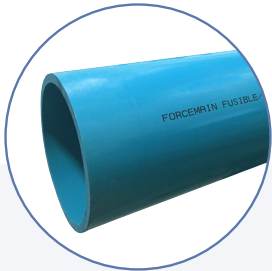


# Case Study

## Complex Watermain Installation under the Rideau River Brings Municipal Drinking Water to Manotick

Demanding project using 600mm Fusible PVC pipe was one of the longest installs in Canada and first in Eastern Canada



**Product:** Fusible Brute™

**Client:** City of Ottawa

**Engineering Consulting Firm:**

JL Richards & Associates  
Limited Ottawa

### FUSIBLE BRUTE™

- Continuous pull-in lengths of over 1,500 meters
- Greater pull force rating
- Better flow rates from a reduced wall thickness
- Abrasion and scratch-resistant
- Strength and long service life



### The Challenge

Bringing municipal drinking water to the community of Manotick, Ottawa, was a long, complex and demanding project.

One of the most challenging aspects of this extensive project was installing piping systems underneath two separate 300-meter river crossings on the Rideau River. These crossings served a significant portion of Manotick residents that live on the island at the centre of town.

But installing watermains beneath a river is no easy task.

Using horizontal directional drilling (HDD), the pipes had to be installed deep under the riverbed – more than 5 meters. The design of the piping system also included several extremely sharp turns, meaning the bend radius requirements were significant.

While the piping system's required shape made this a difficult project, the depth of the trenchless installation presented other challenges. Given how deep the pipe had to be installed, the pressure on the material and the risk of buckling were considerable.



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Boasting continuous pull-in lengths of over 1,500 meters, FPVC offers greater pull force ratings compared to High-Density Polyethylene (HDPE) as well as being lower in cost and lighter in weight.

FPVC piping systems also offer unparalleled strength and a proven long service life compared to alternative piping materials.

IPEX's patented fusion process incorporates a proprietary PVC formulation and a unique combination of heat, pressure and time, using slightly modified standard industry fusion machines. Fusible Brute™ pipes also have distinctive properties allowing for full-strength butt fusion joints. Testing performed in accordance with ASTM D-638 methods demonstrates that the tensile strength of the fused joint equals the tensile strength of the pipe.

Additionally, in order to protect at-risk fish species that live in the Rideau River, specifically Burbot, the watermain project needed to be completed before the spring when these freshwater fish lay their eggs.

Considering the Canadian winter conditions, the team were up against the following significant obstacles to see this project to completion:

- Pipe ends and fusion area needed to be maintained above 4°C
- The pipe is stiffer
- Installers had to keep drilling fluid away from freezing

## The Solution

The only trenchless material with ample flexibility and strength for the specific challenges of this project was IPEX's Fusible Brute™ DR18 Polyvinyl Chloride (FPVC).

PVC is the most widely installed material in water systems today. Fusible Brute™ FPVC pipes combine the mechanical properties of PVC with a patented butt fusion process and offer the only available method of installing a continuous, monolithic, fully restrained PVC pipe system.




The project was a success with the use of Fusible PVC. The long-term deformation strength of Fusible PVC allowed the installation by Horizontal Directional Drilling under the Rideau River at a depth that would not be feasible with HDPE pipe. The internal diameter of the 600mm and 400mm Fusible PVC allowed additional hydraulic capacity compared to the same size HDPE pipe. The Fusible PVC also provided continuity from the open cut sections of the project, which used Bionax PVC.

**Toby Racine, Civil Engineer**  
JL Richards & Associates Limited

Fusible PVC also has a reduced wall thickness relative to HDPE, with better flow rates and less material in its given pressure class. It also has gasket-free joints and excellent abrasion and scratch-resistant properties.

Following several meetings between the City of Ottawa, IPEX, the consultant and the contractor, it was determined that fusible PVC was the best option, considering the length of the trenchless crossing, the radius of the bore and the combined strength and flexibility of the PVC material itself.



One of the longest such install  
in Canada and a First in Eastern Canada

## The Results

With deep FPVC knowledge and trenchless expertise, IPEX was able to assist the engineers and contractors throughout every stage of the Manotick project. This installation was one of the first in Canada: The 300-meter pull using 600mm FPVC was longest of its kind in Eastern Canada.

The team was on hand to ensure the fusion went smoothly, the pipe was laid properly, and the bend radius of the pipe was accounted for during the install. IPEX was onsite for the duration of the project, which lasted more than three months.

Over the course of the job, the IPEX team was always available and willing to step up during any challenges that presented themselves. By taking a team-oriented, collaborative approach, they were able to overcome even the most demanding aspects of the job and complete the project on time.

The success of the Manotick Watermain link project using Fusible Brute™ has opened the door to future watermain projects in the City of Ottawa and across North America.