

Attention: Mr. Sam Morra

Re: Letter of Opinion - Global Stability Assessment for Proposed Driveway Apron at Proposed Residential Development 13290 Nunnville Road Town of Caledon (Bolton)

Mar 23, 2023

Dear Sir:

In accordance with your email authorization dated March 14, 2023, we have carried out a global stability assessment for the proposed driveway apron at the entrance from Nunnville Road. We herein present the results of the assessment.

Based on a review of the site grading plan in conjunction with the topographic information for the site, it is understood that a driveway entrance into the site is proposed at the southeast limit of the property. A portion of the driveway, closest to the existing slope, will be built up with engineered fill, with a retaining wall proposed along the edge of the driveway. The existing slope in the vicinity of the driveway has average gradients ranging from 2.6 to more than 4.8 horizontal (H):1 vertical (V) from the edge of the trail (which starts from the north end of Nunnville Road running down to Old King Road) to the top of the slope.

One (1) cross-section, Cross-Section DR1-DR1, at the location where the proposed driveway apron is closest to the Long-Term Stable Top of Slope (LTSTOS) was selected for analysis as the vehicle loading along the proposed driveway at this location would be closer to the slope. The location of the cross-section is shown on Drawing No. G1. It should be noted that the LTSTOS was previously established at the site through a detailed borehole investigation and slope stability assessment, which were presented in the Geotechnical Investigation and Slope Stability Assessment Report, Reference No. 2201-S054, dated March 2023.



Bolton Summit Developments Inc. March 17, 2023

The surface profile at the cross-section was interpolated from the topographic survey and the site grading plans provided by your office. The subsurface soil profile is derived from the borehole findings from the geotechnical report, referenced above.

The global stability at Cross-Section DR1-DR1 was analysed using the Bishop Method with the soil strength parameters shown in the following table, and incorporating a load of 12 kPa to account for vehicular traffic along the driveway.

Soil Type	Unit Weight γ (kN/m³)	Cohesion c (kPa)	Internal Friction Angle φ
Silty Clay Till	22.0	5	30°
Silty Clay	20.5	5	26°
Engineered Fill	20.5	0	28°
Retaining Wall*	20.0	200	45°

Soil Strength Parameters

*For slope stability analysis, the retaining wall is modelled as a rigid structure

The resulting factor of safety (FOS) at Cross-Section DR1-DR1 incorporating the proposed grading meets the Ontario Ministry of Natural Resources (OMNR) guideline requirements for active land use (minimum FOS of 1.5) with a minimum FOS of 1.779; the result is shown on the enclosed Drawing No. G2.

Any proposed engineered fill should consist of inorganic fill compacted to at least 98% of its maximum Standard Proctor Dry Density (SPDD) in lifts of not more than 20 cm. Where granular material is required for the pavement construction, the granular base and sub-base should be compacted to 100% SPDD.

This letter only covers the global slope stability analysis incorporating the proposed driveway, and generic parameters for the proposed retaining wall. The retaining wall must be properly designed by an engineer to ensure its internal, sliding, overturning and global stability are satisfactory. This report does not address the design and approval of the retaining wall. Should the location of the driveway and retaining wall or the proposed grading at the site change, the slope should be reanalysed to confirm that the proposed grading will not compromise the stability of the slope.

In addition, other recommendations provided in our original Geotechnical Investigation Report remain applicable without revision.



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We trust this letter satisfies your present requirements; however, should any queries arise please feel free to contact this office.

Yours truly, **SOIL ENGINEERS LTD.**



ENCLOSURES

Cross-Section Location Plan	Drawing No. Gl	1
Global Stability Analysis - Cross-Section DR1-DR1 (Proposed Condition)	Drawing No. G2	2

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