July 21, 2023 Project No. CA0007991.6340

Mrs. Tanya Chowieri, Partner
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Attention: Mrs. Tanya Chowieri, Partner

ADDENDUM 1 - GEOTECHNICAL INVESTIGATION - PROPOSED RESIDENTIAL MIXED-USE BUILDING, 770-774 BRONSON AVENUE, OTTAWA, ON

Dear Madam:

This document is an addendum to the geotechnical report submitted by WSP on June 2, 2021. The addendum provides geotechnical recommendations in answer to the City of Ottawa comments forwarded by the client, based on the scope of work outlined in our proposal dated June 22, 2023.

Based on the schematic design plans, cisterns are projected to be built within the building area. Detailed structural design have not been developed yet. It is possible that a raft foundation be needed to support the cistern element. The following recommendations can be followed.

Cistern Raft Foundation

It is understood that a raft slab placed on a base of granular fill might serve as a foundation for the proposed cisterns.

The geotechnical resistance of the raft itself at SLS will depend on the settlement characteristics of the soil below the slab, as well as the magnitude and geometry of loading. The geotechnical parameter typically used for analysis of settlement below a raft or slab is the vertical modulus of subgrade reaction. The modulus of vertical subgrade reaction is defined as:

$$K_{BxB}=q/\delta$$

Where:

q = applied bearing or contact pressure on footing

δ = settlement of footing under applied pressure q

The modulus of subgrade reaction is not a fundamental soil property, but is dependent upon the size and shape of the loaded area, soil type, relative stiffness of the raft and soil, duration of loading, etc. As a result, the modulus for a 300 mm square footing is typically used as a standard basis.

A value of 50 MPa/m may be used for the modulus of subgrade reaction, if compacted OPSS Granular A is placed under the raft.

For loaded areas greater than 300 mm square the above value should be multiplied as follows:

$$k_{(BXB)} = k_{0.3}\left(\frac{3.28B + 1}{6.56B}\right)^2$$

Where:

k_{BxB} = the modulus for a square loaded area of length and width B (kN/m^3)

$k_{0.3}$ = Use 50 MPa/m (compacted OPSS Granular A)

B = width of the loaded area;

Provision should be made for at least 200 millimetres of OPSS Granular A to form the base for the raft slab, compacted to 100% Maximum Standard Proctor Dry Density (MSPDD).

WSP Canada Inc.

Othmane Benkirane
Candidate to the Engineering Profession - Geotechnical

David Feghali, P.Eng. PMP
Senior Lead Geotechnical Engineer

OB/DF/rk

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