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September 28, 2022

220998

Richmond Agricultural Society
6121 Perth Street
Richmond, Ontario
K0A 2Z0

RE: LIMITED SUBSURFACE INVESTIGATION
PROPOSED PAVILION
6107 PERTH STREET, RICHMOND
CITY OF OTTAWA, ONTARIO

Dear Sir:

This letter reports the results of a limited subsurface investigation carried out for the above noted proposed pavilion. The location of the pavilion was indicated onsite by a representative of the Richmond Agricultural Society. (See Key Plan, Figure 1 for approximate site location). The purpose of the investigation was to identify the upper subsurface conditions within the area of the proposed pavilion based on observations made within a series of shallow test pits and, based on the information obtained, to provide a maximum allowable bearing pressure for design of footings for the pavilion to be constructed at the site. It is understood that the proposed pavilion will be founded on a conventional spread footing foundation bearing below the depth of seasonal frost penetration.

The field work for this investigation was carried out on September 27, 2022 at which time observations were made within two test pits (TP1 and TP2) put down in the area of the proposed pavilion.

The location of the test pits for this investigation are shown on the attached Site Plan, Figure 2. The test pits were advanced to depths of about 3.3 metres below the existing ground surface using a track mounted excavator supplied and operated by a local excavation contractor. In situ shear vane tests were completed in the softer cohesive materials at various intervals when encountered. The soil conditions observed in the test pits were classified based on the in situ shear vane results, the difficulty of digging and on visual and tactile examination of the materials on the walls and bottom of the test pits. The groundwater conditions were observed in the open test pits at the time of the field work.

SUBSURFACE CONDITIONS

The soil and groundwater conditions encountered at the test pit locations, for the purpose of this investigation, are given on the Record of Test Pit sheets following the text of this letter. The test pit logs indicate the subsurface conditions at the specific test pit locations only. Boundaries between zones on the logs are often not distinct, but rather are transitional and have been interpreted.



Subsurface conditions at other than the test pit locations may vary from the conditions encountered in the test pits.

The soil descriptions in this letter are based on commonly accepted methods of classification and identification employed in geotechnical practice. Classification and identification of soil involves judgement and Kollaard Associates Inc. does not guarantee descriptions as exact, but infers accuracy to the extent that is common in current geotechnical practice.

The groundwater conditions described in this letter refer only to those observed at the location and date of observations noted in the letter. Groundwater conditions may vary seasonally, or may be affected by construction activities on or in the vicinity of the site.

In general, the soil conditions encountered at the test pits consisted of about 0.3 metres of topsoil overlying yellow brown to grey brown to grey silty clay. Test pits TP1 and TP2 were terminated within the silty clay at depths of about 3.3 metres below the existing ground surface.

Shear vane tests completed within the silty clay ranged from 40 to greater than 120 kPa, indicating a firm to stiff consistency.

Some groundwater seepage was encountered at test pits TP1 and TP2 at depths of about 2.1 and 2.7 metres, respectively, below the existing ground surface. It should be noted that the groundwater levels may be higher during wet periods of the year. A detailed account of the subsurface conditions encountered in each of the test pits is provided in the attached Table I, Record of Test Pits.

PROPOSED FOUNDATION

It is stressed that the information in the following sections is provided for the guidance of the designers and is intended for this project only. Contractors bidding on or undertaking the works should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction, and make their own interpretation of the factual data as it affects their construction techniques, schedule, safety and equipment capabilities.

The professional services retained for this project include only the geotechnical aspects of the subsurface conditions at this site. The presence or implications of possible surface and/or subsurface contamination resulting from previous uses or activities at this site or adjacent properties, and/or resulting from the introduction onto the site of materials from offsite sources are outside the terms of reference for this letter and have not been investigated or addressed.

The allowable bearing pressure for any footings depends on the depth of the footings below original ground surface, the width of the footings, and the height above the original ground surface of any landscape grade raise adjacent to the building foundation.

RESULTS

Based on the results of the test pits, the subsurface conditions encountered at the test pits advanced at the site near the proposed pavilion during this investigation consist of topsoil overlying silty clay. The native silty clay is considered suitable for the support of the proposed pavilion constructed on conventional cast in place spread footing foundations, at a depth of no more than 1.5 metres below the existing ground surface.



For predictable performance of the proposed foundation all existing topsoil or softened/disturbed material should be removed from within the proposed foundation area to expose the native grey brown silty clay.

The exposed subgrade should be mechanically cleaned by the excavation equipment to remove loose and disturbed material. The subgrade surface should then be inspected and approved by geotechnical personnel.

Based on the results of the test pits it is considered that the footings for the proposed pavilion founded on the native grey brown silty clay or an engineered pad placed on the native silty clay may be designed using a maximum allowable bearing pressure of 100 kilopascals for the strip and pad footings for serviceability limit states design and 180 kilopascals for ultimate limit states design.

The above allowable bearing pressure is subject to a maximum allowable grade raise of 1.0 metres and a maximum footing width of 1.0 metres..

Should the subgrade require raising to the proposed founding level, the subgrade may be built up using engineered fill. The engineered fill should consist of granular material meeting Ontario Provincial Standards Specifications (OPSS) grading requirements for Granular A or Granular B Type II and should be compacted in maximum 300 millimetre thick loose lifts to at least 95 percent of the standard Proctor maximum dry density. To allow the spread of load beneath the footings, the engineered fill should extend out from the edges of the foundation 0.5 metres then down and out at 1 horizontal to 1 vertical, or flatter. The excavations for the proposed structure should be sized to accommodate this fill placement.

Provided that the loose and disturbed material has been removed from the subgrade surface prior to pouring concrete and/or prior to the placement of the granular fill and provided that the granular fill is adequately compacted, the total and differential settlement of the foundation should be less than 25 millimetres and 20 millimetres, respectively.

All exterior footings and those in any unheated parts of the proposed pavilion should be provided with at least 1.5 metres of earth cover for frost protection purposes. Isolated, exterior footings constructed in areas that are to be cleared of snow during the winter period should be provided with at least 1.8 metres of earth cover for frost protection purposes. Alternatively, the required frost protection could be provided using a combination of earth cover and extruded polystyrene insulation. Further guidelines on the insulation alternative could be provided upon request.

The engagement of the services of the geotechnical consultant during construction is recommended to confirm that the subsurface conditions throughout the proposed development do not materially differ from those given in this letter and that the construction activities do not adversely affect the intent of the design.

All subgrade areas and any engineered fill areas for the proposed pavilion should be inspected by Kollaard Associates Inc. to ensure that a suitable subgrade has been reached and properly prepared.



We trust that this report provides sufficient information for your present purposes. If you have any questions concerning this information or if we can be of further assistance to you, please do not hesitate to contact our office.

Yours truly,

Kollaard Associates Inc.



Dean Tataryn, B.E.S., EP.

Steve deWit, P.Eng.

Attachments: Table I, Record of Test Pits
Key Plan, Figure 1
Site Plan, Figure 2



TABLE I

RECORD OF TEST PITS
6107 PERTH ROAD, RICHMOND
CITY OF OTTAWA, ONTARIO

TEST PIT NUMBER	DEPTH (METRES)	DESCRIPTION
TP1	0.00 – 0.30	TOPSOIL
	0.30 – 0.90	Yellow brown SILTY CLAY
	0.90 – 2.00	Grey brown SILTY CLAY
	2.00 – 3.30	Grey SILTY CLAY
	3.30	End of test pit in SILTY CLAY

Some water intrusion observed at about 2.1 metres below existing ground surface, September 27, 2022.

Shear Vane Test Results

Depth	kPa
1.10	96, 104
1.70	100, >120
2.20	82, 84
2.90	48, 62
3.30	44, 48



TABLE I (Continued)

TEST PIT NUMBER	DEPTH (METRES)	DESCRIPTION
TP2	0.00 – 0.30	TOPSOIL
	0.30 – 0.80	Yellow brown SILTY CLAY
	0.80 – 1.90	Grey brown SILTY CLAY
	1.90 – 3.30	Grey SILTY CLAY
	3.30	End of test pit in SILTY CLAY

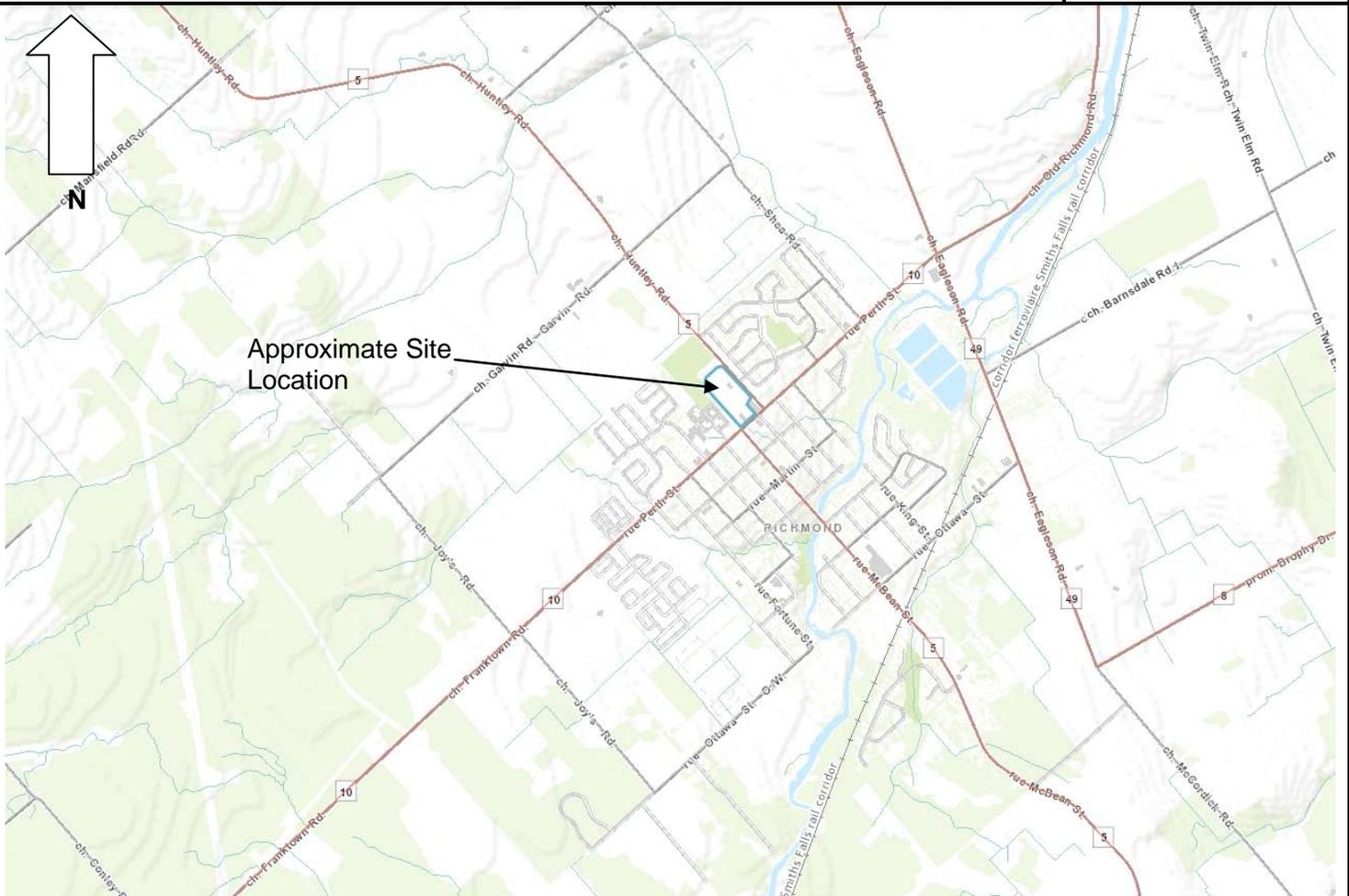
Some water intrusion observed at about 2.7 metres below existing ground surface, September 27, 2022.

Shear Vane Test Results

Depth	kPa
0.90	96, 108
2.20	90, 86
3.00	40, 44
3.30	62, 70

KEY PLAN

FIGURE 1



NOT TO SCALE



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Project No. 220998
Date September 2022

DRAWING NUMBER:
SITE PLAN, FIGURE 2

LEGEND:

- TP1 ■ APPROXIMATE TEST PIT LOCATION

REFERENCE: PLAN SUPPLIED BY
CITY OF OTTAWA EMAPS.

SPECIAL NOTE: THIS DRAWING TO
BE READ IN CONJUNCTION WITH
THE ACCOMPANYING REPORT.

REV.	NAME	DATE	DESCRIPTION

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CLIENT:
RICHMOND AGRICULTURAL SOCIETY

PROJECT:
LIMITED SUBSURFACE
INVESTIGATION
PROPOSED PAVILLION

LOCATION:
6107 PERTH STREET, RICHMOND
CITY OF OTTAWA, ONTARIO

DESIGNED BY: DATE: SEPTEMBER 28, 2022
DRAWN BY: CI SCALE: N.T.S.
KOLLAARD FILE NUMBER: 220998

