

Reference No.: 152-P0016868-F3

April 27, 2020

AECOM
189 Wyld Street, Suite 103
North Bay, Ontario
P1B 1Z2

Attention: Mr. Jason Wright, P.Eng.

**Re: Comments on Draft Foundation Investigation and Design Report
Culvert Replacement STA 16+302
Highway 141, Township of Cardwell, Ontario
GWP 5122-13-00**

Dear Sir:

On March 19, 2020, Englobe received a copy of the MTO's review comments on the Draft Foundation Investigation Report prepared and submitted by Englobe for the above noted project. Our responses to the MTO comments, as issued by Ms. Olta Kociu, P.Eng., and Mr. Ken Ahmad, P. Eng. are as follows. Our responses are presented in the same order as the review comments contained in the above referenced report.

1. **The Geocres No. for this project is 31E-412. This number should be provided in the Final Foundation Reports and Foundation Drawings (BH Location and Soil).**

The Geocres Number for this project has been added to the cover page and on the drawings in the Final Report.

2. **The Final Foundation Investigation and Design Report and Foundation Drawings must be signed and stamped by two Professional Engineers licensed by PEO, one of which shall be Englobe's Designated Principal Contact identified for MTO Foundations Engineering Projects).**

The attached Final Report has been signed and stamped by two Professional Engineers licensed by PEO and prequalified under MTO-RAQs including Englobe's MTO Foundation Designated Contact, Mr. Michael H. Mackay.

3. **Section 4.1.6 – Gravelly Silty Sand to Sand and Silt: Borehole 1 indicates that occasional cobbles and boulders were present at this layer, please include that in the report.**

The text of Section 4.1.6 has been revised to note the presence of occasional cobbles and boulders. The Borehole Location Plan has similarly been updated.

4. **Section 4.1.8 – Bedrock: Were there any UCS tests conducted to determine the strength of bedrock?**

UCS tests were not completed on any of the bedrock samples.

5. **Section 6.1 – General: What will be the inlet and outlet elevations of the new proposed culvert?**

It is understood that the proposed culvert will be at a similar skew and alignment and the final vertical alignment is to remain essentially the same. However, the design team is considering a slight shift of the inlet and outlet to improve hydraulics and as such the proposed elevations have not been finalized.

6. **Section 6.2.1 – Slope Stability for Embankment Reconstruction: The slope stability analyses are indicating that the factor of safety for the slopes of the existing embankment are less than 1.3, are there any signs of instability at the embankments slope?**

There were no signs of embankment instability for the existing embankment slope. Section 6.2.1 will be revised to reflect this.

7. **Section 6.2.1 – Slope Stability for Embankment Reconstruction: The last paragraph indicates “it is noted that extending the length of the culvert in order to flatten the embankment slopes as noted above may be limited by the east and west back slopes” please clarify what it is meant by the back slopes?**

The term back slopes refers to the existing geometry of the terrain naturally sloping back up at the culvert inlet and outlet. Please refer to the Photo Essay in Enclosure 7, specifically Photo No. 4. A reference to the photos will be included within Section 6.2.1.

8. **Section 6.4.2 – Temporary Shoring: Please include an Operational Constraint to warn the contractor of the presence of cobbles and boulders.**

An Operational Constraint has been included in Appendix 6 and this is indicated in Section 6.4.2.

9. **Section 6.4.3 – Trenchless/Tunneling Techniques: It will be challenging to determine a trenchless technique that will consider the earth fill/native soil and bedrock, if the culvert alignment will be found in that interface. Please comment on these challenges in the report in addition to the presence of cobbles and boulders.**

The report has been revised to include comments on the potential soil interfaces and challenges for trenchless techniques. A Notice to Contractor has been added to Appendix 6 of the Final Report.

10. **Section 6.6 – Excavation, Dewatering, and Embankment Reconstruction: “Appropriate laboratory and field testing of the embankment fill material should be conducted to determine which material meets the SSM standards and acceptable material should be stockpiled for potential reuse” Please include an NSSP in the report to instruct the contractor**

An NSSP has been included in Appendix 6 and this is indicated in Section 6.6.

11. **Section 6.6 – Excavation, Dewatering and Embankment Reconstruction: Please indicate the groundwater elevation in this section**

The groundwater levels encountered during the field investigation have been included in Section 6.6.

We trust the enclosed is sufficient for your present requirements. Should you have further queries please do not hesitate to contact the undersigned.

Yours truly,
Englobe Corp.



Evan Childerhose, P. Eng.

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