

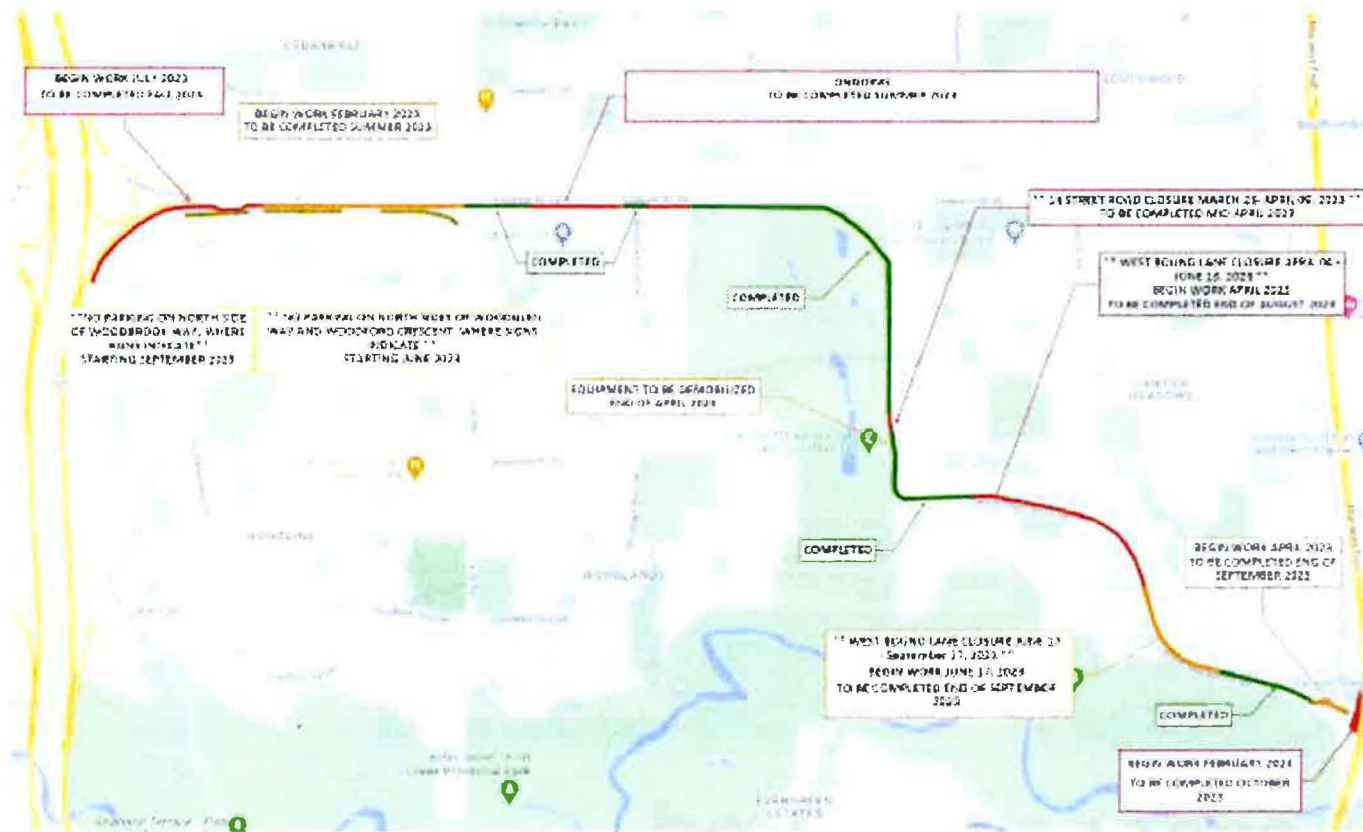
Projects Review – Lessons Learned Fish Creek West Sanitary Sub-Trunk

Abel Leon / Utilities Delivery / Linear Infrastructure
April 20, 2023

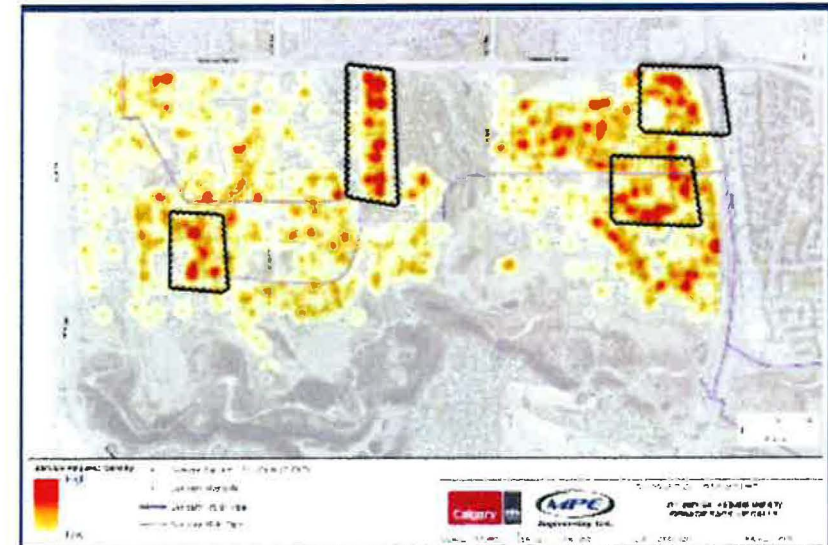
CITY OF CALGARY
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IN COUNCIL CHAMBER
APR 20 2023
ITEM: #7.2.3 (PL2023-0428)
Distribution - Proactive
CITY CLERK'S DEPARTMENT



Map of Project Location



WASTEWATER SERVICING FLOWS	Period							
	2015 - 2018	2019	2020	2021	2022	2023 - 2026	2027 - 2030	2030 - 2034
Lands South of Elbow River								
Instantaneous (L/s)	11.4	9.4	15.4	21.0	21.0	46	62	78
Maximum Daily (ML/d)	0.47	0.27	0.47	0.61	1.13	1.72	2.31	2.90
Maximum Annual (ML)	86.2	50.1	87.6	113.8	209.0	318.8	428.5	538.2

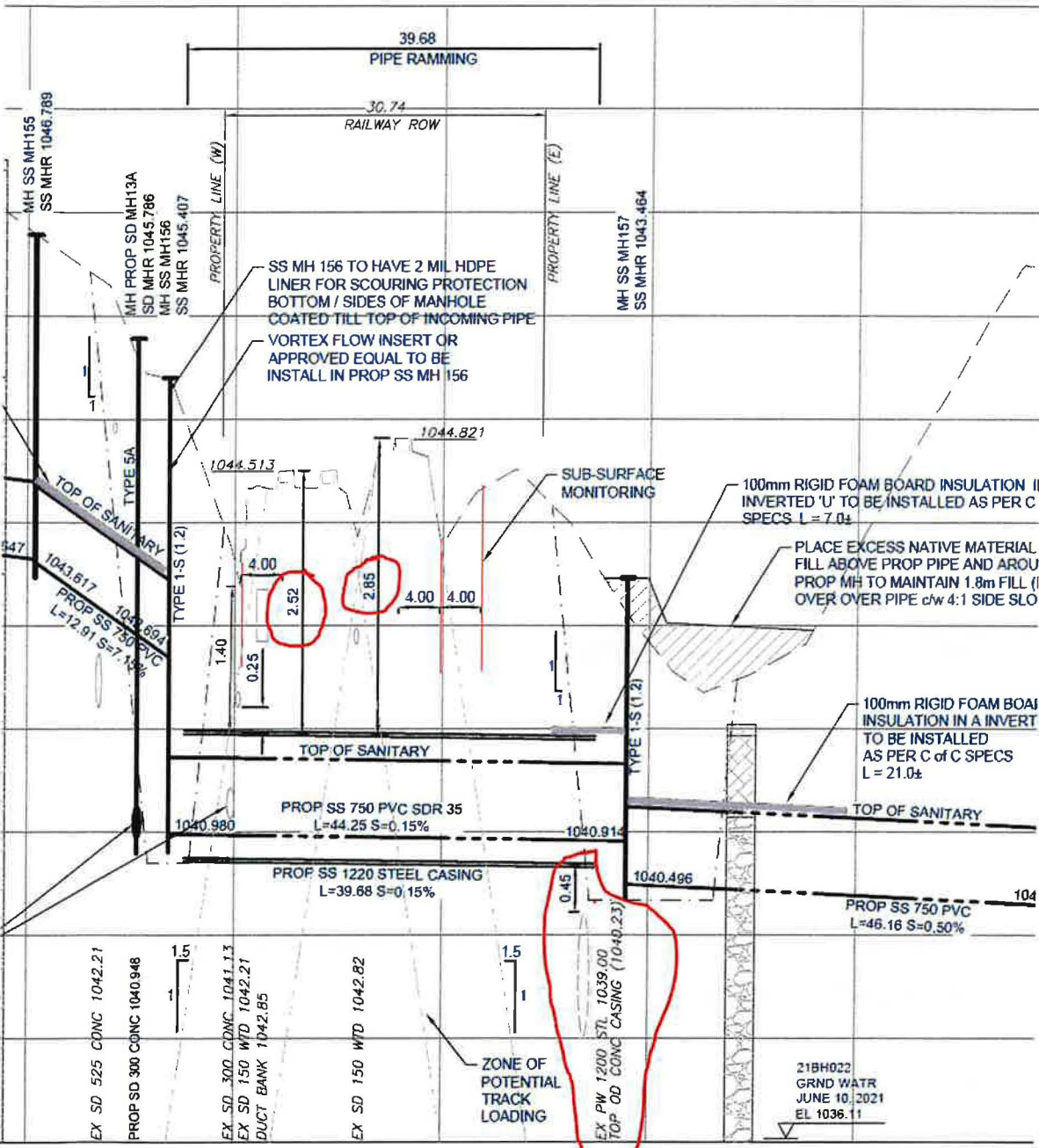


Scope of Work

Fish Creek West Sanitary Sub-Trunk (FCSS) is a 6.2 km long sanitary trunk 525 mm and 750 mm in diameter. The FCSS will service the projected increased sanitary sewage flows from regional customers such as the Tsuut'ina and Woodbine, Woodlands, and Canyon Meadows areas. The design criteria is to provide a 1:50yr level of service.

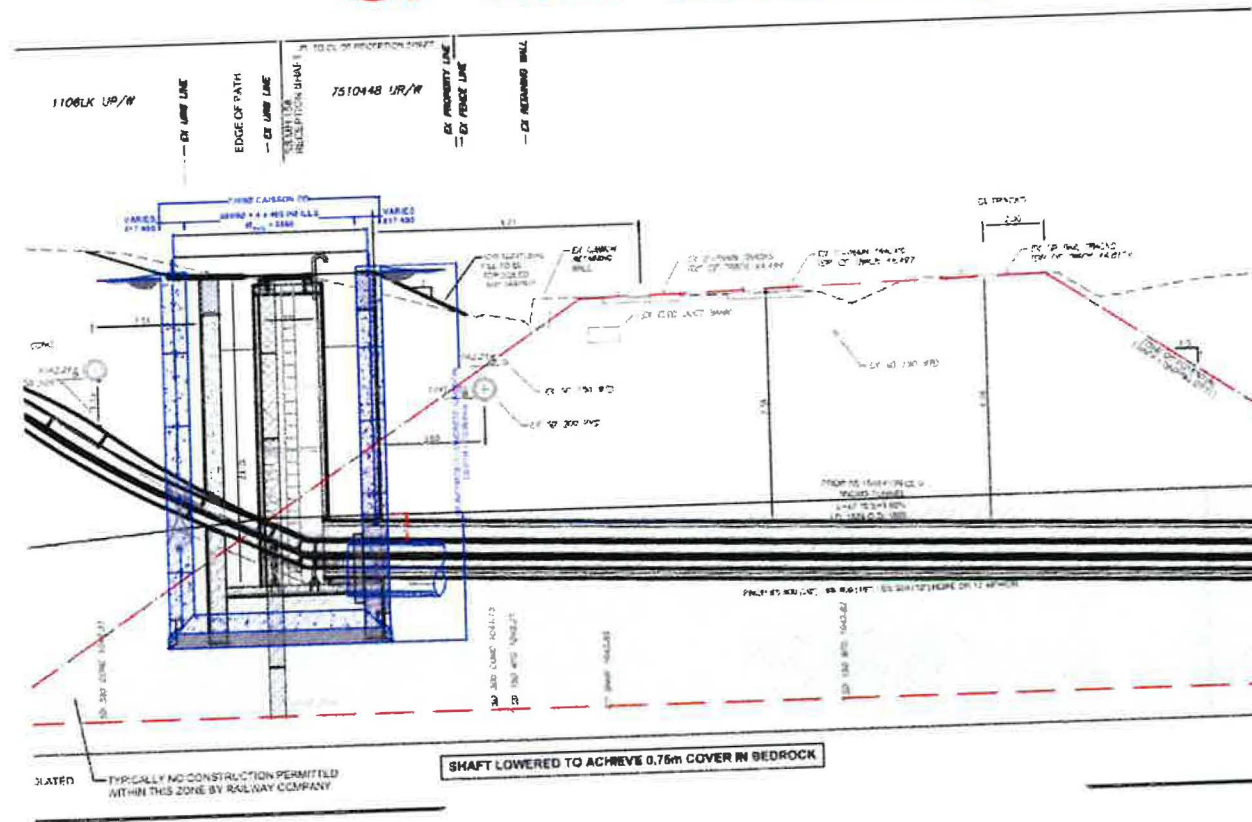
CP-LRT Crossing

- In the original design, the consultant proposed Pipe Ramming to cross CP rail with 2.85m and LRT with 2.52m
- There is an existing 1.2m diameter water feedermain in the existing infrastructure and there was 0.45m separation
- There was not sufficient space to safely cross CP and LRT





CP-LRT Crossing



- With the new design, we accommodate to have more cover between the pipe and the CP and LRT tracks from 2.85m to 8.08m cover in CP tracks and from 2.52m to 7.5 m cover in LRT Tracks
- This cover will reduce the risk of settlement at CP and LRT tracks.



Management Strategy

Location	1	2	3	4	5	6
Generation	Low	Low	Low	Low	Low	High
Release	Medium	Medium	Medium	Low	Medium	High
Migration	Low	Medium	High	High	High	Extreme
Pathway	Low	Medium	Low	Extreme	Medium	Medium
Receptor	High	High	High	Low	High	Medium
Overall	Medium	Medium	Medium	High	High	High

Upgrade Odour Control Unit

Chemical Injection System

Stagger upsizing (i.e. two medium pipes)

Improve sewer geometry (i.e. reduce turbulence)

1	2	3	4	5	6
Green	Green	Green	Green	Green	Yellow
Light Blue	Light Blue	Light Blue	Green	Light Blue	Yellow
Yellow	Yellow	Yellow	Yellow	Yellow	Red
Green	Green	Green	Green	Green	Green
Yellow	Yellow	Yellow	Green	Yellow	Light Blue
Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue

1	2	3	4	5	6
Green	Green	Green	Green	Green	Green
Green	Green	Green	Green	Green	Green
Green	Light Blue	Yellow	Yellow	Yellow	Red
Yellow	Yellow	Yellow	Red	Light Blue	Light Blue
Green	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue

1	2	3	4	5	6
Green	Green	Green	Green	Green	Yellow
Green	Green	Green	Green	Green	Yellow
Green	Yellow	Yellow	Red	Red	Red
Yellow	Light Blue	Light Blue	Red	Light Blue	Light Blue
Green	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue

1	2	3	4	5	6
Green	Green	Green	Green	Green	Yellow
Green	Green	Green	Green	Green	Yellow
Green	Light Blue	Light Blue	Light Blue	Light Blue	Red
Yellow	Yellow	Yellow	Green	Yellow	Light Blue
Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue



Odour Control building

Building



- The sulphide study predicted that overall the upgrade would not lead to odour complaints, except at one location that had a high risk of odour generation due to the geometry of the upstream sewer leading to increased turbulence, the high risk of migration of the odours due to headspace restriction (i.e. siphon), and the proximity of the residents.

- The study predicted that although migration of odours may increase in the future due to displacement and drag effects from the pump station, this was counter balanced by the predicted decrease in sulphide generation.

- This study determine the risk of odour complaints to the community, and it helps the City to proactively manage the risk at the design stage through the modifications of the pipe geometry to reduce turbulence and inclusion of an odour control facility at that location.



Questions?

Hydrogen Sulphide

Hydrogen Sulphide

Concentration	Risk
Less than 1 ppm	Most people can smell "rotten eggs".
3 to 5 ppm	Odour is strong. Biogenic corrosion of concrete pipe begins.
10 ppm	Work Safe Alberta's 8-hour occupational exposure limit (OEL). The OEL is the level of an airborne substance that workers may be exposed to without wearing protective equipment, and without normally suffering adverse health effects.
15 ppm	Work Safe Alberta's ceiling OEL.
100 ppm	Immediately dangerous to life and health (IDLH) level in some jurisdictions (referenced by Work Safe Alberta).
200 to 250 ppm	Major irritation of the nose, throat, and lungs occurs, along with headache, nausea, vomiting, and dizziness. Prolonged exposure can cause fluid buildup in the lungs (pulmonary edema), which can be fatal.

Our concerns

← Odour Complaints from the Community

Occupational Health and Safety