



VIA EMAIL ONLY

February 15, 2023

Andrew Giesen C.E.T, PMP
Transportation Manager
Municipality of Middlesex Centre
10227 Ilderton Road,
Ilderton, ON N0M 2A0

Re: Closure of Structure C-558 on Fernhill Drive

On Friday, February 10, 2023 we were informed that the fill material was washed out around this structure leaving a large void in the roadway surface. Upon notification and a review by Municipal staff the road was closed, and we were asked to complete a review of the structure to determine if temporary repairs could be made to allow the road to be re-opened, or if the road should remain closed.

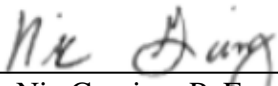
The existing structure is a bolted together multi-plate corrugated steel structure with a 3.8 m span and 2.25 m height that was slated for replacement next year. The bottom of the structure at the downstream end of the culvert has rusted completely through creating a perforated strip along the east haunch at the bottom of the culvert that runs almost half of the culvert length from the north end. The bottom of the culvert in the center did not appear to have perforations through it, but the steel is severely corroded in that area as well; and we were easily able to poke a steel rod through the bottom of the culvert. At the south end there was also a perforated strip along the east haunch, at the culvert bottom, that extends about 3 to 4 m in from that end. During our site visit, it was identified that water was actively flowing under the north end for about half the culvert length and is likely also flowing under the remainder of the culvert. This washed some of the granular material out from the underside of the culvert at the north end and it eventually pulled material out from around the east side and overtop of the culvert. This ultimately caused the sink hole in the road immediately beside the culvert. As water appears to be passing under other parts of the culvert, there is a concern backfill material at other locations along the structure has also been washed out and there is a possibility the sink hole will extend further across the road within a short period of time. Also, the structural integrity of a culvert is minimal when the culvert does not form a complete circle and the culvert is discontinuous across the bottom at both ends. Given the concerns about the structural integrity of the culvert, and the possibility that granular backfill around the culvert is missing elsewhere, it is recommended the road at the culvert remain closed until the culvert can be replaced.

If you have any questions or require additional information about this structure, feel free to let us know.

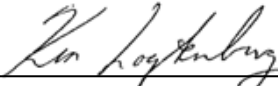


Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per 
Nic Gowing, P. Eng.



Per 
Ken D. Logtenberg, P.Eng.

:hv