

TECHNICAL MEMO

To

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From

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Portside / Blundell Rd Improvements Project:
 Geotechnical Report Framework
 ID020X-TENG-REP-GE-0001-Geotech Framework-A

Date

Nov. 25, 2022

Revision History

Rev.	Date of Changes	Nature of Change	Prepared by:	Approved by:
A	Nov. 25, 2022	N/A	P. Wilson	L. Zarei

GENERAL

This memo summarizes the framework for geotechnical reports issued for the Portside Blundell Road Improvements Project. McElhanney has retained EXP and Thurber Engineering Ltd. as subconsultants for the project. McElhanney, EXP and Thurber completed various aspects of the geotechnical investigation. EXP and Thurber provided geotechnical and pavement recommendations for the project. Thurber is responsible for seismic aspects of the rail overpass and approaches, including the cellular concrete approach embankments. EXP is responsible for all other geotechnical aspects of the project.

For time efficiency, geotechnical investigation data and recommendations are provided in a series of memos and reports, which are appended as separate PDF files to this framework report.

- A. Doc. No. ID020X-MECS-REP-AM-0004-Environmental Report-C – McElhanney – Report includes factual geotechnical data.
- B. Doc. No. ID020X-EXPG-REP-GE-0002-Geotech Factual-A – EXP – Factual Report
- C. Doc. No. ID020A-TENG-REP-GE-0001-Thurber Factual Report-A – Thurber – Factual Report
- D. Doc. No. ID020X-EXPG-REP-GE-0003-Pavement Design Report-A – EXP – Pavement Design Report
- E. Doc. No. ID020X-EXPG-MEM-GE-001-CIP WALL-A – EXP – Geotechnical Assessment for CIP Retaining Wall Design Along Blundell Road
- F. Doc. No. ID020X-EXPG-MEM-GE-0002-Preload Impact CN & Util-A – EXP – Preload Impact on Underground Utilities and CN Rail
- G. Doc. No. ID020A-EXPG-MEM-GE-0001-Waste Mtrl Reuse & Subgrade-A – EXP – Geotechnical Considerations for Waste Layers, Material Re-Use and Subgrade Preparation
- H. Doc. No. ID020A-EXPG-MEM-GE-0002-Overpass Pile Design-A – EXP – Rail Overpass - Axial Pile Design Recommendations
- I. Doc. No. ID020A-EXPG-MEM-GE-0003-Static Embankment-A – EXP – Geotechnical Recommendations for Static Embankment Design
- J. Doc. No. ID020A-TENG-MEM-GE-0001-Seismic & Cellular Concrete-A – Thurber – Rail Overpass – Seismic Analysis and Cellular Concrete Approach Embankment Recommendations

Appendix C is not included in this submission as lab testing is still in progress from the recent investigation; this report will be issued once the lab testing is complete in about one week time.

Appendix G is included but has not been finalized, as an MASW geophysics survey will be completed early next week; this memo will be issued once the MASW survey is completed and the results considered in the analyses.

VALUE ANALYSIS

Value analysis of the geotechnical design was completed following the preliminary design submission and has continued through the draft indicative design and indicative design stages. Thurber proposed a solution that includes a revised abutment span configuration (extended end span, eliminate jump span, pile supported abutment), extended pile lengths and full-height cellular concrete approach embankments that removes the risks associated with deep ground improvement by eliminating stone columns.

The risks with stone column installation included utility conflicts and leachate migration. For the configuration presented in the previous design submission, the recommended footprint of stone columns required major utility relocations. The removal of stone columns with updated design configuration eliminated these relocations due to stone columns placement. However, it should be noted that settlement impacts on the aforementioned utilities are still under investigation and discussion with third party utilities.



To mitigate the potential for leachate migration due to stone column installation, removal of the waste material within the stone column footprint would have been required along with vertical cut-off walls to prevent lateral migration of leachate into the stone column improved zone. With the revised design configuration (extended end span, eliminate jump span, pile supported abutment), the stone columns could be eliminated removing the requirement to excavate and replace waste material and construction cut-off walls, which was proving cost prohibitive.

Further value analysis was completed on the revised design configuration, including: numerical analysis to finalize the extent of the cellular concrete; analysis and discussions with the geotechnical, structural and construction teams on pile size and pile concrete infill / reinforcement details; and evaluation of geogrid reinforcement vs rapid impact compaction (RIC) for the mineral fill approach embankments.

Value analysis related to other geotechnical elements not associated with the rail overpass and approaches, was also completed including: refining the embedment depth and subgrade improvement requirements for the CIP wall along Blundell Road; selection of asphalt and gravel thicknesses / material properties; additional investigations to quantify seepage info rates into excavations that may require treatment prior to discharge; analysis to estimate excavated materials from the ADESA site that can be re-used as permanent embankment fill.

CLOSING

If you have any questions or require further information, please contact Lamme Zarei of McElhanney at lzarei@McELhanney.com or Paul Wilson of Thurber at paulwilson@thurber.ca.

Sincerely,
McElhanney Engineering Services Ltd.

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Appendices:

Statement of Limitations



APPENDIX A

STATEMENT OF LIMITATIONS

Statement of Limitations

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Investigation Cost Estimates. This investigation cost estimate has been prepared using the design and technical information currently available, and without the benefit of geotechnical and environmental information. Furthermore, McElhanney cannot predict the competitive environment, weather or other unforeseen conditions that will prevail at the time that contractors will prepare their bids. The cost estimate is therefore subject to factors over which McElhanney has no control, and McElhanney does not guarantee or warranty the accuracy of such estimate.

