

# Low Impact Development Obstacles, Concerns, Solutions, and Project Examples

*Prepared By:*

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## OBSTACLES & CONCERNS

- Municipal objection and concern over long term maintenance and operation costs
- High value of land
- Reluctance to allow dual land use for LIDs & stormwater storage
- Monitoring every LID
- Not always recognized for quantity or erosion control attributes
- Challenging erosion and sediment control measures
- Rapidly evolving science with dynamic standards
- ECA requirements for private lot LIDs



- Maximize dual land use: LIDs & stormwater storage
  - Parks, buffers, schools, valley, ROW, private
- Share success stories
  - Sustainable Technologies Evaluation Program
- Collaborative approach with municipalities and CAs
  - “Rainscaping” (LSRCA)
  - Consistent approach
- Focused monitoring program, not every one
- Acknowledge quantity control attributes
- ECA exemption for private lot LIDs

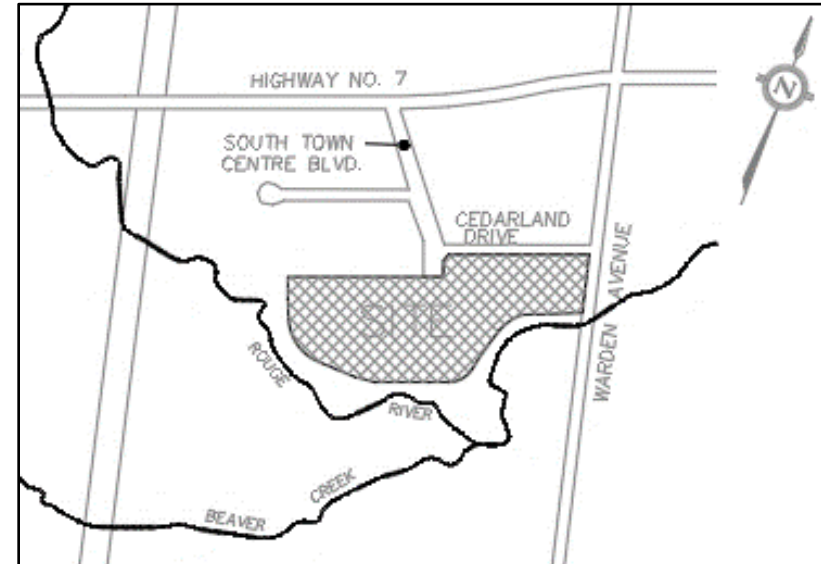


**IBM Facility for Software Development, City of Markham, TRCA**



## **IBM Facility for Software Development, City of Markham, TRCA**

- Property is 31.45 ha
- Consists of four (4) large office buildings
- Private road with multiple parking facilities
- Water quantity control – 2 through 100 year storms
- Water quality protection
- Water balance through infiltration



## IBM Facility for Software Development, City of Markham, TRCA

Parking Lot  
Bioswale

End-of-pipe Wet  
Quality/Erosion  
Pond

Infiltration Gallery  
for Rooftop  
Drainage



## IBM Facility for Software Development, City of Markham, TRCA



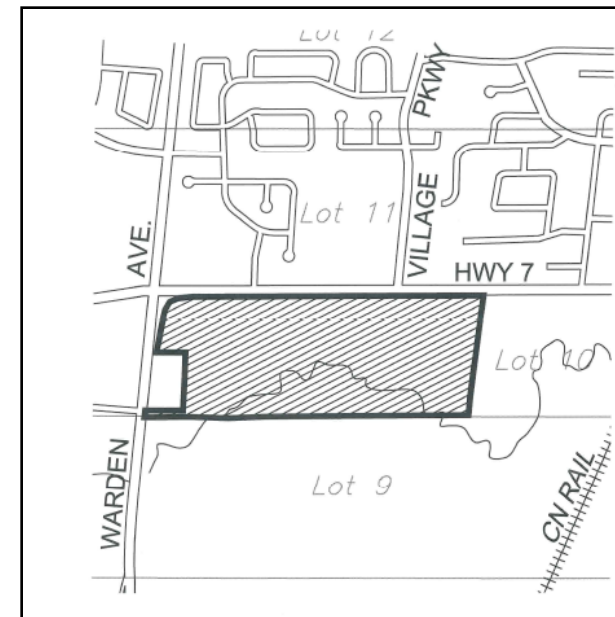
## Times Group Corporation, City of Markham, TRCA





## Times Group Corporation, City of Markham, TRCA

- Property is 35.76 ha
- Consists of high density residential development with commercial block
- Condominium blocks with private roads, and municipal roads surrounding
- No Quantity Control – Drains directly to Rouge River
- Quality Control – 80% TSS Removal
- Erosion Control – 25 mm rainfall
- Water Budget
- LEED Certified
- Cooling of Stormwater Runoff  
(Redside Dace)
- 100% Park Credit



## **Times Group Corporation, City of Markham, TRCA**

### **On-site Solutions**

Greens Roofs – 75% Building Coverage

Rooftop storage and evaporation of first 5mm of rainfall (standard roofs)

Rainwater Harvesting and Storage (Cisterns in Underground Parking)

Rain Gardens within Private Spaces

Pervious Pavement & Landscape Strip (2m private ownership)

### **Street Level & End of Pipe Solutions**

Cisterns within Community Parks for Irrigation/Markham District Energy Cooling Towers – 100% park credit

Rain Gardens in Public Spaces

Pervious Pavement for Parking Lanes & Hard Surfaces in Park Blocks

Infiltration Galleries along the Valley Edge within Park Blocks – 100% park credit





## Times Group Corporation, City of Markham, TRCA



## **Times Group Corporation, City of Markham, TRCA**

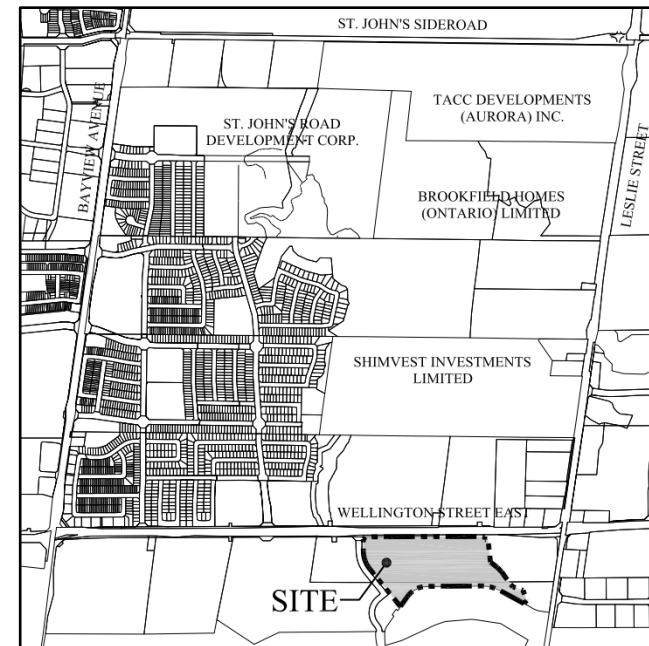


## Treasure Hill, Town of Aurora, LSRCA



## Adena Views, Town of Aurora, LSRCA

- Property is 11.80 ha
- Consists of low density residential
- Public roads
- Water quantity control – 2 through 100 year storms
- Water quality protection
- Water balance through infiltration
- Phosphorus Budget
- Rainscaping



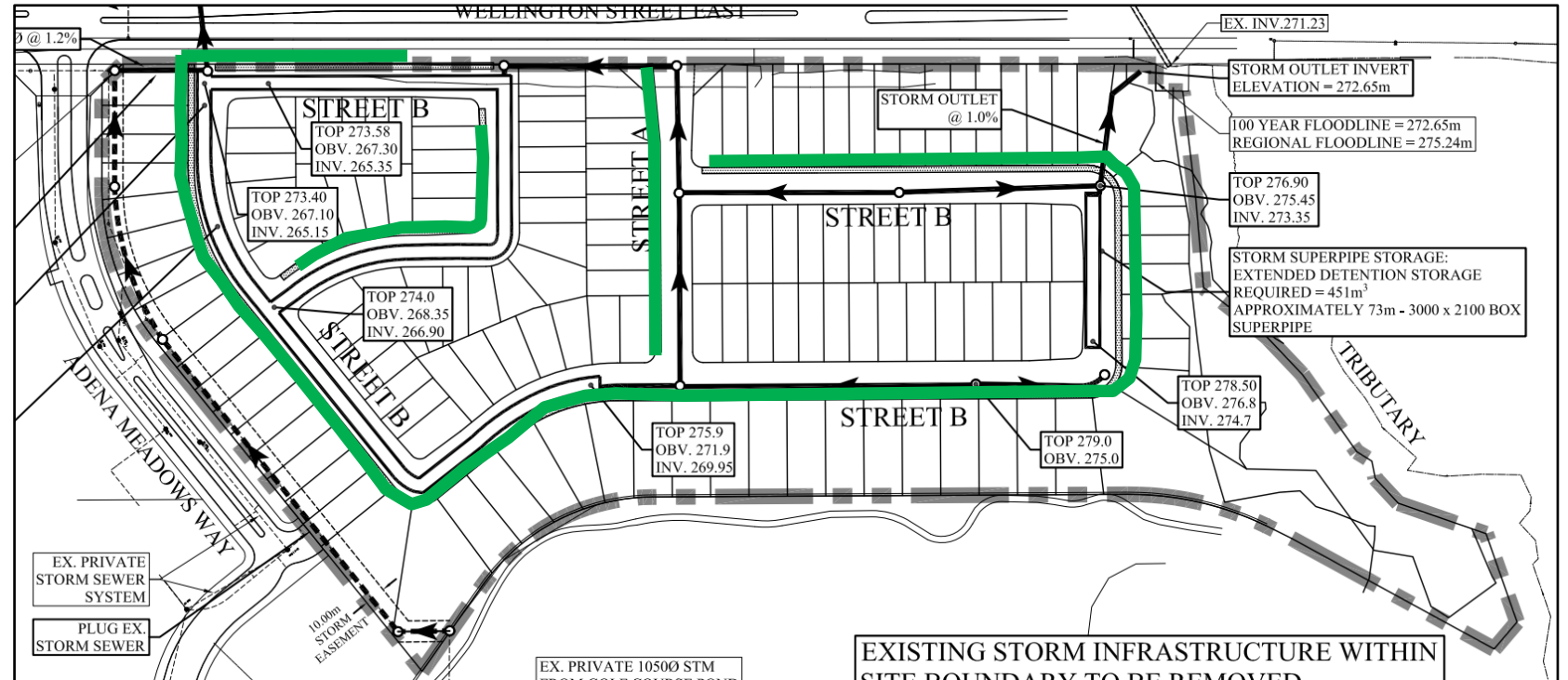
## Adena Views, Town of Aurora, LSRCA

Bioswales

Exfiltration at Rear Lot  
Catchbasins

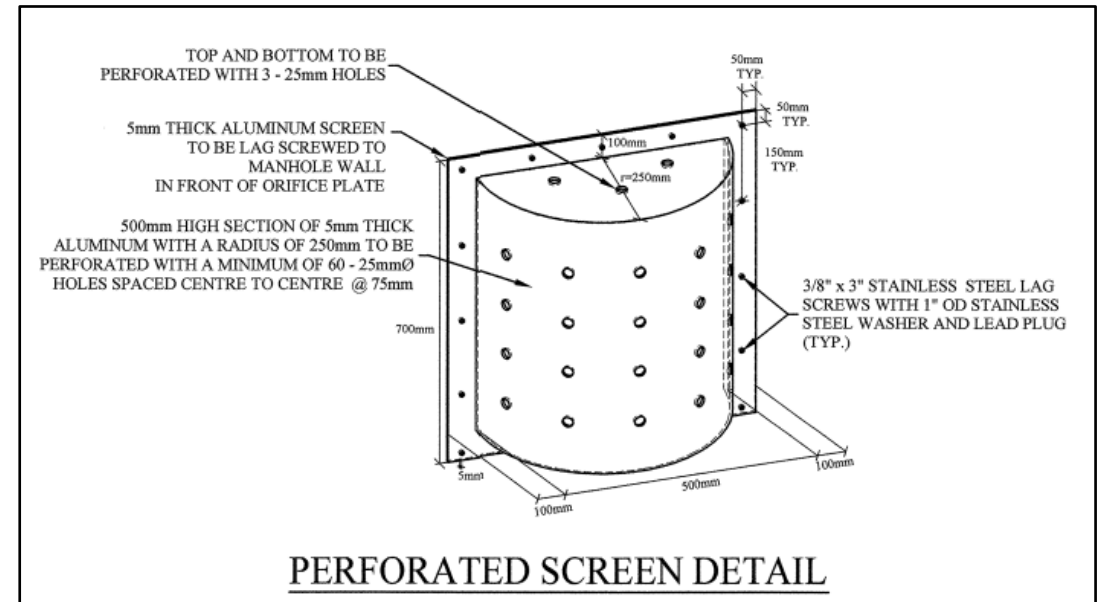
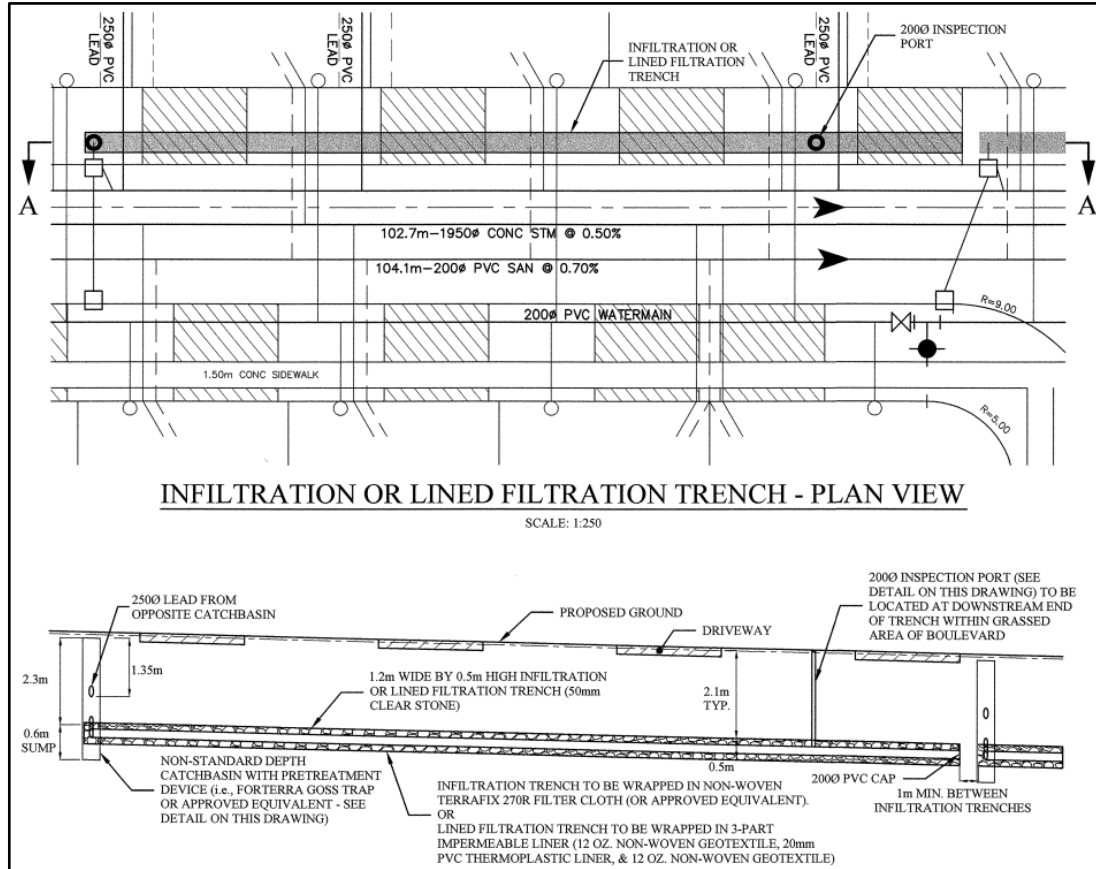
Street Catchbasins  
Infiltration System

Quantity control via  
Storm Superpipe





## Adena Views, Town of Aurora, LSRCA



## Adena Views, Town of Aurora, LSRCA

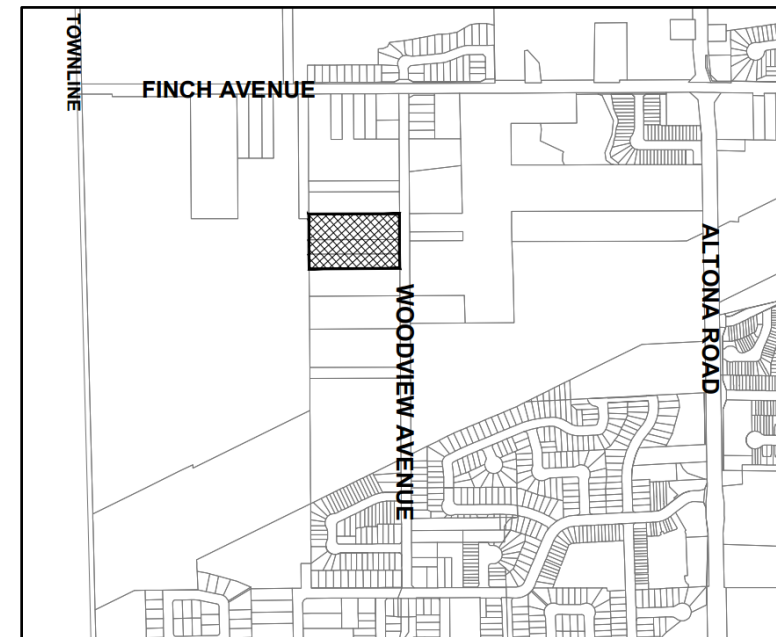


**Woodview Avenue, City of Pickering, TRCA**



## Woodview Avenue, City of Pickering, TRCA

- Property is 2.02 ha
- Consists of low and medium density residential
- Public roads
- Water quantity control – 2 through 100 year
- Water quality – 80% TSS
- Water balance through infiltration
- Provincially Significant Wetland



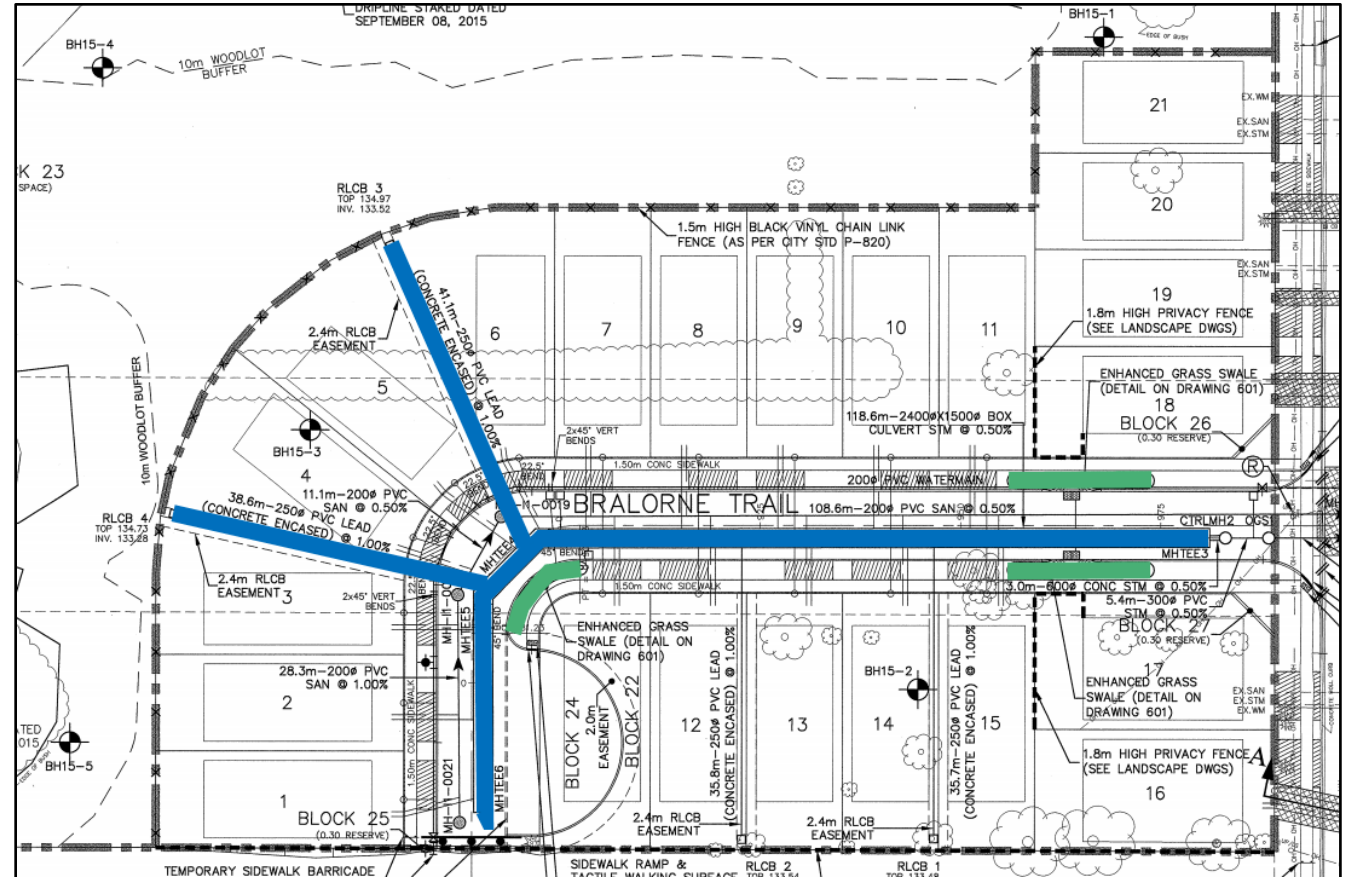
## Woodview Avenue, City of Pickering, TRCA

Reduced Lot Grading

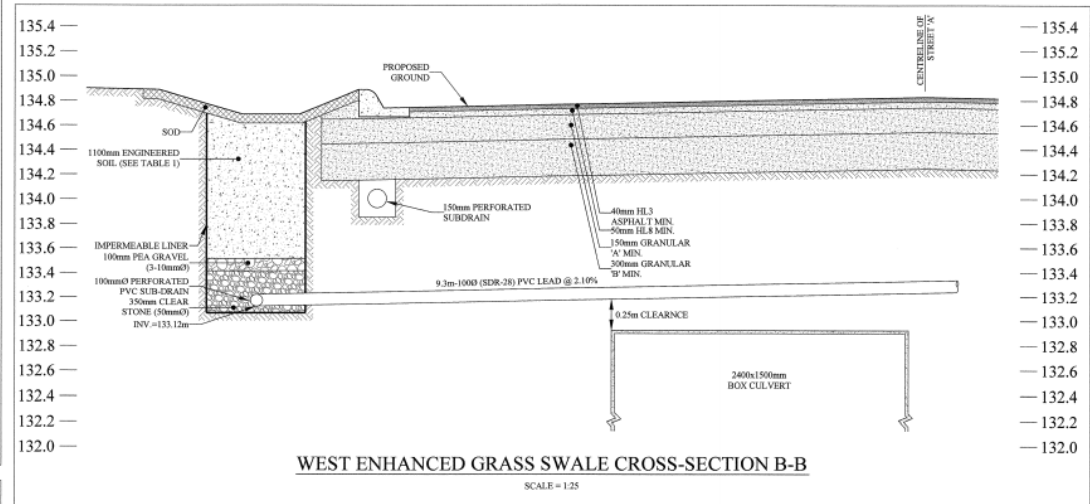
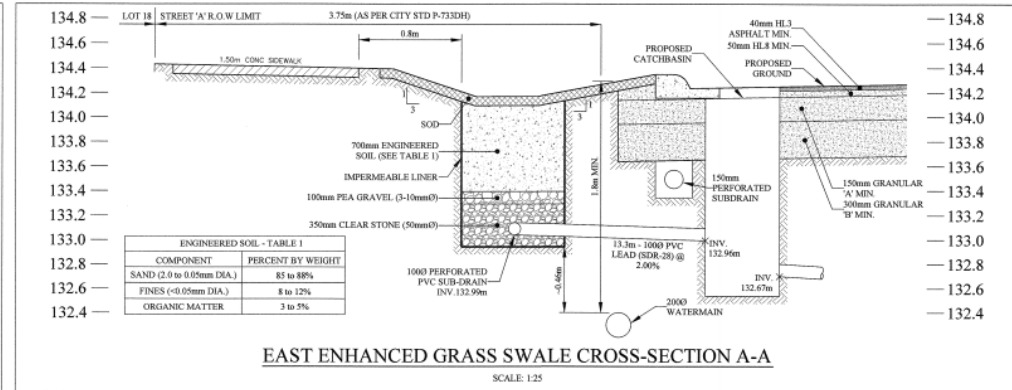
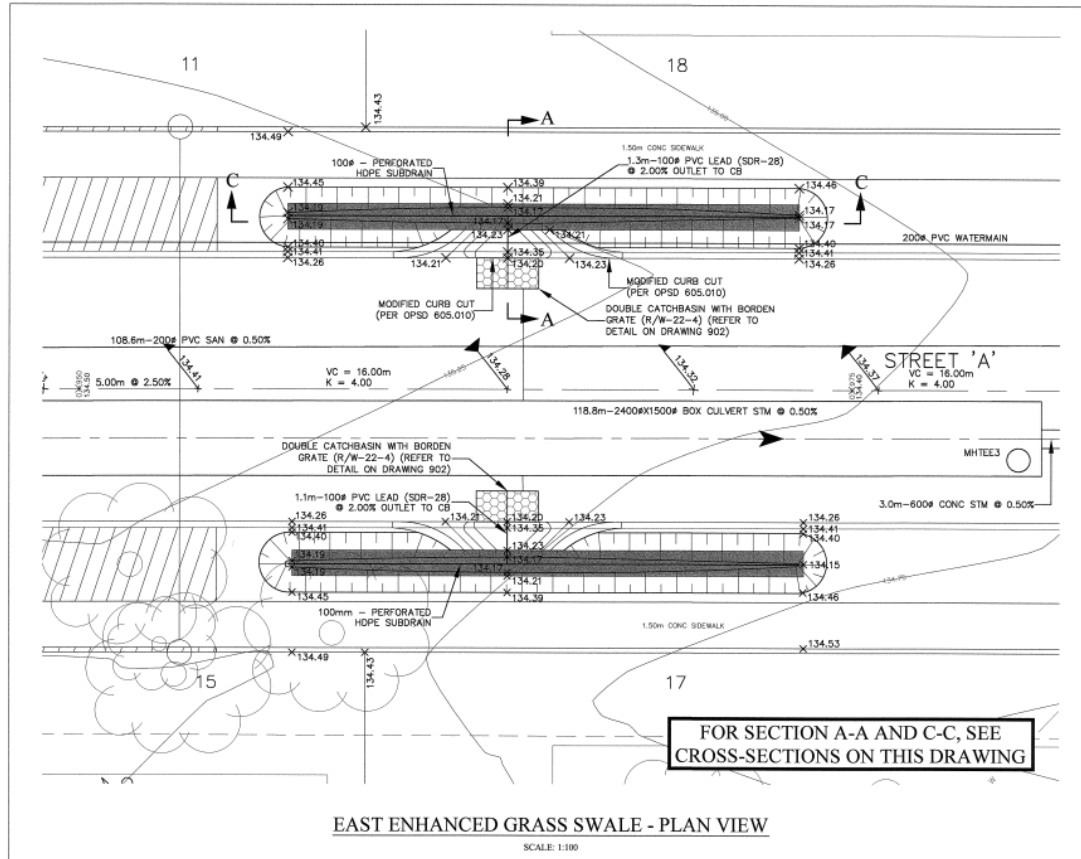
Bio-Retention/  
Raingarden

Grassed Swales

Stormwater Detention  
Facility (Superpipe)



## Woodview Avenue, City of Pickering, TRCA

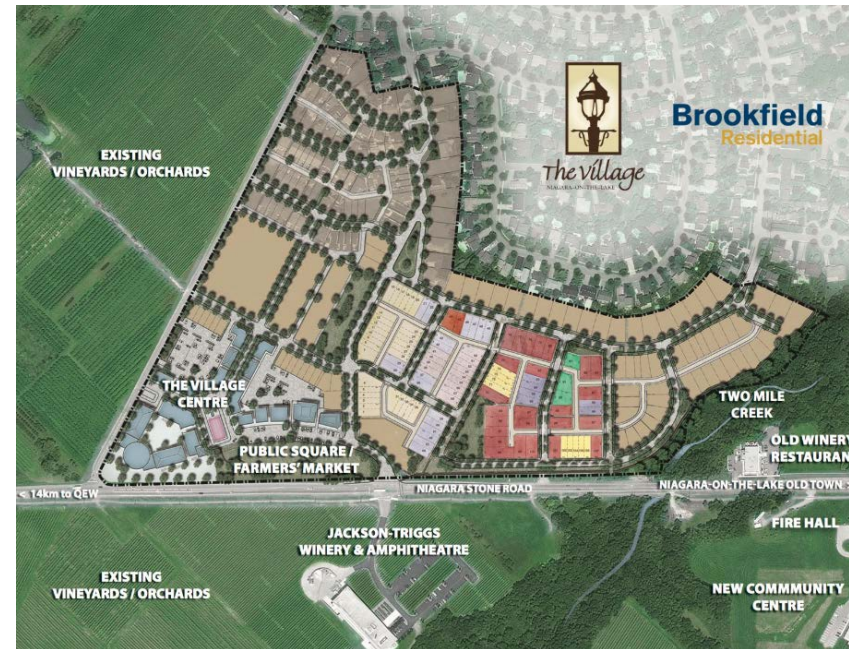


**Brookfield Residential, Niagara-on-the-Lake, NPCA**



## Brookfield Residential, Niagara-on-the-Lake, NPCA

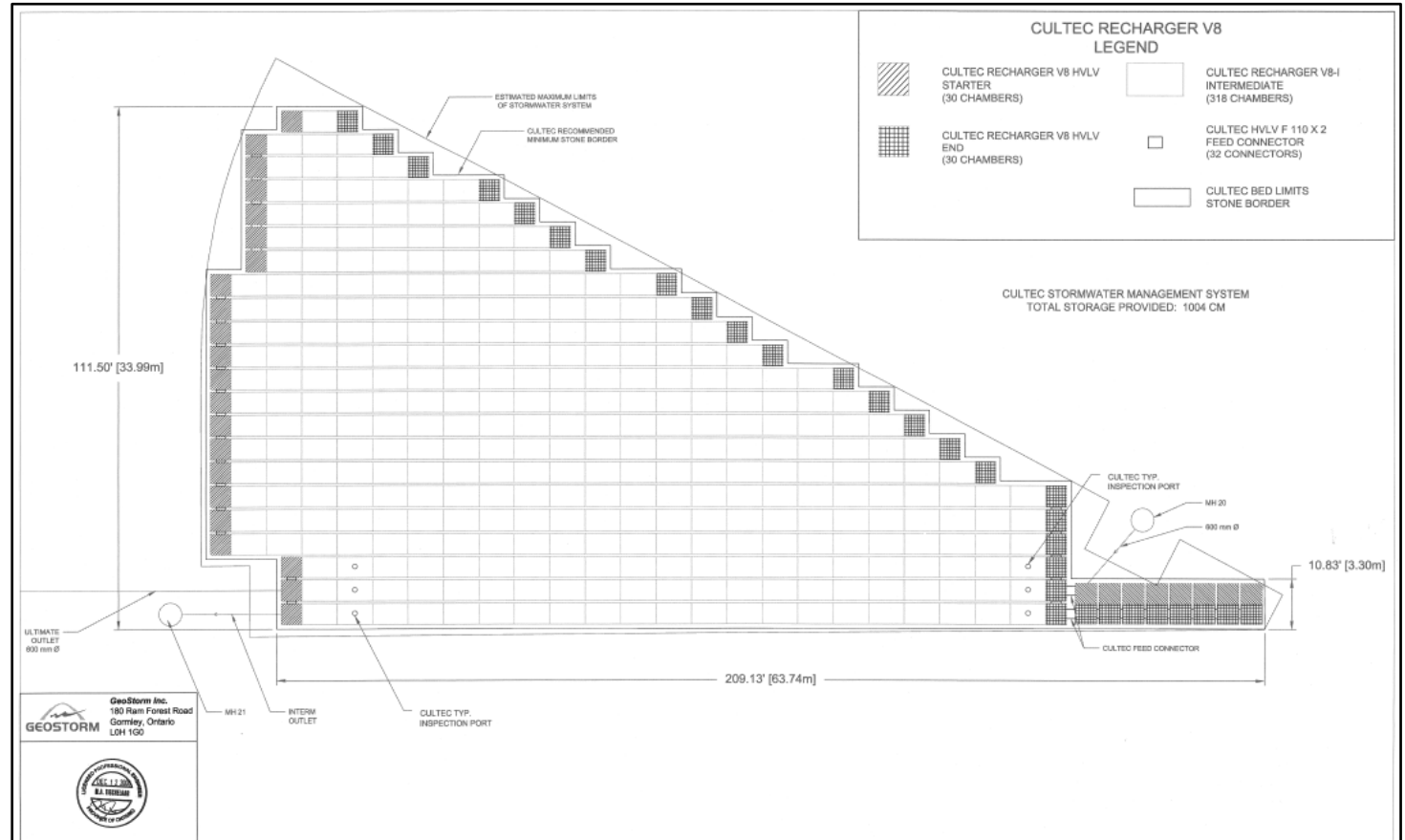
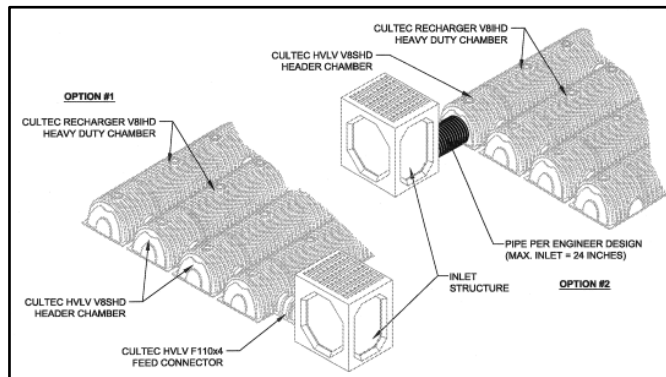
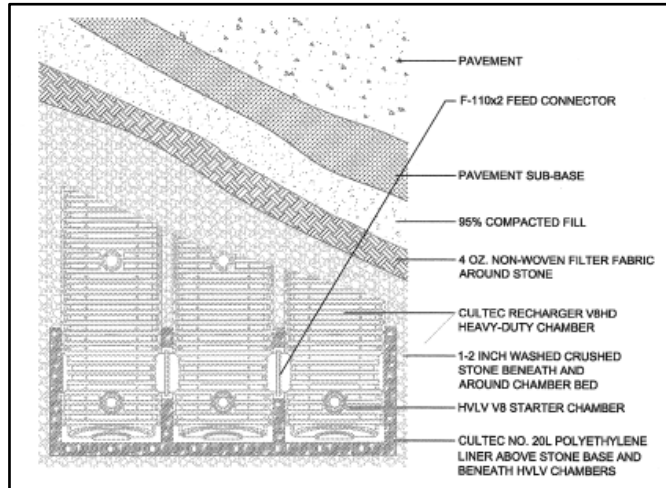
- Property is 16.04 ha
- Consists of low and medium residential development and commercial
- Public road
- Water quantity control – 2-100 year control
- Water quality – 80% TSS
- Water balance through infiltration
- 100% Park Credit







## Brookfield Residential, Niagara-on-the-Lake, NPCA



**Brookfield Residential, Niagara-on-the-Lake, NPCA**

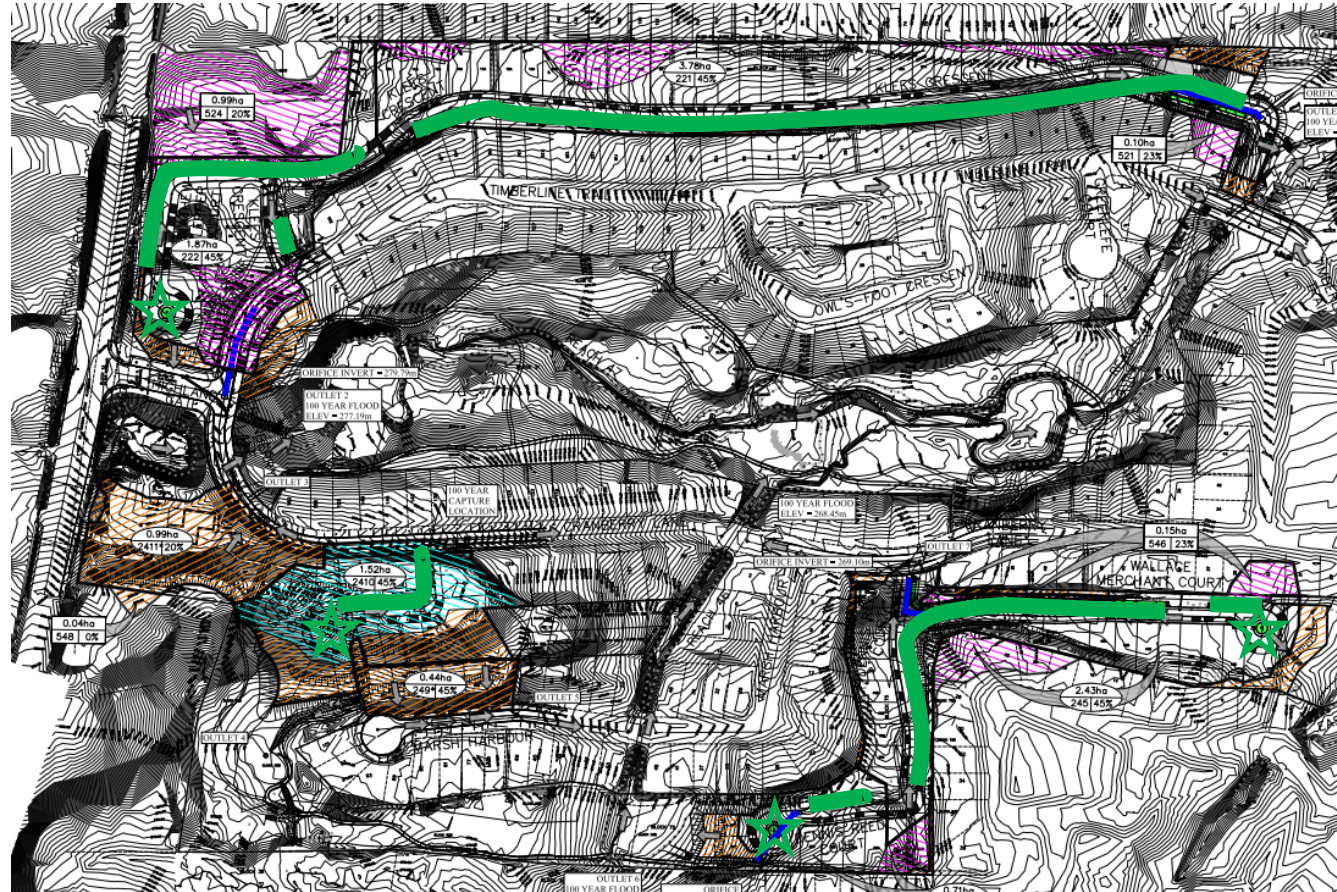


## Highland Gate, Geranium Corporation, Town of Aurora, LSRCA

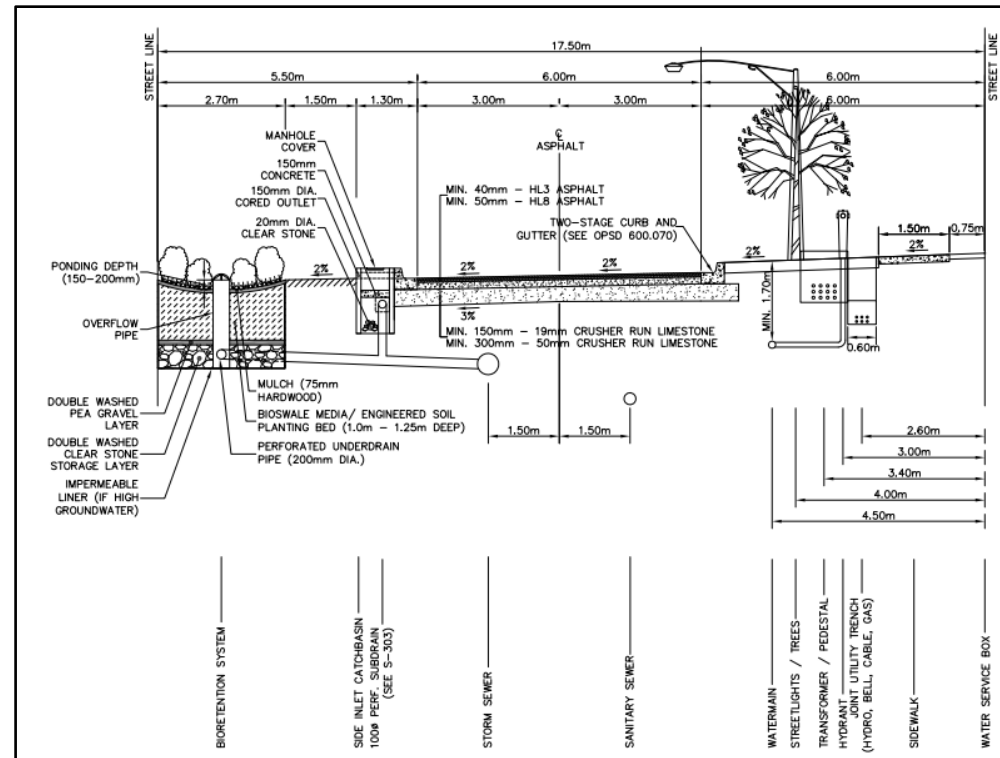
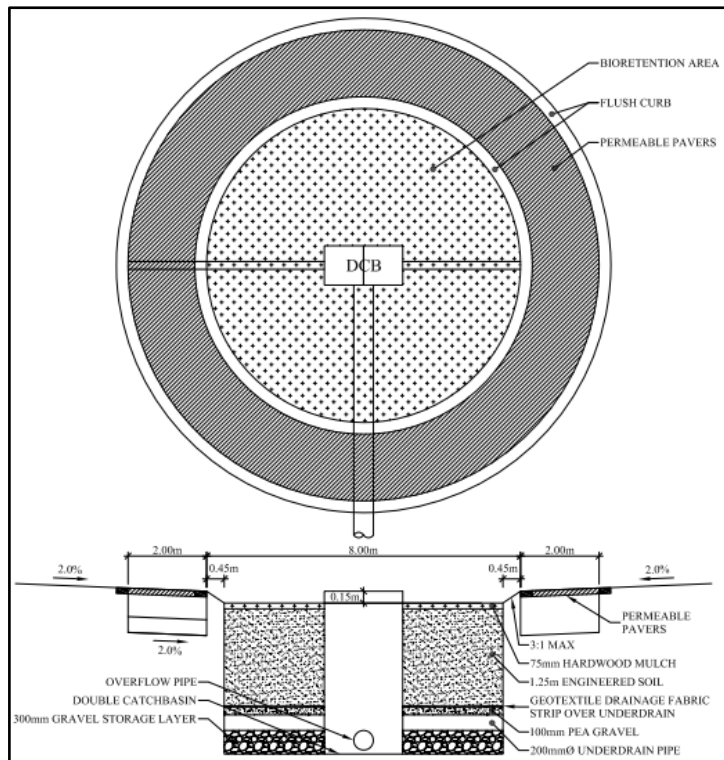
Roadside  
Bioretention Filters  
(mostly lined)

Underground SWM  
Detention Facility  
(i.e., Super Pipe)

Bio-retention in cul-  
de-sacs



## Highland Gate, Geranium Corporation, Town of Aurora, LSRCA



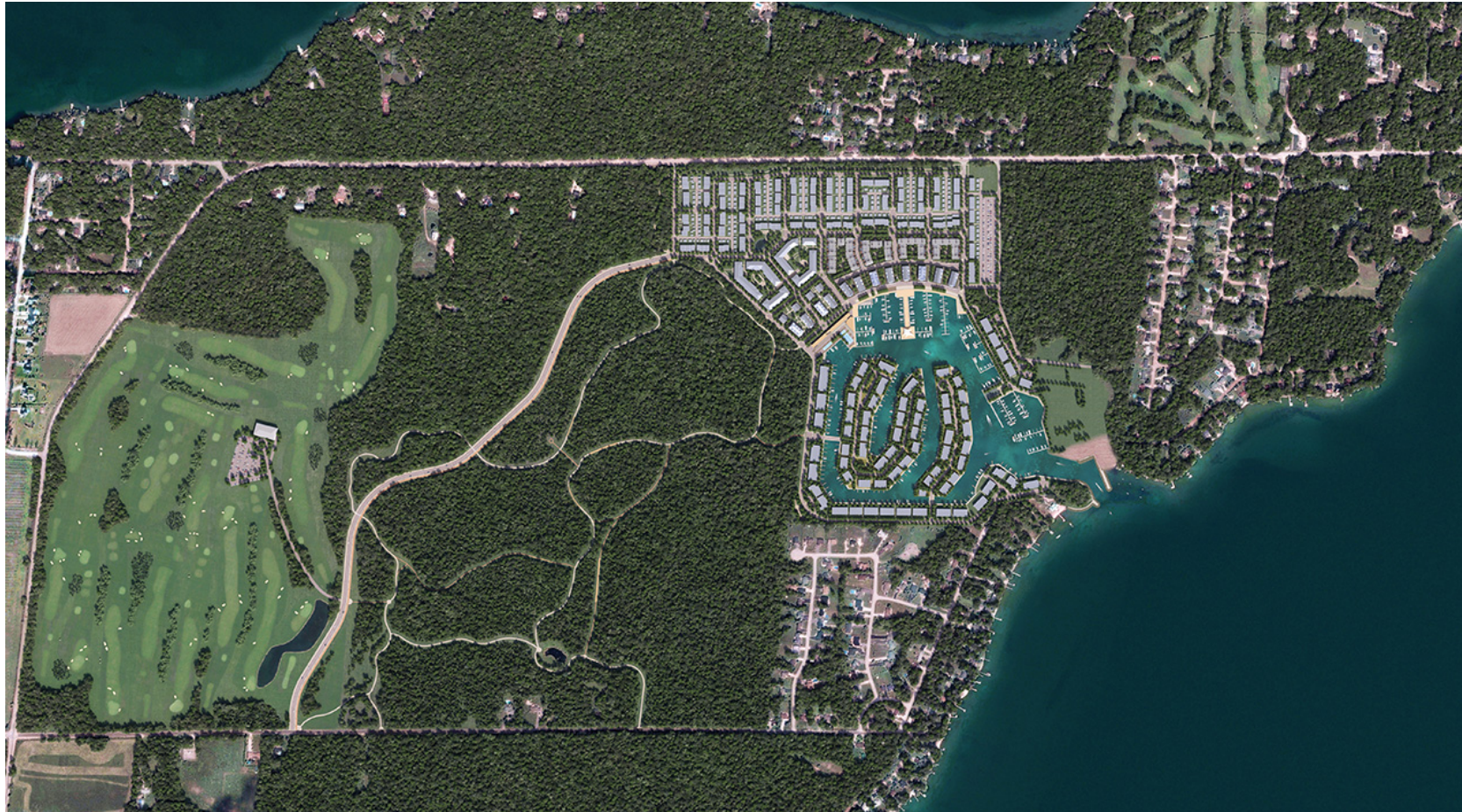
**Highland Gate, Geranium Corporation, Town of Aurora, LSRCA**



## Friday Harbour, Innisfil - LSRCA



**Friday Harbour, Innisfil - LSRCA**





**Thank You**

