



January 11, 2021

Treasure Hill
1681 Langstaff Road, Unit 1
Vaughan, Ontario
L4K 5T3

Attention: Mr. Joseph Pavia

Re: BRM-21000590-A0 Geotechnical Report Review
65 and 105 Ripplewood Road
Cambridge, Ontario

Dear Mr. Pavia:

As requested, EXP Services Inc. (EXP) has carried out a review of a geotechnical investigation report prepared for the above noted site. The report was prepared by Naylor Engineering Associates (Naylor) titled "Geotechnical Investigation, Proposed Urban Development, 65 and 105 Ripplewood Road, Cambridge, Ontario" File No. 5685G1.R01 issued on July 4, 2005.

It is our understanding that Treasure Hill is considering purchasing the site. EXP is to provide recommendations regarding the suitability of the site for development from a geotechnical point of view. Any review comments addressed in this report are intended to provide preliminary information and/or recommendations to Treasure Hill based on the assumption that the subsurface information presented in the Naylor report is accurate.

The number of boreholes advanced for a site of this size is considered inadequate for the proposed development. Additional boreholes should be advanced to confirm the subsurface soil and groundwater conditions.

1. Background

The site is located on the north side of Ripplewood Road in Cambridge, Ontario. The site has partial frontage on Ripplewood Road and extends approximately 800 m to the north. West and east site boundaries are co-linear with Vanier Drive (off the west end of Ripplewood) and a tree line east of the cul-de-sac at the east end of Ripplewood Road, respectively. The property is 40.1 ha in size and is irregular in shape.

The geotechnical investigation was carried out to determine subsurface soil and groundwater conditions to provide recommendations for construction of a proposed urban development including site grading, site servicing, houses, pavement design and stormwater infiltration.

The geotechnical investigation was carried out in conjunction with Phase I and II Environmental Site Assessments (ESAs) on the site by Naylor.

2. Fieldwork and Subsoil Conditions

The fieldwork for the geotechnical investigation comprised the excavation of twenty-one (21) test pits (Test Pits 1 to 21) to depths between 2.2 and 3.0 m on May 13, 2005. Seven (7) boreholes (Boreholes 1 to 7) advanced to 3.5 to 5.0 m depth on May 16, 2005 for Phase II ESA purposes were also utilized for geotechnical purposes. The seven (7) boreholes were all instrumented with monitoring wells.

Based on the boreholes drilled in the east central and northeast portions of the site, the subsoil generally consists of topsoil overlying silt and glacial silt till. However, sand was encountered below the topsoil, silt and silt till in Test Pits 3, 4, 10, 11 and 15 excavated elsewhere on the site. Saturated conditions were observed in the sand at depth at some of these test pit locations. Fill was encountered to depths of 0.1 to 0.8 m in Boreholes 2, 3, 4 and 5 and Test Pit 6 in the vicinity of the buildings in the central portion of the site. Debris such as concrete, asphalt, glass, scrap metal and leather pieces were noted in the fill. Buried topsoil was noted below the fill in Boreholes 2 and 4. Peat was identified surficially in Test Pits 4 and 16 in the southwestern and east central portions of the site, respectively.

Groundwater observations in the monitoring wells indicate groundwater levels ranging from 0.5 to 2.8 m below ground surface. These levels are indicative of seepage from the wet seams and layers in the glacial till. The stabilized groundwater table is interpreted to be at a depth greater than the maximum depth of investigation of 5 m.

3. Geotechnical Assessment

Base on the reported subsoil conditions, it is our opinion that construction of the proposed urban development at the site is feasible.

3.1 Site Grading

It is anticipated that some regrading (cut and fill operations) will be carried out at the site.

All topsoil, organics, fill, former buildings/building foundations or otherwise deleterious materials should be removed. Upfill areas can be brought up to design grades using approved portions of cut soils compacted in accordance with requirements for building foundations,

floor slab support and road construction dependent upon location. Any shortfall of suitable on-site material can be made up with approved imported soil or granular material, OPSS Granular 'B' or equivalent.

3.2 Site Servicing

It is noted that the depths to sewer inverts have not yet been determined. However, if they fall within the depths of investigation, sewers will be placed on competent native silt, silt till, sand or compacted approved fill soils. Where sewer inverts fall below the water table in native sand, the water table will have to be drawn down to at least 1 m below the design level to facilitate construction. All excavations must be carried out in accordance with the Occupational Health and Safety Act (OHSA). Within the meaning of OHSA the native silt till would be classified as Type 2 soil. The native silt and dewatered sand would be classified as Type 3 soil. Compacted approved fill soils would be classified as Type 3 soil. Controlling the groundwater in these soils may be achieved by conventional sump pump techniques and oversized excavations.

3.3 Building Foundations

Based on the results of the investigation, it is considered that the site is generally suitable for construction of residential dwellings. No bearing pressures are included in the report reviewed. However, based on the existing information provided, it is EXP's opinion that for preliminary purposes, footings founded on the native compact silt, silt till or sand may be designed using a geotechnical reaction of 100 kPa at Serviceability Limit States (SLS), subject to inspection by qualified geotechnical personnel during construction. The factored geotechnical resistance at Ultimate Limit States (ULS) is 150 kPa.

In any proposed fill areas at the site, structures may be founded on compacted 'engineered fill' and designed for a geotechnical reaction of 100 kPa at SLS. The factored geotechnical resistance at ULS is 150 kPa.

3.4 Pavement

The reviewed report presents the following component thicknesses for pavement design.

| Pavement Layer | Compaction Requirements | Local Roadway | Collector Roadway |
|-------------------------------|-------------------------|------------------------|------------------------|
| Asphaltic Concrete (OPSS 310) | As per OPSS 310 | 35 mm HL3 55 mm HL4 | 40 mm HL3 60 mm HL4 |
| OPSS Granular A Base | 100% SPMDD | 125 mm | 150 mm |
| OPSS Granular B Subbase | 100% SPMDD | 300 mm | 400 mm |

These pavement component thicknesses are considered acceptable provided they meet the minimum requirements of the City of Cambridge.

3.5 Infiltration

The hydraulic conductivity of the predominant silt till at the site has been estimated at 10^{-4} to 10^{-5} cm/s. In the absence of in-situ field testing, EXP concurs with this estimation. We also concur with the opinion of the author of the report that the low hydraulic conductivity of this soil is not suitable for conventional stormwater infiltration.

3.6 Earthquake Site Class

No Seismic Site Class has been provided in the report for design of structures. Based on the information presented, it is EXP's opinion that the Site Class of this site can be taken as "D". The Seismic Site Class may be improved if in-situ Shear Wave Velocity testing is carried out.

4. Closure

It is noted that the fieldwork for the report reviewed comprised seven (7) boreholes concentrated near the centre and northeast corner of the site and twenty-one (21) test pits scattered over the remainder of the site. Moreover, it is understood that grading operations are currently underway at the site. Since the site has been altered post preparation of the report reviewed, an updated geotechnical report based on additional boreholes will be required once layout plans for the subdivision have been finalized.

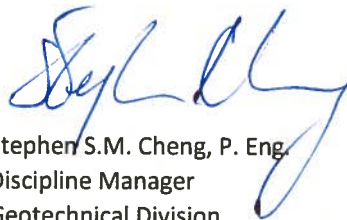
We trust that you will find the foregoing information satisfactory. Should you have any questions, please do not hesitate to contact us.

Sincerely,

EXP Services Inc.



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Geotechnical Division



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