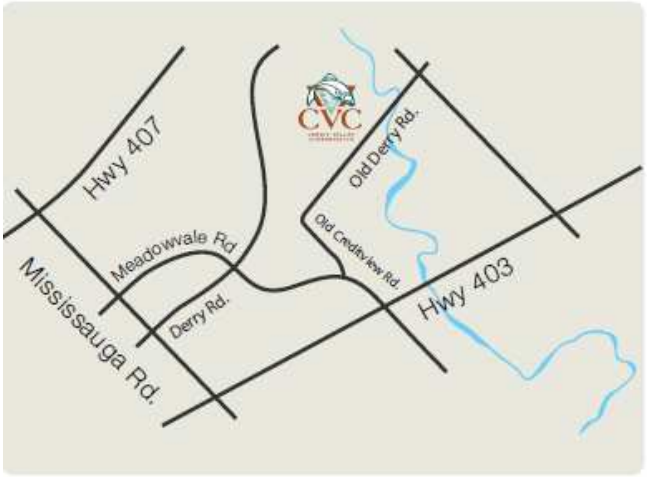
Overview

Credit Valley Conservation's (CVC) head office is located on Old Derry Road in Meadowvale Conservation Area in Mississauga.



CVC's head office addition is located at 1255 Old Derry Road, Mississauga, Ontario

Established in 1954, CVC is one of 36 conservation authorities in Ontario with a mandate to ensure Ontario's water, land and natural habitats are conserved, restored and responsibly managed through watershed-based programs.

The new addition to CVC's head office is registered with the Canada Green Building Council and is certified LEED Gold. The building features numerous low impact development (LID) practices such as a permeable pavement parking lot with grass swales and a rainwater harvesting (RWH) system supplying non-potable water to toilets, urinals and outdoor hose taps.

Goals and Drivers

Given CVC's mandate, the conservation authority and its member municipalities approached the construction of an addition to CVC's head office as an opportunity to showcase a green building that effectively manages water resources on the site.

The goals and drivers for the project included:

- Creating a demonstration site that showcased LID practices within a typical commercial office setting
- Providing an opportunity to 'learn by doing' and closely monitoring the performance and maintenance of LID practices

Successes

Cost savings – installation of a permeable pavement parking lot provided a $90,000 net savings compared to a traditional lot due to reduced infrastructure requirements (catchbasins were not required).

Demonstration showcase –LID features at CVC's head office have been showcased in numerous workshops and site tours. It provides an opportunity for developers, engineers, municipal staff and others to see on-the-ground examples and learn about their design and performance.

Performance – LID features have performed well to date, during both spring/summer and fall/winter months. During winter months the permeable pavers have had fewer issues with 'black ice' formation than the asphalt roadway on the property.

Design

One of the main design goals was to use resources (water, gas and electricity) more efficiently and to manage stormwater more sustainably.

This was achieved using:

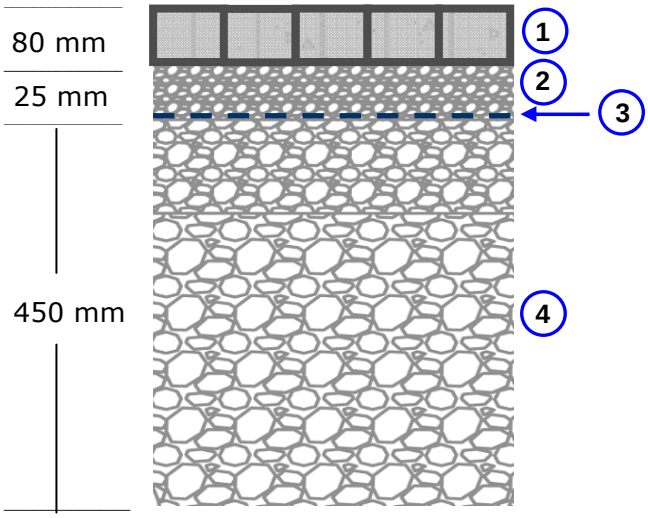
- Permeable Pavement
- Rooftop Rainwater Harvesting System

Permeable Pavement

The permeable parking lot provides a total of 60 spaces for visitors and staff. The permeable pavers primarily handle rainfall landing directly on the lot.

Permeable pavement expansion. Parking lot during construction

To provide a firm base and adequate storage volume for the parking lot, the permeable pavement installation utilizes several layers (as shown in the section view below).



Section view of the permeable pavement, illustrating the various layers

1	**Permeable interlocking concrete pavers** – the pavers have nubs around them which leave a consistent 1cm space between each paver that allows water to drain through.
2	**Bedding layer (chip stone)** – the bedding provides a level surface for the pavers. The same chip stone also fills the spaces between the pavers.
3	**Drainage fabric** – the drainage fabric separates the bedding and base layers.
4	**Base layer (recycled concrete) –** the base layer provides structural support to the pavement and a storage reservoir for stormwater.

Rainwater Harvesting System (RWH)

The RWH system uses a 5,000 litre rainwater storage tank located in the basement of the building. Rainwater from the roof is directed through interior rain leaders to a central mechanical room. All excess rainwater is discharged through the building's storm drain, connected to an on-site wetland.

The rainwater is used to supply non-potable water to toilets in the building, as well as supply water to outdoor hose taps.

Indoor rainwater storage tank located in the basement

Rainwater is treated by a 100-micron particle filter.

In times when the tank is nearly empty (from insufficient rainfall or excess demands from indoor or outdoor use) a 'top-up' system is used to supply the tank with potable municipal water.

Operations and Maintenance

Proposed Maintenance Activities

There is typically less ponding on permeable lots so it is estimated there will be less need for snow plowing and de-icer application.

Two permeable pavement lots were designed with different coloured pavers - one light grey and the other dark grey. The performance of these two lots will be compared over time for the amount of de-icer required. It is anticipated that the dark grey stone may experience fewer instances of black ice due to its ability to absorb more light/heat during winter months.

Photograph of the expanded parking lot after construction

Long-term Performance

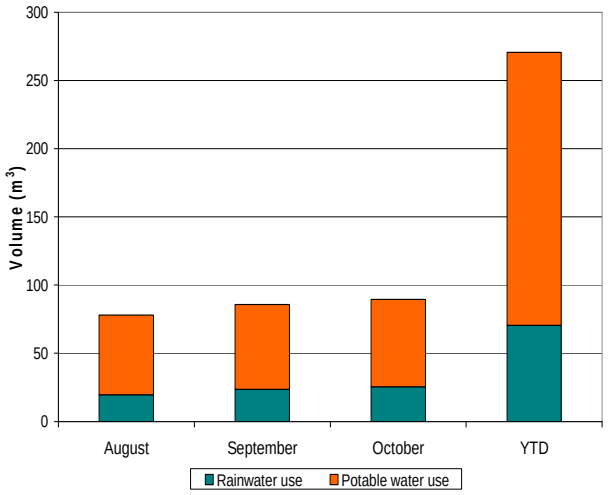
In addition to keeping records of the operations and maintenance work that is performed on the LID features, CVC is also conducting more extensive performance assessments on the LID infrastructure.

Performance assessment equipment will be used to quantify reduction in stormwater runoff volume, peak flows and pollutants from the parking lot (and the site overall). It will be compared to a typical office building and parking lot without any LID controls.

Installation of exterior housing for performance assessment equipment

For more details on the infrastructure performance assessment work, visit bealeader.ca.

CVC is also monitoring water savings associated with the RWH system through water meters installed on both the rainwater supply and the municipal top-up supply. Preliminary data indicates that CVC is reducing its municipal water use in the building by approximately 25per cent by re-using rainwater. Additional details are n the following figure:



Rainwater and potable water use in CVC's building addition

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