



# WINNIPEG

Early adaptation of backwater valve by-laws and incentives

## THE SCIENCE

Backwater valves are recommended or required by many municipalities across Canada as a measure to reduce the risk of sewers backing up into homes during extreme rainfall events. Sewer backup can happen in any home, new or old, when municipal sewer systems receive more water than they can handle. This additional volume of water can create a surcharge, pushing water and untreated waste backwards through private sewer laterals and eventually causing sewage to back up in homes through basement floor drains, toilets and sinks.

When a proper backwater valve is in place, it can considerably reduce the risk of damage to homes from sewer backup. In Canada, municipalities have developed a variety of mechanisms to encourage the installation of backwater valves. This includes education and subsidy programs for existing homeowners. By-laws and code enforcement are some approaches used to influence new home construction. There is a wide consensus among local government experts across Canada that backwater valves are a valuable protection mechanism for all homes connected to a sanitary sewer system.

Data provided by insurance companies indicates that damage to homes from sewer backup has been growing for three or four decades, including an alarming increase over the last five to 10 years. In recent years damage to homes from sewer backup and other water damage has exceeded \$2 billion a year. Most communities taking action

to encourage the use of backwater valves are responding to a major local loss event, so many actions have been implemented relatively recently. Some communities, like Winnipeg, took initial action in the 1970s, and continue to evolve and renew their programs to prevent damage to homes from basement flooding.

## THE TRIGGER

The City of Winnipeg is located in a former glacial lake with a remarkably low-lying flood plain over a flat topography. Sewers and other buried infrastructure are particularly vulnerable to damage from flooding because they are located below ground at very low elevation.

Moreover, sanitary sewers and stormwater systems are vulnerable to water inflow and infiltration from also extreme rainfall events. The City has experienced many extreme rainfall events in the past that have overwhelmed the capacity of the storm and wastewater management systems.

These extreme rainfall events have convinced local authorities early on to think more aggressively about possible mitigation measures to protect homes from basement flooding. In particular a backwater valve by-law was developed in 1979, followed by a sump pump by-law in 1980.



**Backwater valve  
normally open**



**Backwater valve  
normally closed**

**Figure 12:** Depending on the plumbing in a house, homeowners may need one or more backwater valves of either the normally open or normally closed type to properly protect their basement from flooding. The City of Winnipeg recommends that homeowners consult with a plumbing contractor licensed by the City for an assessment of the cost involved in installing any of these two eligible devices.  
(Source: City of Winnipeg)

## THE APPROACH

Winnipeg was one of the first municipalities in Canada to create a by-law requiring the installation of backwater valves in all new homes. Since 1979, houses have to be built with an in-line backwater valve on the sanitary sewer connection. Approximately 28 percent of houses across the City have installed a backwater valve and 15 percent have installed a sump pit system since the implementation of the by-laws.

The core area of Winnipeg was built prior to 1979. Recently the City has implemented a subsidy program to encourage the installation of backwater valves and sump pumps in older homes. Winnipeg will pay 60 percent of the invoiced costs for the installation of an in-line backwater valve, up to a maximum of \$1,000. The City will also pay 60 percent of the invoiced cost of a sump pit drainage system up to a maximum of \$2,000. The province of Manitoba and the City of Winnipeg share equally in the cost of funding the program. All homes in Winnipeg qualify for the program regardless of their flood history.

## THE OUTCOME

Early implementation of backwater valve and sump pit by-laws made it possible to protect a relatively large part of the City of Winnipeg against basement flooding. Over time, the number of homes with protection has continued to grow. In particular it has been possible to ensure that the risk of basement flooding is low in new developments for more than 35 years.

It was important to extend Winnipeg's efforts into the historic core of the City. Winnipeg has made significant commitments to renewal of sewer infrastructure, and this is now supported by the Basement Flood Relief Subsidy Program. Over the past three years, the program has generated an additional 1,532 backwater valve and 2,275 sump pit approved applications, a significant increase in the number of protected homes in the City. Securing cost sharing with the Province of Manitoba was an important element to the early success of the subsidy program.

## A WORD FROM WINNIPEG

When asked about his thoughts on the by-laws and the flood damage reduction subsidy program developed by Winnipeg, Charles Boulet, Senior Project Engineer for the City of Winnipeg responded that he would completely support the implementation of similar programs in other cities since it represents an effective means to prevent basement flooding. One of the biggest challenges

that Winnipeg faced when implementing the subsidy program was to ask the province for a fifty percent cost-sharing. "We received a commitment from them for the last three years and we are going to ask for three more," said Mr. Boulet.

Through his career, Mr. Boulet noticed that homeowners are not always aware of whether or not they have a backwater valve or sump pump, where it is located and how it needs to be maintained. In order to better educate the public, the City of Winnipeg has been hosting presentations directed to homeowners through a local Home and Garden Show where they explain to the public how to find and maintain a sump pump and backwater valve. They also send flyers to homeowners on a regular basis as well as information on backwater valves.