

**City of Clarence-Rockland**

**CONTRACT No. 170402**

**Celine Street Rehabilitation**

**ADDENDUM No. 1 TO CONTRACT**

**Date: June 13, 2017**

**1. CLARIFICATIONS**

- i) Please take notice that a slope stability report (6 pages) is attached for additional information regarding the soil conditions. There is no geotechnical report available for this project.**

**END OF ADDENDUM NO. 1**

**ATREL ENGINEERING LTD**



Pier-Luc Mainville, E.I.T.



**Golder Associates**  
CONSULTING GEOTECHNICAL AND MINING ENGINEERS

DP-200

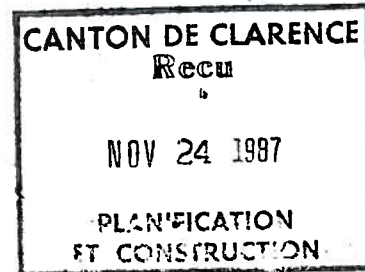
November 12, 1987

Our Ref: 871-2544

Jocerok Enterprises  
Box 6  
Clarence Creek, Ontario  
K0A 1N0

ATTENTION: Mr. C. Lemay

**RE: SLOPE STABILITY STUDY  
LOTS 49 TO 53  
PART LOT 6, CONCESSION 6,  
TOWNSHIP OF CLARENCE, ONTARIO**



Dear Sirs:

This letter reports the results of a slope stability study carried out at the above site. The purpose of this study was to assess the stability of the escarpment slopes which exist on and adjacent to the noted lots and, based on this information, to provide recommendations for the geotechnical design aspects of development of these lots.

**DESCRIPTION OF SITE**

The proposed development is located south of the township road between lots 5 and 6 and west of the township road between concessions V and VI, on the south side of the Village of Clarence Creek, Ontario (see Key Plan, Figure 1). Lots 49 to 53 are in the northwesterly portion of the development adjacent to the existing water tower as shown on Figure 2. Slopes some 14 metres high and having slope angles ranging from about 2.5 to 4 horizontal to 1 vertical exist on and adjacent to the above lots. The development of the site is understood to call for construction of detached houses with individual septic disposal systems.

From the results of boreholes put down at the site of the adjacent water tower by others, it is understood that the soil conditions in this area consist of a thin surficial cap of sand, underlain by silty clay to a depth of about 16 metres. The clay is in turn underlain by glacial till and limestone bedrock.

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*No reference made to lot 54 ?*

INVESTIGATIVE PROCEDURE

The site was visited by the writer on October 6, 1987. At that time the slope height and inclination was measured at each lot. Stability analyses were subsequently carried out to determine the overall stability of the slopes. These analyses were carried out using strength parameters for the native soils derived during a previous geotechnical investigation on the property to the north and west of the site (i.e. Golder Associates report 811-2036). The water level used in the analyses approached full saturation, a condition that is considered to occur during wet periods of the year such as the early spring. The results of these analyses and our observations and recommendations are given in the following section.

Slope Stability

Lots 52 and 53

The crest of the slopes in this part of the site ranges from about 9 to in excess of 25 metres east of the east property line. The natural slopes in this area were found to be about 14 metres high and to have slope angles of about 2.5 horizontal to 1 vertical. Fill materials, consisting of sand and silty clay have been placed along the lower portion of the slopes adjacent to lot 52. The surface of the fill has been graded to about 4.5 horizontal to 1 vertical.

The stability analyses indicated that the slopes adjacent to lots 52 and 53 have a factor of safety ranging from about 1.2, which is marginal, to 1.5, which is acceptable, in their present condition. The east property line for these lots will, however, be outside the zone of influence of slope movement in all cases (i.e. the factor of safety at the lot line is consistently 1.5 or greater). As such, the proposed development of lots 52 and 53 is considered to be geotechnically acceptable provided that the existing grade is maintained in the area from the east property line to the crest of the slopes.

Lots 49 to 51

Lots 49 to 51 are located at least partially on the slopes. From examination of the contours shown on the draft plan of subdivision and observations during the site visit, it is known that the natural slopes in this area are about 10 metres high and have a slope angle of about 3.5 to 4 horizontal to 1 vertical. Some fill, consisting of sand and silty clay has been placed on these slopes and is presently standing at an inclination of about 4 to 5 horizontal to 1 vertical.

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It is understood from conversations during the site visit that the finished grade from the roadway to the west side of the houses will be 0.3 metres (or less) above the existing grade. The grade will then be dropped 0.9 metres across the house area. The grade at the house will then be maintained to the east lot line. This will involve placing some additional fill on the slopes.

It is considered that the proposed development in lots 49 to 51 will be geotechnically acceptable and that the slopes will have an adequate factor of safety provided that the following constraints are followed:

- 1) The foundations for the houses should be placed on native sand or silty clay or on well compacted granular fill placed over the native soil.
- 2) Fill materials placed on the slopes should be spread in layers about 0.3 metres thick and compacted using several passes of a tractor dozer.
- 3) The fill materials should be shaped to a slope no steeper than 4 horizontal to 1 vertical.
- 4) The surface of the filled slopes should be mulched and the ground cover re-established as soon as possible after final grading to resist surface erosion. This could be accomplished by seeding and mulching as well as planting shrubs. Vegetation having deep, wide spread root systems is best suited for planting on the slopes.
- 5) The septic tile beds, which are to be placed behind the houses, are constructed carefully so as not to adversely affect the stability of the slopes. In this respect, the effluent should not be allowed to outlet directly onto the slopes.

#### Construction Supervision

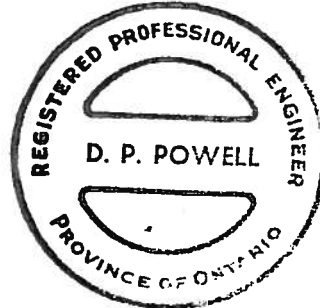
It is suggested that house construction and the placement of fill materials on lots 49, 50 and 51 be supervised by qualified geotechnical personnel to ensure that the recommendations given in this letter are followed.

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We trust that this letter provides sufficient information for your present requirements. If you have any questions concerning this letter, or if we can be of further assistance to you on this project, please call us.

Yours truly,

GOLDER ASSOCIATES (EASTERN CANADA) LTD.



D. P. Powell, P. Eng.

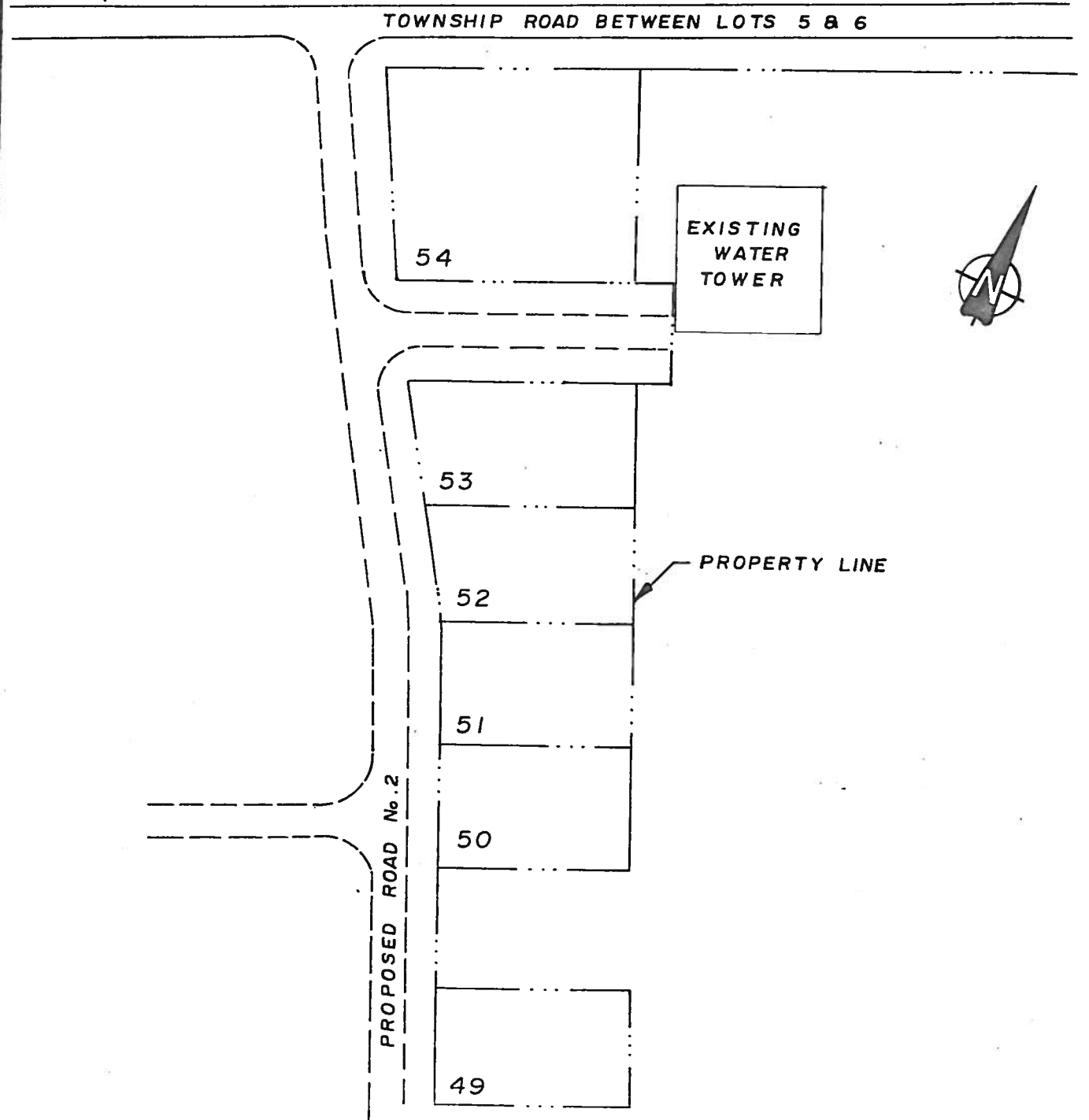
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Att: Figures 1 and 2

cc. Mr. F. Ribas, J. L. Richards & Associates Ltd.

# SITE PLAN

FIGURE 2



REFERENCE : PLAN SUPPLIED BY : J.L. RICHARDS AND ASSOCIATES LTD.

SCALE 1:1250

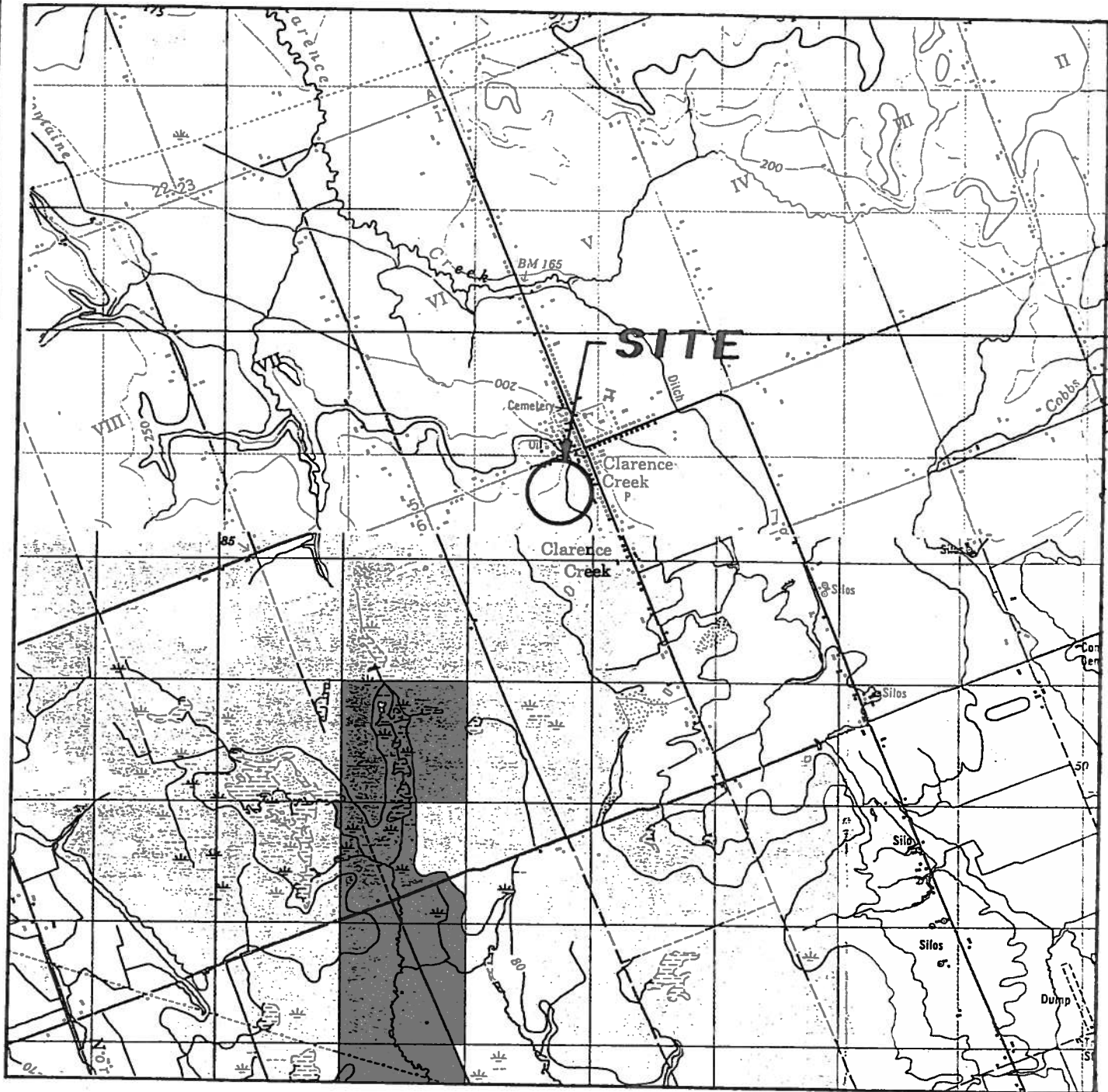
Date NOV 18, 1987  
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**Golder Associates**

Drawn S.L.  
Chkd. [Signature]

# KEY PLAN

FIGURE I



**SPECIAL NOTE**  
THIS DRAWING IS TO BE READ IN CONJUNCTION  
WITH ACCOMPANYING REPORT



SCALE 1 : 50,000

Date NOV 18, 1987  
Project No. 871-2544

**Golder Associates**

Drawn S.L.  
Chkd. [Signature]