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No Outlet, No Problem. Infiltrate!

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Agenda

1. Site Conditions
2. Criteria
3. RBJ Schlegel Park Stormwater Management Plan
4. Construction

Site Conditions

Site Conditions

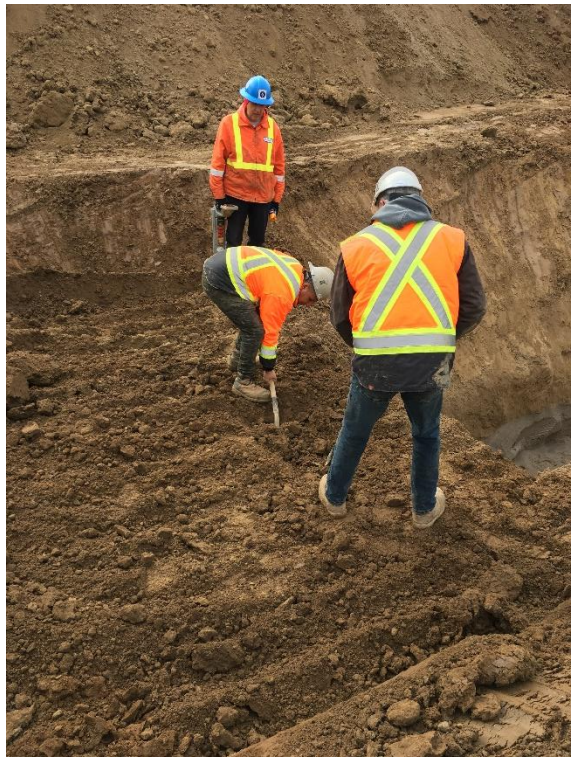
- 16 ha site located in the south-west corner of Kitchener
- Currently is agricultural
- Rapidly developing area (residential)

Site Conditions

- Site currently has no natural stormwater outlet
- Rather than building a new outlet, City wanted to maintain the existing gravel infiltration conditions
- Site infiltrates all events up to and including the regional (Hurricane Hazel) event
- City wanted a stormwater approach that supported the City's LID policy

Site Conditions

- Groundwater is more than 20 m below the ground
- Soils consist of silty sand and sandy silts
- Mean infiltration rate of approximately 43 mm/hr



Site Conditions- Proposed Park

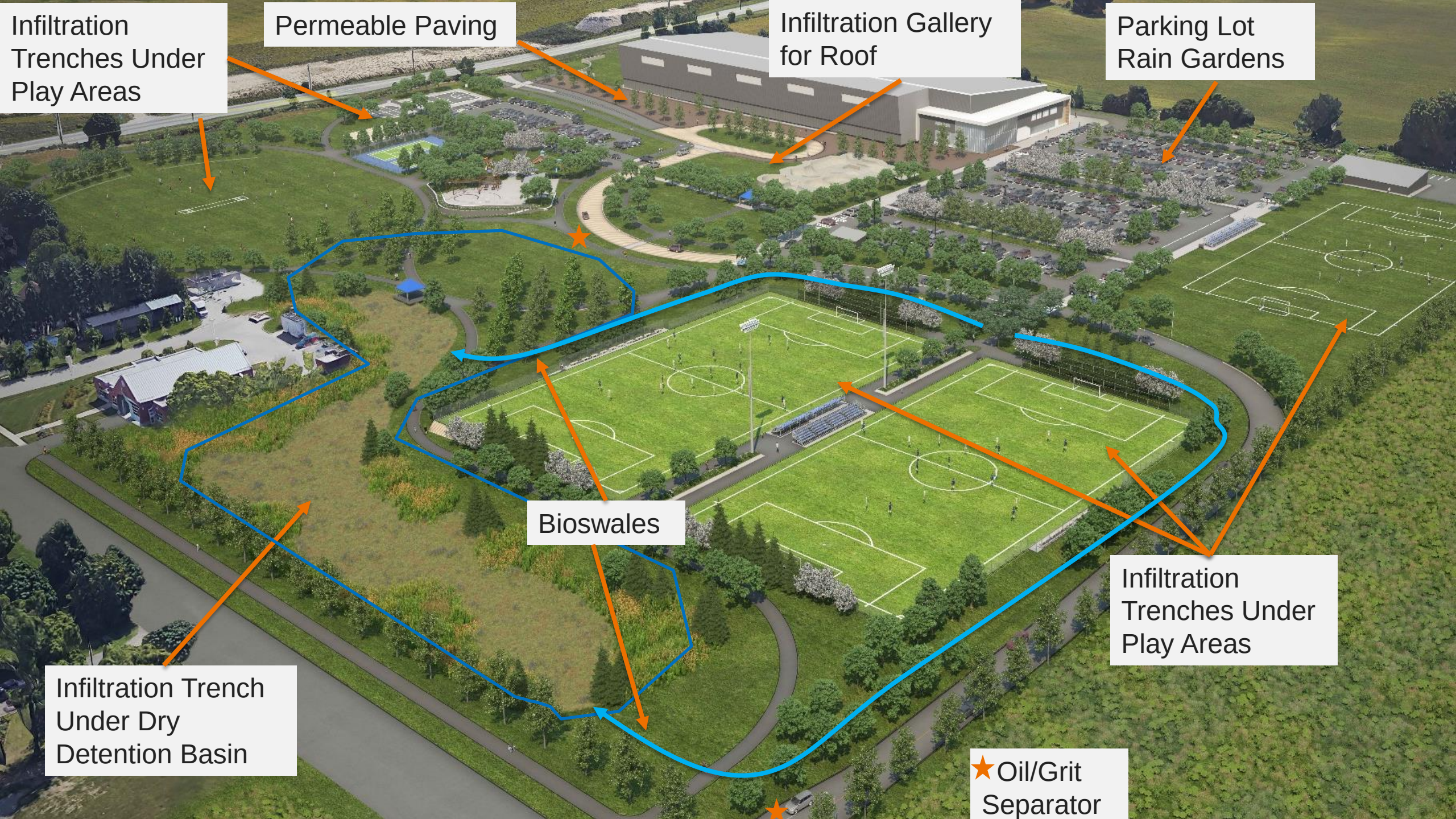
- Indoor recreation centre
- Football, soccer, and multipurpose fields
- Tennis, volleyball and basketball courts
- Splash pad
- BMX area and skate park
- Cricket pitch
- Supporting elements (trails, passive park areas, parking)

Criteria

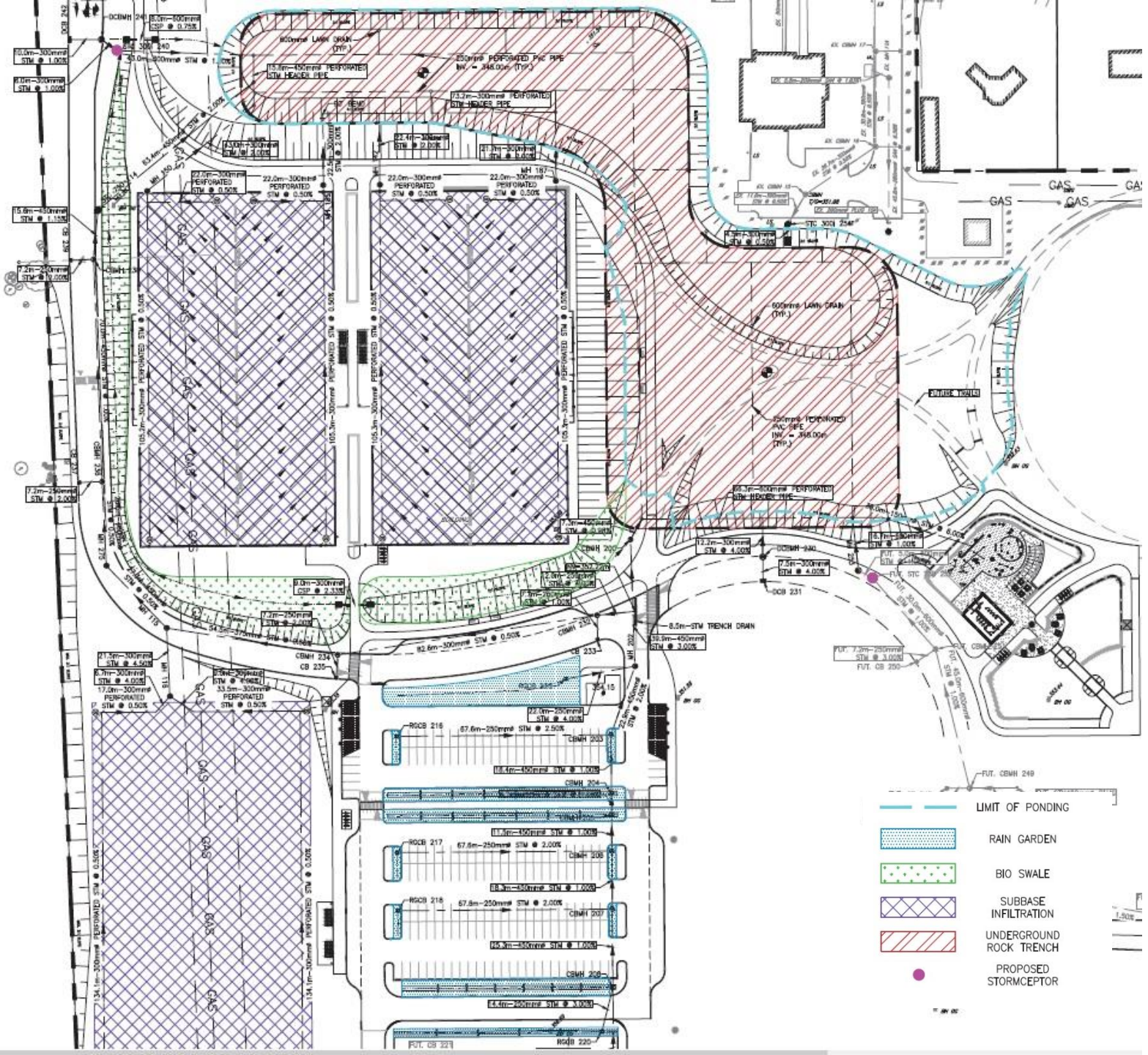
Criteria for the Site

- Meet the City of Kitchener’s new infiltration targets for the site
- Meet the water balance requirements for the site and maintain the existing drainage regime
- Infiltrate up to and including the regional storm
- Water quality
- Avoid construction of a stormwater outlet
- Minimum disruption of park use by stormwater facilities
- City wanted a show-case project that was fully LID

RBJ Schlegel Park Stormwater Management Plan

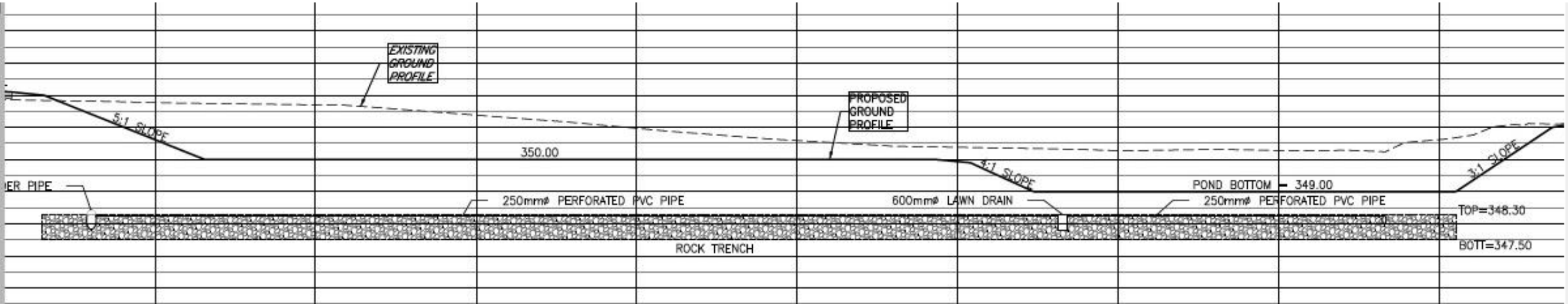

Infiltration Trenches Under Play Areas
Permeable Paving
Infiltration Gallery for Roof
Parking Lot Rain Gardens
Bioswales
Infiltration Trenches Under Play Areas
Infiltration Trench Under Dry Detention Basin
Oil/Grit Separator

RBJ Schlegel Park
Stormwater
Management Plan



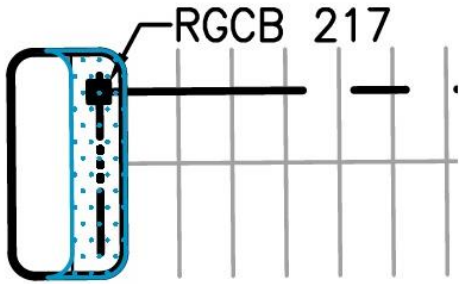
Low Impact Development Strategy

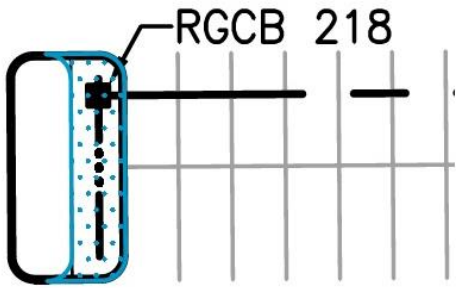
- The 24,200 m^3 dry pond was designed to have no surface ponding in smaller rainfall events (< 5 year storm), to allow for continued use
- Dry pond design discounts any upstream infiltration
- Has a ‘step-up’ design with two levels

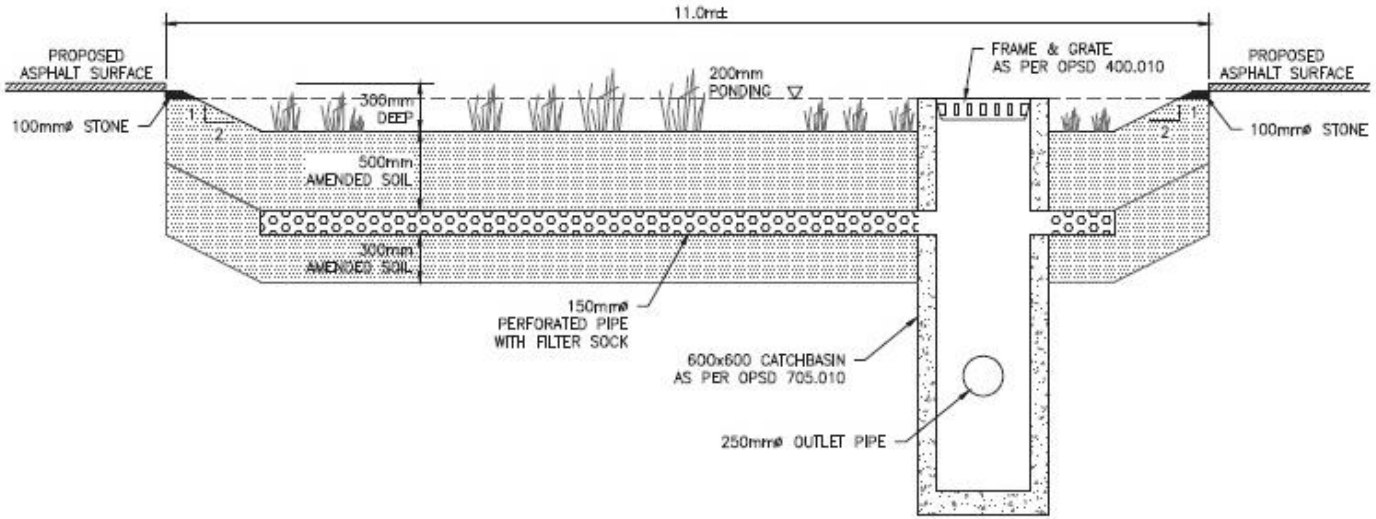


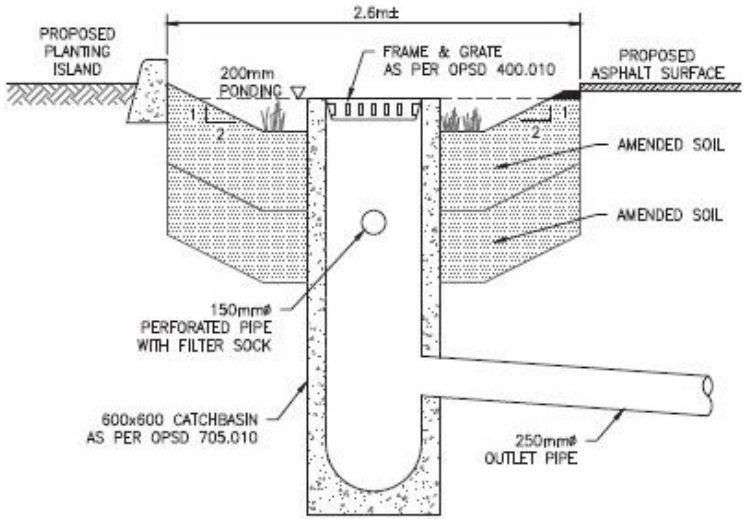
Low Impact Development Strategy

- Parking lot rain gardens were designed with trees in mind
- Parking spaces were removed to allow for both tree planting and rain gardens









PARKING LOT RAIN GARDENS
NTS

Construction

Construction Challenges

- Winter Construction- frozen ground, snow, cold snaps
- Materials sourcing- 12,000 m^3 of rock just in the dry pond
- Stormwater pond is in the natural low point for the site
- LID construction is not just a soil moving exercise
- Contractor is aware of challenges and is proactive in seeking material inspection, required testing, and guidance if needed

Construction Challenges

- Staging- dry pond has to double as sediment pond
- Protection of LID features- prevent dirty water from entering rock trench
- Dry pond rock trench is too large to construct using LID best practices

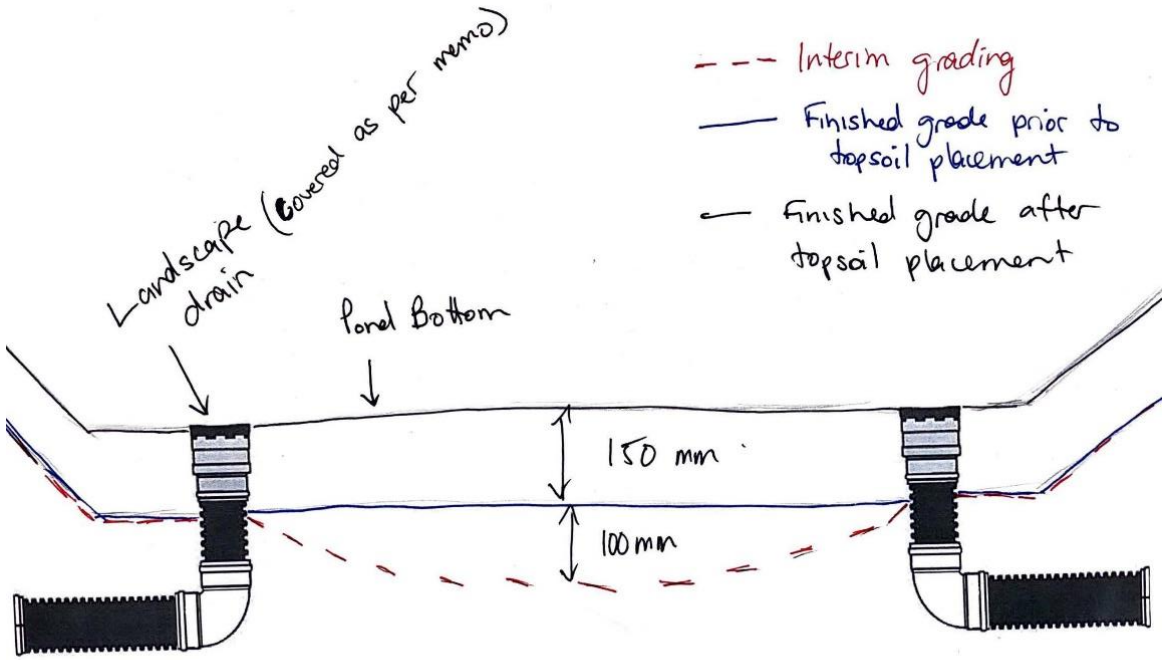
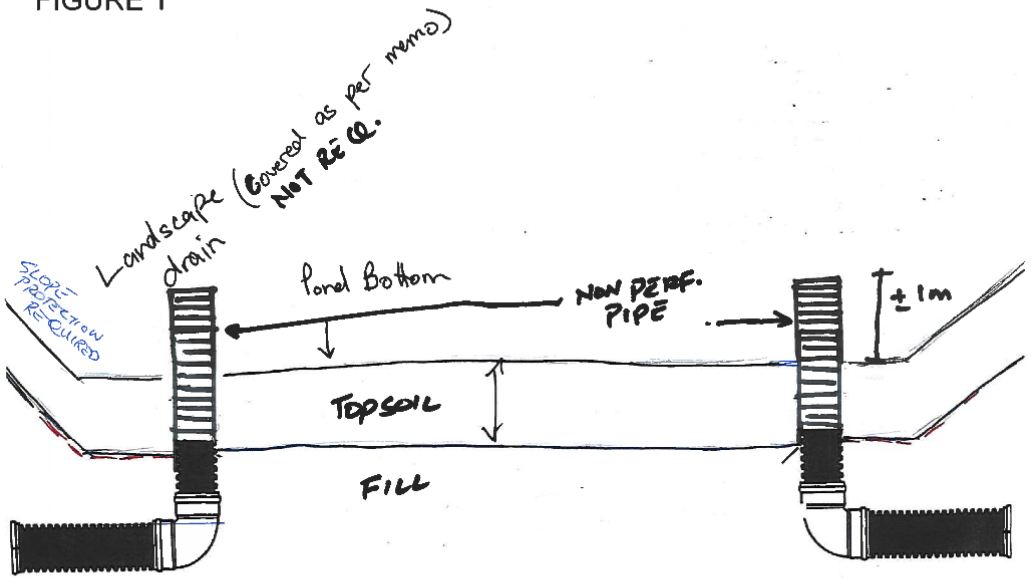
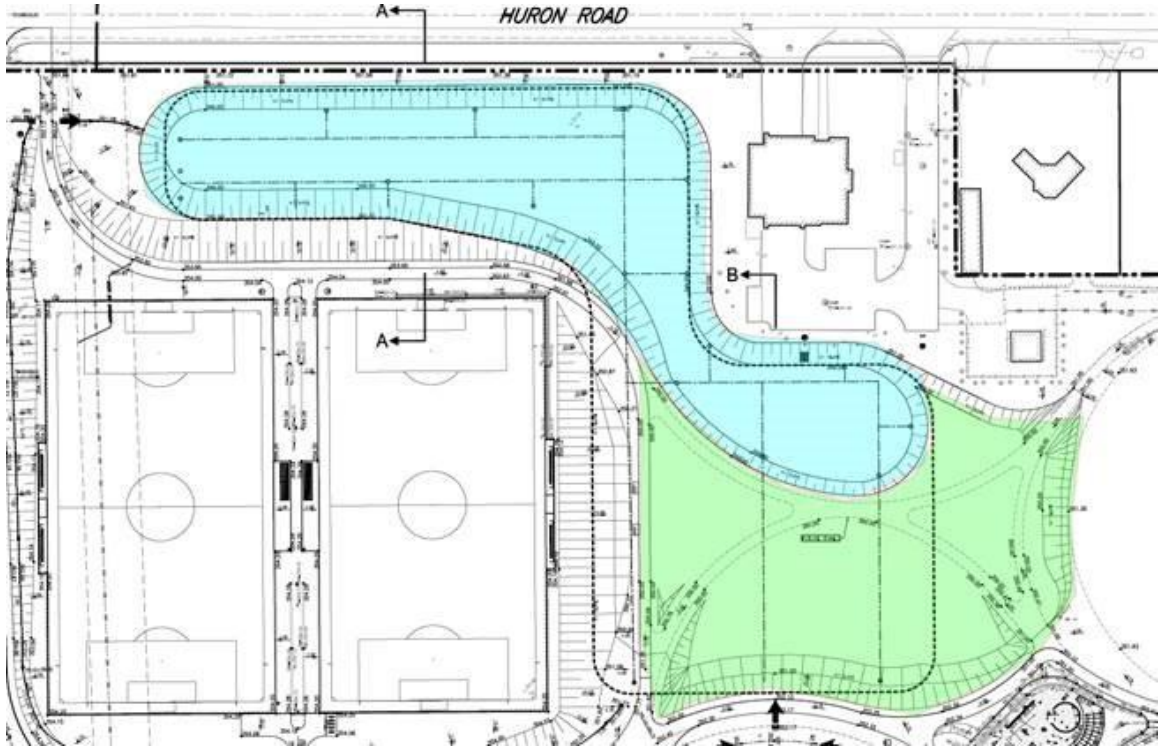


FIGURE 1



Construction Challenges

- Post construction staging- soil placement, seeding, sediment clean out
- 2,534 m^3 of top soil just in the pond area
- Amended soil approvals this summer



No Outlet, No Problem. Infiltrate!

No Outlet, No problem

It's possible to do a large scale, 100% infiltration, LID based stormwater project under the right conditions:

- lack of natural outlet drove the completely infiltration based design
- Ideal site conditions helped make large scale infiltration possible
- Avoided having to build costly new stormwater outlet
- Minimized the disruption to park use due to SWM facilities
- Working with the contractor to minimize construction risks and obstacles

Thank you!

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