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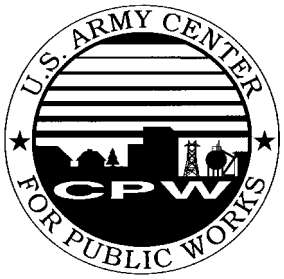
SEWER SYSTEM INFRASTRUCTURE ANALYSIS and REHABILITATION



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SEWER SYSTEM INFRASTRUCTURE ANALYSIS and REHABILITATION

1. Purpose. The purpose of this Public Works Technical Bulletin (PWTB) is to transmit the US Environmental Protection Agency (EPA) Handbook for Sewer System Infrastructure Analysis and Rehabilitation, EPA/625/6-91/030 (October 1991). This EPA publication provides guidance on the evaluation and rehabilitation of existing sewers.

2. Applicability. This PWTB applies to all US Army Public Works activities.

3. References.

a. AR 420-46, Water Supply and Wastewater, 1 May 1992.

b. Public Law 100-4, Clean Water Quality Act (CWA) of 1987.

c. *Existing Sewer Evaluation & Rehabilitation*. ASCE Manual and Report on Engineering Practice No. 62, WEF Manual of Practice FD-6. American Society of Civil Engineers, Water Environment Federation, 1994.

4. Discussion.

a. AR 420-46 prescribes policy, responsibilities, and procedures for operating wastewater treatment facilities in a manner that protects public health and the environment.

b. Wastewater collection systems (sewers) on military installations require periodic maintenance and repair, and occasional replacement. Sewers deteriorate from internal and external forces. Internal forces include crown corrosion (pooled water produces hydrogen sulfide which is later converted to sulfuric acid on the pipe crown), and attack by corrosive or abrasive materials contained in the wastewater (e.g., industrial wastes). External forces include overburden (soil and traffic), groundwater buoyancy, frost heave, penetration by surrounding tree roots, and differential soil settlement.

c. Wastewater collection system deterioration is aggravated by water leaking into the wastewater collection system through cracks in the sanitary sewer system pipes (defective pipes, pipe joints, or connections), manholes, and building laterals. Water entering the system in this manner is called infiltration. Relatively pure water that is deliberately diverted into the sanitary sewer system reduces the capability of the collection system. This entry method is called inflow because water sources such as roof or basement drains are intentionally connected to the sanitary sewer system. Both infiltration and inflow are grouped as one variable commonly referred to as Infiltration/ Inflow (I/I). The elimination of I/I by sewer system rehabilitation can substantially reduce the cost of wastewater collection and treatment, and avoid possible National Pollutant Discharge Elimination System (NPDES) permit violations.

d. Cost effective I/I elimination must be an integral part of any ongoing sewer operation and maintenance program to effectively prevent overall sewer infrastructure deterioration. A logical and systematic sewer system evaluation survey (SSES) is necessary to determine the presence and extent of excessive extraneous water flow. A collection system rehabilitation program for the failed or failing sewer system components and a preventive maintenance plan for the less deteriorated sewer system components can be determined after the SSES is conducted.

e. The enclosed EPA handbook can assist in the understanding and development of I/I. Step-by-step instructions describe sewer system evaluation methods, design parameters, and rehabilitation practices. Additional copies of the EPA handbook can be obtained from the EPA National Center for Environmental Publications & Information, Post Office Box 42419, Cincinnati, OH 45242-2419, commercial phone: (513) 891-6561.

5. Point of Contact. Technical guidance and/or questions regarding this subject may be directed to US Army Center for Public Works, CECPW-ES, 7701 Telegraph Road, Alexandria, VA 22315-3862, at DSN 656-5194, commercial (703) 806-5194 or PAXID CPWES.

FOR THE DIRECTOR:

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