dispose of such materials at a location designated by the owner.

4.1.10 *A Secure Storage Area,* of a size adequate to accommodate the required vehicles, equipment, and materials for the period of the contract.

4.1.11 *Notice to Third Parties,* (such as utilities) of the contractor's intent to perform work in an area where such parties may have rights to underground property or facilities. Request for maps or other descriptive information as to the nature and location of such underground facilities or property and assurance of the contractor's ability to enter any public or private lands to which access is required for performance of the work under the contract.

4.1.12 *Information Pertinent to the Site,* including reports prepared under previously accomplished studies or surveys and other data relative to the project, such as, maps, drawings, construction specifications sewer system records, and so forth.

4.1.13 *Authorization,* to perform work that must be performed during nighttime hours, on weekends, or on holidays.

4.1.14 *Traffic Control,* by uniformed officers when the safety of workers or the public requires such protection, or as may be specified.

4.1.15 The contractor shall certify that backup equipment is available and can be delivered to the site within 48 h.

4.1.16 Submit equipment utilization schedule to the owner's representative for review and approval prior to commencement of the project.

4.1.17 Submit equipment operating procedures and systems to the owner's representative for review and approval prior to commencement of the project.

5. Chemical Grouts (Chemical Sealing Materials)

5.1 *Intent*—The intent of this section is to define the properties that a chemical sealing material must have to perform effectively in the intended application and under expected field conditions. The intended application is remotely sealing sewer lateral connections and a predetermined portion of the lateral from the connection to the mainline sewer with a lateral packer as specified in Section 12.

5.1.1 Generic chemical sealing materials currently in use are listed in 5.3 with the basic properties, performance standards, and mix ratios, which are known to give acceptable performance.

5.1.2 It is recognized that new and improved chemical sealing materials will become available from time to time. Sources, manufacturers, and product names of chemical sealing materials will thus change, and therefore; specific sources, manufacturers, and product names are not given.

5.1.3 In every case, mixing and handling of chemical sealing materials shall be in accordance with the manufacturer's or supplier's, or both, recommendations.

5.2 *General*—All chemical-sealing materials used in the performance of the work specified must have the following characteristics:

5.2.1 While being injected, the chemical sealant must be able to react/perform in the presence of water (groundwater).