

March 7, 2011

PML Ref.: 11BF004  
Report: 1

Mr. Mark Catchpole, Associate  
Reich+Petch Architects  
1867 Yonge Street  
Suite 1100  
Toronto, Ontario  
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Dear Mr. Catchpole

**Muskoka Medium Security Institution**  
**Fenbrook Site**  
**Gravenhurst, Ontario**

Further to the Phase 2 Geotechnical Investigation report, PML Ref.: 94BF053A, dated May 16, 1995, for the above noted project, additional geotechnical consultation was requested for design of the building referred to as the Future Residential Building.

The recommendations for the Future Residential Building were made on Page 35 of the above mentioned report. The specific pile foundation recommendations provided on Pages 17 and 18 of the report are considered appropriate for design of the Future Residential Building. In short, piles driven to bedrock can be designed based on 50% of structural capacity of the pile section and should be fitted with rock points. Sloping bedrock is present and may necessitate the need for additional/substitute piles subject to inspection during construction.

The soil profile revealed in Boreholes 68 and 69 (in the building area) comprised loose sands and a high ground water table extending to 5.5 to 8.2 m depth overlying soft to firm clay to 9.8 to 12.8 m underlain by assumed bedrock. The loose sands, in combination with the high ground water table, are susceptible to liquefaction.

An assessment was carried out to evaluate the potential for soil liquefaction at the site by comparison of the loading effect of an earthquake (Cyclic Stress Ratio, CSR), and the soils ability to resist liquefaction (Cyclic Resistance Ratio, CRR).

Based on the analysis the computed factor of safety (CRR/CSR) is at least 1.1, indicating that there is no potential for soil liquefaction at the site.

Based on the above Site Classification E is applicable for Seismic Site Response as set out in Table 4.1.8.4.A of the Ontario Building Code (2006).

Shear wave velocity testing can be conducted to potentially upgrade the Seismic Site Classification.

For lateral resistance a  $K_p$  value of 2.6 is recommended.



We trust this information is sufficient for your present purposes; however, should you have any questions, please do not hesitate to call our office.

Sincerely

Peto MacCallum Ltd.



Geoffrey R. White, P.Eng.  
Associate,  
Manager, Geotechnical and Geoenvironmental Services

GRW:jlb

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