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#101 – 38026 Second Avenue, Squamish, BC V8B 0C3 T: 604.815.4646 F: 604.815.4647

January 13, 2023

Our Reference: 32564

Resort Municipality of Whistler
4325 Blackcomb Way
Whistler, BC V8E 0X5

Attention: Chelsey Roberts, Capital Projects Manager, Infrastructure Services

Dear Madam:

Reference: Sewer Fixture & Fittings Corrosion – Observations and Recommendations

1.0 Introduction

ISL Engineering and Land Services Ltd. (ISL) was retained by the Resort Municipality of Whistler (RMOW) to provide design, contract and construction management services associated with the valves and fittings replacement project. The construction scope involved replacement of valves and fittings on the sanitary sewer system due to age and suspected corrosive attack. Drake Excavating Ltd. was awarded the contract to perform the work. All replacements were located on Northlands Boulevard & Blackcomb Way North or Lorimer Rd, and on the trail behind 4405 Blackcomb Way.

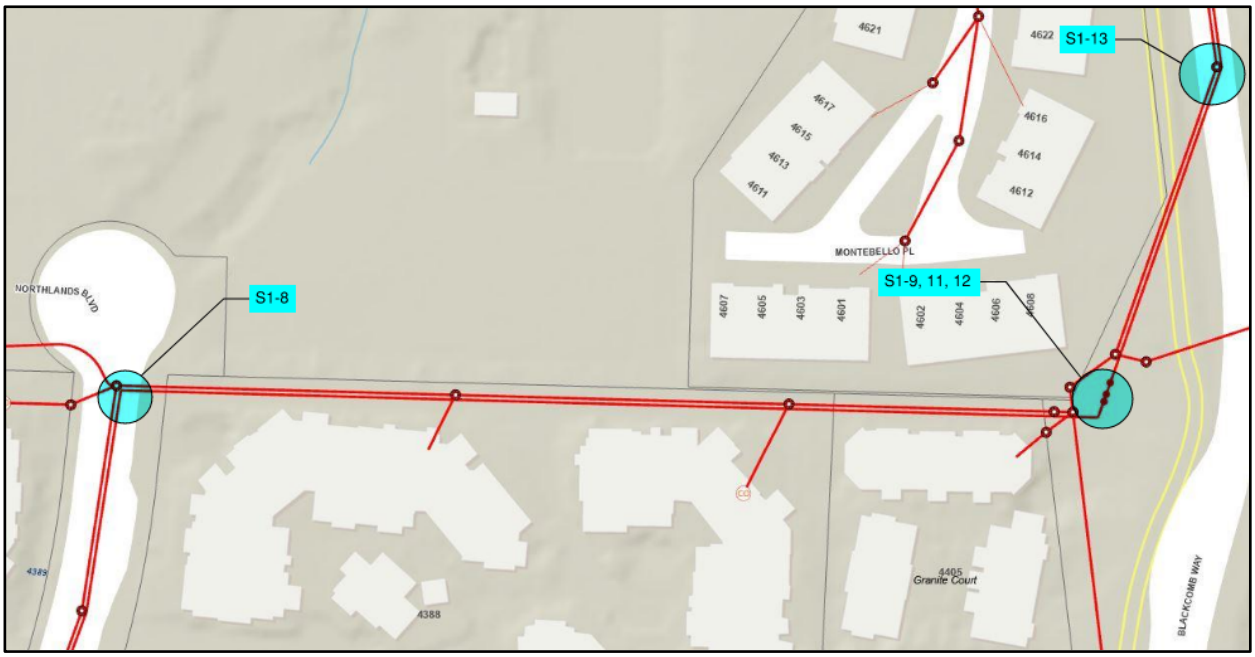

Figure 1 – Project Limits

2.0 Inspection

Upon completion of all sanitary sewer valve and fitting replacements, it can be confirmed that corrosion was present in all instances; however, the degree of corrosive attack varied. In general, the corrosion was the most extreme on the restraining rings and rods (to the point of near failure in some instances).

Photos 1 to 4 show examples of corrosion found throughout this project. Further photos can be found in ISL's project completion submission.

Photo 1 - Corroded Restraining Rod.

Photo 2 - Corroded 90° Bend Restraining Ear.

Photo 3 - Corroded Restraining Ring Ear.

Photo 4 - Corroded Restraining Ring Ear.

3.0 Conclusions/Recommendations

After review of our observations and findings it appears that corrosion was the worst in cases where there was heavy groundwater present in the trench. It was also noted that the restraining rings and rods were most subject to corrosive attack. Valves and the fittings themselves complete with hardware appeared to be less affected however corrosion was observed on these items and if left in place future failure of these fittings is considered likely.

ISL has the following comments/recommendations:

- Continue with fittings replacement program focusing on areas where there have been recent failures and/or areas that extensive corrosion has been noted during excavation.
- Scheduled replacement will likely be more cost effective and less disruptive in comparison with emergency replacement in the unfortunate case of failure.
- When replacing any iron works wrapping in Denso as per manufacturers specifications with the three-part system is imperative.
- Look into other methods of corrosion control available.

Best regards,

Grant Wilburn, E.I.T.
Project Engineer

Reviewed by:

Graham Schulz, P.Eng.
Manager, Squamish Office/Senior Project Engineer

#101 – 38026 Second Avenue, Squamish, BC V8B 0C3 T: 604.815.4646 F: 604.815.4647

January 13, 2023

Our Reference: 32683

Resort Municipality of Whistler
4325 Blackcomb Way
Whistler, BC V8E 0X5

Attention: Chelsey Roberts, Capital Projects Manager, Infrastructure Services

Dear Madam:

Reference: Water Fixture & Fittings Corrosion – Observations and Recommendations

1.0 Introduction

ISL Engineering and Land Services Ltd. (ISL) was retained by the Resort Municipality of Whistler (RMOW) to provide design, contract and construction management services associated with the valves and fittings replacement project. The construction scope involved replacement of valves and fittings on the water sewer system due to age and suspected corrosive attack. Drake Excavating Ltd. was awarded the contract to perform the work. All replacements were on Northlands Boulevard north of Lorimer Road.

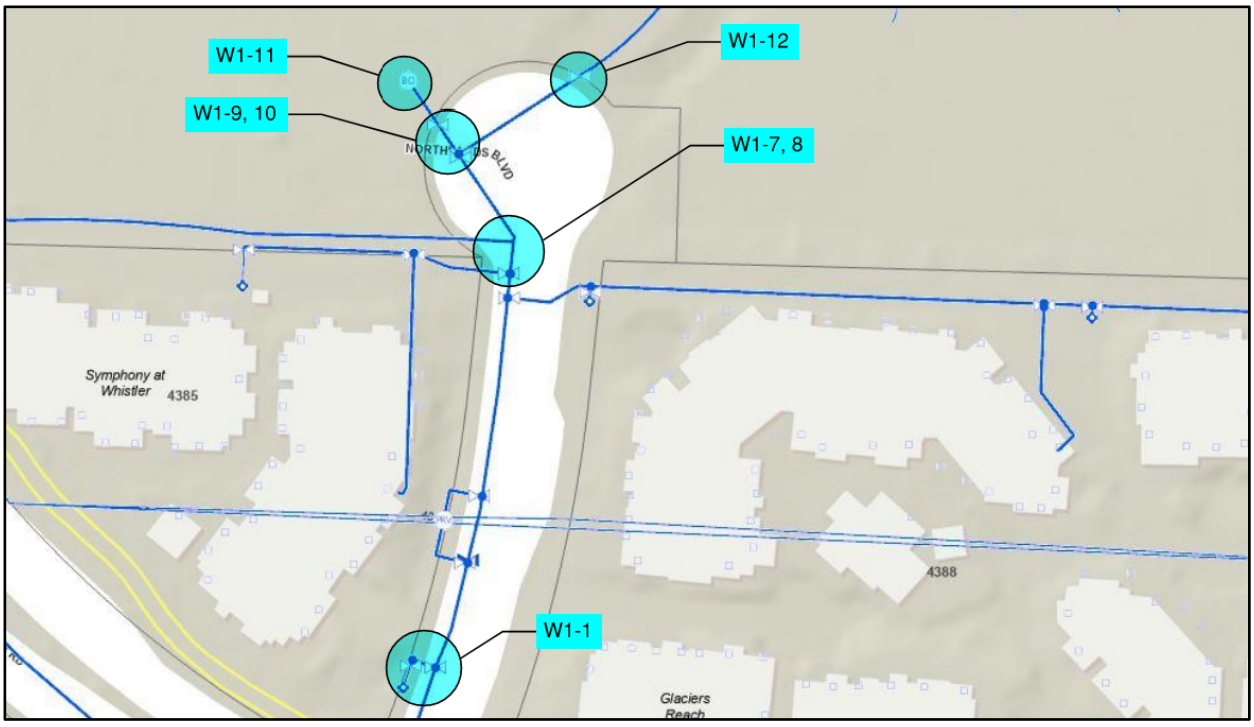

Figure 1 – Project Limits

2.0 Inspection

Upon completion of all water valve/fitting replacements, it can be confirmed that corrosion was present in all instances; however, the degree of corrosive attack varied. As Drake moved north on Northlands Boulevard the corrosion worsened. In general, the corrosion was the most extreme on the restraining rings and rods.

Photos 1 to 4 show examples of corrosion found throughout this project. Further photos can be found in ISL's project completion submission.

Photo 1 - Corroded Restraining Rod.

Photo 2 - Corroded Restraining Ring Ear.

Photo 3 – Blow-off Pipe Corrosion.

Photo 4 – Valve & Tee Corrosion.

3.0 Conclusions/Recommendations

After review of our observations/findings it appears that corrosion was the worst in cases where there was heavy groundwater present in the trench. It was also noted that the restraining rings and rods were most subject to corrosive attack. Valves and the fittings themselves complete with hardware appeared to be less affected however corrosion was observed on these items and if left in place future failure of these fittings is considered likely.

ISL has the following comments/recommendations:

- Continue with fittings replacement program focusing on areas where there have been recent failures and/or areas that extensive corrosion has been noted during excavation.
- Scheduled replacement will likely be more cost effective and less disruptive in comparison with emergency replacement in the unfortunate case of failure.
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