PATERSON GROUP

Geotechnical Investigation

Proposed Mixed-Use Development

5970 and 6083 Ottawa Street
Ottawa, Ontario

Prepared for Tamarack (Richmond) Corporation

Report PG4216-1 Revision 4 dated March 14, 2025

Table of Contents

Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Tamarack (Richmond) Corporation to conduct a geotechnical investigation for the proposed mixed-use development to be located at 5970 and 6038 Ottawa Street in the Village of Richmond, Ontario (reference should be made to Figure 1 - Key Plan presented in Appendix 2).

The objectives of the investigations were to:

- determine the subsoil and groundwater conditions based on available subsoil information and borehole investigation.
- provide geotechnical recommendations pertaining to the design of the proposed development including construction considerations which may affect the design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. Investigating the presence or potential presence of contamination on the proposed development was not part of the scope of work. Therefore, the present report does not address environmental issues.

2.0 Proposed Development

Paterson understands that the proposed development will consist of a series of single and townhouse style residential dwellings with basement levels. Commercial and school buildings of slab-on-grade construction, a park and a communal well are also expected to be part of the proposed development. Paterson anticipates a portion of the buildings located throughout the proposed development will have basements equipped with sump pumps.

Associated access lanes, roadways, landscaped areas, and a stormwater management facility are also anticipated as part of the development. It is also understood that the proposed development will be municipally serviced.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

A field investigation program was completed at the subject site by Paterson on December 13, 2018. At that time, a total of ten (10) boreholes were advanced to a maximum depth of 9.7 m or auger refusal. Supplemental investigations were completed by this firm on February 27, 2019 and on March 19, 22 and 23, 2021. The supplemental investigations consisted of eleven (11) test pits and eleven (11) boreholes advanced to a maximum depth of 3.8 below existing grade, respectively. A bedrock delineation program was also carried out on April 20 and December 1, 2020, consisting of a total of 87 probe holes to the bedrock surface.

A field program for groundwater monitoring was conducted from March 19 to March 23, 2021 and consisted of fifteen (15) boreholes, advanced to a maximum depth of 3.7 m below existing grade. All boreholes were equipped with monitoring wells. The most recent field investigation was completed by this firm on December 16 to December 19, 2024 and March 6 to March 7, 2025, and consisted of advancing twenty (20) boreholes and thirteen (13) test pits to maximum depths of 6.8 and 3.0 m, respectively.

The test holes were distributed in a manner to provide general coverage of the subject site taking into considerations site features. The test hole locations are shown on Drawing PG4216-2 – Test Hole Location Plan included in Appendix 2.

The boreholes were completed using a track mounted auger drill rig operated by a two-person crew while the test pits were excavated using a hydraulic shovel. The bedrock probe holes were advanced using a track-mounted, pneumatic drill rig. All fieldwork was conducted under the full-time supervision of personnel from our geotechnical division under the direction of a senior engineer. The drilling procedure consisted of augering and coring to the required depths at the selected locations and sampling the overburden, while the test pits procedure consisted of excavating to the required depth at the selected location and sampling the overburden.

Sampling and In Situ Testing

Soil samples collected from the boreholes were either recovered directly from the auger flights (AU), collected using a 50 mm diameter split-spoon (SS) sampler, using core recovery barrels, or 73 mm diameter thing walled (TW) Shelby tubes in conjunction with a piston sampler. Grab samples (G) were collected from the test pits at selected intervals. Rock cores were obtained using 47.6 mm inside diameter coring equipment.

All samples were visually inspected and classified on site. The auger, split-spoon and grab samples were placed in sealed plastic bags. Shelby tubes were sealed at both ends on site and protected from disturbances over the entire process. Rock cores were placed in cardboard boxes. All samples were transported to our laboratory for examination and classification. The depths at which the auger, split-spoon samples, Shelby tube samples, rock core samples, and grab samples were recovered from the test holes are shown as AU, SS, TW, RC, and G, respectively, on the Soil Profile and Test Data sheets presented in Appendix 1.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as “N” values on the Soil Profile and Test Data sheets. The “N” value is the number of blows required to drive the split-spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

Undrained shear strength testing, using a vane apparatus, was carried out at regular intervals of depth in cohesive soils.

Overburden thickness was evaluated by a dynamic cone penetration testing (DCPT) completed at BH9. The DCPT consists of driving a steel drill rod, equipped with a 50 mm diameter cone at the tip, using a 63.5 kg hammer falling from a height of 760 mm. The number of blows required to drive the cone into the soil is recorded for each 300 mm increment.

The thickness of the overburden was also evaluated by the use of probeholes at several test hole locations. This technique consisted of advancing augers until refusal to augering was reached by the drill rig.

Rock samples were recovered from boreholes BH 9-24 using a core barrel and diamond drilling techniques. The recovery value and Rock Quality Designation (RQD) value were calculated for each drilled section of bedrock and are presented on the borehole log. The recovery value is the length of the bedrock sample recovered over the length of the drilled section.

The RQD value is the total length of intact rock pieces longer than 100 mm over the length of the core run. The values indicate the bedrock quality.

The subsurface conditions observed at the test hole locations were recorded in detail in the field. Our findings are presented in the Soil Profile and Test Data sheets in Appendix 1.

Groundwater Monitoring

Monitoring wells were installed at boreholes BH 1-21 to BH 11-21 and BH 9-24 to BH 12-24. Flexible polyethylene standpipes were installed at boreholes BH 1 to BH 4 and BH 6 to BH 10. Monitoring wells and standpipes were installed to permit monitoring of the groundwater levels subsequent to the completion of the sampling program. Groundwater level observations are discussed in Subsection 4.3 and presented in the Soil Profile and Test Data sheets in Appendix 1.

Monitoring Well Installation

Typical monitoring well construction details are described below:

- Slotted PVC screen at the base of each borehole.
- 32 or 51 mm diameter PVC riser pipe from the top of the screen to the ground surface.
- No.3 silica sand backfill within annular space around screen.
- Bentonite hole plug placed directly above PVC slotted screen.
- Clean backfill from top of bentonite plug to the ground surface.

Refer to the Soil Profile and Test Data sheets in Appendix 1 for specific well construction details.

3.2 Field Survey

The test hole locations were selected by Paterson to provide general coverage of the proposed development, taking into consideration the existing site features and underground utilities. The location and ground surface elevation at each borehole and test pit location were provided by Stantec Geomatics Ltd during the initial investigation, and by Paterson for the supplemental investigations.

The test hole locations and ground surface elevations at each test hole location are referenced to a geodetic datum. The location of the test holes and ground surface elevations at each test hole location are presented on Drawing PG4216-2 - Test Hole Location Plan in Appendix 2.

3.3 Laboratory Testing

Soil and bedrock samples were collected from the subject site during the investigations and were visually examined in our laboratory to review the results of the field logging. A total of twelve (12) soil samples were submitted for grain size distribution and hydrometer analysis, fourteen (14) soil samples were submitted for Atterberg Limits testing, three (3) samples submitted for consolidation testing and two (2) soil samples were submitted for linear shrinkage testing. All recovered samples during the latest field investigation were submitted for moisture testing.

The results of our testing are presented in Subsection 4.2 and on the associated testing sheets presented in Appendix 1.

Sample Storage

All samples procured from the 2024 and 2025 field investigations will be stored in the laboratory for a period of one (1) month after the issuance of this report. They will then be discarded unless we are otherwise directed.

3.4 Analytical Testing

One (1) soil sample was submitted for analytical testing to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures. The sample was submitted to determine the concentration of sulphate and chloride, the resistivity and the pH of the sample. The results are presented in Appendix 1 and are discussed further in Subsection 6.7.

3.5 Hydraulic Conductivity (Slug) Testing

Hydraulic conductivity (slug) testing was conducted at the monitoring wells located within the proposed stormwater management facility (SWMF) footprint to evaluate the hydraulic properties of the overburden material and bedrock within the area of interest at the subject site.

The analysis was carried out using AQTESOLV Pro Version 4.5 aquifer analysis developed by HydroSOLVE Inc, which processes the data using the method developed by Hvorslev (1951).

Assumptions inherent to the Hvorslev method include a homogeneous and isotropic aquifer of infinite extent with zero-storage assumption, and a screen length significantly greater than the monitoring well diameter. The assumption regarding aquifer storage is considered to be appropriate for groundwater inflow through the overburden aquifer. The assumption regarding screen length and well diameter is considered to be met based on a screen length of 1.5 m and a diameter of 0.03 to 0.05 m.

While the idealized assumptions regarding aquifer extent, homogeneity, and isotropy are not strictly met in this case (or in any real-world situation), it has been our experience that the Hvorslev method produces effective point estimates of hydraulic conductivity in conditions similar to those encountered at the subject site.

The Hvorslev analysis is based on the line of best fit through the field data (hydraulic head recovery vs. time), plotted on a semi-logarithmic scale. The results of testing are further discussed in Subsection 4.5.

4.0 Observations

4.1 Surface Conditions

The subject site generally consists of agricultural lands in the east portion and undeveloped and vacant lands in its west portion. Marlborough Creek is also observed to meander along the northern boundary of the property. The Canadian National Railway Corridor is located beyond the creek following the general direction of the watercourse.

The ground surface across the subject site is generally flat, with a gradual upward slope towards its southwest portion. The site is approximately up to 600 mm lower than the neighboring roads and the adjacent properties. The northern portion of the site is bordered by a shallow (up to 2 m high) downward slope toward Marlborough Creek.

4.2 Subsurface Profile

Generally, the subsurface profile encountered at the test hole locations consisted of topsoil underlain by a compact to dense glacial till deposit and by a deposit of silty clay and further by glacial till throughout the east portion of the subject site.

The silty clay deposit, where encountered, generally consisted of very stiff to stiff brown silty clay with depths ranging between 2 and 5 m below the existing ground surface. The brown silty clay was observed to be underlain by firm grey silty clay at the location of boreholes BH 4-24, BH 11-24, BH 3A-21, BH 11-21, BH 10, and test pits TP 2 to TP 8.

Estimation of clay sensitivity (ratio of in-situ undisturbed to remoulded shear strength) was completed based on the information obtained during the field investigations undertaken throughout the subject site. The undrained shear strength of the silty clay ranges between 48 and exceeding 250 kPa (beyond range of employed shear vanes) while the remoulded shear strength was observed to range between 10 and 109 kPa, the sensitivity was estimated to range between 1.4 and 11.2.

The glacial till deposit was generally observed to consist of compact to dense silty sand and/or silty clay with gravel, cobbles and boulders. Practical refusal to drill and excavation was encountered at multiple locations throughout the subject site. Bedrock surface elevations are presented in Drawing PG4216-4 - Bedrock Contour Plan in Appendix 2.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for specific details of the soil profiles encountered at each test hole location.

Atterberg Limits

Atterberg Limits testing was completed on fourteen (14) recovered fine-grained samples at selected locations throughout the subject site. The results of the Atterberg Limits testing are presented in Table 1 and Appendix 1 and classified in accordance with the Unified Soil Classification System (USCS).

Table 1 – Summary of Atterberg Limits

Test Hole	Sample	Depth (m)	LL (%)	PL (%)	PI (%)	WC (%)	Classification
BH 4-24	SS4	2.3-2.9	65	29	36	57.0	CH
BH 12-24	SS2	1.5-2.1	54	25	29	53.5	CH
BH 14-24	SS1	2.3-2.9	32	22	10	36.4	CL
BH 3A-21	SS2	3.1-3.6	48	22	26	44.5	CL
BH 2	SS2	0.6-1.2	35	21	14	37.1	CL
BH 3	SS3	1.4-2.0	29	19	10	20.0	CL
BH 8	SS2	0.8-1.4	29	19	10	20.7	CL
TP 2	G3	1.8-2.0	33	21	12	28.5	CL
TP 3	G4	2.2-2.4	33	21	12	33.0	CL
TP 4	G6	3.0-3.2	52	21	31	38.5	CH
TP 5	G6	3.0-3.2	51	23	28	40.7	CH
TP 6	G5	2.5-2.7	36	19	17	29.5	CL
TP 7	G6	3.0-3.2	27	21	6	25.4	CL-ML
TP 8	G5	2.5-2.7	54	16	29	43.1	CH

Notes: LL: Liquid Limit; PL: Plastic Limit; PI: Plasticity Index; WC: Water Content;
CH: Inorganic Clay of High Plasticity
CL: Inorganic Clay of Low Plasticity
CL-ML: Inorganic Silt with Some Clay with Low Plasticity

Shrinkage Testing

Linear shrinkage testing was completed on two (2) selected samples. The results are summarized in Table 2.

Table 2 – Linear Shrinkage Results

Borehole	Sample	Depth (m)	Shrinkage Limit	Shrinkage Ratio
TP 6	G5	2.5-2.7	20.0	1.93
BH 3A-21	SS1	2.3-2.9	22.2	17.36

The results of the shrinkage limit testing are consistent with clay soils Paterson has encountered and tested on other sites in the Ottawa area.

Consolidation Testing

Generally, the post-construction settlement of a clay deposit is evaluated based on its compressibility characteristics. A method to evaluate these characteristics is by completing unidimensional consolidation tests on satisfactorily undisturbed soil samples collected from thin-walled Shelby tubes. A total of four (3) consolidation tests were completed from the Shelby tubes collected during the current investigation. The results of the consolidation testing are presented on the Consolidation Test sheets in Appendix 1 and discussed in Section 5.3.

A total of three (3) consolidation tests were completed from the Shelby tubes collected during the current investigation. The results of the consolidation tests are presented in Table 7 and in Appendix 1.

Value p'_c is the preconsolidation pressure of the sample and p'_o is the effective overburden pressure of the test sample. The values C_{cr} and C_c are the recompression and compression indices, respectively. These soil parameters are a measure of the compressibility of the soil due to stress increases below and above the preconsolidation pressures.

Table 7 – Consolidation Test Results

Borehole	Sample	Depth (m)	p'_c (kPa)	p'_o (kPa)	C_{cr}	C_c
BH 3B-21	TW1	3.38	300.0	56.7	0.009	0.687
	TW2	4.06	176.4	60.5	0.006	0.247
BH 12A-24	TW2	4.27	146.0	54.8	0.012	0.420

Notes: p'_c: Preconsolidation pressure; p'_o: Effective overburden pressure; C_{cr}: Recompression indice; C_c: Compression indice.

The values of p'_c, p'_o, C_{cr} and C_c are determined using standard engineering testing procedures and are estimates only given the natural variations o the in-situ soils and limited sample size.

Reference should be made to Consolidation Test data sheets provided in Appendix 1 of this report.

Grain Size Distribution and Hydrometer Testing

Grain size distribution (sieve and hydrometer analysis) testing was completed on twelve (12) selected soil samples. The results of the grain size analysis are summarized in Table 3 and presented on the Grain-Size Distribution and Hydrometer Testing Results Sheets in Appendix 1.

Table 3 – Summary of Grain Size Distribution Analysis

Test Hole	Sample	Depth (m)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	MC (%)
BH 5-24	SS3	3.1-3.7	17.9	47.8	34.3	0.0	9.3
BH 11-24	SS4	3.8-4.4	18.0	43.6	28.9	9.5	12.8
BH 12-24	SS6	6.8-6.9	1.8	69.0	27.5	1.7	13.0
BH 14-24	SS3	3.8-4.4	23.8	47.2	23.0	6.0	8.9
TP 4	G6	3.0-3.2	0.0	0.9	59.6	39.5	30.3
TP 6	G5	2.5-2.7	0.0	0.2	84.8	15.0	21.6
TP 8	G5	2.5-2.7	0.0	6.1	54.4	39.5	29.9
TP 9	G1	1.2-1.6	15.9	42.5	41.6		-
TP 11	G4	2.5-2.7	6.5	64.5	29.0		-
BH 1D	SS3	1.5-2.1	0.3	13.8	73.5	12.4	22.5
BH 5D	SS3	1.5-2.1	0.0	1.5	76.0	22.5	33.9
BH 10D	SS3	1.5-2.1	0.0	3.3	46.2	50.5	46.8

Notes: MC: Moisture Content

Bedrock

Bedrock was cored in BH 9-24 with an average RQD value ranging from 92 to 74 %. The recovery values ranged between 100 and 83% at the selected borehole. The bedrock is therefore considered to range between excellent and very good quality.

Based on available geological mapping, the bedrock in the subject area consists of dolomite of the Oxford Formation with an overburden drift thickness of 1 to 10 m depth.

Reference should be made to Drawing PG4216-4 – Bedrock Contour Plan in Appendix 2 for the test hole locations and depth where bedrock was encountered and/or where refusal to augering had been encountered.

4.3 Groundwater

Groundwater levels were measured on December 28, 2018, February 27, 2019, March 31, 2021, and January 19, 2025 within the installed monitoring wells and piezometers. Depths of sidewall groundwater infiltration, as observed during the test pit investigation were also recorded. The majority of the test pits were dry upon completion with the exception of some minor infiltration noted where test pits were carried out below the long-term groundwater table. The measured groundwater levels and observed groundwater infiltration are presented in Table 4 below. However, it is important to note that groundwater readings can be influenced by surface water perched within the borehole backfill material.

Table 4 – Summary of Groundwater Levels

Test Hole	Observation Method	Surface Elev. (m)	Measured Groundwater Level		Date Recorded
			Depth (m)	Elevation (m)	
2018 Investigation (Boreholes with Piezometers)					
BH1	Piezometer	93.37	0.61	92.76	December 28, 2018
BH2	Piezometer	94.23	0.77	93.46	
BH3	Piezometer	94.76	0.62	94.14	
BH4	Piezometer	97.71	1.10	96.61	
BH5	Piezometer	97.45	-	-	
BH6	Piezometer	94.70	0.73	93.97	
BH7	Piezometer	94.88	0.83	94.05	
BH8	Piezometer	94.03	1.28	92.75	
BH9	Piezometer	93.78	0.70	93.08	
BH10	Piezometer	93.37	0.48	92.89	
2019 Investigation (Test Pits)					
TP1	Test Pit Sidewalls	94.63	3.5	91.1	February 27, 2019
TP2	Test Pit Sidewalls	94.42	Dry to 3.7	-	
TP3	Test Pit Sidewalls	94.48	3.5	91.0	

Table 4 – Summary of Groundwater Levels

Test Hole	Observation Method	Surface Elev. (m)	Measured Groundwater Level		Date Recorded
			Depth (m)	Elevation (m)	
TP4	Test Pit Sidewalls	93.63	1.0	92.6	
TP5	Test Pit Sidewalls	94.28	1.2	93.1	
TP6	Test Pit Sidewalls	94.03	1.8	92.2	
TP7	Test Pit Sidewalls	94.46	1.8	92.7	
TP8	Test Pit Sidewalls	94.53	1.9	92.6	
TP9	Test Pit Sidewalls	97.18	Dry to 1.8	-	
TP9A	Test Pit Sidewalls	97.48	Dry to 2.4	-	
TP10	Test Pit Sidewalls	95.63	Dry to 0.9	-	
TP11	Test Pit Sidewalls	94.45	Dry to 2.8	-	

Test Hole	Observation Method	Surface Elev. (m)	Measured Groundwater Level		Date Recorded
			Depth (m)	Elevation (m)	
2021 Investigation (boreholes with monitoring wells)					
BH1D-21	Monitoring Well	94.24	0.15	94.09	March 31, 2021
			1.82	92.42	June 7, 2021
BH1S-21	Monitoring Well	94.24	0.16	94.08	March 31, 2021
			1.80	92.44	June 7, 2021
BH2-21	Monitoring Well	93.91	0.32	93.59	March 31, 2021
			1.08	92.83	June 7, 2021
BH3-21	Monitoring Well	93.91	-	-	-
BH4D-21	Monitoring Well	94.51	0.29	94.22	March 31, 2021
			1.09	93.42	June 7, 2021
BH4S-21	Monitoring Well	94.51	0.30	94.21	March 31, 2021
			1.05	93.46	June 7, 2021
BH5-21	Monitoring Well	94.21	0.30	93.91	March 31, 2021
			1.03	93.18	June 7, 2021
BH6-21	Monitoring Well	94.04	0.26	93.78	March 31, 2021
			1.09	92.95	June 7, 2021
BH7D-21	Monitoring Well	93.62	-	-	-
			1.15	92.49	June 7, 2021
BH7S-21	Monitoring Well	93.62	-	-	-
			1.01	92.61	June 7, 2021
BH8-21	Monitoring Well	94.05	0.49	93.56	March 31, 2021
			0.80	93.25	June 7, 2021
BH9-21	Monitoring Well	94.21	0.68	93.53	March 31, 2021
			1.23	92.98	June 7, 2021
BH10D-21	Monitoring Well	94.08	0.72	93.36	March 31, 2021
			2.96	91.12	June 7, 2021
BH10S-21	Monitoring Well	94.08	0.49	93.59	March 31, 2021
			1.54	92.54	June 7, 2021
BH11-21	Monitoring Well	93.92	0.13	92.81	March 31, 2021
			1.22	91.72	June 7, 2021

Table 4B – Summary of Groundwater Levels

Test Hole	Observation Method	Surface Elev. (m)	Measured Groundwater Level		Date Recorded
			Depth (m)	Elevation (m)	
2024 Investigation (Boreholes with Monitoring Wells)					
BH 9-24	Monitoring Well	94.18	0.92	93.26	January 9, 2025
BH 10-24	Monitoring Well	94.18	0.94	93.24	January 9, 2025
BH 11-24	Monitoring Well	93.82	1.98	91.84	January 9, 2025
BH 12-24	Monitoring Well	93.93	1.08	92.85	January 9, 2025

Groundwater levels are subject to seasonal fluctuations and therefore could vary during the time of construction. The groundwater conditions observed at the borehole and test pits were recorded in detail in the field. Our groundwater observations are also presented in the Soil Profile and Test Data sheets in Appendix 1.

Groundwater Monitoring Program (Silty Clay Area)

In addition to the groundwater readings noted above, the results of the groundwater fluctuations and correlated precipitation events for each monitoring well location between April 8, 2021 and April 21, 2023 have been summarized in Figure 1 through Figure 11 attached to Appendix 2 of this report. The boreholes were distributed in a manner to provide general coverage within the areas where silty clay was encountered.

4.5 Hydraulic Conductivity Testing Results

Hydraulic conductivity (slug) tests were conducted at five (5) monitoring well locations on January 9, 2025, to evaluate the hydraulic properties of the overburden material and bedrock at the test locations. The hydraulic conductivity results are shown in Table 5 below and summarized in Appendix 1.

Table 5 – Summary Of Hydraulic Conductivity Testing Results

Test Hole	Ground Elev. (m)	Testing Depth (m)	Testing Elevation (m)	K (m/sec)	Test Type	Material at Testing Depth
BH 9-24	94.18	5.5-6.0	88.68-88.18	5.18×10^{-4}	Falling Head	Bedrock
				5.07×10^{-4}	Rising Head	
BH10-24	94.18	1.5-2.9	92.68-91.28	1.27×10^{-7}	Falling Head	Silty Sand/ Glacial Till
BH 11-24	93.82	5.0-6.5	88.82-87.32	5.30×10^{-6}	Falling Head	Glacial Till
				5.69×10^{-6}	Rising Head	
BH 12-24	93.93	5.4-6.8	88.53-87.13	3.28×10^{-6}	Falling Head	Glacial Till
				2.91×10^{-6}	Rising Head	
BH 10D-21	94.08	2.2-3.6	91.88-90.48	9.25×10^{-6}	Falling Head	Glacial Till
				1.00×10^{-5}	Rising Head	

The measured hydraulic conductivity (K) values of the bedrock and glacial till ranged between approximately 5.07×10^{-4} to 5.18×10^{-4} m/sec and 1.27×10^{-7} to 1.00×10^{-5} m/sec, respectively. The results are consistent with similar materials Paterson has encountered on other sites and typical published values for bedrock and glacial till.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is considered suitable for the proposed development. It is expected that the proposed buildings will be founded on conventional shallow footings placed on undisturbed, very stiff silty clay, compact to dense silty sand, compact to dense glacial till, clean, surface sounded bedrock bearing and an approved engineered fill layer over one of the aforementioned surfaces.

Where a deposit of silty clay is present below services and foundations of proposed buildings, a grade raise restriction will apply to grading throughout that area of the subject site. Permissible grade raise recommendations are discussed in Subsection 5.3. If higher than permissible grade raises are required, preloading with or without a surcharge, lightweight fill and/or other measures will be advised by Paterson to reduce the risks of unacceptable long-term post-construction total and differential settlements. Reference should be made to Drawing PG4216-5 - Designated Silty Clay Areas for the location of the clay deposit.

Depending on the extent of the proposed basement level and depths of services, bedrock might be encountered during excavation and construction. All contractors should be prepared for bedrock removal, and handling and removing boulders and oversized boulders throughout the subject site.

The above and other considerations are further discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and deleterious fill, such as those containing organic materials, should be stripped from under any buildings, paved areas, pipe bedding, and other settlement sensitive structures. Care should be taken not to disturb adequate bearing soils below the founding level during site preparation activities. Disturbance of the subgrade may result in having to sub-excavate the disturbed material and the placement of additional suitable fill material. Due to the relatively shallow depth of the bedrock surface within the southwest portion of the site, bedrock removal will be required to accommodate site services and building foundations.

Bedrock Removal

Bedrock removal can be accomplished by hoe ramming where only a small quantity of the bedrock needs to be removed. Sound bedrock may be removed by line drilling and controlled blasting and/or hoe ramming.

Prior to considering blasting operations, the blasting effects on the existing services, buildings and other structures should be addressed. A pre-blast or pre-construction survey of the existing structures located in proximity to the blasting operations should be completed prior to commencing site activities. The extent of the survey should be determined by the blasting consultant and should be sufficient to respond to any inquiries/claims related to the blasting operations.

As a general guideline, peak particle velocities (measured at the structures) should not exceed 25 mm/s during the blasting program to reduce the risks of damage to the existing structures.

The blasting operations should be planned and conducted under the supervision of a licensed professional engineer who is also an experienced blasting consultant.

Vibration Considerations

Construction operations are the cause of vibrations, and possibly, sources of nuisance to the community. Therefore, means to reduce the vibration levels as much as possible should be incorporated in the construction operations to maintain, as much as possible, a cooperative environment with the residents.

The following construction equipment could be the source of vibrations: hoe ram, compactor, dozer, crane, truck traffic, etc. Vibrations, whether caused by blasting operations or by construction operations, could be the source of detrimental vibrations on the nearby buildings and structures. Therefore, all vibrations are recommended to be limited.

Two parameters are used to determine the permissible vibrations, namely, the maximum peak particle velocity and the frequency. For low frequency vibrations, the maximum allowable peak particle velocity is less than that for high frequency vibrations. As a guideline, the peak particle velocity should be less than 15 mm/s between frequencies of 4 to 12 Hz, and 50 mm/s above a frequency of 40 Hz (interpolate between 12 and 40 Hz). The guidelines are for current construction standards.

Considering that these guidelines are above perceptible human level and, in some cases, could be very disturbing to some people, a pre-construction survey is recommended to be completed to minimize the risks of claims during or following the construction of the proposed buildings.

Noise vibration monitoring could be conducted during construction activities to monitor that vibrations are within the permissible parameters. If vibrations were encountered to be above permissible limits, recommendations should be provided at that time to minimize or limit the vibrations produced by the activities at the subject site.

It should be noted that if vibrations were a concern for the subject site, a pre-construction survey would be recommended to be completed to minimize the risks of claims during or following the construction of the proposed building.

Overbreak in Bedrock

Sedimentary bedrock formation, such as limestone, dolomite and shale, contain bedding planes, joints and fractures, and mud seams which create natural planes of weakness within the rock mass. Although several factors of a blast may be controlled to reduce backbreak and overbreak, upon blasting, the rock mass will tend to break along natural planes of weakness that may be present beyond the designed blast profile.

However, estimating the exact amount of backbreak and overbreak that may occur is not possible with conventional construction drill and blast methods. Backbreak should be expected to occur along the perimeter of the building excavation footprint with conventional drill and blast bedrock removal methods. Further, overbreak is expected to occur throughout the lowest lifts of blasting due to the variable bedding planes and planes of weakness in the in-situ bedrock.

It is very difficult to mitigate significant overblasting given the constraints posed by footing geometry and spacing with respect to the zone of influence of blasts and the bedrocks in-situ characteristics. Depending on the methodology undertaken by the contractor, efforts taken to minimize backbreak and overbreak may add significant time and costs to the excavation operations and is not guaranteed to completely eliminate the potential for backbreak and overbreak. Overbreak below footings should be in-filled with lean-concrete and approved by Paterson prior to placing concrete.

As such, volume estimates of bedrock to be removed may not be reflective of the actual volume of bedrock that may be required to be removed at the time of construction. This may result in additional materials, such as imported fill and concrete, required to make up for additional rock loss. It is recommended that the blasting operations be planned and conducted under the supervision of a licensed professional engineer who is an experienced blasting consultant.

Fill Placement

Fill used for grading beneath the building areas should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II material, or blast rock fill approved by the geotechnical consultant. This material should be tested and approved prior to delivery to the site. The fill should be placed in lifts no greater than 300 mm thick and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the buildings should be compacted to at least 98% of its standard Proctor maximum dry density (SPMDD).

Non-specified existing fill along with site-excavated soil could be placed as general landscaping fill where settlement of the ground surface is of minor concern. These materials should be spread in lifts with a maximum thickness of 300 mm and compacted by the tracks of the spreading equipment to minimize voids. If these materials are to be used to build up the subgrade level for areas to be paved, they should be compacted in thin lifts to a minimum density of 95% of the SPMDD.

Non-specified existing fill and site-excavated soils are not suitable for use as backfill against foundation walls unless used in conjunction with a composite drainage membrane connected to a perimeter drainage system.

Consideration could be given to re-using site-generated soils for fill to build-up the subgrade for structures such as the proposed buildings and subgrade for service trenches. From a geotechnical perspective, site-generated workable soil fill free of organic debris (topsoil, logs, stumps, etc.), inorganic material and/or stones/cobbles larger than 200 mm in their longest dimension meeting the aforementioned conditions are considered suitable for re-use throughout the subject site. Wet site-generated fill, such as grey silty clay or grey glacial till soils will be saturated and expected to be difficult to re-use as the high-water contents make compacting impractical without an extensive drying period. Therefore, those soils are not anticipated to be suitable for this purpose.

Prior to considering site-generated soil for the above-noted purposes, Paterson field personnel must review, test (i.e., grain-size and proctor testing) and confirm the fill is in accordance with the above-noted recommendations. Once reviewed and approved by Paterson personnel, care should be taken during storage, placement and compaction of the site-generated fill to maintain the material in an unfrozen state and at a moisture content which is suitable for compaction.

Soils intended for re-use which become frozen and/or which have excessive moisture content will not be considered suitable for re-use at the subject site. Precautions must be taken if placement of this material is completed during winter months. The introduction of frozen material is expected to result in poor performing areas that will require repairs due to long-term thawing and higher than tolerable amounts of settlement. Paterson personnel should complete periodic inspections during fill placement to ensure that snow and ice quantities are minimized.

Provided the fill is considered acceptable for placement by Paterson personnel at the time of construction, the approved soil fill may be placed in maximum 300 mm thick loose lifts, compacted using a suitably sized vibratory sheepsfoot roller to a minimum of 98% of the materials SPMDD, in dry and above-freezing conditions.

Consideration may also be given to re-using the site-generated cobbles, boulders and bedrock for re-use if crushed to meet suitable gradation requirements. If considered, it is recommended to crush these materials to produce a well-graded crushed stone fill material matching the envelope of an OPSS Granular B Type I or Type II with a maximum particle size of 50 mm.

Testing and approval by Paterson during the crushing stages would be required to verify the adequacy of the material being produced for re-use. If the site-crushed material does not yield sufficiently well-graded material, Paterson may advise combining the material with sand, OPSS Granular A or other material to improve the material gradation. This fill is advised to be placed in loose lifts no greater than 300 mm thick and compacted to a minimum of 98% of the materials SMPDD using a suitably sized smooth-drum compactor.

The placement of site-generated fill should be reviewed and approved by Paterson field personnel at the time of construction. Where this fill layer is placed below building footprints, it would be recommended to be capped with a minimum 300 mm thick layer of OPSS Granular A crushed stone compacted to a minimum of 98% of the materials SPMDD.

Frozen material may not be considered for the above-noted purposes. This process should be reviewed and approved by Paterson field personnel upon completion of each lift and who are experienced in reviewing the placement of soil fill in this manner.

In-Filling Existing Ditches and Stormwater Management Ponds

If in-filling of existing ditches and pond was required, it is recommended that in-filling operations be completed in a stepped fashion within the lateral support of the proposed buildings. The fill should consist of clean imported granular fill, such as OPSS Granular A or OPSS Granular B Type II material. The steps should have a minimum horizontal length of 1.5 m and minimum vertical height of 500 mm and should be compacted using suitable compaction equipment to a minimum 98% of the material's SPMDD.

Alternatively, the backfill material can consist of dry, workable brown silty clay placed in maximum 300 mm thick lifts and compact each layer using a suitably sized sheepsfoot roller making several passes. The placement of the silty clay backfill should be completed in dry conditions and above freezing temperatures, reviewed and approved by Paterson at the time of placement. The fill layers are recommended to be capped with a minimum 300 mm thick layer of OPSS Granular A crushed stone compacted to a minimum of 985 of the materials SPMDD and directly below the design footing elevation for overlying structures.

5.3 Foundation Design

Bearing Resistance Values

It is expected that the proposed buildings will be founded on conventional spread footings placed on undisturbed, very stiff silty clay, compact to dense silty sand, compact to dense glacial till, clean, surface sounded bedrock bearing and an approved engineered fill layer over one of the aforementioned surfaces. Using continuously applied loads, footings for the proposed buildings can be designed using the bearing resistance values presented in Table 6.

A geotechnical resistance factor of 0.5 was applied to the bearing resistance values at ULS. The bearing resistance values are provided on the assumption that the footings will be placed on undisturbed soil bearing surfaces. An undisturbed soil bearing surface consists of one from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete for footings.

Where sandy subgrade is observed to be in a loose state of compactness, it is recommended to be proof-rolled under dry conditions and above freezing temperatures by an adequately sized roller making several passes to achieve optimum compaction levels. The compaction program should be reviewed and approved by Paterson field personnel.

Bearing resistance values for footing design should be confirmed on a per lot basis by Paterson field personnel at the time of construction.

The bearing resistance values at SLS for shallow footing bearing on the above noted soils will be subjected to potential post-construction total and differential settlements of 25 and 15 mm, respectively.

A clean, surface-sounded bedrock bearing surface should be free of loose materials, and have no near surface seams, voids, fissures or open joints which can be detected from surface sounding with a rock hammer. Footings bearing on an acceptable bedrock bearing surface and designed using the bearing resistance values provided herein will be subjected to negligible potential post-construction total and differential settlements. Overbreak in bedrock located directly below footings should be in-filled with lean-concrete and approved by Paterson prior to placing concrete.

Table 6 - Bearing Resistance Values

Bearing Surface	Bearing Resistance Value at SLS (kPa)	Factored Bearing Resistance Value at ULS (kPa)
Compact to Dense Silty Sand	100	150
Very Stiff Silty Clay/Clayey Silt	150	225
Compact to Dense Glacial Till	150	225
Engineered Fill Over Acceptable Soils	150	225
Clean, Surface Sounded Bedrock	-	500

Note: Pad footings, up to 5 m wide, and strip footings, up to 3 m wide, can be designed using the above-noted bearing resistance values placed over an undisturbed, very stiff silty clay bearing surface. These values are considered standard limitations for the types of buildings being considered throughout the subject site and are not expected to limit design or construction of the proposed foundations.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels. Adequate lateral support is provided to a soil bearing medium when a plane extending down and out from the bottom edge of the footing at a minimum of 1.5H:1V, passes only through in situ soil or engineered fill of the same or higher capacity as the soil. Adequate lateral support is provided to bedrock bearing medium when a plane extending down and out from the bottom edges of the footing at a minimum of 1H:6V (or flatter) passes only through sound bedrock or a material of the same or higher capacity as the bedrock, such as concrete. A heavily fractured, weathered bedrock and/or overburden bearing medium will require a lateral support zone of 1.5H:1V (or flatter).

Bedrock/Soil Transition

Where a building is founded partly on bedrock and partly on soil, it is recommended to decrease the soil bearing resistance value by 25% for the footings placed on soil bearing medium to reduce the potential long-term total and differential settlements associated with the compressibility of the two bearing mediums. It is recommended that the upper 0.5 m of the bedrock at the bedrock/soil transition area be removed for a minimum length of 2 m on the bedrock side and replaced with compacted OPSS Granular A or Granular B Type II material. The fill layer should be placed in maximum 300 mm thick loose lifts and compacted to 98% of the materials SPMDD.

The width of the sub-excavation should be at least the proposed footing width plus an additional 500 mm across the footing footprint. Additional steel reinforcement, if not already considered as part of the design, should extend at least 3 m beyond both sides of the 2 m long transition and placed in the top part of the footings and foundation walls. Paterson will identify where this condition may arise during the detailed design and grading plan review stage once detailed design details are available for this assessment.

Permissible Grade Raise Restrictions

Where a deposit of silty clay is present below services and foundations of proposed buildings, a grade raise restriction of **2 m** is recommended. Locally higher grade restrictions may be accommodated in areas where clay deposits are limited to the

hard to very stiff brown silty clay layer, and would be assessed on a case-by-case basis.
Estimates of the applicable restrictions are expected to greatly exceed reasonably expected grade raise heights but may be considered as being in the range of 2 to 3 m or higher depending on the thickness of the clay layer. However, these would be reviewed, assessed and advised upon by Paterson once that detailed grading is available for review and to confirm as acceptable.

If higher grade raises than the permissible grade raises identified herein are identified during the detailed design stage, preloading with or without a surcharge, lightweight fill and/or other measures would be advised upon by Paterson to mitigate the potential for unacceptable long-term post-construction total and differential settlements.

5.4 Design for Earthquakes

The site class for seismic site response can be taken as a seismic **Site Designation X_C** for the foundations bearing on a compact to dense glacial till and/or bedrock. A higher site class, such as X_A or X_B, is applicable for footings bearing on the bedrock surface. However, a site-specific seismic shear wave test will be required to confirm the higher seismic site classifications. Foundations founded upon the clay deposit area may be designed using a seismic **Site Designation X_D.**

Reference should be made to the latest revision of the Ontario Building Code for a full discussion of the earthquake design requirements. Based on Paterson's review of the in-situ soils compactness and stiffness for non-cohesive and cohesive soils, the subsoils underlying the subject site are not considered susceptible to liquefaction or cyclic softening, respectively. This considers all laboratory testing results identified in Section 4.2 of this report, subsurface information identified on the Soil Profile and Test Data Sheets and current methodologies identified in the 5th editions of the Canadian Foundation Engineering Manual (CFEM).

5.5 Basement Slab/Slab on Grade Construction

With the removal of all topsoil and fill, containing deleterious or organic materials, the native soil or engineered fill specified by Paterson field personnel will be considered to be an acceptable subgrade surface on which to commence backfilling for basement floor slab or slab on grade construction.

Where the subgrade consists of silty sand in a loose state of compaction a suitably-sized vibratory drum roller should complete several passes over the subgrade surface as a proof-rolling program, reviewed and approved by Paterson at the time of construction. Any poor performing areas under proof rolling or soft areas should be removed and reinstated with an engineered fill, such as OPSS Granular A or Granular B Type II placed in maximum 300 mm thick loose lifts and compacted to a minimum of 98% of the material's SPMDD.

Any soft areas identified during the construction phase should be removed as based on Paterson field personnel's recommendations and backfilled with appropriate backfill material. OPSS Granular A or Granular B Type II are recommended for backfilling below floor slabs.

For structures of slab-on-grade construction, the upper 200 mm of sub-floor fill is recommended to consist of OPSS Granular A crushed stone. For structures with basement slabs, the upper 200 mm of sub-floor fill may consist of 19 mm clear crushed stone. All backfill material within the footprint of the proposed buildings should be placed in maximum 300 mm thick loose layers and compacted to a minimum of 98% of the materials SPMDD. All grade raise fill used to raise the subgrade to the underside of the slab-on-grade should be placed in maximum 300 mm thick loose lifts. Soil fill reviewed and approved by Paterson during the construction phase would be advised to be compacted using a suitably sized vibratory sheepsfoot roller and as advised in Subsection 5.2 of this report.

5.6 Pavement Structure

For design purposes, the pavement structure presented in the following tables could be used for the design of car-only parking areas, local roadways and arterial roadways with bus traffic, if required.

Table 8 – Recommended Pavement Structure – Car Only Parking Areas/Driveways

Thickness (mm)	Material Description
50	**Wear Course -** HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE -** OPSS Granular A Crushed Stone
300	**SUBBASE -** OPSS Granular B Type II
SUBGRADE – Either in situ soils or OPSS Granular B Type I or II material placed over in situ soil.	

Table 9 - Recommended Pavement Structure - Local Roadways	
Thickness (mm)	**Material Description**
40	**Wear Course -** HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course -** HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
400	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either in situ soils or OPSS Granular B Type I or II material placed over in situ soil	

Table 10 - Recommended Pavement Structure – Collector Roadway with Bus Traffic	
Thickness (mm)	**Material Description**
40	**Wear Course -** HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Upper Binder Course -** HL-8 or Superpave 19.0 Asphaltic Concrete
50	**Lower Binder Course -** HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
550	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either in situ soils or OPSS Granular B Type I or II material placed over in situ soil	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for local roadways and parking areas. Minimum Performance Graded (PG) 64-34 asphalt cement should be used for arterial roadways with bus traffic. The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable vibratory equipment.

If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type I or II material.

If bedrock is encountered at the subgrade level, the total thickness of the pavement granular materials (base and subbase) could be reduced to 300 mm. The upper 300 mm of the bedrock surface should be reviewed and approved by Paterson field personnel prior to placing the base and subbase materials. Care should be exercised to ensure that the bedrock subgrade does not have depressions that will trap water which would be subject to heaving and thawing due to freezing below the finished pavement structure.

Temporary Access Roads and Construction Traffic

Paterson anticipates that the earthworks contractor will require several haul roads, staging areas and other temporary access lanes to facilitate construction traffic. Paterson also anticipates construction traffic will be directed over unpaved access paths constructed using the base and subbase layers identified in the above-noted tables and will be used throughout the duration of the construction phase. Omitting the asphalt layer, the above-noted pavement designs are not considered suitable to support temporary construction traffic without requiring additional measures to remediate the proposed base and subbase layers to accommodate the placement of asphalt to complete the pavement design.

Therefore, provisions should be carried to either reinstate temporary construction access and haul roads prior to placing asphalt or improve the durability of the temporary unpaved construction access and haul roads to minimize additional efforts for preparing the base course for the placement of asphalt once construction traffic would no longer be required. Examples of scenarios that would require these provisions would consist of areas which construction traffic results in rutting and compromising subgrade soils, placement of subbase layers directly over subgrade shortly following periods of spring thaw, snowmelt and rainfall events or over service trenches that may consist of poorly compacted backfill.

For planning purposes, temporary construction haul roads and working pads should be planned to be 600 mm of crushed stone consisting of a 500 mm of a combination of OPSS Granular B Type I or Type II crushed stone and/or blast-rock covered with a minimum 50 to 100 mm thick layer of OPSS Granular B Type II or OPSS Granular A crushed stone (to provide suitable surface for vehicle tires) over a Paterson-reviewed and -approved subgrade. These types of roads should also be underlain by a non-woven geotextile layer, such as Terraifx 200R, where they would be integrated into the final pavement structure and accommodate the placement of asphalt to minimize pumping of fines into the subbase layer. Cow-pathing site-generated soil may also be considered to provide suitable haul and access roads.

Temporary access roads that will not support heavy truck traffic (i.e., conventional light-duty vehicles only) may be prepared using a minimum of 150 mm of OPSS Granular A and 400 mm of OPSS Granular B Type II crushed stone. However, provisions should be carried to provide a non-woven geotextile separation layer, such as Terrafix 200R, over the subgrade soils to lessen the amount of fines that migrate into the subbase layers in response to a combination of construction traffic and seasonal fluctuations in the subgrades performance. Provisions should also be carried to scarify and replace the upper 100 to 150 mm of these areas with clean OPSS Granular A crushed stone prior to placing asphalt.

Provisions should also be carried by the earthworks contractor to suitably compact trench backfill placed over services when reinstating servicing trenches below areas proposed to support paved areas. Since it is anticipated this material would consist of workable brown silty clay, silty sand or glacial till fill (and not wet, non-workable grey silty clay or saturated materials) it is recommended to place this material in maximum 400 mm thick loose lifts compacted using a suitably sized vibratory sheepsfoot roller making several passes under the supervision of Paterson field personnel. The subgrade surface is also recommended to be provided with a layer of bi-axial geogrid, such as Terrafix TBX2500, to improve the stiffness of the reinstated trench backfill subgrade for supporting the final pavement structures.

These efforts would be reviewed, approved and advised upon by Paterson field staff during the construction program. Further, Paterson should review design, tender and construction documents associated with temporary and permanent pavement design throughout those phases of the project.

Pavement Structure Drainage

Satisfactory performance of the pavement structure is largely dependent on the contact zone between the subgrade material and the base stone in a dry condition. Failure to provide adequate drainage under conditions of heavy wheel loading can result in the fine subgrade soil being pumped into the voids in the stone subbase, thereby reducing load carrying capacity.

Where silty clay is anticipated at the pavement subgrade level, consideration should be given to installing subdrains during pavement construction. The subdrain inverts should be approximately 300 mm below subgrade level, and the subgrade surface should be crowned to promote water flow to the drainage lines.

5.7 Stormwater Management Facilities

It is expected stormwater management facilities (SWMF), such as ponds and associated infrastructure, will be considered as part of the proposed development. Design details for those facilities are not currently known at the time of preparing this report. However, these facilities are considered feasible throughout the subject site. Design details associated with these facilities should be reviewed and assessed by Paterson during the preliminary and detailed design stages when details are available at that time.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

Basement and Partial Basement Structures

Foundation Drainage

It is recommended that a perimeter foundation drainage system be provided for the proposed structures provided with a basement level. The system should consist of a 100 to 150 mm diameter perforated corrugated plastic pipe, surrounded on all sides by 150 mm of 19 mm clear crushed stone, placed at the footing level around the exterior perimeter of the structure. The clear stone should be wrapped in a non-woven geotextile. The pipe should have a positive outlet, such as a gravity connection to the storm sewer or sump pit. The foundation walls are recommended to be covered with a drainage geocomposite, such as CCW Miradrain 2000 or Delta-Teraxx, connected to the perimeter foundation drainage system.

Foundation Backfill – Non-Sump Gravity Foundation Drain

Backfill against the exterior sides of the foundation walls should consist of free draining non frost susceptible granular materials, such as clean sand or OPSS Granular B Type I granular material, or site generated workable soils placed in maximum 400 mm thick loose lifts and compacted using suitably sized compaction equipment. If consideration is given to backfilling the structures with crushed stone, Paterson should be advised of this during the tender process to review and advise on impacts to grade raise restrictions.

Foundation Backfill – Basements Equipped with Sump Pump Systems

Backfill against the exterior sides of the foundation walls should consist of workable, brown silty clay extending a minimum of 1.5 m away from and along the perimeter of the foundations and in accordance with recommendations provided in Subsection 5.2 of this report. The clay backfill must be implemented in conjunction with a drainage geocomposite and foundation drainage system connected to a dedicated sump pump system. Imported granular materials, such as clean sand or OPSS Granular B Type I granular material, are not recommended to be used for this purpose where sump pump systems are considered.

Slab-On-Grade Structures

Foundation Drainage

The perimeter foundation drainage system identified for basement structures is considered optional for slab-on-grade structures. Consideration should be given to implementing it below areas supporting hardscaping/settlement sensitive structures (i.e., driveways and pathways) to maintain the service life of these surfaces where the supporting subsoils consist of silty clay. Where implemented, the system should consist of a 100 to 150 mm diameter perforated corrugated plastic pipe wrapped in a geosock and surrounded by 150 mm of 19 mm clear crushed stone. The clear stone should be wrapped in a non-woven geotextile. The pipe should have a positive outlet, such as a gravity connection to the storm sewer.

The perimeter drainage pipe may be placed against the structure and with the invert placed a minimum of 600 mm below the subgrade of the overlying hardscaping and upon Paterson-reviewed and-approved compacted soil backfill to ensure adequate drainage of the overlying granular fill layer is provided from precipitation events and/or spring meltwater.

In this configuration, provided the backfill overlying the pipe consists of crushed stone fill associated with the hardscaping, a composite foundation drainage board will not be required. The installation of the perimeter drainage system should be reviewed by Paterson personnel at the time of construction.

Foundation Backfill

Backfill against the exterior sides of the foundation walls should consist of free draining non-frost susceptible granular materials (such as clean sand or OPSS Granular B Type I granular material) or site-generated workable soils placed in maximum 400 mm thick loose lifts and compacted using suitably sized compaction equipment. If consideration is given to backfilling the structures with crushed stone, Paterson should be advised of this during the tendering stage to review and advise on impacts to grade raise restrictions.

6.2 Protection of Footings Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effect of frost action. A minimum of 1.5 m thick soil cover (or equivalent) should be provided in this regard.

Exterior unheated footings, such as those for isolated exterior piers, are more prone to deleterious movement associated with frost action than the exterior walls of the structure proper and require additional protection, such as soil cover of 2.1 m or a combination of soil cover and foundation insulation.

Foundations which are founded directly on clean, surface-sounded bedrock with no cracks or fissures, and which is approved by Paterson at the time of construction, is not considered frost susceptible and does not require soil cover. Where the bedrock is considered frost susceptible (i.e., weathered bedrock with soil in-filled fractures), foundation insulation will need to be provided if located within the depth of frost penetration, or, the frost susceptible bedrock will need to be removed and replaced with lean concrete (minimum 17 MPa 28-day strength).

6.3 Excavation Side Slopes

The side slopes of excavations in the overburden materials should either be cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled. It is assumed that sufficient room will be available for the greater part of the excavations to be undertaken by open-cut methods (i.e. unsupported excavations).

Unsupported Side Slopes

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The slope cross-sections recommended are for temporary slopes.

The subsoil at this site is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress. Excavation side slopes should also be protected from erosion by surface water and rainfall events by the use of tarpaulins or other means of erosion protection along their footprint in conjunction with dry conditions at the slope toes.

Excavation side slopes in sound bedrock can be completed with almost vertical side walls. A minimum of 1 m horizontal ledge should be left between the bottom of the overburden and the top of the sound bedrock surface to provide an area for potential sloughing.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by "cut and cover" methods and excavations will not be left open for extended periods of time.

6.4 Pipe Bedding and Backfill

Bedding and backfill materials should be in accordance with the most recent Material Specifications and Standard Detail Drawings from the Department of Public Works and Services, Infrastructure Services Branch of the City of Ottawa.

The pipe bedding for the sewer and water pipes should consist of at least 150 mm of OPSS Granular A crushed stone. However, when the bedding is located within firm, grey silty clay or upon bedrock subgrade, a minimum of 300 mm of OPSS Granular A should be placed for bedding for sewer or water pipes. The material should be placed in a maximum 225 mm thick loose lifts and compacted to a minimum of 99% of its SPMDD. The bedding material should extend at least to the spring line of the pipe.

The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to at least 300 mm above the obvert of the pipe. The material should be placed in maximum 225 mm thick lifts and compacted to a minimum of 99% of its SPMDD.

It should generally be possible to re-use the moist (not wet) site-generated fill above the cover material if the excavation and filling operations are carried out in dry weather conditions (and as described in Subsection 5.2 and Subsection 5.6 of this report). Wet site-generated fill will be difficult to re-use, as the high-water contents make compacting impractical without an extensive drying period and is not expected to be able to re-used readily.

Any stones greater than 200 mm in their longest dimension should be removed from these materials prior to placement. Well fractured bedrock should be acceptable as backfill for the lower portion of the trenches when the excavation is within bedrock provided the rock fill is placed only from at least 300 mm above the top of the service pipe and that all stones are 300 mm or smaller in their longest dimension.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.

Bedrock/Soil Transitions

In areas where the service subgrade transitions from soil to bedrock, it is recommended that the founding medium be inspected in the field to determine how steeply the bedrock surface, where encountered, drops off. A transition treatment is generally recommended to be provided where the bedrock slopes steeper than 3H:1V. At these locations, the bedrock should be excavated, and a minimum 500 mm thick layer of bedding, such as OPSS Granular A crushed stone, be placed to provide a 3H:1V transition from the bedrock subgrade toward the soil subgrade. This treatment will reduce the propensity for bending stresses to occur in the service pipe alignments.

It is recommended that this condition be reviewed in the field by Paterson personnel at the time of excavation and construction of site services. Paterson field personnel may advise on appropriate treatments where pipe subgrade transition between soil and bedrock surfaces.

Glacial Till to Clay Deposit Transitions

In areas where site servicing trenches advance across transitions between relatively shallow deposits of glacial till (shallow relative to bedrock surface) and deeper deposits of clay, glacial till soils consisting of predominantly fine-grained fines matrixes and high in-situ moisture levels will be difficult to place bedding materials upon. It is expected these soils will be in a relatively loose state of compactness and be readily disturbed by vibrations induced by compaction equipment. It would be expected that satisfactory dewatering efforts would be undertaken ahead of the trenching works to ensure efforts may be undertaken in the dry.

It is recommended that provisions be carried to provide localized bedding layers that may exceed 150 to 300 mm (i.e., in the range of 500 mm to 1 m and potentially higher) to place the bedding material upon compact to dense glacial till soils that would underlie the shallower looser material. Thickened bedding layers would be recommended to consist of OPSS Granular B Type I or II crushed stone and/or suitably-fragmented and -sized blast rock, if available. During the detailed design phase, Paterson will review all site servicing drawings to identify areas where the above-noted transition zone treatment would be expected to be considered.

Backfilling Within Trench Boxes

When the bedding and cover material is placed within the confines of a trench box and steel plates, it is recommended that the trench box be placed tightly against the outside of the trench walls and remains approximately 300 mm above the obvert level of the service pipe.

The vertical excavation sidewalls within the lower portion of the trench (below the obvert level of the pipe) can be supported using steel plates extended down to the bottom of the trench. The steel plates can be extended below the base of the excavation to prevent basal heave, in conjunction with adequate dewatering measures when located below the groundwater table.

To minimize the potential for disturbance of the bedding and cover material and subsequent settlement of the service pipe during the removal of the steel plates, it is recommended that the bedding layer be re-compacted tightly against the trench sidewalls upon removal/lifting of the steel plate up to the top of the bedding layer and prior to placing the pipe. This is recommended to mitigate settlement of the pipe that would results from removing the plates without re-compacting the fill that would be left unconfined to the sides of the trench. This procedure would be repeated for the springling and cover layers until the steel plates are removed.

It is generally recommended that this procedure be reviewed by Paterson field personnel at the time of construction.

6.5 Groundwater Control

Groundwater Control for Building Construction

It is anticipated that groundwater infiltration into the excavations through the clayey overburden materials should be low to moderate and controllable using open sumps. Higher infiltration rates are anticipated to be encountered within the glacial till and below the bedrock surface. It is recommended that dewatering in support of site services and excavations undertaken below the groundwater table throughout the glacial till deposit and bedrock formations be assessed by a professional hydrogeologist during the detailed design stage.

The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

Permit to Take Water

A temporary Ministry of the Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required for this project if more than 400,000 L/day of ground and/or surface water is to be pumped during the construction phase. A minimum 4 to 5 months should be allowed for completion of the PTTW application package and issuance of the permit by the MECP.

For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16.

6.6 Winter Construction

Precautions must be taken if winter construction is considered for this project.

The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters and tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost in the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions. Under winter conditions, if snow and ice is present within the blast rock or other fill below future basement slabs, then settlement of the fill should be expected and support of a future basement slab and/or temporary supports for slab pours will be negatively impacted and could undergo settlement during spring and summer time conditions. The geotechnical consultant should complete periodic inspections during fill placement to ensure that snow and ice quantities are minimized in settlement-sensitive areas.

6.7 Corrosion Potential and Sulphate

The results of analytical testing show that the sulphate content is less than 0.1%. These results are indicative that Type 10 Portland cement (normal cement) would be appropriate for this site. The results of the chloride content, pH and resistivity indicate the presence of a non-aggressive to slightly aggressive environment for exposed ferrous metals at this site. No further requirements are needed to be considered for this item.

6.8 Landscaping Considerations

Tree Planting Restrictions

Paterson completed a soils review of the site to determine applicable tree planting setbacks, in accordance with the City of Ottawa Tree Planting in Sensitive Marine Clay Soils (2017 Guidelines) for trees planted within a public right-of-way (ROW). Atterberg limits testing was completed for recovered silty clay samples at selected locations throughout the subject site. Grain size distribution and hydrometer testing was also completed on selected soil samples. The above-noted test results were completed on samples taken at depths between the anticipated underside of footing elevation and a 3.5 m depth below finished grade. The results of our testing are presented in Tables 1 and 2 in Subsection 4.2 and in Appendix 1.

Based on the results of the Atterberg limit testing mentioned above, the plasticity index was found to be less than 40% in all the tested clay samples. In addition, based on the clay content found in the clay samples from the grain size distribution test results, moisture levels and consistency, the silty clay across the subject site is considered low to medium potential for soil volume change.

The following tree planting setbacks are recommended throughout the subject site where silty clay was encountered, and as depicted in Drawing PG4216-3 - Permissible Grade Raise Plan. Large trees (mature height over 14 m) can be planted within these areas provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g. in a park or other green space). Tree planting setback limits may be reduced to **4.5 m** for small (mature height up to 7.5 m) and medium size trees (mature tree height 7.5 to 14 m), provided that the conditions noted below are met:

- ❑ The underside of footing (USF) is 2.1 m or greater below the lowest finished grade must be satisfied for footings within 10 m from the tree, as measured from the centre of the tree trunk and verified by means of the Grading Plan as indicated procedural changes below.

- A small tree must be provided with a minimum of 25 m^3 of available soil volume while a medium tree must be provided with a minimum of 30 m^3 of available soil volume, as determined by the Landscape Architect. The developer is to ensure that the soil is generally un-compacted when backfilling in street tree planting locations.
- The tree species must be small (mature tree height up to 7.5 m) to medium size (mature tree height 7.5 m to 14 m) as confirmed by the Landscape Architect.
- The foundation walls are to be reinforced at least nominally (minimum of two upper and two lower 15M bars in the foundation wall).
- Grading surround the tree must promote drainage to the tree root zone (in such a manner as not to be detrimental to the tree).

It is well documented in the literature, and is our experience, that fast-growing trees located near buildings founded on cohesive soils that shrink on drying can result in long-term differential settlements of the structures. Tree varieties that have the most pronounced effect on foundations are seen to consist of poplars, willows and some maples (i.e. Manitoba Maples) and, as such, they should not be considered in the landscaping design.

6.9 Slope Stability Analysis

Due to the presence of Marlborough Creek along the northern property line, a slope stability assessment was completed for the slope located along the north property line of the subject site. Based on the existing topographic information, the creek's south side slope ranges in height between 1.5 to 2.5 m. The bottom of the water course was found to be at an elevation of 92 m while the average top of slope was found at an elevation of 94 m. The horizontal length of the slope face including the flood plain was estimated to range between 16.5 and 65.5 m. It is our understanding that the proposed development is expected to raise the overall site grade between 1 to 1.5 m above existing grade.

The subsurface profile across the subject slope face is expected to consist of brown silty clay along the east portion of the site overlying glacial till and bedrock. The slope along the west portion of the site is expected to consist of glacial till overlying bedrock. Based on our assessment of the above information, the existing slope is expected to have an inclination between 6H:1V and 26H:1V. The slope inclination may be increased upon the completion of the proposed development with slopes ranging between 4.5H:1V and 16.5H:1V. Therefore, the subject slope is considered stable and acceptable from a geotechnical perspective with no restrictions/setbacks required to protect the slope as result of developing the subject site.

7.0 Recommendations

It is a requirement for the foundation design data provided herein to be applicable that a material testing and observation services program including the following aspects be performed by the geotechnical consultant.

- ❑ Grading plan review from a geotechnical perspective, once the final grading plan is available.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ Observation of all subgrades prior to backfilling.
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.
- ❑ Review and installation of the foundation drainage system.

A report confirming that these works have been conducted in general accordance with Paterson's recommendations could be issued upon the completion of a satisfactory material testing and observation program by the geotechnical consultant.

All excess soil must be handled as per *Ontario Regulation 406/19: On-Site and Excess Soil Management*.

8.0 Statement of Limitations

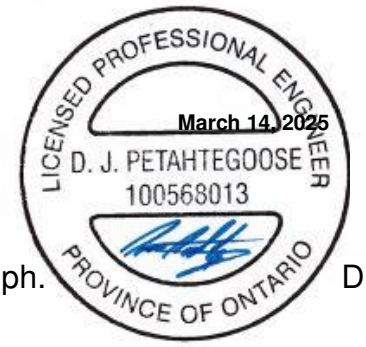
The recommendations made in this report are in accordance with Paterson's present understanding of the project. Paterson requests permission to review the grading plan once available. Paterson's recommendations should be reviewed when the drawings and specifications are complete.

The client should be aware that any information pertaining to soils and the test hole log are furnished as a matter of general information only. Test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes.

A soils investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, Paterson requests to be notified immediately to permit reassessment of the recommendations.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Tamarack (Richmond) Corporation, or their agent(s), is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of the report.

Paterson Group Inc.



Fernanda Carozzi, PhD. Geoph. Drew Petahtegoose, P.Eng.

Report Distribution:

- ❑ Tamarack (Richmond) Corporation (email copy)
- ❑ Paterson Group (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

ATTERBERG LIMITS TESTING RESULTS

GRAIN SIZE DISTRIBUTION AND HYDROMETER TESTING RESULTS

CONSOLIDATION TESTING RESULTS

ANALYTICAL TESTING RESULTS

HYDRUALIC CONDUCTIVITY RESULTS

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435369.03 **NORTHING:** 5003654.34 **ELEVATION:** 95.31

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: March 6, 2025

FILE NO. : PG4216

HOLE NO. : BH 1-25

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE											
TOPSOIL 0.28m [95.03m]			AU 1								95
GLACIAL TILL: Brown silty clay, some gravel and sand ,cobbles and boulders 0.61m [94.70m]			SS 2	64	2-8-50-/ 58/0.2					1.03 m 2025-03-12	94
GLACIAL TILL: Compact, brown silty sand, trace clay and gravel ,cobbles and boulders 94.17m]		1	RC 1	100	RQD 78						93
BEDROCK: Good to excellent quality limestone		2								3.05m	92
4.57m [90.75m]		3	RC 2	100	RQD 95						91
End of Borehole		4	RC 3	100	RQD 100					4.57m	90
(GWL at 1.03 m depth - March 12, 2025)		5									89
		6									88
		7									87
		8									86
		9									
		10									

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435568.93 **NORTHING:** 5003478.60 **ELEVATION:** 96.60

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: March 6, 2025

FILE NO. : PG4216

HOLE NO. : BH 2-25

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.28m [96.32m]									96
FILL: Brown silt, with gravel, with gravel, trace clay, sand and crushed stone 0.69m [95.91m]								1.21 m ▼ 2025-03-12	
BEDROCK: Fair to good quality limestone		1	RC 1 AU 1	100	RQD 53				95
- Good quality below 2.6 m depth		2	RC 2	86	RQD 36				94
		3	RC 3	100	RQD 76			3.43m	93
4.95m [91.65m]		4	RC 4	97	RQD 83				92
End of Borehole		5						4.95m	
(GWL at 1.21 m depth - March 12, 2025)		6							91
		7							90
		8							89
		9							88
		10							87

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435522.74 **NORTHING:** 5003885.37 **ELEVATION:** 95.76

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: March 6, 2025

FILE NO. : PG4216

HOLE NO. : BH 3-25

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL and organics			AU 1						
0.25m [95.51m]									
Loose, brown **CLAYEY SILT**, trace sand									
- Trace gravel by 0.7 m depth		1	SS 2	75	2-2-2-5 4				95
1.45m [94.31m]									
Compact, brown **SILTY SAND**, trace gravel		2	SS 3	83	5-11-15-17 26				94
2.41m [93.35m]			SS 4	100	50-/-/-/ 50/0.1			2.38 m 2025-03-12	
BEDROCK: Excellent to fair quality limestone		3	RC 1	100	RQD 90			3.35m	93
		4							92
			RC 2	74	RQD 56				
4.90m [90.86m]		5						4.88m	91
End of Borehole									
(GWL at 2.38 m depth - March 12, 2025)		6							90
		7							89
		8							88
		9							87
		10							86

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435522.74 **NORTHING:** 5003885.37 **ELEVATION:** 95.76

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

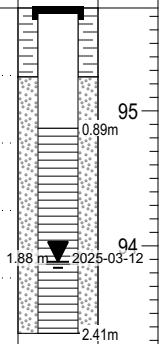
REMARKS:

DATE: March 6, 2025

FILE NO. : PG4216

HOLE NO. : BH 3A-25

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE											
For soil profile refer to BH 3-25											
2.41m [93.35m]											
End of Borehole (GWL at 1.88 m depth - March 12, 2025)											



SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435611.53 **NORTHING:** 5003727.26 **ELEVATION:** 97.14

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: March 6, 2025

FILE NO. : PG4216

HOLE NO. : BH 4-25

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL and organics			AU 1						97
0.25m [96.89m]									
GLACIAL TILL: Compact, brown silty clay, with gravel, trace sand ,cobbles, boulders									96
0.76m [96.38m]									
BEDROCK: Good to fair quality limestone		1	RC 1	85	RQD 85				95
		2	RC 2	68	RQD 58				94
		3	RC 3	76	RQD 58				93
		4	RC 4	100	RQD 54				92
5.03m [92.11m]		5							91
End of Borehole		6							90
(GWL at 3.76 m depth - March 12, 2025)		7							89
		8							88
		9							
		10							

3.45m
3.76 m 2025-03-12
4.98m

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435856.20 **NORTHING:** 5003665.21 **ELEVATION:** 95.53

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: March 7, 2025

FILE NO. : PG4216

HOLE NO. : BH 5-25

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.86m [94.67m]			AU 1					0.34 m 2025-03-12	95
GLACIAL TILL: Compact, brown silty sand, some gravel and cobbles, trace clay 1.45m [94.08m]		1	SS 2	67	3-12-17-23 29				94
BEDROCK: Excellent quality limestone			SS 3	0	50-/-/-/ 50/0.03				
		2	RC 1	100	RQD 100				93
		3	RC 2	100	RQD 100				92
4.95m [90.58m]		4	RC 3	100	RQD 95			3.43m	91
End of Borehole		5						4.95m	90
(GWL at 0.34 m depth - March 12, 2025)		6							89
		7							88
		8							87
		9							86
		10							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435817.85 **NORTHING:** 5004471.80 **ELEVATION:** 94.12

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: March 7, 2025

FILE NO. : PG4216

HOLE NO. : BH 6-25

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL and organics 0.20m [93.92m]			AU 1						94
GLACIAL TILL: Compact, brown silty clay, some sand, trace gravel 0.61m [93.52m]								0.61 m 2025-03-12	
GLACIAL TILL: Dense to very dense, brown sandy silt, with gravel, cobbles and boulders		1	SS 2	79	6-17-13-17 30				93
		2	SS 3	46	10-21-34-27 55				92
2.21m [91.92m]									
GLACIAL TILL: Compact, brown silty sand, trace gravel and cobbles , boulders		3	SS 4	75	7-9-11-11 20			3.05m	91
			SS 5	83	9-12-13-12 25				
- Grey by 3.73 m depth		4	SS 6	43	3-8-50-/ 58/0.25				90
4.57m [89.56m]								4.57m	
End of Borehole		5							89
Practical refusal to augering at 4.57 m depth		6							88
(GWL at 0.61 m depth - March 12, 2025)		7							87
		8							86
		9							85
		10							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435747.94 **NORTHING:** 5004424.67 **ELEVATION:** 94.61

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : BH 1-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.23m [94.38m]									
GLACIAL TILL: Compact, brown silty sand, with gravel, trace clay, cobbles and boulders			AU 1			24	○		
		1	SS 2	58	P	22	○		94
		2	SS 3	75	5-7-9-8 16	12	○		93
- Dense by 3.0 m depth		3	SS 4	67	7-13-21-21 34	13	○		92
		4							91
- Grey by 4.6 m depth		5	SS 5	8	6-5-8-20 13	8	○		90
6.71m [87.90m]		6	SS 6	58	8-12-13-6 25	10	○		89
End of Borehole		7							88
		8							87
		9							86
		10							85

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435865.23 **NORTHING:** 5004448.81 **ELEVATION:** 94.07

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									94
TOPSOIL, trace sand and gravel 0.28m [93.79m]		0	AU 1			16			
GLACIAL TILL: Compact to dense, brown silty sand, with gravel, cobbles and boulders		1	SS 2	58	11-11-11-24 22	11			93
		2	SS 3	58	9-18-23-20 41	11			92
3.05m [91.02m]		3							91
Compact to dense, brown **SILTY SAND**, trace gravel 3.66m [90.41m]			SS 4	25	16-14-13-13 27	23			
GLACIAL TILL: Dense, grey silty sand, with gravel, cobbles and boulders		4							90
		5	SS 5	33	6-14-25-21 39	9			89
6.71m [87.36m]		6	SS 6	83	9-19-25-24 44	10			88
End of Borehole		7							87
		8							86
		9							85
		10							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435899.31 **NORTHING:** 5004264.51 **ELEVATION:** 94.06

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : BH 3-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL, trace clay		0	AU 1			39			94
0.23m [93.83m]									
Hard, brown **SILTY CLAY**		1	SS 2	100	P	37	△80 ▲>250		93
1.45m [92.61m]									
GLACIAL TILL: Compact, brown silty clay, with gravel, trace sand, cobbles and boulders		2	SS 3	50	P	31			92
2.29m [91.77m]									
GLACIAL TILL: Compact, brown silty sand, with gravel, trace clay, occasional cobbles		3	SS 4	58	4-9-7-4 16	12			91
			SS 5	50	8-4-15-19 19	12			
		4							90
- Grey by 4.6 m depth		5	SS 6	42	3-17-4-6 21	11			89
		6							88
6.71m [87.35m]			SS 7	42	15-28-13-12 41	14			
End of Borehole		7							87
		8							86
		9							85
		10							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435891.01 **NORTHING:** 5004133.10 **ELEVATION:** 93.78

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

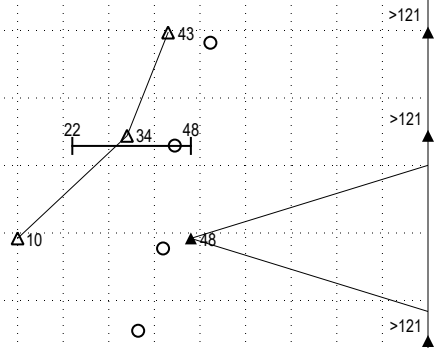
REMARKS:

DATE: December 19, 2024

FILE NO. : PG4216

HOLE NO. : BH 3A-21

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) / PL (%) WATER CONTENT (%) LL (%)	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
For soil profile refer to BH 3-21									
2.29m [91.49m]									
Very stiff, brown **SILTY CLAY**			SS 1	100	P	52			
			SS 2	100	P	44			
3.73m [90.05m]									
Firm, grey **SILTY CLAY**			SS 3	75	P	42			
4.88m [88.90m]			SS 4	100	2-4-1-1 5	36 12			
GLACIAL TILL: Dense, grey silty clay, trace sand, gravel, cobbles and boulders			SS 5	94	2-5-27-50 32	12			
5.87m [87.91m]									
End of Borehole									



SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435936.41 **NORTHING:** 5004099.07 **ELEVATION:** 93.87

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

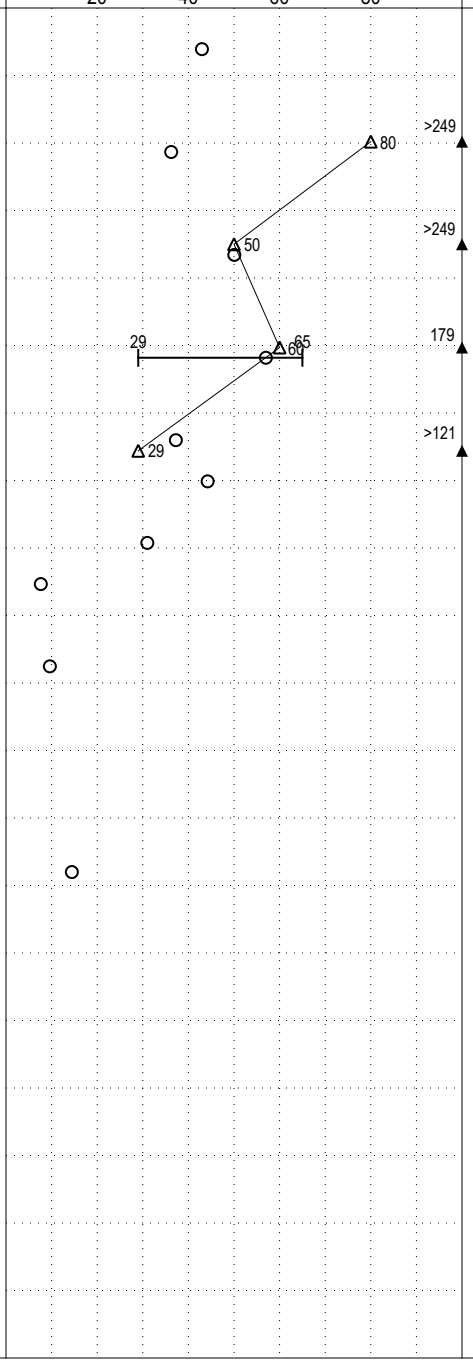
REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : BH 4-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [93.62m]			AU 1			43			93
Hard, brown **SILTY CLAY**		1	SS 2	50	P	36			92
		2	SS 3	100	P	50			91
- Very stiff by 2.3 m depth		3	SS 4	100	P	57			90
3.50m [90.37m]			SS 5		P	37			89
GLACIAL TILL: Compact, grey silty sand, with clay, gravel, cobbles and boulders		4	SS 6	100	P	44 / 31 / 8			88
		5	SS 7	50	2-6-9-5 15	10			87
6.71m [87.16m]		6	SS 8	67	3-3-3-2 6	14			86
End of Borehole		7							85
		8							84
		9							
		10							



SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435994.61 **NORTHING:** 5003956.27 **ELEVATION:** 93.90

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : BH 5-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) / PL (%) WATER CONTENT (%) LL (%)	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE							20 40 60 80		
TOPSOIL 0.25m [93.65m]		0							94
Hard, brown **SILTY CLAY**		1	AU 1			39			93
		2	SS 2	100	P	52			92
2.90m [91.00m]		3	SS 3	42	4-5-4-6 9	9 11			91
GLACIAL TILL: Compact, brown silty sand, with gravel, cobbles and boulders - Grey by 3.4 m depth		4							90
- Dense by 4.6 m depth		5	SS 4		5-10-29-24 39	9			89
5.36m [88.54m]		6							88
End of Borehole		7							87
Practical refusal to augering at 5.36 m depth		8							86
		9							85
		10							84

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435422.68 **NORTHING:** 5003879.79 **ELEVATION:** 94.24

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 17, 2024

FILE NO. : PG4216

HOLE NO. : BH 6-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL, trace clay 0.05m [94.19m]			AU 1			39			94
GLACIAL TILL: Compact, brown sandy clay, with silt, gravel, cobbles and boulders		1	SS 2	100	P	30			93
		2	SS 3	50	3-3-3-2 6	14			92
		3	SS 4	92	6-8-3-2 11	13			91
4.57m [89.67m]		4							90
GLACIAL TILL: Compact grey silty sand, with gravel, cobbles and boulders		5	SS 5	83	8-13-18-19 31	9			89
6.10m [88.14m]		6							88
GLACIAL TILL: Compact, grey sand, with cobbles and boulders 6.71m [87.53m]			SS 6	100	2-3-16-43 19	19			
End of Borehole		7							87
		8							86
		9							85
		10							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435600.21 **NORTHING:** 5004031.42 **ELEVATION:** 93.94

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 17, 2024

FILE NO. : PG4216

HOLE NO. : BH 7-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.20m [93.74m]			AU 1			34			
GLACIAL TILL: Brown silty sand, with gravel, cobbles and boulders		1	SS 2	75	13-20-12-8 32	10			93
- Increasing clay content by 1.5 m depth		2	SS 3	75	4-8-4-4 12	11			92
- Increasing sand content by 3.0 m depth		3	SS 4	83	1-20-23-16 43	9			91
- Grey by 3.5 m depth 3.71m [90.23m]									
End of Borehole		4							90
Practical refusal to augering at 3.71 m depth		5							89
		6							88
		7							87
		8							86
		9							85
		10							84

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435672.21 **NORTHING:** 5003946.75 **ELEVATION:** 94.52

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 17, 2024

FILE NO. : PG4216

HOLE NO. : BH 8-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.18m [94.34m]									
GLACIAL TILL: Compact, brown silty sand, with clay, gravel, cobbles and boulders			AU 1			22			94
		1	SS 2	33	4-9-5-3 14	25			
			SS 3	67	6-5-4-6 9	14			93
		2							
									92
- Increasing sand content by 3.0 m depth		3	SS 4		12-50-/-/ 50/0.08	11			
3.53m [90.99m]									91
End of Borehole									
Practical refusal to augering at 3.53 m depth		4							90
		5							89
		6							
		7							88
		8							87
		9							86
		10							85

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435719.68 **NORTHING:** 5004015.59 **ELEVATION:** 94.18

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 17, 2024

FILE NO. : PG4216

HOLE NO. : BH 9-24

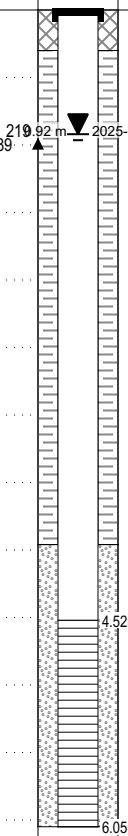
SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	ELEVATION (m)
GROUND SURFACE							
TOPSOIL 0.25m [93.93m]							
Hard, brown **SILTY CLAY**			AU 1			31	
		1	SS 2	58	P	25	
1.45m [92.73m]							
Compact, brown **SILTY SAND**, with clay, gravel, cobbles and boulders			SS 3	100	2-5-5-3	23	
2.06m [92.12m]		2			10	17	
GLACIAL TILL: Dense, brown silty sand, with gravel, cobbles and boulders							
2.97m [91.21m]		3	RC 1	100	RQD 90		
BEDROCK: Excellent to good quality limestone		4					
		5	RC 2	100	RQD 92		
6.17m [88.01m]		6	RC 3	83	RQD 74		
End of Borehole		7					
(GWL at 0.92 m depth - January 9, 2025)		8					
		9					
		10					

PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80

REMOULDED SHEAR STRENGTH (kPa)

UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80

PL (%) WATER CONTENT (%) LL (%) 20 40 60 80



SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435719.68 **NORTHING:** 5004015.59 **ELEVATION:** 94.18

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

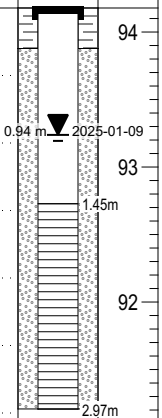
REMARKS:

DATE: December 18, 2024

FILE NO. : PG4216

HOLE NO. : BH10-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE											
For soil profile refer to BH 9-24											
2.97m [91.21m]											
End of Borehole Practical refusal to augering at 2.97 m depth (GWL at 0.94 m depth - January 9, 2025)											



SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435692.30 **NORTHING:** 5004138.10 **ELEVATION:** 93.82

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

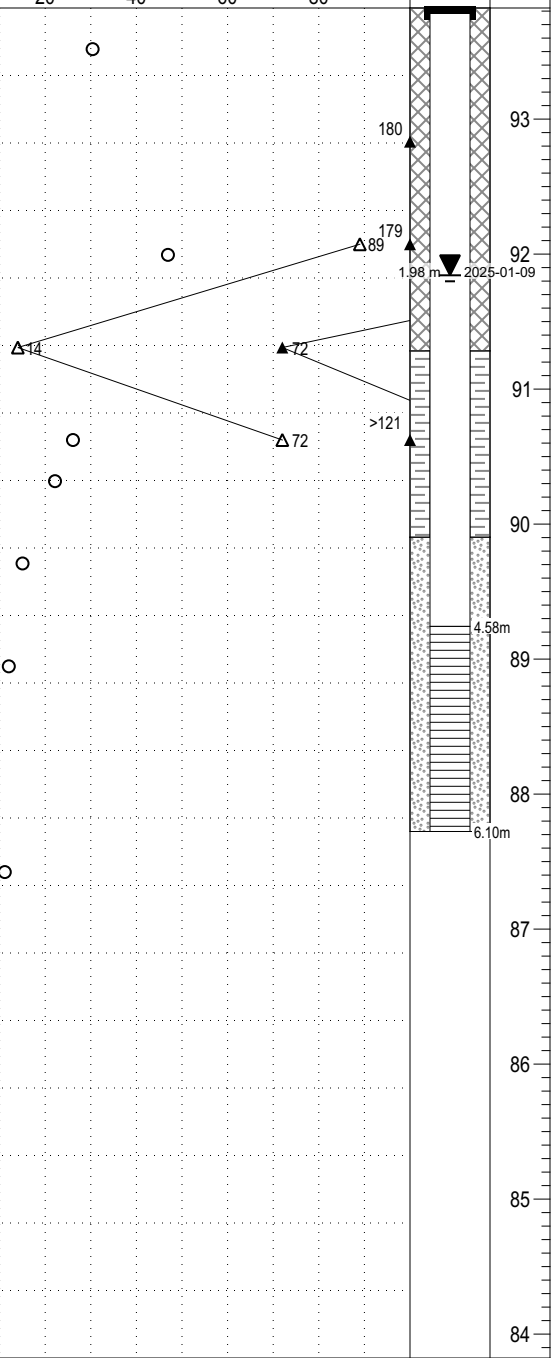
REMARKS:

DATE: December 18, 2024

FILE NO. : PG4216

HOLE NO. : BH11-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [93.57m]									
Very stiff, brown **SILTY CLAY**		1	AU 1			30			
		2	SS 2	100	P	47			
- Grey by 3.4 m depth		3	SS 3	75	P	26			
3.66m [90.16m]						22			
GLACIAL TILL: Loose to dense, grey silty sand, with clay, gravel, cobbles and boulders		4	SS 4	67	0-1-1-/ 2	15			
		5	SS 5	67	2-3-3-5 6	12			
6.53m [87.29m]		6	SS 6	42	13-21-50-/ 71/0.23	11			
End of Borehole		7							
Practical refusal to augering at 6.53 m depth		8							
(GWL at 1.98 m depth - January 9, 2025)		9							
		10							



SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435768.33 **NORTHING:** 5004247.28 **ELEVATION:** 93.93

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 18, 2024

FILE NO. : PG4216

HOLE NO. : BH12-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	MONITORING WELL CONSTRUCTION	ELEVATION (m)
GROUND SURFACE								
TOPSOIL 0.36m [93.57m]		0	AU 1			36		93
Hard, brown **SILTY CLAY**		1					239 1.08 m 2025-01-09	
		2	SS 2	100	P	54	199	92
- Silt content increasing by 3.0 m depth		3	SS 3	83	P	29	149 >121	91
3.73m [90.20m]								
GLACIAL TILL: Compact, grey silty clay, with sand, gravel, cobbles and boulders		4	SS 4	67	9-3-9-9 12	15		90
4.57m [89.36m]								
GLACIAL TILL: Dense, grey silty sand, with gravel, cobbles and boulders, trace clay		5	SS 5	67	9-15-22-21 37	18	5.34m	89
6.91m [87.02m]		6	SS 6	100	50-/-/-/ 50/0.08	16	6.86m	88
End of Borehole		7						87
(GWL at 1.08 m depth - January 9, 2025)		8						86
		9						85
		10						84

PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80

REMOULDED SHEAR STRENGTH (kPa)

UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80

PL (%) WATER CONTENT (%) LL (%) 20 40 60 80

25 54 40 87

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435792.21 **NORTHING:** 5004358.09 **ELEVATION:** 93.96

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 19, 2024

FILE NO. : PG4216

HOLE NO. : BH13-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	RECOVERY (%)	N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
Hard to very stiff, brown **SILTY CLAY**		0	SS 1	50	4-4-4-3 8	36			93
1.45m [92.51m]		1					109 >249		
GLACIAL TILL: Compact, brown silty clay, with sand, gravel, cobble sand boulders		2	SS 2	92	1-2-8-9 10	14			92
			SS 3	100	3-4-4-5 8	13			
- Silty sand, with clay, gravel, cobbles and boulders by 3.3 m depth		3	SS 4	67	5-8-18-16 26	12			91
3.66m [90.30m]									
End of Borehole		4							90
		5							89
		6							88
		7							87
		8							86
		9							85
		10							84

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 436034.93 **NORTHING:** 5004037.45 **ELEVATION:** 93.95

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: December 19, 2024

FILE NO. : PG4216

HOLE NO. : BH14-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	RECOVERY (%)	N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) / PL (%) WATER CONTENT (%) LL (%)	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE							20 40 60 80		
For soil profile refer to TP 6		1							93
		2							92
2.29m [91.66m]									
Very stiff, brown **SILTY CLAY**, with high silt content			SS 1	83	P	36	22 32 △43 >121		
2.97m [90.98m]		3							91
GLACIAL TILL: Dense to compact, brown silty clay, with sand, gravel, cobbles and boulders			SS 2	50	5-12-6-3 18	11	>121		
		4	SS 3	33	4-3-2-2 5	10			90
- Silty sand by 4.2 m depth			SS 4	42	23-26-20-16 46	12			89
5.18m [88.77m]		5							
End of Borehole		6							88
		7							87
		8							86
		9							85
		10							84

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

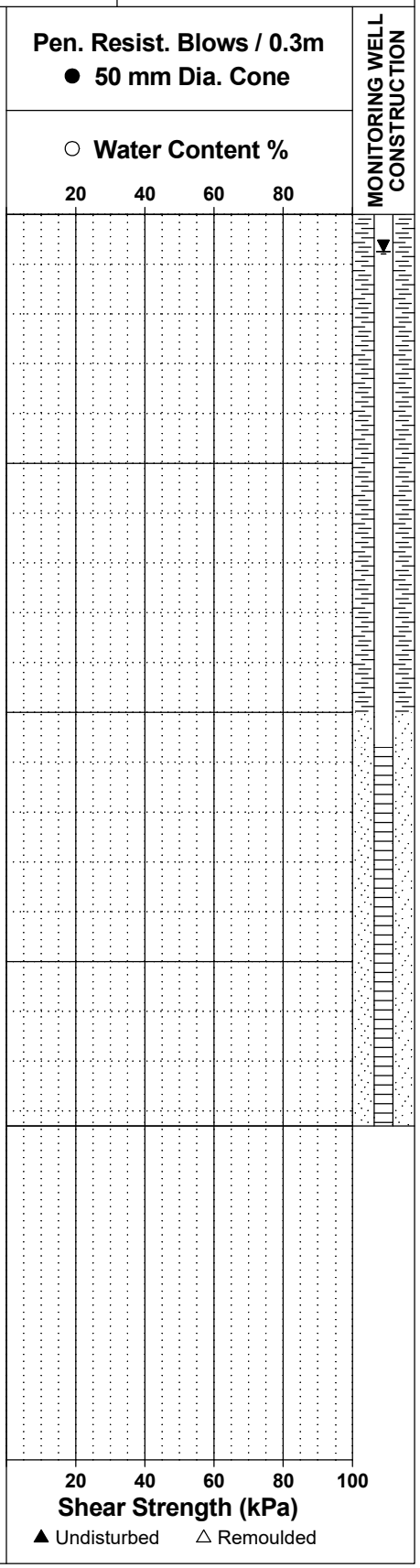
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.237
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 19

FILE NO. PG4216
HOLE NO. BH 1D-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	94.24
TOPSOIL 0.30		AU	1				
Very stiff, brown **SILTY CLAY**		SS	2	100	7	1	93.24
1.83		SS	3	100	16		
GLACIAL TILL: Compact silt, some sand and clay, trace gravel 2.13						2	92.24
GLACIAL TILL: Dense, brown silty sand with gravel, cobbles and boulders		SS	4	8	+50		
- some running sand present by 3.5m depth		SS	5	100	34	3	91.24
3.66							
End of Borehole							
(GWL @ 0.15m - March 31, 2021)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.237
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 19

FILE NO. PG4216
HOLE NO. BH 1S-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	94.24
TOPSOIL 0.30							
Very stiff, brown **SILTY CLAY**						1	93.24
1.83							
GLACIAL TILL: Compact silt, some sand and clay, trace gravel 2.13						2	92.24
End of Borehole							
(GWL @ 0.16m - March 31, 2021)							

Pen. Resist. Blows / 0.3m
● 50 mm Dia. Cone
○ Water Content %

20 40 60 80

MONITORING WELL CONSTRUCTION

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

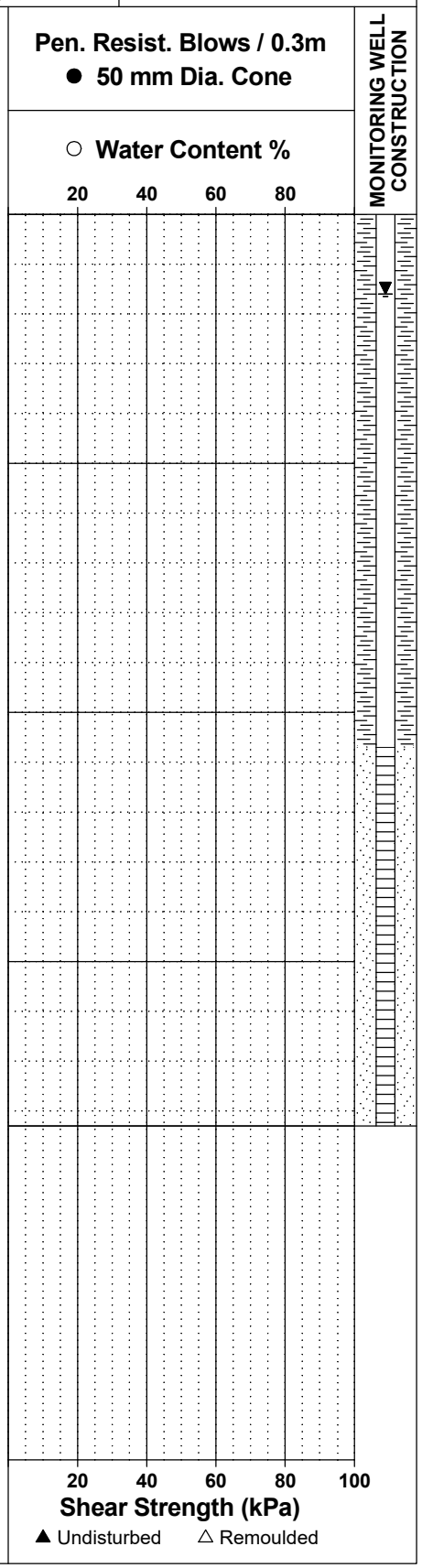
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 93.908
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 75 Power Auger **DATE:** 2021 March 19

FILE NO. PG4216
HOLE NO. BH 2-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	93.91
TOPSOIL							
0.25		AU	1				
Very stiff to stiff, brown **SILTY CLAY,** trace sand		SS	2	92	4	1	92.91
		SS	3	100	2	2	91.91
2.21							
GLACIAL TILL: Brown silty clay some sand, gravel, cobbles and boulders		SS	4	75	4	3	90.91
		SS	5	17	3		
3.66							
End of Borehole							
(GWL @ 0.32m - March 31, 2021)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 92.787
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 75 Power Auger **DATE:** 2021 March 19

FILE NO. PG4216
HOLE NO. BH 3-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	92.79		
		AU	1						
		SS	2	100	6	1	91.79		
Very stiff to stiff, brown **SILTY CLAY**		SS	3	50	4	2	90.79		
		SS	4	75	3	3	89.79		
3.12									
Stiff, grey **SILTY CLAY**		SS	5	100	2				
3.66									
End of Borehole									

Pen. Resist. Blows / 0.3m: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

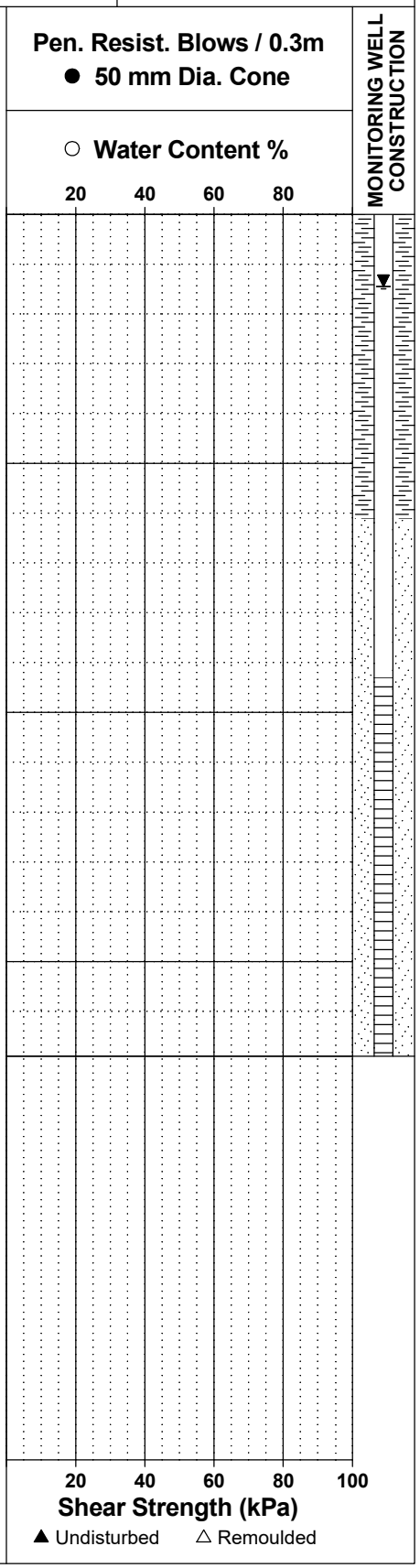
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.514
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 22

FILE NO. PG4216
HOLE NO. BH 4D-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL						0	94.51
0.18							
		AU	1				
Very stiff to stiff, brown **SILTY CLAY,** trace sand		SS	2	58	5	1	93.51
		SS	3	50	11	2	92.51
2.36							
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders		SS	4	58	20	3	91.51
		SS	5	8	+50		
3.38							
End of Borehole							
Practical refusal to augering at 3.38m depth							
(GWL @ 0.29m - March 31, 2021)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

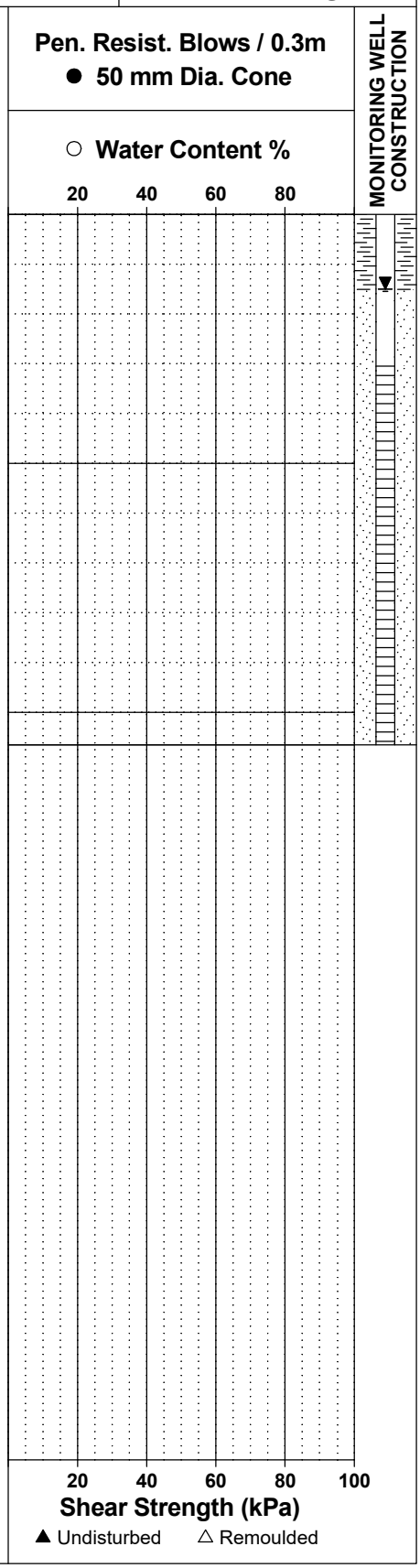
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.514
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 22

FILE NO. PG4216
HOLE NO. BH 4S-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE									
TOPSOIL 0.18						0	94.51		
Very stiff to stiff, brown **SILTY CLAY,** trace sand						1	93.51		
2.13						2	92.51		
End of Borehole (GWL @ 0.30m - March 31, 2021)									



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.212
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 22

FILE NO. PG4216
HOLE NO. BH 5-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	94.21		
TOPSOIL 0.23		AU	1						
Very stiff to stiff, brown **SILTY CLAY,** trace sand		SS	2	58	5	1	93.21		
		SS	3	50	5	2	92.21		
2.49									
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders		SS	4	100	6	3	91.21		
		SS	5	42	7				
3.66									
End of Borehole									
(GWL @ 0.30m - March 31, 2021)									

Pen. Resist. Blows / 0.3m: 20 40 60 80
Water Content %: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.044
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 22

FILE NO. PG4216
HOLE NO. BH 6-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	94.04		
TOPSOIL 0.25		AU	1						
Very stiff to stiff, brown **SILTY CLAY**		SS	2	100	5	1	93.04		
		SS	3	33	1	2	92.04		
2.21									
GLACIAL TILL: Compact to dense, brown silty clay with sand, gravel, cobbles and boulders		SS	4	75	9	3	91.04		
		SS	5	50	33				
3.66									
End of Borehole									
(GWL @ 0.26m - March 31, 2021)									

Pen. Resist. Blows / 0.3m: 20 40 60 80
Water Content %: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 93.623
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 75 Power Auger **DATE:** 2021 March 23

FILE NO. PG4216
HOLE NO. BH 7D-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	93.62		
		AU	1						
		SS	2	33	9	1	92.62		
Very stiff to stiff, brown **SILTY CLAY**		SS	3	17	4	2	91.62		
		SS	4	50	6				
						3	90.62		
3.35		SS	5	67	6				
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders									
3.66									
End of Borehole									

Pen. Resist. Blows / 0.3m: 20 40 60 80
Water Content %: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 93.623
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 23

FILE NO. PG4216
HOLE NO. BH 7S-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	93.62	20 40 60 80	
Very stiff to stiff, brown **SILTY CLAY**						1	92.62		
2.13						2	91.62		
End of Borehole									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.047
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 75 Power Auger **DATE:** 2021 March 23

FILE NO. PG4216
HOLE NO. BH 8-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	94.05		
TOPSOIL 0.25		AU	1						
Very stiff to stiff, brown **SILTY CLAY**		SS	2	100	2	1	93.05		
		SS	3	100	12				
2.13						2	92.05		
GLACIAL TILL: Compact, brown silty clay with sand, gravel, cobbles and boulders		SS	4	58	23				
3.20						3	91.05		
GLACIAL TILL: Compact, brown silty sand with gravel, clay, cobbles and boulders		SS	5	58	24				
3.66									
End of Borehole									
(GWL @ 0.49m - March 31, 2021)									

Pen. Resist. Blows / 0.3m: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

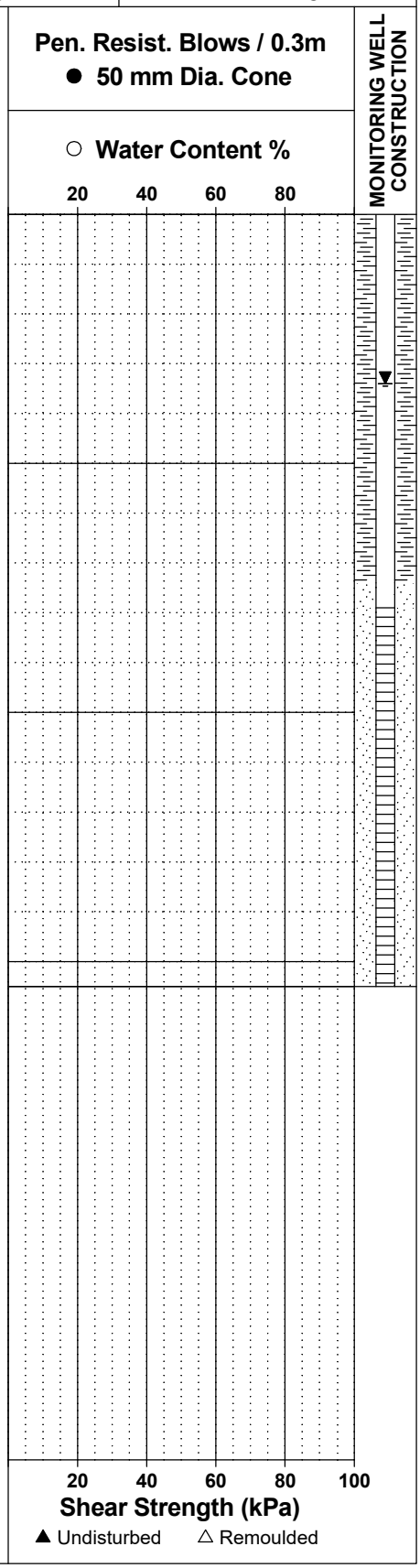
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.209
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 23

FILE NO. PG4216
HOLE NO. BH 9-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	94.21
TOPSOIL		AU	1				
0.20							
Very stiff to stiff, brown **SILTY CLAY**		SS	2	100	2	1	93.21
		SS	3	75	2	2	92.21
2.21							
GLACIAL TILL: Compact, brown silty sand with gravel, clay, cobbles and boulders		SS	4	50	23		
3.10		SS	5	8	+50	3	91.21
End of Borehole							
(GWL @ 0.68m - March 31, 2021)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.076
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 23

FILE NO. PG4216
HOLE NO. BH10D-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	94.08		
TOPSOIL 0.23		AU	1						
Very stiff to stiff, brown **SILTY CLAY**		SS	2	75	8	1	93.08		
		SS	3	100	4	2	92.08		
2.13 **GLACIAL TILL:** Clayey silt, some sand, gravel, cobbles and boulders		SS	4	100	6				
		SS	5	75	7	3	91.08		
3.66 End of Borehole									
(GWL @ 0.72m - March 31, 2021)									

Pen. Resist. Blows / 0.3m: 20 40 60 80
Water Content %: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.076
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 23

FILE NO. PG4216
HOLE NO. BH10S-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	94.08	20 40 60 80	
TOPSOIL 0.23									
Very stiff to stiff, brown **SILTY CLAY**						1	93.08		
2.13						2	92.08		
End of Borehole (GWL @ 0.49m - March 31, 2021)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Residential Development - Eagleson Road
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 92.938
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2021 March 23

FILE NO. PG4216
HOLE NO. BH11-21

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows / 0.3m ● 50 mm Dia. Cone ○ Water Content %	MONITORING WELL CONSTRUCTION
GROUND SURFACE						0	92.94		
		AU	1						
Very stiff to stiff, brown **SILTY CLAY**		SS	2	100	4	1	91.94		
		SS	3	67	6	2	90.94		
2.21									
Stiff, grey **SILTY CLAY**		SS	4	83	3	3	89.94		
3.35		SS	5	75	15				
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders									
3.66									
End of Borehole									
(GWL @ 0.13m - March 31, 2021)									

Pen. Resist. Blows / 0.3m: 20 40 60 80
Water Content %: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 93.96
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH 1

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	93.96
TOPSOIL 0.20		AU	1				
Loose, brown **SANDY SILT,** some clay		SS	2	54	5	1	92.96
1.22		SS	3	67	39	2	91.96
		SS	4	71	23		
		SS	5	58	14	3	90.96
Dense to compact, brown **SILTY SAND,** trace gravel		SS	6	71	32	4	89.96
		SS	7		24	5	88.96
5.94		SS	8	100	3		
		SS	9	67	42	6	87.96
GLACIAL TILL: Dense to very dense, grey silty sand with gravel and clay		SS	10	91	82	7	86.96
						8	85.96
						9	84.96
9.75		SS	11		7		
End of Borehole							
(GWL @ 0.61m - Dec. 28, 2018)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %
20 40 60 80

PIEZOMETER CONSTRUCTION

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

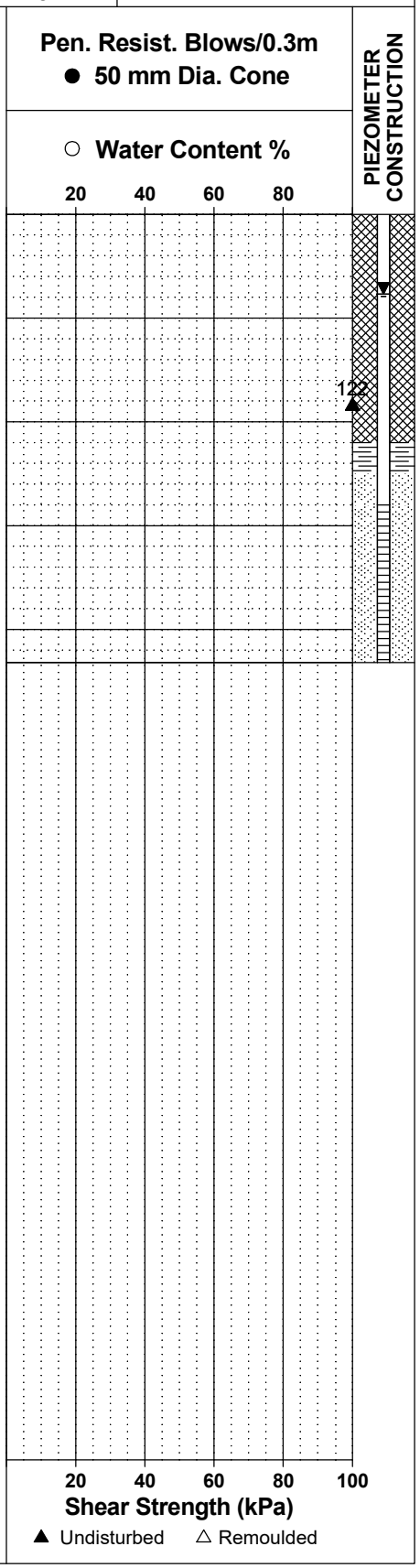
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.23
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. **PG4216**
HOLE NO. **BH 2**

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	94.23
TOPSOIL 0.25		AU	1				
Stiff to very stiff, brown **SILTY CLAY** some sand		SS	2	92	4	1	93.23
2.13						2	92.23
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders		SS	3	8	12		
		SS	4	42	35	3	91.23
4.32						4	90.23
End of Borehole							
Practical refusal to augering at 4.32m depth							
(GWL @ 0.77m - Dec. 28, 2018)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.76

DATUM: Ground surface elevations were referenced to a geodetic datum.

REMARKS:

BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216

HOLE NO. BH 3

SAMPLE DESCRIPTION	STRATA PLOT	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	94.76
TOPSOIL (to 0.15)		AU	1				
Stiff to firm, brown **SILTY CLAY**		SS	2	92	6	1	93.76
(to 2.13)		SS	3	92	6	2	92.76
GLACIAL TILL: Brown sandy silt with clay, gravel, cobbles and boulders		SS	4	0	50+		
		SS	5	67	23	3	91.76
(to 4.42)						4	90.76
End of Borehole							

Practical refusal to augering at 4.42m depth

(GWL @ 0.62m - Dec. 28, 2018)

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %

20 40 60 80

PIEZOMETER CONSTRUCTION

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 97.71
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH 4

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface									
TOPSOIL 0.30		AU	1			0	97.71		
		SS	2	71	40	1	96.71		
		SS	3	71	68	2	95.71		
GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders		SS	4	71	50+	3	94.71		
		SS	5	88	73	4	93.71		
4.85		SS	6	100	50+				
End of Borehole Practical refusal to augering at 4.85m depth (GWL @ 1.10m - Dec. 28, 2018)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa): 20 40 60 80 100

▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

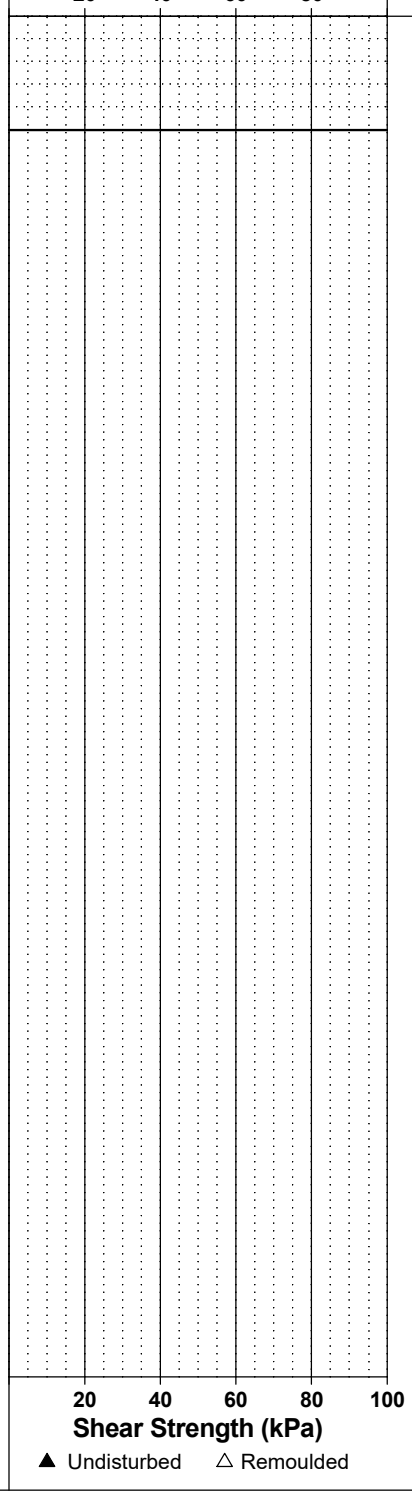
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 97.45
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH 5

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface									
TOPSOIL 0.30		AU	1			0	97.45		
Very stiff, brown **CLAYEY SILT**		SS	2		50+				
1.01						1	96.45		
End of Borehole									
Practical refusal to augering at 1.01m depth									
(BH dry upon completion)									



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

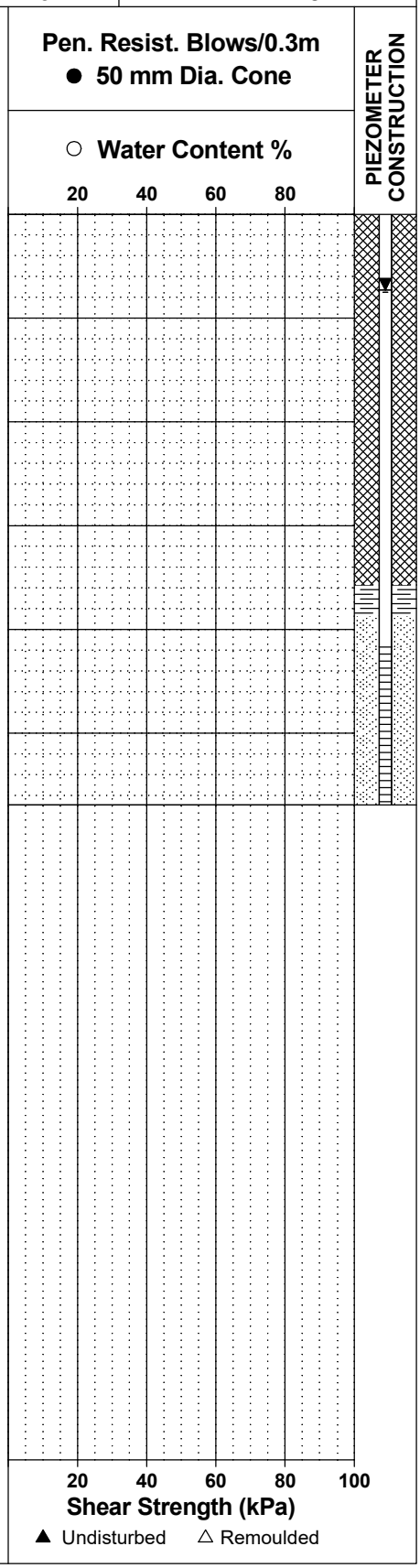
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.70
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH 6

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	94.70
TOPSOIL 0.30		AU	1				
Compact to loose, brown **SANDY SILT,** trace clay		SS	2	67	12	1	93.70
1.93		SS	3	92	5	2	92.70
Brown **SILTY CLAY** 2.19		SS	4	88	59		
GLACIAL TILL: Very dense, brown silty sand with gravel, cobbles and boulders		SS	5	71	68	3	91.70
		SS	6	100	50	4	90.70
5.69		SS	7	100	50+	5	89.70
End of Borehole							
Practical refusal to augering at 5.69m depth							
(GWL @ 0.73m - Dec. 28, 2018)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

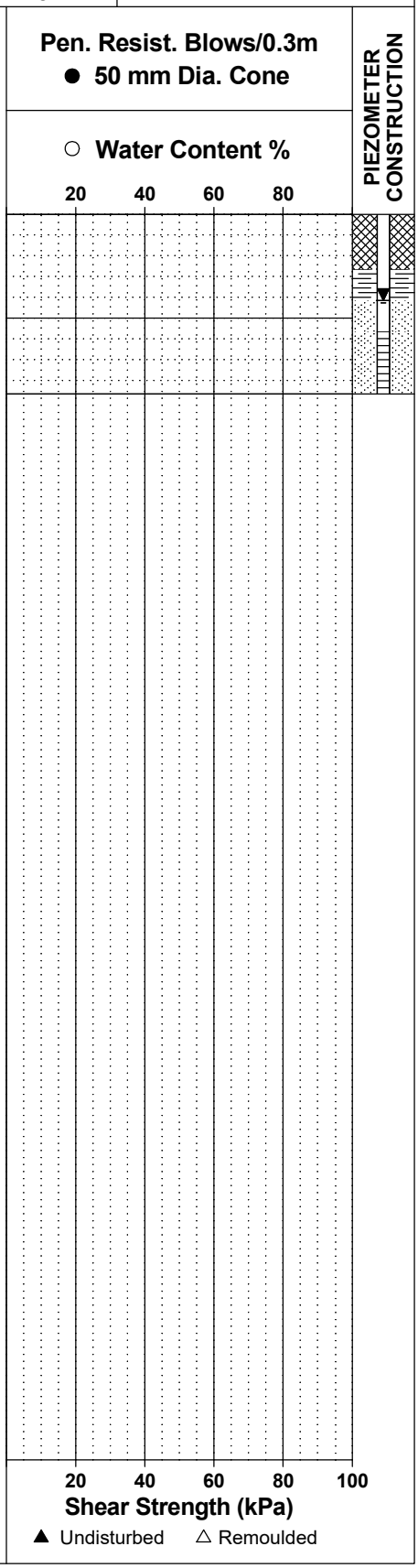
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.88
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH 7

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface							
TOPSOIL 0.25		AU	1			0	94.88
GLACIAL TILL: Brown silty sand with clay and gravel		SS	2	67	9	1	93.88
1.73		SS	3	50	50+		
End of Borehole							
Practical refusal to augering at 1.73m depth							
(GWL @ 0.83m - Dec. 28, 2018)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

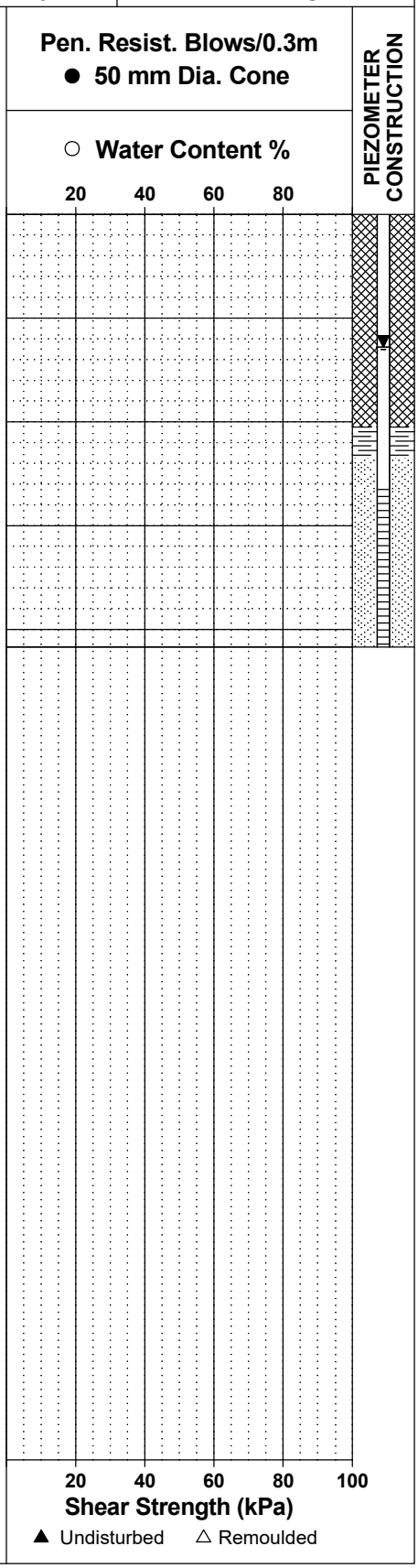
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.03
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH 8

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	94.03
TOPSOIL 0.25		AU	1				
Very stiff, brown **SILTY CLAY**		SS	2	79	13	1	93.03
1.73		SS	3	96	6	2	92.03
GLACIAL TILL: Brown silty sand with gravel, cobbles, boulders		SS	4	71	7		
		SS	5	50	36	3	91.03
4.17						4	90.03
End of Borehole							
Practical refusal to augering at 4.17m depth							
(GWL @ 1.28m - Dec. 28, 2018)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

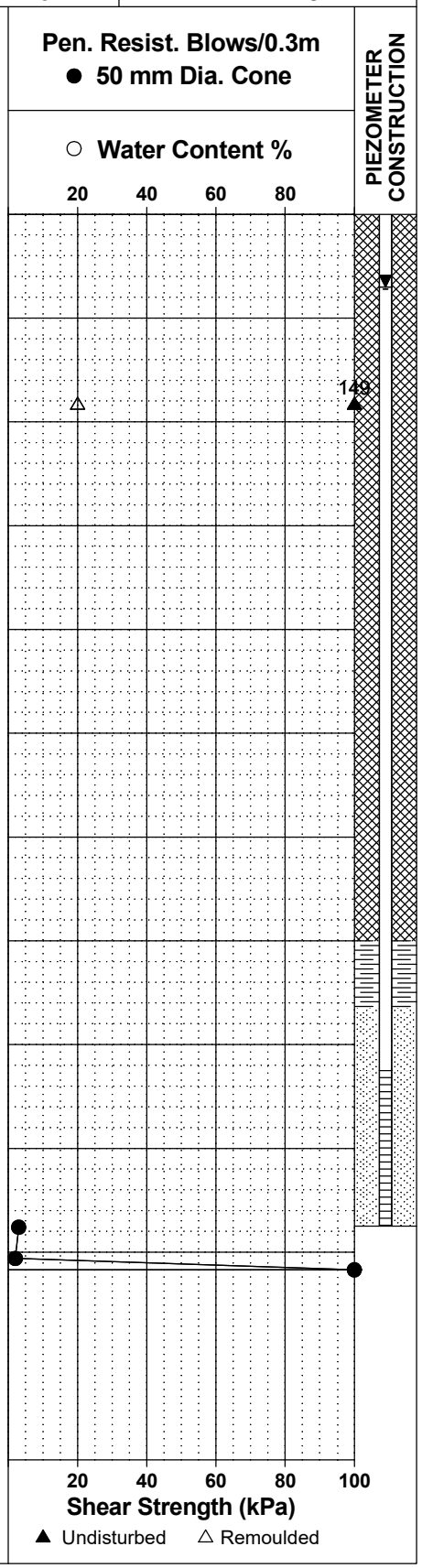
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 93.78
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH 9

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	93.78
TOPSOIL 0.25		AU	1				
Very stiff, brown **SILTY CLAY**		SS	2	96	4	1	92.78
		SS	3	83	P	2	91.78
2.29							
Brown **SANDY SILT,** trace clay		SS		88	P	3	90.78
3.05							
		SS	5	46	7	4	89.78
		SS	6	79	9		
Loose, brown **SILTY SAND** with gravel, trace clay		SS	7	71	9	5	88.78
6.10						6	87.78
		SS	8	100	26		
		SS	9	62	14	7	86.78
Compact to dense, grey **SILTY SAND**		SS	10	62	36	8	85.78
						9	84.78
9.75		SS	11	42	31		
Dynamic Cone Penetration Test commenced at 9.75m depth. 10.17						10	83.78
End of Borehole							
Practical DCPT refusal at 10.17m depth							
(GWL @ 0.70m - Dec. 28, 2018)							



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

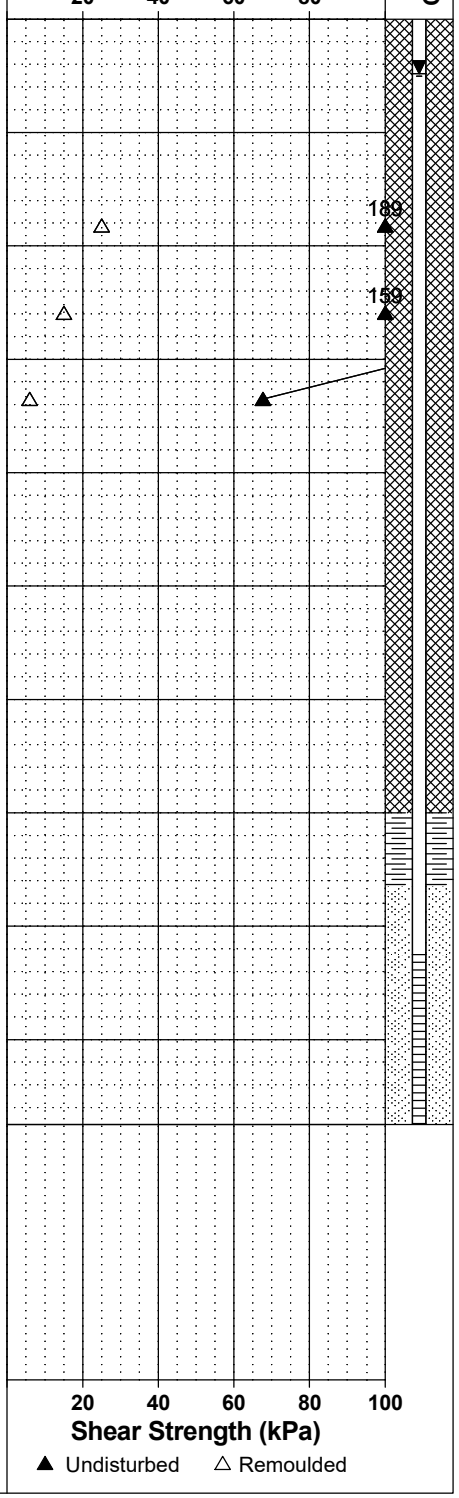
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 93.37
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** 2018 December 13

FILE NO. PG4216
HOLE NO. BH10

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface							
TOPSOIL 0.30		AU	1			0	93.37
		SS	2	96	6	1	92.37
		SS	3	54	P	2	91.37
Very stiff, brown **SILTY CLAY**		SS	4	100	P		
- grey by 2.9m depth						3	90.37
		SS	5	58	10	4	89.37
		SS	6	83	37	5	88.37
5.41		SS	7	96	50+		
		SS	8	83	75	6	87.37
GLACIAL TILL: Very dense, grey silty sand with gravel, cobbles and boulders		SS	9	92		7	86.37
						8	85.37
			10	100	50+	9	84.37
9.75							
End of Borehole							
(GWL @ 0.48m - Dec. 28, 2018)							



SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 436079.41 **NORTHING:** 5003734.86 **ELEVATION:** 94.53

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 1-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.20m [94.33m]									
Stiff, brown **SILTY CLAY**			G 1			34	△22 ▲88		94
1.40m [93.12m]		1							
GLACIAL TILL: Compact, brown silty clay, some gravel, occasional cobbles and boulder									93
2.15m [92.38m]		2	G 2			27			
End of Test Pit Test pit terminated on bedrock surface No groundwater infiltration was observed upon completion of the test pit		3							92
		4							91
		5							90

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435766.77 **NORTHING:** 5003865.03 **ELEVATION:** 95.89

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 2-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.15m [95.74m]									
GLACIAL TILL: Compact to very dense, brown silty sand, some gravel, cobbles and boulders		1	G 1			9	○		95
- Increasing boulder content by 2.7 m depth		2	G 2			11	○		94
3.00m [92.89m]		3							93
End of Test Pit Practical refusal to excavation at 3.00 m depth Groundwater infiltration was observed the bottom of the test pit		4							92
		5							91

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435639.53 **NORTHING:** 5003762.56 **ELEVATION:** 97.15

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 3-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.20m [96.95m]									97
GLACIAL TILL: Compact, brown silty sand, some gravel and cobbles, occasional boulders			G 1			13	○		
		1							96
			G 2			10	○		
1.95m [95.20m]		2							
End of Test Pit Test pit terminated on bedrock surface No groundwater infiltration was observed upon completion of the test pit		3							95
									94
		4							93
		5							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435453.45 **NORTHING:** 5003767.76 **ELEVATION:** 94.94

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 4-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [94.69m]									
Compact, brown **SILT**, trace clay and sand			G 1			33	○		
1.00m [93.94m]		1							94
GLACIAL TILL: Loose, brown silt, some clay and gravel			G 2			26	○		
2.05m [92.89m]		2							93
End of Test Pit Test pit terminated on bedrock surface Groundwater infiltration was observed at 1.30 m depth		3							92
		4							91
		5							90

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435320.86 **NORTHING:** 5003704.85 **ELEVATION:** 94.65

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 5-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE											
TOPSOIL 0.20m [94.45m]											
Compact, brown **SILT**, some sand			G 1			25					94
1.25m [93.40m]		1									
End of Test Pit											93
Test pit terminated on bedrock surface		2									
No groundwater infiltration was observed upon completion of the test pit											92
		3									
											91
		4									
											90
		5									

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435449.30 **NORTHING:** 5003642.99 **ELEVATION:** 95.32

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 6-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE											
TOPSOIL 0.10m [95.22m]											
GLACIAL TILL: Compact, brown silty sand, with gravel, cobbles and boulders			G 1			13					
1.05m [94.27m]		1									
End of Test Pit Test pit terminated on bedrock surface No groundwater infiltration was observed upon completion of the test pit		2									94 93 92 91
		3									
		4									
		5									

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435565.10 **NORTHING:** 5003574.64 **ELEVATION:** 96.93

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 7-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.15m [96.78m]		0							96
GLACIAL TILL: Compact, brown silty sand, some gravel and cobbles, occasional boulders		1	G 1			17	○		95
		2	G 2			12	○		94
2.75m [94.18m]		3	G 3			12	○		93
End of Test Pit Test pit terminated on bedrock surface		4							92
		5							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435618.80 **NORTHING:** 5003684.74 **ELEVATION:** 97.72

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 8-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL		0							97
0.25m [97.47m]									
GLACIAL TILL: Compact, brown silty sand, some gravel, cobbles and boulders		1	G 1			12			96
		2	G 2			11			95
2.70m [95.02m]		3	G 3			10			94
End of Test Pit		4							93
Test pit terminated on bedrock surface		5							
No groundwater infiltration was observed upon completion of the test pit									

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435764.56 **NORTHING:** 5003694.37 **ELEVATION:** 95.94

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP 9-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.15m [95.79m]									
GLACIAL TILL: Compact, brown silty sand, some gravel, cobbles and boulders		1	G 1			11	○		95
			G 2			12	○		
2.40m [93.54m]		2							94
End of Test Pit Test pit terminated on bedrock surface No groundwater infiltration was observed upon completion of the test pit		3							93
		4							92
		5							91

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435773.40 **NORTHING:** 5003504.87 **ELEVATION:** 97.38

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP10-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.20m [97.18m]		0							97
GLACIAL TILL: Compact, brown silty sand, some gravel, cobbles and boulders			G 1			14	○		
		1							
			G 2			12	○		96
2.30m [95.08m]		2							
End of Test Pit Test pit terminated on bedrock surface No groundwater infiltration was observed upon completion of the test pit		3							95
									94
		4							
									93
		5							

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435928.90 **NORTHING:** 5003701.30 **ELEVATION:** 94.87

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP11-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.25m [94.62m]									
GLACIAL TILL: Compact, brown silty sand, clay, with gravel, some cobbles, boulders and clay		1	G 1			13	○		94
1.80m [93.07m]			G 2			14	○		
End of Test Pit Test pit terminated on bedrock surface No groundwater infiltration was observed upon completion of the test pit		2 3 4 5							93 92 91 90

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435480.15 **NORTHING:** 5003517.81 **ELEVATION:** 95.92

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP12-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.20m [95.72m]									
GLACIAL TILL: Compact to loose, brown silty sand, some gravel, occasional cobbles and boulders		1	G 1			14	○		95
			G 2			40	○		
- Grey by 1.60 m depth			G 3			7	○		
1.90m [94.02m]									94
End of Test Pit Test pit terminated on bedrock surface Groundwater infiltration was observed at 1.40 m depth		2							
		3							93
		4							92
		5							91

SOIL PROFILE AND TEST DATA

Supplemental Geotechnical Investigation

5970 and 6038 Ottawa Street, Ottawa, Ontario

COORD. SYS.: UTM ZONE 18 **EASTING:** 435577.21 **NORTHING:** 5003410.85 **ELEVATION:** 96.69

PROJECT: Proposed Mixed-Use Development

ADVANCED BY: Excavator

REMARKS:

DATE: December 16, 2024

FILE NO. : PG4216

HOLE NO. : TP13-24

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80	REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80	PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE											
TOPSOIL 0.25m [96.44m]											
GLACIAL TILL: Compact, brown silty sand, some gravel, occasional cobbles and boulders 0.40m [96.29m]			G 1			21					
Weathered **BEDROCK** 0.60m [96.09m]											96
End of Test Pit		1									
Test pit terminated on bedrock surface											95
No groundwater infiltration was observed upon completion of the test pit		2									94
		3									93
		4									92
		5									

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.63
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 1

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface									
TOPSOIL 0.30						0	94.63		
GLACIAL TILL: Loose to compact, grey-brown silty sand with clay, gravel and cobbles - some rootlest at upper 0.2m depth - grey by 2.0m depth		G	1			1	93.63		
		G	2			2	92.63		
		G	3						
		G	4			3	91.63		
		G	5						▽
End of Test Pit 3.70 (Groundwater infiltration at 3.5m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.42
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 2

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	94.42		
TOPSOIL									
0.30									
Very stiff, grey-brown **SILTY CLAY**		G	1			1	93.42	>130	
- some rootlets at upper 0.2m depth		G	2					>130	
- grey by 1.0m depth									
2.00		G	3			2	92.42		
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders		G	4						
		G	5			3	91.42		
		G	6						
3.70		G	7						
End of Test Pit									
(TP dry upon completion)									

Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.48
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. **PG4216**
HOLE NO. **TP 3**

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	94.48		
TOPSOIL 0.30									
Very stiff, brown **SILTY CLAY**		G	1			1	93.48	>130	
		G	2						
- grey by 1.6m depth		G	3			2	92.48		
		G	4						
2.50									
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders		G	5			3	91.48		
		G	6						
3.50									
End of Test Pit									
(Water infiltration at base of test pit)									

Pen. Resist. Blows/0.3m: 20 40 60 80
Water Content %: 20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 93.63
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 4

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	93.63	20 40 60 80	
TOPSOIL									
0.30									
		G	1					>130	
		G	2			1	92.63	>130	▽
Very stiff, brown **SILTY CLAY**		G	3					>130	
		G	4			2	91.63		
		G	5						
- grey by 2.8m depth		G	6			3	90.63		
		G	7						
3.70									
End of Test Pit									
(Groundwater infiltration at 1.0m depth)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.28
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. **PG4216**
HOLE NO. **TP 5**

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	94.28		
TOPSOIL									
0.30									
		G	1					>130	
Very stiff, brown **SILTY CLAY**		G	2			1	93.28	>130	▽
- grey-brown by 1.0m depth		G	3						
- grey by 1.8m depth		G	4			2	92.28		
		G	5						
		G	6			3	91.28		
3.50		G	7						
End of Test Pit Practical refusal to excavation at 3.50m depth (Groundwater infiltration at 1.2m depth)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

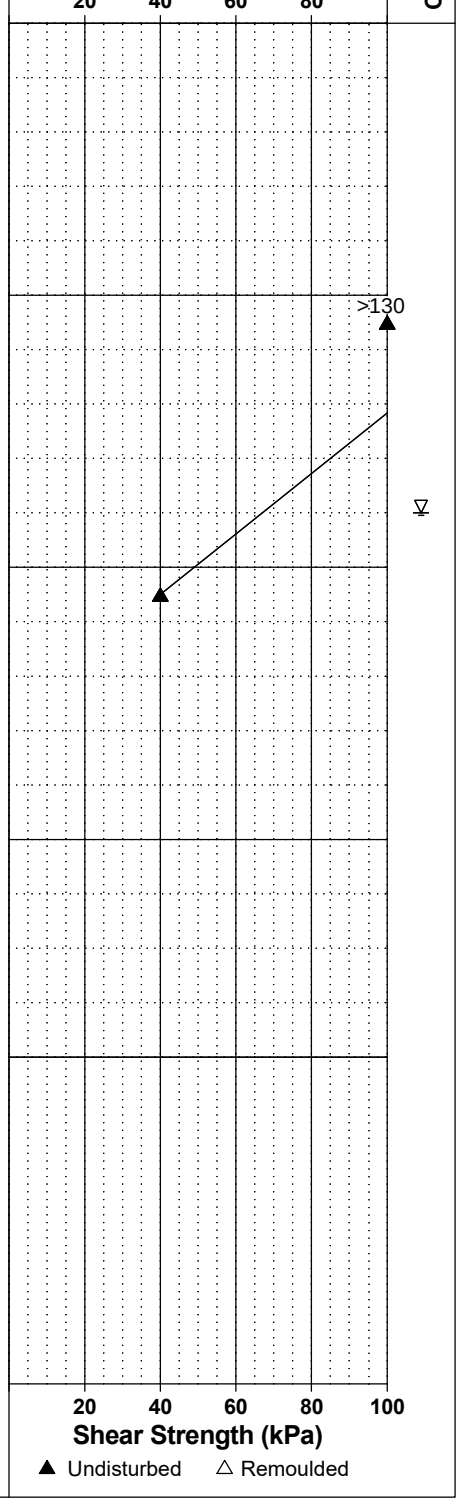
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.03
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 6

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
Ground Surface						0	94.03
TOPSOIL 0.30							
Very stiff to stiff, brown **SILTY CLAY**		G	1				
		G	2			1	93.03
		G	3				
- firm and grey by 1.8m depth		G	4			2	92.03
2.80		G	5				
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders		G	6			3	91.03
3.80		G	7				
End of Test Pit Practical refusal to excavation at 3.80m depth (Groundwater infiltration at 1.8m depth)							



PIEZOMETER CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.46
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 7

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	94.46	20 40 60 80	
TOPSOIL 0.30		G	1						
Very stiff, brown **SILTY CLAY**		G	2			1	93.46		
		G	3						▽
- grey and with sand by 1.8m depth		G	4			2	92.46		
		G	5						
3.00 Grey **CLAYEY SILT** 3.20		G	6			3	91.46		
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders 3.70		G	7						
End of Test Pit									
Practical refusal to excavation at 3.70m depth									
(Groundwater infiltration at 1.8m depth)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.53
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 8

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	94.53		
TOPSOIL 0.30		G	1						
Very stiff, brown **SILTY CLAY**						1	93.53		
- grey-brown by 0.8m depth		G	2						
- grey by 1.4m depth		G	3						▽
		G	4			2	92.53		
2.80		G	5						
GLACIAL TILL: Grey silty clay with sand, gravel, cobbles and boulders		G	6			3	91.53		
3.80		G	7						
End of Test Pit									
Practical refusal to excavation at 3.80m depth									
(Groundwater infiltration at 1.9m depth)									

Pen. Resist. Blows/0.3m: ● 50 mm Dia. Cone; ○ Water Content %
20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

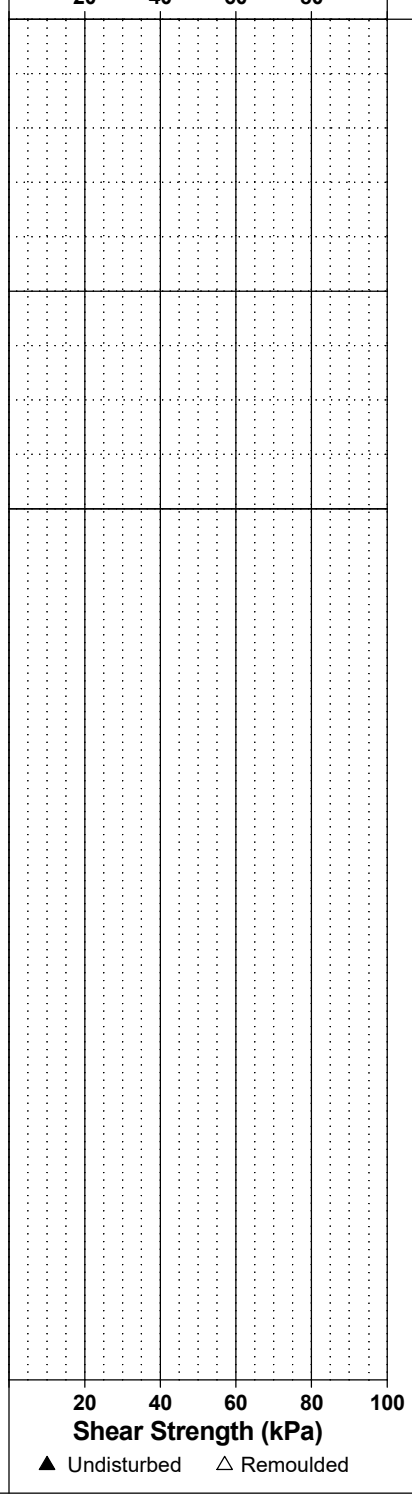
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 97.18
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 9

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	97.18		
TOPSOIL 0.30									
Brown **SILTY SAND** with rootlets 0.60									
GLACIAL TILL: Brown silty sand with gravel, cobbles and boulders, some clay		G	1			1	96.18		
1.80 End of Test Pit									
Practical refusal to excavation at 1.80m depth									
(TP dry upon completion)									



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

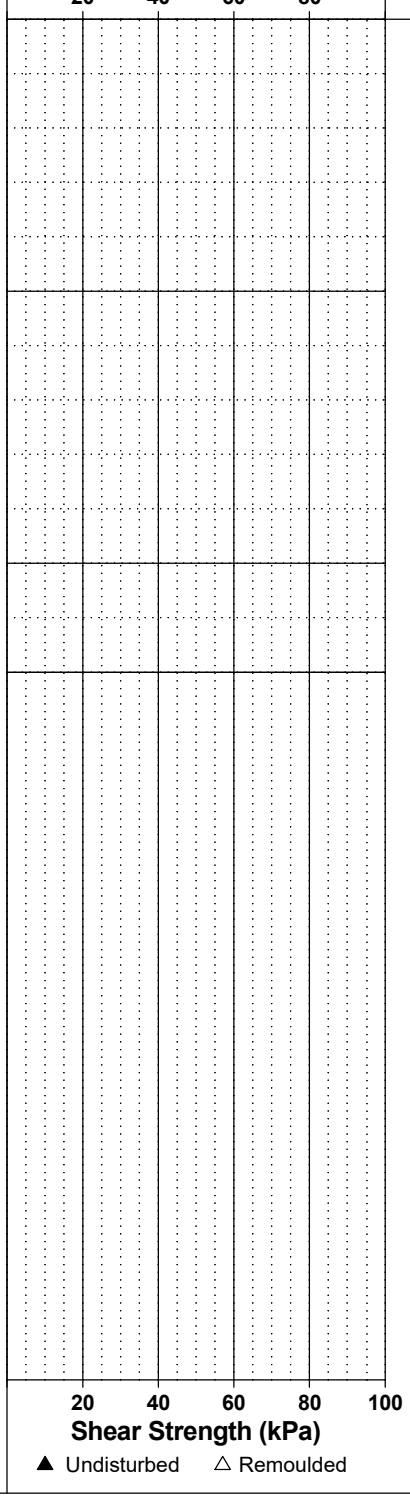
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 97.48
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP 9A

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	97.48		
TOPSOIL 0.30									
Brown **SILTY SAND,** trace rootlets 0.60									
GLACIAL TILL: Light brown to grey silty sand with clay, gravel, cobbles and boulders						1	96.48		
						2	95.48		
2.40 End of Test Pit Practical refusal to excavation at 2.40m depth (TP dry upon completion)									



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

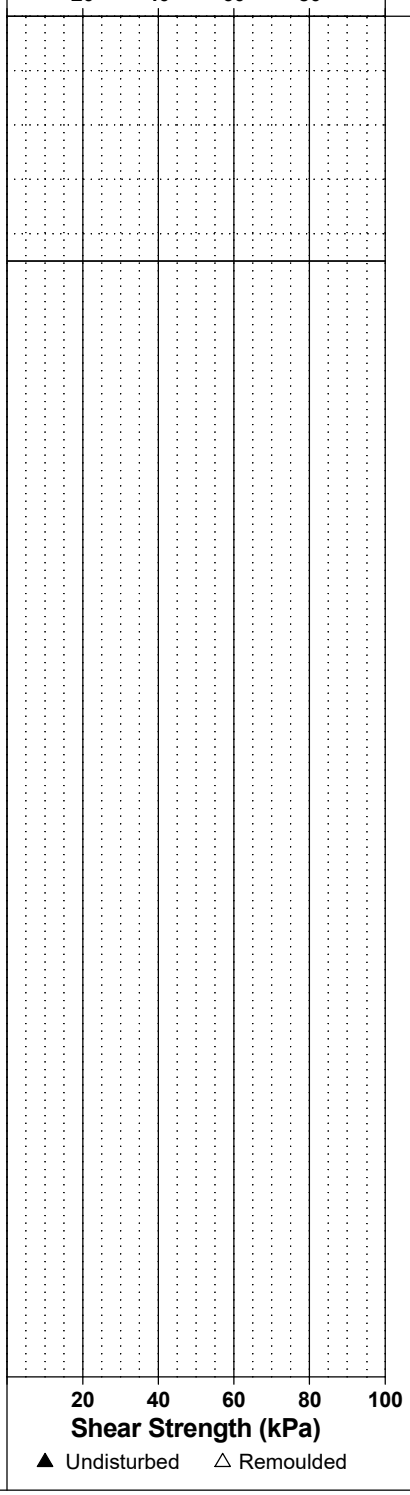
SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 95.63
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP10

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	95.63		
TOPSOIL 0.35									
Very stiff, red-brown **SILTY CLAY,** some sand, trace organics 0.65		G	1						
GLACIAL TILL: Brown silty sand with gravel and sand 0.90		G	2						
End of Test Pit									
Practical refusal to excavation at 0.90m depth									
(TP dry upon completion)									



patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Proposed Development - Eagleson Road at Ottawa St.
Ottawa, Ontario

EASTING: **NORTHING:** **ELEVATION:** 94.45
DATUM: Ground surface elevations were referenced to a geodetic datum.
REMARKS:
BORINGS BY: Hydraulic Shovel **DATE:** 2019 February 27

FILE NO. PG4216
HOLE NO. TP11

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
Ground Surface						0	94.45		
FILL: Sand with cobbles									
0.25									
GLACIAL TILL: Loose to compact, grey-brown silty sand with clay, gravel, cobbles and boulders		G	1			1	93.45		
		G	2						
		G	3			2	92.45		
		G	4						
2.80									
End of Test Pit									
Practical refusal to excavation at 2.80m depth									
(TP dry upon completion)									

Pen. Resist. Blows/0.3m: 20 40 60 80
Water Content %: 20 40 60 80
Shear Strength (kPa): 20 40 60 80 100
▲ Undisturbed △ Remoulded

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.
P	-	Split-spoon pushed through sampling interval which was also tested using a vane apparatus and resulted in a obtaining a sample of disturbed material (i.e., blow-counts not reflective of undisturbed, in-situ soils and not considered relevant)

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

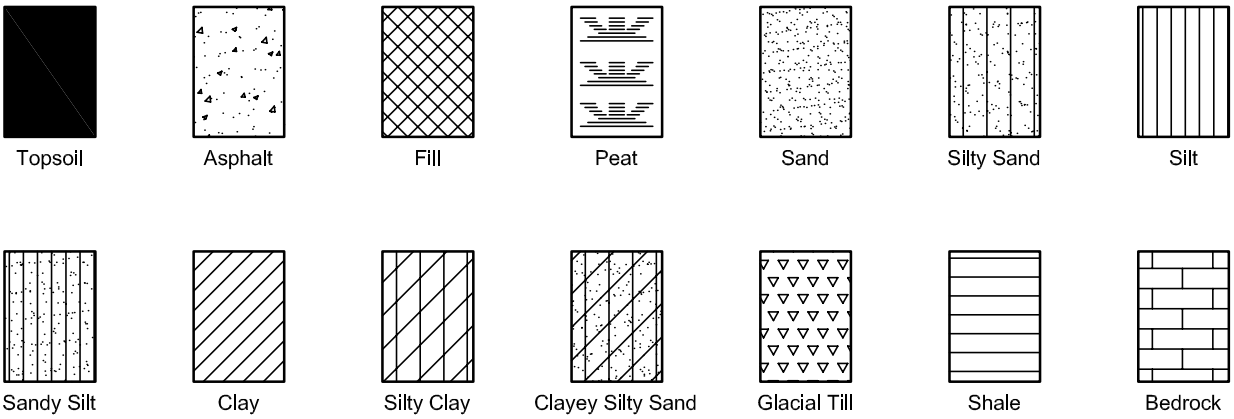
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

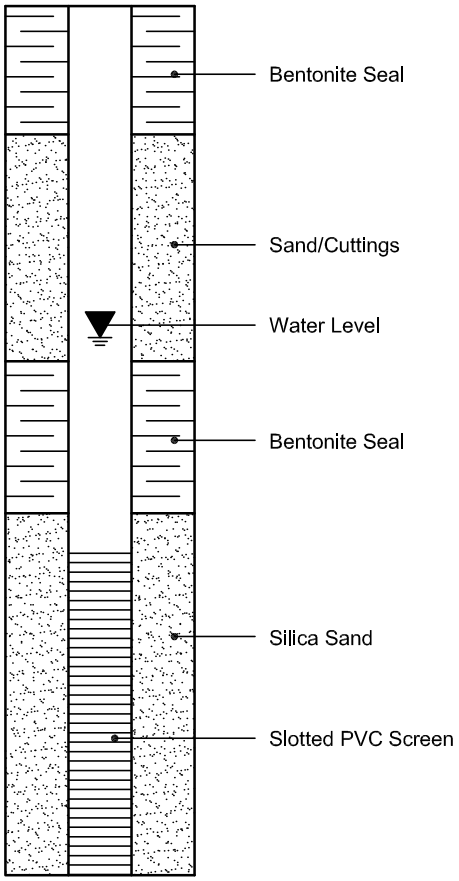
SYMBOLS AND TERMS (continued)

STRATA PLOT

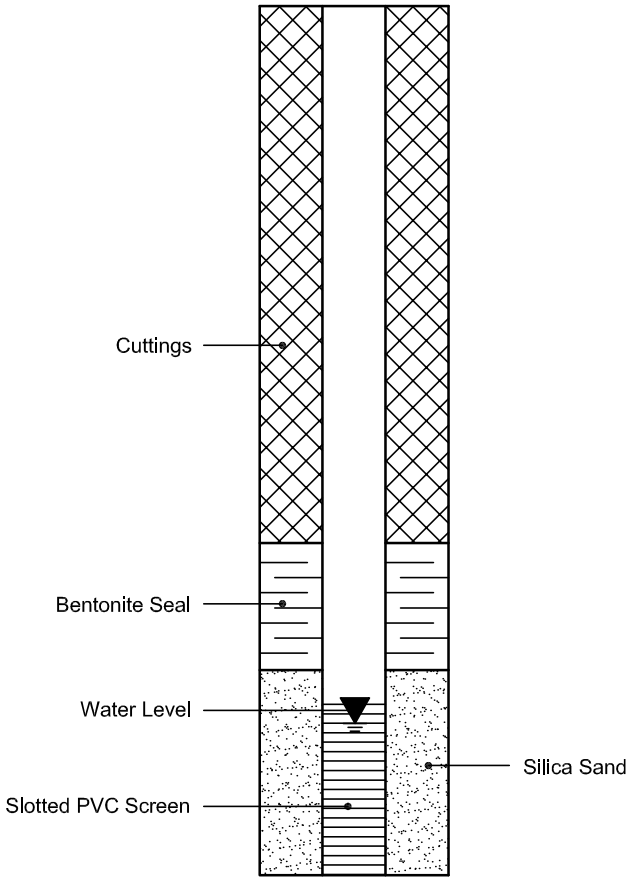


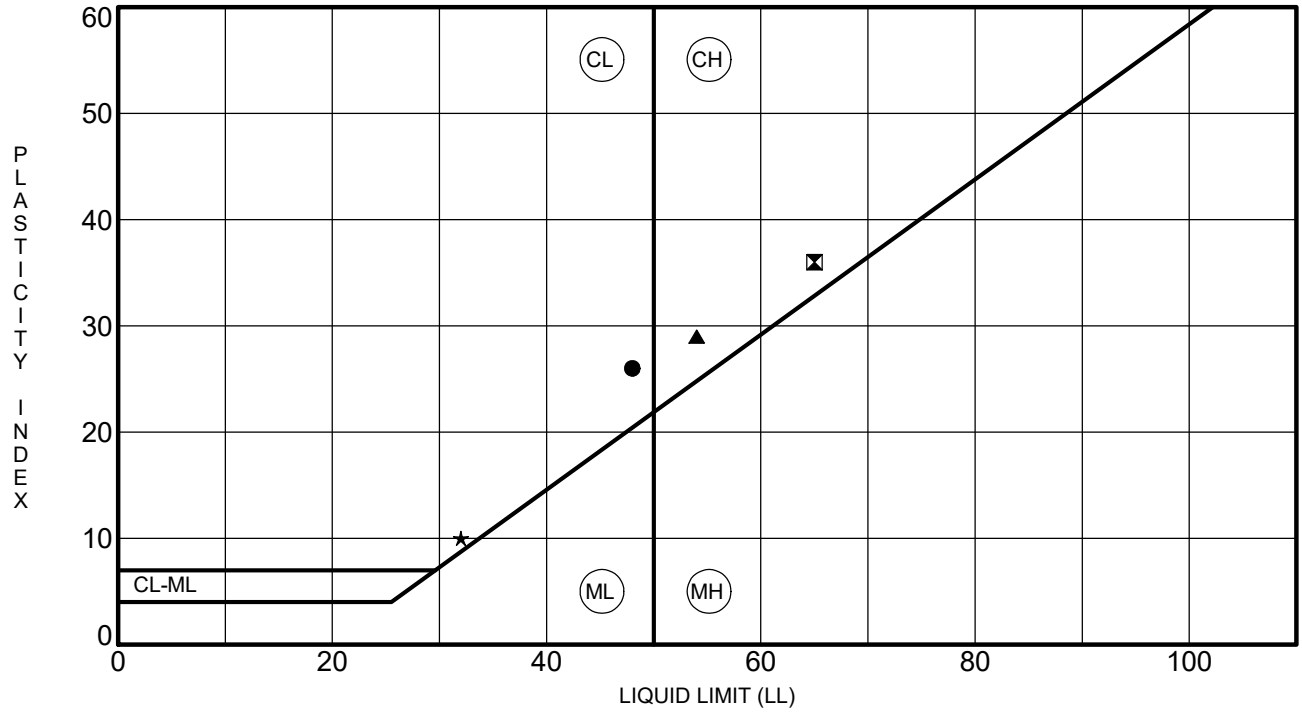
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





Specimen Identification			LL	PL	PI	Fines	Classification
●	BH 3A-21	SS2	48	22	26		CL - Inorganic clays of low plasticity
⊠	BH 4-24	SS4	65	29	36		CH - Inorganic clays of high plasticity
▲	BH12-24	SS2	54	25	29		CH - Inorganic clays of high plasticity
★	BH14-24	SS1	32	22	10		CL - Inorganic clays of low plasticity

CLIENT **Tamarack ("Richmond") Corporation**

PROJECT **Geotechnical Investigation - Proposed Mixed-Use Development - 5970 and 6038 Ottawa Street**

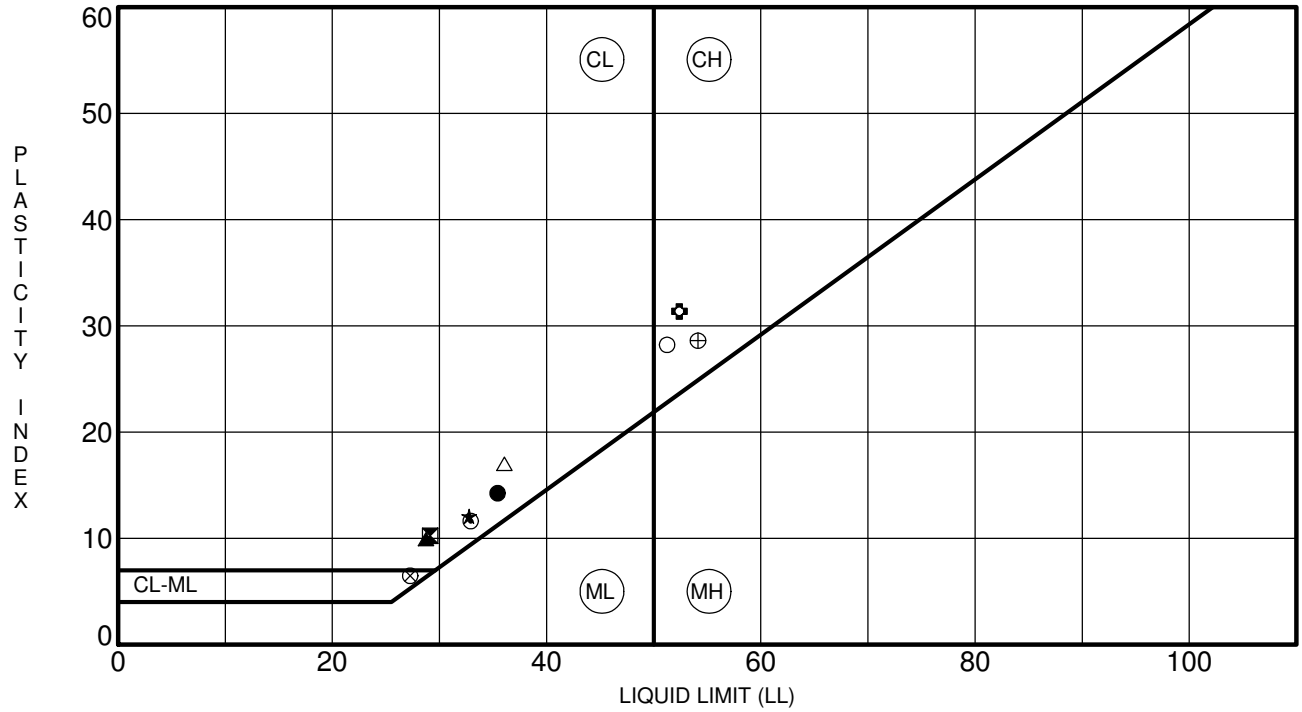
FILE NO. **PG4216**

DATE **14 Jan 25**

PATERSON GROUP

9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

ATTERBERG LIMITS' RESULTS



Specimen Identification			LL	PL	PI	Fines	Classification
●	BH 2	SS 2	35	21	14		CL - Inorganic clay with low plasticity
⧓	BH 3	SS 3	29	19	10		CL - Inorganic clay with low plasticity
▲	BH 8	SS 2	29	19	10		CL - Inorganic clay with low plasticity
★	TP 2	G 3	33	21	12		CL - Inorganic clay with low plasticity
⊙	TP 3	G 4	33	21	12		CL - Inorganic clay with low plasticity
✿	TP 4	G 6	52	21	31		CH - Inorganic clays of high plasticity
○	TP 5	G 6	51	23	28		CH - Inorganic clays of high plasticity
△	TP 6	G 5	36	19	17		CL - Inorganic clay with low plasticity
⊗	TP 7	G 6	27	21	6		CL-ML - Inorganic silt with some clay with low plasticity
⊕	TP 8	G 5	54	26	29		CH - Inorganic clays of high plasticity

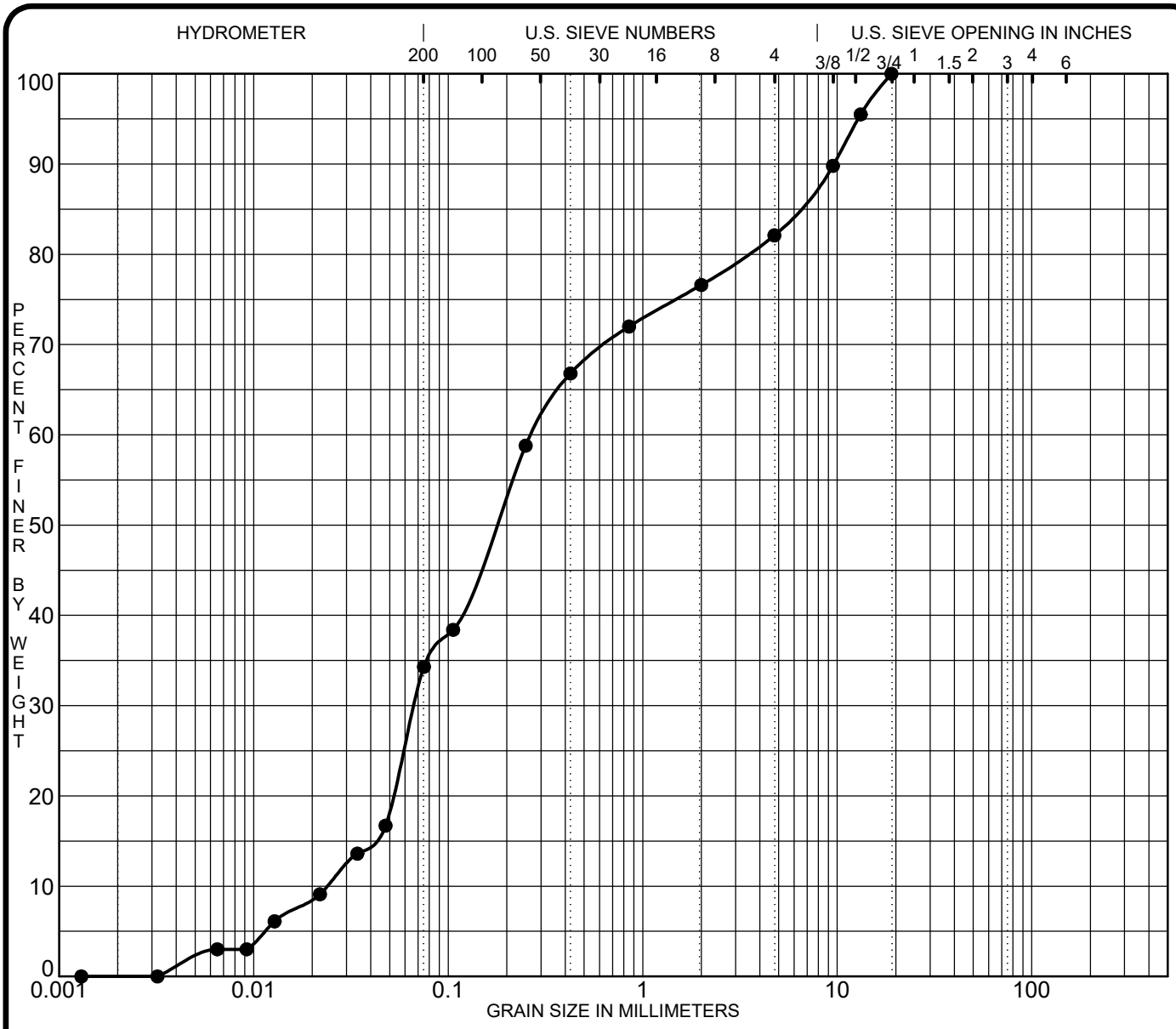
CLIENT **Taggart Construction** FILE NO. **PG4216**

PROJECT **Geotechnical Investigation - Proposed Development - Eagleson Road at Ottawa St.** DATE **27 Feb 19**

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

ATTERBERG LIMITS' RESULTS



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 5-24**	**SS3**		**9.3**				**0.70**	**11.3**
⊠									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 5-24**	**SS3**	**19.00**	**0.27**	**0.067**	**0.0239**	**17.9**	**47.8**	**34.3**	**0.0**
⊠										
▲										
★										

CLIENT **Tamarack ("Richmond") Corporation**

PROJECT **Geotechnical Investigation - Proposed Mixed-Use Development - 5970 and 6038 Ottawa Street**

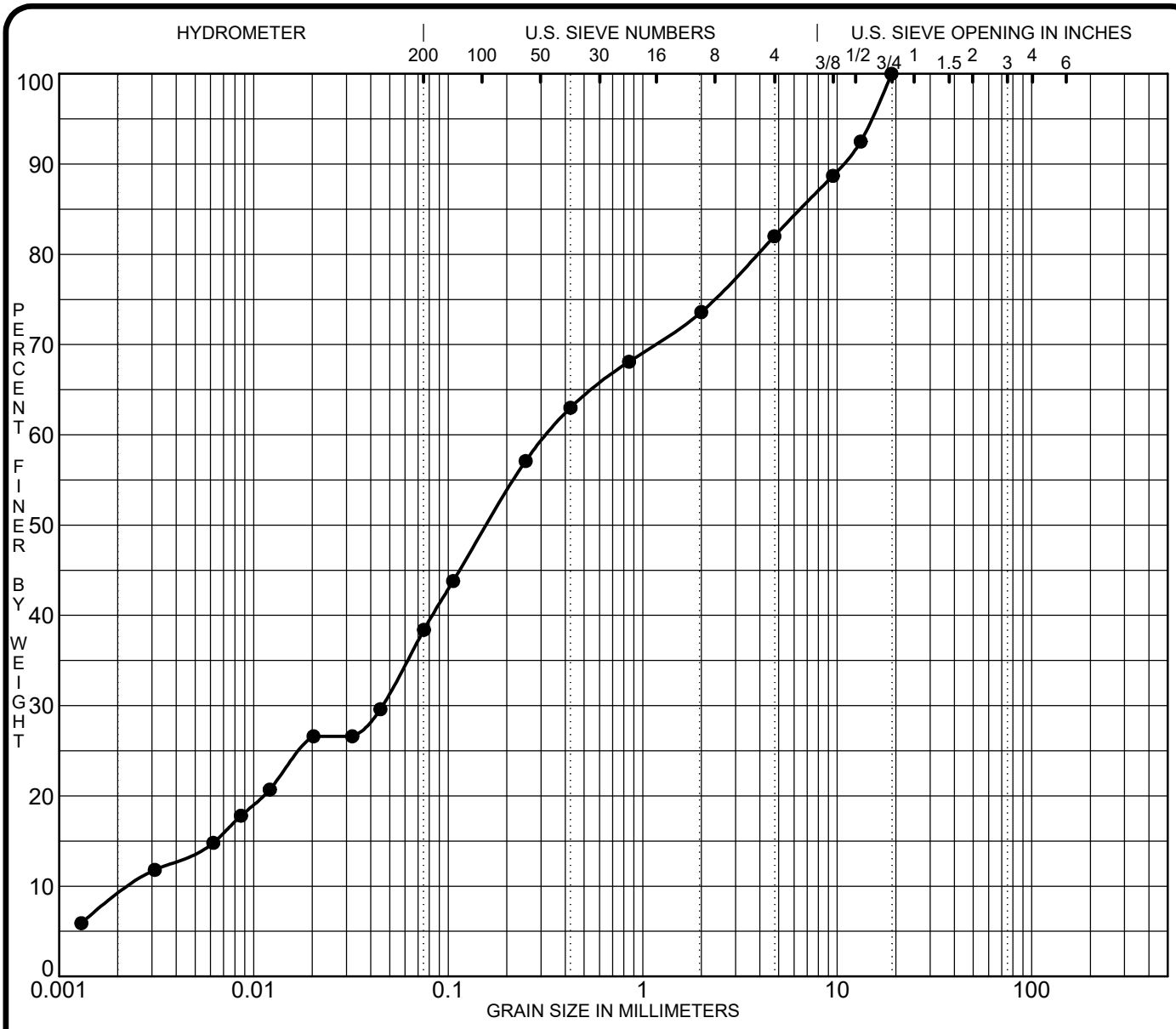
FILE NO. **PG4216**

DATE **14 Jan 25**

PATERSON GROUP

9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH11-24 SS4**		**12.8**				**2.73**	**136.5**
⊠								
▲								
★								

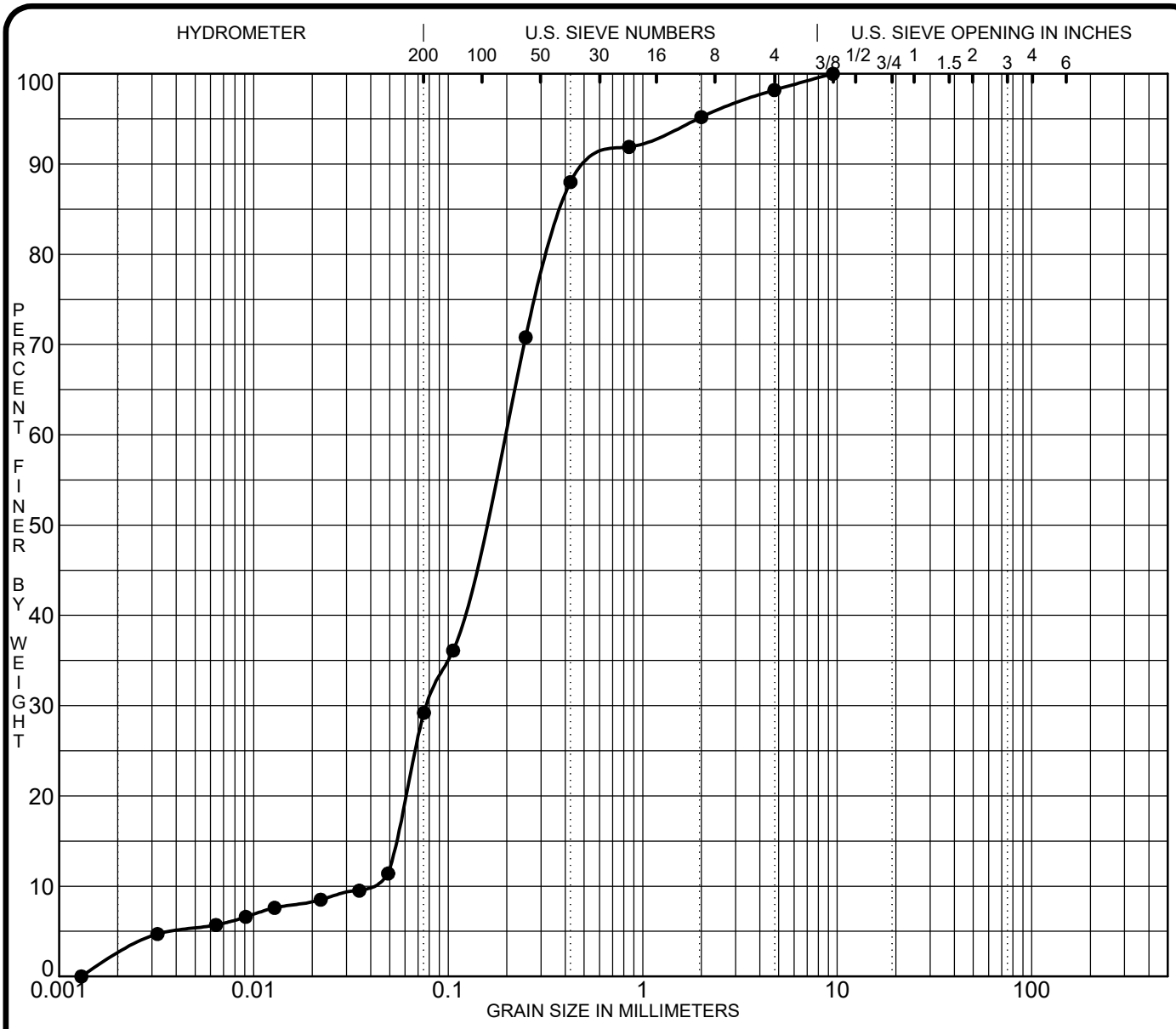
	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH11-24 SS4**	**19.00**	**0.32**	**0.046**	**0.0024**	**18.0**	**43.6**	**28.9**	**9.5**
⊠									
▲									
★									

CLIENT **Tamarack ("Richmond") Corporation** FILE NO. **PG4216**

PROJECT **Geotechnical Investigation - Proposed Mixed-Use Development - 5970 and 6038 Ottawa Street** DATE **14 Jan 25**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH12-24**	**SS6**		**13.0**				**0.83**	**5.0**
⊠									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH12-24**	**SS6**	**9.50**	**0.19**	**0.078**	**0.0382**	**1.8**	**69.0**	**27.5**	**1.7**
⊠										
▲										
★										

CLIENT **Tamarack ("Richmond") Corporation**

PROJECT **Geotechnical Investigation - Proposed Mixed-Use Development - 5970 and 6038 Ottawa Street**

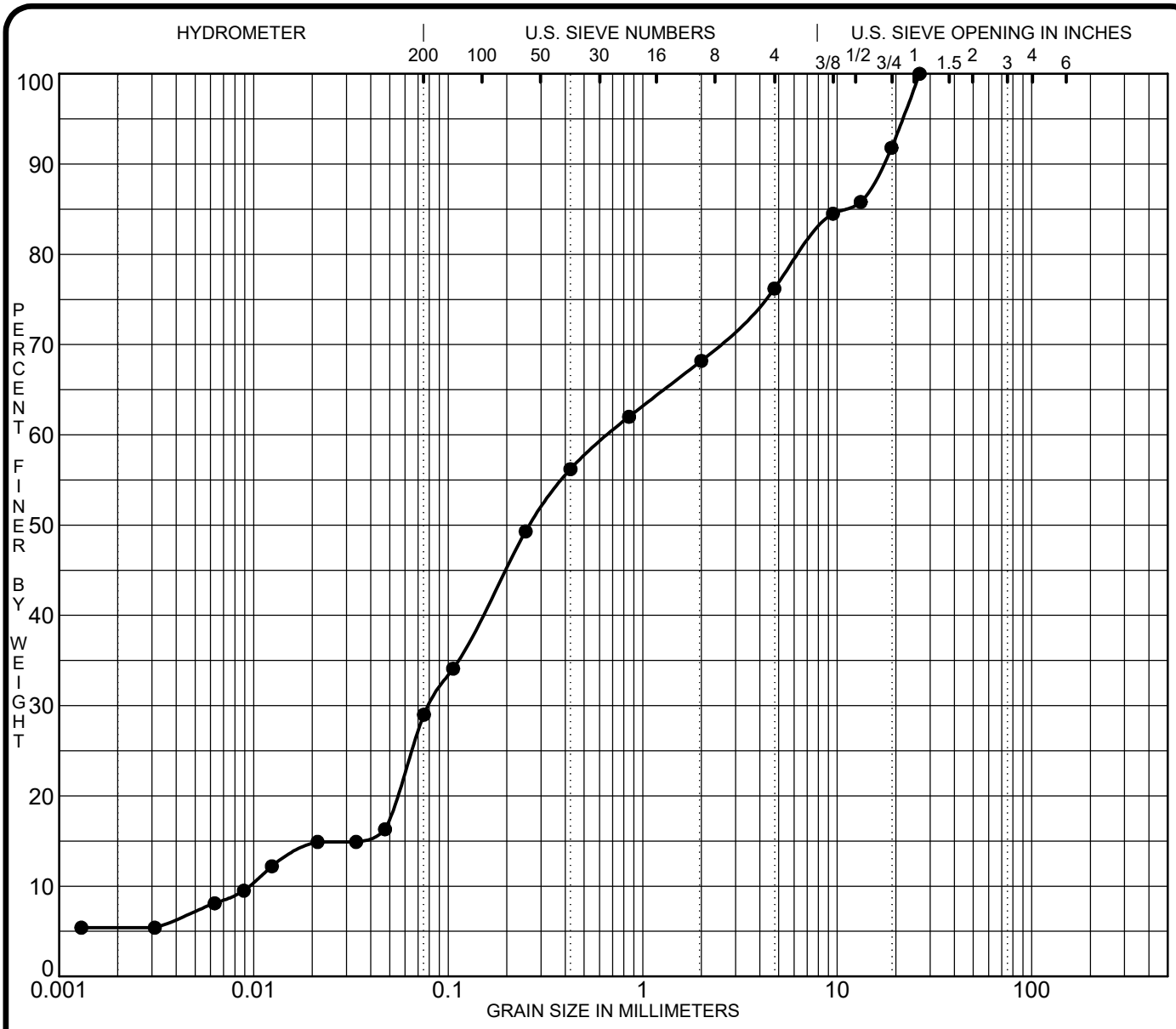
FILE NO. **PG4216**

DATE **14 Jan 25**

PATERSON GROUP

9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH14-24**	**SS3**		**8.9**				**1.02**	**70.7**
⊠									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH14-24**	**SS3**	**26.50**	**0.67**	**0.080**	**0.0095**	**23.8**	**47.2**	**23.0**	**6.0**
⊠										
▲										
★										

CLIENT **Tamarack ("Richmond") Corporation**

PROJECT **Geotechnical Investigation - Proposed Mixed-Use Development - 5970 and 6038 Ottawa Street**

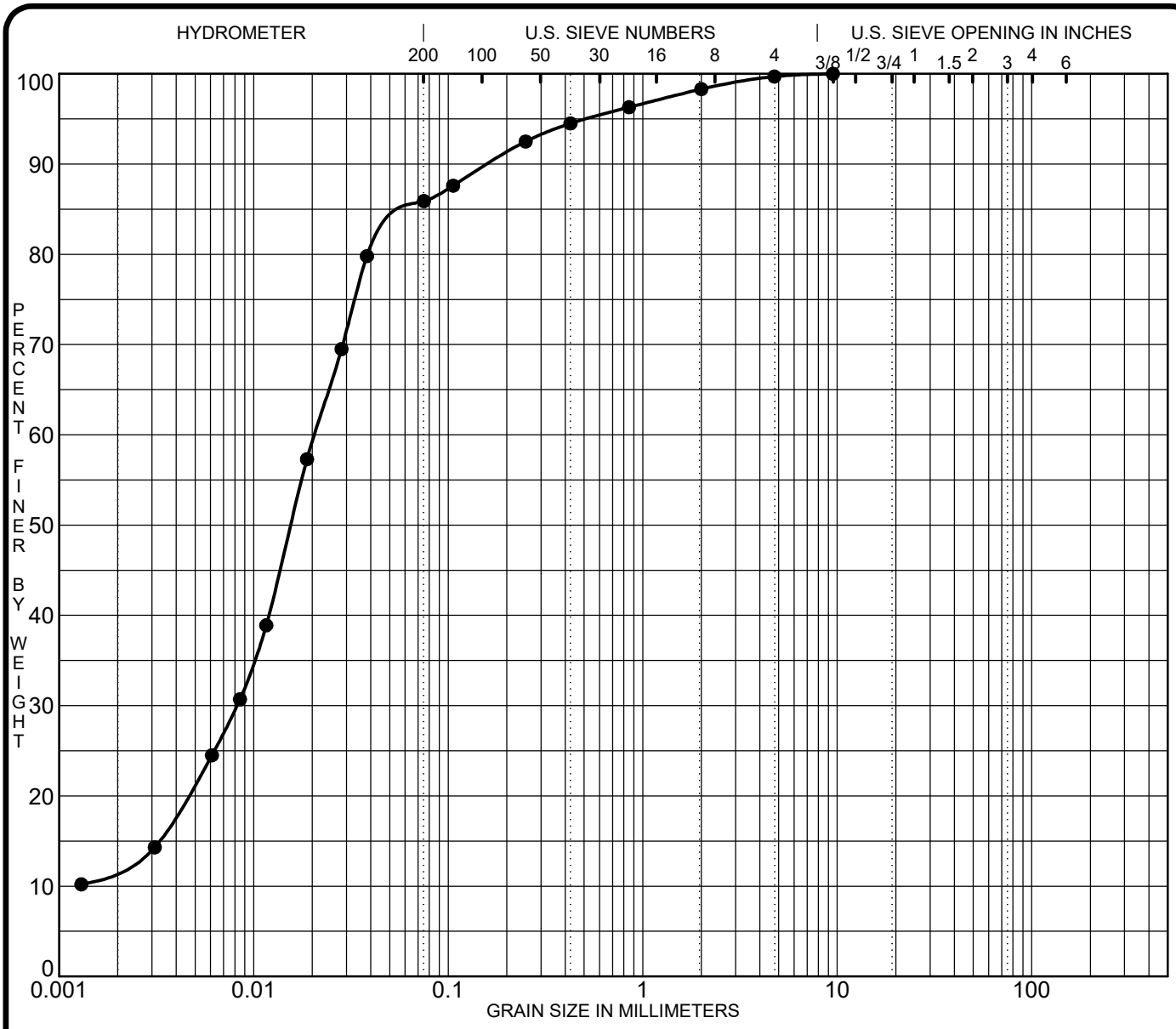
FILE NO. **PG4216**

DATE **14 Jan 25**

PATERSON GROUP

9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

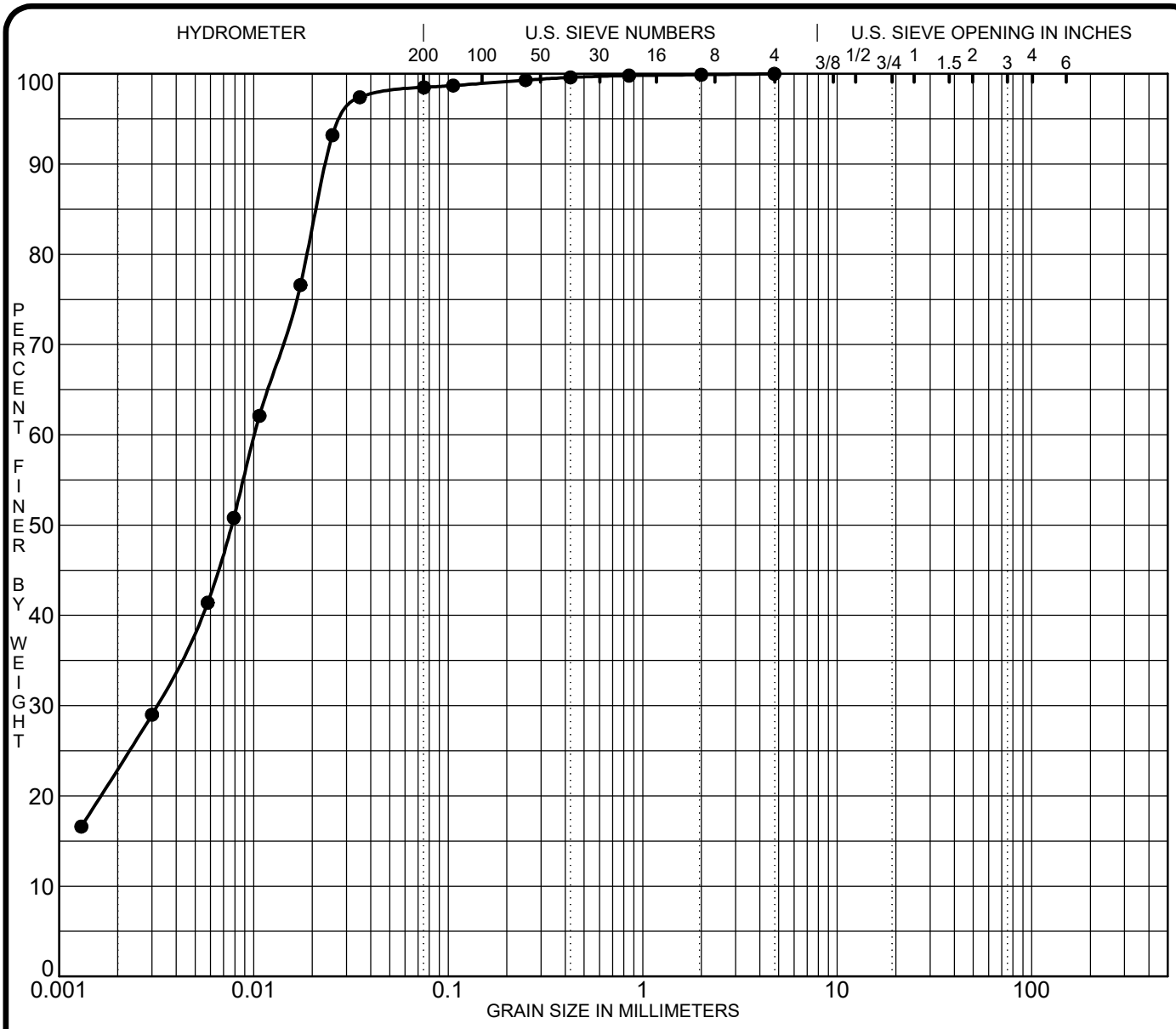
	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 1D-21 SS3**		**22.5**					
⊠								
▲								
★								

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 1D-21 SS3**	**9.50**	**0.02**	**0.008**		**0.3**	**13.8**	**73.5**	**12.4**
⊠									
▲									
★									

CLIENT **Taggart Group of Companies**
PROJECT **Geotechnical Investigation - Proposed Residential Development - Eagleson Road**
FILE NO. **PG4216**
DATE **23 Mar 21**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 5D-21 SS3**		**33.9**					
⊠								
▲								
★								

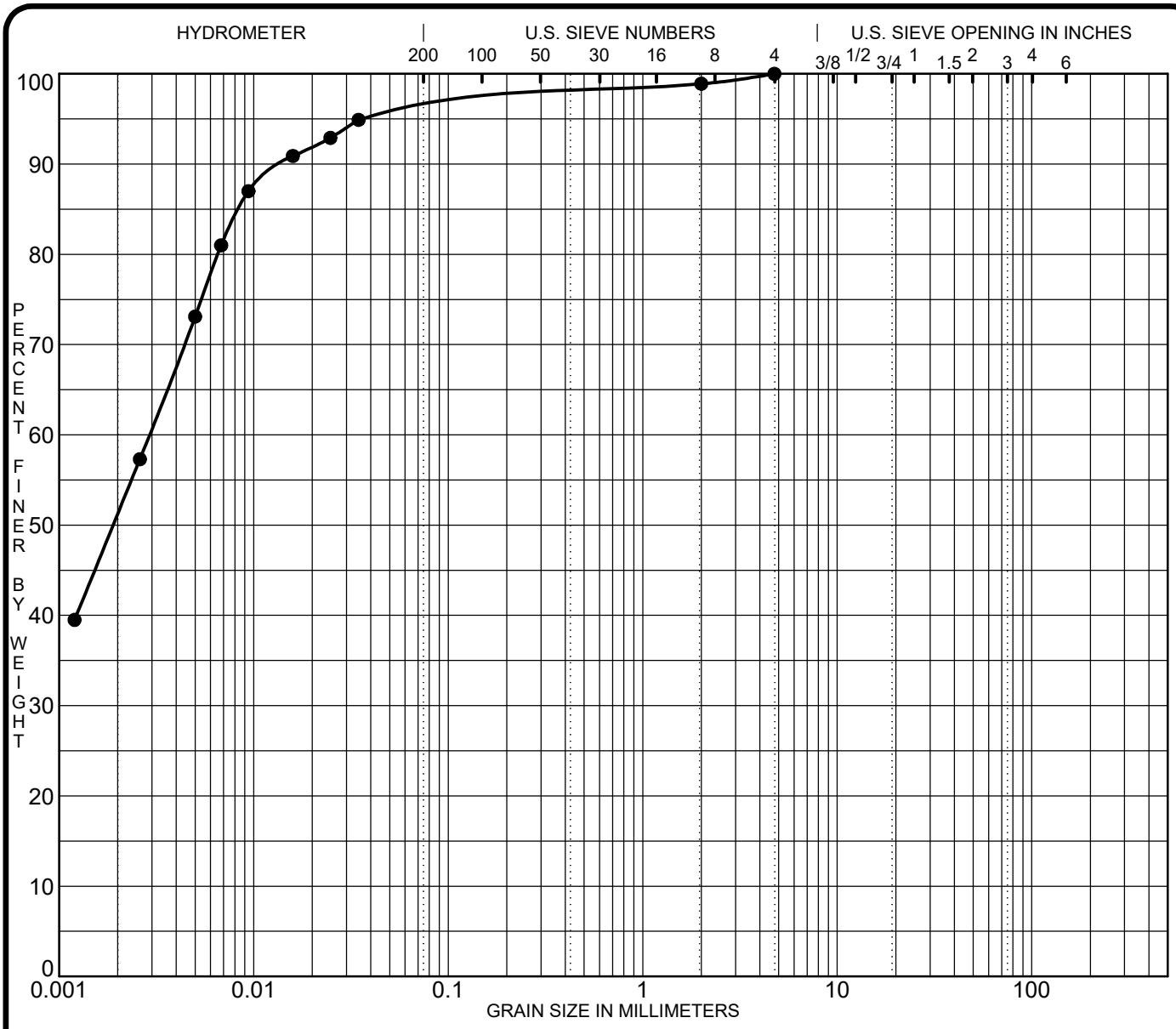
	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 5D-21 SS3**	**4.75**	**0.01**	**0.003**		**0.0**	**1.5**	**76.0**	**22.5**
⊠									
▲									
★									

CLIENT **Taggart Group of Companies**
PROJECT **Geotechnical Investigation - Proposed Residential Development - Eagleson Road**

FILE NO. **PG4216**
DATE **19 Mar 21**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	**BH 10D-21 SS3**		**46.8**					
⊠								
▲								
★								

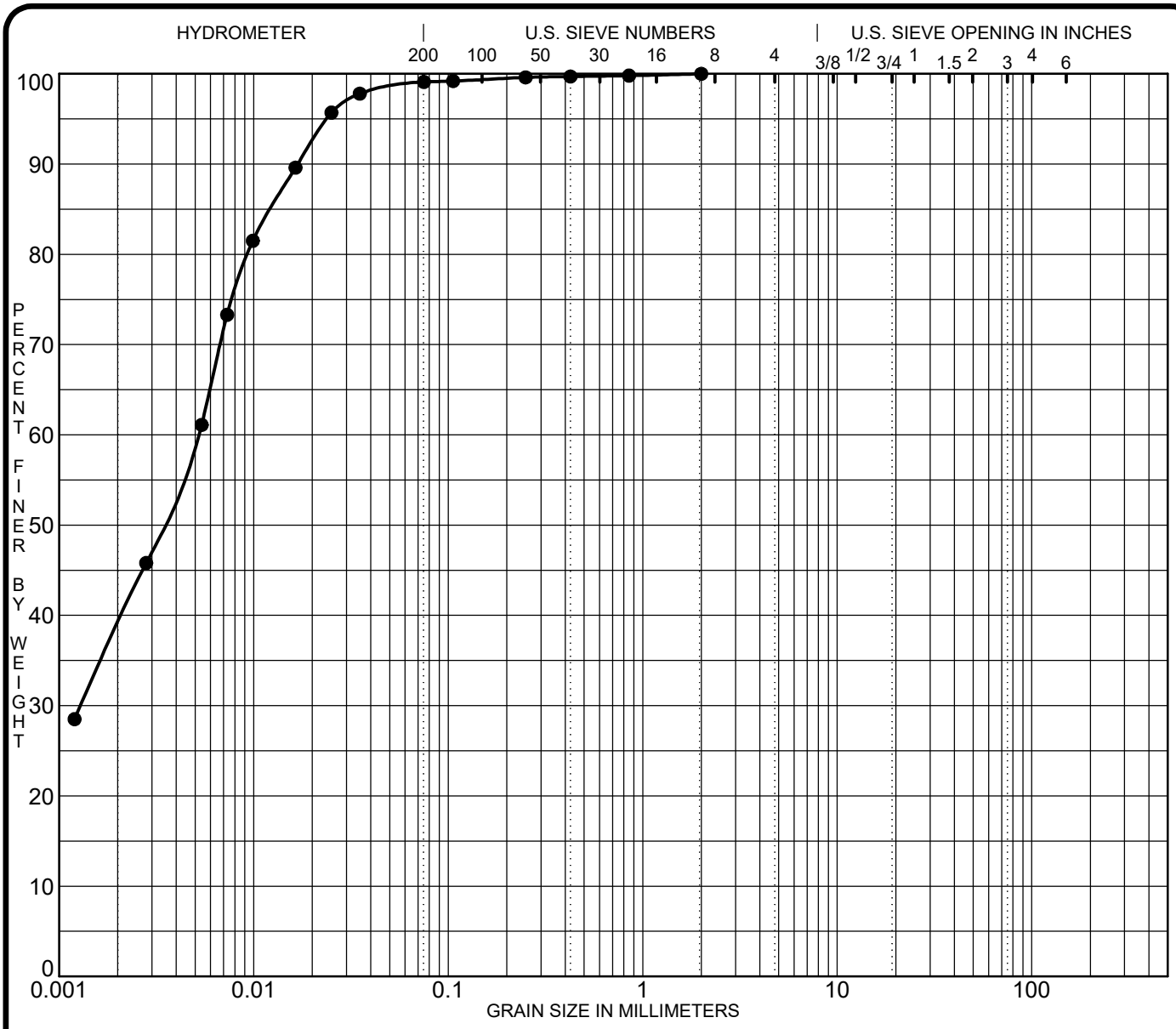
	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH 10D-21 SS3**	**4.75**	**0.00**			**0.0**	**3.3**	**46.2**	**50.5**
⊠									
▲									
★									

CLIENT **Taggart Group of Companies** FILE NO. **PG4216**

PROJECT **Geotechnical Investigation - Proposed Residential Development - Eagleson Road** DATE **19 Mar 21**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● **TP 4**	**G6**	**CH - Inorganic clays of high plasticity**	**30.3**	**52**	**21**	**31**		
⊠								
▲								
★								

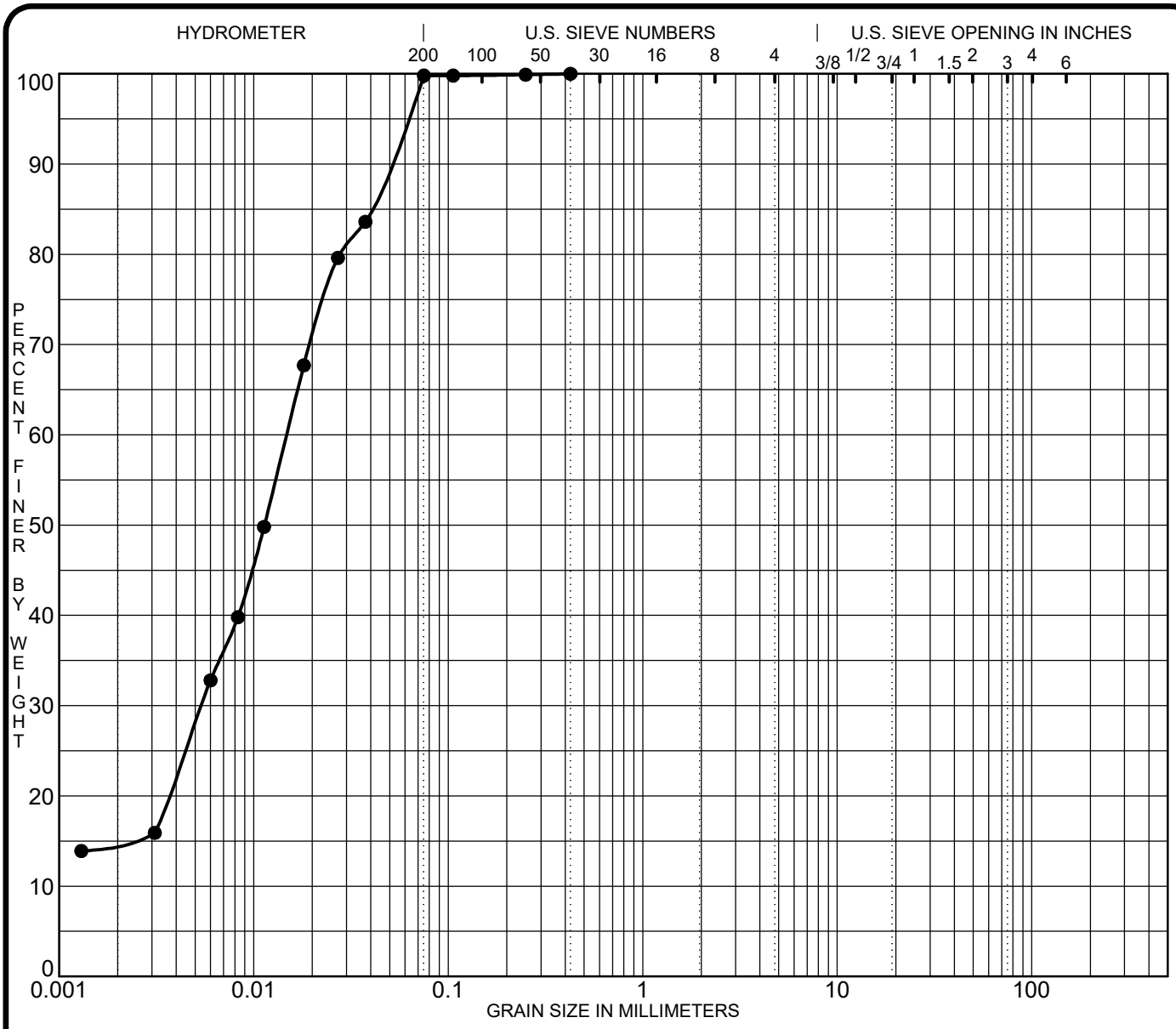
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **TP 4**	**G6**	**2.00**	**0.01**	**0.001**		**0.0**	**0.9**	**59.6**	**39.5**
⊠									
▲									
★									

CLIENT **Taggart Group of Companies**
PROJECT **Geotechnical Investigation - Proposed Development - Eagleson Road at Ottawa St.**

FILE NO. **PG4216**
DATE **27 Feb 19**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● **TP 6**	**G5**	**CL - Inorganic clay with low plasticity**	**21.6**	**36**	**19**	**17**		
⊠								
▲								
★								

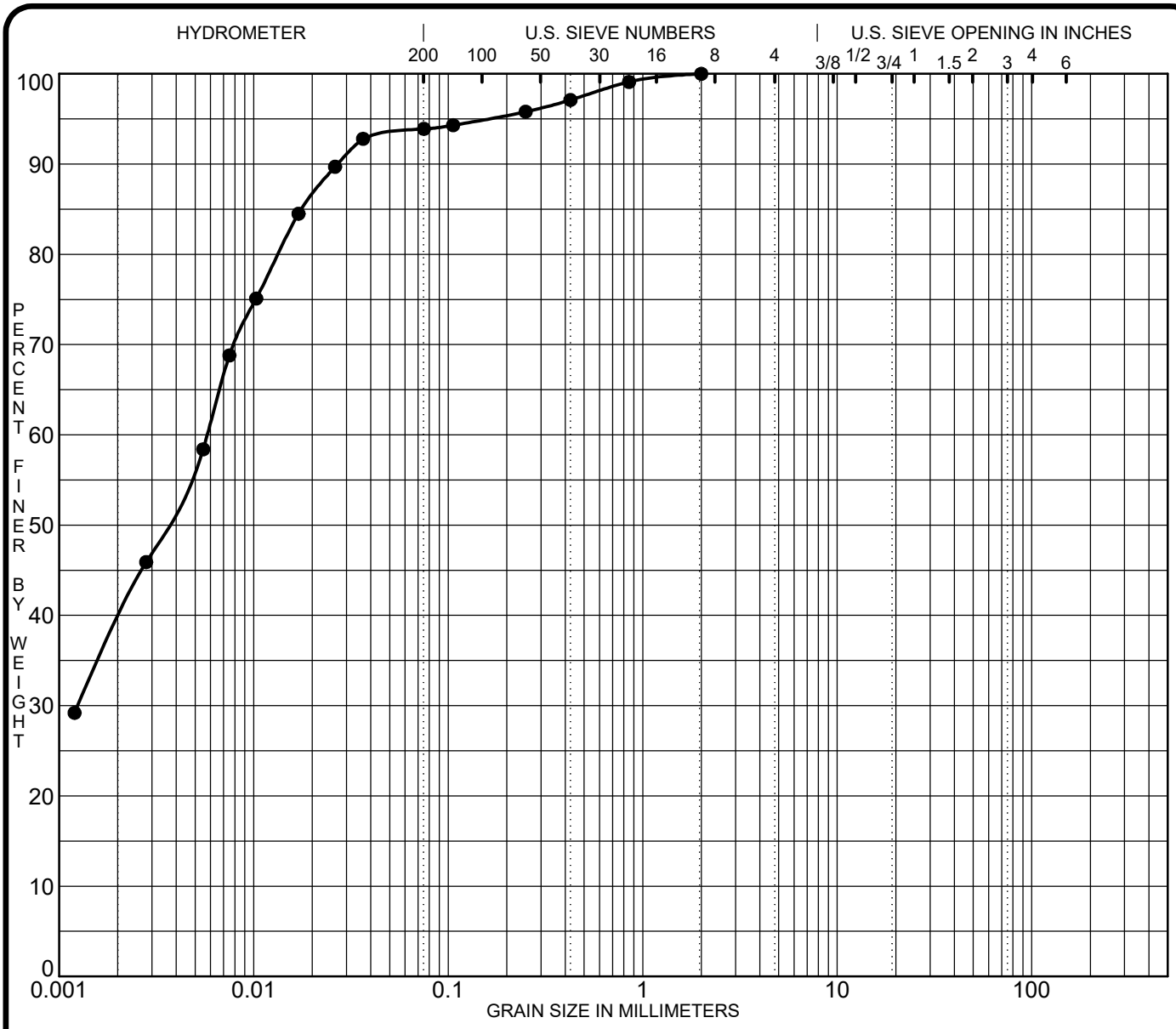
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **TP 6**	**G5**	**0.43**	**0.01**	**0.005**		**0.0**	**0.2**	**84.8**	**15.0**
⊠									
▲									
★									

CLIENT **Taggart Group of Companies**
PROJECT **Geotechnical Investigation - Proposed Development - Eagleson Road at Ottawa St.**

FILE NO. **PG4216**
DATE **27 Feb 19**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



CLAY	SILT	SAND			GRAVEL		COBBLES
		fine	medium	coarse	fine	coarse	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● **TP 8**	**G5**	**CH - Inorganic clays of high plasticity**	**29.9**	**54**	**26**	**29**		
⊠								
▲								
★								

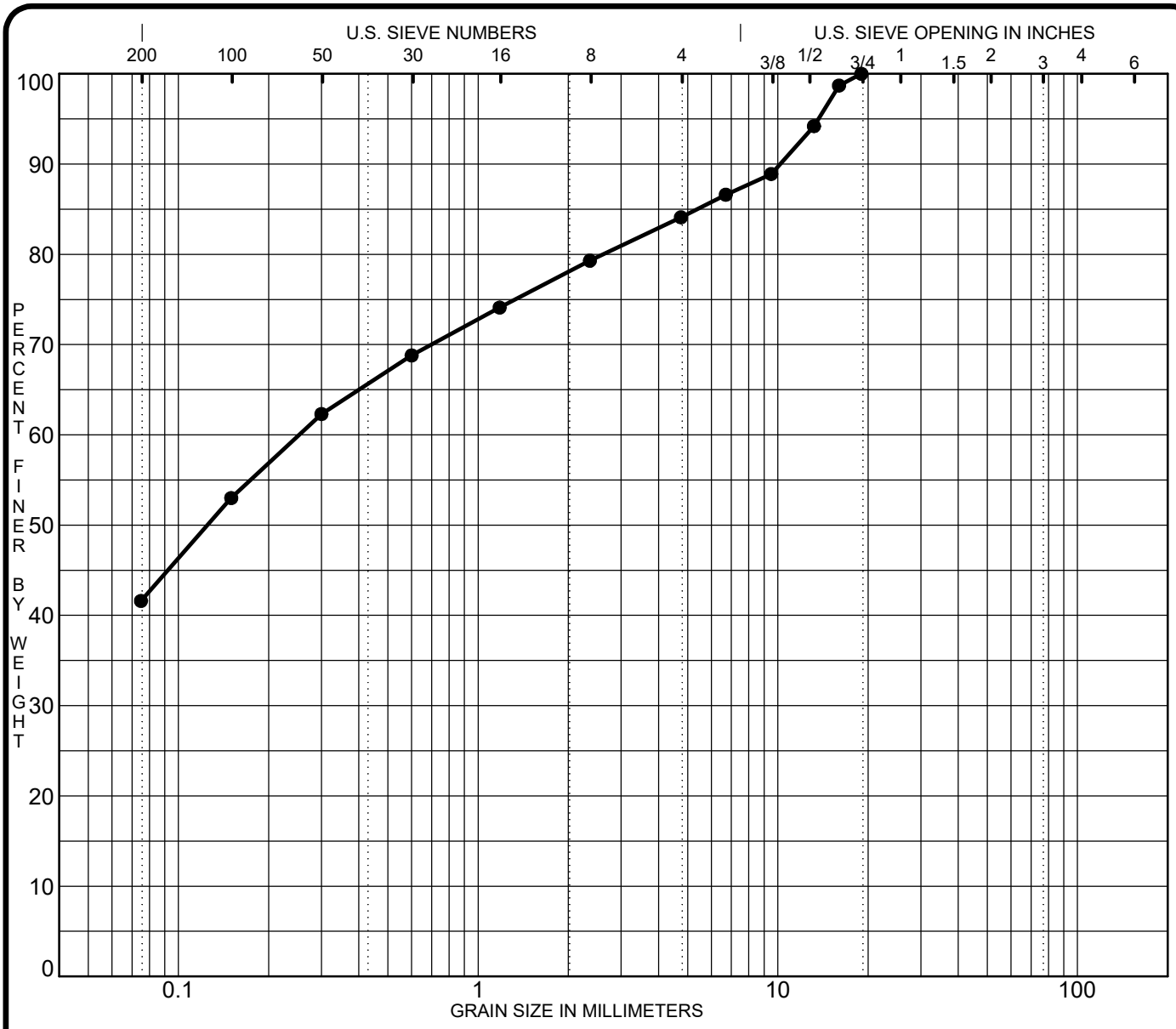
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **TP 8**	**G5**	**2.00**	**0.01**	**0.001**		**0.0**	**6.1**	**54.4**	**39.5**
⊠									
▲									
★									

CLIENT **Taggart Group of Companies**
PROJECT **Geotechnical Investigation - Proposed Development - Eagleson Road at Ottawa St.**

FILE NO. **PG4216**
DATE **27 Feb 19**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**TP 9**	**G1**							
⊠									
▲									
★									

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP 9**	**G1**	**19.00**	**0.25**			**15.9**	**42.5**	**41.6**	
⊠										
▲										
★										

CLIENT **Taggart Group of Companies**

PROJECT **Geotechnical Investigation - Proposed Development - Eagleson Road at Ottawa St.**

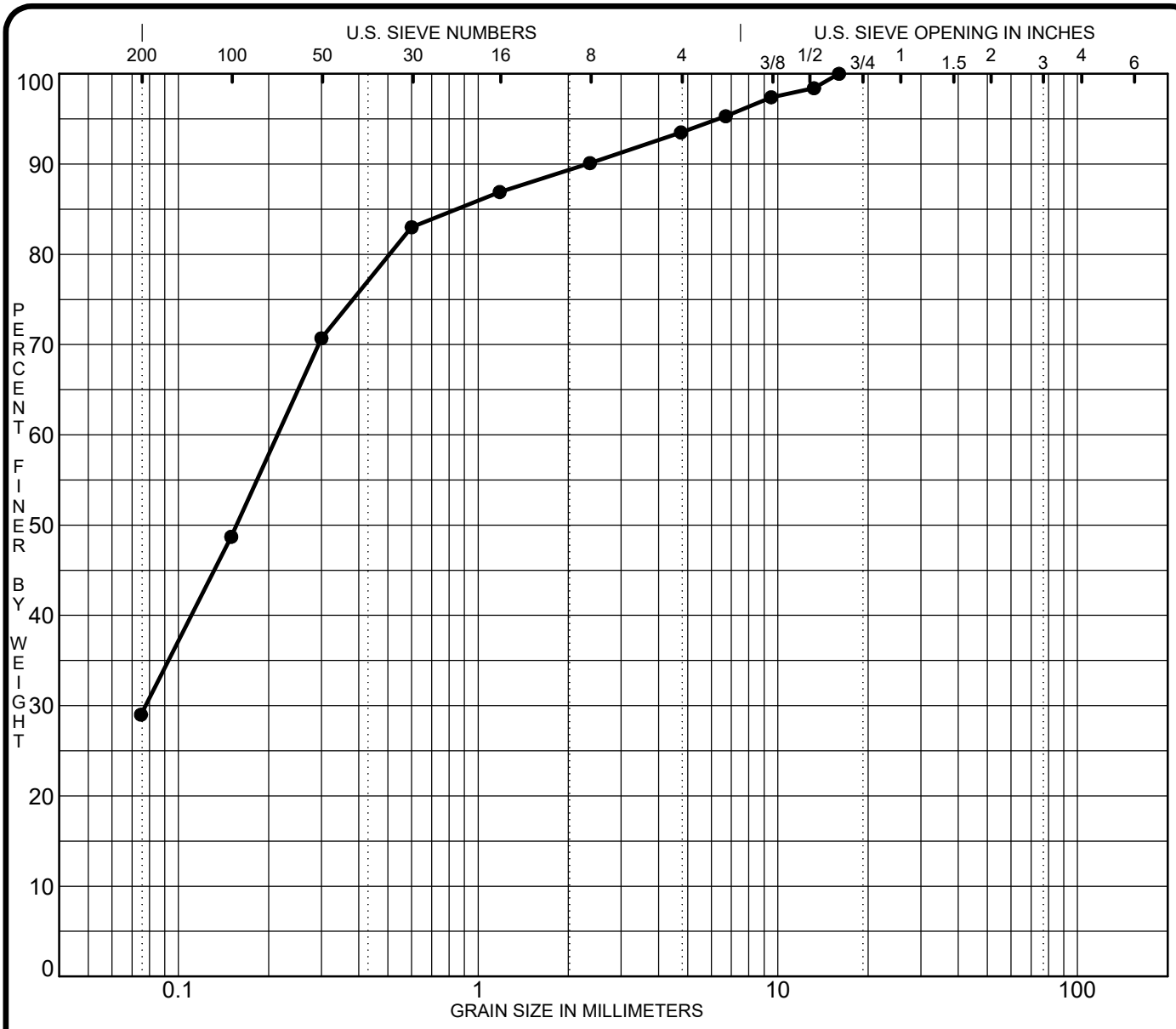
FILE NO. **PG4216**

DATE **27 Feb 19**

PATERSON GROUP

9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**TP11**	**G4**							
⊠									
▲									
★									

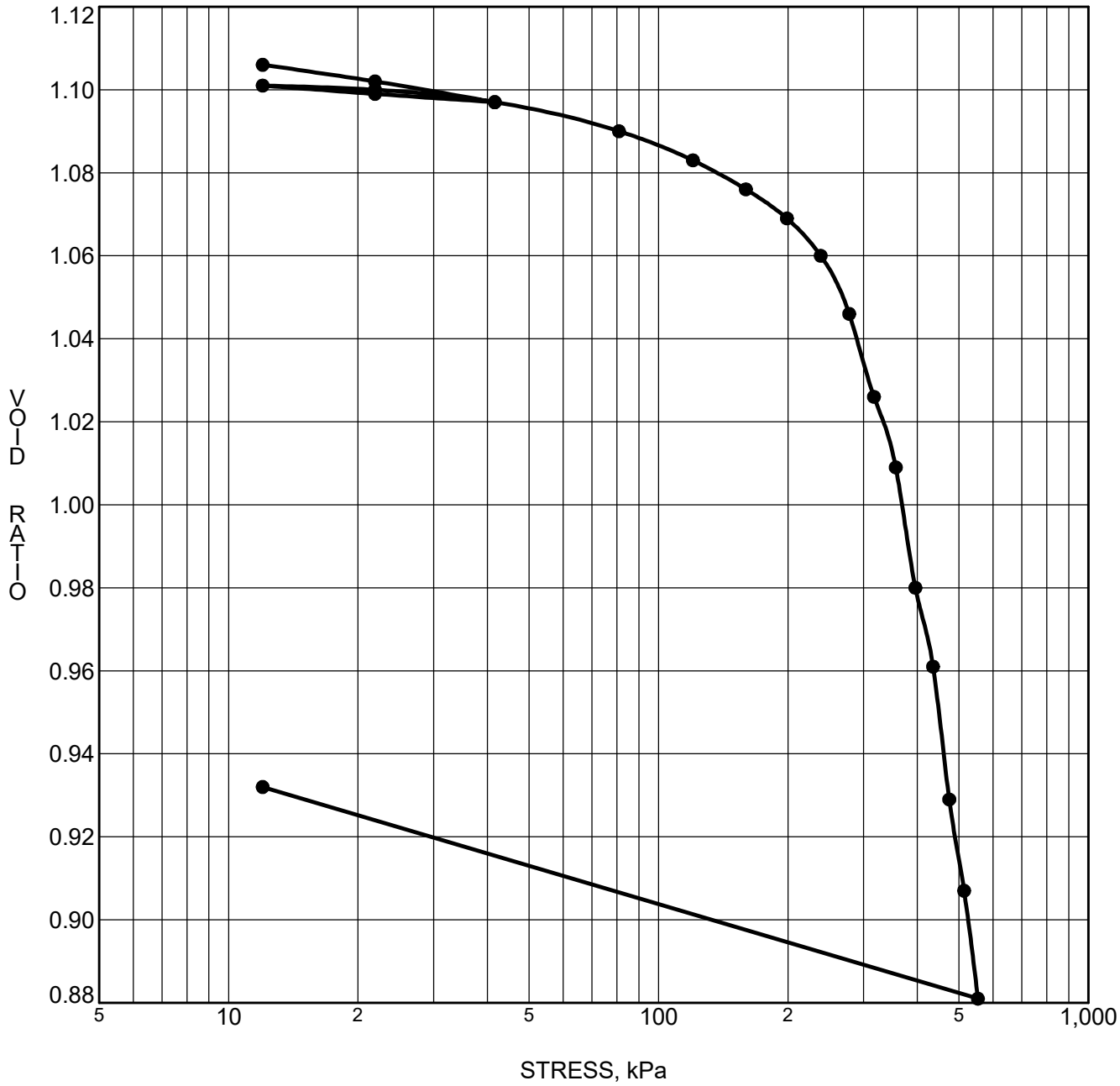
	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**TP11**	**G4**	**16.00**	**0.21**	**0.078**		**6.5**	**64.5**	**29.0**	
⊠										
▲										
★										

CLIENT **Taggart Group of Companies**
PROJECT **Geotechnical Investigation - Proposed Development - Eagleson Road at Ottawa St.**

FILE NO. **PG4216**
DATE **27 Feb 19**

PATERSON GROUP
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
TEL: (613) 226-7381

GRAIN SIZE DISTRIBUTION



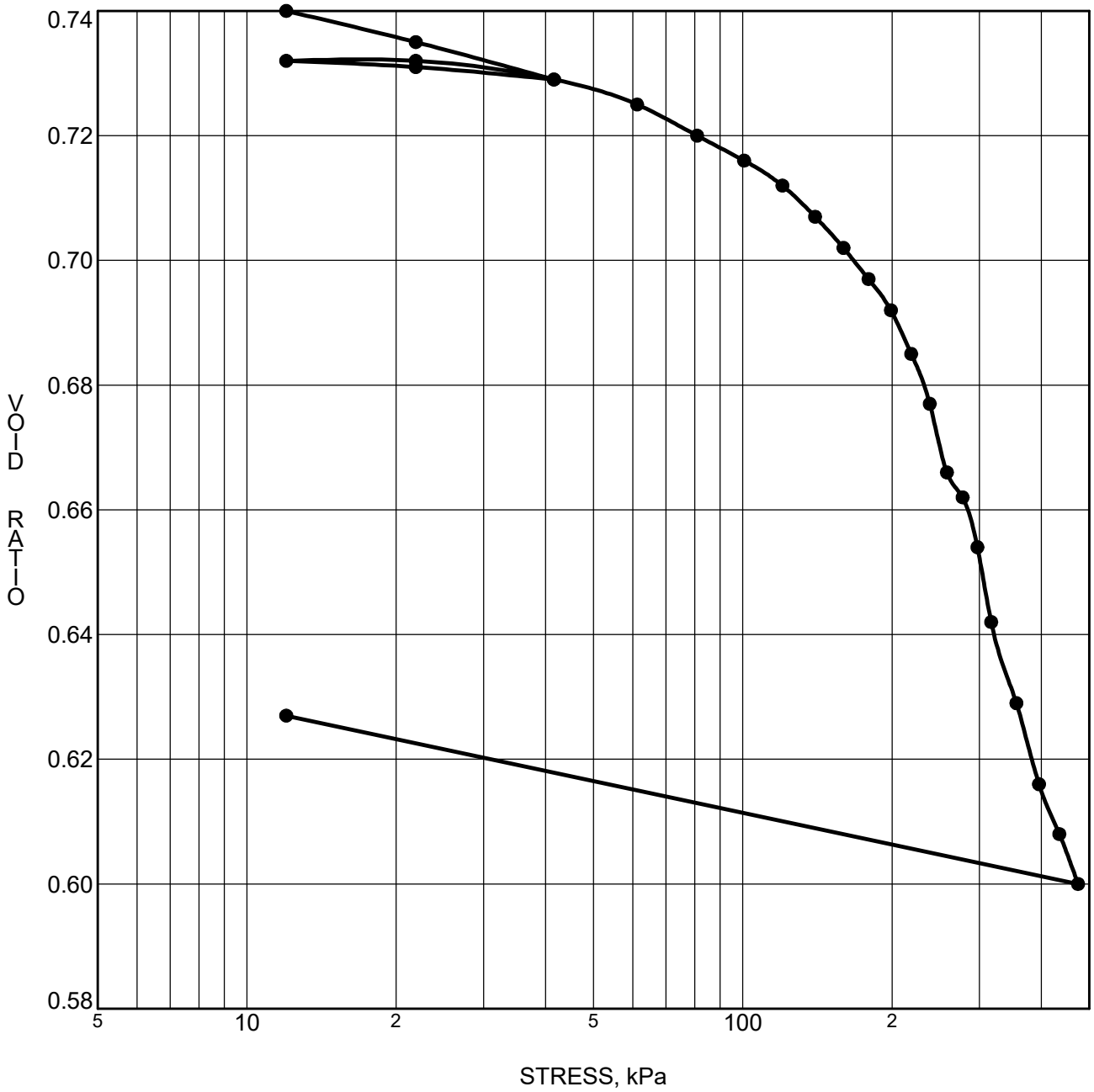
CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 3B-21**	p'o	**56.76** kPa	Ccr	**0.009**
Sample No.	**TW1**	p'c	**300** kPa	Cc	**0.687**
Sample Depth	**3.38** m	OC Ratio	**5.3**	Wo	**40.4** %
Sample Elev.	**90.40** m	Void Ratio	**1.111**	Unit Wt.	**17.9** kN/m ^{3}

CLIENT **Tamarack ("Richmond") Corporation** FILE NO. **PG4216**

PROJECT **Geotechnical Investigation Proposed Mixed-Use Development - Eagleson Road** DATE **2025-01-20**

patersongroup Consulting Engineers
9 Auriga Drive, Ottawa, Ontario K2E 7T9

CONSOLIDATION TEST



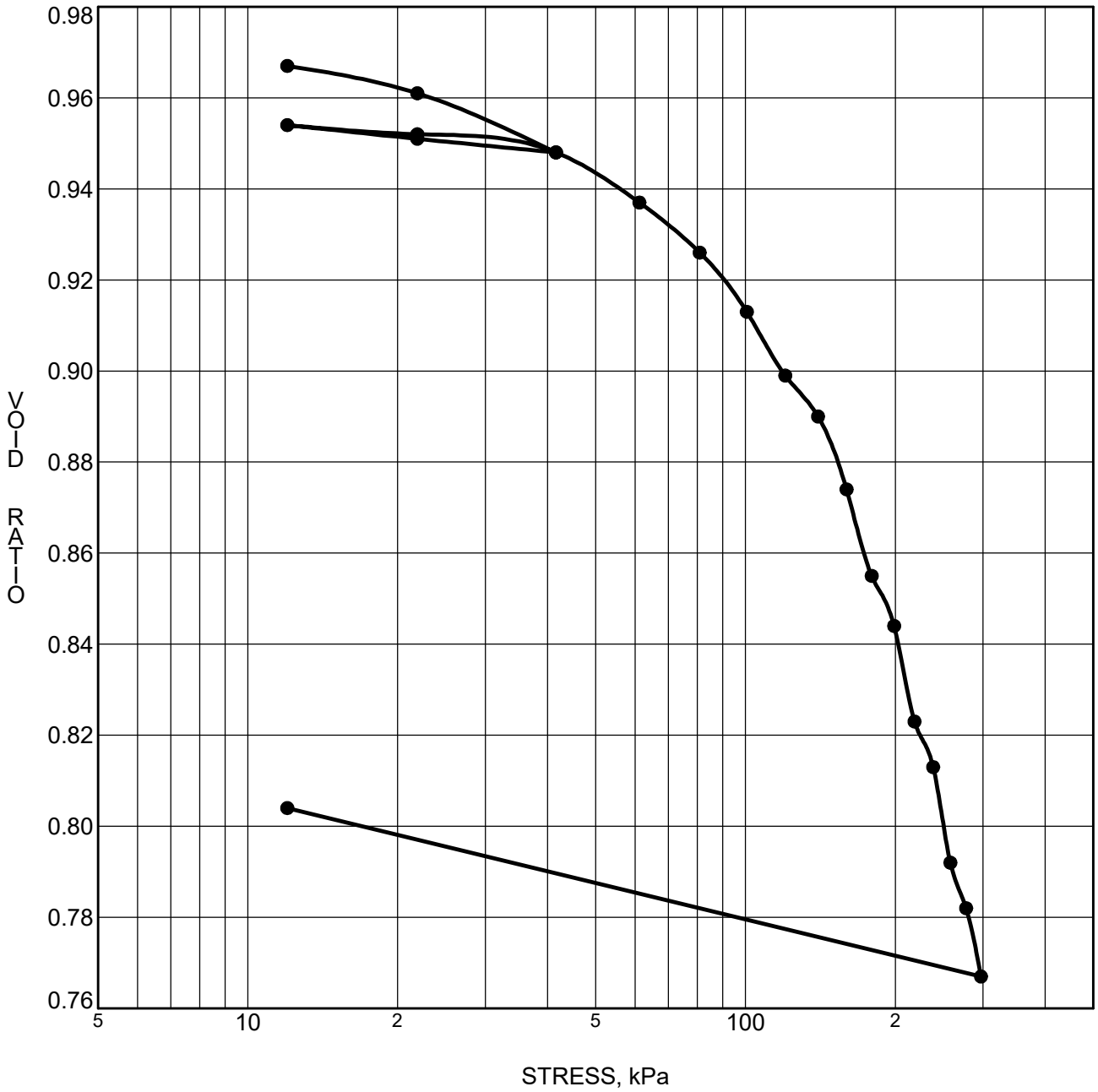
CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 3B-21**	p'o	**60.58** kPa	Ccr	**0.006**
Sample No.	**TW2**	p'c	**176.43** kPa	Cc	**0.247**
Sample Depth	**4.06** m	OC Ratio	**2.9**	Wo	**27.1** %
Sample Elev.	**89.72** m	Void Ratio	**0.746**	Unit Wt.	**19.6** kN/m ^{3}

CLIENT **Tamarack ("Richmond") Corporation** FILE NO. **PG4216**

PROJECT **Geotechnical Investigation Proposed Mixed-Use Development - Eagleson Road** DATE **2025-01-14**

patersongroup Consulting Engineers
9 Auriga Drive, Ottawa, Ontario K2E 7T9

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH12A-24**	p'o	**54.83** kPa	Ccr	**0.012**
Sample No.	**TW2**	p'c	**146.01** kPa	Cc	**0.420**
Sample Depth	**4.27** m	OC Ratio	**2.7**	Wo	**35.5** %
Sample Elev.	**89.24** m	Void Ratio	**0.975**	Unit Wt.	**18.5** kN/m ^{3}

CLIENT **Tamarack ("Richmond") Corporation** FILE NO. **PG4216**

PROJECT **Geotechnical Investigation Proposed Mixed-Use Development - Eagleson Road** DATE **2025-01-20**

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

CONSOLIDATION TEST

Certificate of Analysis

Client: Paterson Group Consulting Engineers

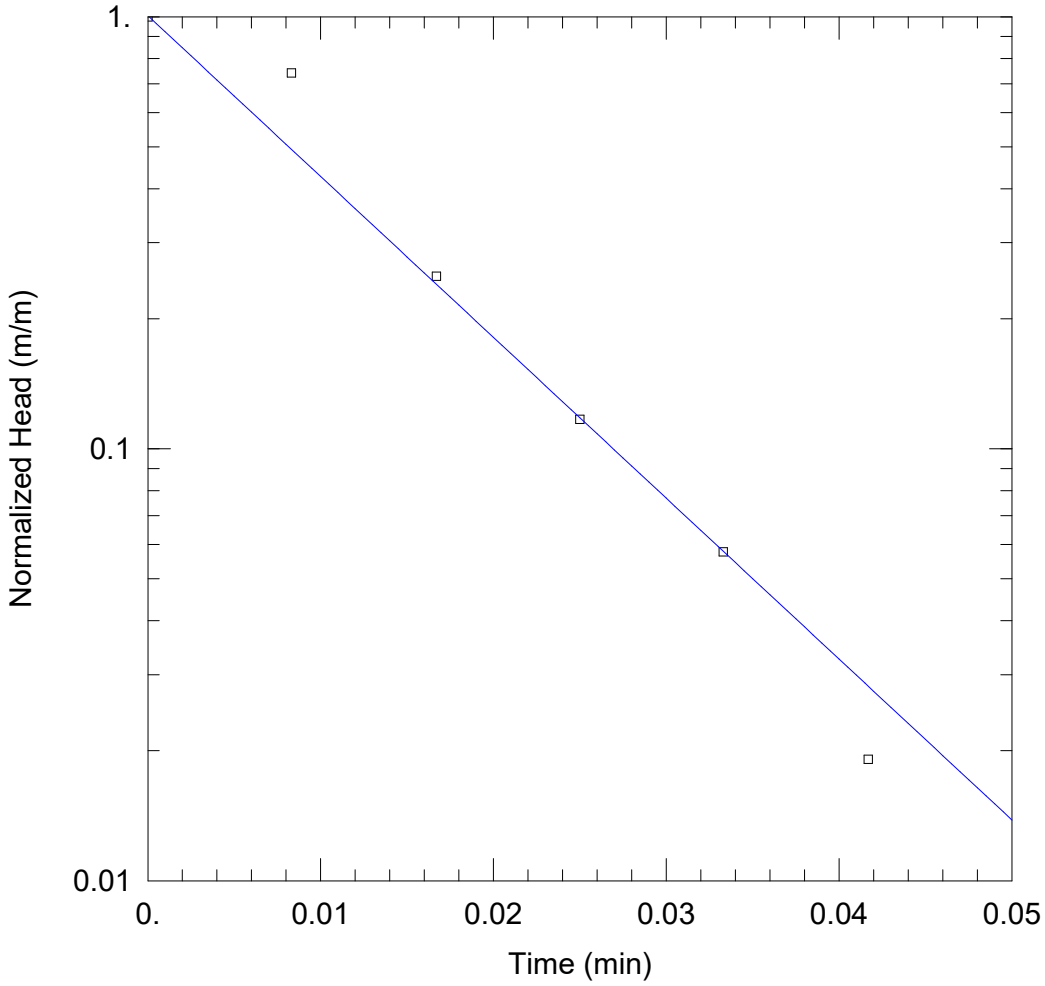
Client PO: 25710

Report Date: 27-Dec-2018

Order Date: 19-Dec-2018

Project Description: PG4216

	Client ID:	BH8-SS3	-	-	-
	Sample Date:	12/17/2018 15:00	-	-	-
	Sample ID:	1851341-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	89.5	-	-	-
General Inorganics					
pH	0.05 pH Units	7.94	-	-	-
Resistivity	0.10 Ohm.m	96.9	-	-	-
Anions					
Chloride	5 ug/g dry	6	-	-	-
Sulphate	5 ug/g dry	<5	-	-	-



FALLING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH9-24 Falling Head 1 of 1.aqt
Date: 02/26/25 Time: 16:14:40

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH9-24
Test Date: January 9, 2025

AQUIFER DATA

Saturated Thickness: 5.135 m Anisotropy Ratio (Kz/Kr): 1.

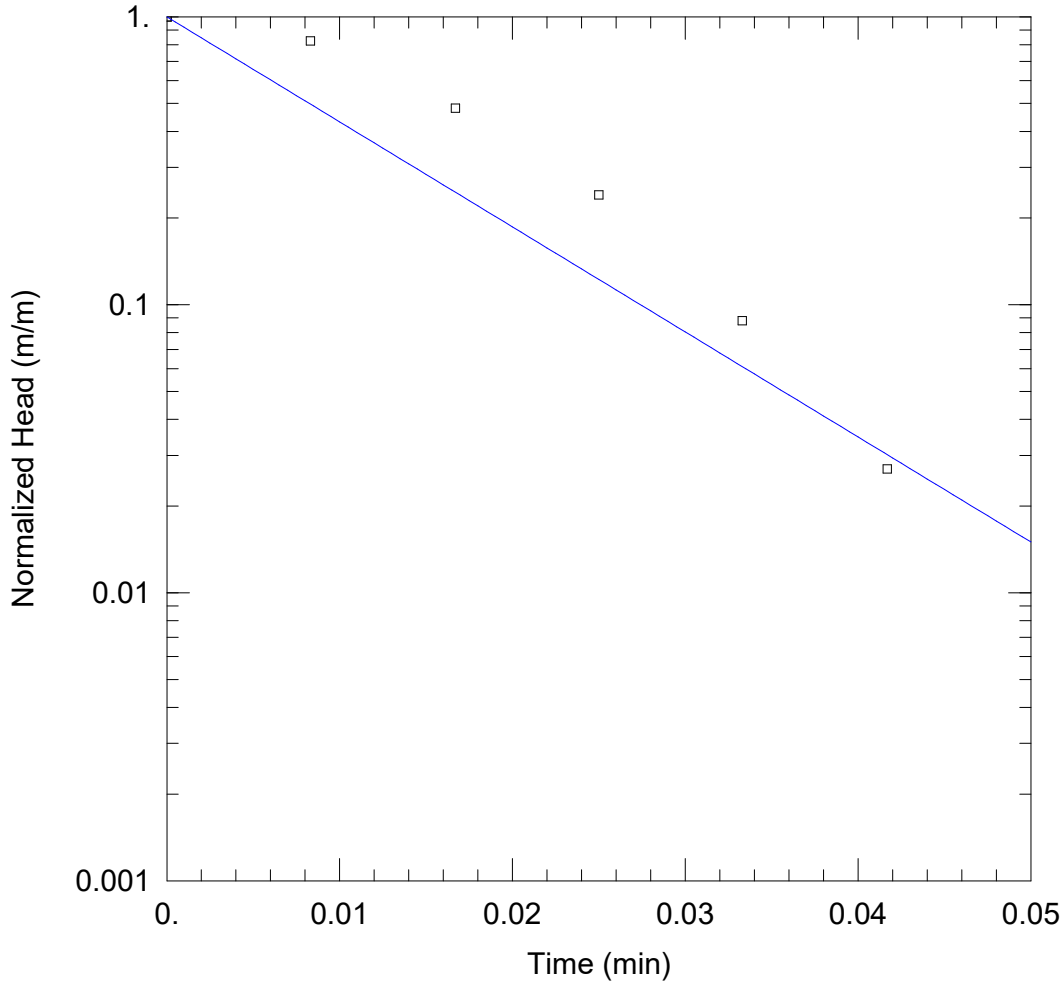
WELL DATA (BH9-24)

Initial Displacement: 0.649 m Static Water Column Height: 5.135 m
Total Well Penetration Depth: 5.135 m Screen Length: 1.524 m
Casing Radius: 0.01588 m Well Radius: 0.0381 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.0005179 m/sec y0 = 0.6533 m



RISING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH9-24 Rising Head 1 of 1 - Copy.aqt
Date: 02/26/25 Time: 16:59:59

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH9-24
Test Date: January 9, 2025

AQUIFER DATA

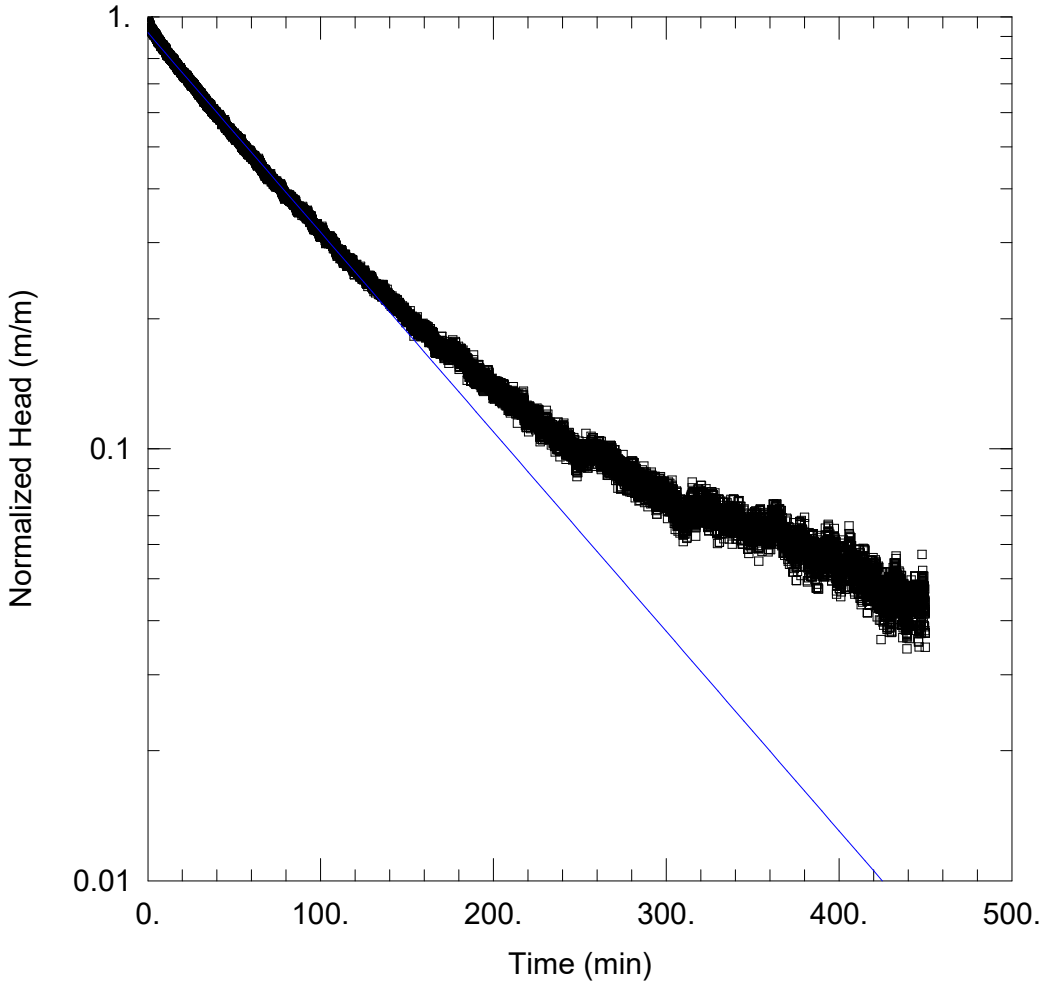
Saturated Thickness: 5.14 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH9-24)

Initial Displacement: 0.325 m
Total Well Penetration Depth: 5.14 m
Casing Radius: 0.01588 m
Static Water Column Height: 5.14 m
Screen Length: 1.524 m
Well Radius: 0.0381 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.0005072 m/sec
y0 = 0.325 m



FALLING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH10-24 Falling Head 1 of 1.aqt
Date: 02/26/25 Time: 16:18:32

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH10-24
Test Date: January 9, 2025

AQUIFER DATA

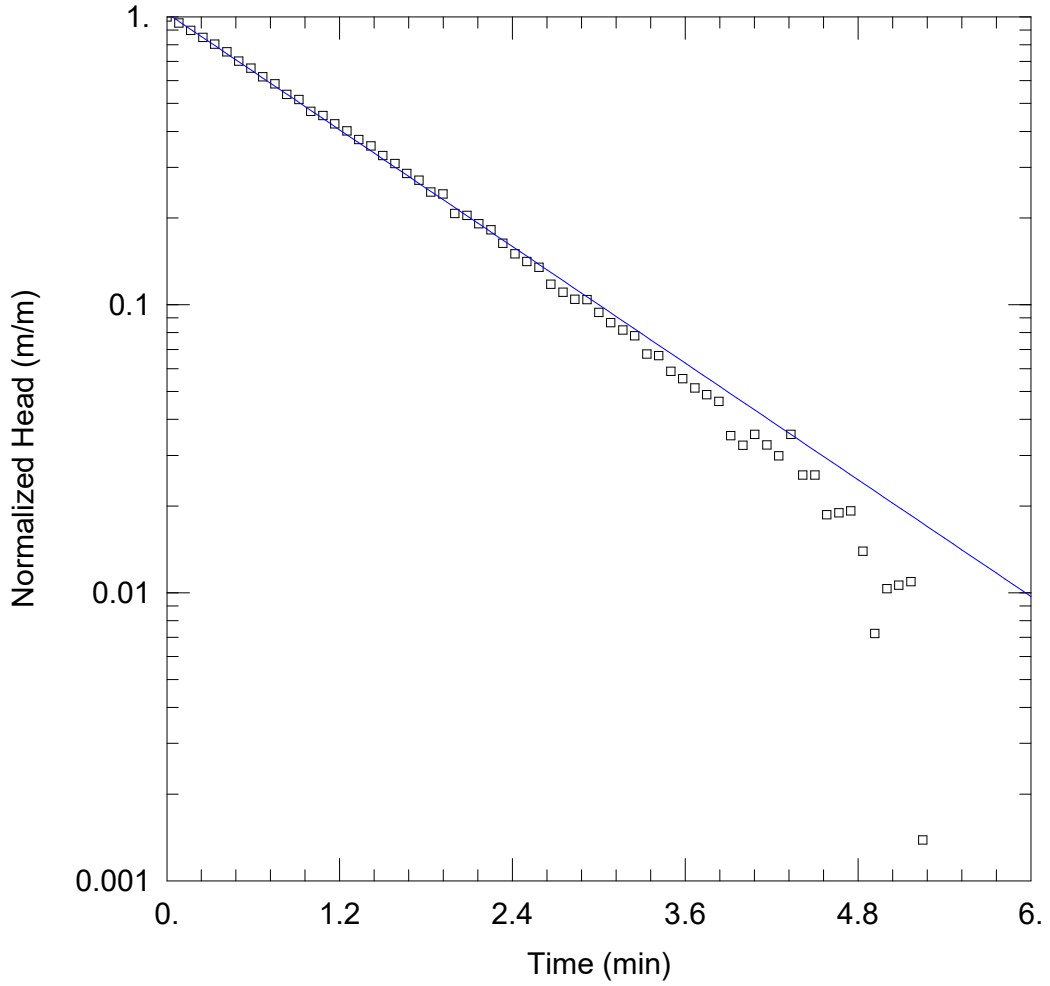
Saturated Thickness: 2.11 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH10-24)

Initial Displacement: 0.448 m
Total Well Penetration Depth: 2.11 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.11 m
Screen Length: 1.524 m
Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 1.265E-7 m/sec
y0 = 0.4117 m



FALLING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH10D-21 Falling Head 1 of 1.aqt
Date: 02/26/25 Time: 16:20:38

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH10D-21
Test Date: January 9, 2025

AQUIFER DATA

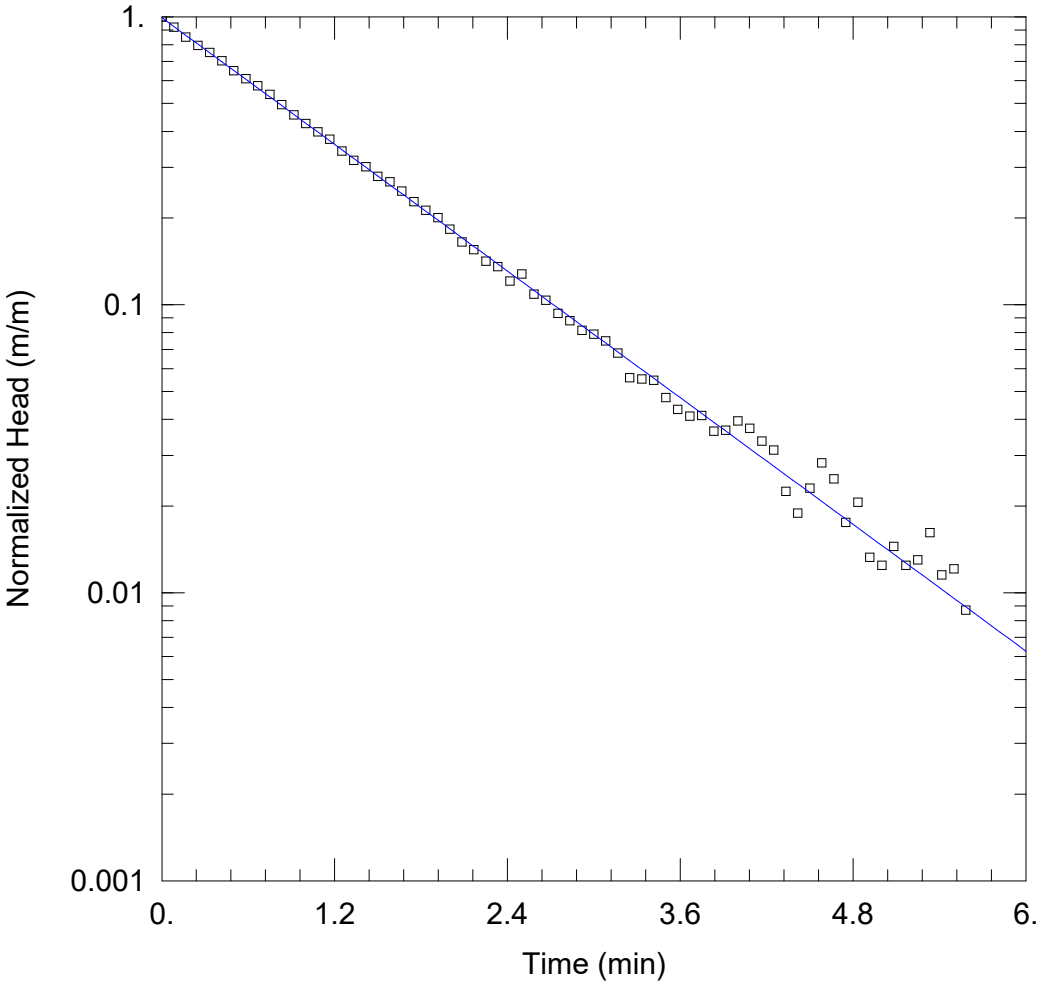
Saturated Thickness: 2.375 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH10D-21)

Initial Displacement: 0.415 m
Total Well Penetration Depth: 2.375 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.375 m
Screen Length: 1.524 m
Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 9.245E-6 m/sec
y0 = 0.4272 m



RISING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH10D-21 Rising Head 1 of 1.aqt
Date: 02/26/25 Time: 16:23:01

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH10D-21
Test Date: January 9, 2025

AQUIFER DATA

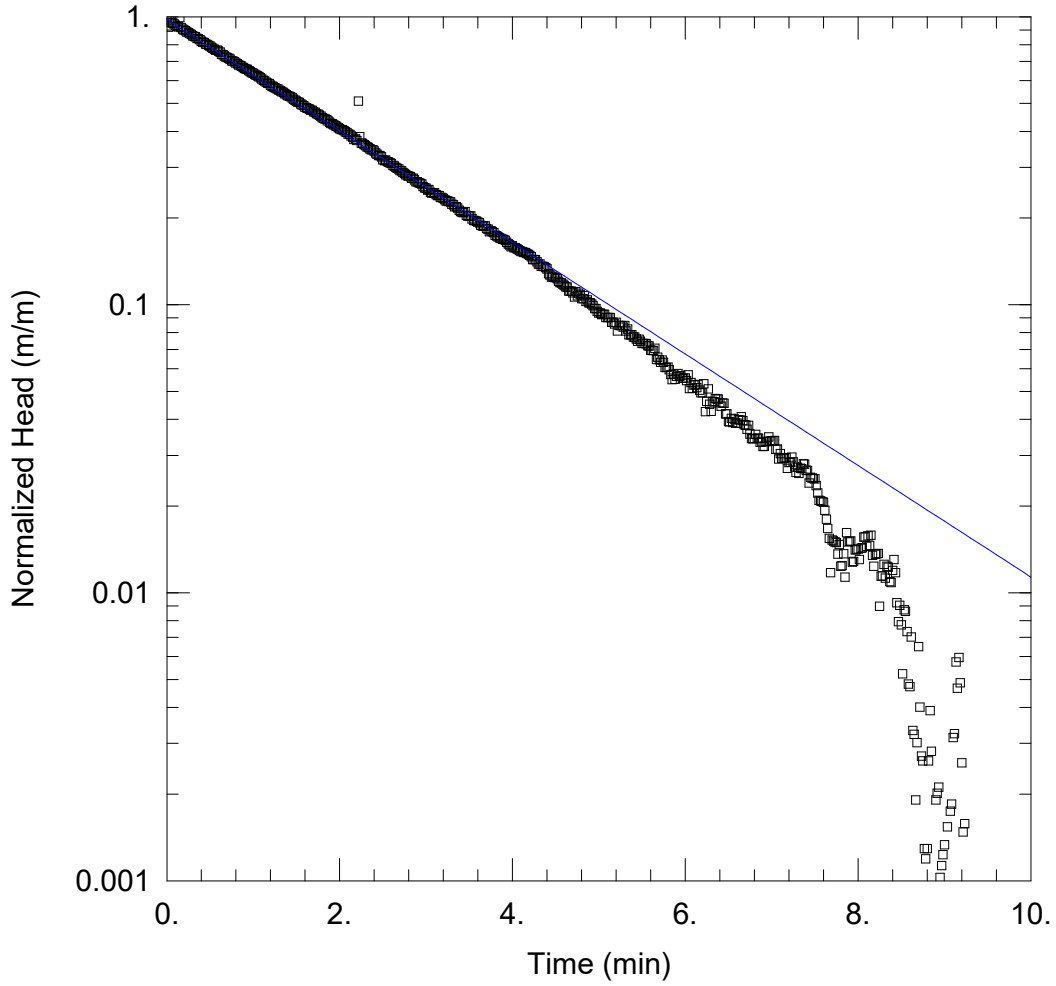
Saturated Thickness: 2.375 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH10D-21)

Initial Displacement: 0.45 m
Total Well Penetration Depth: 2.375 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.375 m
Screen Length: 1.524 m
Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 1.004E-5 m/sec
y0 = 0.4468 m



FALLING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH11-24 Falling Head 1 of 1.aqt
Date: 02/26/25 Time: 16:24:14

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH11-24
Test Date: January 9, 2025

AQUIFER DATA

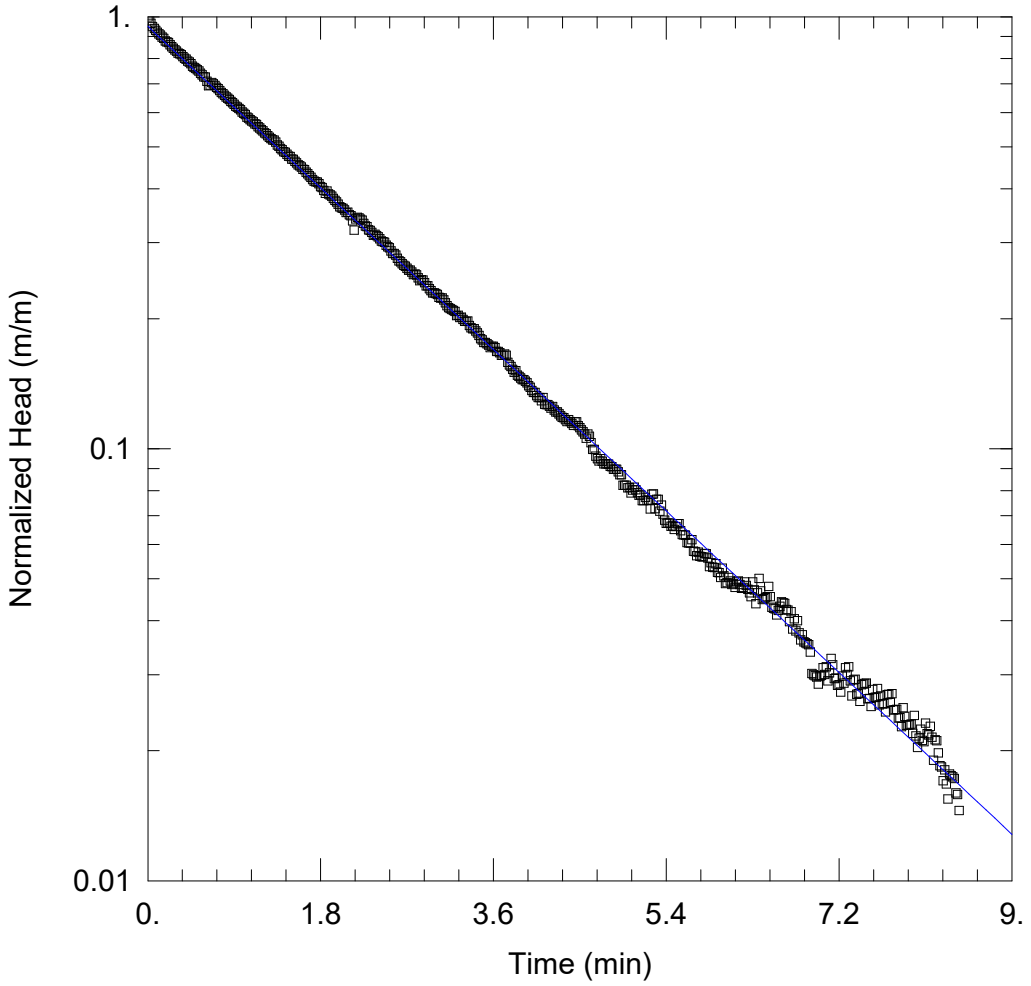
Saturated Thickness: 4.585 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH11-24)

Initial Displacement: 0.487 m Static Water Column Height: 4.585 m
Total Well Penetration Depth: 4.585 m Screen Length: 1.524 m
Casing Radius: 0.0254 m Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev
K = 5.301E-6 m/sec y0 = 0.4764 m



RISING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH11-24 Rising Head 1 of 1.aqt
Date: 02/26/25 Time: 16:25:47

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH11-24
Test Date: January 9, 2025

AQUIFER DATA

Saturated Thickness: 4.58 m Anisotropy Ratio (Kz/Kr): 1.

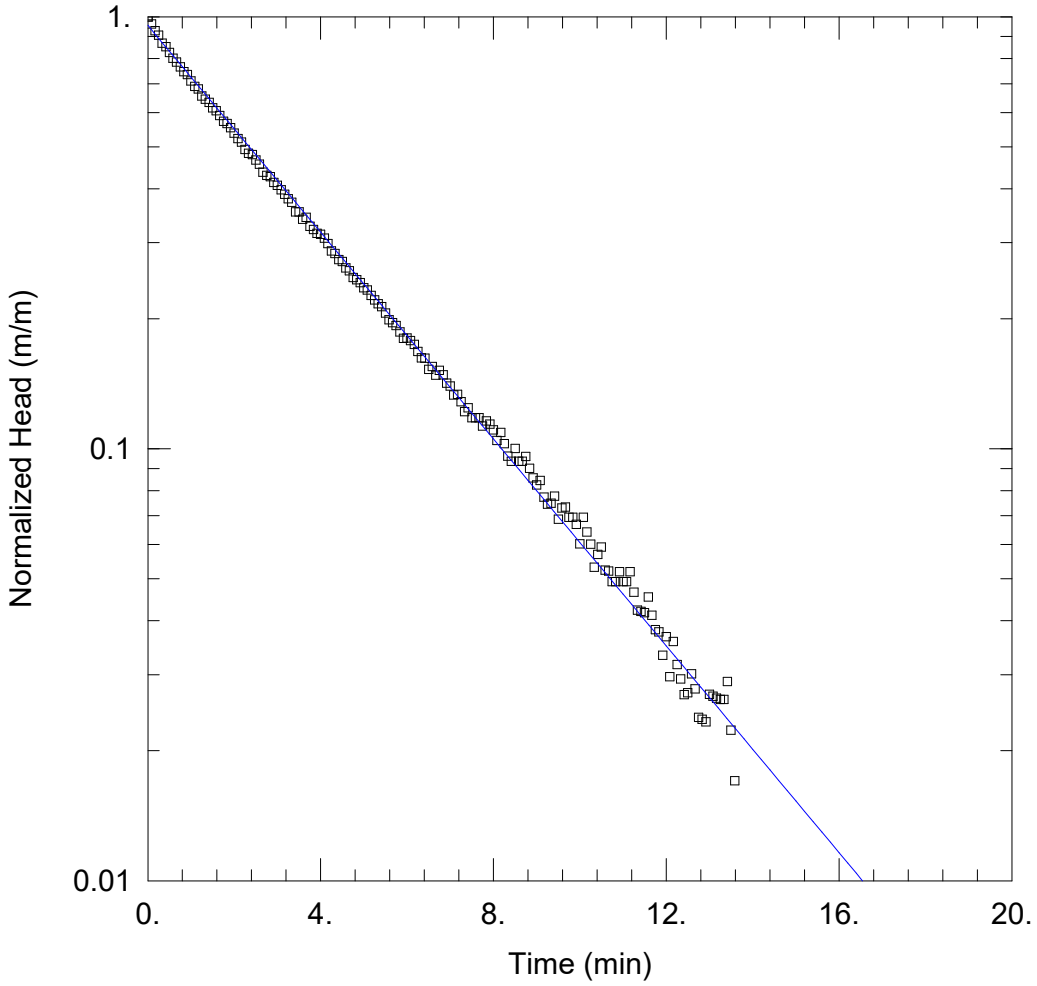
WELL DATA (BH11-24)

Initial Displacement: 0.498 m Static Water Column Height: 4.58 m
Total Well Penetration Depth: 4.58 m Screen Length: 1.524 m
Casing Radius: 0.0254 m Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 5.69E-6 m/sec y0 = 0.4732 m



FALLING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH12-24 Falling Head 1 of 1.aqt
Date: 02/26/25 Time: 16:26:49

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH12-24
Test Date: January 9, 2025

AQUIFER DATA

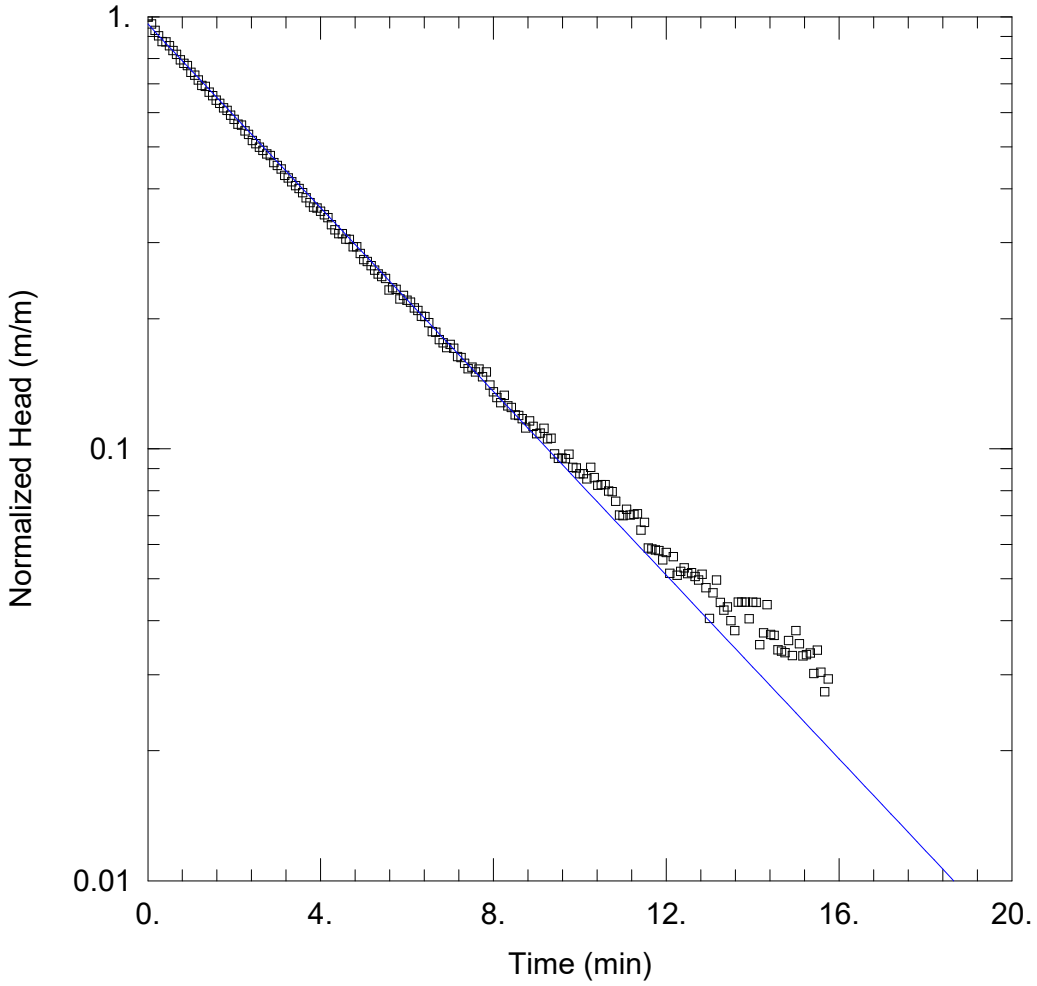
Saturated Thickness: 5.855 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH12-24)

Initial Displacement: 0.442 m Static Water Column Height: 5.855 m
Total Well Penetration Depth: 5.855 m Screen Length: 1.524 m
Casing Radius: 0.0254 m Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev
K = 3.278E-6 m/sec y0 = 0.4223 m



RISING HEAD 1 OF 1

Data Set: P:\...\PG4216 BH12-24 Rising Head 1 of 1.aqt
Date: 02/26/25 Time: 16:29:31

PROJECT INFORMATION

Company: Paterson Group
Client: Taggart Investments
Project: PG4216
Location: Eagleson Road at Ottawa Street
Test Well: BH12-24
Test Date: January 9, 2025

AQUIFER DATA

Saturated Thickness: 5.845 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (BH12-24)

Initial Displacement: 0.467 m Static Water Column Height: 5.845 m
Total Well Penetration Depth: 5.845 m Screen Length: 1.524 m
Casing Radius: 0.0254 m Well Radius: 0.1048 m

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev
K = 2.912E-6 m/sec y0 = 0.4493 m

APPENDIX 2

FIGURE 1 - KEY PLAN

GROUNDWATER MONITORING LEVELS

DRAWING PG4216-2 - TEST HOLE LOCATION PLAN

DRAWING PG4216-3 - PERMISSIBLE GRADE RAISE PLAN

DRAWING PG4216-4 - BEDROCK CONTOUR PLAN

DRAWING PG4216-5 - DESIGNATED SILTY CLAY AREAS

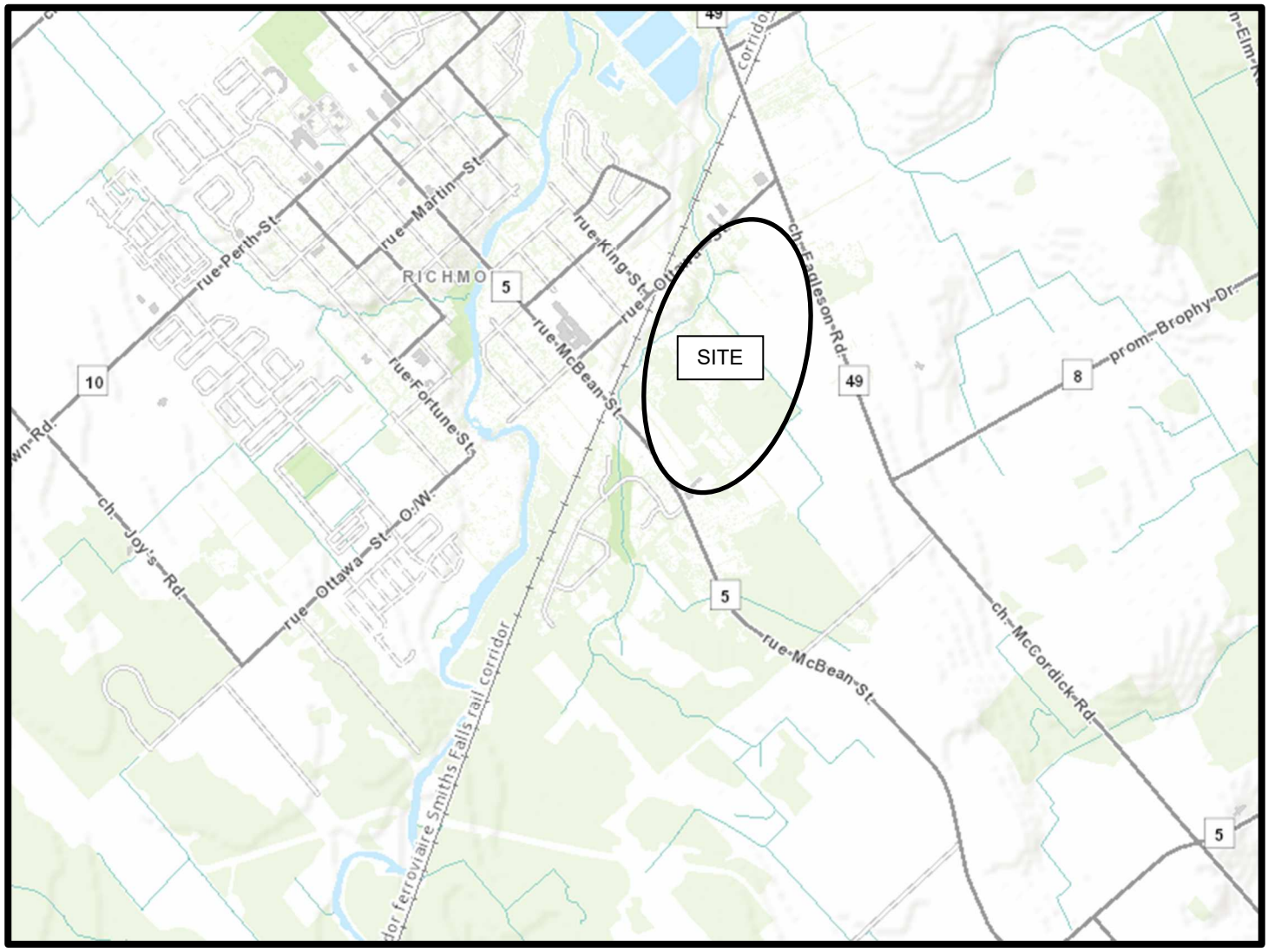


FIGURE 1

KEY PLAN

PATERSON GROUP

Figure 1: BH 1-21 - Groundwater Monitoring Levels vs Precipitation Data

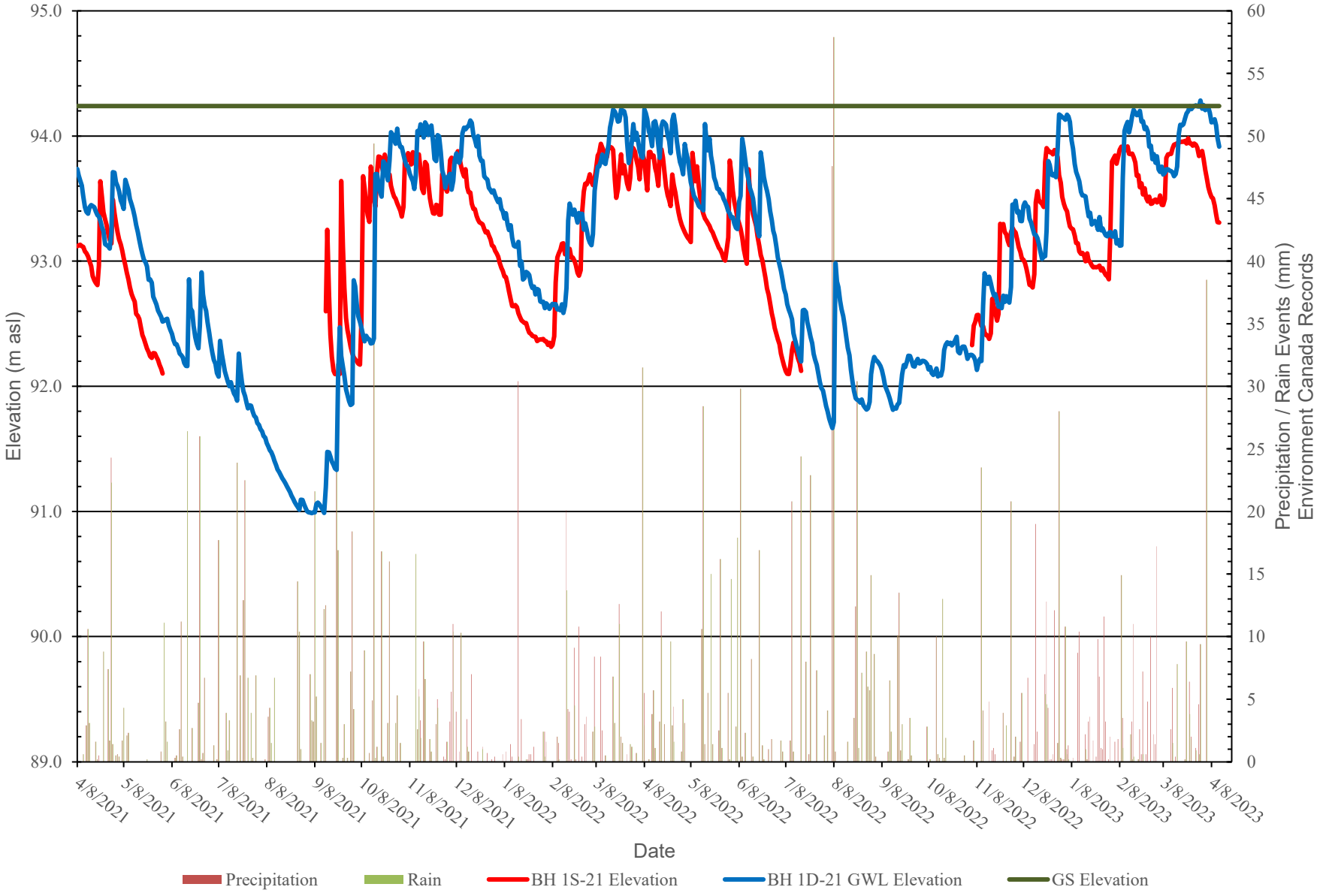
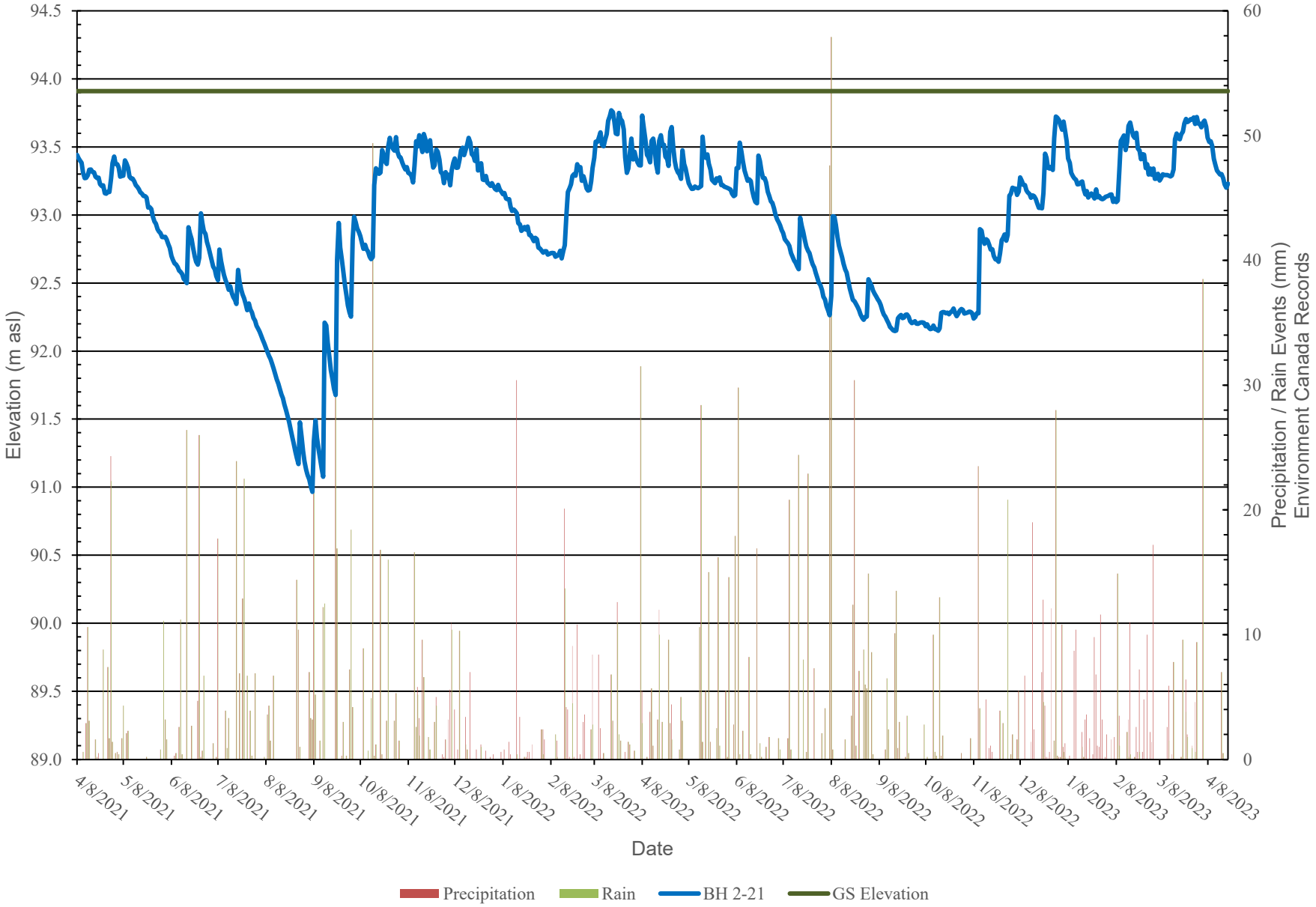
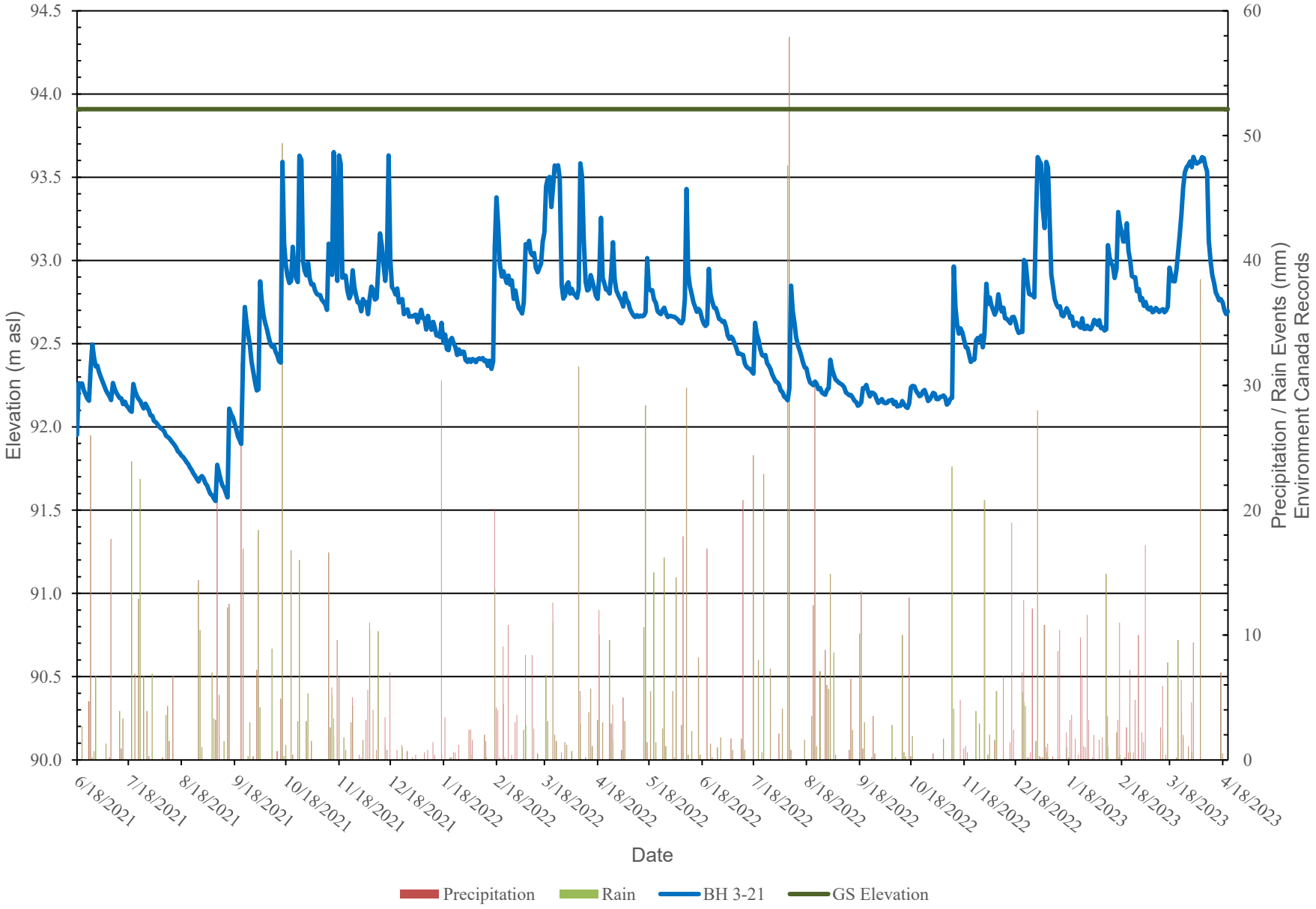


Figure 2: BH 2-21 - Groundwater Monitoring Levels vs Precipitation Data



PATERSON GROUP

Figure 3: BH 3-21 - Groundwater Monitoring Levels vs Precipitation Data



PATERSON GROUP

Figure 4: BH 4-21 - Groundwater Monitoring Levels vs Precipitation Data

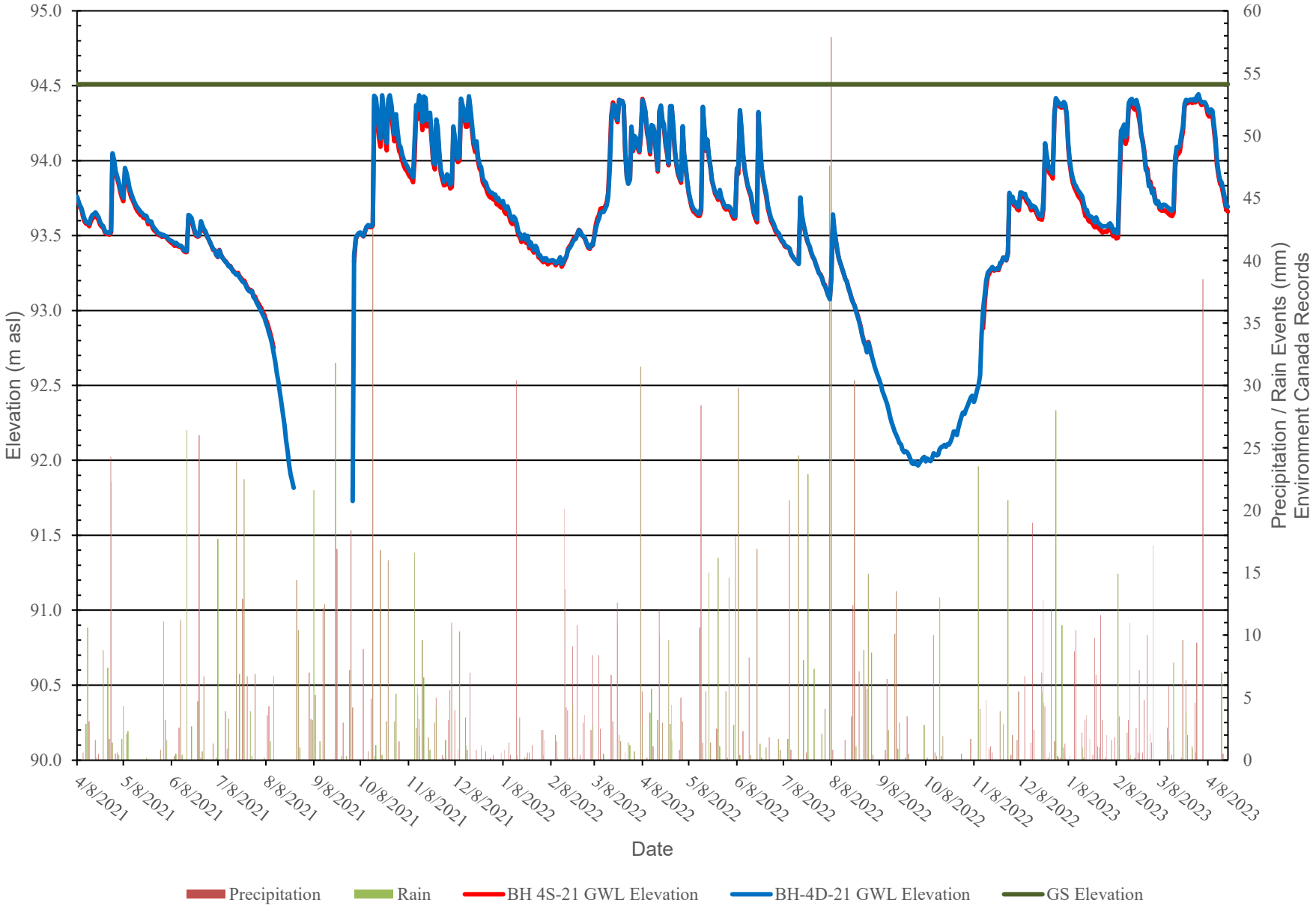


Figure 5: BH 5-21 - Groundwater Monitoring Levels vs Precipitation Data

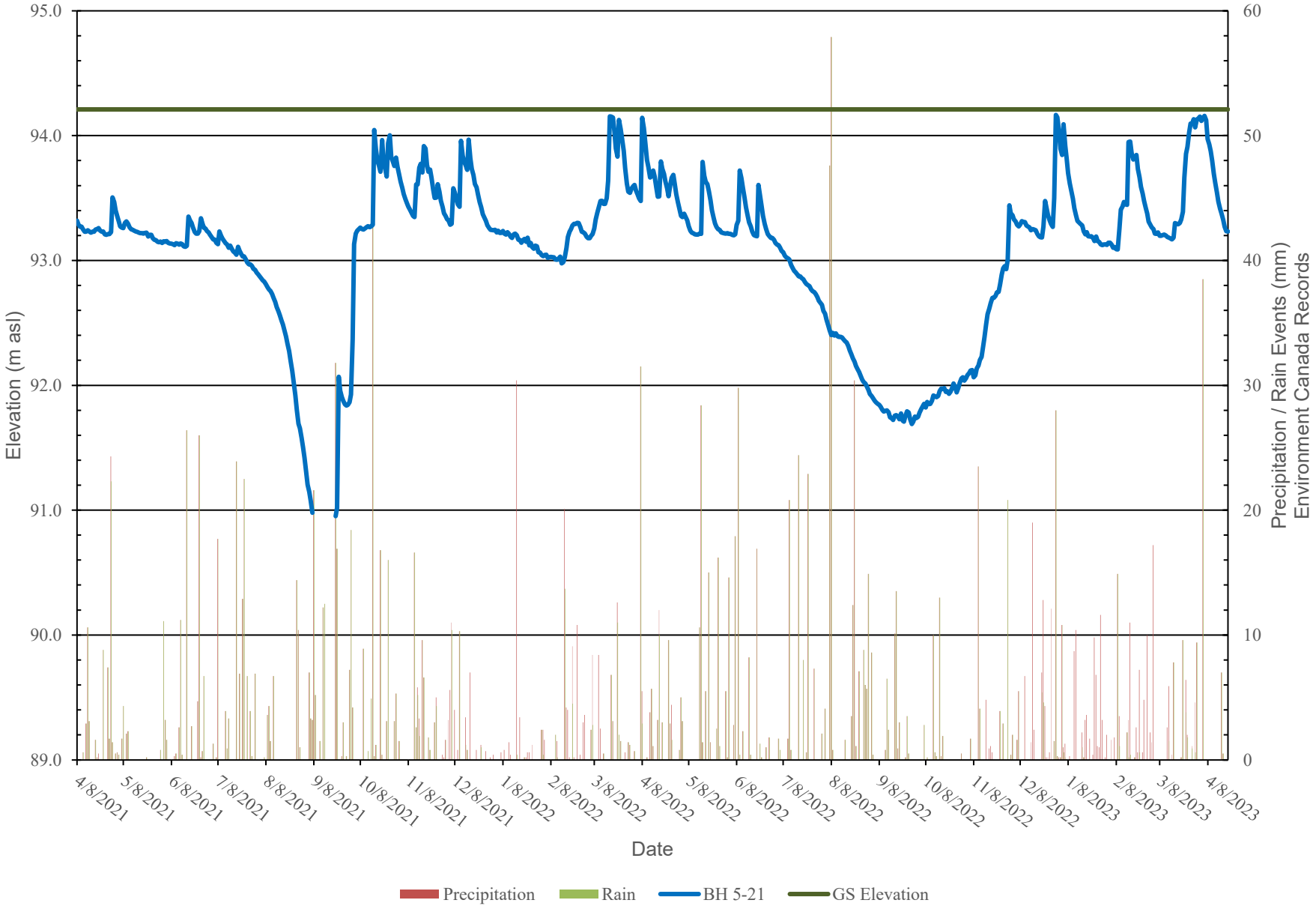


Figure 6: BH 6-21 - Groundwater Monitoring Levels vs Precipitation Data

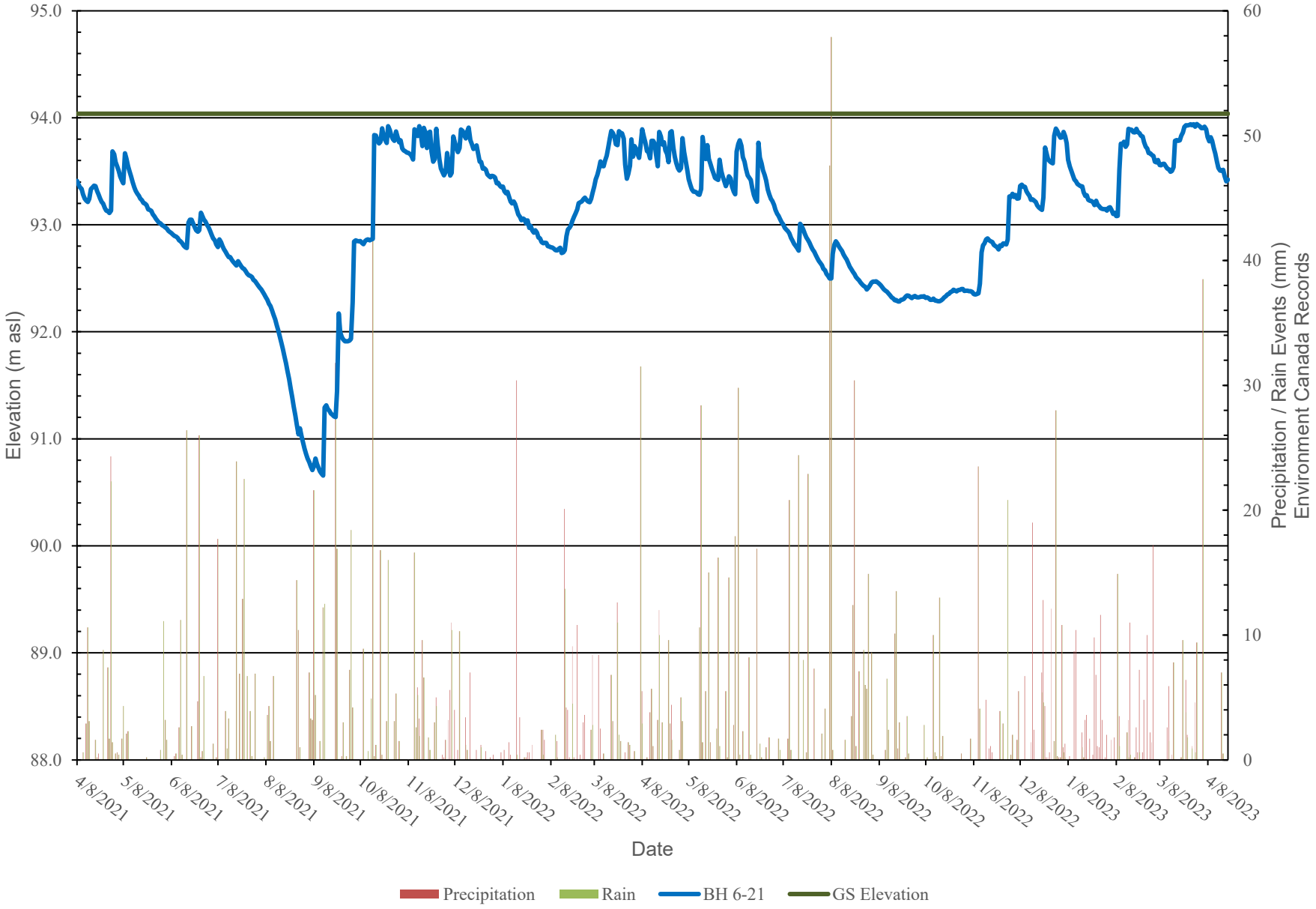


Figure 7: BH 7-21 - Groundwater Monitoring Levels vs Precipitation Data

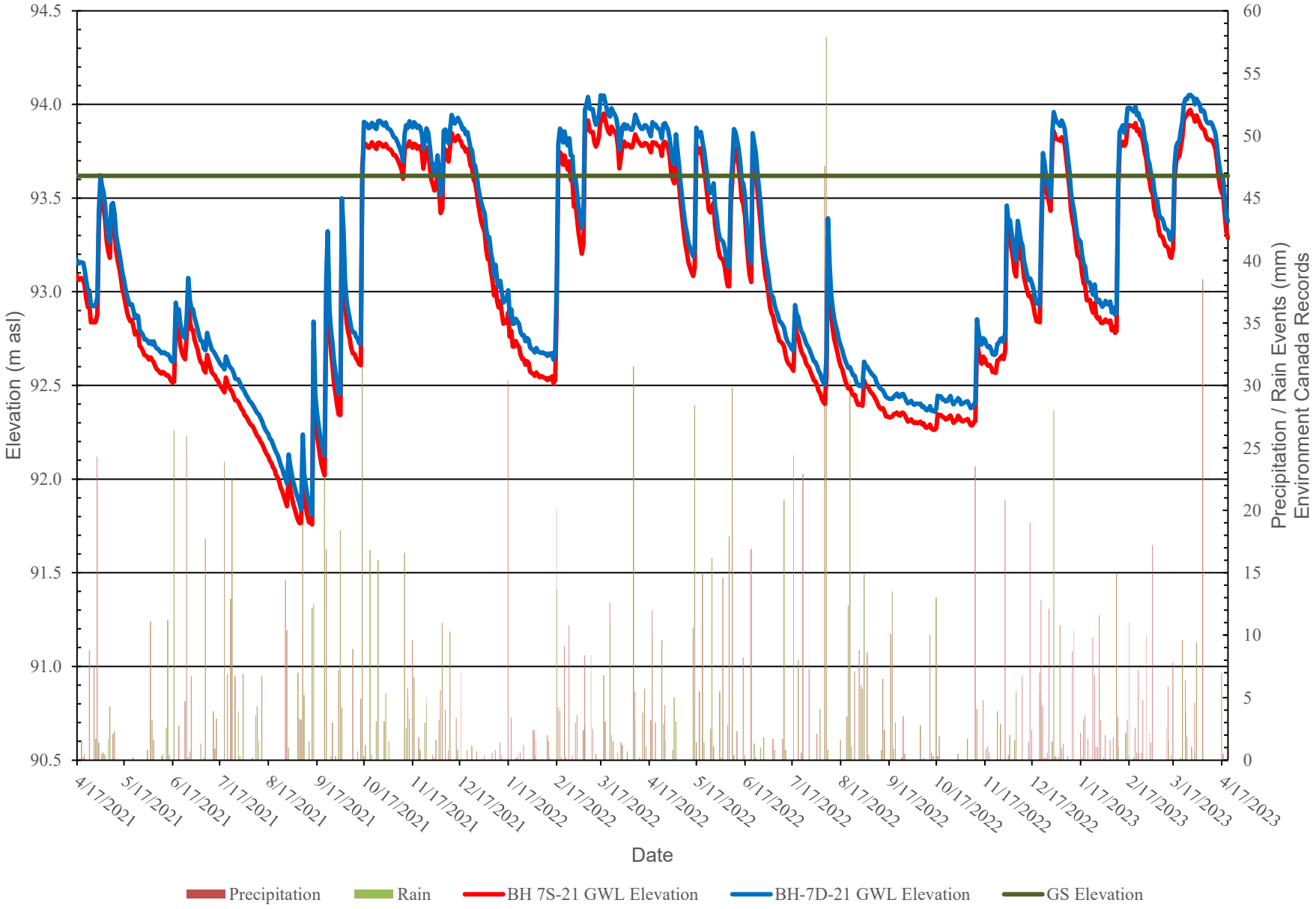


Figure 8: BH 8-21 - Groundwater Monitoring Levels vs Precipitation Data

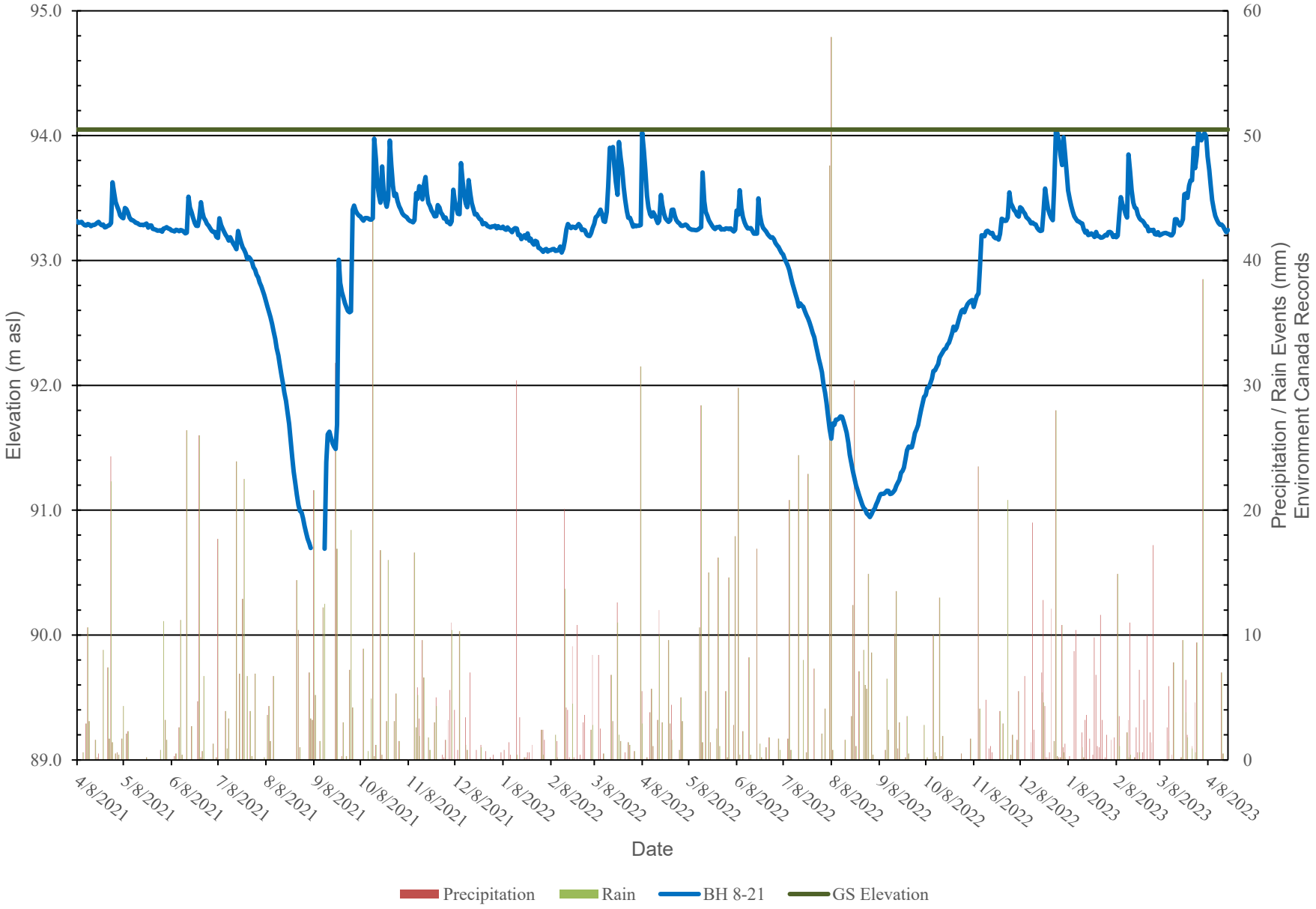


Figure 9: BH 9-21 - Groundwater Monitoring Levels vs Precipitation Data

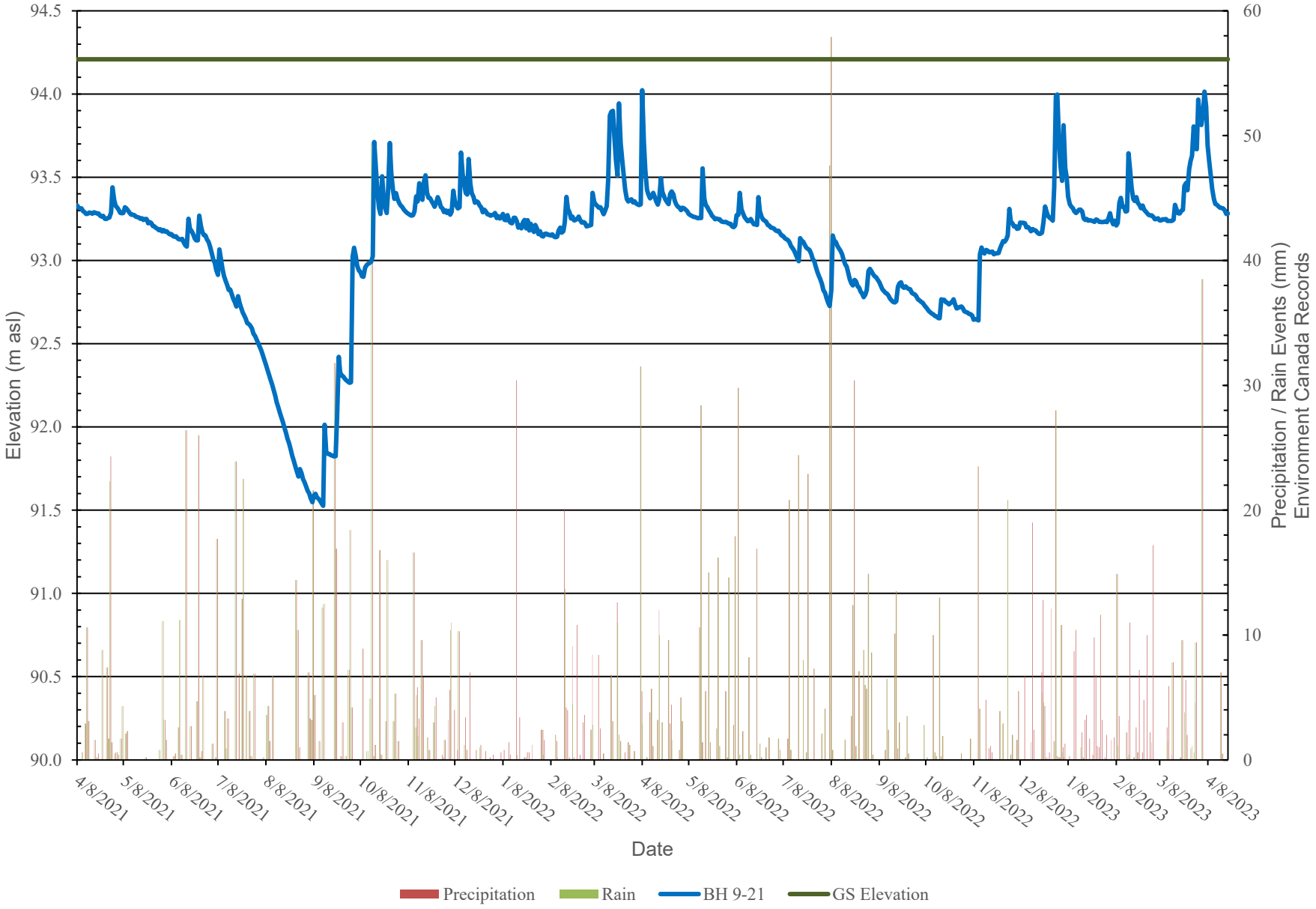


Figure 10: BH 10-21 - Groundwater Monitoring Levels vs Precipitation Data

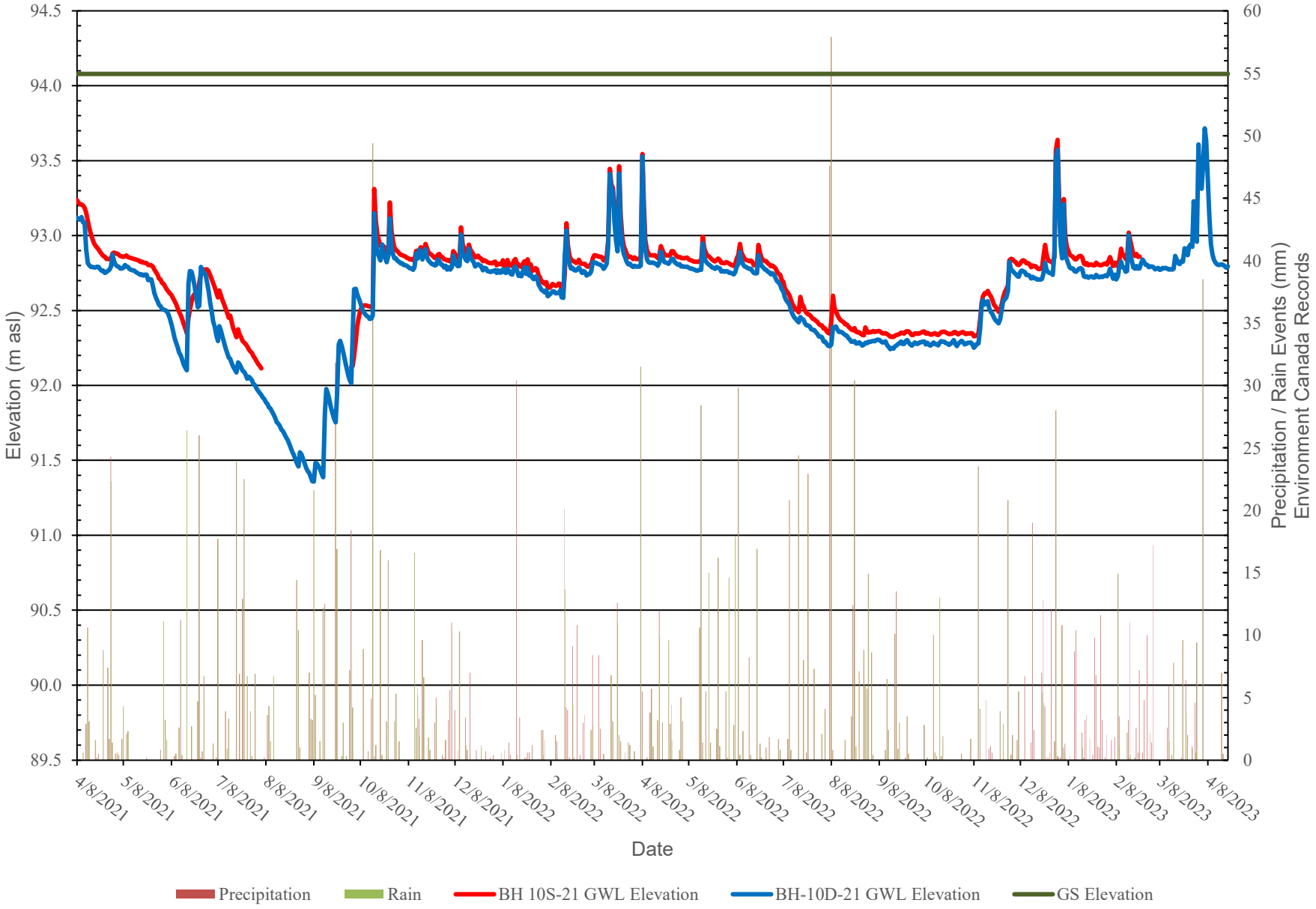
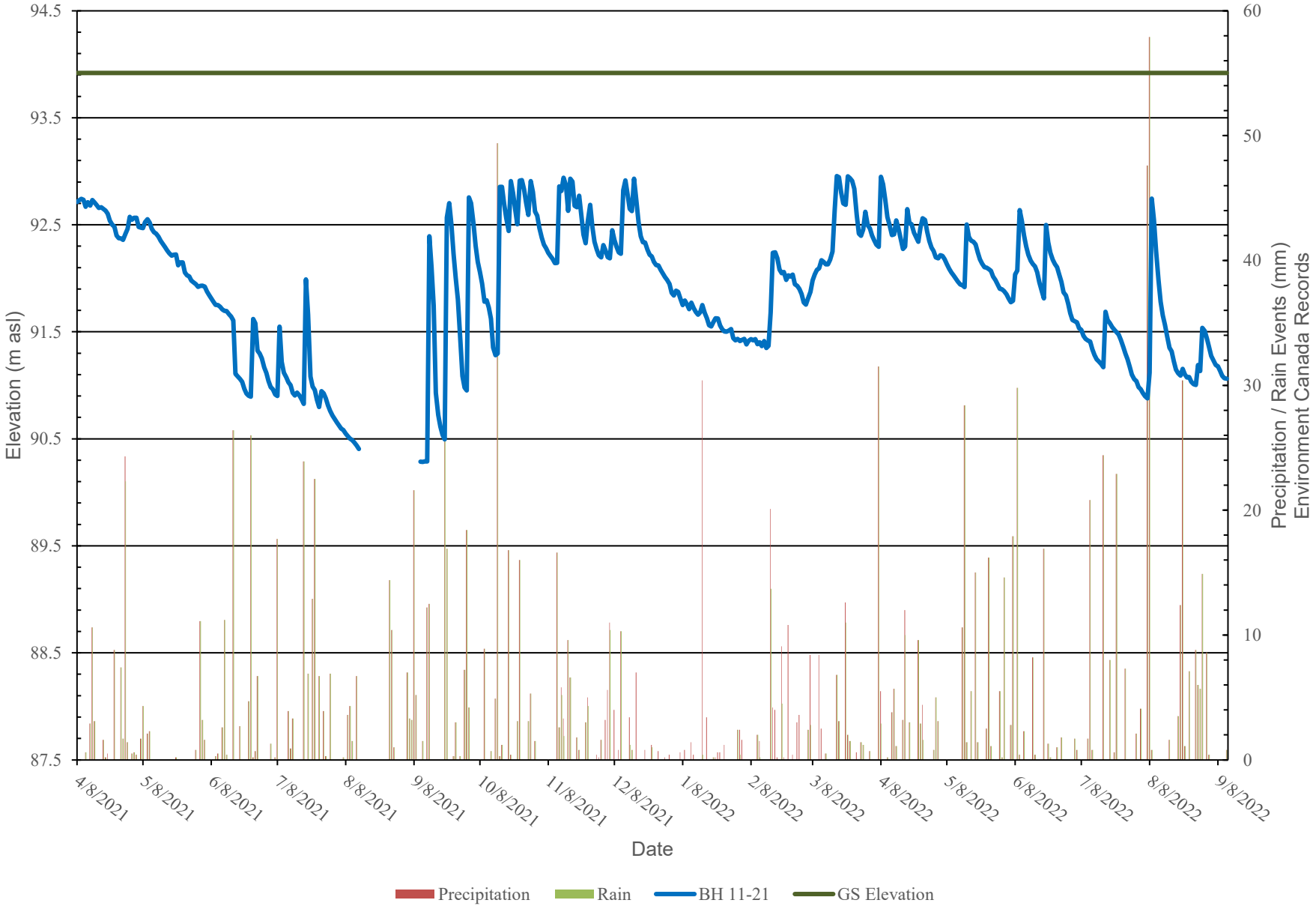
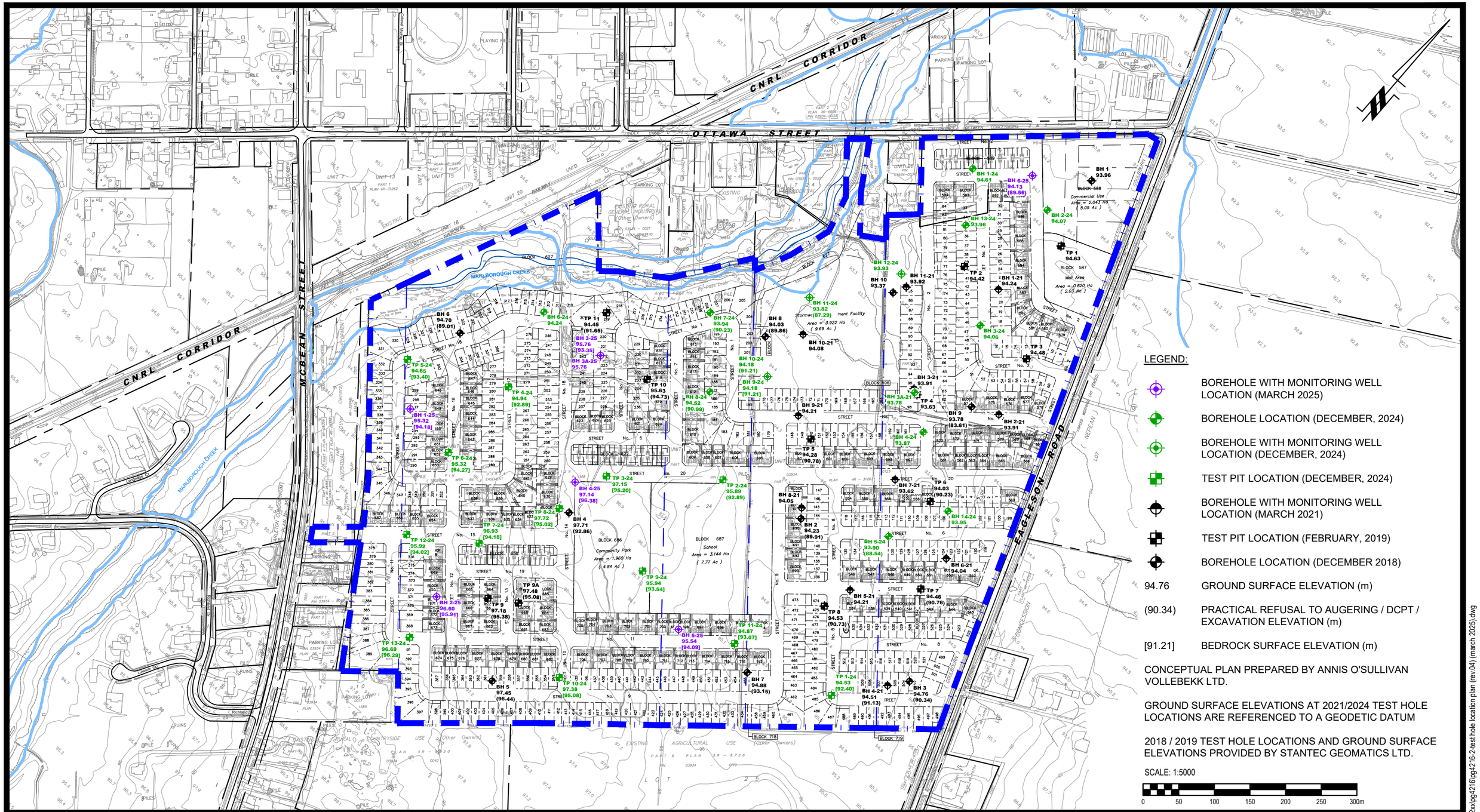


Figure 11: BH 11-21 - Groundwater Monitoring Levels vs Precipitation Data





LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2025)
- BOREHOLE LOCATION (DECEMBER, 2024)
- BOREHOLE WITH MONITORING WELL LOCATION (DECEMBER, 2024)
- TEST PIT LOCATION (DECEMBER, 2024)
- BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2021)
- TEST PIT LOCATION (FEBRUARY, 2019)
- BOREHOLE LOCATION (DECEMBER 2018)
- 94.76 GROUND SURFACE ELEVATION (m)
- (90.34) PRACTICAL REFUSAL TO AUGERING / DCPT / EXCAVATION ELEVATION (m)
- [91.21] BEDROCK SURFACE ELEVATION (m)

CONCEPTUAL PLAN PREPARED BY ANNIS O'SULLIVAN VOLLEBEKK LTD.

GROUND SURFACE ELEVATIONS AT 2021/2024 TEST HOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM

2018 / 2019 TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:5000

0 50 100 150 200 250 300m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
4	ADDED 2024/2025 BOREHOLES AND 2024 TEST PITS	03/14/2025	FC
3	ADDED CONCEPTUAL PLAN	05/12/2024	FC
2	BH 1-21 TO BH 11-21 ADDED	05/04/2021	OC
1	NEW TEST PITS ADDED	28/03/2019	DP

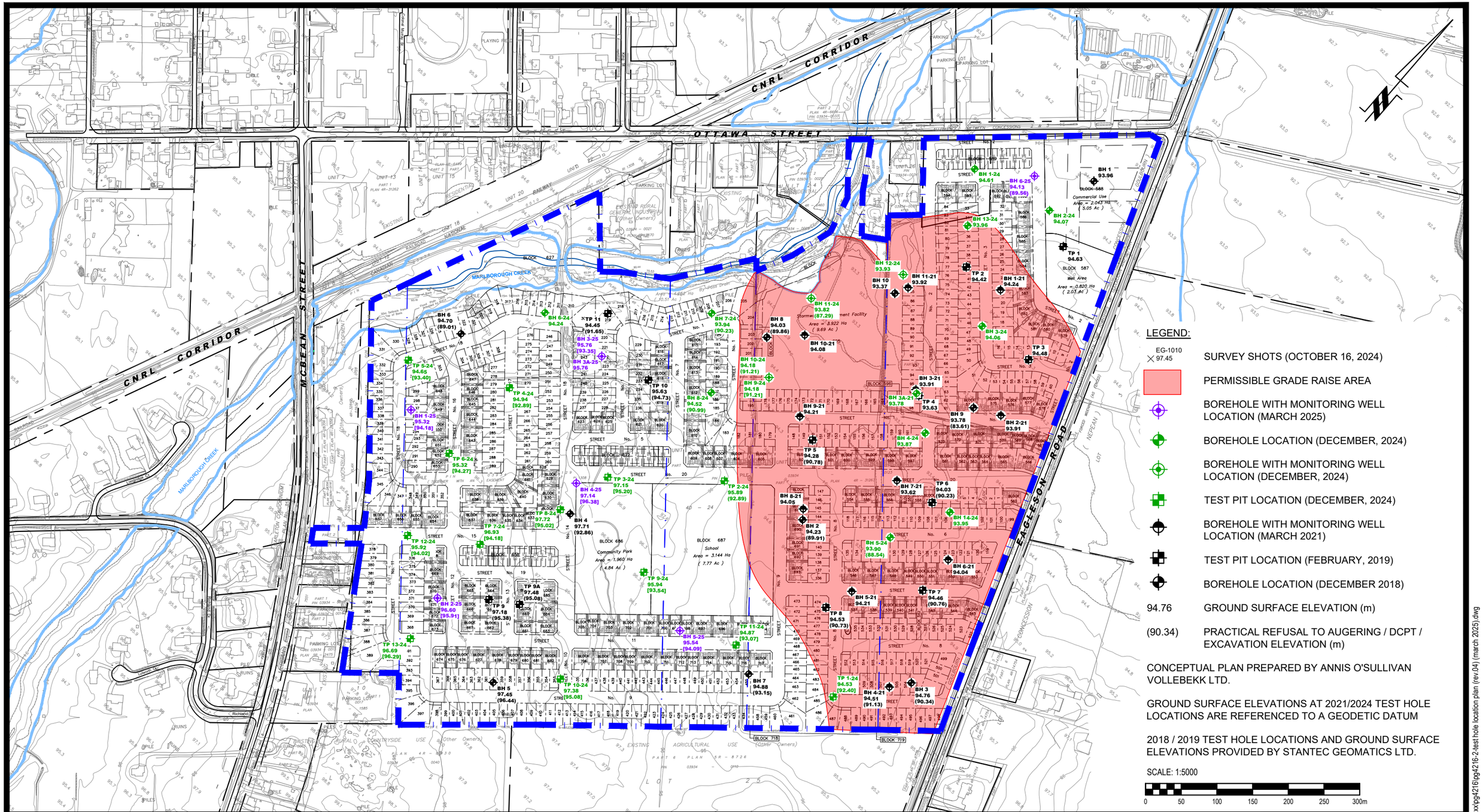
TAMARACK (RICHMOND) CORPORATION
SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
5970 AND 6038 OTTAWA STREET
OTTAWA, ONTARIO

Title:
TEST HOLE LOCATION PLAN

Scale: 1:5000	Date: 01/2019
Drawn by: MPG	Report No.: PG4216-1
Checked by: KP	Dwg. No.: PG4216-2
Approved by: FA	Revision No.: 4

p:\autocad drawings\geotechnical\pg42xx\pg4216\pg4216-2-test hole location plan (rev.04) (march 2025).dwg

11x17



LEGEND:

- EG-1010 / 97.45 — SURVEY SHOTS (OCTOBER 16, 2024)
- PERMISSIBLE GRADE RAISE AREA
- BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2025)
- BOREHOLE LOCATION (DECEMBER, 2024)
- BOREHOLE WITH MONITORING WELL LOCATION (DECEMBER, 2024)
- TEST PIT LOCATION (DECEMBER, 2024)
- BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2021)
- TEST PIT LOCATION (FEBRUARY, 2019)
- BOREHOLE LOCATION (DECEMBER 2018)

94.76 GROUND SURFACE ELEVATION (m)

(90.34) PRACTICAL REFUSAL TO AUGERING / DCPT / EXCAVATION ELEVATION (m)

CONCEPTUAL PLAN PREPARED BY ANNIS O'SULLIVAN VOLLEBEKK LTD.

GROUND SURFACE ELEVATIONS AT 2021/2024 TEST HOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM

2018 / 2019 TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:5000

0 50 100 150 200 250 300m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
4	ADDED 2024/2025 BOREHOLES AND 2024 TEST PITS	03/14/2025	FC
3	ADDED CONCEPTUAL PLAN	05/12/2024	FC
2	BH 1-21 TO BH 11-21 ADDED	05/04/2021	OC
1	NEW TEST PITS ADDED	28/03/2019	DP

TAMARACK (RICHMOND) CORPORATION
SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
5970 AND 6038 OTTAWA STREET
OTTAWA, ONTARIO

Title:

PERMISSIBLE GRADE RAISE PLAN

Scale: 1:5000	Date: 01/2019
Drawn by: MPG	Report No.: PG4216-1
Checked by: KP	Dwg. No.: PG4216-3
Approved by: FA	Revision No.: 4

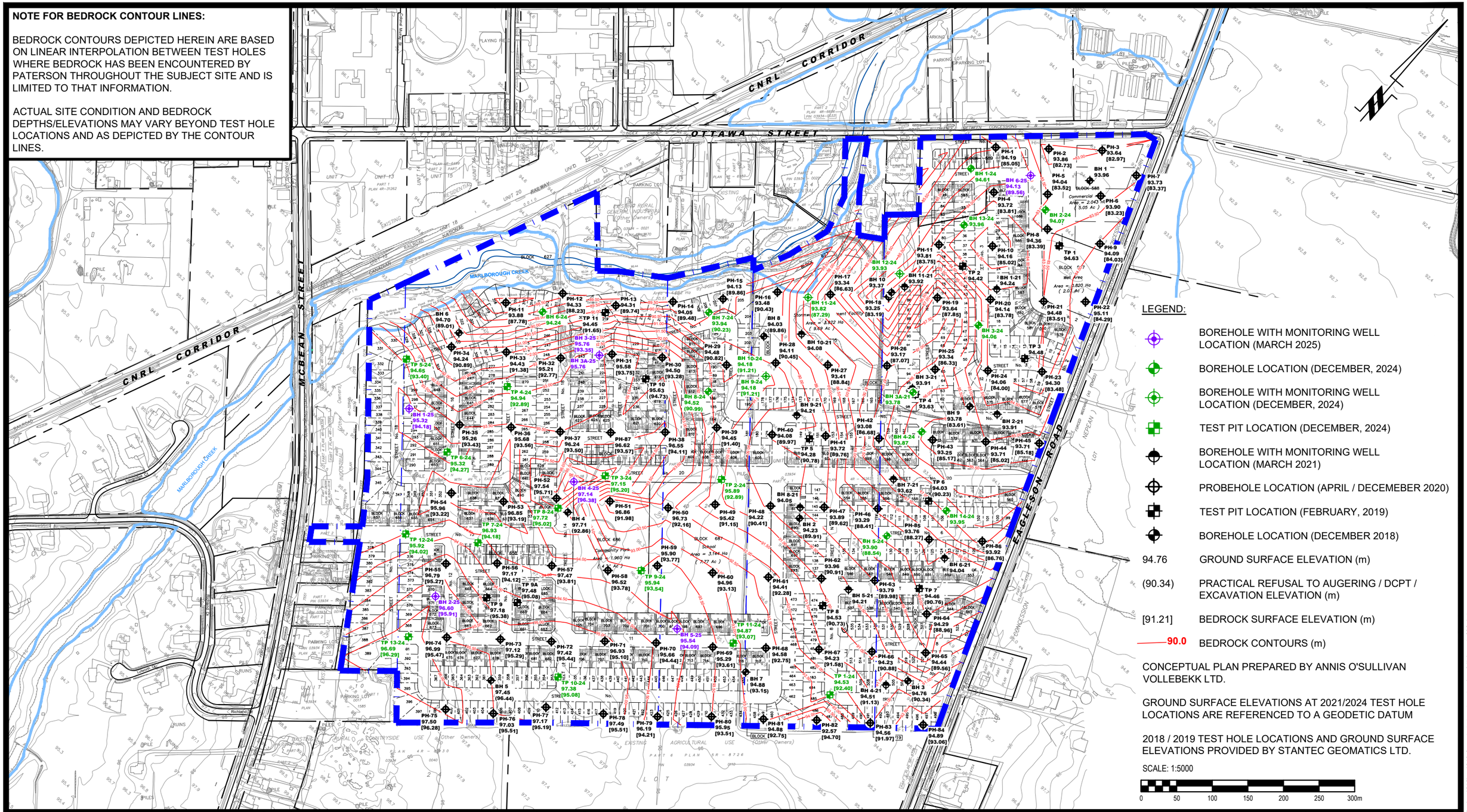
p:\autocad drawings\geotechnical\pg42xx\pg4216\pg4216-2-test hole location plan (rev.04) (march 2025).dwg

11x17

NOTE FOR BEDROCK CONTOUR LINES:

BEDROCK CONTOURS DEPICTED HEREIN ARE BASED ON LINEAR INTERPOLATION BETWEEN TEST HOLES WHERE BEDROCK HAS BEEN ENCOUNTERED BY PATERSON THROUGHOUT THE SUBJECT SITE AND IS LIMITED TO THAT INFORMATION.

ACTUAL SITE CONDITION AND BEDROCK DEPTHS/ELEVATIONS MAY VARY BEYOND TEST HOLE LOCATIONS AND AS DEPICTED BY THE CONTOUR LINES.



LEGEND:

BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2025)

BOREHOLE LOCATION (DECEMBER, 2024)

BOREHOLE WITH MONITORING WELL LOCATION (DECEMBER, 2024)

TEST PIT LOCATION (DECEMBER, 2024)

BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2021)

PROBEHOLE LOCATION (APRIL / DECEMEBER 2020)

TEST PIT LOCATION (FEBRUARY, 2019)

BOREHOLE LOCATION (DECEMBER 2018)

94.76 GROUND SURFACE ELEVATION (m)

(90.34) PRACTICAL REFUSAL TO AUGERING / DCPT / EXCAVATION ELEVATION (m)

[91.21] BEDROCK SURFACE ELEVATION (m)

90.0 BEDROCK CONTOURS (m)

CONCEPTUAL PLAN PREPARED BY ANNIS O'SULLIVAN VOLLEBEKK LTD.

GROUND SURFACE ELEVATIONS AT 2021/2024 TEST HOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM

2018 / 2019 TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:5000

0 50 100 150 200 250 300m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
3	ADDED 2024/2025 BOREHOLES AND 2024 TEST PITS UPDATED BEDROCK CONTOURS	03/14/2025	FC
2	ADDED CONCEPTUAL PLAN	05/12/2024	FC
1	BH 1-21 TO BH 11-21 ADDED	05/04/2021	OC

TAMARACK (RICHMOND) CORPORATION
SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
5970 AND 6038 OTTAWA STREET
OTTAWA, ONTARIO

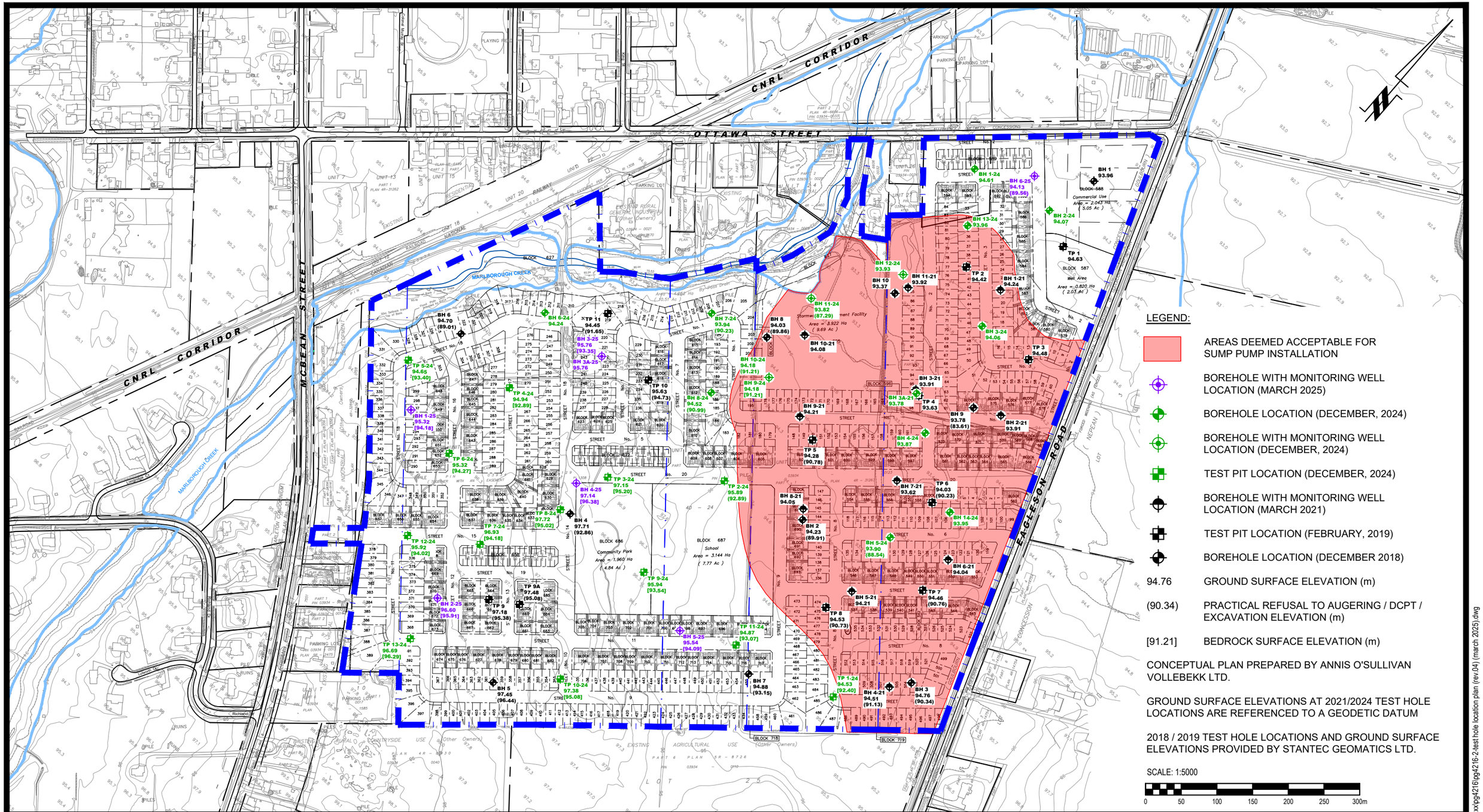
Title:

BEDROCK CONTOUR PLAN

Scale: 1:5000	Date: 02/2020
Drawn by: RCG	Report No.: PG4216
Checked by: KP	Dwg. No.: PG4216-4
Approved by: FA	Revision No.: 3

p:\autocad drawings\geotechnical\pg4xx\xpg4216\pg4216-2-test hole location plan (rev.04) (march 2025).dwg

11x17



LEGEND:

- AREAS DEEMED ACCEPTABLE FOR SUMP PUMP INSTALLATION
- BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2025)
- BOREHOLE LOCATION (DECEMBER, 2024)
- BOREHOLE WITH MONITORING WELL LOCATION (DECEMBER, 2024)
- TEST PIT LOCATION (DECEMBER, 2024)
- BOREHOLE WITH MONITORING WELL LOCATION (MARCH 2021)
- TEST PIT LOCATION (FEBRUARY, 2019)
- BOREHOLE LOCATION (DECEMBER 2018)

94.76 GROUND SURFACE ELEVATION (m)

(90.34) PRACTICAL REFUSAL TO AUGERING / DCPT / EXCAVATION ELEVATION (m)

[91.21] BEDROCK SURFACE ELEVATION (m)

CONCEPTUAL PLAN PREPARED BY ANNIS O'SULLIVAN VOLLEBEKK LTD.

GROUND SURFACE ELEVATIONS AT 2021/2024 TEST HOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM

2018 / 2019 TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS PROVIDED BY STANTEC GEOMATICS LTD.

SCALE: 1:5000

0 50 100 150 200 250 300m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL
3	ADDED 2024/2025 BOREHOLES AND 2024 TEST PITS	03/14/2025	FC
2	ADDED CONCEPTUAL PLAN	05/12/2024	FC
1	BH 1-21 TO BH 11-21 ADDED	05/04/2021	OC

TAMARACK (RICHMOND) CORPORATION
SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
PROPOSED MIXED-USE DEVELOPMENT
5970 AND 6038 OTTAWA STREET
OTTAWA, ONTARIO

Title:

DESIGNATED SILTY CLAY AREAS

Scale: 1:5000	Date: 02/2020
Drawn by: RCG	Report No.: PG4216-1
Checked by: KP	Dwg. No.: PG4216-5
Approved by: FA	Revision No.: 3

p:\autocad drawings\geotechnical\pg42xx\pg4216\pg4216-2-test hole location plan (rev.04) (march 2025).dwg

11x17