

re: Groundwater Field Investigation
Proposed Warehouse Complex - 3713 Borrisokane Road - Ottawa
to: Caivan Greenbank North Inc. - Mr. Hugo Lalonde
date: May 13, 2020
file: PG5155-MEMO.04

Further to your request, Paterson Group (Paterson) has prepared the following memorandum to provide an overview of the field program to delineate the groundwater elevations at the east side of the subject site. The current memorandum should be read in conjunction with Paterson report PG5155-1 Revision 1, dated February 10, 2020.

Background

It is understood that an infiltration pond is proposed for the subject site as shown on Paterson Drawing PG5016-1 Rev.3 - Test Hole Location Plan. The infiltration gallery is proposed to be placed in proximity to the northeast corner of the site. It is our understanding that the base elevation of the proposed infiltration gallery will be at 97.5 m asl. A field program consisting of test pits left open for 48 hours was completed in the east end of the subject site that extended to a maximum depth of 9 m below ground surface. Additional test pits were completed south of the proposed infiltration pond to delineate further groundwater conditions.

Field Investigation

The majority of the area consists of a silty clay fill material with sand, gravel, and cobbles or a silty sand fill material with clay, gravel and cobbles. The intermixed fill has led to various perched groundwater conditions in the shallow fill material. In order to review the groundwater conditions, eleven test holes were extended to approximately 96 to 99 m asl. See attached Paterson Soil Profile and Test Data sheets for specific profiles at each location. The test hole locations can be found on the attached Paterson Drawing PG5016-1 Rev. 3 - Test Hole Location Plan.

The test holes in proximity to the proposed infiltration pond consisted of TP74, TP75, TP76 and TP77. The test pits were excavated and allowed to remain open for 48 hours to provide stabilized groundwater elevations. It is expected that the open hole water levels provide a slightly higher groundwater elevation due to the reduced restrictions related to the removal of overburden within the test hole.

Table 1: Infiltration Pond Area Groundwater Elevations	
Test Hole	Groundwater Elevation (m asl)
TP74	98.77
TP75	97.01
TP76	Dry to 95.9
TP77	97.51

TP78 was completed in proximity to the proposed septic tankage for the sewage system. The overburden material consisted of a silty sand fill material with some gravel, cobbles, and boulders and trace clay. The test pit was dry to below the underside of the proposed sewage system tankage.

Cross sections of the area have been completed in a north-south (Section D-D') direction and an east-west (Section E-E') direction. The proposed grading and pond cross section have been included in the sections. See attached plan Paterson drawing PG5016-7 - Cross Section D-D' and E-E'.

Dewatering Review

The sewage system is located above the existing groundwater elevations and would be able to be constructed without requiring pumping activities.

The proposed infiltration pond has locations of perched groundwater within the low hydraulic conductivity fill material noted within the test holes such as TP74 which encountered a higher perched groundwater condition than the other test holes. The groundwater was located at a higher elevation due to a restriction to lateral flow at this location. TP76 was noted to be dry to almost 3 m below the perched groundwater measured in TP74. It is expected that the low hydraulic conductivity fill material in the area of the test holes contains limited groundwater and it is expected that pumping of groundwater will not be required to complete the construction of the proposed infiltration pond.

We trust that this information satisfies your requirements.

Best Regards,

Paterson Group Inc.



Michael S. Killam, P.Eng.



David J. Gilbert, P.Eng.

Attachments:

- ☐ PG5016 - Soil Profile and Test Data
- ☐ PG5016-1 Rev.3 - Test Hole Location Plan
- ☐ PG5016-7 - Cross Section D-D' and E-E'



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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

**Prop. Residential Development - Borrisokane Road
Ottawa, Ontario**

DATUM	Geodetic
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FILE NO.

PG5155

REMARKS

HOLE NO.

TP74

BORINGS BY Excavator

DATE May 6, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Brown silty clay, some sand and gravel, occasional cobbles and boulders, trace debris		G	1			0	103.77					
						1	102.77					
						2	101.77					
2.30	G	2			3	100.77						
4					99.77							
5.00					5	98.77						
FILL: Brown silty sand, some clay and gravel, occasional cobbles and boulders, trace debris		G	3			6	97.77					
						7	96.77					
7.80												
End of Test Pit												
(Groundwater infiltration at 5.0m depth)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Borrisokane Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY Excavator

DATE May 6, 2020

FILE NO. PG5155

HOLE NO. TP75

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	105.01						
FILL: Brown silty clay, some sand and gravel, occasional cobbles and boulders, trace debris and organics		G	1			1	104.01						
						2	103.01						
						3	102.01						
FILL: Brown silty sand, some clay and gravel, trace debris		G	2			4	101.01						
						5	100.01						
						6	99.01						
						7	98.01						
						8	97.01						
End of Test Pit						9	96.01						
(Groundwater infiltration at 8.0m depth)								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

**Prop. Residential Development - Borrisokane Road
Ottawa, Ontario**

DATUM	Geodetic
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FILE NO.

PG5155

REMARKS

HOLE NO.

TP76

BORINGS BY Excavator

DATE May 6, 2020

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Prop. Residential Development - Borrisokane Road
Ottawa, Ontario**

FILE NO. PG5155

HOLE NO. TP77

DATE May 6, 2020

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Prop. Residential Development - Borrisokane Road
Ottawa, Ontario**

FILE NO. PG5155

HOLE NO. **TP78**

DATE May 7, 2020

[illegible]

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

**Prop. Residential Development - Borrisokane Road
Ottawa, Ontario**

DATUM	Geodetic
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FILE NO.

PG5155

REMARKS

HOLE NO.

TP79

BORINGS BY Excavator

DATE May 7, 2020

[illegible]

SOIL PROFILE AND TEST DATA

HOLE NO. **TP95**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	105.72						
FILL: Brown silty clay, some sand and gravel, occasional cobbles and boulders, trace debris and organics		G	1			1	104.72						
						2	103.72						
		G	2			3	102.72						
						4	101.72						
						5	100.72						
						6	99.72						
		G	4			7	98.72						
7.80													
Compact, brown SILTY SAND		G	5			8	97.72						▽
8.50													
End of Test Pit													
(Groundwater infiltration at 8.0m depth)													

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Borrisokane Road
Ottawa, Ontario

FILE NO. PG5155

HOLE NO. TP97

DATE May 8, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	103.91						
FILL: Brown sandy silt, some clay and gravel, occasional cobbles and boulders, trace debris and organics		G	1			1	102.91						
		G	2			2	101.91						
		G	3			3	100.91						
		G	4			4	99.91						
FILL: Brown silty clay, some sand and gravel, occasional cobbles and boulders, trace debris and organics						5	98.91						
						6	97.91						
						7	96.91						
Compact, brown SILTY SAND		G	5										
End of Test Pit													
(Groundwater infiltration at 6.0m depth)													

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Residential Development - Borrisokane Road
Ottawa, Ontario

DATUM Geodetic

REMARKS

BORINGS BY Excavator

DATE May 8, 2020

FILE NO.

PG5155

HOLE NO.

TP98

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	103.97						
FILL: Brown sandy silt, occasional cobbles and boulders, trace clay, gravel and organics		G	1			1	102.97						
		G	2			2	101.97						
		G	3			3	100.97						
						4	99.97						
						5	98.97						
	6.00					6	97.97						
FILL: Brown silty clay, some sand and gravel, occasional cobbles and boulders, trace debris and organics		G	4			7	96.97						
						8	95.97						
End of Test Pit (TP dry upon completion)													
							</						

DATUM	Geodetic
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FILE NO. PG5155

REMARKS

HOLE NO. **TP99**

BORINGS BY Excavator

DATE May 8, 2020

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Prop. Residential Development - Borrisokane Road
Ottawa, Ontario**

DATUM	Geodetic
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FILE NO. PG5155

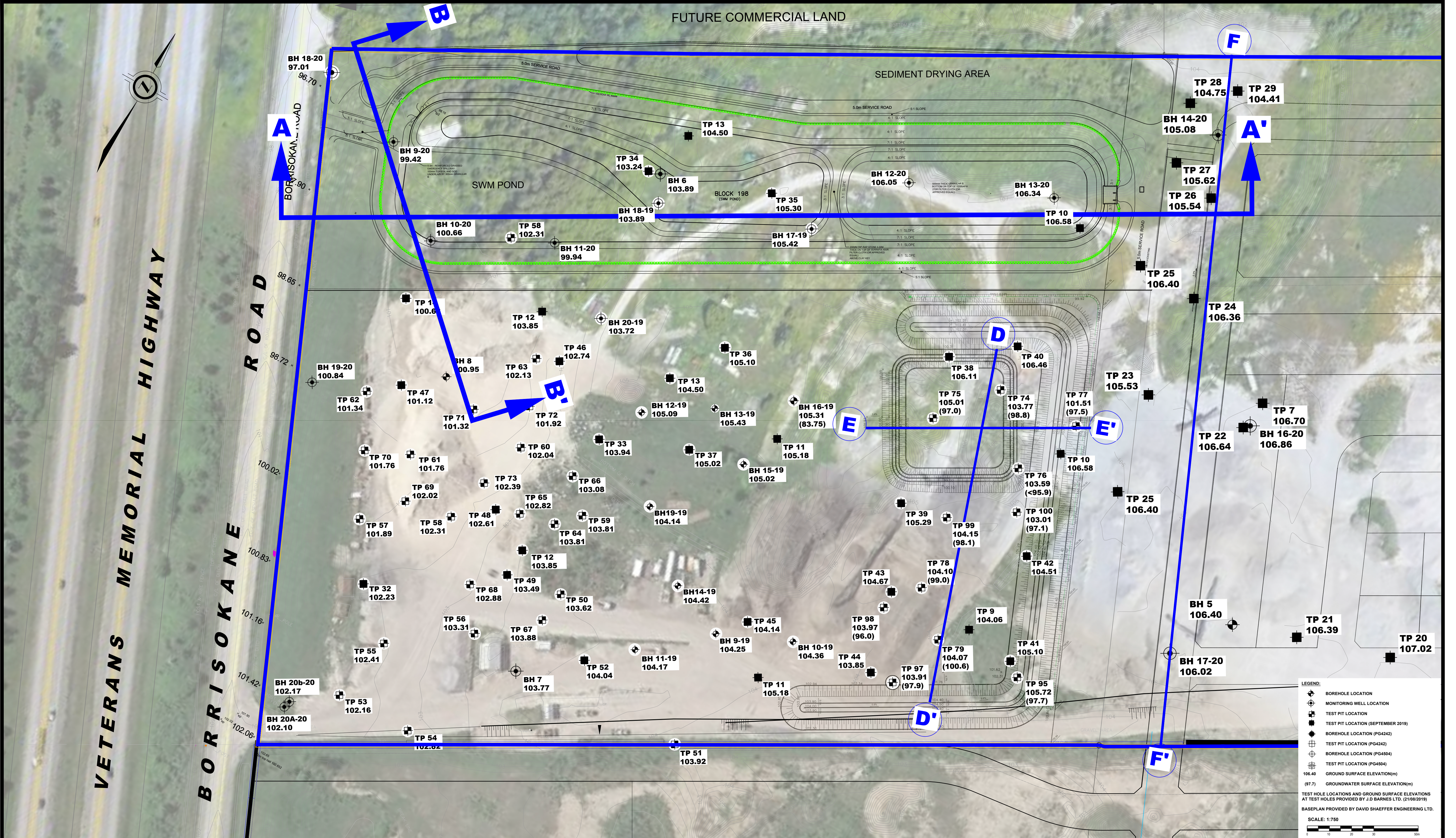
REMARKS

HOLE NO. **TP100**

BORINGS BY Excavator

DATE May 1, 1985

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	103.01						
FILL: Brown silty clay, some sand and gravel, occasional cobbles and boulders, trace debris and organics		G	1			1	102.01						
		G	2			2	101.01						
		G	3			3	100.01						
		G	4			4	99.01						
5.90		G	5			5	98.01						
Compact, brown SILTY SAND		G	5			6	97.01						
End of Test Pit													
(Groundwater infiltration at 5.9m depth)													
								20 40 60 80 100					
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					



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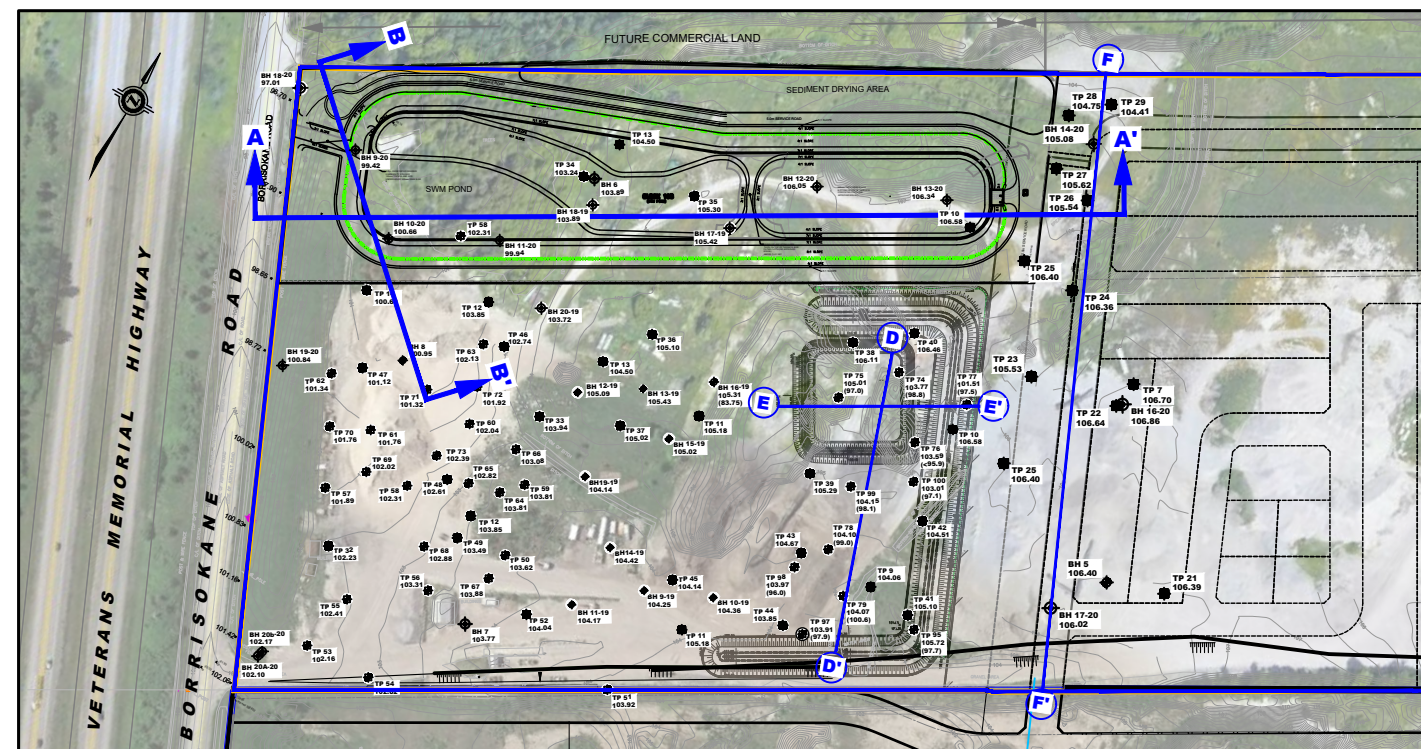
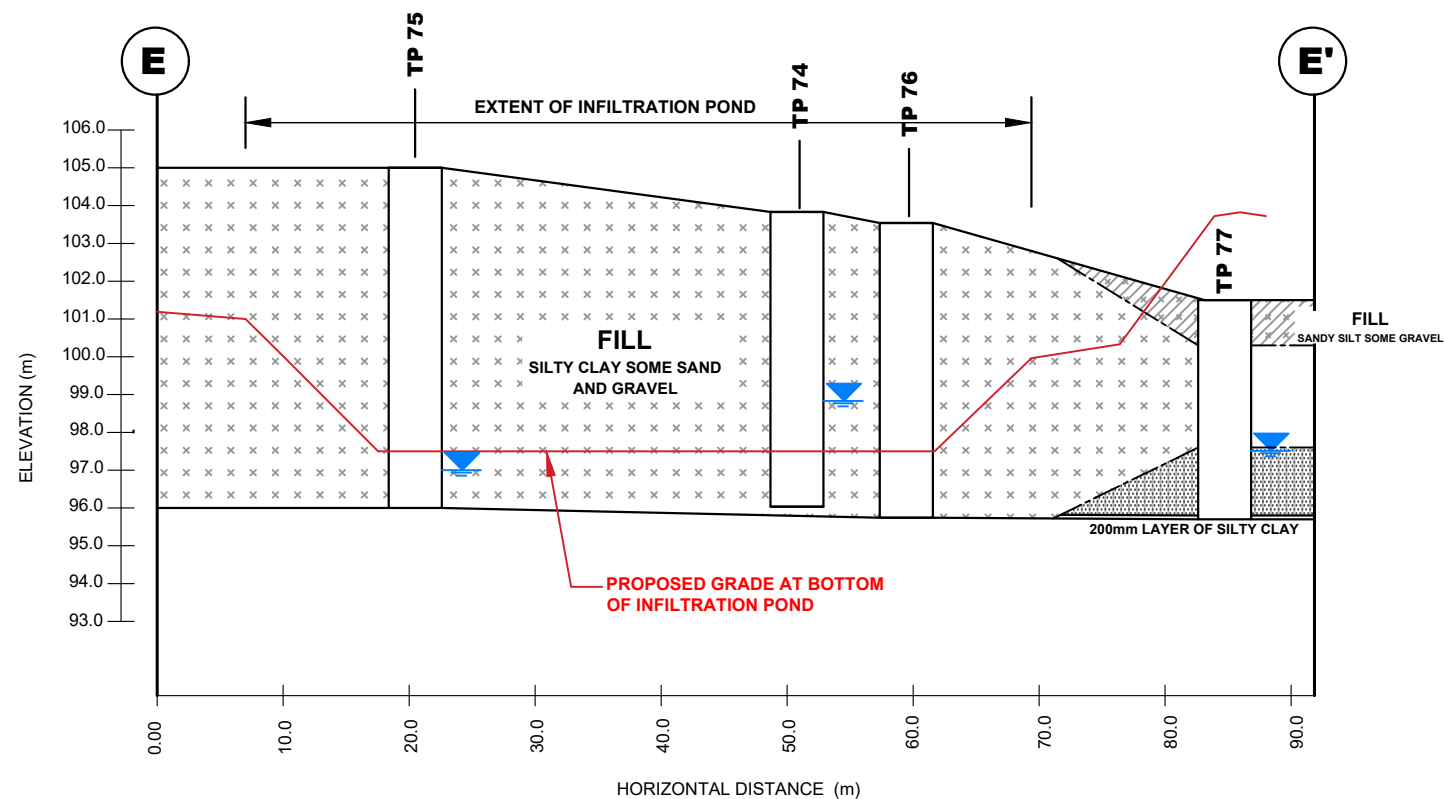
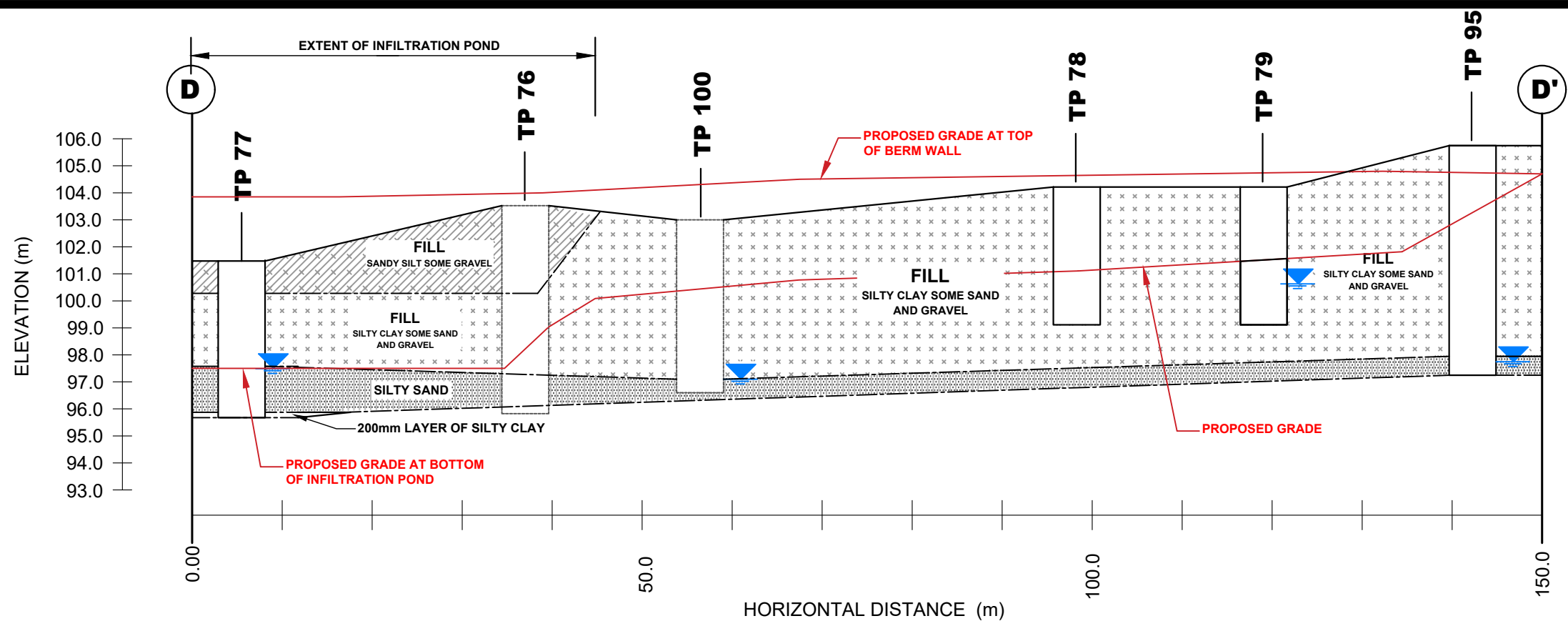
NO.	REVISIONS	DATE	INITIAL
3	LOCALIZED ABIC SITE VIEW AND CROSS SECTIONS	13/05/2020	DJG
2	TP74 TO TP 100 ADDED	11/05/2020	DJG
1	BH25-20 TO BH28-20 ADDED	23/04/2020	DJG

CAIVAN COMMUNITIES
GEOTECHNICAL INVESTIGATION - PROPOSED DEVELOPMENT
BORRISOKANE ROAD - DRUMMONDS PIT

TEST HOLE LOCATION PLAN

Scale:	1:750
Drawn by:	RCG
Checked by:	MK
Approved by:	DJG
Date:	03/2020

Report No.:	PG5155-MEMO.04
Drawn No.:	
Revision No.:	3



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NO.	REVISIONS	DATE	INITIAL

CAIVAN COMMUNITIES
GEOTECHNICAL INVESTIGATION - PROPOSED DEVELOPMENT
BORRISOKANE ROAD - DRUMMONDS PIT

OTTAWA,
Title:

ONTARIO

CROSS SECTION D-D' AND E-E'

Scale:	V 1:200 H 1:600	Date:	05/2020
Drawn by:	RCG	Report No.:	PG5155-MEMO.04
Checked by:	MK	Dwg. No.:	PG5016-7
Approved by:	DJB	Revision No.:	