

# City of Hamilton

YVR Deals

## BUMPOUT STORMWATER LOW IMPACT DEVELOPMENT

### MUNICIPAL PROFILE:

POPULATION: ~536,930

LOCATION: Port City on the west end of Lake Ontario

SIZE: 1,138 km<sup>2</sup>

TOTAL PRIVATE DWELLINGS: 222,920

GREAT LAKES WATERSHED: Lake Ontario

### BACKGROUND

In the last decade, the City of Hamilton has experienced many unprecedented heavy rainstorms, such as events in 2009 and 2013, causing devastating damages to both private properties and public infrastructure as a result of flooding. As such, it is critical for the City to implement a diverse set of stormwater management strategies, including Low Impact Development (LID). Currently, the City of Hamilton is working on implementing their North End Traffic Management Plan, the purpose of which is to resolve neighbourhood traffic and transportation problems through the application of traffic improvement measures, including the installation of temporary traffic calming measures. This provided an excellent opportunity for the City to include a rain garden at a new road bumpout site in order to pilot the use and implementation of LID. Ultimately, the City hopes to make LID a standard practice in their suite of stormwater infrastructure solutions through pilot implementation.

### PROJECT DESCRIPTION

This project involved the design and construction of a rain garden at a pilot bumpout site at the intersection of Bay Street North and Simcoe Street in the City of Hamilton. The purpose of the LID project was to control stormwater runoff and improve infiltration on site. The rain garden functions by directing stormwater from paved surfaces towards the garden where mulch and native plants absorb the water and nutrients from the runoff. The water is then slowly filtered through layers of sand and other organic materials, eventually travelling to a gravel layer below the soils where the water is cleaned once more, and allowed to seep into the ground. Excess stormwater that is not filtered into the ground is then fed into the storm sewer through a flood drain.

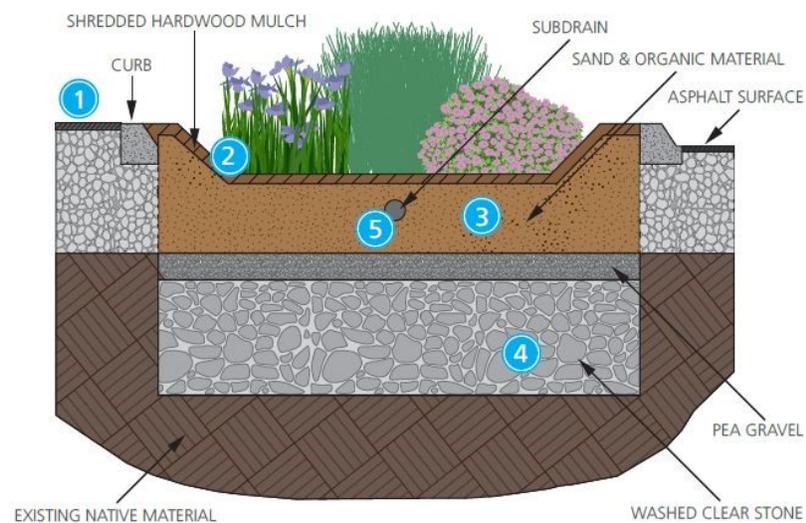
In addition to the construction of the LID features, the project involved a number of education and outreach components, including internal meetings with City Staff, signage at the LID site, website information, handouts, and community events.

### OBJECTIVES

- Improve stormwater management within the road right-of-way.
- Increase pollutant removal through proper drainage and stormwater treatment.
- Reduce pollutant loading to the Hamilton Harbour.
- Improve water conveyance and eliminate standing water at road right of way.
- Improve the overall aesthetic appearance of streets.
- Address resident concerns regarding drainage difficulties.

### PROJECT PLANNING AND IMPLEMENTATION

The LID bumpout project is a part of Hamilton's North End Traffic Management Plan, which means the LID design was incorporated into the overall traffic design by a third-party



City of Hamilton website



consulting firm, IBI Group. Planning for the LID bumpout began prior to the commencement of the CIG project in January 2017. Preliminary assessments were completed in March 2016, while several planning meetings and workshops also took place in 2016, and included stakeholders from the City's Wastewater Collection Group, Road Operations, Horticulture, and Storm Pond Management. A Public Information Centre was held to educate the general public about the project in October 2016.

In January 2017, Aquafor Beech Ltd. began developing detailed designs for the LID. Over the next several months, the designs were reviewed and edited by various City departments, with a final review completed by IBI Group. In consultation with the Horticulture department, a number of native species were selected to be planted in the rain garden, including blue flag iris, purple dome aster, and heavy metal switchgrass. The selection of plants was based on low maintenance needs, tolerance to varying weather conditions, and their ability to provide a natural habitat for pollinators and other species. Once the design of the LID was finalized, construction tendering took place in July 2017, and Rankin Construction Ltd. was selected as the final successful bidder in August 2017. An application for Environmental Compliance Approval (ECA) from the Ministry of Environment and Climate Change was also developed and reviewed by the City's Design Group during this time. Approval was secured for the project in August.

Development of the communication strategy for the project was lead by the City's Customer Service & Community Outreach (CS&CO) Section. CS&CO conducted a thorough review of the general practice of LID outreach activities around the world, especially in North America.

This helped shape the communication strategy for the project, which included a LID public education mailout, creating a LID information page on the City's website, installing signage at the LID site, and including information concerning the project in a local Councillor's newsletter. In July, North Hamilton Community Health Centre hosted its 20th annual Park N' Party, an event which promotes community health and celebrated Canada's 150Year Birthday. The Project Team was able to capitalize on this event, and speak to residents about the LID project, solicit feedback, and share an information handout.

Two pre-construction meetings were held in September 2017 to update the awarded contractor with the City's expectations and to discuss project handover after the contractor's 2-year operation and maintenance warranty is complete. It was also discussed that the City needed to develop a LID Governance Model for future projects, as ownership, operations, and maintenance of the LID site are critical for the project to function permanently. Aquafor Beech Ltd. is in the process of developing a LID Governance Model for all the parties involved, including but not limited to Infrastructure Planning & Systems Design Section, Wastewater Collection Group, Road Operations, Horticulture Culture Section, and Asset Management Section. The LID Governance Model will help the City with future LID projects to identify ownership, operations and maintenance issues, and is expected to be completed in July 2018.

IBI Group is undertaking soil testing to ensure there is no soil contamination before construction begins. Construction of the rain garden is expected to be completed in May 2018.

### FUNDING

Funding for the project was supported by the \$7,000 grant from the MOECC for participating in the Collaborative Implementation Group project. These funds were primarily used for publication and community outreach purposes, including the best practice review, interpretive signage, and public information centres. These funds were matched by cash or in-kind contributions on behalf of the City of Hamilton. In addition to the CIG project funds, the City allocated \$35,000 for the provision of engineering consulting services and more than \$40,000 for the construction of the Bumpout Stormwater LID project.

### PARTNERSHIPS

The project involved extensive coordination and partnership among different City departments. These included:

- Wastewater Collection Group: Storm sewer maintenance
- Road Operations: Catch basin maintenance
- Horticulture: Planting maintenance

- Traffic Planning: Overall project management
- Design Section: Design input & QA/QC
- Construction Section: Tendering and construction process
- Customer Services & Community Outreach: Public education and outreach
- Infrastructure Planning: LID design management and coordination
- Forestry & Horticulture Section: Planting maintenance
- Asset Management Section: Asset maintenance tracking

External partnerships involved in the design, construction, and management of the LID project included Aquafor Beech Ltd., IBI Group, and Rankin Construction Ltd.

### CHALLENGES

The City experienced a few challenges in the planning and implementation of the project.

**PROJECT MANAGEMENT:** As the LID Stormwater Bumpout was part of the City's North End Traffic Management Plan, the project design, tendering, contract award, and construction needed to be incorporated into the overall project plan by a third-party consulting firm. This resulted in some delays to the project tendering and construction. The Project Lead ensured that the overall Project Manager was involved quickly and efficiently as possible to reduce delays.

**PROJECT FUNDING:** Available funding for the LID project was less than what was requested by the construction company. To resolve this, the CIG Project Lead spoke to the North End Traffic Management Plan Project Manager, who was able to provide part of the cost-sharing so that the City's budget for the LID project was not exceeded.

### POSITIVE OUTCOMES

Several positive outcomes were achieved as a result of the project.

**POSSIBILITIES FOR SCALING UP:** The City of Hamilton is currently in the early stages of integrating LID solutions. The continued implementation of pilot demonstration sites throughout the City will lead LID to becoming a standard practice in Hamilton's suite of stormwater infrastructure solutions. This project ultimately assisted the City in developing its ability and capacity to adopt and implement LID solutions on a citywide scale.

**STANDARDIZATION:** The creation of the Governance Model for future LIDs as a result of this project will create a standardization for operation and maintenance of current and future LID sites within the City of Hamilton. The Governance Model will provide responsible departments with a long-term framework regarding LID O&M, including the frequency of inspections and maintenance, the responsible entity, etc.

**INCREASED AWARENESS:** The communication and outreach initiatives undertaken as part of the project will help to increase both staff and citizen awareness of LID solutions. This awareness may help increase the number of LID sites installed throughout the city, both on public and private property.

### MEASURING OUTCOMES

In order to measure public engagement and outreach in relation to the project, the City will be counting the number of outreach events hosted, as well as the number of attendees. These will include the number of Public Information Centres, internal meetings, internal workshops, and Councilor meetings. Furthermore, the City will track the number of communication materials developed to promote the project, including mail outs, signs, and web page articles.

The City will also be measuring the success of the rain garden in offsetting wastewater treatment. This will be based on calculations completed during the design stage and on the treatment cost per unit of wastewater reduced due to infiltration.

Lastly, the City will also be measuring the volume of stormwater interception of the rain garden. This will also be theoretically calculated during the design stage of the project.

### LOOKING AHEAD

Construction of the LID began in November 2017 and is expected to continue until July 2018. The City will also be completing its LID Governance Model for the operation and maintenance of the rain garden and future LID projects, which will be completed in March of 2018.

Continued operations and maintenance of the rain garden will involve inspection of the LID after each storm event greater than 15mm for the first 6 months, with subsequent inspections occurring each Spring and after rainfalls of 60mm or greater. Routine maintenance of the site will involve trash removal, pruning and weeding, mowing, and watering as needed.

Additional outreach events, including tours of the LID sites and field trips with local schools, are expected to commence once construction is complete.

## Acknowledgements

This project was made possible by the Ontario Ministry of Environment and Climate Change, under the Canada-Ontario (COA) Respecting the Great Lakes.

## The Great Lakes Adaptation Project Collaborative Implementation Groups

The Collaborative Implementation Groups (CIG) project targeted 12 municipalities throughout the Great Lakes watershed to identify and implement an adaptation initiative in their community over the period of one year (January 2017 – December 2017). The CIGs came together at various stages to share experiences, challenges, and opportunities on such items as measuring progress through indicators, project financing, budgeting, scheduling, evaluation, monitoring, and reporting. Ultimately, the CIGs were an opportunity to bring together practitioners struggling with implementation challenges to create a peer support network that brings these individuals together (both online and in person) to collectively work through the implementation of an identified action and share the resulting experiences.

**Author: ICLEI—Local Governments for Sustainability Canada Office**

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