Town of Whitby Tackles Overflow & Flooding

Located east of Toronto, Whitby has a population of more than 122,000 and encompasses more than 146 sq km, including one of the finest natural harbors on Lake Ontario. Over the years, the town of Whitby has done its best to manage its storm water. In the predominantly urban southern portion of the town, the storm sewer system is sized to handle a five-year storm. Hydraulic modeling has been regularly used throughout the town to identify grade lines for 100-year flow events, which has helped determine proper basement grades to prevent flooding and catch excessive flows. Storm water management ponds also collect the first 25 mm of rainfall to provide pollution control. While these methods have successfully prevented flooding during smaller rain events, significant rainfall events and costly flooding ultimately compelled the municipality to find a better solution.

Storms in 1985 created excess flow through downspouts and weeper systems and caused the sewer system to exceed capacity and storm water to flow into low-lying neighborhoods and basements. After this, the town set out to investigate the problem. Unfortunately, the municipality was not aware of newer techniques being used in other areas of the country, and only minor, inexpensive, conventional methods were implemented—including the disconnection of downspouts and the implementation of a floodplain that would discharge to a local creek.

More than 20 years passed without major incident until summer storms in 2008 caused more water to enter Whitby's storm sewer system than it could handle. The flood significantly impacted the downtown area and surrounding residential subdivisions, prompting the municipality to once again investigate solutions to regulate the amount of storm water entering the sewer system.

Following the flooding in 2008, updated research and information identified inlet control devices (ICDs) as an effective and economical solution. The town approved new capital funds for the installation of ICDs in a series of catch basins in flood-sensitive areas. More stringent hydraulic modeling was used to identify areas where storm water ponding could temporarily occur above ground during heavy rain events and to determine precisely where flow route improvements via ICDs were needed to ensure that water drained away from residential properties.

For the ICDs, the town of Whitby selected the Tempest ICD system from Ipex. Available in a wide range of flow rates, from 32 to 270 gal per minute, Tempest units are mounted over existing sewer inlets to restrict flow to a narrower range. Constructed of durable PVC that is corrosion and odor 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 lift out the unit for easy maintenance. In addition to controlling flow, Tempest systems can help alleviate odor emissions and prevent flowing debris from entering the sewer system.

Between 2009 and 2011, the town of Whitby installed more than 175 Tempest ICDs over sewer lead pipes in various locations to reduce the pipe openings and utilize catch basins for storm water storage. Depending on the severity of the storms, the ICDs allow water to accumulate to a maximum of 0.15 meters over the curb and completely drain away within 30 minutes after the end of the storm. While some of the ICDs were tweaked to ensure that they were draining enough storm water or not draining too much, the units installed in Whitby since 2008 have been working as planned and have proved to be successful in protecting residential homes and businesses against basement flooding. SWS

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