

The Rumble Pond Adaptive Stormwater Infrastructure Project is part of Richmond Hill's Stormwater Management Facility Rehabilitation Plan, which identifies stormwater ponds that have reached the end of their lifecycle and require rehabilitation. Rumble Pond, located at the northeast corner of Bathurst Street and Mill Street, is the third project to be implemented as a component of the pond rehabilitation program.

MAIN ISSUES WITH RUMBLE POND

There were several major issues with the state of Rumble Pond that indicated the need to upgrade its infrastructure. Rumble Pond, an online pond with Patterson Creek flowing through it, was built in the 1980s to manage runoff from an adjacent 44 hectare residential area. Over the past few decades it has filled in with sediment, which has resulted in reduced water quality and quantity control.

The compromised function of Rumble Pond was negatively impacting the local natural environment. Online ponds are known for increasing water temperatures to levels that some fish cannot tolerate. In addition, the outfall weir, which controlled the flow of water leaving the pond was a major barrier to fish passage. The weir fragmented Patterson Creek and impeded fish, including the endangered Redside Dace, from moving upstream to find other sources of food.



Rumble Pond Adaptive Stormwater Infrastructure Project
Conceptual Landscape Plan



GOALS OF THE PROJECT

The goals of the Rumble Pond Adaptive Stormwater Infrastructure Project are to meet or exceed current standards for water quality, quantity and erosion control, as well as apply innovative technologies to achieve these objectives where possible. The modifications to the pond also help reduce the risk of community flooding and downstream environmental impacts.

A number of alternatives were evaluated through a Municipal Class Environmental Assessment Schedule 'B'. The preferred solution was to modify the configuration of the pond to take it "offline", separating the pond and Patterson Creek. This alternative will allow Richmond Hill to:

- improve the level of stormwater quantity and quality treatment of stormwater discharged from the neighbouring subdivision;
- control the outlet release rate to allow for extended detention (weather permitting);
- provide for continued enjoyment at the park as a recreational space for the local community; and
- protect and enhance the natural environment.

Throughout the process, Richmond Hill applied 'lessons learned' from previous stormwater pond rehabilitation projects, such as:

- the need to establish partnerships with other agencies to share expertise and resources; and
- making the most of the project by considering environmental, cultural and recreational opportunities within the pond design.

These approaches were key to the success of this project. Richmond Hill and the project consultants, R.J. Burnside & Associates, Schollen & Company Inc. and Gateman Milloy, worked with various agencies, including the Toronto and Region Conservation Authority (TRCA), to design and construct the project to protect and enhance the local environment while providing a recreational space for local residents to enjoy.

The Ontario Ministry of the Environment awarded a \$1 million grant* through the *Showcasing Water Innovation* program to the Town of Richmond Hill to assist in the implementation of the project. This program funds projects which explore leading edge, innovative and cost-effective solutions for managing and protecting water resources. Richmond Hill partnered with stormwater industry leaders Imbrium Systems, Inc., Hanson Pipe & Precast, Ltd., Permacon Group Ltd. and the TRCA to showcase their technologies and practices within the stormwater facility.

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Rumble Pond, September 2013



INNOVATIVE CHANGES AT RUMBLE POND

Real-time monitoring:

- Gauges track water level, flow, turbidity and temperature in the facility and the receiving watercourse, and transmit this information in real-time to a control center so that an operator can adapt and respond to local weather and pond conditions using a remotely controlled valve at the outlet.
- Alarms use real-time monitoring data to alert the operator when outlet adjustments are needed.

Outfall control structure:

- Mechanical valves close remotely to retain water during rain events to help control water quality.
- Water is selectively discharged from the pond only at night when water temperatures are coolest. This helps enhance fish habitat and benefits species living in Patterson Creek, including the endangered Redside Dace, which prefer cooler water temperatures.



Realigned Patterson Creek

AquaPave® permeable pavers and Sorbtive® Media:

- AquaPave® permeable pavers allow stormwater from the east portion of the park to seep through the ground to reduce the amount of surface runoff reaching the pond.
- Sorbtive® Media installed under the pavers help remove dissolved phosphorus and other pollutants from entering Rumble Pond.

Innovative pre-treatment infrastructure at upstream inlets:

- A treatment train approach is used to remove oils, grease and sediment with the use of Stormceptor® oil grit separators, followed by a Jellyfish® Filter system at the storm sewer outfalls. This allowed the pond's sediment forebay to be removed.
- Sediment will be removed from the Stormceptor® and Jellyfish® Filter units as part of a regular maintenance program. This will help extend the life cycle of the detention pond.

Re-naturalized Patterson Creek:

- Fish barriers were removed, including the outfall weir, to improve fish migration – this is especially important for endangered Redside Dace.
- Aquatic habitat was improved with natural channel design by mimicking the natural riffle-pool patterns.
- Native trees and shrubs were planted to decrease bank erosion, provide cover for fish from predators and attract prey such as insects. The cover will also help shade the stream and keep the temperature cool.



Stormwater pond and stream monitoring will commence once construction is completed, which is expected by spring 2014. Richmond Hill will use the information collected from the monitoring program to make adjustments for optimal pond operation, and to help inform future stormwater pond rehabilitation projects.

Once construction is complete, the park will look and function like a natural space with walkways, benches, native vegetation, a pavilion, an island and interpretive signage for the community to learn from and enjoy.

For further information on the Rumble Pond Adaptive Stormwater Infrastructure Project, visit RichmondHill.ca/RumblePond or contact the project representatives below.

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Engineering Consultant



Landscape Architect



Contractor

