



**St. Lawrence Testing
& Inspection Co. Ltd.**

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February 10, 2022

Mr. Richard VanVeldhuisen, P.Eng.
Marguerita Residence Corporation
48 Church St.
Brockville, ON
K6V 6L3

**RE: Bobbie Leeder Property, Cardinal, ON
Report No. 22C024**

Dear Mr. VanVeldhuisen:

This report is submitted in response to the January 27, 2022 letter from Mr. James Holland to Ms. Wendy Van Keulen. .

With regard to slope stability, this is based on the boreholes put down and the measurements taken on the horizontal and vertical distances of the property. We concluded that a standard house with footings could not be built since it would extend vertical and horizontal loads towards the edge of the Galop canal. That is the reasoning for supporting the house with auger piles. The auger piles transfer the loads down vertically to the glacial till.

We measured the side slopes on the property. From the water's edge going North, the side slope is 3 to 1 up to 9 m North of the water's edge. For the next 9 m going North, the side slop ratio is 5 to 1. Going further North the land has a very mild slope, rising in the order of 10 to 1, if not flatter.

Our experience in this area goes back to the mid 1960's when we did surveying in the Iroquois to North Channel area which also included Cardinal.

Our geotechnical experience in this area started in the mid 1970's. We completed many projects in the Cardinal area, along the St. Lawrence River and along the Galop canal during this period. We've been working regularly at the Ingredion plant in Cardinal since the late 1970's.

With regard to this site, one factor to consider is that there is very minimal wave action against the edge of the slope. There are very few small boats that travel in this area, mainly since it is an old canal. The Seaway ships travel along the St. Lawrence River.

The static factor of safety is greater than 1.5 to 1 over the entire slope, from the edge of the canal and going North.

The dynamic factor of safety is 1 to 1 or greater.

In addition, the house is supported on piles. We have also suggested battered piles to provide additional safety to the house. Basically the house is self supporting and has no effect on the slope and slope stability.

Respectfully submitted

ST. LAWRENCE TESTING & INSPECTION CO. LTD.



G.G. McIntee, P. Eng.

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