

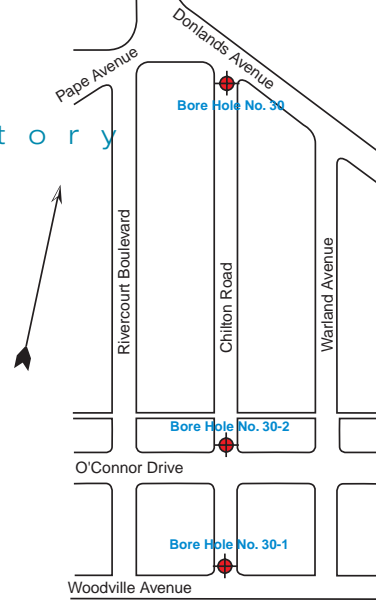
Fast-Paced Installation of RCP Spells Quick Relief for Canadian Residents

By Frank Mazza, C.E.T.
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A chronic flooding problem for residents along Chilton Road in East York, Toronto has been corrected with a 1200 mm (48-inch) diameter reinforced concrete storm sewer, installed by the jacking method. Munro Concrete Products of Barrie, Ontario, supplied the specially designed pipe to accommodate the installation challenges faced by the contractor. The new sewer is one of many ongoing projects by the City of Toronto to reduce surface and basement flooding in various neighborhoods of the city. Residents in some old neighborhoods in the Borough of East York have endured periodic flooding for decades.

The City of Toronto has been phasing in corrective measures for several years to mitigate the flooding. Historically, during wet weather conditions, stormwater was discharged along with sanitary sewage into combined sewers. Many of these old combined sewers were constructed over eighty years ago, and now have insufficient capacity to convey flows. Stormwater

that once was absorbed in open fields is now carried from rooftops of buildings then overland by paved surfaces. The combined stormwater and sanitary sewage causes flooding and overcharging of Toronto's wastewater treatment plants. In some instances, the combined stormwater and



Sketch showing proposed borehole locations.



Two different jacking contractors, working from two locations, enabled Toronto's Works and Emergency Technical Services Department to complete the 1200 mm, 100 D (48-inch diameter Class IV) jacking project in only 90 days.

wastewater flowed directly into Lake Ontario causing beach closures and increased levels of pollution.

In East York, part of the solution is construction of trunk storm sewers to collect flows from local storm sewers and discharge effluent to East York's existing Leaside trunk storm sewer. The Chilton Road trunk storm sewer is part of Toronto's Combined Sewer Overflow (CSO) management strategy.

Emergency Technical Services Department to install the sewer by jacking reinforced concrete pipe below the road. Concrete pipe was the obvious choice for this project because of its inherent strength and durability.

Alsi Contracting Ltd. of Maple, Ontario was awarded the contract to install 440 meters (1,443 feet) of 1200 mm (48-inch) diameter jacking pipe. Because of the concerns of the residents, Alsi was given only ninety working days to complete this project. To meet the tight construction schedule, Alsi decided to tunnel from two locations, using two tunneling subcontractors.

The jacking operation was complicated because of an existing sanitary sewer located three to four meters above the crown of the new storm sewer, and silty soil that resulted in wet jacking conditions. The soil in the area



Swift Lift® lifting devices and steel bands around the pipe bells were integral components of the precast concrete pipe manufactured by Munro Concrete Products Ltd.



The reinforcing steel of each pipe was extended into the spigot to enhance jacking performance.

Chilton Road services an environmentally sensitive, and mature residential neighborhood. Installation of the trunk sewer by open cut method would have been extremely disruptive to the daily routines of the residents, and would have adversely effected the natural environment. Residents and their local elected representative expressed concerns about any construction activity that would cause traffic delays and road closures. The decision was made by the City's Works &

is saturated below three to five meters, to a depth of 6.5 meters (21.3 feet). The invert of the new trunk sewer is at 9 meters (29.5 feet).

All 1200 mm, 100D (48-inch diameter Class IV) jacking pipe supplied by Munro were manufactured with Swift Lift lifting devices and steel bands around the pipe bells. Every sixth pipe was manufactured with 50 mm (2-inch) diameter grout ports at 10 o'clock and at 2 o'clock positions on the barrel. These grout ports were required to feed bentonite

around the barrel to lubricate the pipe as it was being jacked. In total, 187 pipe units were supplied including three pipes with no spigot, and 30 with the grout ports.

Munro produced 30 pipes each day to complete the order. Steel end rings were engineered into the structure to assist with keeping the line and grade of the installation. A 5 mm (.20 inch) thick x 203 mm (8-inch) high band was selected so that the band itself would remain stiff and in place at the bottom of the form while pipe units were being poured. The reinforcing steel of each pipe was extended into the spigot to enhance jacking performance. The only change required to the production equipment was the use of an O-ring header.

The two tunneling contractors were Peran Tunnelling Ltd. and Jimmy Mack. Jimmy Mack was assigned two pushes that started from a shaft at O'Connor Drive and Chilton Road, running north for 129 meters (423 feet) and south for 129 meters (423 feet). Peran was assigned a section that began at a shaft at Donlands Avenue and Chilton Road, pushing south for 182 meters (597 feet). This construction technique, supervised by Lou Di Sarra of Alsi, was quickly initiated despite encountering poor soil conditions when sinking one of the access shafts to install the jacking equipment. As the pipe was being jacked through the silty soil, water was pumped back to the shafts, along with the spoil, and then removed from the shafts. The line and grade of the trunk sewer was guided by laser instrumentation, and a City survey crew checked the accuracy of the pushes every second day. The City took responsibility for the geodetic control and line of the sewer.

Alsi Contracting has been in business for over 30 years, specializing in sewer and watermain construction and site servicing. According to Lou Di Sarra, Alsi's General Manager, "We use reinforced concrete pipe for all jobs requiring pipe over 375 mm (15-inch) diameter. The product is better than alterna-

tives, and concrete pipe is more reliable."

With the new stormwater trunk sewer running the length of Chilton Road, residents have the flooding relief they have been seeking for many years. Because of the reliability of the concrete pipe installation, they will enjoy life in their neighborhood with little thought to a section of the City's lifeline deep below their street. ☺

Project:	Chilton Road Storm Sewer Construction Contract 01D1-86WP
Owner:	Works and Emergency Services Department City of Toronto
Designer:	Works and Emergency Services Department City of Toronto
Contractor:	Alsi Contracting Ltd. Lou Di Sarra, General Manager
Tunneling Contractor:	Peran Tunnelling Ltd. Jimmy Mack
Quantities:	440 meters (1,443 feet) of 1200 mm (48-inch) diameter Reinforced Concrete Jacking Pipe
Producer:	Munro Concrete Products Ltd. Barrie, Ontario John Munro, President

Munro Concrete Products Ltd was established 40 years ago under the name Precast Tank and Vault Company. In 1989 Munro's Barrie operation was opened in a 1400 square meter (15,000 sq. ft.) facility that expanded to 3,800 square meters (40,900 sq. ft.) by 1996. A second expansion is now under construction. Pipe and manholes are produced using a dry cast - vibration under pressure process. The facility features the latest in computerized batching and wire reinforcing cage fabrication equipment. Manholes, catch basins and pipe laterals can be quickly cored on one of the company's three coring machines. The facility has an ongoing quality assurance program in which raw materials and the finished product are inspected and tested. Products shipped from the plant include manholes, catch basins and ditch inlets, reinforced concrete pipe and fittings and headwalls. See www.munroconcrete.com for details.