City of Ottawa Tackles System Overflow and Flooding with Tempest Inlet Controls

Over the past few decades, rain events throughout North America have become more frequent and substantial. The combination of increased rain and outdated infrastructure has caused many municipality storm sewers and drainage systems to exceed capacity, resulting in flooding and additional expense.

> **The Tempest units we deployed in the City of Ottawa are very durable, which allows us to install them in cold weather conditions. They are also very lightweight and easy to install.**
>
> **Curtis Friesen,** Multi-Drain Inc.

To cost-effectively mitigate the problem, municipalities are turning to the use of inlet control devices, or ICDs. Together with catch basins, ICDs limit the amount of storm water runoff that can enter a system during a storm event. ICDs control water flow at the sewer inlet, allowing excess water surge to remain in catch basins or temporarily above the ground until the storm subsides, thus preventing sewer system backups and overflows.

PROBLEMS IN THE CITY OF OTTAWA

In the mid 1980s, the City of Ottawa introduced the concept of minor and major storm drainage, also referred to as a dual drainage system. This system features a minor underground system designed to handle typical rainstorm activity and a major system that involves the grading of roads and water retention facilities to handle significantly larger and less frequent storms. Unfortunately, several communities built prior to the 1980s did not include the level of protection provided by the balanced dual drainage system found in newer communities.

In the summer of 2009, the City of Ottawa experienced a significant rainstorm that generated more than 100 mm of rain in a 24-hour period. In older Kanata and Stittsville communities located in the west end of the city, nearly 1,500 basements flooded when surface drainage entered the storm sewer without flow restriction. The extraneous flow in the storm system also

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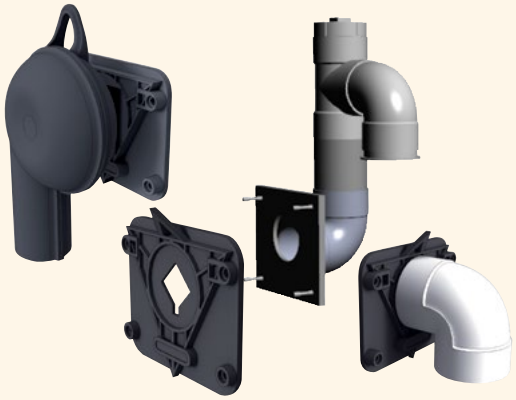
TEMPEST™
INLET CONTROL DEVICES

- ☑ Easy to Install, Inspect & Maintain
- ☑ Odor Control & Corrosion Resistant
- ☑ Prevent Floatables
- ☑ Control a Wide Range of Flow Rates



placed a significant strain on the sanitary sewer system — as storm water entered basements through window wells, foundations and improperly-sealed back water valves and cleanouts, it began to drain into the sanitary sewer system.

FINDING THE RIGHT SOLUTION

Following the flooding, an investigation led by Infrastructure Services Department and supported by several city departments was initiated to pinpoint the problem and determine a flood control solution to prevent future flooding in high-risk areas. A combination of municipal and public input, field assessments, topographical surveys, and sewer system testing and inspection demonstrated the need to limit the amount of storm water that enters the storm sewer system to prevent the capacity of the pipes from being exceeded.

To limit the amount of water that can enter the storm sewer, the City of Ottawa decided to implement ICDs in catch basis, as well as seal maintenance-hole covers and ensure proper storm water storage through the strategic use of berms, regrading and open space. They determined that ICDs were the most cost-effective solution that would result in minimal disruption to the existing community.

With flow rates starting at 2 LPS/32 GPM, Tempest units are mounted over existing sewer inlets to restrict flow and prevent debris from entering the sewer system.

"Our only other solution was to excavate and replace the pipes with larger pipes," says Graeme Stewart, senior standards engineer with the City of Ottawa. "While ICDs were not a new idea, we wanted something that we could easily remove, inspect and maintain without having to go into the catch basin. We also wanted to control odor and prevent floatables from entering the sewer, which offers significant advantage from an environmental standpoint."

> **"In addition to meeting the basic criteria, IPEX was proactive in addressing our concerns and further developing the solution to meet our needs as an approved product for the City."**
>
> Graeme Stewart,
> Senior Standards Engineer

To settle on the right solution, the City of Ottawa sent out a request to review ICD options based on a specific set of technical specifications. Several manufacturers submitted products for review. "This was a new process for us — we would usually purchase an existing product, but we couldn't locate anything that met our criteria," says Stewart. "We wanted to help advance the industry by working with manufacturers on product development, guarantee them a certain amount that we would purchase and then develop an approved product list for the city."

While the City of Ottawa received some products that successfully met the criteria in different categories, the Tempest ICD system from IPEX proved a viable solution to provide the required flow control in several catch basins throughout the city. "In addition to meeting the basic criteria, IPEX was proactive in addressing our concerns and further developing the solution to meet our needs as an approved product for the City," says Stewart.

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THE NEXT GENERATION IN INLET CONTROL

Available in a wide range of flow rates starting from 2 LPS/32 GPM, Tempest units are mounted over existing sewer inlets to restrict flow to a more narrow range. Constructed of durable PVC that is corrosion resistant, the units feature an air-tight neoprene gasket, a universal back plate that accommodates both square and round catch basins, and no moving parts for a quick and easy installation. A quick release mechanism on the unit can be accessed with a reach bar to easily lift out the unit for maintenance. In addition to controlling flow, Tempest systems can help alleviate odor emissions and prevent flowing debris from entering the sewer system.

The City of Ottawa Multi-Drain Incorporated, a local drain and sewer repair specialist, undertook the task of cleaning out catch basin structures and installing nearly 1,000 Tempest units throughout the city.

"IPEX offers a good product and we definitely recommend the Tempest ICDs as a good choice for areas of heavy rainfall," says Curtis Friesen with Multi-Drain Inc. "The Tempest units we deployed in the City of Ottawa are very durable, which allows us to install them in cold weather conditions. They are also very lightweight and easy to install."

A COST-EFFECTIVE APPROACH

With the use of Tempest ICDs, the City of Ottawa can rest. They are now able to restrict flow into the sewer system during significant rainfall events, preventing a repeat of the residential flooding and flash flooding that was experienced during the summer of 2009.

"Many cities strive to keep water off the roads and in the pipes, but we have taken strategic measures to effectively manage overland flow in a way that temporarily keeps the water above ground until the storm waters subside rather than overflowing the system and flooding homes," says Stewart. "We are confident that the ICDs and the additional measures we've taken will ultimately help us minimize the impact of storm water where we previously had problems. It's all part of an integrated system, and certainly Tempest ICDs play their part."

Ultimately, installing the Tempest units was much less expensive, less disruptive and less time consuming than traditional approaches that can require full catch basin and pipe replacement — saving the City of Ottawa significant cost, hassles and future risk.

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