



Control Building under construction

Reservoir/Pumphouse and Wastewater Pump Station for the Multi Use Recreational Facility Town of Innisfil

In 2005, Ainley & Associates Limited completed a Schedule B Class Environmental Assessment planning process with respect to both water and wastewater servicing for a multi use recreational facility in Innisfil. The preferred solution was to extend servicing from the municipal systems in Alcona, along County Road 21. After completing a Design Brief in March, 2006, Ainley & Associates Limited proceeded with the detailed design, tendering and construction administration for the project.

Water System Design

Based on design criteria it was determined that the grade level reservoir should have a total usable volume of 460 m³ in two interconnected cells.

Three vertical turbine pumps were selected to provide pressure to the closed system. Two vertical turbine pumps, equipped with variable frequency drives (VFDs), provide a range of flows required to deliver the MDD (6.25 L/s) and the Irrigation demand (11.4 L/s).

Project Facts

Client: Town of Innisfil

Scope of Work:

- Preliminary and detailed design:
 - Pumphouse (structural and architectural)
 - Radio communication system for water pump station
 - Telephone communication system for wastewater pump station
 - HVAC
- Construction administration
- Site observation.

Design Criteria:

Water System Design:

- Volume: 460 m³
- 2 pumps @ 15.8 L/s with VFDs
- 1 pump @ 47.3 L/s with VFDs

Wastewater System Design:

- 2 pumps @ 10.0L/s

Capital Cost: \$1,500,000 (2006)

One pump operates as the duty pump with the other acting as the stand-by unit. The pump operates based on pressure in the system. A pressure of 75 psi (517 kPa) will be provided to the MURF facilities. Depending on demand, the pump will ramp up to maintain that pressure. The third pump (labelled as the Maximum Duty pump) was sized to provide the design fire flow rate of 40 L/s at a discharge pressure of 520 kPa.

Wastewater System Design

The wastewater pump station was constructed using 2400-mm diameter pre-cast concrete sections. It is equipped with two submersible pumps – duty and standby. The wastewater pump selection was made based on a flow of 10L/s pumping to the high point in the forcemain. The flow is based on maintaining a minimum velocity of 0.8m/s.

Pumphouse

The Control Building was constructed partially on top of the reservoir roof and partially on a slab on grade. It services both the water supply and wastewater systems. The control building houses a diesel generator set for standby power, electrical and control equipment for pump operations (water and wastewater) and HVAC equipment.