

Leading in Innovation Through LID – Commercial Developer's Perspective

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Project Background

Proposed Development

Low Impact Development (LID) Initiatives

Other Initiatives

LID Challenges

Future of LID

Questions

Mississauga (East) Commercial Development Project



- Formerly industrial uses and golf driving range
- Proximity to Little Etobicoke Creek
- Brownfield site requiring extensive remediation

Proposed Development



Mississauga (East) Commercial Development Project

- 360,000 sq. ft. of retail space, anchored by 2 major retailers
- Significant restoration of the Little Etobicoke Creek corridor
- Extensive application of LID initiatives
- Enhanced sustainability of buildings
- Used an environmental balance sheet



Developed as a joint-venture between:

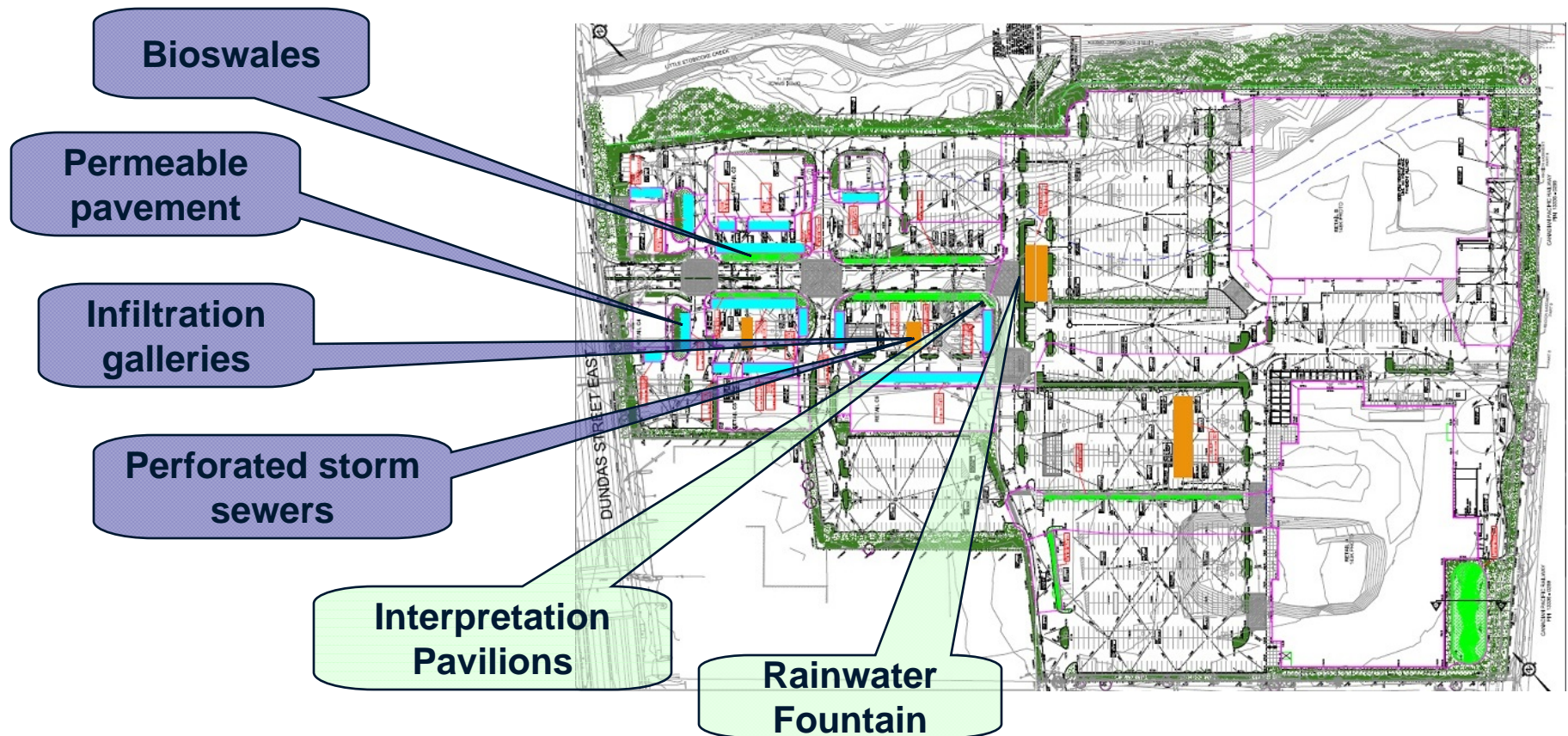


LID Initiatives



Objective: to promote water balance onsite by retaining 10mm of runoff through attenuation, infiltration and evapotranspiration across the area of developed site

Criteria: established through discussions with Toronto and Region Conservation Authority and City of Mississauga and in accordance with TRCA/CVC Low Impact Development Stormwater Management Planning and Design Guide (2010)



LID Initiatives Summary



**Total onsite attenuation/infiltration
volume breakdown per initiative:**

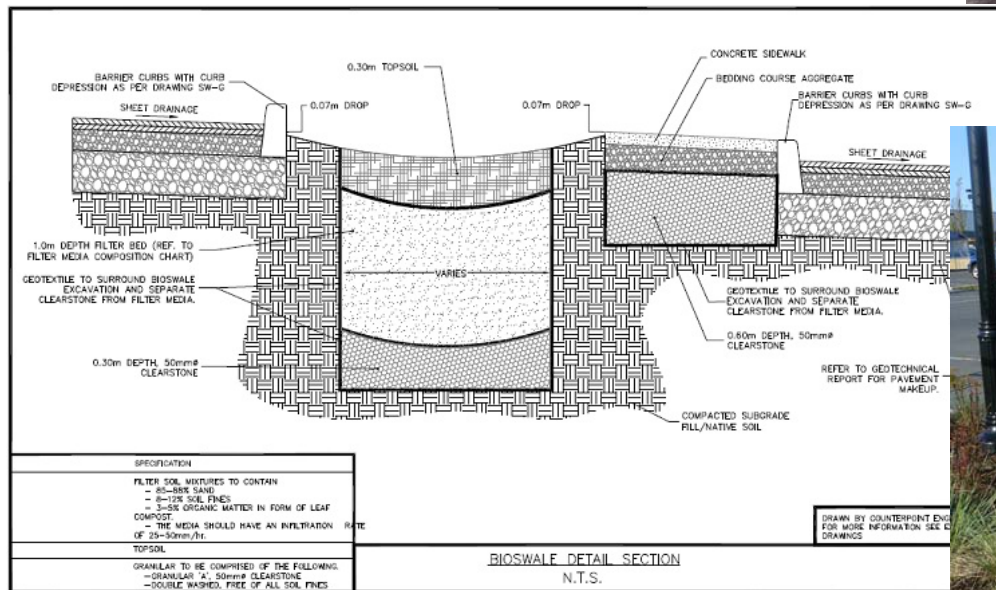
*Total Attenuation/Infiltration
Volume Achieved = 1,476m³*



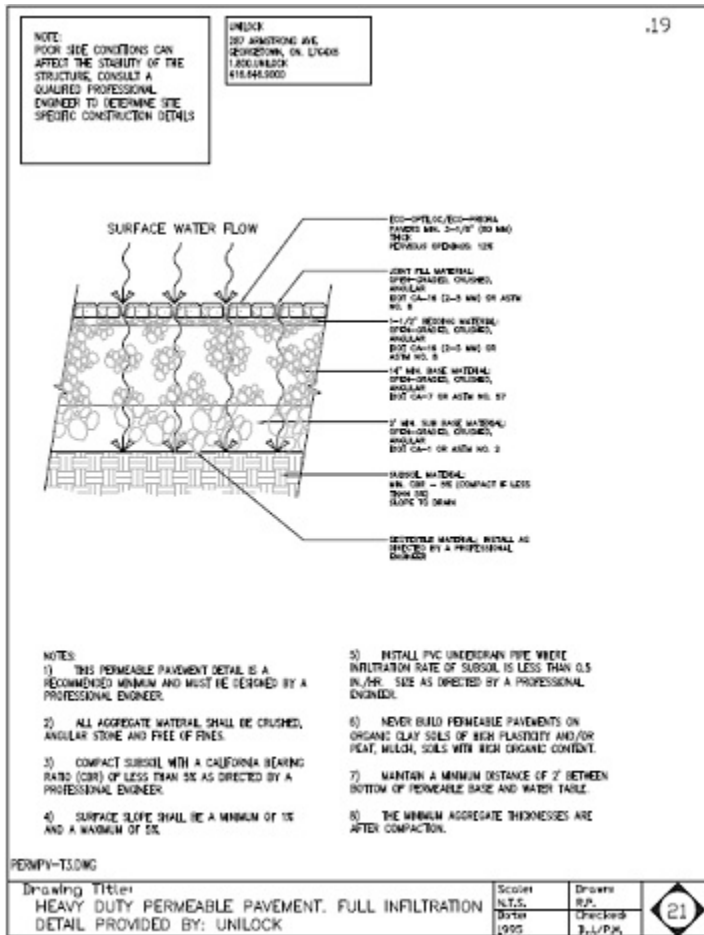
LID: Bioswales



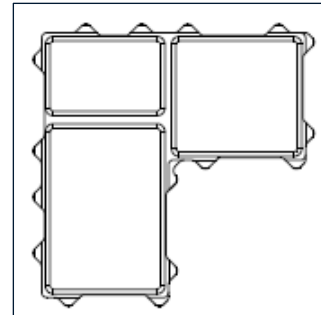
- open channels designed to convey, treat, and attenuate/infiltrate stormwater runoff
- reduce quantity of runoff and improve water quality through infiltration and microbial processes
- total onsite bioswale area 2,236 m²
- total onsite attenuation/infiltration volume of 385 m³ (26% of total volume)



LID: Permeable Pavement



- Eco-Optiloc patented heavy-duty paving system shaped to create drainage openings and joints that facilitate infiltration of water into stone reservoir below



- total onsite attenuation/infiltration volume of 478m³ (32% of total volume)

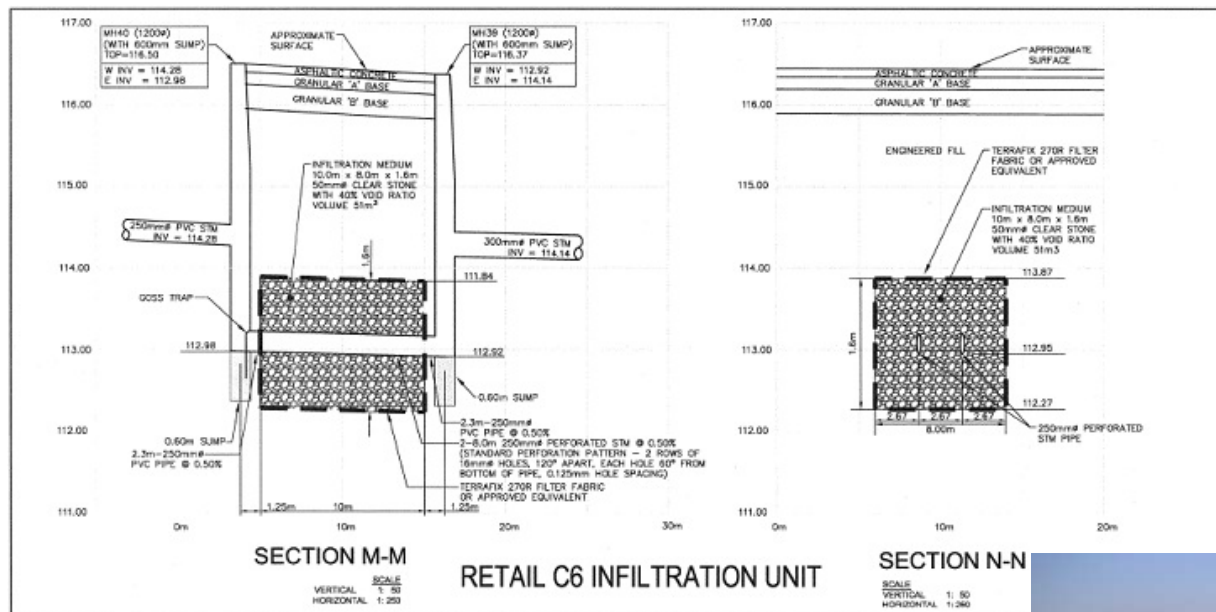


- total onsite permeable pavement area 1,990 m²

LID: Infiltration Galleries



- rectangular excavations lined with geofabric and filled with clean granular stone that include a system of parallel sections of perforated pipe between two control manholes



- designed to receive and attenuate clean rooftop runoff from proposed buildings
- total onsite infiltration gallery area 1,056 m²
- total onsite attenuation/infiltration volume of 613m³ (42% of total volume)



Associated LID Features



Rainwater Fountain:
a fountain utilizing rainwater sourced from a nearby infiltration gallery and circulated by a submersible solar-powered pump



Solar Arcade:
photovoltaic panels mounted on a metal superstructure, powering the fountain pump and light columns



Interpretation Pavilions:

“Water 101” &
“Watershed Ecology”

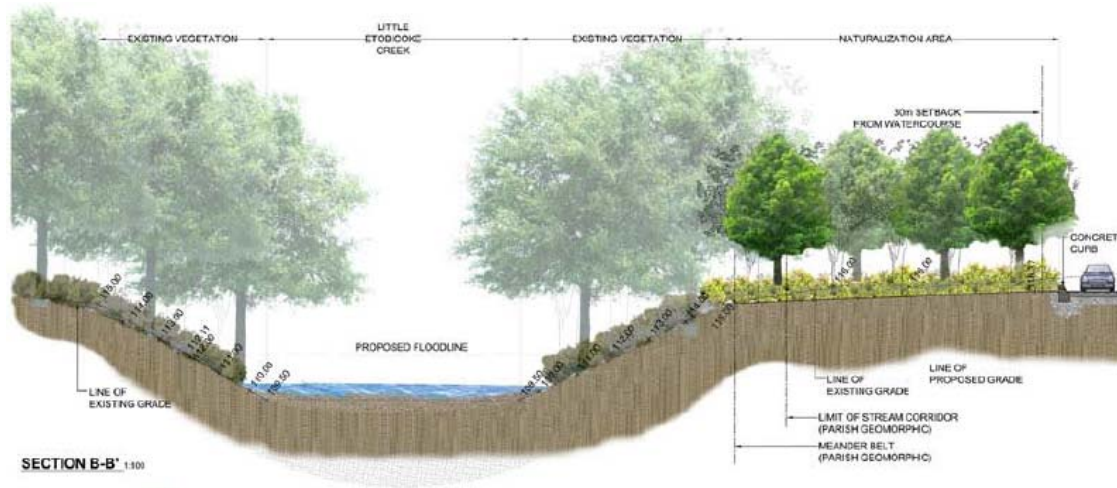
LID public outreach program to educate through use of illustrative and graphically captivating panels

Other Initiatives



Comprehensive site remediation including:

- demolition of old industrial buildings
- removal and proper disposal of hazardous materials
- excavation, removal, disposal and replacement of contaminated soils



Restoration of the stream corridor of Little Etobicoke Creek including:

- removal of dumped debris
- creation of additional 1.2 hectares of naturalized area
- removal and replacement of invasive non-native vegetation with native species

Other Initiatives



Reduced urban heat-island effect:

- highly reflective roofing materials
 - shade over parking areas
 - planting of over 300 trees

Enhanced sustainability of buildings and systems:

- energy conservation
- waste diversion



Provision of multi-modal transportation support initiatives:

- bicycle racks
- car-pool parking spaces
- public transit connection



Environmental Balance Sheet



	Characteristics and Benefits
	Integrated Master Plan January 2011
Stream corridor width	±60m
Area of stream corridor	2.69 ha
Retaining wall required along stream corridor	No

Summarizes the characteristics and benefits of the Integrated Master Plan and the proposed initiatives

	Characteristics and Benefits		
	Integrated Master Plan January 2011		
Stream corridor width	±60m		
Area of stream	<ul style="list-style-type: none"> Multi-modal transport 		
Retaining wall	<ul style="list-style-type: none"> Bicycle storage facility Dedicated car pool parking 	Yes	Yes
Area of existing pavement	<ul style="list-style-type: none"> Taxi stand/st Connected p Linkage to tr 		
Area of new pavement	<ul style="list-style-type: none"> Urban Heat-Island Reduction 		
Volume	<ul style="list-style-type: none"> Reflectivity paving Tree cover over paved areas High reflectivity roofing 	Yes	Yes
Volume of clean soil recycled		Yes	Yes
Volume of concrete recycled			
Quantity of scrap vehicles/metals	<ul style="list-style-type: none"> Building systems 		
Quantity of garbage removed	<ul style="list-style-type: none"> High reflect Efficiency li Efficiency r Efficiency t 		
Quantity of asbestos removed			
Operational/Management Protocols	<ul style="list-style-type: none"> Operational/Man Waste dive Consumer Provision of Renewable On-site ene 		
Interpretive Features	<ul style="list-style-type: none"> Stomwater management system Stormwater management target Biofilters Rainwater harvesting/recycling Infiltration galleries Permeable pavement Interpretive Features Rainwater fountain Solar arcade Interpretive pavilion Strategic landscaping 	10mm runoff attenuated	Yes
		Yes - Fountain feature	Yes
		Yes	Yes
		Yes	Yes

- **Costs**

- relatively new technology requiring higher engineering design fees
- more research required into full life cycle costs

- **Constructibility**

- require native soils which are permeable and allow proper drainage
- vulnerable to clogging and compaction during construction

- **Maintenance**

- permeable pavements need to be vacuumed and void aggregate needs to be replenished
- granular trenches may clog over the years resulting in deteriorating performance and high replacement costs

- **Approvals**

- variance from local development standards may result in longer approvals
- sometimes conflicting responses from permitting agencies

- **Monitoring**

- risk of groundwater contamination

- The industry and government have to work together to ensure continuous improvement of stormwater management technologies and to allow development to proceed in environmentally sustainable and economically viable manner.

- Municipalities and other agencies have to support developments using LID initiatives :
 - encourage developers by speeding up approval times when LID initiatives are proposed
 - ensure better coordination among permitting agencies



- Develop maintenance programs to gain more insights into long term performance and life cycle costs of LID initiatives compared to conventional SWM practices



LID Site Layout

