PATERSON GROUP

memorandum

re: **Groundwater Monitoring Program**
Proposed Commercial Development
5923 Ottawa Street, Richmond, Ontario

to: Stratford Foxrun – **Jack Gulas** – jack@stratfordfoxrun.com
date: August 5, 2025
file: PH4924-MEMO.01

Further to your request and authorization, Paterson Group (Paterson) conducted a groundwater monitoring program in support of a Low Impact Development (LID) design for the proposed commercial development at the aforementioned site. This report should be read in conjunction with Paterson Report PG7183-1 Revision 1 dated November 20, 2024, and PG7183-2 Revision 1 dated July 9, 2025.

1.0 Background Information

Geotechnical field investigations were carried out between June 17, 2024, and April 17, 2025, where a total of eight (8) boreholes were advanced, respectively. The boreholes were advanced to a maximum depth of 6.71 m below existing grade (bgs). The test holes were distributed in a manner to provide general coverage of the study area, taking into consideration existing site features.

Field Survey

The borehole locations, and ground surface elevations at each borehole location, were surveyed by Paterson using a high precision, handheld GPS and referenced to a geodetic datum. The location and ground surface elevation at each borehole location is presented on Drawing PG7183-2 - Test Hole Location Plan attached to the current memorandum.

Subsurface Profile

The subsurface profile at the borehole locations generally consisted of topsoil underlain by silty clay and/or glacial till deposits. The glacial till layer typically consisted of compact to very dense, brown silty sand with varying amounts of gravel, cobbles, boulders and clay. Practical refusal to augering was encountered between 3.4 and 3.6 m bgs in BH 2-25 and BH 1-24, respectively, while practical DCPT refusal was encountered at a depth of approximately 8.1 m bgs at BH 3-25.

Details of the subsurface profile can be found in the Soil Profile and Test Data Sheets attached to the current report.

Monitoring Well Installation

Typical monitoring well construction details are described below:

- 1.5 m of slotted 51 mm diameter PVC screen at the base of the aforementioned boreholes.
- 51 mm diameter PVC riser pipe from the top of the screen to above ground surface.
- No.3 silica sand backfill within the annular space around the screen.
- Bentonite hole plug placed directly above PVC slotted screen extending to the existing ground surface.
- The 51 mm diameter PVC riser extended above the ground surface was covered with a protective steel monitoring well casing.

Specific details of the installation of each monitoring well are further included in the Soil Profile and Test Data Sheets attached to the current report.

2.0 Groundwater Monitoring Program

The monitoring wells installed at BH 2-24, BH 3-24, and BH 5-24 were equipped with a Van Essen Instrument Mini-Diver Water Level Logger on April 4, 2025, October 22, 2024, and October 22, 2024, respectively, to accurately monitor fluctuations in the groundwater levels. In addition, a Van Essen Instruments Baro-Diver was installed in BH 3-24 to monitor changes in atmospheric pressure. The Mini-Divers were programmed to continuously measure and record groundwater levels throughout the subject site at a rate of 1 reading every 24 hours for BH 2-24 for a period of approximately 4 months, and every 12 hours for a period of 9 months for BH 3-24 and BH 5-24.

The results of the groundwater fluctuations and correlated precipitation events at the monitoring well location between October 2024 and July 2025, have been summarized in Figure 1 through Figure 3 attached to the current report.

3.0 Groundwater Monitoring Results

The data presented in Figure 1 through Figure 3 illustrates the collected groundwater elevations between October 2024 and July 2025. The groundwater readings measured within the monitoring wells varied from an elevation of 91.83 m asl to a maximum elevation of 93.79 m asl for BH 2-24; 91.21 to 93.86 m asl for BH 3-24; and 91.13 to 93.82 m asl for BH 5-24. The low and high groundwater elevation are summarized in Table 1 below.

Based on our analysis of the data logger groundwater readings, seasonal groundwater fluctuations can be observed at the well location with a difference in elevation between low and high readings of 1.96, 2.64, and 2.69 m for BH 2-24, BH 3-24, and BH 5-24, respectively. Note that the highest groundwater elevations were noted to be greater than the ground surface elevation for BH 2-24 and BH 3-24.

Table 1: Groundwater Monitoring Summary

Monitoring Well ID	Ground Surface Elevation (m asl)	Low Groundwater Elevation (m asl)	High Groundwater Elevation (m asl)	Difference in Groundwater Elevation (m asl)
BH 2-24	93.69	91.83	93.79	1.96
BH 3-24	93.85	91.21	93.86	2.64
BH 5-24	93.92	91.13	93.82	2.69

We trust that this information satisfies your requirements.

Best Regards,

Paterson Group Inc.

PROFESSIONAL GEOSCIENTIST
NICHOLAS ZULINSKI
PRACTISING MEMBER
2359
ONTARIO

Nicholas Zulinski, P.Geo., géo.

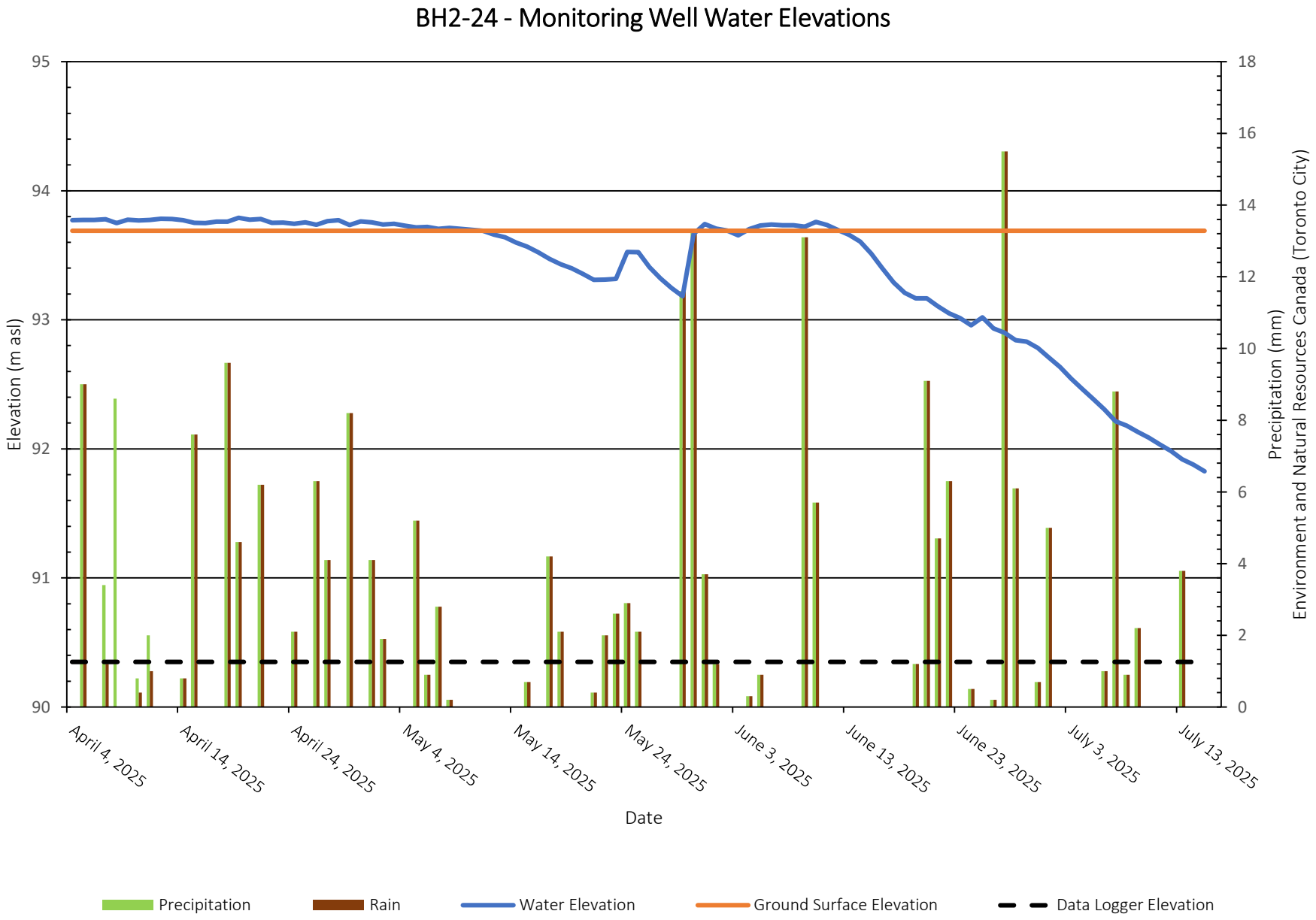
Alexander Schopf, PhD, EIT.

Attachments

- ❑ Figure 1 through Figure 3 – Groundwater Monitoring Levels
- ❑ Soil Profile and Test Data Sheets
- ❑ Drawing PG7183-2 – Test Hole Location Plan

File: PH4924

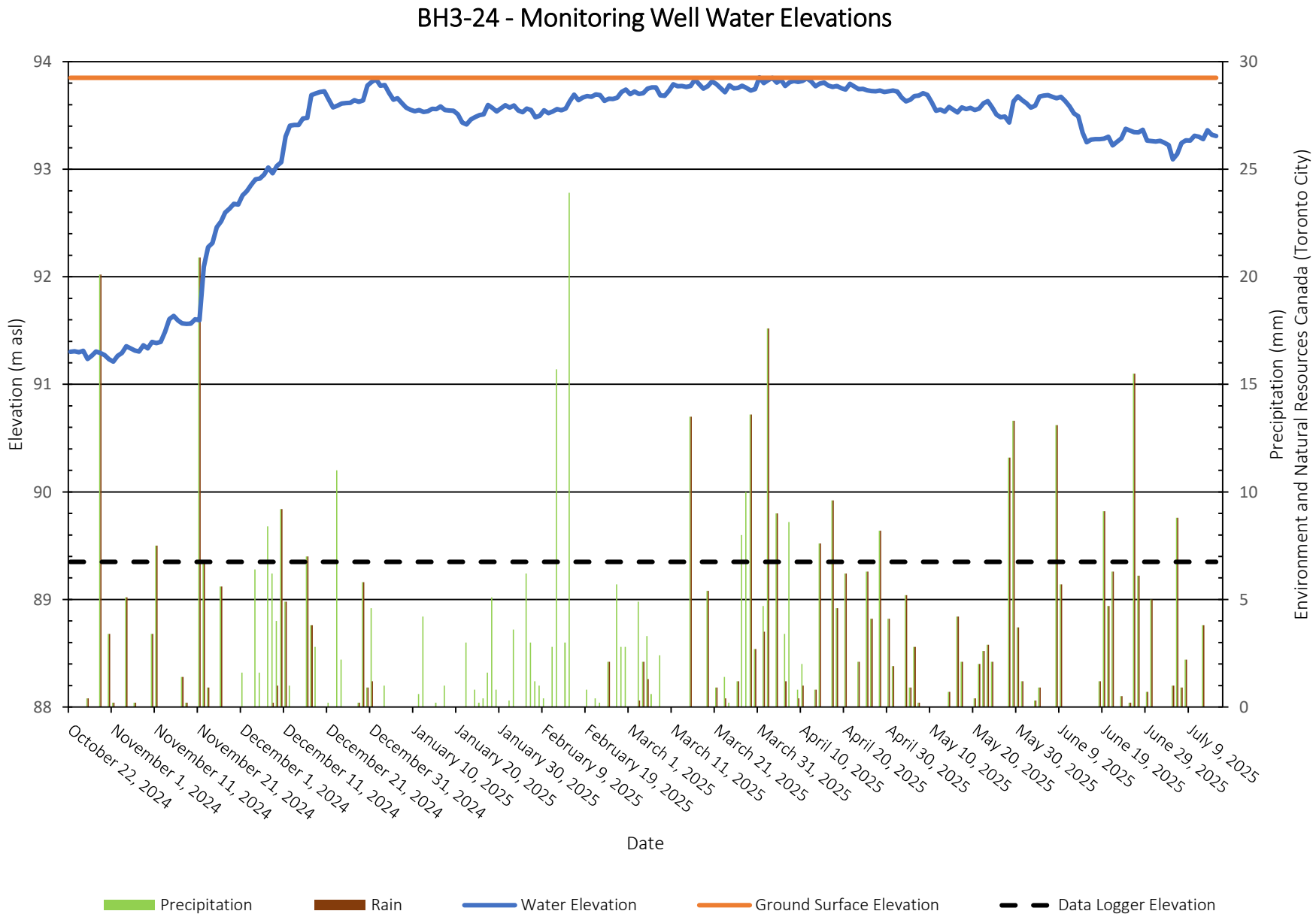
Stratford Foxrun
5923 Ottawa Street, Richmond, ON
Monitoring Well Water Elevations



PATERSON GROUP

File: PH4924

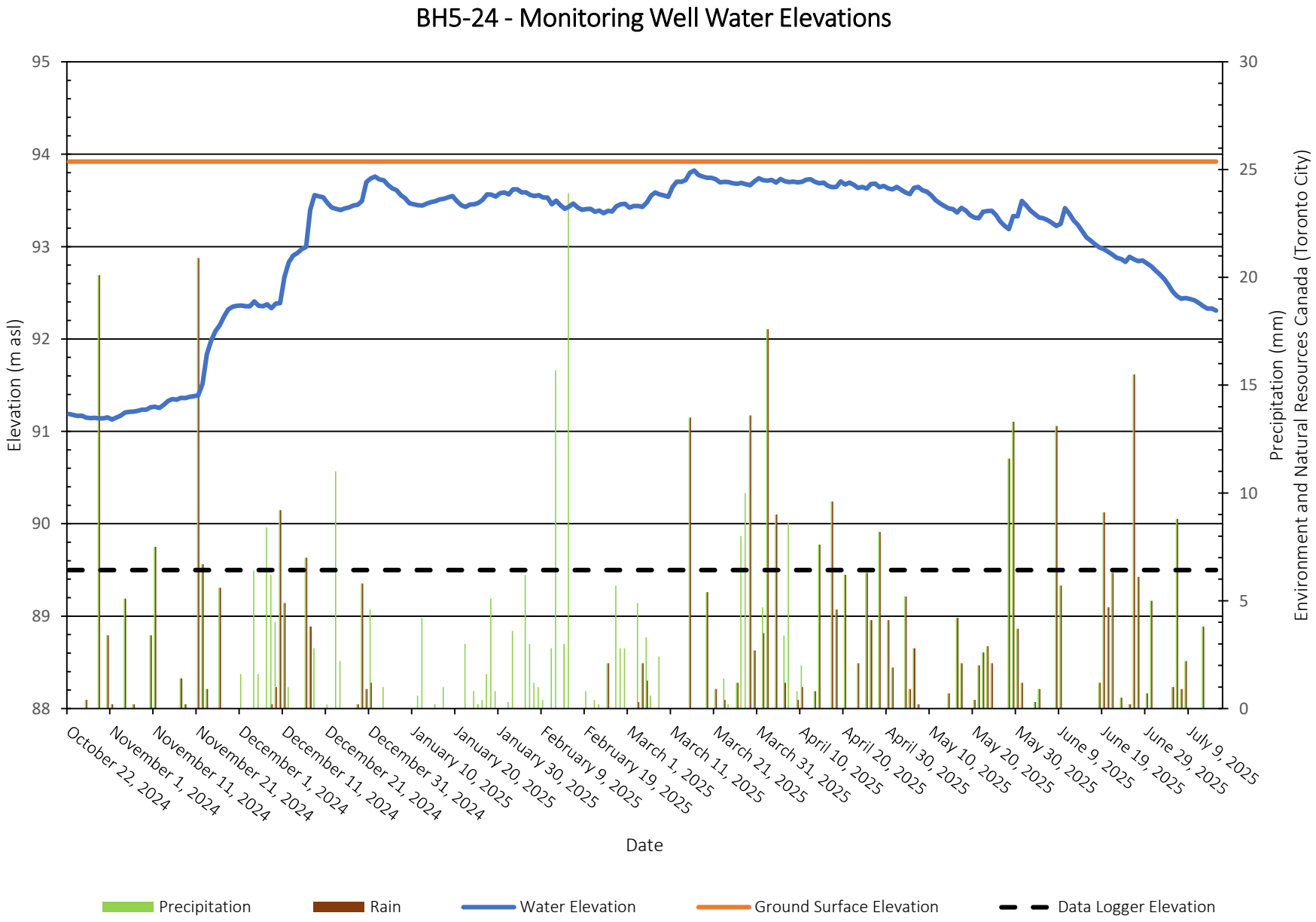
Stratford Foxrun
5923 Ottawa Street, Richmond, ON
Monitoring Well Water Elevations



PATERSON GROUP

File: PH4924

Stratford Foxrun
5923 Ottawa Street, Richmond, ON
Monitoring Well Water Elevations



PATERSON GROUP

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358362.138 **NORTHING:** 5005913.959 **ELEVATION:** 94.20
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** June 17, 2024

FILE NO. PG7183
HOLE NO. BH 1-24

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 and organics						0	94.20		
0.28									
GLACIAL TILL: Dense brown silty sand to sandy silt with gravel, cobbles and boulders, trace clay		AU	1						
- Clay content decreasing with depth		SS	2	83	26	1	93.20		
		SS	3	58	31	2	92.20		
- Very dense by 2.4 m depth		SS	4	83	46				
		SS	5	100	+50	3	91.20		
3.56									
End of Borehole Practical refusal to augering at 3.56 m depth (GWL at 0.28 m - June 25, 2024)									

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
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358409.319 **NORTHING:** 5005999.639 **ELEVATION:** 93.69
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** June 17, 2024

FILE NO. PG7183
HOLE NO. BH 2-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	93.69
TOPSOIL and organics 0.08							
Hard to very stiff brown **SILTY CLAY**		AU	1				
		SS	2	100	9	1	92.69
1.45							
GLACIAL TILL: Dense brown silty sand with gravel, cobbles and boulders, trace clay		SS	3	67	27	2	91.69
- Clay content decreasing with depth		SS	4	58	20		
		SS	5	83	24	3	90.69
3.73							
GLACIAL TILL: Dense to very dense grey silty sand to sandy silt with gravel, cobbles and boulders		SS	6	58	20	4	89.69
		SS	7	100	38	5	88.69
		SS	8	92	33		
		SS	9	100	+50	6	87.69
6.60							
End of Borehole							
(GWL at 0.05 m - June 25, 2024)							

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

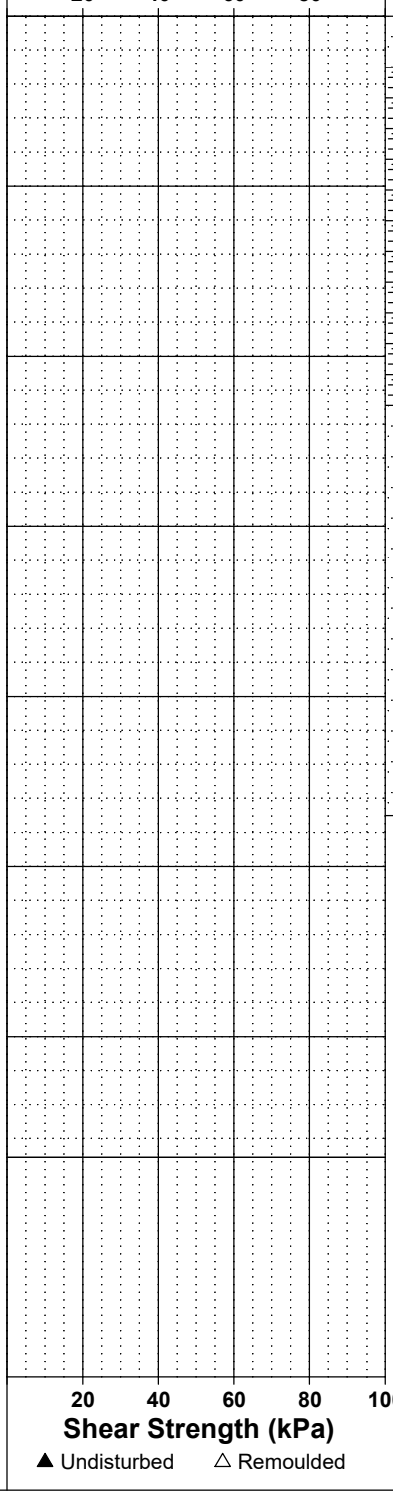
Geotechnical Investigation
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358326.994 **NORTHING:** 5005950.976 **ELEVATION:** 93.85
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** June 17, 2024

FILE NO. PG7183
HOLE NO. BH 3-24

SAMPLE DESCRIPTION		STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE								
TOPSOIL and organics, trace clay	0.20						0	93.85
Very stiff brown **SILTY CLAY**	0.61		AU	1				
GLACIAL TILL: Compact to dense brown silty sand to sandy silt with gravel, cobbles and boulders, trace clay			SS	2	67	21	1	92.85
- Clay content decreasing with depth			SS	3	67	15	2	91.85
			SS	4	58	33	3	90.85
			SS	5	83	28		
GLACIAL TILL: Very dense grey silty sand to sandy silt with gravel, cobbles and boulders	4.11		SS	6	83	36	4	89.85
			SS	7	50	50	5	88.85
			SS	8	58	26	6	87.85
			SS	9		+50		
End of Borehole	6.71							
(GWL at 0.10 m - June 25, 2024)								

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



MONITORING WELL CONSTRUCTION

patersongroup Consulting Engineers

9 Auriga Drive, Ottawa, Ontario K2E 7T9

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358331.858 **NORTHING:** 5005978.835 **ELEVATION:** 94.11
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** June 17, 2024

FILE NO. PG7183
HOLE NO. BH 4-24

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 and organics 0.13		AU	1			0	94.11		
GLACIAL TILL: Dense brown silty sand to sandy silt with gravel, cobbles and boulders, some to trace clay		SS	2	50	34	1	93.11		
		SS	3	100	16	2	92.11		
		SS	4	42	32				
3.33		SS	5	91	+50	3	91.11		
End of Borehole									
(GWL at 0.45 m - June 25, 2024)									

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
5923 Ottawa Street
Ottawa, Ontario

EASTING: 358383.011 **NORTHING:** 5005949.836 **ELEVATION:** 93.92
DATUM: Geodetic
REMARKS:
BORINGS BY: CME 55 Power Auger **DATE:** June 17, 2024

FILE NO. PG7183
HOLE NO. BH 5-24

SAMPLE DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE							
TOPSOIL and organics						0	93.92
0.25							
GLACIAL TILL: Dense brown silty sand to sandy silt with gravel, cobbles and boulders, some to trace clay		AU	1				
- Clay content decreasing with depth		SS	2	100	26	1	92.92
		SS	3	92	+50	2	91.92
		SS	4	83	22	3	90.92
3.51		SS	5	25	15		
GLACIAL TILL: Compact to dense grey silty sand to sandy silt with gravel, cobbles and boulders		SS	6	42	21	4	89.92
		SS	7		14	5	88.92
5.18							
End of Borehole							
(GWL at 0.18 m - June 25, 2024)							

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

MONITORING WELL CONSTRUCTION

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

5923 Ottawa Street, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 358355.92 **NORTHING:** 5006024.43 **ELEVATION:** 94.07

PROJECT: Proposed Commercial Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: April 17, 2025

FILE NO. : PG7183

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	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
CLAYEY TOPSOIL 0.41m [93.66m]			AU 1						94
Very stiff, brown **SILTY CLAY**, trace sand 1.07m [93.00m]		1	SS 2	83	2-3-5-12 8		24 36	0.44 m 2025-04-24	93
GLACIAL TILL: Compact, brown clayey silt, with gravel, trace to some sand, occasional cobbles and boulders 1.45m [92.62m]			SS 3	83	12-24-16-17 40				
GLACIAL TILL: Dense to compact, brown silty sand, with gravel, occasional cobbles and boulders		2	SS 4	83	15-11-11-44 22				92
3.73m [90.34m]		3	SS 5	75	11-11-10-7 21				91
GLACIAL TILL: Loose to compact, grey silty sand, some gravel, trace clay, occasional cobbles and boulders		4	SS 6	50	3-3-3-6 6				90
		5	SS 7	58	3-3-3-2 6				89
		6	SS 8	50	5-5-6-6 11				88
6.35m [87.72m]			SS 9	100	4-6-15-11 21				
GLACIAL TILL: Compact, grey **SANDY SILT**, some gravel, trace clay, occasional cobbles and boulders 6.71m [87.36m]		7							87
End of Borehole									
(GWL at 0.44 m depth - April 24, 2025)		8							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

5923 Ottawa Street, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 358380.22 **NORTHING:** 5006016.15 **ELEVATION:** 94.07

PROJECT: Proposed Commercial Development

ADVANCED BY: Track Mounted Drill Rig

REMARKS:

DATE: April 17, 2025

FILE NO. : PG7183

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	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
CLAYEY TOPSOIL 0.36m [93.71m]			AU 1					0.14 m ▽ 2025-04-24	94
GLACIAL TILL: Loose to dense, brown silty sand, with gravel, some clay, occasional cobbles and boulders		1	SS 2	100	1-2-5-10 7				93
		2	SS 3	67	8-15-18-42 33				92
2.97m [91.10m]			SS 4	75	6-6-4-5 10				
GLACIAL TILL: Dense, grey sandy silt, with gravel, occasional cobbles and boulders 3.43m [90.64m]		3	SS 5	67	14-18-50-/ 68/0.23				91
End of Borehole		4							90
Practical refusal to augering at 3.43 m depth		5							89
(GWL at 0.14 m depth - April 24, 2025)		6							88
		7							87
		8							

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

5923 Ottawa Street, Ottawa, Ontario

COORD. SYS.: MTM ZONE 9 **EASTING:** 358388.50 **NORTHING:** 5005993.41 **ELEVATION:** 94.07

PROJECT: Proposed Commercial Development

ADVANCED BY: Track Mounted Drill Rig

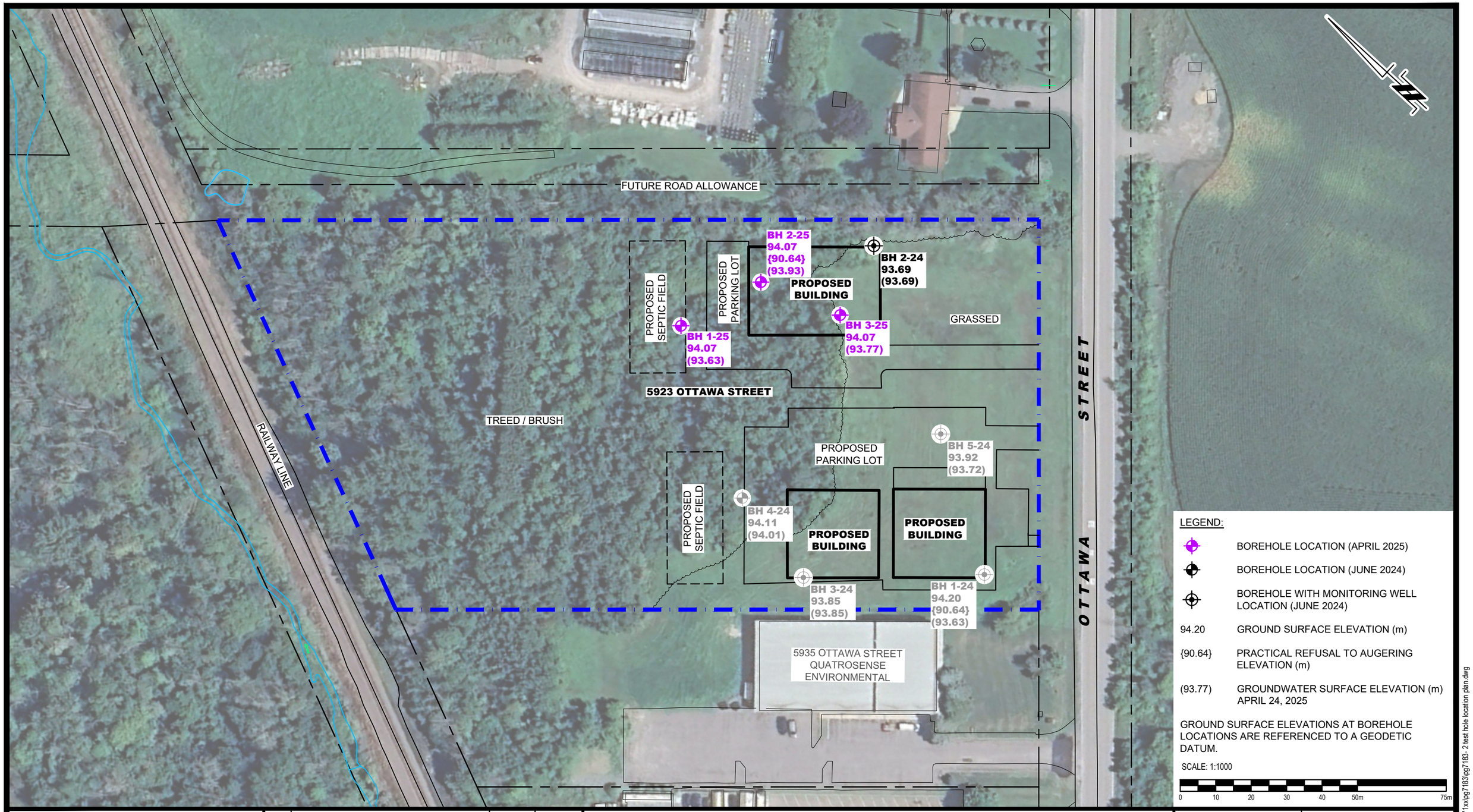
REMARKS:

DATE: April 17, 2025

FILE NO. : PG7183

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	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
CLAYEY TOPSOIL 0.41m [93.66m]			AU 1					0.30 m ▼ 2025-04-24	94
Compact, brown **CLAYEY SILT**, trace sand 1.35m [92.72m]		1	SS 2	83	5-7-9-17 16				93
GLACIAL TILL: Dense to compact, brown silty sand, with gravel, occasional cobbles and boulders, trace clay 3.35m [90.72m]		2	SS 3	75	6-11-21-14 32				92
			SS 4	92	9-8-6-9 14				
		3	SS 5	83	7-8-7-11 15				91
GLACIAL TILL: Compact to dense, grey silty sand, some gravel, occasional cobbles and boulders - Trace clay by 4.6 m depth 6.71m [87.36m]		4	SS 6	100	7-8-16-14 24				90
		5	SS 7	75	10-9-8-18 17				89
			SS 8	83	4-18-17-16 35				88
		6	SS 9	75	11-16-23-25 39				
End of Borehole (GWL at 0.30 m depth - April 24, 2025)		7							87
		8							



LEGEND:

- BOREHOLE LOCATION (APRIL 2025)
- BOREHOLE LOCATION (JUNE 2024)
- BOREHOLE WITH MONITORING WELL LOCATION (JUNE 2024)
- 94.20 GROUND SURFACE ELEVATION (m)
- {90.64} PRACTICAL REFUSAL TO AUGERING ELEVATION (m)
- (93.77) GROUNDWATER SURFACE ELEVATION (m) APRIL 24, 2025

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:1000

0 10 20 30 40 50m 75m

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

NO.	REVISIONS	DATE	INITIAL

STRATFORD FOXRUN
GEOTECHNICAL INVESTIGATION
PROPOSED COMMERCIAL DEVELOPMENT
5923 OTTAWA STREET

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:1000	Date: 04/2025
Drawn by: GK	Report No.: PG7183-2
Checked by: DR	Dwg. No.: PG7183-2
Approved by: SD	Revision No.:

p:\autocad drawings\geotechnical\pg71xx\pg7183\pg7183- 2 test hole location plan.dwg

11x17