

Municipal Case Study

City of Hamilton Chooses Vortex Flow™ Insert for Major Infrastructure Project

A revolutionary and award-winning solution for odour and sewage control

Vortex Flow™
ODOR & CORROSION CONTROL

Product: Vortex Flow™

Size and Length:

Two 20 meters manholes in depth

Construction Company:

CoCo Group

Municipality:

City of Hamilton



*Custom-Built
Vortex Flow™ Insert*



THE CHALLENGE

The population of Hamilton is on the rise and growing rapidly. Development in the area has increased in response to this boom, especially in the city's east end around the Stoney Creek community.

To support this ongoing growth, the City has undertaken several large infrastructure improvement projects. One of these projects involved sanitary sewer upgrades at the corner of Rymal Road East and Regional Road 56, which supported ongoing road widening and intersection improvement work in the area.

“The City engineers were incredibly proud that they were able to complete the installation of not one but two VFI units over the course of two consecutive years.”

These sanitary sewer improvements had to accommodate the demands that both new and future population growth would place on the system. As a result, the two manholes where the effluent sanitary waste would be collected needed to be extremely large, reaching 20 meters in depth. By comparison, a standard manhole is generally between three to seven meters deep.

But a high volume of effluent material vertically dropping into a manhole at that depth needed to be properly managed, otherwise, sewage odors and corrosive gases and elements could drastically reduce the lifespan of these concrete-drop manholes.

THE SOLUTION

The City of Hamilton had worked with IPEX previously and was familiar with its line of municipal sewer products.

There was really only one suitable specialty product on the market that could meet the needs of this project: IPEX's Vortex Flow™ Insert (VFI).

Winner of the American Public Works Association (APWA) Technical Innovation Award, VFI's revolutionary technology helps eliminate odorous emissions and minimize corrosion in vertical sewer drops.

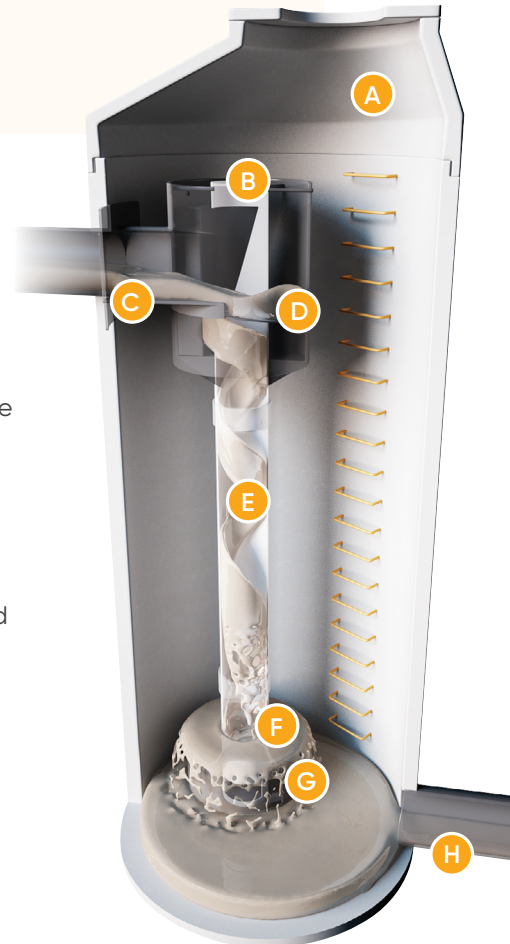
Hydrogen sulphide (H₂S) emissions from sanitary sewers can eat through

a concrete drop manhole. By oxidizing dissolved H₂S, a VFI in a municipal sewer drop can significantly reduce concrete and metal corrosion, reducing maintenance, extending the sewer life, and providing the municipality with future cost-savings.

VFI's patented spiral flow design uses the wastewater's own flow energy to suppress the turbulence, which releases noxious gases. With no moving parts and requiring no maintenance, VFIs deliver significant long-term cost savings for municipalities across North America.

By increasing dissolved oxygen levels in wastewater and oxidizing sulphides and other odorous compounds, using a VFI in a drop structure reduces the need for costly chemical injection, high maintenance biofilters, and air scrubbers. It also provides long-term cost savings for the City when these units eventually start reaching their peak flow requirements.

While a normal-sized manhole might not require the same solution, a manhole of this size and depth needed this type of energy control to maintain the integrity of the access point for as long as possible. Extending the lifespan of this manhole helps reduce the financial, social, and environmental cost of constant upgrades and replacements over the years.



- A Influent Line
- B Drop Structure
- C Vortex Top Form
- D Vortex Channel
- E Vortex Drop Shaft
- F Flow Exit
- G Energy Dissipation Pool
- H Effluent Line

IPEX custom-built two new VFIs to accommodate both current and future demand on the system, designing each unit to meet the peak flow requirements for local wastewater in the area.

There was a learning curve for the crew installing these massive units, including understanding how the pieces fit together, how they would arrive on site, how the crane would be set up and how the support bracing would work. Once the team arrived on the project site, however, the assembly and installation became much easier.

IPEX reps were also on-site to provide training and support to the team of skilled contractors and engineers working on the project. Our reps offered guidance related to the install and handling of the VFI and answered questions the crew had about its design and purpose.

Although this was a big project, the team worked in the confined spaces of the two manholes to set up scaffolding, get each VFI unit in place, and ensure they remained intact. The team also braced the unit and used custom-designed stainless-steel strapping to secure them into place.



THE RESULTS

Although Hamilton City Planners spent years preparing and designing the new sanitary sewer systems, installation for each Vortex Flow™ Insert took just days to install, from scaffold and safety barrier construction to assembly and finally bracing the VFI in place. The first installation was completed in 2020, and the second in 2021.



Ease of Installation

Given the sheer scale of this project, the City engineers were incredibly proud that they were able to complete the installation of not one but two VFI units over the course of two consecutive years.



Lower Maintenance Costs

Without a solution like the VFI in place, the effluent flow would have gone entirely unmanaged as it poured into the drop structure at a high volume. These VFI units will help reduce future costs associated with replacing this infrastructure frequently due to the corrosion caused by sewer emissions and gases.



Lower Social Costs

These future costs are not only financial but also include the social cost of infrastructure work, including environmental impacts, disruption to traffic flows and existing infrastructure every time the drop structures need be replaced.

Vortex Flow™ Inserts will help the City of Hamilton maintain the integrity of both manholes and extend their lifecycles. Plus, their ease of installation and maintenance means the team at the City is now confident in using these products again for future infrastructure projects in the municipality.