



**THURBER** ENGINEERING LTD.



October 19, 2017

File: 13161

Laura Donaldson P.Eng.  
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Kingston ON K7P 0L8

**RESPONSE TO MINISTRY COMMENTS ON  
FOUNDATION INVESTIGATION AND DESIGN REPORT  
HIGHWAY 17 DINORWIC LAKE CULVERT REPLACEMENT  
SITE 41S-247/C  
1.85 KM WEST OF HIGHWAY 72/HIGHWAY 17 JUNCTION  
GWP 6370-14-00**

Dear Ms. Donaldson:

We have reviewed the comments received from MTO dated June 2, 2017, regarding the draft Foundation Investigation and Design Report for the above captioned project. Our responses are documented below in italics following MTO's comments.

1. MTO GEOCRES No. **52F-55** has been assigned to the Final Report and Foundation Drawings (BH Locations and Soil Strata). Please update the geocres number on the report to reflect this number.  
*- The Geocres No. has been added to the report and drawings.*
2. MTO GWP Number should appear on the report cover page.  
*- The GWP Number has been added to the report cover page.*
3. General – Please update the report to include recommendations for twin box culverts.  
*- The report has been updated to include recommendations for twin box culverts.*
4. Section 9 – Frost depth should be provided for this location  
*- The frost depth is provided in Section 10.3.*
5. Section 10.2 – Consider adding an NSSP to instruct the contractor to protect the subgrade in accordance with the recommendation in this section.  
*- Example wording for an NSSP has been provided in the report.*
6. Section 10.3 – Frost tapers are used to account for changes in pavement subgrade material at transitions from a relatively non frost susceptible trench backfill to a more frost susceptible subgrade. Please clarify why a shallow cover above a culvert would remove the need to have frost tapers.  
*- The report has been updated for direction on the design of frost taper.*

7. Section 10.4 – This section notes that a surficial instability was noted at the site. Please clarify whether this surficial instability will impact the proposed works and how the instability should be mitigated.  
*- Further discussion on the noted surficial instability has been added to the report.*
8. Section 11.4 – Reference is made to using both a cutoff wall and a clay seal. Since these both provide the same function consider clarifying that only one is required  
*- A cutoff wall is to intercept the ground water flow below the culvert whereas the clay seal is to intercept water flow around the sides of the culvert.*
9. Section 12 – Example working for the NSSP referenced in bullet 3 should be added to the report.  
*- Example wording for an NSSP has been provided in the report.*
10. Record of Borehole Sheets – No groundwater is noted on the borehole logs, please confirm that no ground water was noted in any of the borehole upon completion of drilling.  
*- A standing groundwater elevation was not recorded in the open borehole.*
11. The Final Foundation Investigation Report and Foundation Drawings must be signed and stamped by two Professional Engineers licensed by PEO, one of which shall be Golder's Designated Principal Contact identified for MTO Foundation Engineering Projects.  
*- The final report and drawings have been stamped by two Professional Engineers.*

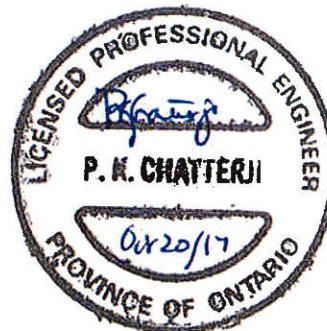
## Closure

We trust that these revisions fully address the Ministry's comments. If you have any questions or require further information, please contact us at your convenience.

Yours truly,  
 Thurber Engineering Ltd.



Paul Carnaffan, P.Eng.  
 Principal  
 Senior Geotechnical Engineer



PK. Chatterji, P.Eng., Ph.D.  
 Designated Principal Contact  
 Senior Geotechnical Engineer