2013 INFRA CONGRESS

Centre d'expertise et de recherche en infrastructures urbaines

Low Impact Development – Case Studies and Lessons Learned

D1 – STORMWATER MANAGEMENT: QUALITY AND PERFORMANCE

December 3, 2013

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Principal
Schollen & Company Inc.

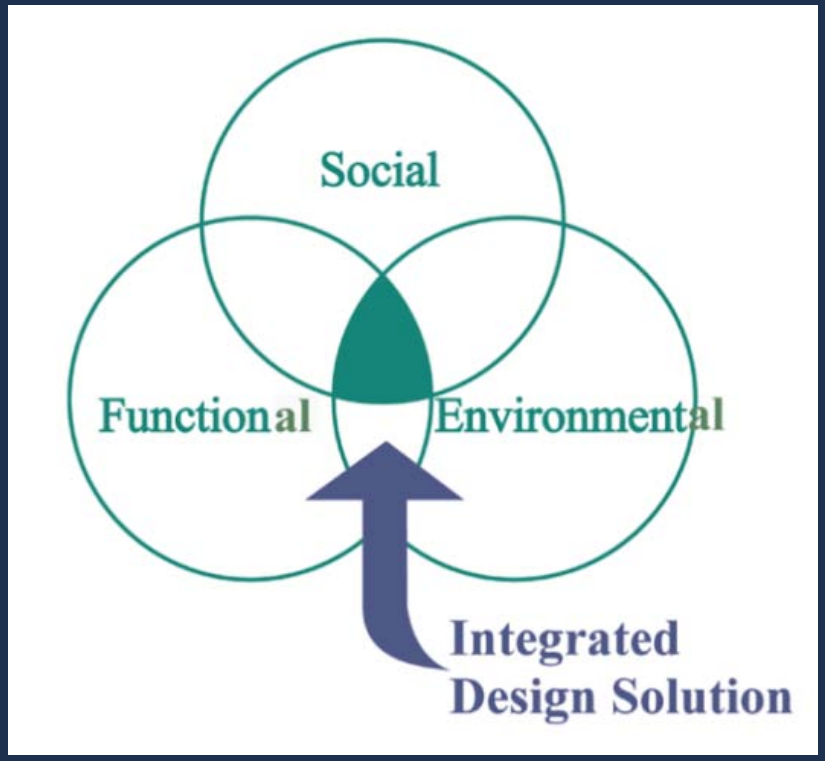
Low Impact Development (L.I.D.) Design Essentials

– Multi-disciplinary team
  - Engineers
  - Architects
  - Landscape architects
  - Ecologists

– Integrated design process

– Multi-objective based approach

– Commitment to innovation



Edwards Gardens / TBG Sustainable Parking Lot, Toronto

Objectives:

- **Restore an existing degraded parking lot**
- **Integrate SWM – quality and quantity**
- **Enhance tree canopy**
- **Improve circulation and utility**
- **Position as complementary to TBG programs**

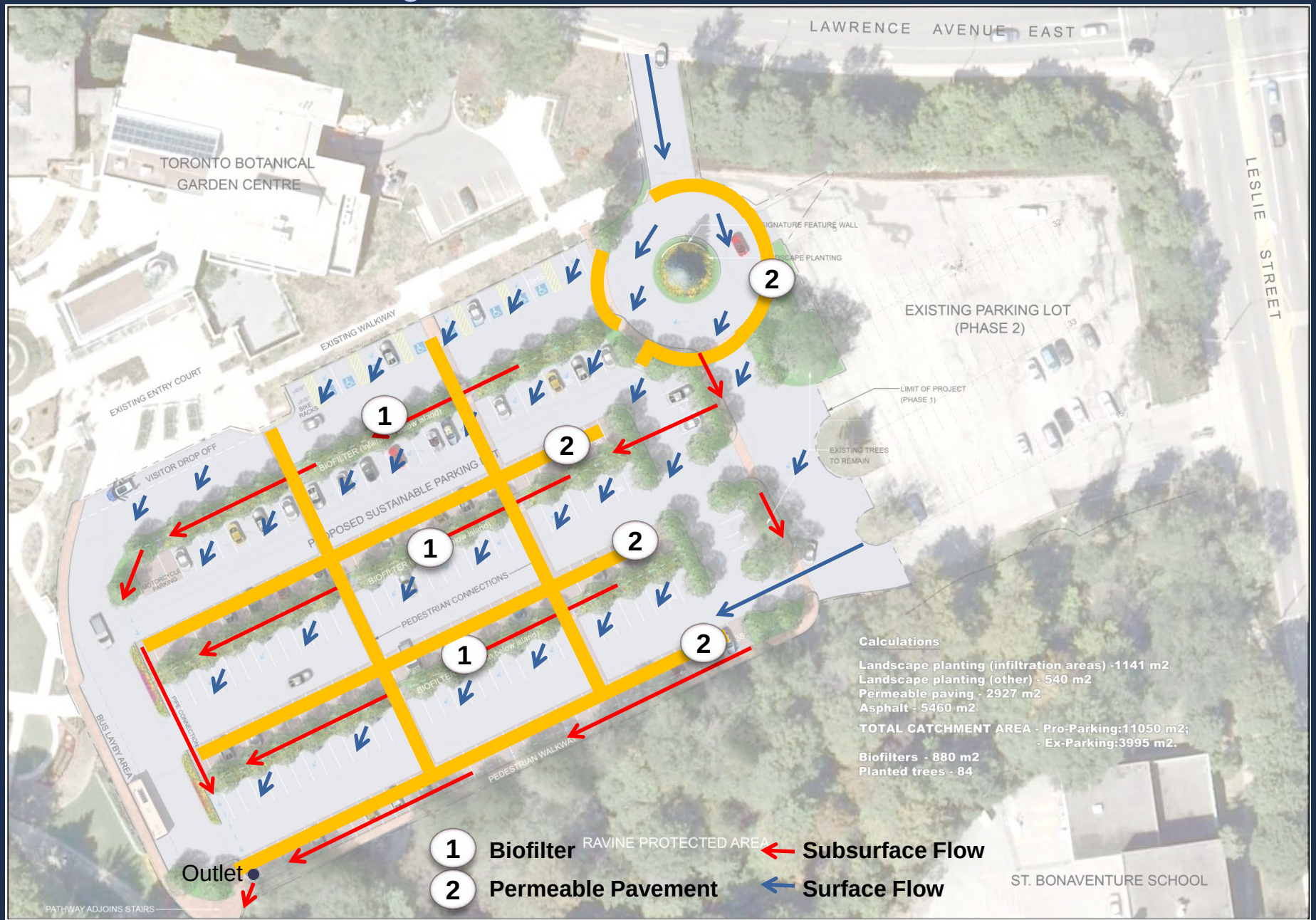
Schollen & Company Inc.
RV Anderson Associates
City of Toronto
Toronto Botanical Garden

Edwards Gardens / TBG Sustainable Parking Lot, Toronto

Concept Plan

Edwards Gardens / TBG Sustainable Parking Lot, Toronto

Stormwater Management Plan



Edwards Gardens / TBG Sustainable Parking Lot, Toronto

Construction Process

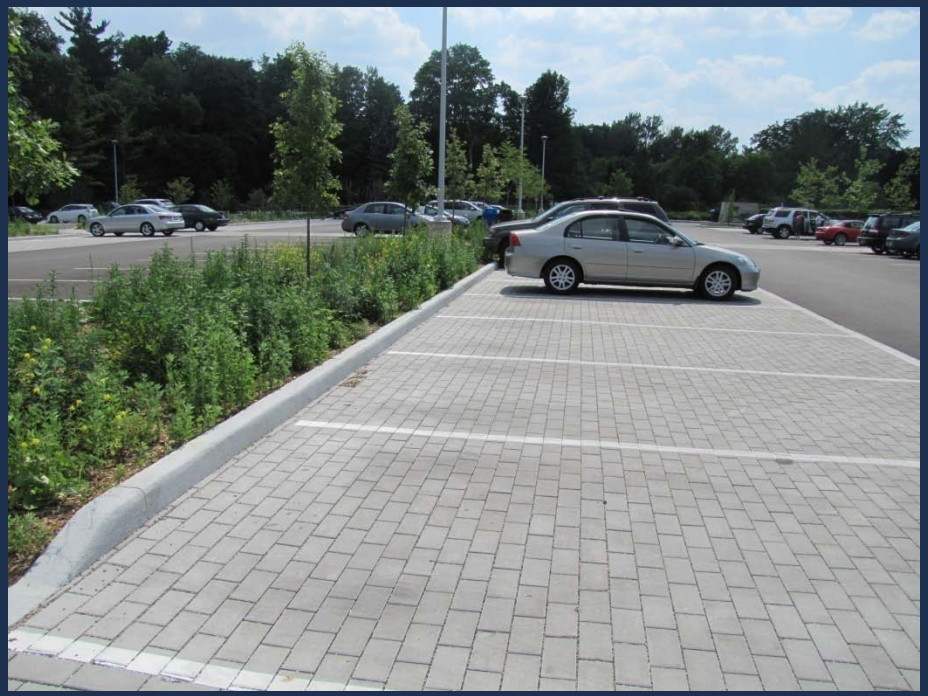
Biofilter inlet and permeable paver installation

Biofilter installation

Edwards Gardens / TBG Sustainable Parking Lot, Toronto

Completed Installation

Permeable pavement at entrance roundabout

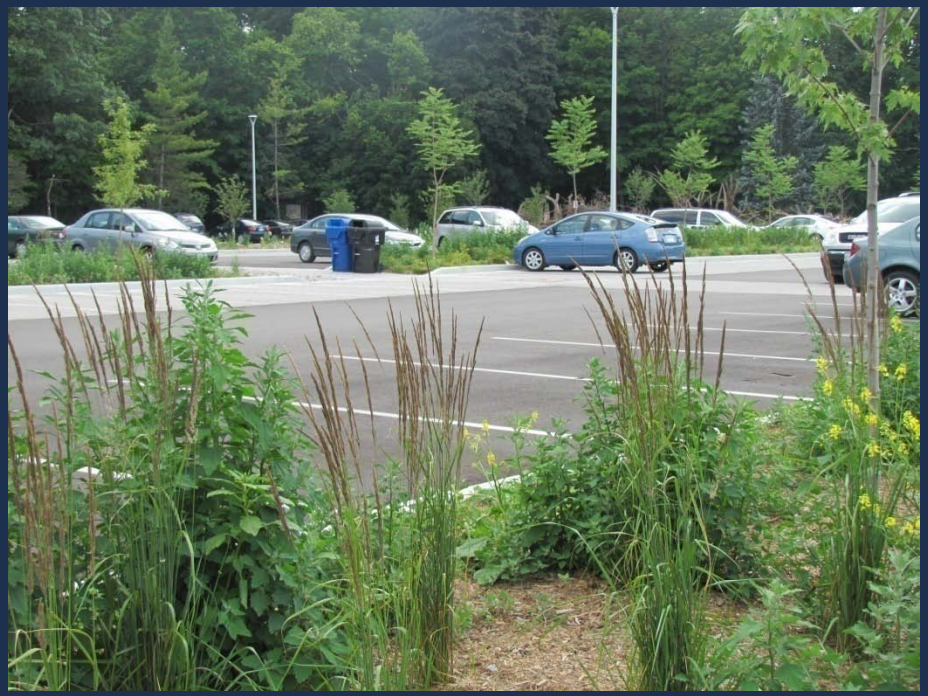


Permeable pavement and biofilter

Edwards Gardens / TBG Sustainable Parking Lot, Toronto

Completed Installation

Permeable pavement parking pads and walkways



Extensive plantings to complement TBG

Edwards Gardens / TBG Sustainable Parking Lot, Toronto

Challenges / Lessons Learned:

– Budget

- Basic resurfacing $800,000
- Sustainable parking lot $1.8 million

– Timing – relative to TBG programs

– Need to maintain parking capacity

– Retrofit project issues

Honda Canada Campus, Markham

Objectives:

- **Minimize reliance on end-of-pipe SWM**
- **Optimize efficiency**
- **Utilize the landscape as a functional system**
- **Address practical considerations**
- **Reflect Honda's corporate mission**
- **Achieve LEED® Certification**

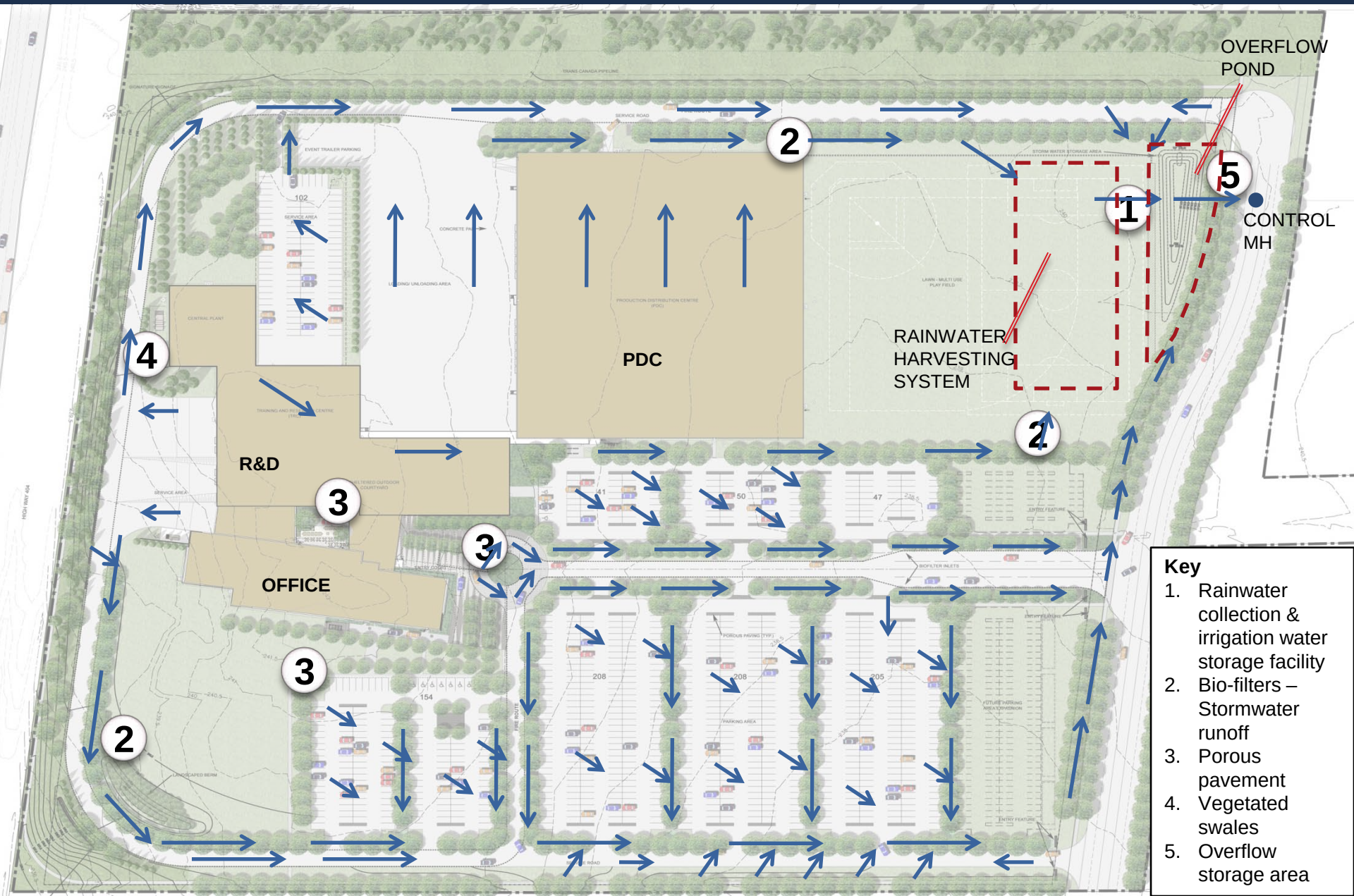
ZAS / HOK Architects
Sabourin Kimble & Associates
Schollen & Company Inc.

Honda Canada Campus, Markham

Site Plan

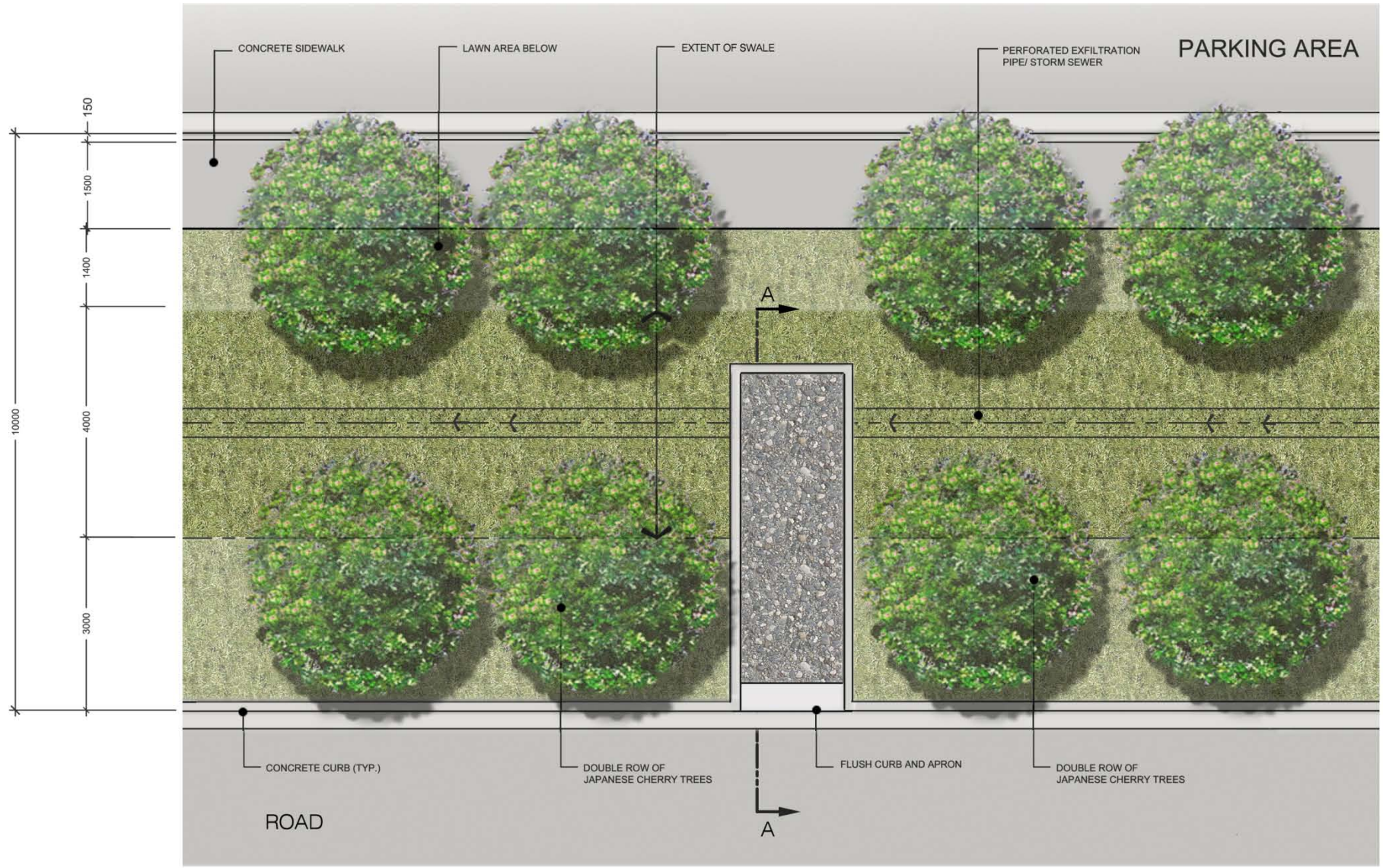
Site Area = approx.27 ha
Building Area = 27,127m²

Honda Canada Campus, Markham
Stormwater Management Plan



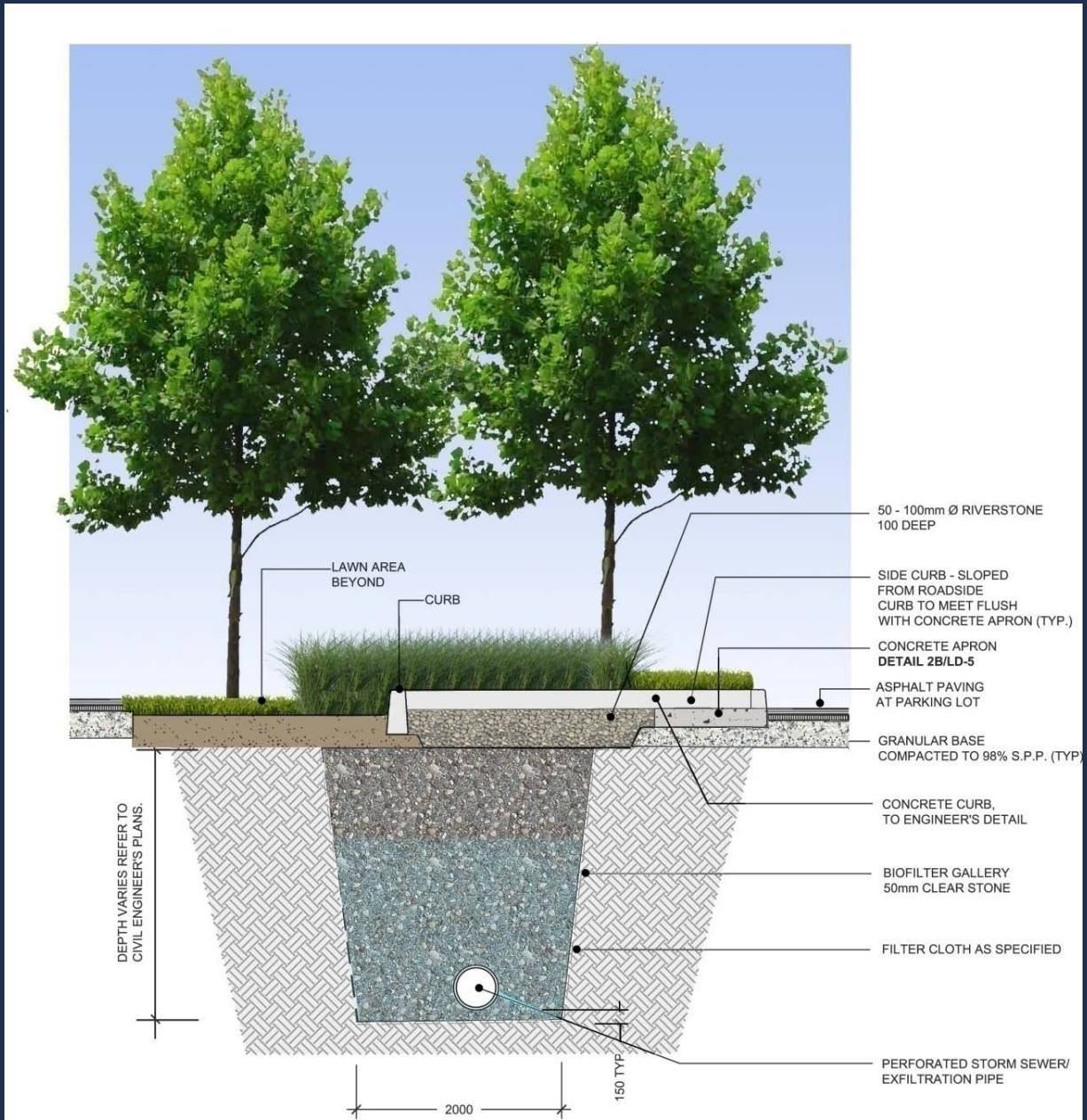
Honda Canada Campus, Markham

Biofilter Plan



Honda Canada Campus, Markham

Biofilter Section



Honda Canada Campus, Markham

Selected Site Photos

Rainwater Harvesting Tank

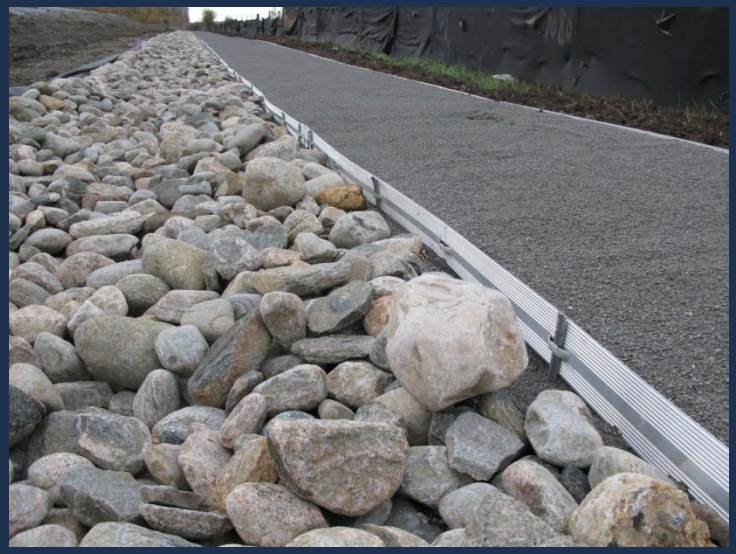
Natural Drainage

Permeable Pavement in Parking Lot

Permeable Pavement in Forecourt Roundabout

Honda Canada Campus, Markham

Selected Site Photos



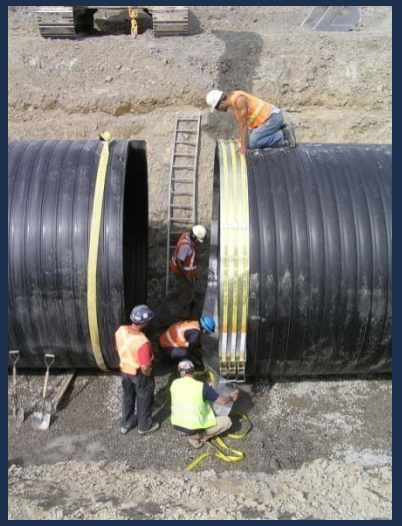
Granular Fitness Path and Drainage Swale

Biofilter

Paving and plants in courtyard

Landscaped Outdoor Eating Areas

Honda Canada Campus, Markham



Challenges / Lessons Learned:

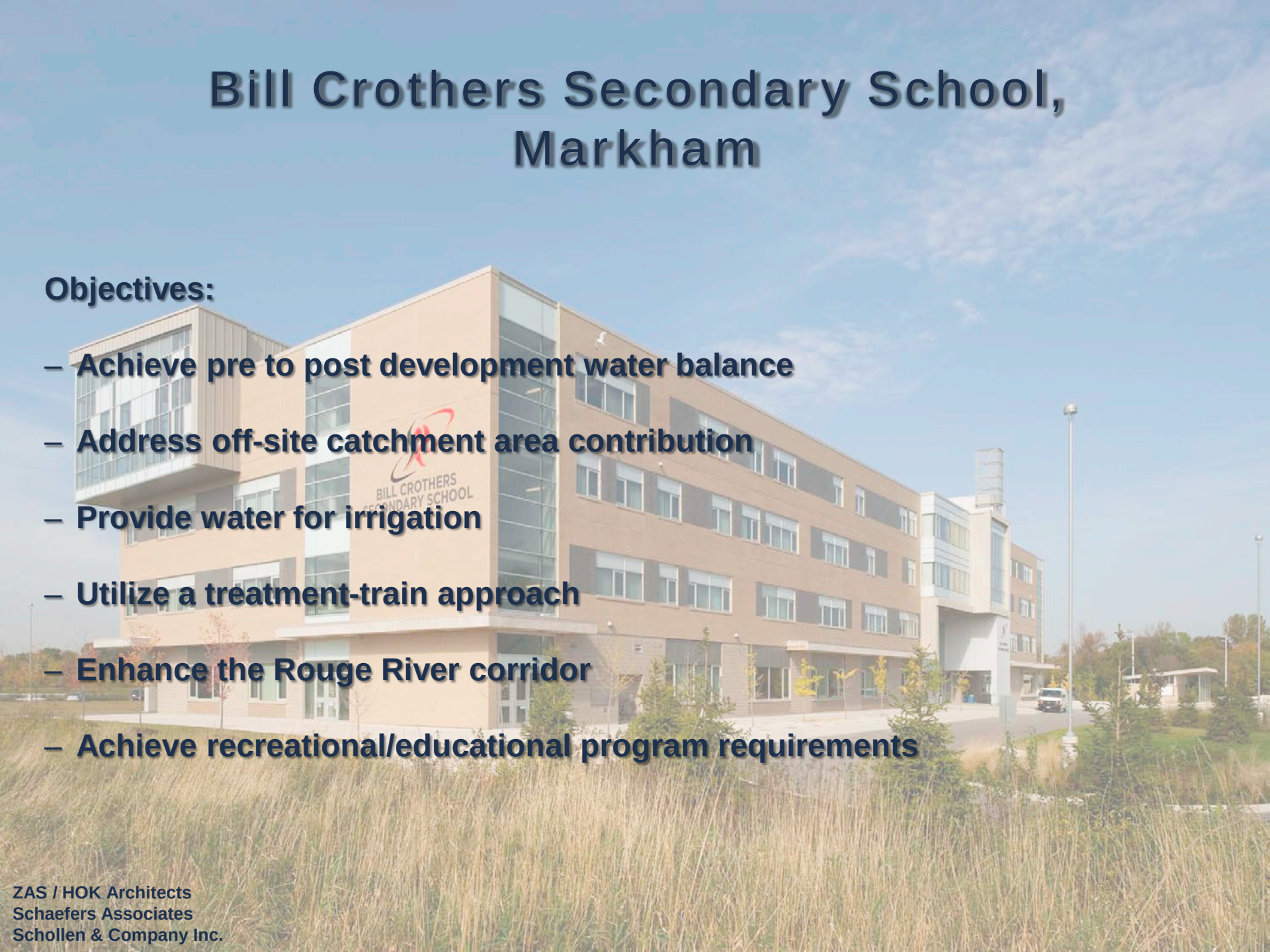
– Contractor education is key

– Integration of utilities and infrastructure is critical

– Maintenance / management program is essential

– System must be protected during construction

Bill Crothers Secondary School, Markham



Objectives:

- Achieve pre to post development water balance
- Address off-site catchment area contribution
- Provide water for irrigation
- Utilize a treatment-train approach
- Enhance the Rouge River corridor
- Achieve recreational/educational program requirements

ZAS / HOK Architects
Schaefers Associates
Schollen & Company Inc.

Bill Crothers Secondary School, Markham

Concept Plan