



INFILTRATION AND INFLOW STUDIES

What Do They Really Show?

The studies show that many cities and towns with vitrified clay sewers have been well served by VCP for many years. The pipe has not been worn by abrasive material in the sewage, eaten away by the corrosive waste on the inside or the corrosive soil on the outside.

It would be unrealistic to say that the older sewers do not have infiltration or inflow. For the most part they do have one or the other, some even both. They were designed that way! The cliché was “dilution is the solution to pollution.” Many people do not realize that clay pipe lines were installed about 50 years before sewage treatment plants were commonplace. These early lines were often designed to allow infiltration and inflow not only to dilute the sewage, but to aid in its flow downstream. A clay pipe sewer that is still in service after 50 to 125 years has demonstrated that it is an extremely durable product. Most materials used in sewers cannot make this claim.

INFILTRATION

Infiltration is the ground water that actually gets into the system through the pipe-and manholes.

Many years ago the accepted jointing system for clay pipe was either cement mortar or hot poured or cold applied bitumastic compounds. Even the factory applied bitumastic joints of the 40’s and 50’s were not permanent or water-tight and have become a source of leakage and root penetration.

Television inspection of existing sewer lines often reveal pipe that have broken through the years from one cause or another. These breaks are another source of infiltration. In the majority of cases, these breaks were caused by errors at the time of construction or by the pipeline being subject to backfill loads that were not predictable at the time of installation.

We must remind ourselves that sewer lines were not routinely tested for line acceptance until the late 1950’s resulting in nearly 75 years of generally untested sewer construction practice. It is likely that much of the cause of the infiltration occurred very early in the line’s history.

Leakage in manholes can contribute greatly to the infiltration problem. Manhole joints and porous manhole walls are a source of leakage as are the points of pipe entry and exit through the manhole wall. Sometimes the leakage is directly through a porous or deteriorated manhole bottom.

INFLOW

Inflow is the extraneous water that enters a sewerline from connections such as roof,

foundation and footer drains. It includes both ground water and surface run-off

Are there inflow problems in some of the old sewers? Of course. In the past it was common practice to connect roof, basement and foundation drains to the sanitary sewer. Many areas have low manhole tops that are under water in heavy rains. These all contribute to excessive flow at the treatment plant. Inflow problems should be isolated and corrected and not be attributed to the sewer pipe that simply carries the water from the point of inflow to the treatment plant.

Inflow can be eliminated or significantly reduced by disconnecting unwanted-drains, connections and raising manhole tops.

MAINS VS. LATERALS

Many communities have found that correcting mainline leakage has only partially reduced the infiltration and inflow. It has been reported that as much as 43% of the excess flow was attributable to other sources, presumably the service lines. Of the total amount of infiltration and inflow entering the service lines, about 76% entered through faulty lateral connections to the mainline. Excavations have revealed breaks in lateral connections, missing joint materials and poor construction practice. (ENR 3/96)

THE GOOD NEWS

The good news is that in most instances these studies show that the structural integrity of the clay pipe sewer line is intact. The pipe has withstood the test of time, and can be sealed or repaired without replacement.