EnviroTech 2020
Webinar #3 – Water
June 11, 2020

Strathearn Dry Pond Expansion

Lessons Learned from the Christie Park Drainage Improvement Project

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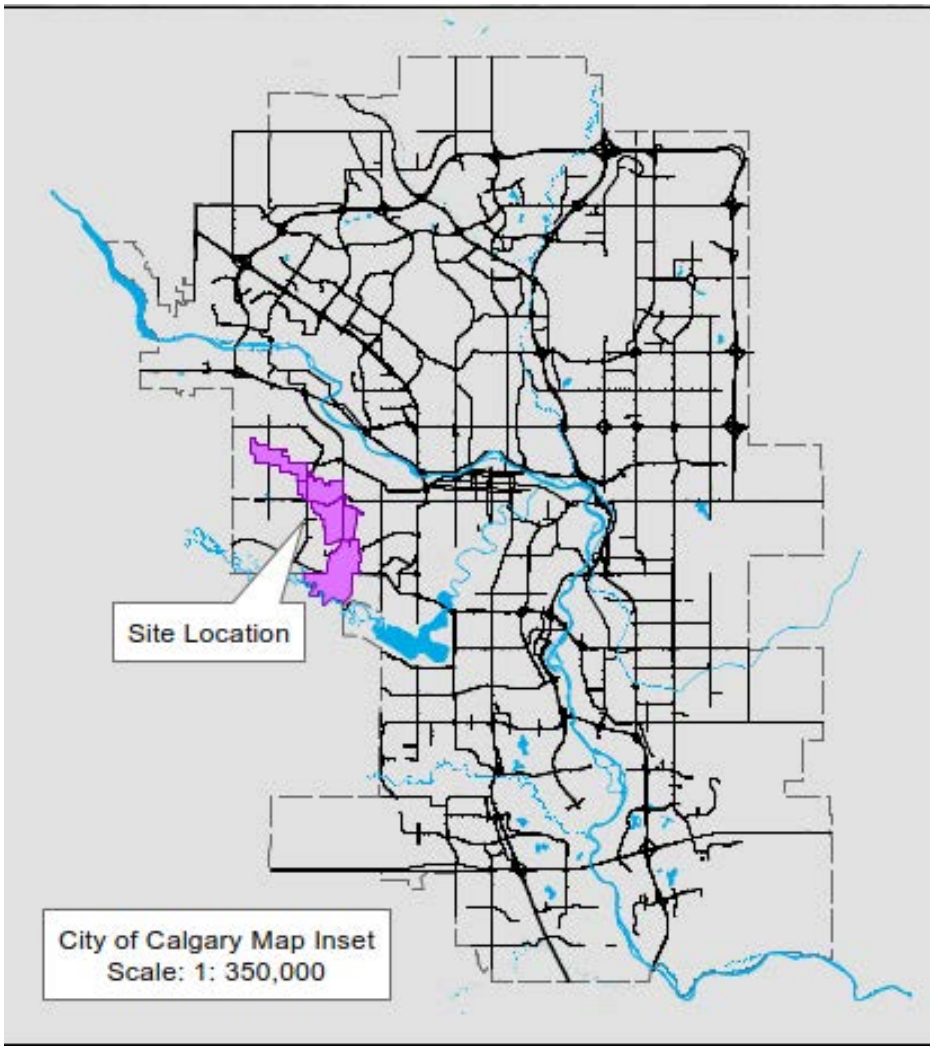
Outline

- Existing Conditions - Minor System and Traplows
- Historical Flooding – Strathearn Crescent SW
- Dry Pond Design
- Lessons Learned
- Photos

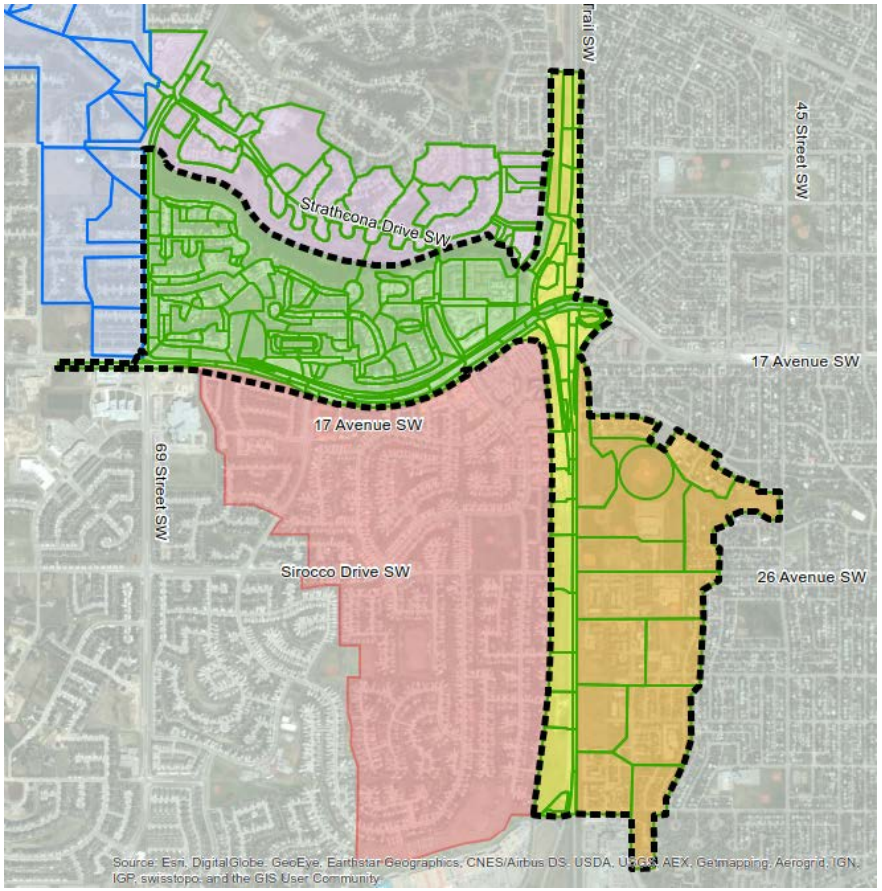


Catchment Area

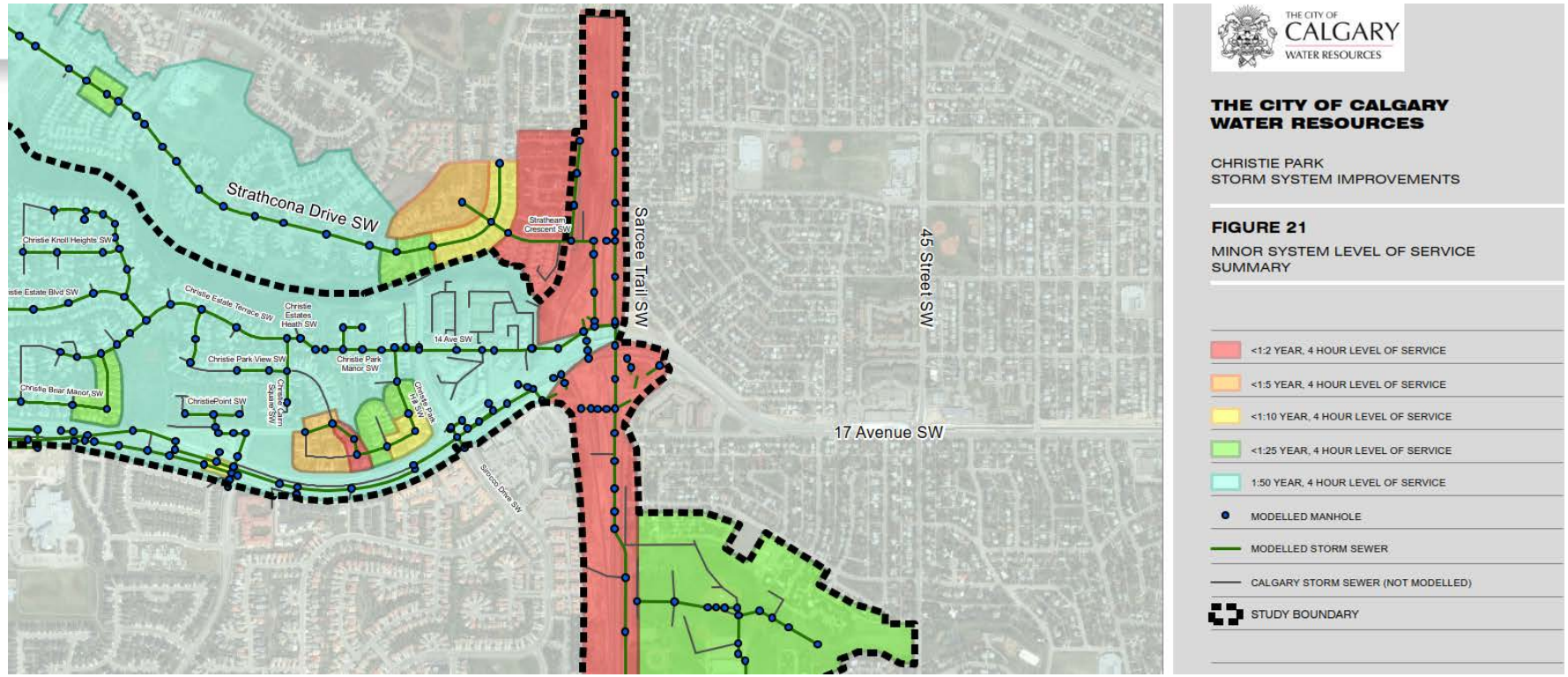
Summary

- Catchment area of 790 ha
- Spread over 4 neighbourhoods and Sarcee Trail SW, a four lane divided arterial road

- **Objective:** Increase level of service from < 2-yr event (currently experienced) to a 50-yr, 4-hr event

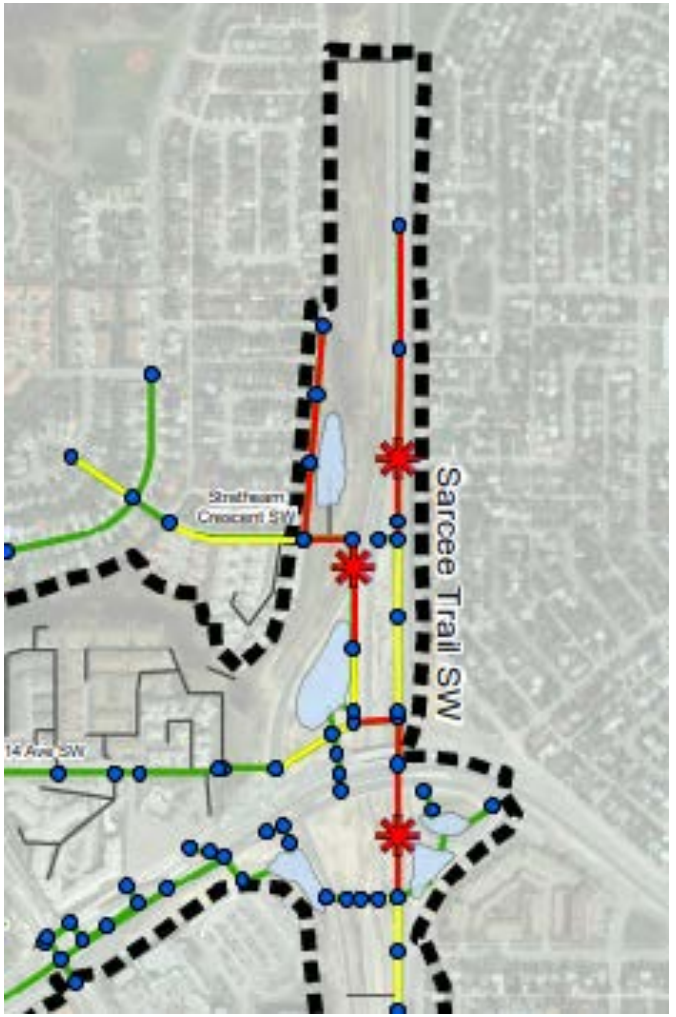


Existing Minor System



Existing Conditions - Minor System
5-yr, 4-hr event

- SURCHARGE TO SURFACE
- 0-0.99 m FREEBOARD
- 1.0-2.49 m FREEBOARD
- >2.50 m FREEBOARD (OR WITHIN PIPE)
- CALGARY STORM SEWER (NOT MODELLED)
- MODELLED MANHOLES
- STUDY BOUNDARY



Existing Conditions - Traplows

TRAPLOW SPILL DIRECTION

TRAPLOW >=0.5m TOTAL DEPTH AND SPILLING

TRAPLOW >=0.5m TOTAL DEPTH AND NOT SPILLING

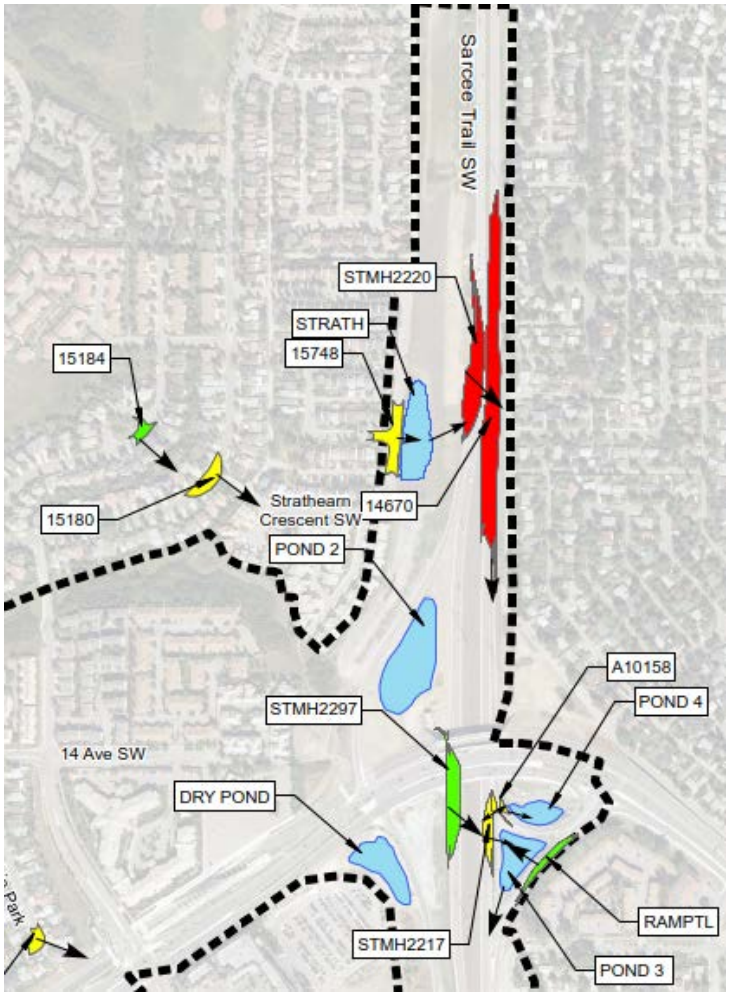
TRAPLOW <0.5m TOTAL DEPTH AND SPILLING

TRAPLOW <0.5m TOTAL DEPTH AND NOT SPILLING

PONDS

STUDY BOUNDARY

XXX TRAPLOW/POND IDENTIFICATION



System Issues

Summary

- **Traplow issues**
  - Spillover depths or max ponding depths > 0.5 m (50-yr, 4-hr event)
  - Spillover drains between houses
  - Inundate to depths on Sarcee Trail that may make both travel lanes impassable during major storms
- **Minor System issues**
  - Strathearn Cres SW storm sewers surcharge during 2-yr, 4-hr event
  - 1 MH along Sarcee Trail surcharges to surface during 2-yr, 4-hr event

Historical Flooding

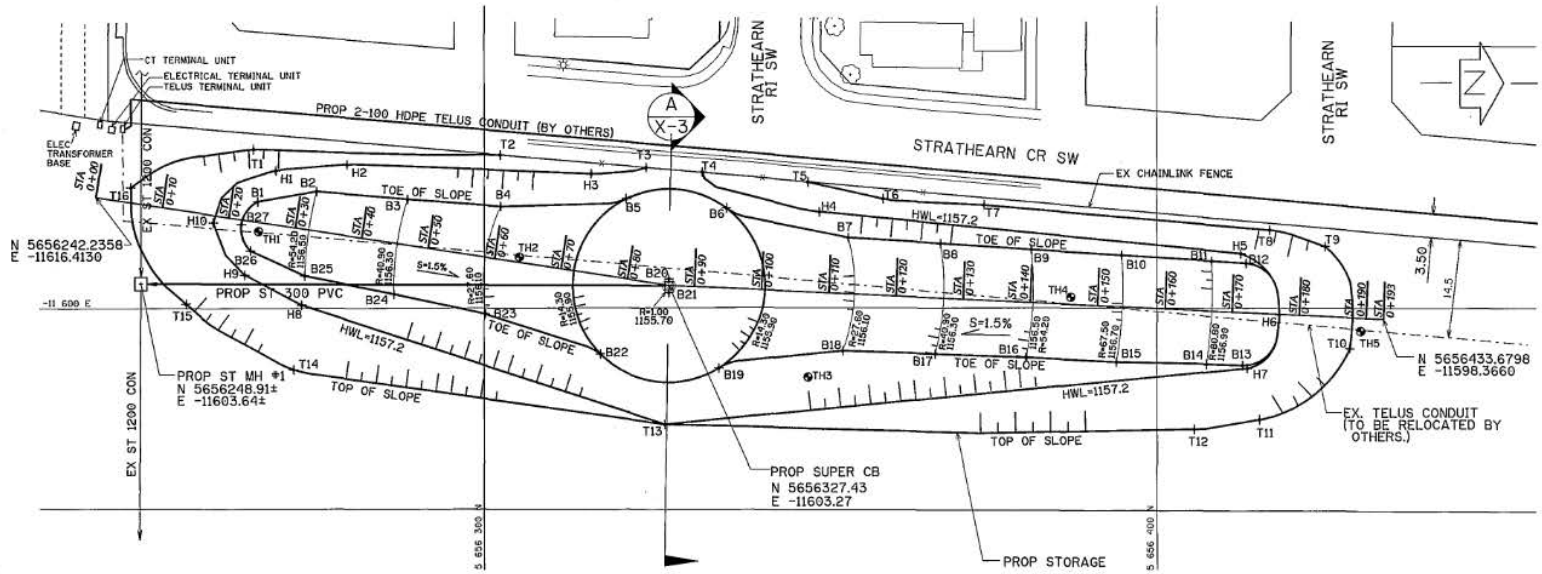
- Strathearn Cres SW (<0.5m deep traplow)
- August 4, 2015

Existing vs. Revised Design

- Storage volume of 3,320 m3
- No emergency spillway
- Drains to CB MH in centre of pond bottom
- CB MH connected to Ex 300 PVC pipe, drains to storm sewers along Sarcee Trail
- Existing regional pathway east of pond
- 1 paved pathway access from Strathearn Cres SW

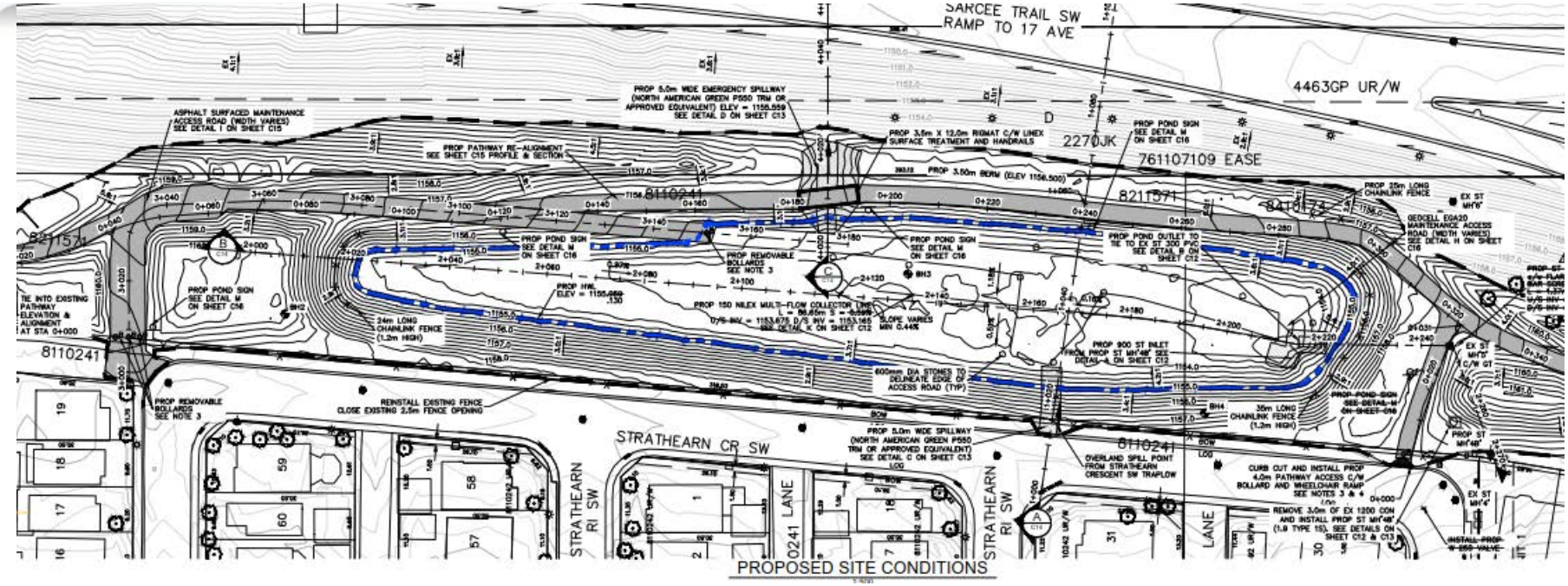
- Storage volume of 4,240 m3 (HWL), 6,450 (emergency spill way)
- 1 emergency spillway towards Sarcee Trail
- Pond underdrain pipe along centre of pond bottom
- High Flow bypass storm inlet (1200 CON)
- Pond Outlet Structure at south end
- Revised pathway alignment
- 2 paved pathway accesses from Strathearn Cres SW

Existing Dry Pond



PLAN VIEW
SCALE 1:500

Revised Dry Pond



Construction

- 5 months to construct
- Pathway detour
- 2 growing seasons for landscape maintenance
- $1.7 M

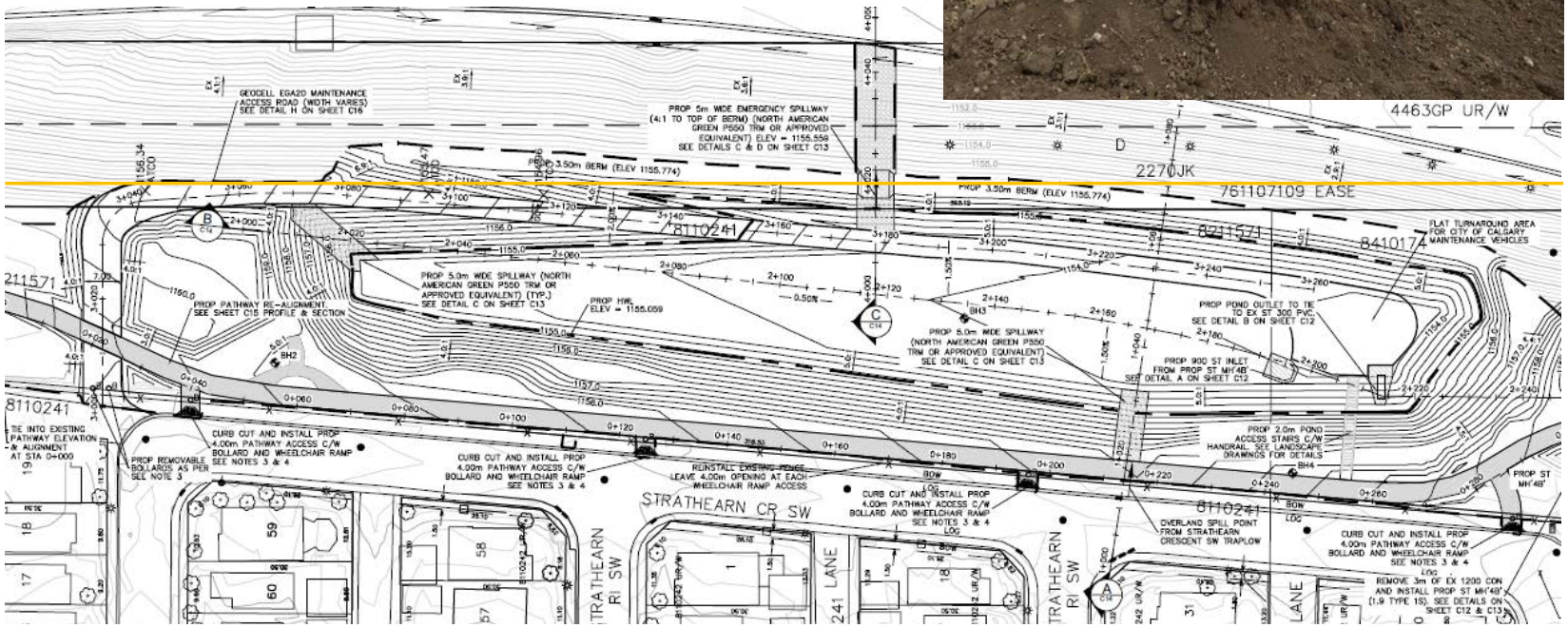
Lessons Learned #1
Public Engagement

Engage public during design phase

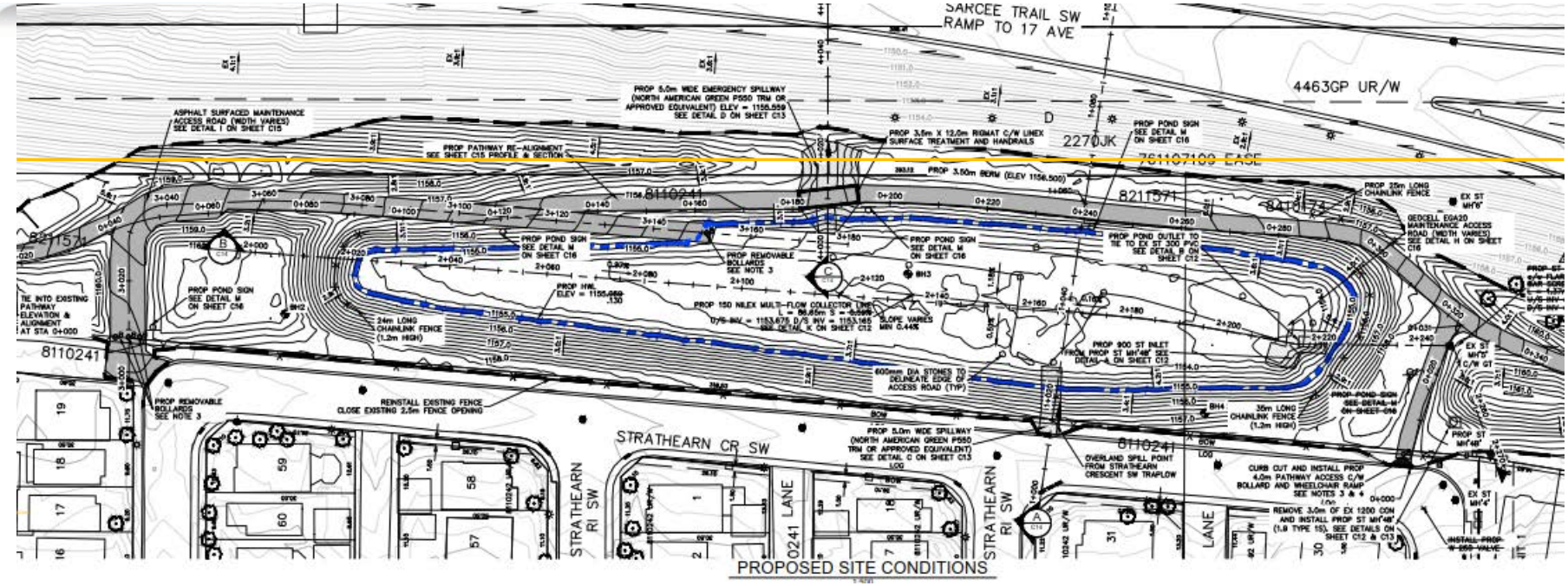
- How do people use the pond area? (off-leash area, regional pathway)
- Previous construction in the area (West LRT, Atco Pipeline upgrade)
- Anecdotal evidence of historical drainage issues (Jul 1996, Aug 2015)

Lessons Learned #2
Utility Locates

Engage 3rd party locate company



Lessons Learned #2
Utility Locates



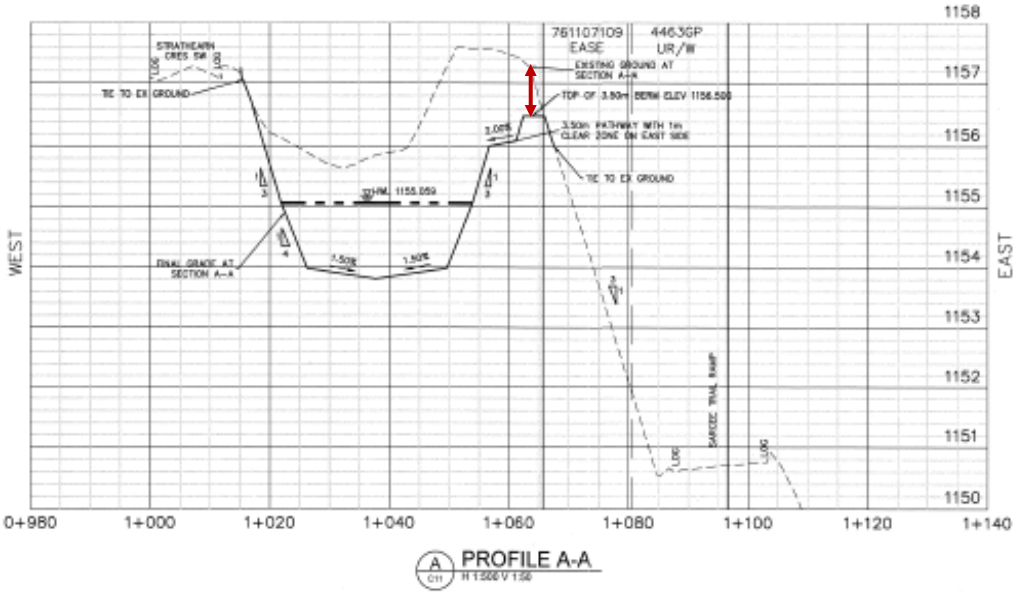
Lessons Learned #3
Pre-construction Baselines

Undertake traffic noise monitoring prior to construction

- City criterion of 65 dBA (L10 peak hour) for designated truck routes
- Earthen berm lowered by

1.0m to 1.5m for approx. 100m

(south end of pond)



Lessons Learned #3
Traffic Noise Modelling CADNA/A

Pre-development

Post-development

Lessons Learned #3
Post-Construction Noise Monitoring

- Sub-consultant undertook 48-hour traffic noise monitoring in Oct 2017 and Sept 2018

L_{10} (peak hour) Measurement Results for 115 Strathearn Rise SW

Date	AM or PM Period	Peak Hour Time Interval	L_{10} for Peak Hour (dBA)*	Meet the City of Calgary Design Noise Level of 65 dBA L_{10} (peak hour)?
September 10, 2018	PM	4:45:46PM – 5:45:46PM	57.0	Yes
September 11, 2018	AM	6:19:35 AM – 7:19:35 AM	59.2	Yes
September 11, 2018	PM	5:03:34 PM – 6:03:34 PM	63.5	Yes
September 12, 2018	AM	6:58:21 AM – 7:58:21 AM	59.9	Yes
September 12, 2018	PM	5:27:44 PM – 6:27:44 PM	57.9	Yes

* These levels are post isolation, after localized non-traffic sounds have been removed.

Lessons Learned #4 Boreholes

- Pond design changed from Aug 2016 (50% design, geotech investigation) to Mar 2017 (start of construction)
- Browns/mixed waste material excavated at south end of pond site. $37k in tipping fees.
- Field Order issued - revise pond grading to reduce volume of browns material being hauled off site. 3 day schedule delay.

Lessons Learned #4
Boreholes - Type A rock

Lessons Learned #5
Landscaping

Try to stay on top of weeding!

- Originally specified native seed mix
- Changed to Urban A (faster growth, trying to limit weed growth)
- Re-seed bare areas with Urban F
- Fenced off pond bottom for 2 growing season (off-leash area)

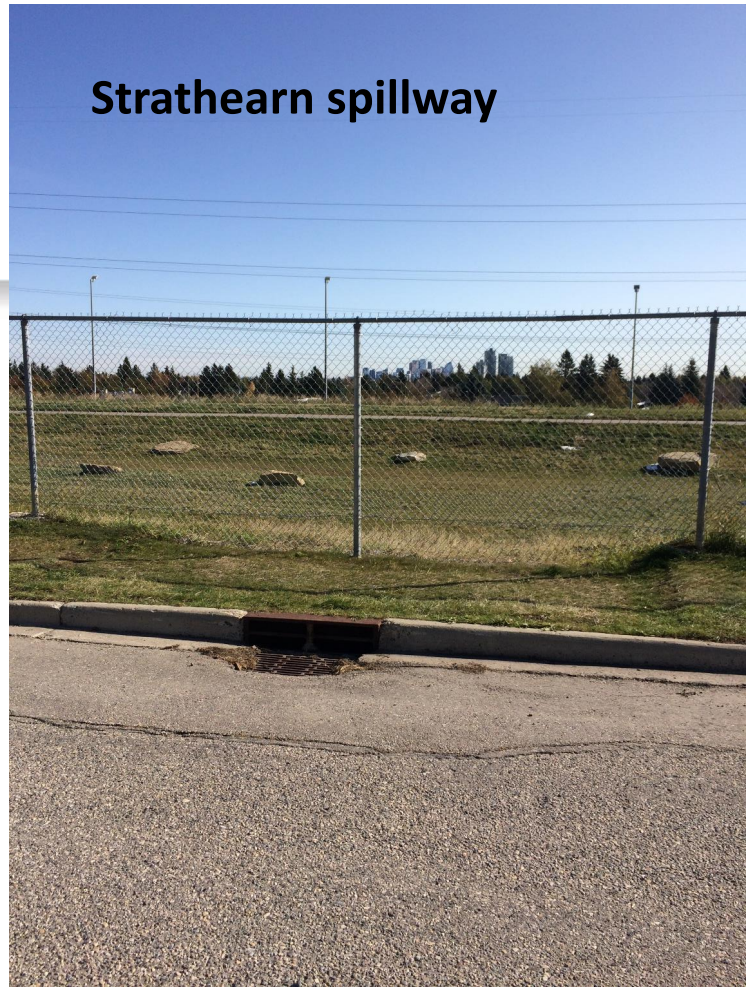
Photos
Dry Pond

Traplow

- **Strathearn Cres SW**
- **0.5m deep traplow**

Traplow - Before

Traplow - After


Strathearn spillway

Access Road

- 200mm sub-base
- 100mm base course
- 80mm asphalt

Geocell Access Road

- 100mm thick levelling gravel
- 150mm thick gravel (25mm)
- 100mm topsoil + seed mix

Pond Side Slopes and Planting Beds

- **Planting Beds and Seating Area**

Emergency Spillway and Rigmat Pathway Crossing

Regional Pathway and Rigmat Emergency Spillway

Questions?