Our File: 2231-27311-01

TECHNICAL MEMO

To	From
Ms. Leslie Carter, Administrator Deep Bay Improvement District	Chris Pogson, P.Eng., Project Manager
Re	**Date**
Watermain Crossing 4891 Thompson Clark West	August 15, 2022

Based on the Trustees Meeting held July 26, 2022, and in accordance with your email dated July 27, 2022. McElhanney Ltd (ML) carried out a site visit to review the proposed slope remediation project with a general contractor and to review an existing culvert located at the south end of the site.

This memorandum summarizes the results of our site visit and comments for further consideration.

1. Background

A site visit was carried out on August 5, 2022, with the following representatives in attendance:

- George Cousineau (Landowner);
- Chris Pogson, P.Eng., (McElhanney Civil Engineer);
- Richard Simpson, P.Eng., (McElhanney Geotechnical Engineer); and,
- Bruce Henderson, (Edgett Excavating Ltd. A potential construction contractor).

The primary focus of the site visit was to review the following:

- Current state of the slope area in question, including groundwater conditions.
- Constructability of proposed slope remediation including:
    - Access (Landowner preference from Ocean Trail).
    - Anticipated construction equipment to be utilized by the contractor.
    - Risk to existing watermain during construction.
- Review of existing south culvert condition and warrant for replacement.

2. SITE OBSERVATIONS

Based on the results of the site visit, our preliminary observations / discussions are summarized as follows:

- The slope appears consistent with previous reviews. Mr. Cousineau did indicate a small area of change.
- In general, the ground conditions are still significantly wet in the area.
- Continued water seepage was observed near the toe of the slope.
- Surface water is present at the top of the pathway slope.
- The toe of the slope remains impacted by moisture and appears loose and soft.
- Site access from Ocean Trail is reasonable. A portion of this access is in Public Road Right-of-Way.
- Based on the anticipated equipment use, accessing the site will impact an approximate 3.0m width.
- The contractor estimated three (3) trees will need to be removed for proposed equipment access. Two (2) are located in Public Road Right-of-Way and will require Ministry of Transportation and Infrastructure (MOTI) approval. One (1) is located on Mr. Cousineau's property. He indicated no issues if it had to be removed.
- The contractor estimated some leveling of the ground west of the pathway would be required to provide a stable platform for equipment.
- Replacement of the Regional District of Nanaimo stairs will be required, if accessing from Ocean Trail.
- Based on the above comments, the existing watermain would be at risk for breaking during construction activities. The preference would be to take it out of service during construction.
- The existing south culvert is a 600mm diameter corrugated steel pipe. The culvert was flowing partially full at the time of inspection. The culvert has gravels and sediments in the bottom reducing its hydraulic capacity. However, at the time of inspection it appeared to be functioning as intended.

3. PROJECT CONSIDERARTIONS

The following recommendations are provided for consideration:

1) Site access can be undertaken from Ocean Trail, permitting from MOTI should be secured as soon as possible.
2) Given the consistent groundwater conditions, we would recommend further geotechnical investigation and modelling to confirm slope stability for the watermain and define the extents of soft soils removal. Budgetary estimate would be approximately $7,500.

3) To minimize risk, remove approximately 12.0 lienal meters of existing 250mm AC watermain during slope stabilization. This will allow the contractor to improve the slope stability under the watermain alignment. Re-instate this section of watermain with new PVC piping.

   The existing main can be bypassed by using the 150mm PVC loop on Faye Road. As such, water can be maintained during construction.

4) The existing culvert was installed in 1977, we believe as part of the watermain construction. Given the age and conditions of the culvert, it is nearing the end of its design life. Although still functioning, it would be prudent to replace it as part of associated works. Please note additional permitting & environmental measures may be required.

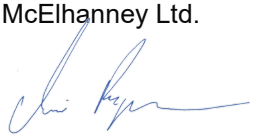
5) Given the additional considerations, permitting and the September 15 environmental window, we would recommend deferring this project until the 2023 construction window.

6) Update the overall construction estimate to reflect the above.

4. Closure

We trust this meets the District needs, however please do not hesitate to contact me directly should you have any further questions or concerns.

Regards,
McElhanney Ltd.



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