

May 11, 2018

File: 64153.85 – R0

Novatech
240 Michael Cowpland Drive, Suite 200
Ottawa, Ontario
K2M 1P6

Attention: Mark Bissett, P.Eng., Senior Project Manager

**Re: Potential for Soil Volume Change
Proposed Residential Subdivision
1055 Klondike Road
Ottawa, Ontario**

INTRODUCTION

This letter provides the potential for soil volume change of the sensitive marine clay soils encountered during the geotechnical investigation carried out for the above indicated project and should be read in conjunction with the geotechnical report titled: “Geotechnical Investigation, Proposed Residential Subdivision, 1055 Klondike Road, Ottawa, Ontario”, dated April 4, 2018.

VOLUME CHANGE POTENTIAL

The City of Ottawa document titled: “Tree Planting in Sensitive Marine Soils - 2017 Guidelines” indicates that sensitive marine clay soils with a modified plasticity index of less than 40 percent are considered to have a low/medium potential for soil volume change. Clay soils with a modified plasticity index that exceeds 40 percent are considered to have a high potential for soil volume change.

As part of the geotechnical investigation, select soil samples were tested in our laboratory to determine the Atterberg limits for the sensitive marine clay. A summary of the test results is provided in Table 1.

Table 1 – Summary of Atterberg Limits

Borehole	Sample Number	Sample Depth (metres)	Shrinkage Limit ³ (%)	Plastic Limit ¹ (%)	Liquid Limit ¹ (%)	Plasticity Index ¹ (%)	Modified Plasticity Index ² (%)
18-2	8	6.1 to 6.7	-	21.6	43.8	22.2	22.1
18-3	5	3.1 to 3.7	-	22.8	54.6	31.9	31.7

Borehole	Sample Number	Sample Depth (metres)	Shrinkage Limit ³ (%)	Plastic Limit ¹ (%)	Liquid Limit ¹ (%)	Plasticity Index ¹ (%)	Modified Plasticity Index ² (%)
18-4	4	2.3 to 2.9	23.8	21.5	48.9	27.5	27.4

1. Calculated in accordance with ASTM D4318

2. The modified plasticity index (PI_m) was calculated using the following formula, where PI is the plasticity index determined in accordance with ASTM D4318: $PI_m = PI \times (\% \text{ passing the } 425\text{-}\mu\text{m sieve} / 100\%)$.

3. Calculated in accordance with ASTM D4943, which was discontinued in 2017 by the ASTM Sponsoring Committee responsible for the standard.

Based on the modified plasticity index of the samples tested, the potential for soil volume change, as defined by the City of Ottawa, is summarized in Table 2.

Table 2 – Potential for Soil Volume Change

Borehole	Sample Number	Sample Depth (metres)	Potential for Soil Volume Change
18-2	8	6.1 to 6.7	Low/Medium
18-3	5	3.1 to 3.7	Low/Medium
18-4	4	2.3 to 2.9	Low/Medium

For this site, the low/medium potential clay soils encompass the entire property (see attached Figure 1).

In accordance with the City of Ottawa Tree Planting Guidelines, tree planting restrictions apply where clay soils with low/medium potential for volume change are present between the underside of footing and a depth of 3.5 metres below finished grade (refer to the City of Ottawa document titled: “Tree Planting in Sensitive Marine Soils - 2017 Guidelines”). In areas where clay soils are not present within 3.5 metres of finished grade (e.g., where relatively thick pads of engineered fill are required below founding level or where the clay soils are overlain by relatively thick sandy soils), the City of Ottawa tree planting restrictions may not apply. Given the considerable grading (i.e. cut/fill) work to be completed on this site, it is recommended that the grades be reviewed by GEMTEC prior to the completion of the landscape plan so that areas where the tree planting restrictions will not apply can be identified.

We trust that this letter is sufficient for your purposes. If you have any questions or require additional information, please contact the undersigned.



Greg Davidson, B.Eng., E.I.T.



Brent Wiebe, P.Eng.
Senior Geotechnical Engineer



Attachments: Figure1

Enclosures

P:\0. Files\64100\64153.85\Tree Planting\64153.85_LTR01_V01_2018_05-11.docx



LEGEND

 BH 18-1
77.61

BOREHOLE
(current investigation by GEMTEC)



GROUND SURFACE ELEVATION IN METRES
GEODETIC DATUM

 BH 17-1
78.30

BOREHOLE
(previous investigation by GEMTEC,
formerly Houle Chevrier Engineering Ltd.(2017))

 72.52

ELEVATION
(current investigation by GEMTEC)

NOTE:

Potential for soil volume change defined as per the City of Ottawa document title:
"Tree Planting in Sensitive Marine Soils - 2017 Guidelines."

Scale 1:1500





GEMTEC
CONSULTING ENGINEERS
AND SCIENTISTS

32 Steacie Drive
Ottawa, ON K2K 2A9
Tel: (613) 836-1422
www.gemtec.ca
ottawa@gemtec.ca