Stormwater Management Practices

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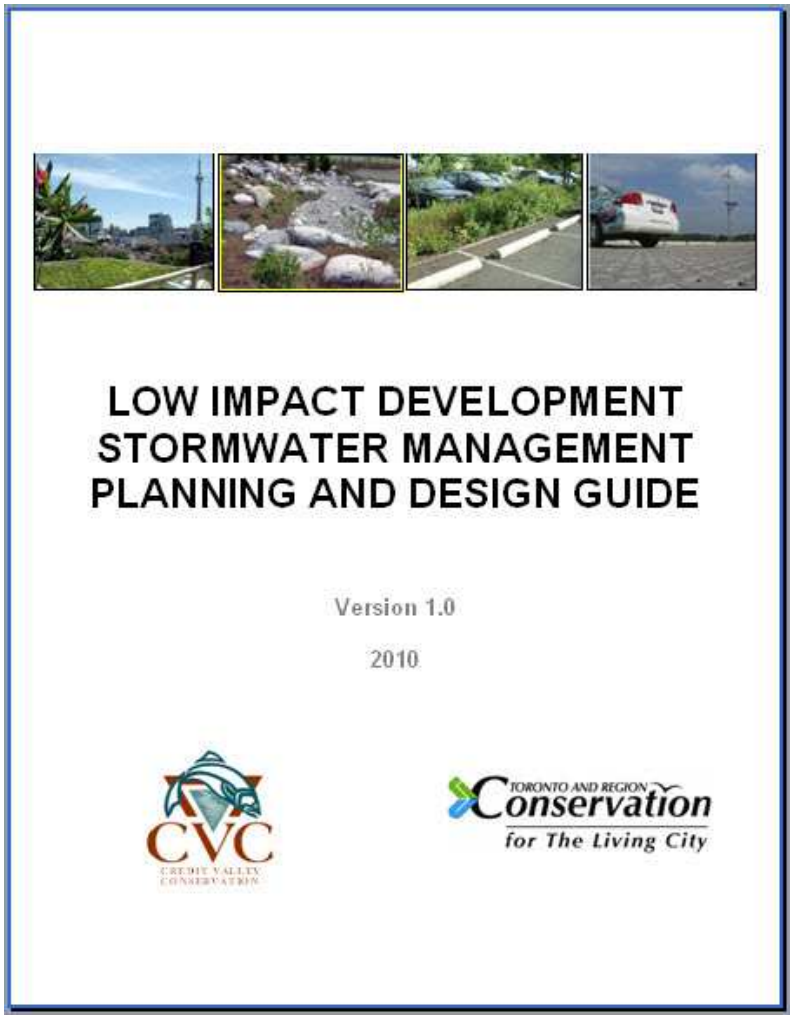
Stormwater Management Practices

- Stormwater Facilities (Conventional) should be designed in accordance with the MOE SWM Manual
- LID Practices should be designed in accordance with the recommendation of the LID Guide
  - Measures must be located on public property, or provision must be made for long term maintenance and operations on private property (e.g. legal agreements or bylaws)
  - For RWH and Green Roofs, winter operations must be considered
  - For infiltration practices, the depth to water table, existing soils infiltration rates and proximity to vulnerable groundwater resources must be considered
  - Pre-treatment for infiltration facilities (e.g. via OGS, filter strip, forebay, etc.) may also be required depending on the source of water to be infiltrated
  - Overflow/underdrain mechanisms must be provided to ensure that SWM practices do not put properties and structures at risk due to backups and flooding. Sufficient storage must be provided to achieve the required SWM criteria before the overflow/underdrain mechanisms are triggered

Low Impact Development

(LID) is a stormwater management strategy that seeks to mitigate the impacts of increased runoff and stormwater pollution.

LID comprises a set of site design strategies and distributed structural best management practices that harvest, filter, evapo-transpire, detain and infiltrate stormwater.



LID Guide can be downloaded at: www.sustainabletechnologies.ca

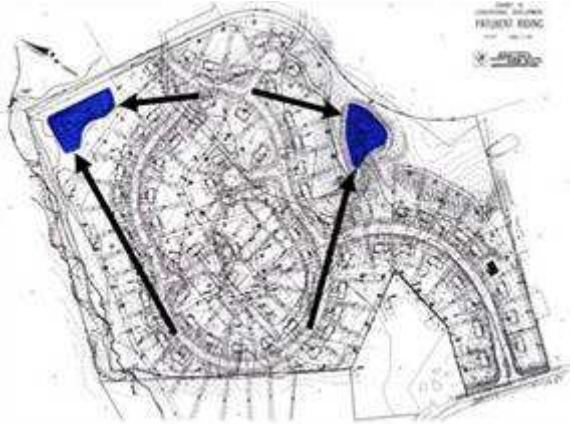
Low Impact Development

Benefits of LID Practices

- Water Quality (MOE Table 2.3)
- Erosion Control (Continuous Modeling)
- Water Balance – LID Required
- Volume requirements can meet multiple objectives (i.e 5 mm can meet both water quality and erosion)
- Minimums retention volume requirements should be above the initial abstraction

STORMWATER MANAGEMENT PRACTICES DESIGN PRINCIPLES

1. Integrate Stormwater into Planning (Multi Disciplinary Approach)
2. Focus on runoff prevention (innovative planning, LID practices)
3. Treat stormwater close to the source (respect natural flow paths, stormwater is a resource)
4. Create multifunctional landscapes (site aesthetics, energy, conserve potable water, wildlife, parks)
5. Educate and maintain (maintenance plans)



Conventional “end-of-pipe” strategy

Low Impact Development strategy

Low Impact Development Practices

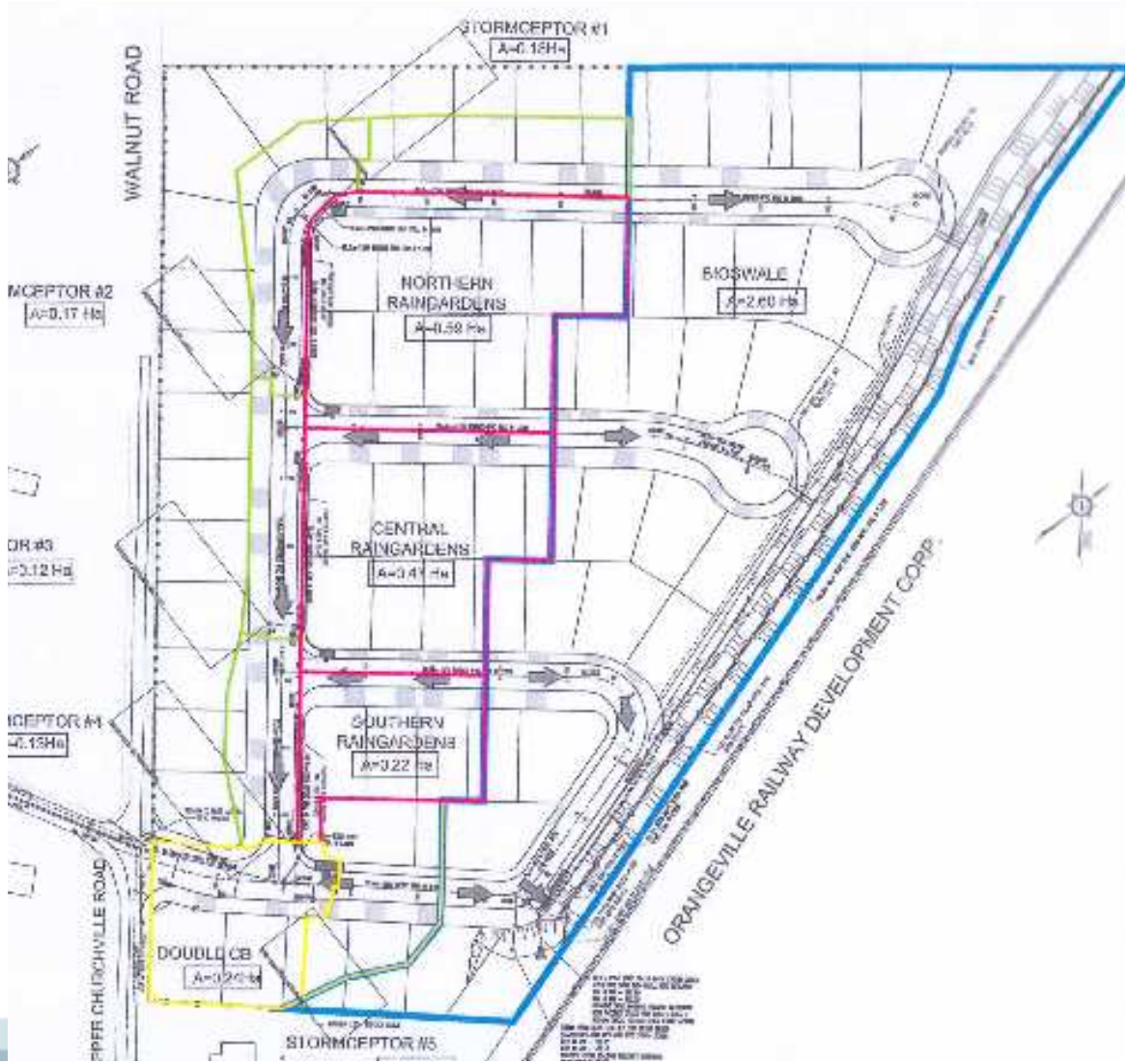
- Rainwater Harvesting
- Green Roof
- Downspout Disconnection
- Soakaway (Infiltration Trench/Chamber)
- Bioretention
- Vegetated Filter Strip
- Permeable Pavement
- Enhanced Grass Swales
- Dry Swale
- Perforated Pipe Systems

“Integrated design teams and the treatment train approach are essential ingredients for the implementation of successful stormwater management strategies, where the environment and our communities are soundly protected by infrastructure that is integrated within the urban fabric.”

CVC/TRCA LID Design Guidance

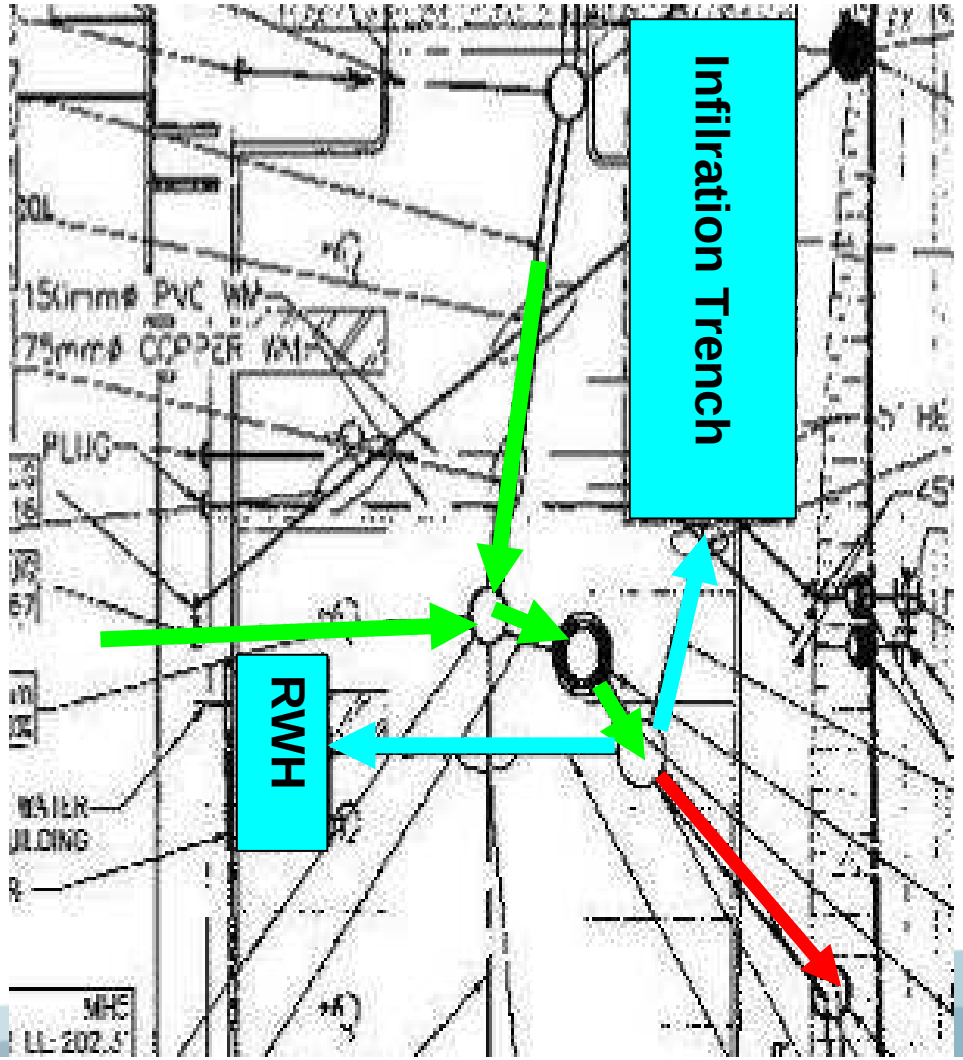
New Development Example: Walnut Grove Homes

- **5.5 hectares**
- **LID design meets**
  - **Water quality,**
  - **Flood,**
  - **Erosion,**
  - **groundwater,**
  - **and ecological requirements.**
- **~1000 cu metres of storage onsite**
- **Developer gained 7 developable lots**

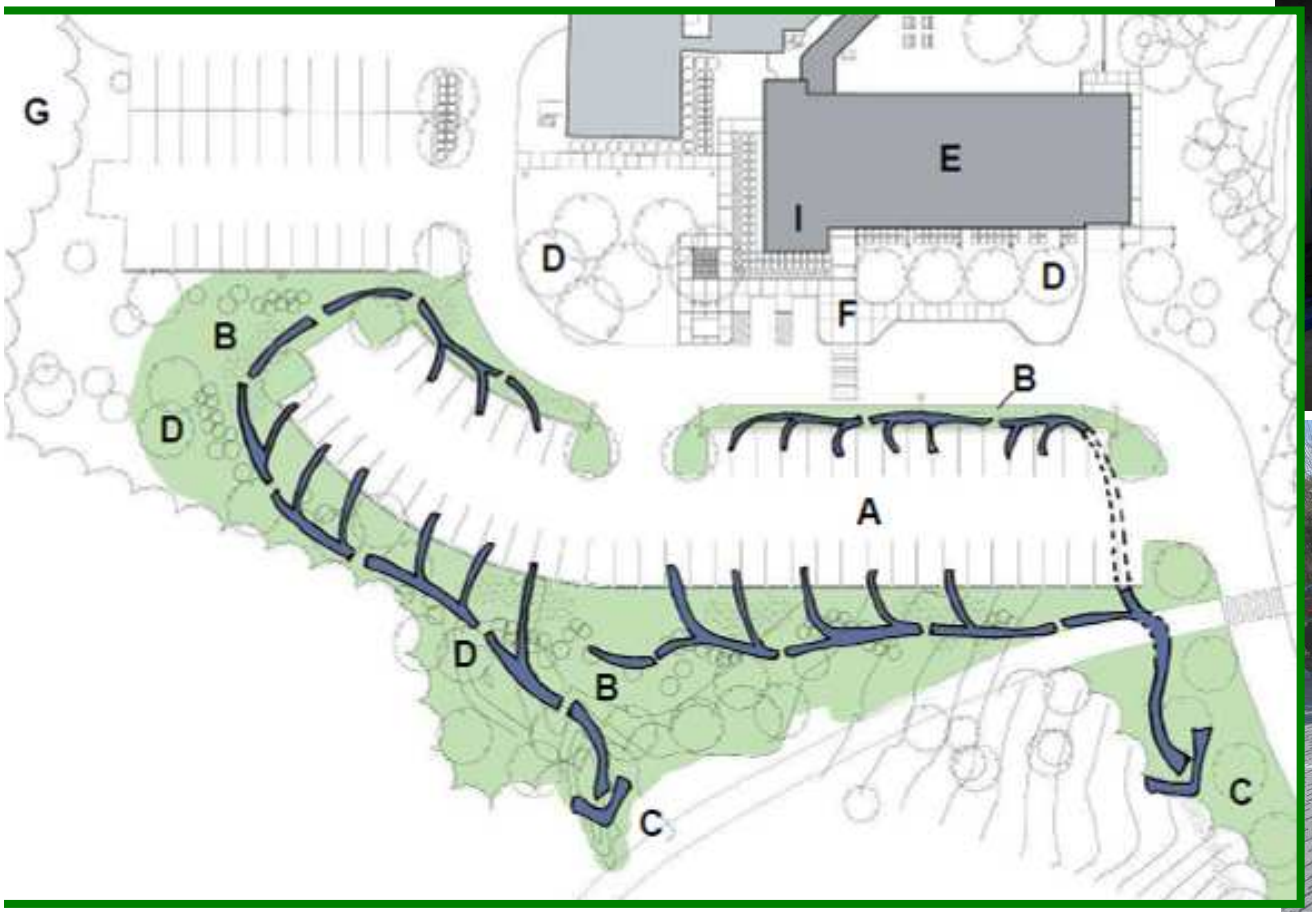


New Development Example: Commercial Office

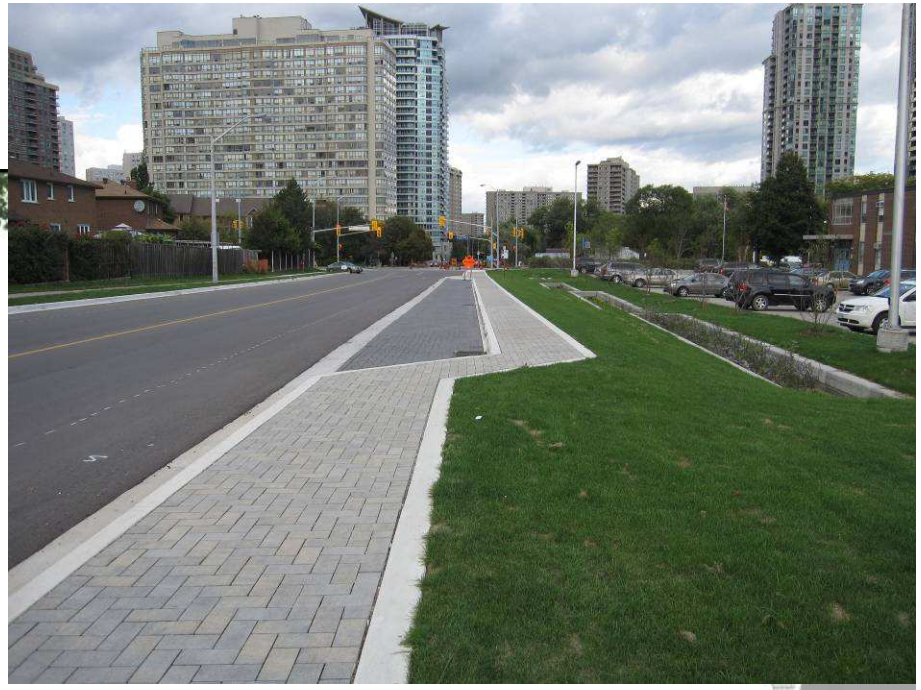
- 1.0 hectare
- LEED GOLD
- LID Practices:
  - Infiltration Trench (347 m^3)
  - Rainwater Harvesting (50 m^3)
  - Rain Garden (50 m^3)
- Stormceptor Pre-treatment
- LID design meets
  - Water quality and
  - Flood detention requirement (1yr-24hr, 2yr-24hr storms)

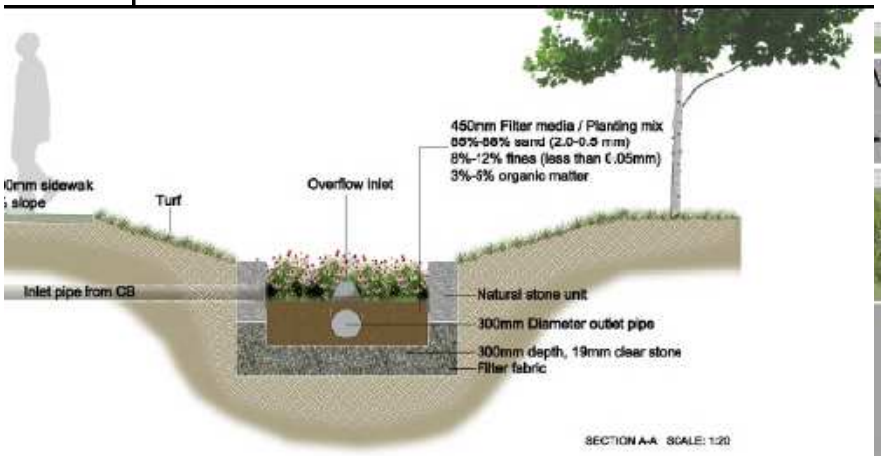


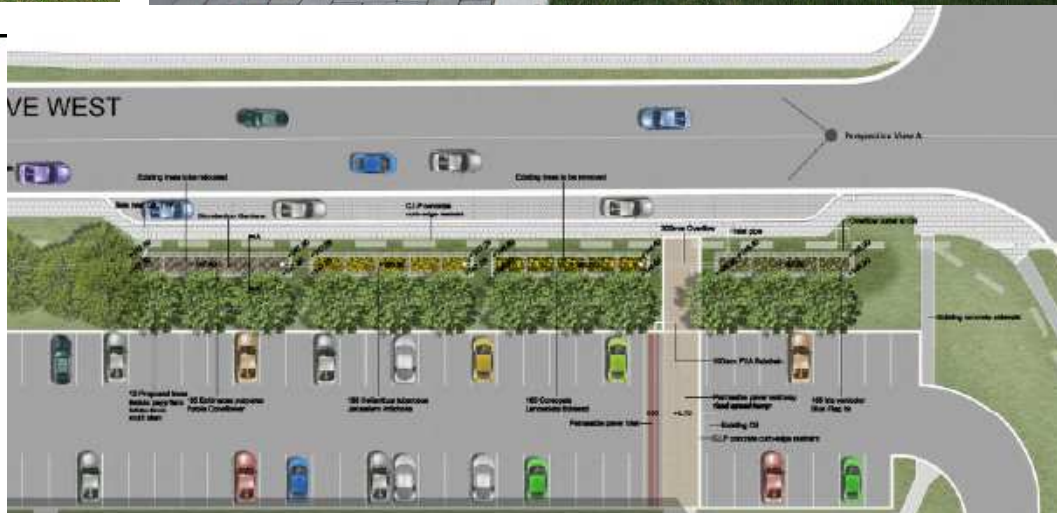
Redevelopment Example: Credit Valley Conservation Main Office



Retrofit Example: Elm Drive

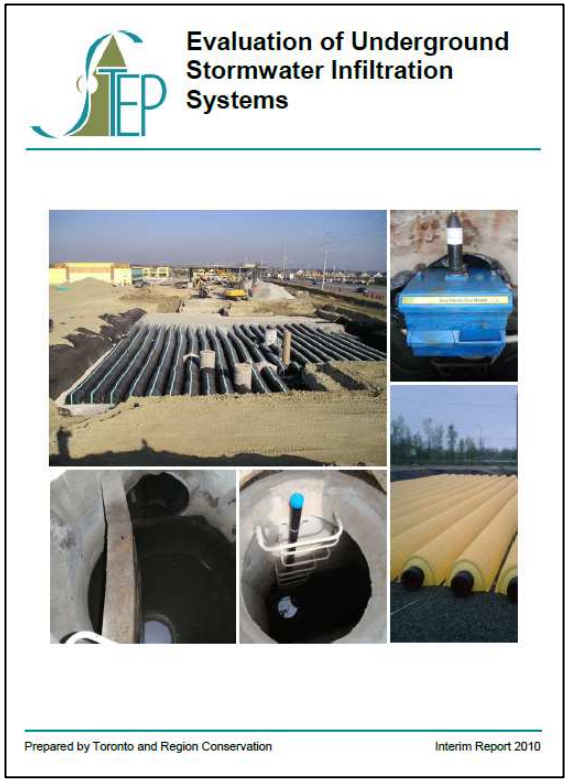






Current TRCA and CVC Initiatives on Stormwater Practices

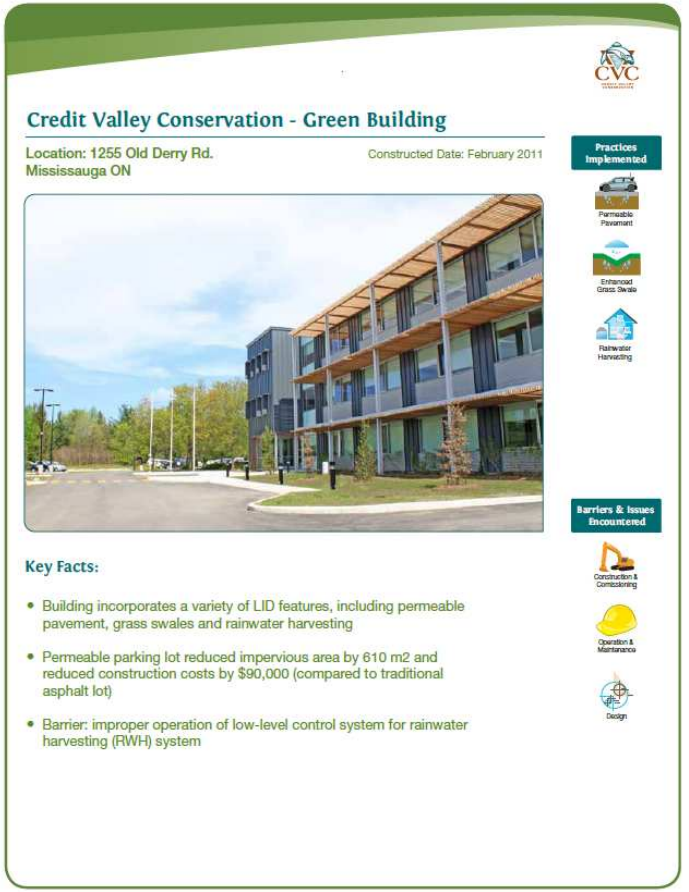
- Monitoring evaluations
  - Green roofs
  - Rainwater harvesting
  - Bioretention
  - Permeable pavements
  - Soil amendments
  - Soakaways, infiltration trenches and chambers
  - Engineered filter media
  - Thermal mitigation measures



- Literature reviews, design and costing tools, guidelines – www.sustainabletechnologies.ca

Current TRCA and CVC Initiatives on Stormwater Practices

- LID case studies
  - Performance
  - Lessons learned
    - Planning
    - Design
    - Construction
    - Maintenance
- Retrofit Guidance
  - Right-of-Way
  - Industrial/Commercial
  - Residential
  - Public Lands
- http://www.creditvalleyca.ca/low-impact-development



Credit Valley Conservation - Green Building

Location: 1255 Old Derry Rd.
Mississauga ON

Constructed Date: February 2011

Practices Implemented

Permeable Pavement

Enhanced Grass Swale

Rainwater Harvesting

Barriers & Issues Encountered

Construction & Commissioning

Operation & Maintenance

Design

Key Facts:

- Building incorporates a variety of LID features, including permeable pavement, grass swales and rainwater harvesting
- Permeable parking lot reduced impervious area by 610 m2 and reduced construction costs by $90,000 (compared to traditional asphalt lot)
- Barrier: improper operation of low-level control system for rainwater harvesting (RWH) system

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STEP website:
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CVC LID website:
http://www.creditvalleyca.ca/low-impact-development/