

April 21, 2022

PML Ref.: 21BF049
Report: 4

Mr. Jesse Marchand
The Corporation of the County of Simcoe
1110 Highway 26
Midhurst, Ontario
L9X 1N6

Dear Mr. Marchand

**Geotechnical Review of Drainage Channel Side Slopes
Proposed Simcoe County Affordable Housing Facility
125 Simcoe Road
Bradford West Gwillimbury, Ontario**

As requested, Peto MacCallum Ltd. (PML) has carried out a geotechnical review of the proposed drainage channel side slopes for the above referenced development project.

The following documents were included in the review which should be read in conjunction with this report:

- Geotechnical Investigation, Proposed Simcoe County Affordable Housing Facility, 125 Simcoe Road, Bradford West Gwillimbury, Ontario; Peto MacCallum Ltd. Project 21BF049, Report 1 dated January 10, 2022
- Site Grading Plan, Drawing SG-1, Revision 2 by Pearson Engineering, Project # 20055 dated June 2020

Based on the information provided in the Site Grading Plan, the proposed drainage channel reconfiguration will generally follow the pre-development watercourse alignment starting on the east boundary of the property and flowing along the southern boundary of the property, connecting back with the existing channel at the southeast corner of the property. A concrete headwall with erosion control mat will be located approximately mid way along the drainage channel and fish habitat features (by others) are to be located in the southeast corner of the site where the proposed channel widens.

The channel generally has a flat bottom with a typical width of about 2.0 m and side slopes graded at between two horizontal to one vertical (2H:1V) to flatter than 3H:1V. The depth of the channel varies from less than 1 m at the west end to about 3.9 m in the eastern portion of the channel.

Based on the geotechnical report, the soil conditions along the channel are expected to comprise compact sand to sandy silt fill, and compact to dense sandy silt till.

The proposed grading plan will require placement of engineered fill to achieve the proposed grades, such that the sections of the channel side slopes will be partially in native soils and partially within engineered fill.



Provided that the engineered fill is adequately placed and compacted in accordance with the engineered fill guidelines provided in the Geotechnical Investigation report, the applicable soil strength parameters for the in-place native soil or compacted engineered fill may assumed as follows:

Soil Type	Bulk Unit Weight, γ (kN/m³)	Internal Friction, Φ (degrees)	Cohesion, C_u (kPa)
Engineered Fill	21	30	0
Sandy Silt Till	21	30	0

Considering the above soil strength parameters and the channel geometry as shown on the site grading plan, the proposed channel is considered to be stable with respect to a factor of safety of 1.3 to greater than 1.5.

Prior to engineered fill placement, the existing ground must be stripped of all topsoil, loose fill and otherwise disturbed or deleterious soil and heavily proofrolled under geotechnical supervision to a minimum of 98% of the materials Standard Proctor maximum dry density. Where engineered fill is placed in areas of pre-existing sloping ground, the existing side slopes must be benched to allow for horizontal placement and compaction of the engineered fill. Benching should follow Ontario Provincial Standard Drawing (OPSD) 208.010.

Adequate erosion protection must be provided to prevent scour or undercutting of the channel slopes.

PML trusts this letter meets your current needs. Should you have any questions, please do not hesitate to contact our office.

Sincerely

Peto MacCallum Ltd.

Scott Jeffrey, P.Eng., QP_{ESA}, LEED_{GA}
Senior Associate
Regional Manager, Geotechnical and Geoenvironmental Services

SJ:tc

- 1 cc: Mr. Jesse Marchand, The Corporation of the County of Simcoe (email only)
- 1 cc: PML Barrie
- 1 cc: PML Hamilton