

Calibrating The Test Models Used for Leak Control in Pipe Joints

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Abstract

Grouts are being used in stopping leaks in sewers, manholes, tunnels and many other applications. The aim of this study is to determine the effectiveness of grouts at leaking pipe joints. This is being achieved by developing relationships between infiltration through pipe joint before and after grouting the leaking joint. Since model test will be used to verify the effectiveness of grouts, model must be calibrated.

1. INTRODUCTION

♦ Infiltration due to leaking pipes, manholes, laterals and other components of a wastewater system will add to the problem of overflow and substantially load the treatment facilities. Frequent overflows not only lead to regulatory problems but also increase the treatment cost. The EPA estimates that 70-to-80% of this increase comes from the inflow and infiltration (I/I) of the home laterals [EPA 2000 Web site]. Several types of grout materials have been used in controlling I/I problems in wastewater systems and storm systems. But selecting the proper grout for solving the problem is a challenge.



2. OBJECTIVES♦

Developing a testing plan for grouts used in leak control. The specific objectives of this study are: I) Developing a model to represent leaking pipe joint and II) Calibrate the model for leak rates.

3. TESTING PROGRAM

Since 8♦ diameter pipes are popular in wastewater systems, this size was selected for the model test. Initial test will be conducted using a water pressure chamber to determine the relationship between maximum infiltration-rate at a given pressure. Then, the joint will be tested in a soil chamber, to provide the ground environment (conditions will apply), under the same conditions. Infiltration will be measured corresponding to the pressure and the results will be compared with water chamber test. Up to 800 lb of sandy soil with a permeability of 10^{-2} cm/sec was used.

Pressure ♦ leak rate relationships for pipe joints are being developed. In order to determine the effectiveness of grouting, the pressure test will be repeated.



Figure 1. ♦ Model Test on Leaking Pipe Joint



4. CONCLUSION:

Based on the calibration results, following observations are advanced:

- 1) Water pressure chamber can be used to initially calibrate the leaking joints.
- 2) The joints must also be calibrated in the soil chamber.
- 3) Relationship between infiltration and pressure (up to 5 psi) was obtained using the two methods.

5. ACKNOWLEDGEMENT

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6. REFERENCE

Environmental Technology Verification Program For Grouts Used For Leak Control In Wastewater Collection And Treatment Systems And Concrete Repair ♦ CIGMAT, October 2000.

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