



FLEIS & VANDENBRINK
DESIGN. BUILD. OPERATE.

SEEING I/I THE RIGHT TOOLS MAKE A DIFFERENCE

Identifying excess water in sewer systems can be critical for many Michigan communities, especially those with consent agreements to stop overflows at their wastewater treatment plants.

Unfortunately, accurately identifying the source of excess water, known as infiltration and inflow (I/I), can be frustrating, time consuming, and costly for municipal leaders. I/I can inundate sanitary sewers, decrease the efficiency of treatment, and cause sewage volumes to exceed design capacity.

Excess flows may affect the quality of treatment at your plant or cause overflows of untreated or partially treated wastewater to a nearby lake or river creating health hazards and costly permit violations. Failure to get the water out of the system can also force communities to install bigger sewers and expand the wastewater plant.

Inflow is caused by storm sewer system connections to sanitary sewers, leaking manholes and covers, and leaky clean-out caps. Infiltration is caused by groundwater seeping into sewers that have cracks, open joints, or other deficiencies due to age, improper construction or damage.

Although inflow is technically different from infiltration, it may be difficult to determine which type of clean water is causing issues; and even harder to find the sources.

"It's been frustrating trying to locate infiltration and inflow, especially in an older community like Pontiac," said Brian Coburn, chief engineer for the Oakland County Water Resources Commissioner's office which oversees the 135-mile Pontiac Sewer Disposal System.

ENGINEER'S TOOLBOX HAS EVERYTHING FOR I/I STUDY

At Fleis & VandenBrink (F&V), we use everything in the engineer's toolbox to locate and reduce your I/I and that means overall savings in pipe size, future treatment plant capacity, and operational costs for urban communities.

Some of the tools used to locate I/I include performing manhole assessments, smoke testing, closed circuit televising (CCTV), and mass flow monitoring (MFM).

- Manhole field inspections identify structural defects and leaks within the manholes. A comprehensive assessment can usually be completed at the top of the manhole without entry.
- Smoke testing is a relatively fast, economical, and effective method of identifying rainwater coming from cross-connections. An odorless, nontoxic smoke is pumped into the sewer system to locate damaged or improper connections like a catch basin connected to the sanitary sewer or a broken sewer lateral clean-out cap.
- Televising an entire sewer system can be expensive, but televising a small amount at a time and prioritizing suspect areas provides insight into what causes any backups or blockages. The data can be stored in the sewer system GIS and updated as you complete future inspections.

- Mass Flow Monitoring (MFM) is a cost-effective, specialized technique utilized by F&V staff that uses depth transducers and flow monitors installed in many manhole locations. It is much less expensive than the cumbersome metering equipment used in the past and provides data at more locations compared to installation of a few expensive flow meters.



MFM technology, which monitors dry and weather flow patterns and estimates flows based on depth monitors, has been used in both big and small communities. The monitors can be easily moved to further refine hot spot areas in the sewer system and no confined space entry is required, making the process of installing the monitors much safer.

Lift station flows and site rain data are also incorporated as part of the data for the analysis. Results can be used to prioritize additional field investigation.

The Oakland County Water Resources Commissioner's office wanted to more accurately pinpoint I/I sources so a cost-effective plan could be developed for the entire system. It is wrapping up Phase 2 of the project with F&V.

"MFM has been beneficial to us. We found leaky sewer leads everywhere and we are now able to target those areas for I/I reduction," Coburn said. "We like it. It's not intrusive to residents and it's quicker and easier to do. MFM is cost-effective and a great advancement in technology."

Last year's wet weather and high groundwater raised havoc for municipal leaders trying to keep excess clear rainwater or groundwater from coming into the sewer system. The excess water led to sewer piping and treatment system overflows, causing backups into basements.

It has been a drier year so far and water levels are down a bit, but as most Michiganders know, the next few months can be unpredictable and when it rains, it pours.

Now is a good time to plan your infiltration and inflow study. Monitors can be installed in late summer or fall to capture dry weather baseline flows to compare to late fall and early spring wet weather events. If you need help developing a strategy to reduce the cost of excess I/I into your sewer system, please contact F&V's Elaine Venema at evenema@fveng.com or at 800.494.5202.

IN THIS ISSUE:
SEEING I/I
THE RIGHT TOOLS MAKE A DIFFERENCE

YES! Please send me more information or change your mailing list!
Simply email us at newsletters@fveng.com or fax this sheet to F&V in:

Grand Rapids	616.977.1005
Grand Blanc	810.771.7860
Farmington Hills	248.536.0079
Kalamazoo	269.382.6972
Midland	989.837.3290
Muskegon	231.726.2200
Traverse City	231.932.8700

Or mail to our corporate office at:
2960 Lucerne Drive, SE
Grand Rapids, MI 49546
www.fveng.com

Name: _____

City/Town/County: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____

In order to minimize our environmental footprint, F&V would like to provide you with future newsletters via email. If you would like to receive future newsletters electronically, email us at info@fveng.com.



"Mass Flow Monitoring has been beneficial to us. We like it. It's not intrusive to residents and it's quicker and easier to do. MFM is cost-effective and a great advancement in technology."

Brian Coburn, Chief Engineer for the Oakland County Water Resources Commissioner's Office

PRESORTED STANDARD
US POSTAGE PAID
GRAND RAPIDS MI
PERMIT NO 848

FLEISCHMANN & VANDENBRINK
OFFICE: 616.977.1000 FAX: 616.977.1005
2960 LUCERNE DR SE STE 100, GRAND RAPIDS, MI 49546