

Memorandum

Date: June 26, 2025
To: RioCan Holdings Inc.
From: Berend Velderman, Geosyntec Consultants International, Inc.
Subject: **Supplemental Hydrogeological Memorandum
1309 Carling Avenue, Ottawa, Ontario**

INTRODUCTION

In February 2025, Geosyntec Consultants International Inc. (Geosyntec) was retained by RioCan Management Inc., an agent of RioCan Holdings Inc. (RioCan), to conduct a geotechnical investigation supporting the redevelopment design and construction of 1309 Carling Avenue, Ottawa, Ontario, for use as a commercial space. That scope included a Phase Two Environmental Site Assessment Report and Geotechnical Investigation Report for a proposed warehouse structure within the existing Westgate Mall footprint. Subsequently, the report entitled “Geotechnical Investigation Report – Proposed New Warehouse Structure 1309 Carling Avenue, Ottawa, Ontario” was provided to the City of Ottawa in May 2025. Upon the City’s review, a hydrogeological report was requested to better understand groundwater management needs for the proposed building during construction and post-construction. This memorandum is intended to address the City’s request.

In this memorandum, the overall Westgate Mall property is termed 'The Property' to distinguish between the location of the new building (The Site) and the remaining site area. **Figure 1** shows the Site and **Figure 2** the borehole locations. This hydrogeological memo interprets the geotechnical investigation results as they pertain to the hydrogeology information gleaned from the report.

GROUNDWATER INFORMATION

Four monitoring wells were installed in the completed geotechnical boreholes located near or within the proposed building footprint. Additionally, three monitoring wells installed as part of the environmental site assessment, located elsewhere on the property, are also referenced in this memorandum. These monitoring wells were constructed using flush-threaded, Schedule 40, clean polyvinyl chloride (PVC) casings with slotted well screens. The exterior wells had a diameter of 50-millimeter (mm) (2 inches), except for well 25-02, which had a 38 mm (1.5 inches) diameter PVC casing. The interior wells had a diameter of 31 mm (1.25 inches). The screens ranged from 0.61 to 3.0 meters (m) in length and were installed to intersect the water table. Detailed information about the installed monitoring wells can be found in the relevant borehole logs in **Appendix A**.

Groundwater levels were measured with a water level tape on April 11, 2025. The groundwater level measurement recorded on April 11, 2025, is summarized in **Table 1**.

Table 1 Groundwater Measurement on 11 April 2025

Boring ID	Depth of Groundwater (m btoc)	Riser Elevation (m amsl)	Groundwater Elevation (m amsl)
25 -02	3.60	73.79	70.19
25 -03	1.59	73.79	72.20
25 -04	0.77	74.02	73.24
25 -05	1.04	74.01	72.97
25 -06	2.73	73.60	70.87
25 -07	2.30	74.25	71.94
25 -08	0.31	73.88	73.57

Acronyms:

m btoc: meters Below Top of Casing

m amsl: meters Above Mean Sea Level

The groundwater table fluctuates seasonally in response to precipitation and snowmelt events.

SUBSURFACE CONDITIONS

Asphaltic concrete with a thickness between 100 mm and 150 mm was encountered at exterior borehole locations. Inside the existing building, concrete with a thickness of 150 mm, and tile and concrete with a combined thickness of 270 mm were encountered at boreholes 25 - 04 and 25- 05, respectively.

Fill

Fill comprised predominantly of gravel and sand was encountered at the borehole locations, with a thickness between approximately 0.5 m and 1.5 m in the geotechnical drilled boreholes.

Borings were advanced through the fill without split spoon sampling, except for 25 01. The recorded SPT 'N' values for the fill materials at borehole 25 01 ranged between 6 to 16 blows per 0.3 m of penetration, indicating a loose to compact condition.

The measured moisture content by weight on samples from this material is approximately 8 percent (%), indicating a moist condition. Depending on the location, the fill may have a perched water table.

Silty Clay/Clayey Silt

A silty clay to clayey silt soil unit was encountered at the borehole locations. The characteristics of the unit varied from the interior to the exterior of the existing structures, likely because of consolidation induced by building loads. Additionally, the upper clayey soil unit at the interior borehole locations is classified as silt to clayey silt, whereas at the exterior borehole locations, the upper soil unit is classified as silty clay. The thickness of this clay ranges from 5 m to 9 m. It is noted that variation in silt and clay content within this soil unit across the Site and with depth should be expected. Typically, the water table is near the top of the surface of the silty clay.

Below the silty clay a glacial till is encountered that ranges from a gravelly sand to sand and gravel. This glacial till overlies a limestone bedrock.

INTERPRETATION

Based on the above findings, the following interpretation is presented for the hydrogeology at 1309 Carling Avenue in Ottawa, Ontario:

- The water table is variable at the Site from near surface to several metres below the ground surface. The variation may be explained by leaky stormwater or municipal water services.
- The hydraulic conductivity (K) for the fill/possible fill unit is estimated to be on the order of 2×10^{-5} meters per second (m/s). This estimated conductivity for the fill/possible fill unit corresponds with typical values for sand and silty sand.
- The K for the silty clay unit is estimated to be on the order of 5×10^{-8} m/s. This estimated conductivity for the clay unit corresponds with typical values for clay.
- If services were to be excavated at the Site, they likely would be excavated in the clay and fill no deeper than 5 m below the ground surface. Groundwater management would be limited to temporary drainage of the fill; however, flows of less than 50,000 liters per day (L/day) would be expected if construction of services involves short sections at a time and is followed by installation of low permeability plugs. Stormwater would be additional and can be managed by minimizing open excavation during storm events.
- Services will channel flows in this type of soil environment; therefore, it is recommended that low-permeability plugs be installed at 20 m intervals to limit services from becoming groundwater migration routes.
- If groundwater discharge is required, a sewer use bylaw discharge agreement should be obtained before discharging to sewers. Management water could be temporarily stored in holding tanks, such that test results for representative discharge quality can be obtained and a discharge permit can be applied for.


- It is understood that the building will be a slab on grade. As such, no groundwater management would be required after construction.
- If conditions differ than those described are encountered or implemented, Geosyntec should be requested to re-evaluate this assessment.


CLOSURE

Respectfully submitted,

Geosyntec Consultants International, Inc.


Bahareh Vazhbakht, M.A.Sc., P.Eng ON
Senior Engineer


Berend Jan Velderman QP_{ESA/RA}, M.Sc. P.Geo ON
Senior Hydrogeologist



Encl.

- Tables Table 1: Groundwater Measurement on 11 April 2025 (in text)
- Figures Figure 1: Site Location
 Figure 2: Borehole Location Plan
- Attachments Attachment 1: Borehole Logs
 Attachment 2: Borehole Logs



REFERENCES

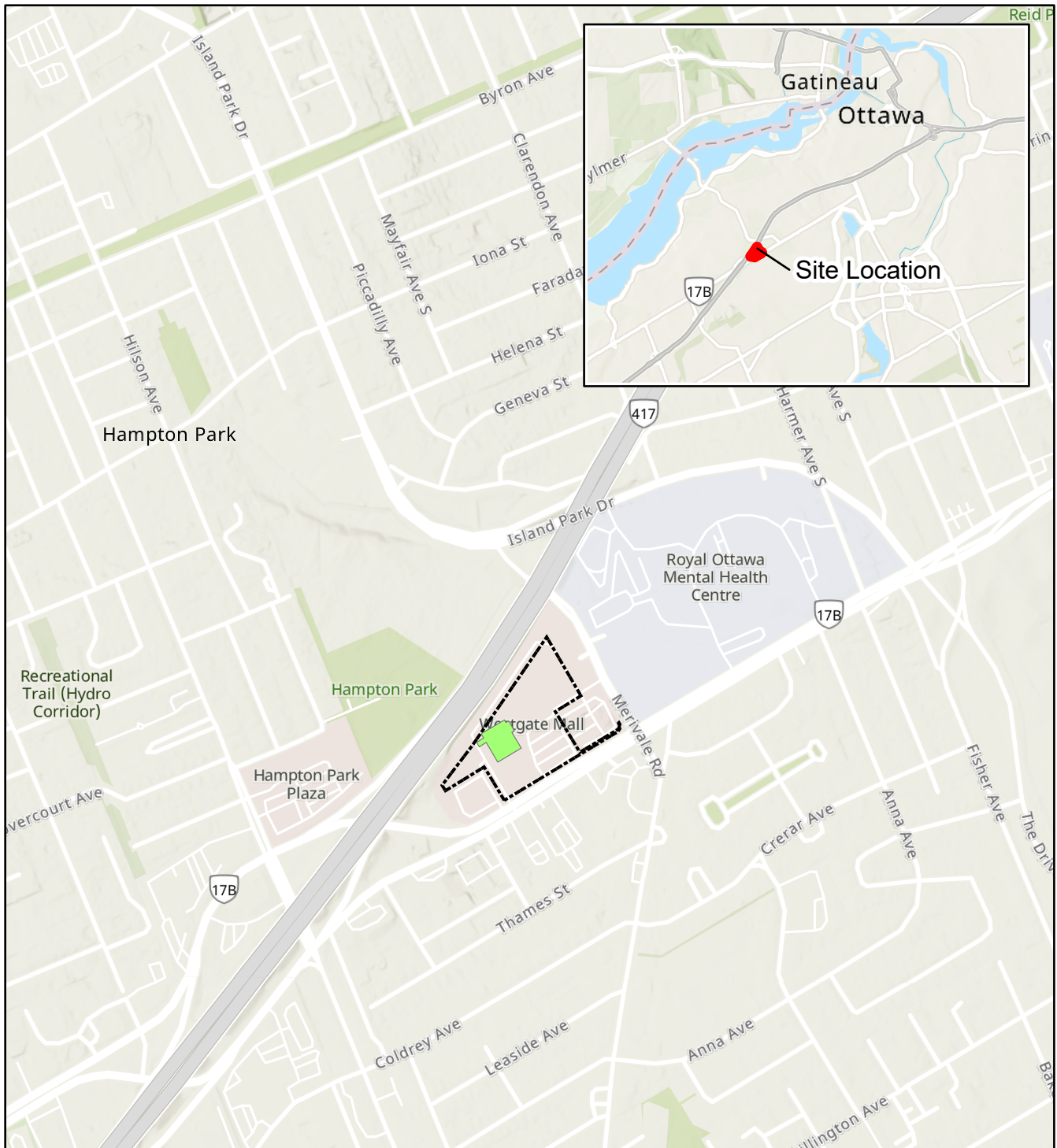
Freeze, A., and Cherry, J. 1979. Groundwater, 1st edition. Pearson

Geosyntec Consultants International, Inc. (2025). *Geotechnical Investigation Report – Proposed New Warehouse Structure 1309 Carling Avenue, Ottawa, Ontario*

Geosyntec Consultants International, Inc. (2025). *Phase Two Environmental Site Assessment – Proposed New Warehouse Structure 1309 Carling Avenue, Ottawa, Ontario*

* * * * *

Figures



Legend:



-  Phase Two Property Boundary
-  Building Footprint - Geotechnical Investigation Target Area

FIGURE 1
PROPERTY LOCATION MAP

1309 CARLING AVENUE,
OTTAWA, ONTARIO

Notes:

- 1) Map Projection: NAD 1983 CSRS UTM Zone 18N
- 2) Imagery Credits: World Topographic Map: Esri Community Maps Contributors, City of Ottawa, Province of Ontario, Ville de Gatineau, Esri Canada, Esri, TomTom, Garmin, SafeGraph,

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OFFICE LOCATION WATERLOO		REVISION 00
DATE PLOTTED 30-Apr-2025	DATE REVISED 30-Apr-2025	REVIEWED PH
APPROX. SCALE 1:10,000	PAGE SIZE 8.5 x 11 in	CHECKED EN
		DRAWN JK

Geosyntec
consultants

TRUE NORTH





- Legend:**
- Borehole (Geosyntec)
 - Monitoring Well (Geosyntec)
 - Previous Borehole (Golder)
 - Previous Monitoring Well (Golder)
 - Unlocatable Previous Monitoring Well (Golder)
 - Phase Two Property Boundary
 - Building Footprint (approximate)

Notes:
 1) Map Projection: NAD 1983 MTM 9
 2) Imagery Credits: Streets and Basemap - City of Ottawa, 2021

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FIGURE 2
BOREHOLE LOCATION PLAN -
PHASE TWO ESA AND GEOTECHNICAL
INVESTIGATION
 1309 CARLING AVENUE
 OTTAWA, ONTARIO

OFFICE LOCATION OTTAWA	REVISION 00	<p>TRUE NORTH</p>
DATE PLOTTED 01-May-2025	DATE REVISED 01-May-2025	
APPROX. SCALE 1:1,100	PAGE SIZE 11 x 17 in	
	DRAWN JK	

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Maxar, Microsoft

Attachment 1
Borehole Logs



MTM : 9	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364627.74	Driller Supplier : OGS	Client : RioCan
Northing : 5027683.11	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 73.838(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 14.63 m	Date : 23/03/2025	Loc Comment :

Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		Recovery	Shear Vane	SPT N	Water	Well Diagram	
									SS	SPT						
1	0.1		Split Spoon		GP	ASPHALT										
2	0.64				GP	FILL, granular fill, some sand, black to grey, compact, wet	W	SS1	12,8,8,4/90mm (N=16)	50%						
3	1	73			SM	FILL, silty sand, some gravel and some clay, black to grey, loose, wet	W	SS2	5,3,3,4 (N=6)	40%						
4	1.22				CI	SILTY CLAY, with some sand and gravel, brown to grey, firm, wet	W	SS3	1,2,3,3 (N=5)	100%						
6	1.82	72			CI	soft	W	SS4	3,2,1,1 (N=3)	100%						
7	2				CI		W	SS4	3,2,1,1 (N=3)	100%						
8	2.43				GP	SANDY GRAVEL, with trace silt, black to brown, very loose, wet	W	SS5	1,2,1,2 (N=3)	100%						
9	3	71			GP		W	SS5	1,2,1,2 (N=3)	100%						
11	3.2				CI	SILTY CLAY, grey, stiff, wet	W	SS6	0, 0, 0, 0	100%						
12		70			CI		W	SS6	0, 0, 0, 0	100%						
13	4		CI		W	SS7	0, 0, 0, 0	100%								
14		70	CI		W	SS7	0, 0, 0, 0	100%								
15	5	69	CI		W	SS7	0, 0, 0, 0	100%								
16	6	68	CI		W	SS7	0, 0, 0, 0	100%								
17		69	CI		W	SS7	0, 0, 0, 0	100%								
18		68	CI		W	SS7	0, 0, 0, 0	100%								
19		68	CI		W	SS7	0, 0, 0, 0	100%								
20	6	68	CI		W	SS7	0, 0, 0, 0	100%								
21	6.1		SM	GRAVELLY SILTY SAND, with clay, grey, very loose, wet	W	SS8	1,1,2,3 (N=3)	5%								
22		67	SM		W	SS8	1,1,2,3 (N=3)	5%								
23	6.86		SM	trace clay, loose	W	SS9	2,2,3,2 (N=5)	60%								
24	7		SM		W	SS9	2,2,3,2 (N=5)	60%								
25		66	SM		W	SS10	2,3,4,3 (N=7)	80%								
26	8		SM		W	SS10	2,3,4,3 (N=7)	80%								
27		66	SM		W	SS10	2,3,4,3 (N=7)	80%								
28		66	SM		W	SS10	2,3,4,3 (N=7)	80%								
29	8.84		SM	boulder, grey, wet	W											
30	9		SM		W											
31		65	SM		W											
32		64	SM		W											

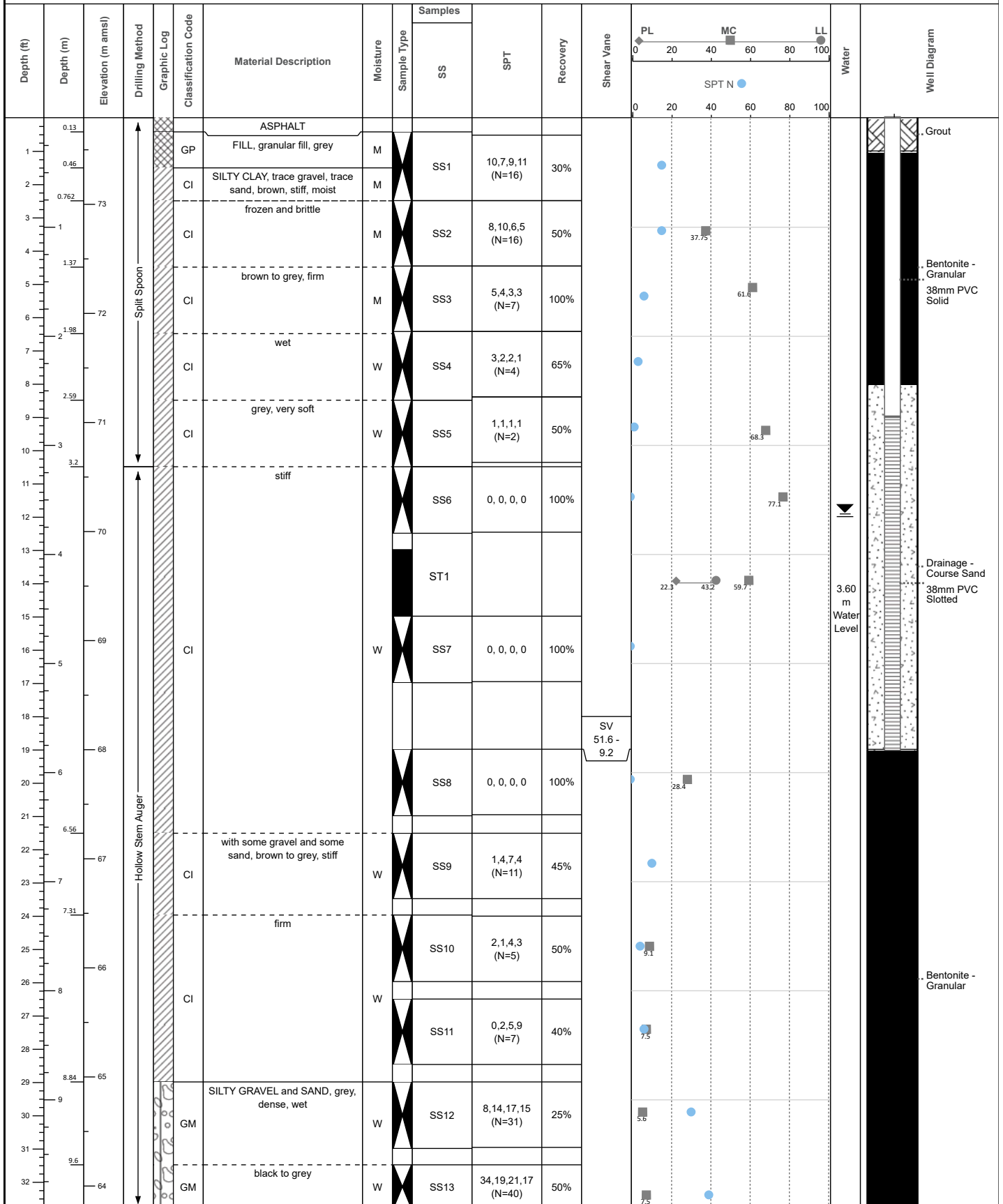
MTM : 9	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364627.74	Driller Supplier : OGS	Client : RioCan
Northing : 5027683.11	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 73.838(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 14.63 m	Date : 23/03/2025	Loc Comment :

Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	SS	SPT	Recovery	Shear Vane	Liquid Limit / Plasticity		Water	Well Diagram	
													PL	LL			
34			Hollow Stem Auger		SM	boulder, grey, wet	W						0	100			
35		63															
36	11																
37	11.28					less sand and fines							0	100			
38								SS11	5,3,6,10 (N=9)	20%							
39	12	62			SM		W										
40																	
40	12.37					Commenced Coring at 12.37m											

MTM : 9	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364627.74	Driller Supplier : OGS	Client : RioCan
Northing : 5027683.11	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 73.838(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 14.63 m	Date : 23/03/2025	Loc Comment :

Depth (ft)	Depth (m)	Elevation (m)	Drilling Method	Classification Code	Graphic Log	Material Description	Stratigraphy	Samples	RQD% and TCR%	RQD	Water	Well Diagram	Remarks / Observations
34										0			
35										20			
36	11	63								40			
37										60			
38										80			
39										100			
40		62				Commenced Coring at 12.37m							
41													
42	61			LIMST		LIMESTONE: grey limestone with black shale bedding, highly weathered and fractured, fine grained, thinly to medium bedded, very poor quality	Bedrock		RQD = 0%				
43	13					excellent quality, very strong							
44			NMLC Coring										
45	60			LIMST					RQD = 95%				
46	14												
47													
						25-01 Terminated at 14.63m (upon reaching target depth. Backfilled with bentonite.)							

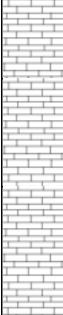
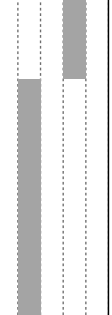
MTM : 9	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364645.68	Driller Supplier : OGS	Client : RioCan
Northing : 5027656.31	Logged By : EN, TK	Project : RioCan Westgate - 1309 Carling Ave
RL : 73.791(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 13.33 m	Date : 17/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)



MTM : 9	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364645.68	Driller Supplier : OGS	Client : RioCan
Northing : 5027656.31	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 73.791(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 13.33 m	Date : 17/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)

Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	SS	SPT	Recovery	Shear Vane	Water		Well Diagram
													PL	LL	
34		63	Hollow Stem Auger		GM	black to grey	W	SS13	34,19,21,17 (N=40)	50%		0	100		
36	11					Commenced Coring at 11.28m									
11.28															

MTM : 9	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364645.68	Driller Supplier : OGS	Client : RioCan
Northing : 5027656.31	Logged By : EN, TK	Project : RioCan Westgate - 1309 Carling Ave
RL : 73.791(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 13.33 m	Date : 17/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)

Depth (ft)	Depth (m)	Elevation (m)	Drilling Method	Graphic Log	Classification Code	Material Description	RQD% and TCR%	RQD	Water	Well Diagram
34		63								
35										
36	11									
37						Commenced Coring at 11.28m				
38			NMLC Coring		LIMST	LIMESTONE: grey limestone with black shale interbeds, fresh, fine grained, thinly to medium bedded, good quality, very strong	RQD = 82%			
38.756	11.81	62				fractured zone, very poor quality				
39					LIMST					
40	12									
41	12.5				LIMST	excellent quality	RQD = 52%			
42		61			LIMST					
43	13									
						25-02 Terminated at 13.33m (upon reaching target depth. Monitoring well installed, details shown on the graph.)				

Coordinate System : EPSG:32189	Driller Rig : CME 75 HT	Job Number : TR1363B
Eastng : 364692.82	Driller Supplier : OGS	Client : RioCan
Northing : 5027788.83	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 73.793(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 7.47 m	Date : 26/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)

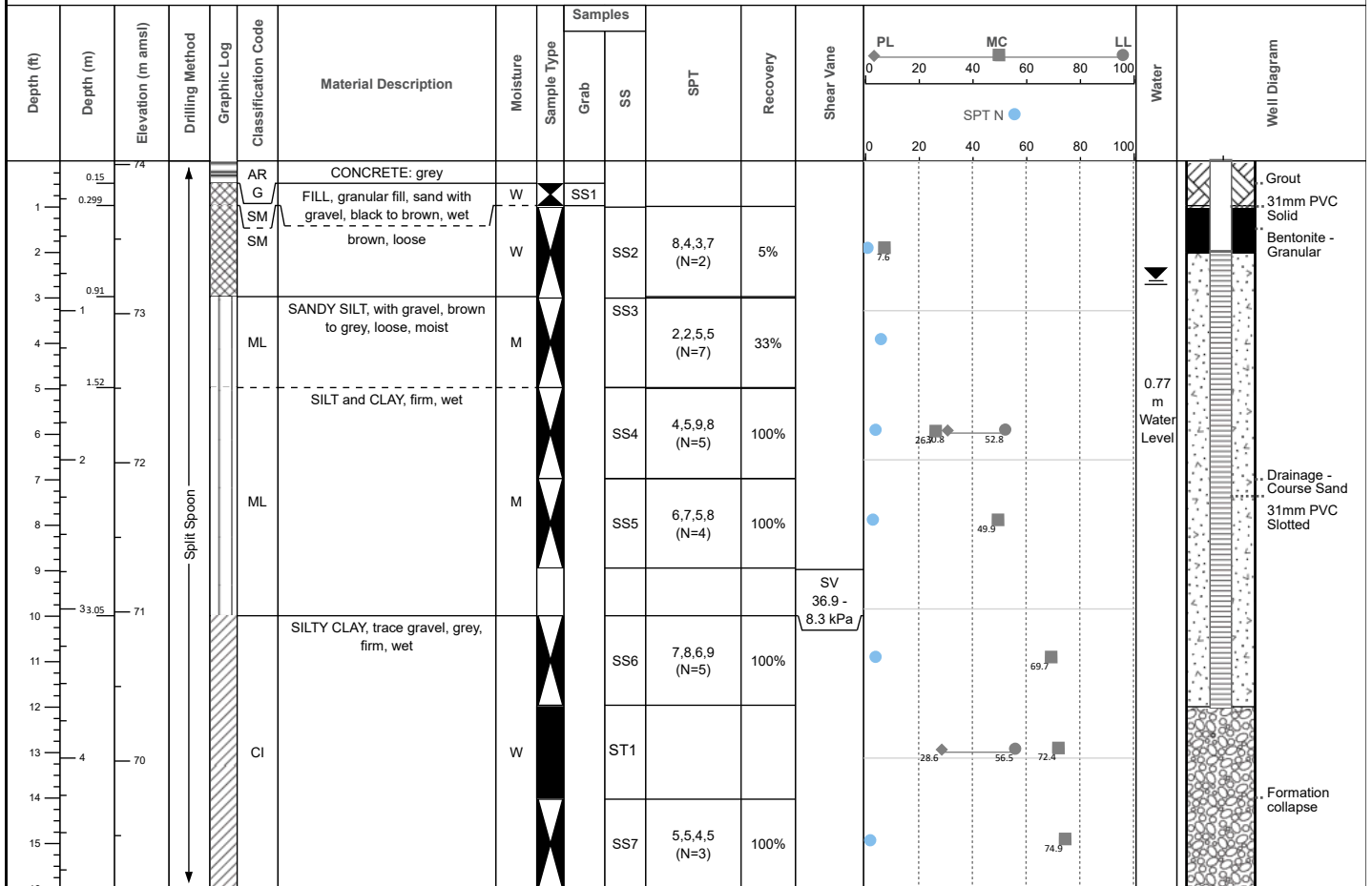
Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		SPT	Recovery	Shear Vane	PL	MC	LL	SPT N	Water	Well Diagram
									Grab	SS									
0.15						ASPHALT													
1					GP	FILL, granular fill	M	SS1											Grout
2																			
3	0.762	73.0			ML	SANDY SILT, grey brown, compact, moist	M	SS2		2,6,4,5 (N=10)	100%								Bentonite - Granular
4																			50mm PVC Solid
5	1.524																		
6		72.0				SILTY CLAY, grey to brown, firm, moist		SS3		3,2,2,2 (N=4)	40%								
7																			
8																			
9		71.0			CI		M	SS4		1,1,0,1 (N=1)	100%								
10																			
11																			
12																			
13	3.81	70.0				some organics, grey, very soft, wet		SS5		0, 0, 0, 0	100%								
14																			
15																			
16		69.0																	
17																			
18					CI		W	SS6		0, 0, 0, 0	100%								
19																			
20																			
21																			
22																			
23	6.858	67.0			ML	SANDY SILT, till with some gravel, grey, compact, wet	W	SS8		2,10,9,8 (N=19)	75%								
24																			

25-03 Terminated at 7.47m (upon reaching target depth. Monitoring well installed.)

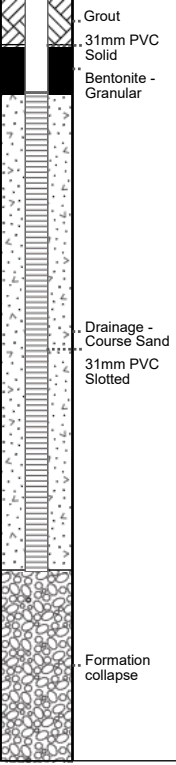
1.59 m Water Level

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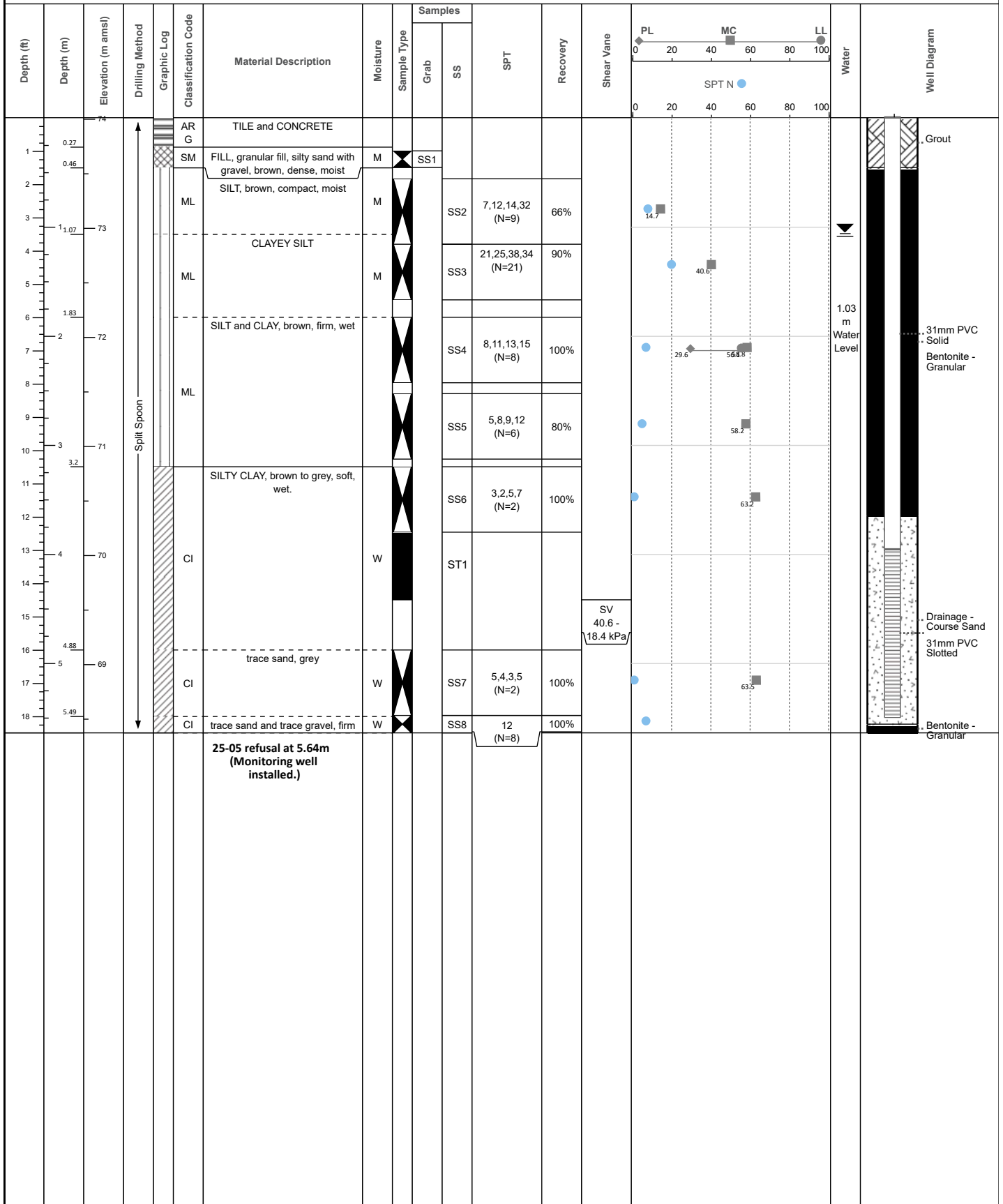
MTM : 9	Driller Rig : Hilti DD250	Job Number : TR1363B
Easting : 364665.65	Driller Supplier : OGS	Client : RioCan
Northing : 5027721.99	Logged By : TK	Project : RioCan Westgate - 1309 Carling Ave
RL : 74.015(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 4.88 m	Date : 24/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)



25-04 Terminated at 4.88m (upon reaching target depth. Monitoring well installed.)



MTM : 9	Driller Rig : Hilti DD250	Job Number : TR1363B
Easting : 364679.23	Driller Supplier : OGS	Client : RioCan
Northing : 5027679.71	Logged By : TK	Project : RioCan Westgate - 1309 Carling Ave
RL : 74.01(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 5.64 m	Date : 25/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)



Coordinate System : EPSG:32189	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364708.68	Driller Supplier : OGS	Client : RioCan
Northing : 5027628.16	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 73.599(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 5.79 m	Date : 20/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)

Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		SPT	Recovery	Shear Vane	SPT N	Water	Well Diagram		
									Grab	SS								
1	0.18		Hollow Stem Auger	[Hatched Pattern]		ASPHALT												
2	0.76	73.0			GP	FILL, granular fill, brown	M		SS1									
3	1				CI	SILTY CLAY, some gravel and some sand, grey, firm, moist	M		SS2	4,3,5,5 (N=8)	50%							
5	1.524	72.0			CI	trace gravel and trace sand, soft, wet	W		SS3	2,1,2,2 (N=3)	50%							
8	2.286					very soft			SS4	1,1,1,1 (N=2)	100%							
9		71.0							SS5	1, 0, 0, 0	90%							
12		70.0							SS6	0, 0, 0, 0	100%							
15		69.0																
17												SV 55.3 - 11.1						
18		68.0						SS7	1,2,6 (N=R)	60%								

25-06 Refusal at 5.79m (Monitoring well installed.)

This report must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

Coordinate System : EPSG:32189	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364739,93	Driller Supplier : OGS	Client : RioCan
Northing : 5027849.22	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 74.246(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 7.47 m	Date : 14/03/2025	Loc Comment : Elevation is Top of PVC Casing (GCVD28)

Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		SPT	Recovery	Shear Vane	PL	MC	LL	SPT N	Water	Well Diagram		
									Grab	SS											
1	0.15	74.0	Hollow Stem Auger		ASPHALT	M	SS1 (gra b)												Grout		
2	0.76				FILL, granular fill	M															Bentonite - Granular
3	1	73.0				M				30,26,11,6 (N=37)	25%										50mm PVC Solid
4	1.524					M															
5	2	72.0				M				5,5,8,9 (N=13)	50%										
6	2.286					M															
7	2.898	71.0				M				2,3,4,2 (N=7)	90%										
8	3.048			M																	
9	3.81	70.0		M																	
10	4			M																	
11	5	69.0		M																	
12	6	68.0		M																	
13	6.86			M																	
14	7	67.0		M																	
15				M																	
16				M																	
17				M																	
18				M																	
19				M																	
20				M																	
21				M																	
22				M																	
23				M																	
24				M																	

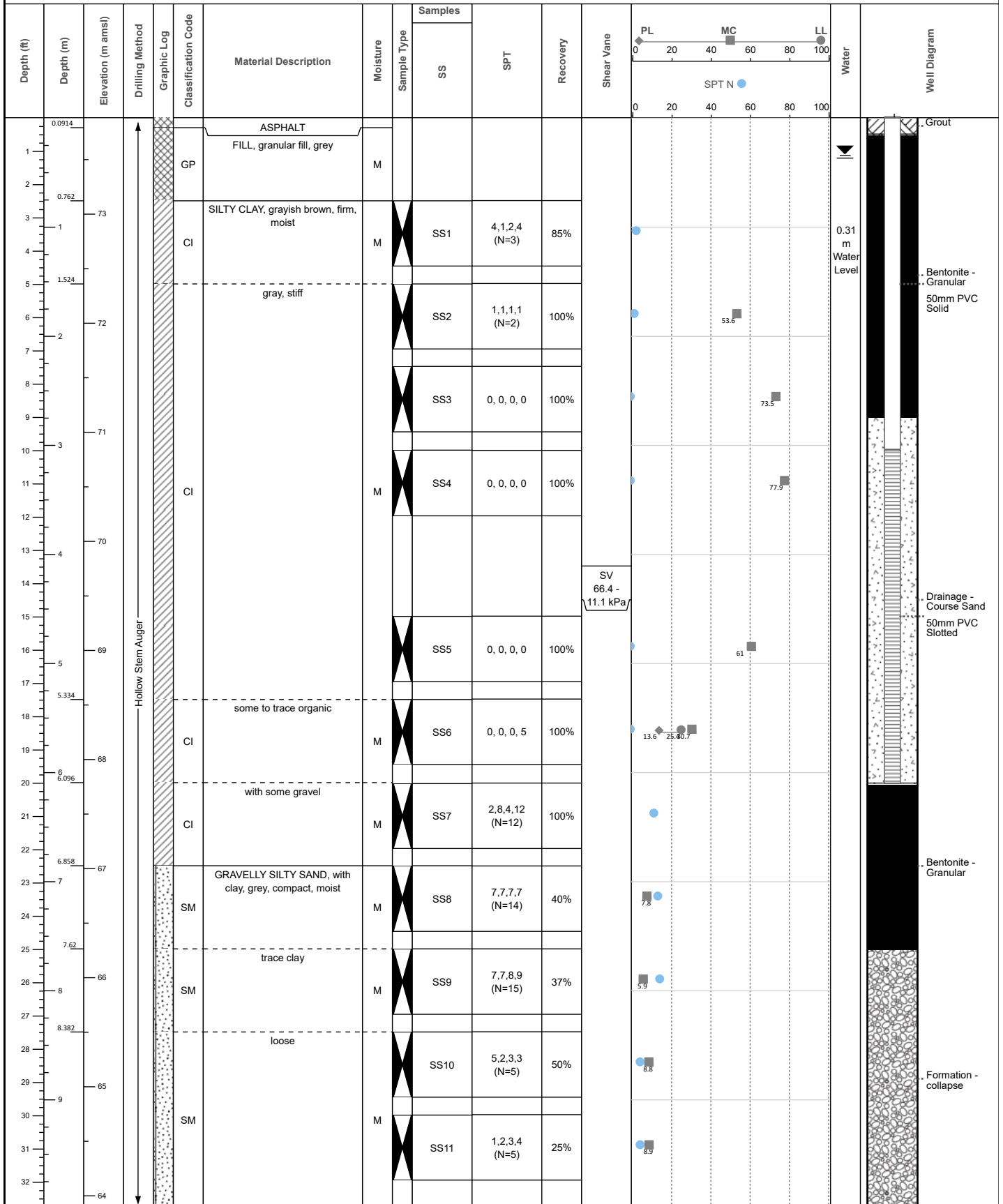
25-07 Terminated at 7.47m (upon reaching the target depth. Monitoring well installed.)

SV 44,3 - 5,5

2.30 m Water Level

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MTM : 9	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364703.62	Driller Supplier : OGS	Client : RioCan
Northing : 5027715.34	Logged By : EN, TK	Project : RioCan Westgate - 1309 Carling Ave
RL : 73.884(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 20.57 m	Date : 11/03/2025	Loc Comment : Elevation is Top of PVC Casing






MTM : 9 Easting : 364703.62 Northing : 5027715.34 RL : 73.884(m) Total Depth : 20.57 m	Driller Rig : CME 75 HT Driller Supplier : OGS Logged By : EN, TK Reviewed By : BV Date : 11/03/2025	Job Number : TR1363B Client : RioCan Project : RioCan Westgate - 1309 Carling Ave Location : 1309 Carling Avenue, Ottawa, ON, Canada Loc Comment : Elevation is Top of PVC Casing
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Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		SPT	Recovery	Shear Vane	Liquid Limit / Plasticity Chart			Water	Well Diagram	
									SS	N				PL	MC	LL			
34			Hollow Stem Auger		SM	loose	M												
35	10.668	63			SM	compact, wet	W		SS12	4,9,12 (N=R)	60%			12.9					
36	11																		
37	11.2776							boulder											
38																			
39	12	62																	
40																			
41					SM		W												
42		61																	
43	13																		
44																			
45	13.72	60			SM	GRAVELLY SAND, with some silt and trace clay, grey, dense, wet	W	SS13	18,16,22,8 (N=38)	40%			8.9						
46	14																		
47																			
48		59																	
49	15																		
50																			
51	15.54					more gravel and less sand		SS14	8,11,19,17 (N=30)	25%			9.9						
52	16	58																	
53																			
54																			
55	17	57						SS15	15,19,33 (N=R)	50%			13.7						
56																			
57																			
58	17.83					Commenced Coring at 17.83m													

MTM : 9 Easting : 364703.62 Northing : 5027715.34 RL : 73.884(m) Total Depth : 20.57 m	Driller Rig : CME 75 HT Driller Supplier : OGS Logged By : EN, TK Reviewed By : BV Date : 11/03/2025	Job Number : TR1363B Client : RioCan Project : RioCan Westage - 1309 Carling Ave Location : 1309 Carling Avenue, Ottawa, ON, Canada Loc Comment : Elevation is Top of PVC Casing
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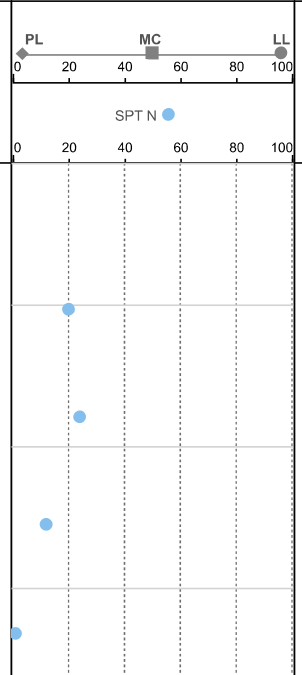
Depth (ft)	Depth (m)	Elevation (m)	Drilling Method	Graphic Log	Classification Code	Material Description	RQD% and TCR%		Water	Well Diagram
							RQD%	TCR%		
34										
35										
36	11	63								
37										
38										
39	12	62								
40										
41										
42										
43	13	61								
44										
45										
46	14	60								
47										
48										
49	15	59								
50										
51										
52	16	58								
53										
54										
55										
56	17	57								
57										
58										
Commenced Coring at 17.83m										
59	18	56	 NMLC Coring	 LIMST	LIMSTONE: grey limestone with shale interbeds, highly weathered and fractured, fine grain, thinly to medium bedded, very poor quality	RQD = 0%				
60						good quality, very strong	RQD = 80%			
61										
62	19	55								
63										
63.468	19.35									
64										
65		54								

MTM : 9 Easting : 364703.62 Northing : 5027715.34 RL : 73.884(m) Total Depth : 20.57 m	Driller Rig : CME 75 HT Driller Supplier : OGS Logged By : EN, TK Reviewed By : BV Date : 11/03/2025	Job Number : TR1363B Client : RioCan Project : RioCan Westgate - 1309 Carling Ave Location : 1309 Carling Avenue, Ottawa, ON, Canada Loc Comment : Elevation is Top of PVC Casing
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Depth (ft)	Depth (m)	Elevation (m)	Drilling Method	Graphic Log	Classification Code	Material Description	RQD% and TCR%	RQD	Water	Well Diagram
67			NMLC Coring		LIMST	good quality, very strong	RQD = 80%			
25-08 Terminated at 20.57m (upon reaching target depth Monitoring well installed.)										

Coordinate System : EPSG:32189	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364771.63	Driller Supplier : OGS	Client : RioCan
Northing : 5027678.26	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 74.227(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 3.65 m	Date : 20/03/2025	Loc Comment :

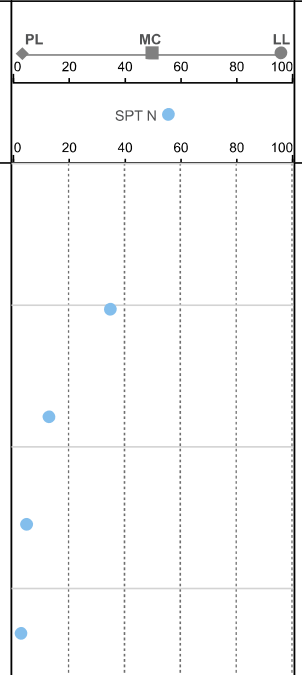
Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		SPT	Recovery	Shear Vane	Water	Well Diagram
									Grab	SS					
1	0.19	74.0	Split Spoon		GP	ASPHALT FILL, granular fill, some silt and some clay, brown, moist	M	SS1							
2	0.76			CI	SILTY CLAY, some gravel and some sand, brown to grey, very stiff, moist	M	SS2	6,11,10,10 (N=21)	75%						
3	1	73.0		CI	trace organic	M	SS3	6,10,15,14 (N=25)	80%						
4	1.524			CI	trace gravel and trace sand, stiff	M	SS4	6,6,7,6 (N=13)	10%						
5	2.286	72.0		CI	trace organic, firm	W	SS5	2,1,1,1 (N=2)	100%						
6	2														
7	2.286	72.0													
8															
9															
10	3.048	71.0													
11															
<p>25-09 Terminated at 3.65m (upon reaching the target depth. Borehole backfilled with bentonite.)</p>															



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Coordinate System : EPSG:32189	Driller Rig : CME 75 HT	Job Number : TR1363B
Easting : 364599,11	Driller Supplier : OGS	Client : RioCan
Northing : 5027648,88	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 75,018(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 3,65 m	Date : 21/03/2025	Loc Comment :

Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		SPT	Recovery	Shear Vane	Water	Well Diagram	
									SS							
0.65	75.0		Hollow Stem Auger	ASPHALT												
1				GP	FILL: granular fill, brown, loose, moist	M										
2																
3	0.76	74.0			CI	SILTY CLAY, grey, hard, moist	M	SS1	12,22,14,8 (N=36)	100%						
4						grey to brown, stiff	M	SS2	4,6,8,9 (N=14)	100%						
5	1.52					CI										
6		73.0			firm	M	SS3	1,3,3,4 (N=6)	80%							
7	2.29					CI										
8		72.0			grey, wet	W	SS4	1,2,2,1 (N=4)	80%							
9																
10	33.05															
11																
25-10 Terminated at 3.65m (upon reaching target depth. Backfilled with bentonite.)																

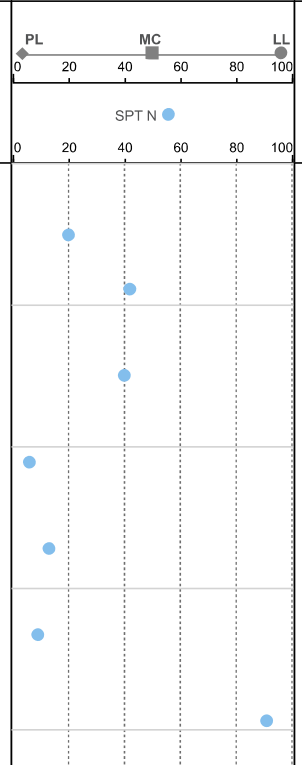


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Coordinate System : EPSG:32189	Driller Rig : Hilti DD250	Job Number : TR1363B
Easting : 364781.18	Driller Supplier : OGS	Client : RioCan
Northing : 5027780.30	Logged By : EN, TK	Project : RioCan Westage - 1309 Carling Ave
RL : 74,404(m)	Reviewed By : BV	Location : 1309 Carling Avenue, Ottawa, ON, Canada
Total Depth : 4.27 m	Date : 21/03/2025	Loc Comment :

Depth (ft)	Depth (m)	Elevation (m amsl)	Drilling Method	Graphic Log	Classification Code	Material Description	Moisture	Sample Type	Samples		SPT	Recovery	Shear Vane	Water	Well Diagram	
									SS							
1	0.061	74.0	Hollow Stem Auger	[Graphic Log]	GP	ASPHALT FILL: granular fill gravel with sand, grey, compact, wet	W									
2	0.61				SW	FILL: silty sand, some gravel, brown, dense, moist	M		SS1	14,21,0 (N=21)	75%					
3	1				SW	trace clay	M		SS2	20,9,34,30 (N=43)	33%					
4	1.219				SW	with asphalt, brown to black, loose	M		SS3	18,22,19,5 (N=41)	50%					
5	1.829	73.0			SW	SANDY SILT, some gravel, brown, compact, moist	M		SS4	3,3,4,3 (N=7)	33%					
6	2				SM	some clay, brown to grey	M		SS5	3,7,7,21 (N=14)	20%					
7	2.44	72.0			SM	grey, dense, wet	M		SS6	4,4,6,9 (N=10)	33%					
8	3.05				SM		W		SS7	17,50,42,24 (N=92)	25%					

25-11 Terminated at 4.27m (upon reaching target depth. Backfilled with bentonite.)



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