

Construction Time for Storage Tanks Reduced on Land Re-used for Recycling Centre



Photos: Angelo Riccio, Varcon
Precast boxes required for construction of triple-celled storage tanks for storm water management.

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Con Cast Pipe

An existing recycling centre in Mississauga, Ontario was replaced by an expanded and more efficient recycling facility on the same site, after demolition, reconstruction and construction of additional services. The Fewster Community Recycling Centre is the second in Mississauga and the fifth integrated waste management facility in Peel Region. The facility includes a drop-off platform for recyclable and non-recyclable materials and a household hazardous waste and reusable goods drop-off area. Management of storm water from the facility was a

significant design consideration because of the extent of the paved surface area and the nature of the land use that required consideration of the quality of storm water runoff and snowmelt.

The 3.9 hectares (9 acres) site drains into Little Etobicoke Creek along the southwest limit of the property. The creek is part of an urban watershed that discharges into Lake Ontario. Management of the volume and sediment load of the storm water required engineering of buried structures that would help reduce the impact of the facility on the

continued on page 2

Construction Time for Storage Tanks Reduced on Land

continued from page 1



Tanks installed with access holes for man entry and maintenance and flow equalizers between each run of boxes.

ecology of the stream and downstream uses in the watershed. Since the design required storage of water on the site while being slowly discharged into the creek, and there was no room for surface storage, the solution was to control the runoff in underground storage tanks and a sewer system comprised of pipes and oil-sediment separators. Earth Tech was awarded the contract for the design and construction administration, and Varcon Construction was awarded the contract for construction.

The design of the storm water services first specified three wetcast tanks. All three consisted of two rows of wetcast boxes with butyl jointing. The contractor and designers realized that the production time for the boxes would increase significantly since the formwork for the boxes acts as part of the curing process. Production would be limited to one pour per day. It would be impossible to meet the construction schedule set for the project.

After meeting with engineers at Con Cast Pipe in Guelph, it was decided that the alternative would be dry casting the boxes and altering the sizes, so that they would meet Ontario Provincial Standards Specification (OPSS) 1821 for reinforced concrete boxes. The standard was acceptable because the backfill over the top of the boxes was greater than 600mm. Production time would be adequate to provide the boxes to construct the tanks for accommodating the design runoff volume.

Instead of two runs of boxes, however, the redesign of the boxes required triple-celled structures to accommodate a total storage volume of 989.5m³ in the same construction footprint. The design was enhanced because the boxes arrive on site with gasketed joints to limit infiltration of fines and leakage of water into the soil envelope.

Storm water entering each tank first passed through an oil-sediment separator to improve the quality of the water entering the tanks. It was possible to accommodate just-in-time delivery, because some standard sizes arrived on site five at a time. On many occasions, boxes were immediately installed as they were offloaded.



Just-in-time delivery and standard box sizes accommodated installation.

Box sizes for the tanks ranged from 1800mm x 900mm to 3000mm x 1800mm span and rise. All boxes were 2.44 m long. Each tank was designed with access holes for man entry and maintenance, and flow equalizers between each run of the triple cells. All joints were wrapped in a geotextile cloth to reduce the possibility of infiltration and exfiltration even further.

The Fewster Community Recycling Centre is a design/build project that will deliver a single stream recovery facility, waste transfer station and associated site works. Construction that commenced in June 2007 is expected to be completed in early 2008. The contract was approximately \$7.2 million.