



SOLENO
Mastering Storm Water

THE MOST
POWERFUL
APPROACH FOR STORM WATER MANAGEMENT

CITY OF GATINEAU WASTEWATER TREATMENT PLANT

A high density polyethylene solution for a large-diameter pipe under low pressure.

This project involves the installation of a UV disinfection process to treat the effluent from the secondary treatment of the wastewater treatment plant, in accordance with the requirements of the Ministère du Développement durable, Environnement et Lutte contre les changements climatiques (MDDELCC) regarding wastewater discharge. This upgrade to standards will improve the treatment of water in accordance with the objectives of the Quebec Water Policy, for effluents from many wastewater treatment plants in the province. Indeed, when the Gatineau treatment plant was put in service in 1984, no chlorination facility had been built. The completion of this project will correct this important deficiency.

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THE CONTEXT

This major project involves the construction of a new technical building to house the new UV disinfection equipment and related services, the installation of underground bypass and transfer pipes, as well as various modifications to the existing infrastructure. The underground pipes will convey wastewater while meeting critical requirements, including lifespan, a low-pressure application, ease and speed of installation and corrosion resistance of the pipes from exposure to wastewater. Although the internal pressures are relatively low, they exceed the specifications of traditional reinforced concrete pipes. One possible solution is to use a concrete pipe with steel cylinder. In this case, the product is designed for high pressure applications such as those found in water systems and in the forcemains in sewage pumping stations. The costs of these products are too high and their use for the project cannot be justified.

THE SOLUTION

Commissioned by the City of Gatineau as consulting engineers for the project, the Dessau firm specialists have worked with Soleno—a distributor of Weholite brand large-diameter HDPE pipes—to explore the possibility to use this type of pipe in the design of this project. After looking at its pros and cons, the choice was made to use Weholite HDPE pipes.

In November and December 2014, a new, 475 m (1558.4 ft) bypass pipe for the secondary treatment system was installed. This new, 1500 mm (59 in), type RSC 250 Weholite pipe is provided with seven elbows and two access shafts, the latter equipped with frames, insulated covers, ladders and vents. At the resumption of construction in the spring of 2016, the installation of two transfer pipes using Weholite type RSC 250 pipes is planned. These pipes, with a diameter of 2400 mm (94.4 in) and a length of 15 m (49.2 ft) each, are set to receive disinfected water and direct it to the outfall chamber. An insertion-type flow meter must be installed on the pipe which will direct the water to be disinfected to the UV disinfection building. The meter will be accessible from an access shaft mounted on the pipe.



THE BENEFITS

The use of large-diameter HDPE pipes, exclusive to manufacturer Uponor, has made it possible, for this particular project, to complete installations at an economical cost. They provide increased resistance to corrosion, abrasion, chemicals, de-icing salts and soil movement, as well as chemical reactions caused by gases in the waste sewage, preventing their degradation and ensuring their durability, with an outstanding lifespan exceeding 100 years. Their large diameter reduces installation time. Their 15.24 m (50 ft) length, light weight and easy connection makes their handling quick and easy. Installation does not require the services of specialized contractors, since any contractor qualified in the installation of sewer and water supply systems can install this product. Moreover, connections between pipe sections is done on site by the Soleno technical team using a proprietary thermal fusion that ensures watertightness. The cost (materials and installation) is lower than that of traditional pipes and their environmental impact is low.

Another huge advantage of HDPE product in this project was the capability to make connections with the same diameter as the pipes in one piece (elbows, 900 mm (35.4 in) access shafts were welded directly on the 1500 mm (59 in) main line). Indeed, only HDPE allows this type of watertight fitting, while the concrete manhole to connect a 1500 mm (59 in) pipe is composed of several large pieces (one manhole 1750 mm x 2150 mm (68.9 in x 84.6 in) or 2400 mm (94.4 in) versus a 900 mm (35.4 in) access shaft), which makes its installation difficult for the contractor. The required excavation surface is therefore larger and numerous operations involving heavy parts must be performed, which increases installation time and costs.

To withstand low pressures, Weholite pipes are welded on the inside and outside. Moreover, the monolithic stacks that are welded in place ensure the system's watertightness. A quality control program also ensures that each joint is subject to a leak test once the welds are completed. The complexity of construction in this project was related to very short lead times as well as installation in cold weather. Given the scale of the project and to increase the productivity of the construction team, a new, more efficient machine for chamfering the pipes was designed and implemented by Jonathan Lemay, President of Jallex (a subcontractor for Soleno Service) and responsible for performing welds on Weholite pipes. Mr. Lemay points out that "for Entreprises Jallex, it was our first major undertaking with Soleno Services. The customer's safety requirements and working methodology led us to make several adjustments that required a lot of flexibility in the execution of the work." Also, to overcome the cold weather, temporary tent was erected to warm the pipe and to protect the welding work from the elements. Mr. Lemay says that "in this project, turnaround times, cold weather and site particulars resulted in technical, administrative and organizational challenges that we have learned to overcome. We were able to adapt to the conditions and have performed the work on time."



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