September 19, 2024



PH4942-LET.01

Day & Ross Transportation Group 398 Main Street Hartland, New Brunswick E7P 1C6

Attention: Tony Reid

Subject: **Terrain Analysis**

Site Plan Application

5494, 5500 and 5510 Boundary Road Ottawa (Carlsbad Springs), Ontario

Consulting Engineers

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

Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Retaining Wall Design
Noise and Vibration Studies

patersongroup.ca

INTRODUCTION

Further to your request, Paterson has completed a Terrain Analysis in support of a Site Plan Application for the proposed commercial development, specifically a cross-dock facility, to be located at the combined properties of 5494, 5500 and 5510 Boundary Road in Ottawa (Carlsbad Springs), Ontario (hereby referred to as 5494 Boundary Road). Please refer to Novatech's Drawing titled Grading Plan – Drawing No. 118168-GR-REV#2 – dated May 28, 2024 attached to this report for further details.

The purpose of this work has been to determine the suitability of the subject site to support private septic system servicing as it relates to the City of Ottawa Hydrogeological and Terrain Analysis Guidelines (HTAG) annotated procedure D-5-4.

The Subject Site consists of a combined 8.46 hectare (ha) area which is largely vacant, with the exception of a residential dwelling currently located at 5494 Boundary Road. The ground surface is generally flat, with elevations ranging from approximately 76 to 79 m above sea level (asl). Based on available mapping, the regional groundwater flow direction is anticipated to be southeast towards the Simpson Municipal Drain.

The Subject Site is bordered to the northwest by treed parcels followed by a commercial property, to the east by Boundary Road followed by commercial properties, to the south by treed parcels and to the west by agricultural land. The subject site itself is zoned RG for Rural General Industrial Zone, while surrounding areas are zoned RH for Rural Heavy Industrial Zone, RU for Rural Countryside Zone or RG for Rural General Industrial Zone (GeoOttawa).



BACKGROUND

Subject Site

The subject site is an approximately 8.46 ha lot and is currently undeveloped with the exception of a residential dwelling located at 5494 Boundary Road. Historically the site has been vacant and tree covered, with some treed areas removed for development purposes. The Site Plan application is for a proposed new commercial development consisting of a cross-dock facility with associated parking areas. Please refer to Figure-1 Key Plan and Novatech's drawing titled Grading Plan – Drawing No. 118168-GR-REV#2 – dated May 28, 2024 attached for the proposed site location and site layout.

A new sewage system to service the commercial building has been proposed. As part of the sewage system design process, a septic flow calculation was completed and resulted in a total daily design sanitary sewage flow (TDDSSF) volume of 4,000 L/day. Please refer to Paterson Drawing PH4942-1-REV.02 - Sewage System Layout Plan and Paterson Drawing PH4942-2-REV.02 - Sewage System Details and Notes attached for additional details. The approved Ottawa Septic System Office (OSSO) Sewage System Installation Permit will be submitted as part of the Site Plan application package.

Regional Geology

Published Ontario Geological Survey (OGS) surficial geology mapping (OGS MRD128) for the area in the vicinity of the subject site indicates that the majority of the site is underlain predominantly by a coarse-textured glaciomarine deposit consisting of sand, gravel, minor silt and clay. The southern portion of the site is mapped to be underlain by a fine-textured glaciomarine deposit consisting of a silt and clay with minor sand and gravel.

Published bedrock geology mapping (OGS MRD219) indicates that the subject lands are underlain by shale and limestone of the Carlsbad Formation. The available bedrock mapping coincides with the well driller's description on the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWR) for the surrounding well supplies installed within the subject area, which generally indicate a shale bedrock.

Available overburden thickness mapping indicates an overburden that is 15 to 25 m thick.

Karst Features

The term "karst" refers to a geologic formation characterized by the dissolution of carbonate bedrock, such as limestone or dolostone. In order for karstification to occur, precipitation must be allowed to infiltrate the top of the bedrock to dissolutionally enlarge previously existing joints and bedding planes. Based on available mapping by the Ontario Geological Survey, there is no inferred, potential or known karstification in the subject area.



Site Geology - Field Programs

A series of boreholes and test pits were put down on the subject site in a manner to provide general coverage taking into account the site features as part of the Geotechnical Investigation (Paterson Report PG4592-1 titled Geotechnical Investigation and dated September 10, 2018). A field investigation was undertaken on August 1 and 3, 2018 to determine subsurface soil profiles, in which 4 boreholes were drilled to a maximum depth of 9.7 m below ground surface (bgs). In addition 12 test pits were excavated to a maximum depth of 3.5 m bgs. BH1-18 was subjected to a Dynamic Cone Penetration Tests (DCPT) which extended to a maximum depth of 23.9 m bgs. The locations of the test hole locations are delineated on Paterson's drawing PG4592-1 - Test Hole Location Plan dated August 2018 attached to this report.

The test hole locations were recorded and the subsurface conditions, including the soil morphology and depth to the groundwater table (if encountered), were carefully observed and recorded. The soils encountered were classified texturally in the field, and later reviewed in the laboratory.

Generally, the subsurface profile at the test hole locations were observed to consist of a fill layer consisting of silty clay with sand/ silty sand with clay, gravel and cobbles extending to greater than 3.5 m bgs in some locations, generally overlying a silty sand layer, which is generally underlain by silty clay layer. Groundwater levels were measured and varied between 1 and 6.5 m bgs.

It should be noted that groundwater levels can fluctuate both seasonally and in conjunction with precipitation events. Therefore, the groundwater levels could vary at the time of construction.

Reference should be made to the test hole logs appended to this report for the details of the soil profiles encountered at each test hole location. The client should be aware that any information pertaining to soils are furnished as a matter of general information only and borehole descriptions are not to be interpreted as descriptive of conditions at locations other than those described by the boreholes themselves.

Carlsbad Trickle System

The Carlsbad Trickle system is a network of small diameter pipes which supplies drinking water from the City of Ottawa's central distribution system. It was needed to address widespread well-water quality and quantity problems in a specific area. As the Carlsbad Trickle System supplies water to this area, it is a strong indicator that there is poor well water quality and/or quantity. As such, there is a reduced potential that dwellings are supplied by a private water supply.



Terrain Analysis

Hydrogeological Sensitivity of the Site

A commercial development consisting of a cross-dock facility, parking areas and associated infrastructure with private septic servicing is proposed for the site. The water supply will be obtained from municipal servicing. The subject site fronts onto Boundary Road and is bordered by commercial properties as well as agricultural or vacant lands. The adjacent properties are serviced by either municipal water supply or private wells and private septic systems.

The overburden at the test hole locations generally consists of a clay/sand matrix fill layer overlying a silty sand which is overlying a silty clay deposit. Refusal to DCPT was encountered at a depth of 23.9 m bgs. According to available geological mapping, the drift thickness within the site varies from 15-25 m bgs.

According to the geotechnical field investigation, the overburden thickness was observed to be greater than 2 m. As the proposed site does not have bedrock within 2 m of the ground surface, the site is not considered hydrogeologically sensitive. Separation distances are not required to be increased between the septic components and drinking water wells.

Conceptual Lot Development Plan

It is proposed to construct a single-story commercial building on the subject site that is to be used as an office space and a cross-dock facility. It is anticipated that the site will not be open to the general public. The location of the proposed building can be found on the attached Novatech's Drawing titled Grading Plan – Drawing No. 118168-GR-REV#2 – dated May 28, 2024. The floor plan can be found on N45 Architecture Inc. drawing A101 – Floor Plan revision 01 with Project number 22-765 dated June 27, 2024 attached to this report.

Theoretical Sewage System Volumes

As the septic flows for the proposed building are based on Part 8 of the Ontario Building Code (OBC), the variables used in the calculation to determine the flows are discussed in the Ottawa Septic System Office (OSSO) approved Septic Installation Permit which has been submitted separately as part of the Site Plan application.

Discussions were had with the Rideau Valley Conservation Authority (RVCA) to determine a reasonable usage volumes approach. The reasonable usage volumes approach is based on volumes from an identically designed site that has been in operation for an extended period of time. Standard Ontario Building Code volumes would overestimate the usage and potentially demonstrate unsuitability of the site, therefore, an actual volumes usage approach was used. The actual flow volume usage from the identically designed site is measured to be less than 2.0 m² per day for a period spanning Jun 2023 to May 2024.



It was confirmed by the RVCA through the OSSO that volumes based on the number of employee shifts for the office and cross-dock facility can be used for the purposes of septic design and predictive nitrate impact assessments.

The following septic flow volumes were calculated for the proposed office and cross-dock facility based on discussions with the OSSO. The calculated Total Daily Design Sanitary Sewage Flow (TDDSSF) volume, as per the direction of the OSSO, was 4,000 L/day. The approved OSSO septic permit has been included separately in the Site Plan application submission package. The septic flow volumes were calculated in accordance with the OSSO and are as follows:

Space: 75 L/day x 5 employees = 375 L/day:
For a total of 375 L/day for the office space
Dock Facility: 125 L/day x 29 employees = 3,625 L/day

For a total of 3,625 L/day for the cross dock facility space

The Total Daily Design Sanitary Sewage Flow (TDDSSF) as confirmed with the OSSO

Predictive Nitrate Impact Assessment

results in a daily sewage flow of 4,000 L/day.

In order to demonstrate that private services would adequately support the proposed commercial development, a predictive nitrate impact assessment for the subject site was completed. The values shown in the Predictive Nitrate Impact Assessment attached to this report are summarized below.

Site area	8.46 ha
Impervious area (%)	57 %
Daily sewage flow	4.0 m ³ /d
Concentration of nitrate in effluent (Value based on typical effluent concentration)	40 mg/L
Surplus Water (The surplus water value was estimated based on Environment Canada values with a soil type comprised of a clay loam (Urban lawns / Shallow Crops) and anthropogenic sources.)	



Combined infiltration factor based on:	0.60
 Topography infiltration factor 	0.20
Soil texture infiltration factor	0.30
Cover infiltration factor	0.10

The topography infiltration factor of 0.20 is based upon a generally rolling land with an average slope of 2.8 to 3.8 m/km. The soil texture infiltration factor was based upon an average of "medium combinations of clay and loam" with a value of 0.2 and a "open sandy loam" with a value of 0.4, which is a reasonable generalization based upon the site investigations and available geological mapping. The "cover infiltration factor" was calculated at 0.10 based upon a cultivated land type cover.

The calculation for a conventional septic system results in a predicted nitrate concentration of **6.23 mg/L** nitrate for the subject site, using a value of 40 mg/L nitrate concentration within the effluent. This value was based upon a daily sewage flow of 4,000 L/day. It is expected that the actual usage should be lower. Therefore, it is anticipated that the site can attenuate the planned TDDSSF using conventional treatment.



CONCLUSIONS

Based on the information contained within the body of this report the following conclusions can be drawn:

- 1. The site is not considered hydrogeologically sensitive, and is not in an area of karst or inferred karst.
- 2. The predicted nitrate concentrations at the property boundary are calculated to be below the required 10 mg/L threshold when a conventional system is used.
- 3. A Sewage System Permit and Building Permit need to be issued prior to the commencement of construction on the proposed warehouse addition or the proposed septic system.
- 4. The results of the Terrain Analysis have provided satisfactory evidence that the subject site can support the proposed commercial development with respect to sewage system flow volumes.

We trust that the current submission satisfies your immediate requirements.

Best Regards,

Paterson Group Inc.

Alexander Schopf, EIT, PhD

September 19, 2024
ERIK ARDLEY
PRACTISING MEMBER
3667

Erik Ardley, P.Geo

Attachments:

- □ Key Plan
- Paterson Borehole and Test Pit Logs
- Nitrate Impact Assessment Calculations
- □ Paterson Drawing PG4592-1 Test Hole Location Plan
- □ N45 Architecture INC Drawing 22-765 A101, Dated June 27 ,2024
- ☐ Paterson Drawing PH4942-1-REV.02 Sewage System Layout Plan
- ☐ Paterson Drawing PH4942-2-REV.02 Sewage System Details and Notes
- □ NOVATECH Drawing 118168-GR, Dated May 28, 2024



FIGURE 1

KEY PLAN



SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM**

FILE NO. **PG4592**

REMARKS

HOLE NO.

BORINGS BY CME 55 Power Auger				D	ATE	1 August 2	2018	BH 1
SOIL DESCRIPTION	PLOT		SAN	IPLE	1	DEPTH	ELEV.	Pen. Resist. Blows/0.3m • 50 mm Dia. Cone
	STRATA E	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)	O Water Content %
GROUND SURFACE		≋		Н.		0-	-78.29	20 40 60 80
FILL: Brown silty clay, trace sand, gravel, cobbles		§ AU	2	54	21	1-	-77.29	
2.29		ss	3	50	10	2-	-76.29	
Loose, brown SILTY SAND		ss	4	8	9	3-	-75.29	
		ss	5	88	W	4-	-74.29	
		ss	6	100	6	5-	-73.29	
Soft to firm, grey SILTY CLAY						6-	-72.29	
						7-	-71.29	
						8-	-70.29	
		-				9-	-69.29	
commenced at 9.45m depth.						10-	-68.29	
						11-	-67.29	
						12-	-66.29	
						13-	-65.29	20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. FILE NO. **DATUM PG4592 REMARKS** HOLE NO. **QH** 1

BORINGS BY CME 55 Power Auger				D	ATE	1 August 2	2018	BH 1	
SOIL DESCRIPTION	PLOT		SAM	IPLE		DEPTH	ELEV.	Pen. Resist. Blows/0.3m • 50 mm Dia. Cone	
SOIL DESCRIPTION	STRATA P	TYPE	NUMBER	* RECOVERY	N VALUE or RQD	(m)	(m)	Water Content %	Piezometer
GROUND SURFACE	ST	H	5 <u>N</u>	REC	N O N			20 40 60 80	Piez
						13-	-65.29		
						14-	-64.29		
						15-	-63.29		
						16-	-62.29	\	
						17-	-61.29		
						18-	-60.29		
						19-	-59.29		
						20-	-58.29		
						20-	- 50.29		
						21-	-57.29		
						22-	-56.29		
						23-	-55.29		
23.95		_							
nd of Borehole									
ractical DCPT refusal at 23.95m epth									
GWL @ 1.30m - Aug. 8, 2018)									
								20 40 60 80 10 Shear Strength (kPa) ▲ Undisturbed △ Remoulded	00

SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. FILE NO. DATUM **PG4592 REMARKS** HOLE NO. **BH 2** BORINGS BY CMF 55 Power Auger DATE 3 August 2018

BORINGS BY CME 55 Power Auger				D	ATE :	3 August 20	018				п∠	
SOIL DESCRIPTION	PLOT		SAM	IPLE		DEPTH (m)	ELEV. (m)		Resist. 50 mm			_
GROUND SURFACE	STRATA	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	(11)	(III)	O 1	Water C	onten	t % 80	Piezometer
GROUND SURI ACL	XXX	93				0+	78.67		 	: : :		
FILL: Brown silty clay with sand,		⊗ AU	1	50	47	1_	77.67					
gravel, cobbles		ss ss	3	50	17 7	•	77.07					
5	2.59	<u>/</u> 1				2+	76.67					
/ery loose, brown SILTY SAND		SS 7	4	25	3	3+	75.67					
3	3.50	SS	5	100	3	4-	74.67					
		TW	6	100		5-	73.67					
Soft to firm, grey SILTY CLAY						6-	72.67					
						7-	71.67					
						8-	70.67					
						9-	69.67					
<u>g</u> End of Borehole	9.75	_										
GWL @ 6.49m - Aug. 8, 2018)												
								20 She	40 ar Stre	60	80 1	100

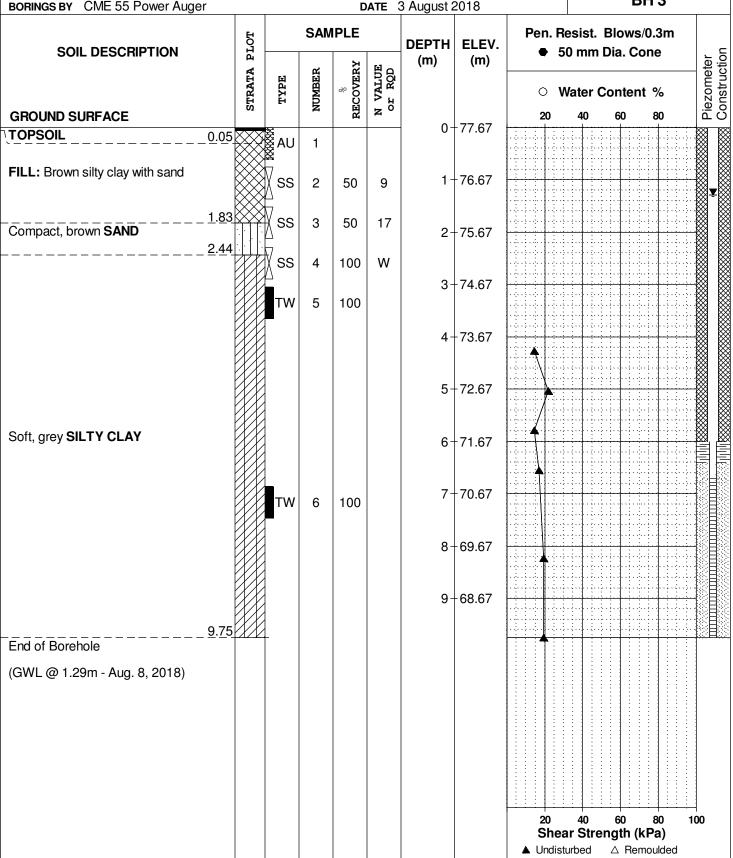
SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. **BH 3 BORINGS BY** CME 55 Power Auger DATE 3 August 2018



SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road Ottawa, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd.

FILE NO. **PG4592**

REMARKS

DATUM

POPINCE BY CME 55 Power Auger					NATE !	3 August 2	2010		HOLE NO.	3H 4	
BORINGS BY CME 55 Power Auger			SAN	/IPLE	DAIE	August	2016	Pen Re	sist. Blow		
SOIL DESCRIPTION	PLOT					DEPTH (m)	ELEV. (m)		mm Dia. C		r no
	STRATA	TYPE	NUMBER	**************************************	VALUE r RQD	(,	(,	○ M/s	ntor Conto	mt 0/	Piezometer Construction
GROUND SURFACE	STR	Τ̈́	NON	RECO	N VZ			○ Wa	ater Conte	nt % 80	Piezo
FILL: Gravelly sand				+ -		0-	77.98	20			
<u>0.6</u>	0	*									
		∭ ss	1	50	5	1-	76.98				
FILL: Grey silty clay with sand		<u>}</u>									
- some gravel by 1.5m depth		∬ ss	2	58	10	2-	75.98				
		₹ 7 00		40							
3.0	5 💢	ss	3	42	2	3-	74.98				
						3-	74.30				
								A			
		1				4-	73.98				
		1		100				1			
		SS	4	100	2	5-	72.98				
		Tw	5	100							
Soft to firm, brown to grey SILTY						6-	71.98]
CLAY											
						7-	70.98				-
		1]]
						8-	69.98				
		1					00.00				
							00.00				
						9-	68.98				
End of Borehole	5	1						<u> </u>			-
(GWL @ 1.08m - Aug. 8, 2018)											
									40 ~~	00 4	00
									40 60 Strength	(kPa)	00
								▲ Undistur	bed △ Re	emoulded	

Consulting Engineers

SOIL PROFILE AND TEST DATA

FILE NO.

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Geotechnical Investigation 5510 Boundary Road Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM PG4592 REMARKS** HOLE NO. TP 1 **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction **SOIL DESCRIPTION** 50 mm Dia. Cone (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % **GROUND SURFACE** 20 80 0+77.871 + 76.87FILL: Silty sand topsoil with G 1 organics, trace gravel, cobbles and boulder 2+75.87 G 2 3+74.87 3.10 ∇ Brown SILTY SAND, trace organics G 3 3.50 End of Test Pit (Open hole GWL @ 3.1 m depth) 40 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

Consulting Engineers

SOIL PROFILE AND TEST DATA

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Geotechnical Investigation 5510 Boundary Road Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. TP 2 **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction **SOIL DESCRIPTION** 50 mm Dia. Cone (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % 80 **GROUND SURFACE** 20 60 | 77.56 **TOPSOIL** 0.08 G 1 ∇ 1 + 76.56FILL: Brown silty sand, some gravel, cobbles, boulders, asphalt, concrete, foam, construction debris, metal, plaster, pipe, brick and clay 2+75.56 2 G 3 + 74.56 3.20 Brown SILTY SAND, trace organics G 3 3.50 End of Test Pit (Open hole GWL @ 0.6 m depth) 40 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

Consulting Engineers

SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road Ottawa, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. TP3 **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % 80 **GROUND SURFACE** 20 60 0 + 77.511 + 76.51FILL: Brown silty sand, trace brown silty clay, some sand, gravel and cobbles, trace asphalt, brick, organics G 1 and concrete. G 2 2+75.51 2.30 G 3 Brown SILTY SAND, trace organics 2.90 Red SILTY CLAY 3 + 74.51 G 4 -grey by 3.3 m depth $\bar{\Delta}$ 5 G End of Test Pit (Open hole GWL @ 3.3 m depth) 40 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

DATUM

Consulting Engineers

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd.

SOIL PROFILE AND TEST DATA

FILE NO.

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

PG4592 REMARKS HOLE NO. TP 4 **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % 80 **GROUND SURFACE** 20 60 | 77.66 G 1 ∇ 1 + 76.66FILL: Brown silty sand, some asphalt, gravel, cobbles, boulders, construction debris and brick 2 G 2+75.66 3 G 3 + 74.66 3.10 Brown SILTY SAND G 4 3.30 Red SILTY CLAY 5 G 3.50 End of Test Pit (Open hole GWL @ 0.75 m depth) 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. TP 5

BORINGS BY Backhoe				0	ATE	1 August 2	2018	TP 5	
SOIL DESCRIPTION	PLOT		SAN	IPLE		DEPTH		Pen. Resist. Blows/0.3m • 50 mm Dia. Cone	ر د ا
	STRATA I	TYPE	NUMBER	% RECOVERY	N VALUE or RQD	(m)	(m)	O Water Content %	Piezometer Construction
GROUND SURFACE	, v		E	R	zö	0	77.93	20 40 60 80	Pie C
		G	1				-76.93		
FILL: Brown silty sand to brown silty clay, some sand, gravel, cobbles and boulders, trace organics, brick, glass, tile, and construction debris		G	2				70.00		
2.20	D	G	3			2-	-75.93		₹
Brown SILTY SAND									
Red SILTY CLAY -grey by 3.3 m depth		G	4			3-	74.93		
End of Test Pit (Open hole GWL @ 2.2 m depth)		G	5						
								20 40 60 80 10 Shear Strength (kPa) ▲ Undisturbed △ Remoulded	0 0

SOIL PROFILE AND TEST DATA

▲ Undisturbed

△ Remoulded

Geotechnical Investigation 5510 Boundary Road Ottawa, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. TP 6 **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % 80 **GROUND SURFACE** 20 60 0 + 78.45FILL: Brown silty clay, some sand, gravel, cobbles, trace organics and construction debris G 1 1 + 77.452 + 76.452.30 Brown SILTY SAND 2 2.50 Red SILTY CLAY G 3 ∇ 3 + 75.45 3.50 End of Test Pit (Open hole GWL @ 3.0 m depth) 60 100 Shear Strength (kPa)

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

5510 Boundary Road Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd.

FILE NO.

PG4592

DATUM

REMARKS BORINGS BY Backhoe				D/	ATE .	1 August 2	2018		HOL	E NO.	TP	7	
SOIL DESCRIPTION	PLOT		SAN	IPLE	416	DEPTH	ELEV.	Pen. R	lesist. 60 mm				
	STRATA P	TYPE	NUMBER	* RECOVERY	N VALUE or RQD	(m)	(m)	0 V	Vater	Con	tent	%	Piezometer
GROUND SURFACE	XXX			<u> </u>		0-	78.00	20	40	60) 	80	
		_											
FILL: Brown silty clay, some sand, race gravel, cobbles, boulders, organics, asphalt, concrete, brick and construction debris		G -	1			1-	- 77.00						
		- G	2			'	77.00						
2.0	0	_ _ G	3			2-	-76.00						
Brown SILTY SAND	60	-											
Red SILTY CLAY		G –	4			3-	-75.00						
	0	-											
Open hole GWL @ 2.1 m depth)													

Consulting Engineers

SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road Ottawa, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. TP8 **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % 80 **GROUND SURFACE** 20 60 | 78.00 G 1 **FILL:** Brown silty clay, some sand, gravel, cobbles, trace boulders, organics, asphalt, brick and construction debris 1 + 77.00G 2 2+76.00 2.05 Red SILTY CLAY G 3 End of Test Pit (TP dry upon completion) 40 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

DATUM

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd.

SOIL PROFILE AND TEST DATA

FILE NO.

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

PG4592 REMARKS HOLE NO. TP9 **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT DEPTH ELEV. Piezometer Construction 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % 80 **GROUND SURFACE** 20 60 0 + 78.17⊻ G 1 1 + 77.17 **FILL:** Brown silty sand, some clay, gravel, cobbles, boulders, and construction debris G 2 2+76.17 G 3 3 + 75.17 G 4 3.50 End of Test Pit (Open hole GWL @ 0.65 m depth) 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

Consulting Engineers

SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road Ottawa, Ontario

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. TP₁₀ **BORINGS BY** Backhoe DATE 1 August 2018 **SAMPLE** Pen. Resist. Blows/0.3m STRATA PLOT **DEPTH** ELEV. Piezometer Construction 50 mm Dia. Cone **SOIL DESCRIPTION** (m) (m) RECOVERY N VALUE or RQD NUMBER TYPE Water Content % 80 **GROUND SURFACE** 20 60 | 78.27 G 1 FILL: Brown silty sand, some gravel and cobbles, trace boulders, brick and organics 1 + 77.27G 2 2+76.27 2.10 Brown SILTY SAND G 3 2.30 Red SILTY CLAY 4 2.60 End of Test Pit (TP dry upon completion) 40 60 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd.

REMARKS

DATUM

FILE NO.

PG4592

HOLE NO.

BORINGS BY Backhoe					DATE	1 August 2	2018		HOLL	TP11	
SOIL DESCRIPTION	PLOT		SAN	IPLE		DEPTH		1		Blows/0.3m Dia. Cone	
	STRATA 1	TYPE	NUMBER	RECOVERY	VALUE r RQD	(m)	(m)	0 N	Water C	content %	Piezometer Construction
GROUND SURFACE	מַ		E	REC	N VZ	0	78.07	20	40	60 80	Pie C
		_					76.07				
FILL: Brown silty sand, some		G	1								
topsoil, trace organics, gravel, cobbles, boulders and clay		_				1-	77.07				
		G	2								
	2.05					2-	76.07				
Brown SII TY SAND	2.25	G	3								
		G	4								
Red SILTY CLAY grey by 3.1 m depth						3-	75.07				
gioy by cir iii dopui		G	5				7 0.07				
	3.50										
End of Test Pit (Open hole GWL @ 3.1 m depth)											
								20	40		00
								She: ▲ Undis	ar Strei	ngth (kPa) △ Remoulded	

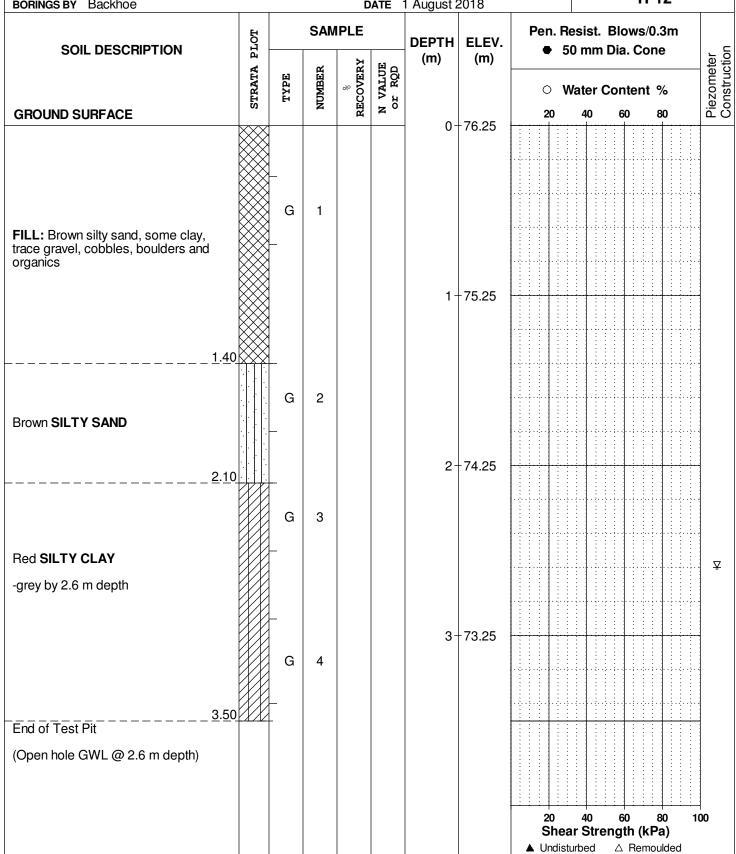
SOIL PROFILE AND TEST DATA

Geotechnical Investigation 5510 Boundary Road

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

Ottawa, Ontario

Ground surface elevation were provided by Annis O'Sullivan Vollebekk Ltd. **DATUM** FILE NO. **PG4592 REMARKS** HOLE NO. **TP12 BORINGS BY** Backhoe DATE 1 August 2018



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.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC% - Natural moisture content or water content of sample, %

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 = $(D30)^2 / (D10 \times D60)$

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

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



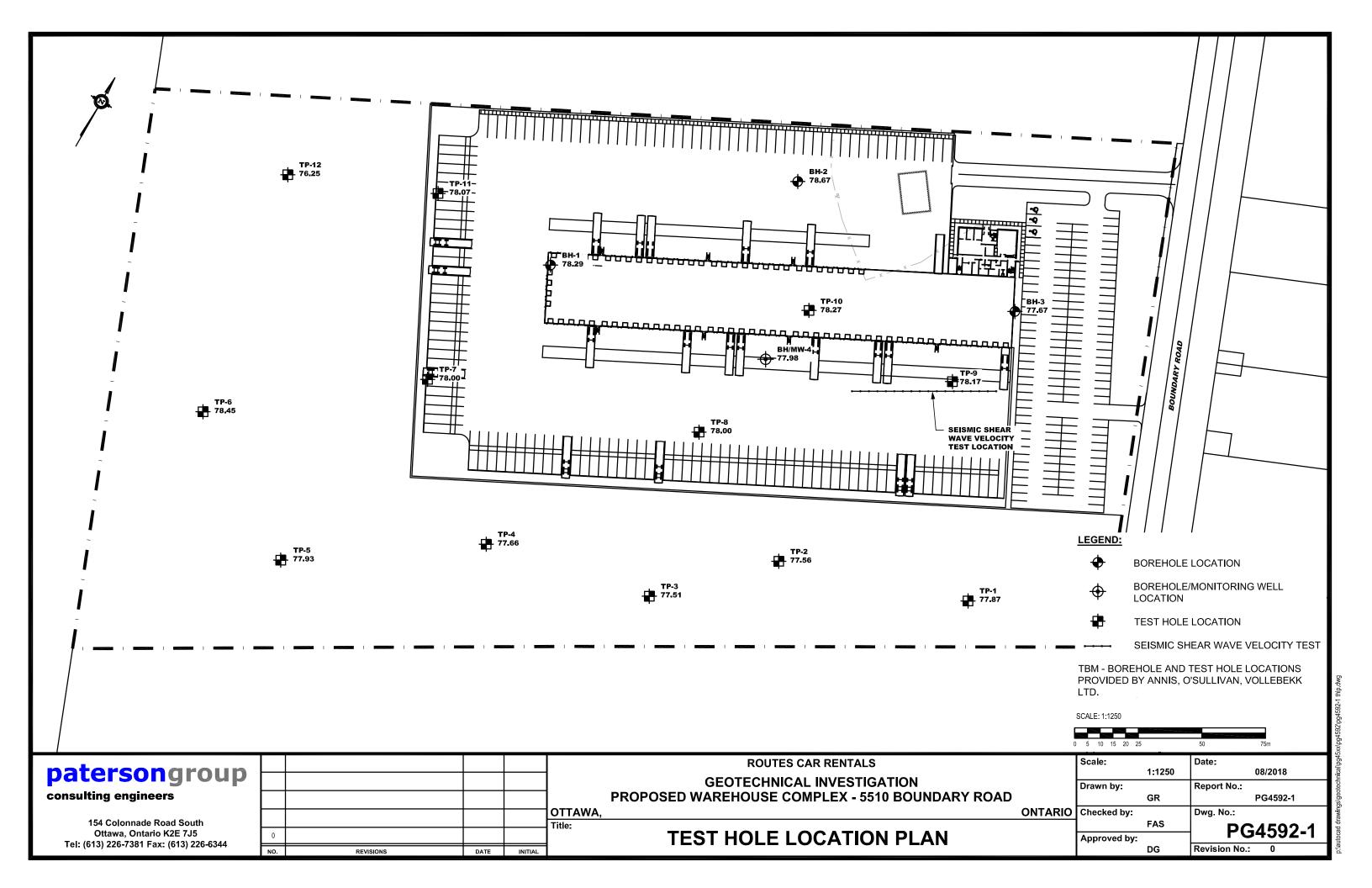
5494 - 5510 Boundary Road

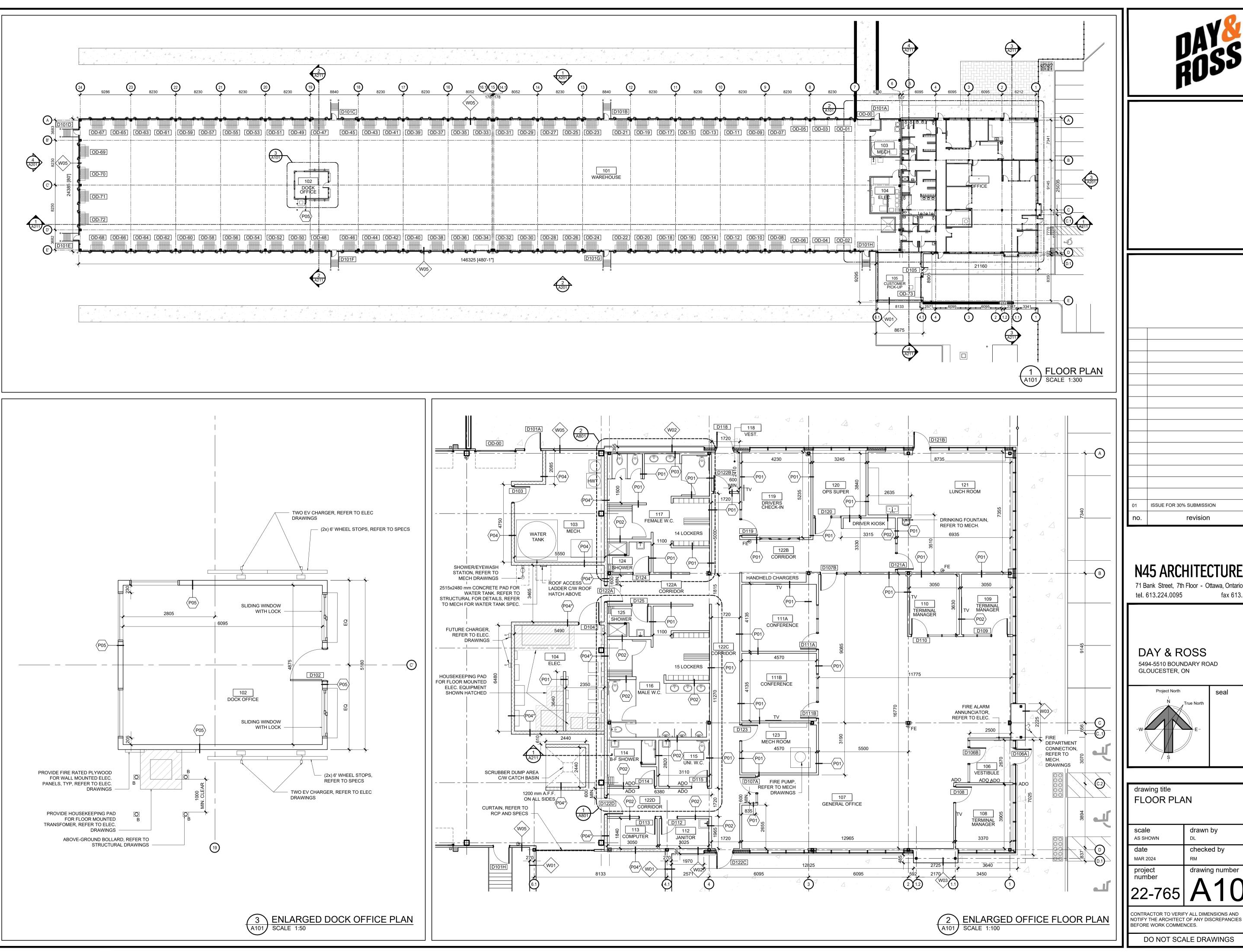
PH4942



PREDICTIVE NITRATE	IMPAC7	T ASSES	SEMENT
Infiltration Factors			
Topography		0.20	
Soil		0.30	
Cover		0.10	
Total		0.60	
Site Characteristics			
Area of Site :		84625	m^2
Total of roof areas:		4350	m^2
Total area of paved driveway areas:		43604	m^2
Roof + paved driveway areas		47954	m^2
Impervious Area		47954	m^2
Percent Impervious Area =		57	%
Infiltration Area =		36671	m^2
Septic Effluent			
Concentration of Effluent (Cs) =		40	mg/L
Daily Sewage Flow (Qs)=		4	m^3
See Notes below.			
Infiltration Calculation			
Nitrate concentration in precipitation (C _i) =		0	mg/L
Surplus Water (Environment Canada)		360	mm/yr
Factored Water Surplus =		216	mm/yr
Infiltration % due to stormwater management measures		-	%
Infiltration rate from stormwater management measures =		0	mm/yr
Infiltration Flow Entering the System (Q _i) =		22	m³/day
Mass Balance Model (MOEE, 1995)			
$C_T = (Q_b C_b + Q_e C_e + Q_i C_i)/(Q_b + Q_e + C_e)$	Q_i) = Cumulative	Nitrate Concentrat	tion
Q _b = flow entering the system across the upgradient area		0	m³/day
C _b = background nitrate concentration		0	mg/L
Q _e = flow entering the system from the septic drainfield		4	m ³ /day
C _e = concentration of nitrates in the septic effluent		40	mg/L
Q _i = flow entering the system from infiltration		22	m ³ /day
C _i = Concentration of nitrates in the infiltrate		0	mg/L
	C _T =	6.23	mg/L

volume was calculted by Paterson Group as a preliminary design flow.





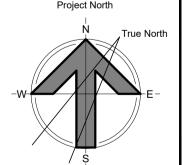




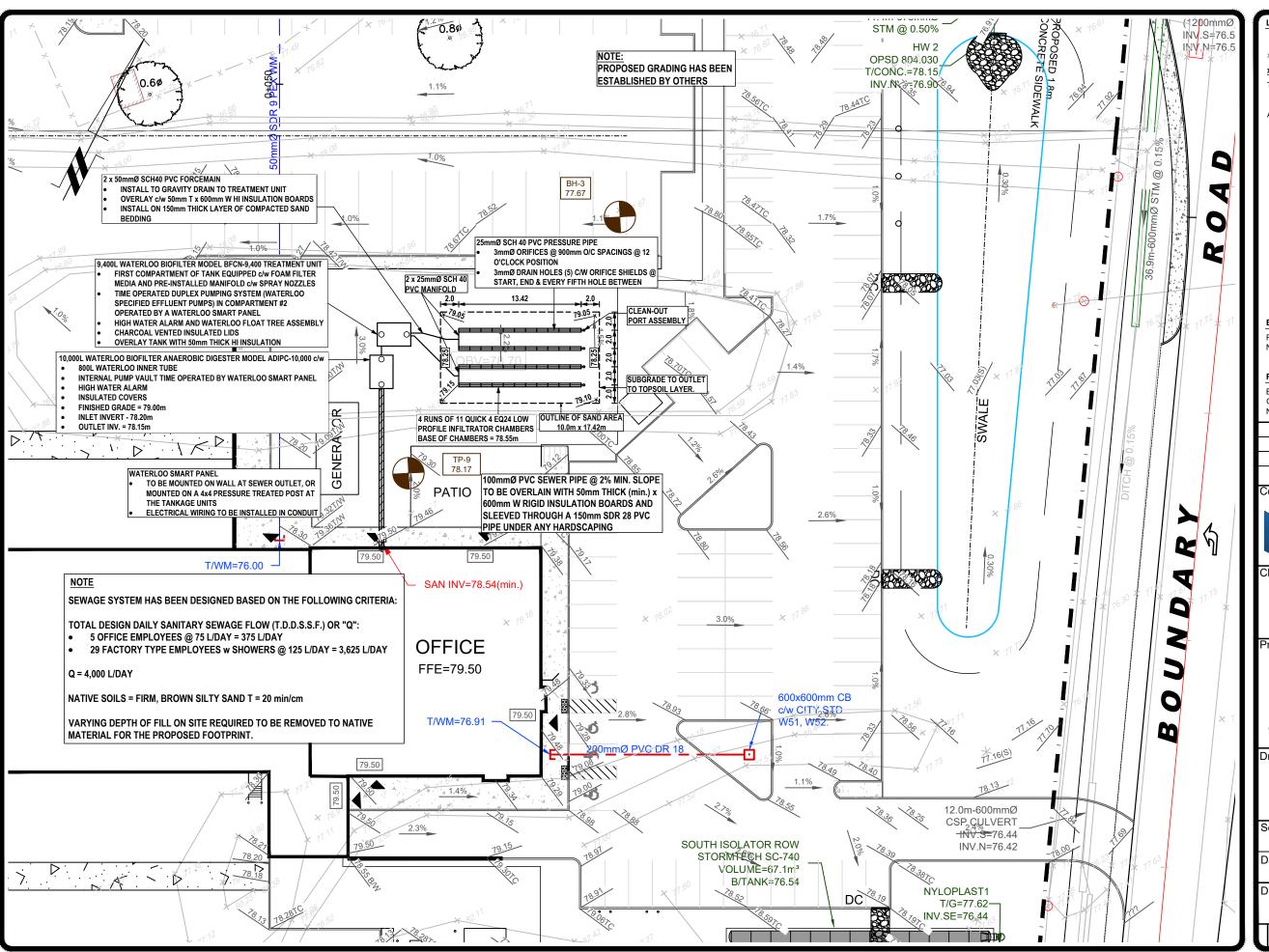
N45 ARCHITECTURE INC.

71 Bank Street, 7th Floor - Ottawa, Ontario, K1P 5N2 tel. 613.224.0095 fax 613.224.9811

5494-5510 BOUNDARY ROAD GLOUCESTER, ON



	drawing title FLOOR PLA	N
	scale AS SHOWN	drawn by
ı		
ı	date	checked by
ı	MAR 2024	RM
I	project number	drawing number
1	Hullibel	Λ Λ Λ
	22-765	ATUT
1		revision





Test Pit / Borehole Location

x 100.99 Existing Ground Surface Elev. (m)

x 102.30 Proposed Ground Surface Elev. (m)

Top of Foundation Wall
Proposed Structure

All units are in meters unless otherwise specified.



BENCHMARK INFORMATION:

Refer to Grading Plan No. 118168-GR, dated March 2024, by Novatech Engineers, PLanners & Landscape Architects

REFERENCE:

Base Plan and Topographic Information obtained from Grading Plan No. 118168-GR, dated March 2024, by Novatech Engineers, PLanners & Landscape Architects

19/09/24	Revised System Location	2
22/08/24	Revised Dispersal Bed	1
14/08/24	Issued for Preliminary Review	0
DD/MM/YY	DESCRIPTION	REV.

Consultant:



9 AURIGA DRI OTTAWA, C K2E 7 EL: (613) 226-73

Client:

DAY AND ROSS TRANSPORTATION

Project:

PROPOSED CROSS DOCK BUILDING

5510 BOUNDARY ROAD OTTAWA (CARLSBAD SPRINGS), ONTARIO

Drawing:

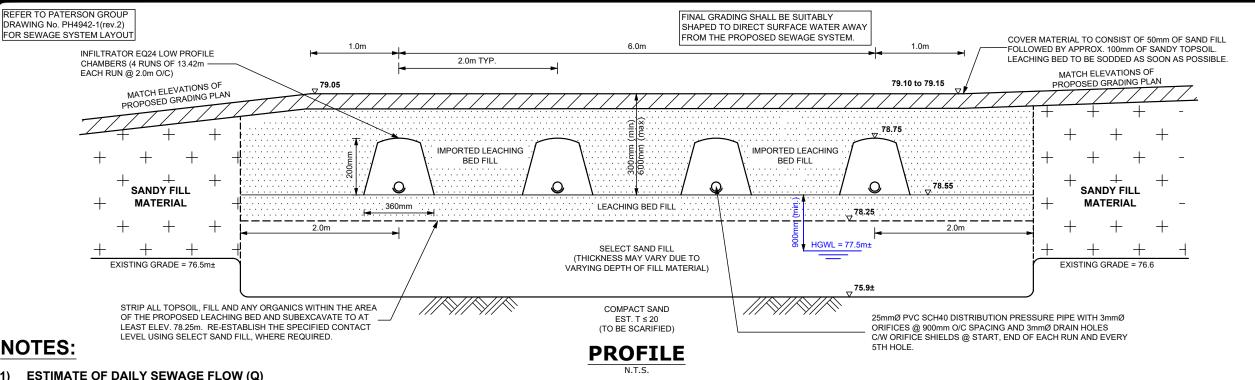
SEWAGE SYSTEM LAYOUT PLAN

Scale:	Drawn by:
1:400	HV
Date:	Checked by:
09/2024	MK

Drawing No.:

PH4942-1(rev.2)

p:\autocad drawings\hydrogeology\ph49xx\ph4942 - day and ross transportation - 5510 boundary road\ph4942-1(rev.2).dwg



ESTIMATE OF DAILY SEWAGE FLOW (Q)

TOTAL DESIGN DAILY SANITARY SEWAGE FLOW (T.D.D.S.S.F) HAS BEEN DESIGNED IN ACCORDANCE WITH ONTARIO BUILDING CODE (OBC) TABLE 8.2.1.3.B. AND HAS BEEN REVIEWED / PRE-APPROVED BY THE OTTAWA SEPTIC SYSTEM OFFICE. (OSSO)

- OFFICE EMPLOYEES @ 75 L/DAY = 5 x 75 L/DAY = 375 L/DAY
- FACTORY TYPE EMPLOYEES w SHOWERS @ 125 L/DAY = 29 x 125 L/DAY = 3.625 L/DAY

TOTAL SEWAGE FLOW = 4,000 L/DAY

2) SOIL CONDITIONS

SOILS INFORMATION GATHERED BY PATERSON GROUP INC. ON AUGUST, 2018 (REFER TO PGI REPORT No. PG4592-1)

BH 3, ELEV. 77.67m

TP 9 ELEV. 78.17m

0 - 0.05TOPSOIL 0 - 3.500.05-1.83 FILL: BROWNSILTY CLAY, SOME SAND COMPACT BROWN SAND SOFT GREY SILTY CLAY 2.44-9.75

FILL:BROWN, SILTY SAND, SOME CLAY GRAVEL, COBBLES, BOULDERS AND

- G.W.L. @ 0.65m (77.52m±) - G.W.L.@ 1.29m (76.4m±)

3) ANAEROBIC DIGESTER

- REFER TO WATERLOO DESIGN AND INSTALLATION GUIDE WITH REGARDS TO MINIMUM TANKAGE SIZING, AND ADDITIONAL 6)
- TANK SHALL BE CONNECTED TO THE PROPOSED BUILDING BY A 100mm PVC SEWER PIPE
- SEWER PIPE SHALL BE INSTALLED AT 2.0% MINIMUM SLOPE AND SHALL BE OVERLAIN WITH 50mm T x 600 mm WIDE RIGID INSULATION BOARDS
- SEWER PIPE SHALL BE SLEEVED THROUGH A 150 mm@ SDR 28 PVC PIPE UNDER ANY HARDSCAPING (CONCRETE, ASPHALT,
- SEWER PIPE SHALL BE BEDDED ON A 150mm THICK LAYER OF GRANLILAR 'A' WHICH SHALL BE COMPACTED TO 95% SPMDD IT IS RECOMMENDED THAT A NEW SINGLE-COMPARTMENT 10.000L CONCRETE ANAEROBIC DIGESTER WATERLOO MODEL
- TANK SHALL BE BEDDED ON A LAYER OF OPSS GRANULAR 'A' OF AT LEAST 150mm IN THICKNESS AND SHALL BE COMPACTED TO AT LEAST 95% SPMDD
- TANK SHALL BE EQUIPPED WITH WATERTIGHT CONNECTIONS (I.E. STAINLESS LINK SEALS OR APPROVED EQUIVALENT). INLET PIPE OF DIGESTER SHALL BE EQUIPPED WITH A 800L (min.) WATERLOO INNER TUBE
- THE DIGESTER TANK SHALL BE COVERED WITH 50mm (2") DOW HI-40 INSULATION BOARDS AND SHALL BE PROVIDED WITH 510 mm OF SOIL COVER PER THE DESIGN MANUAL
- A POLY RISER AND INSULATED COVER ASSEMBLY, WHICH EXTENDS TO THE GROUND SURFACE, SHALL BE INSTALLED
- INTERNAL PUMP VAULT WITH, TIME CONTROLLED EFFLUENT PUMP (WATERLOO SPECIFIED EFFLUENT PUMP) OPERATED BY A WATERLOO SMART PANEL
- ALL ELECTRICAL WORKS SHALL BE CARRIED OUT BY A QUALIFIED ELECTRICAL CONTRACTOR.
- ACCESS LIDS SHALL INCLUDE SAFETY DEVICES AS PER CSA B66-2'

TREATMENT UNIT

- THE TREATMENT UNIT SHALL BE INSTALLED IN SERIES AND DOWNSTREAM FROM THE ANAEROBIC DIGESTER TANK.
- THE TREATMENT UNIT SHALL CONSIST OF A BULK FILLED CONCRETE WATERLOO BIOFILTER MODEL BFCN-9,400 . WASTEWATER TREATMENT
- TANK SHALL BE BEDDED ON A LAYER OF OPSS GRANULAR 'A' OF AT LEAST 150mm IN THICKNESS AND SHALL BE COMPACTED TO AT LEAST 95% SPMDD.
- A 50mmØ SCH 40 PVC FORCEMAIN SHALL BE USED TO CARRY THE EFFLUENT FROM THE PUMP TANK IN THE ANAEROBIC DIGESTER TO THE BULK FILLED BIOFILTER IN THE FIRST COMPARTMENT OF THE TREATMENT UNIT

- THE FIRST COMPARTMENT OF THE BIOFILTER TANK SHALL BE BIJLK FILLED WITH THE BIOFILTER FOAM FILTER MEDIA THE SECOND COMPARTMENT OF THE TREATMENT UNIT SHALL BE EQUIPPED WITH A TIME OPERATED DUPLEX EFFLUENT
- PUMPS SPECIFIED BY WATERLOO. THE FINAL TREATED EFFLUENT COLLECTS ON THE FLOOR OF THE SECOND . COMPARTMENT AND THE EFFLUENT PUMP, DOSES THE LEACHING BED.
- MINIMUM RESIDUAL PRESSURE HEAD AT THE FURTHEST POINT FROM THE PUMP SHALL BE 600mm TO BE VERIFIED IN THE FIFI D THE DOSING TIME OPERATED DUPLEX PUMPING SYSTEM SHALL OPERATE HOURLY AND SHALL ALTERNATE BETWEEN THE
- LEACHING BED "CELLS". THE RECOMMENDED PUMP TIME DOSING CYCLE IS 167L + CHARGE (28L) (TOTAL OF 195 L), THE PUMP DISCHARGE TAKES A
- DURATION OF 75 SECONDS FOR EACH PUMP. THE TREATMENT UNIT SHALL BE PROVIDED WITH A MINIMUM OF 510 mm SOIL COVER AND OVERLAIN WITH 50mm THICK HI INSULATION BOARDS
- A POLYLOK RISER AND CHARCOAL VENTED INSULATED COVER ASSEMBLY, WHICH EXTENDS TO THE GROUND SURFACE SHALL BE INSTALLED OVER EACH OF THE TANK OPENINGS.
- ALL ELECTRICAL WORKS SHALL BE CARRIED OUT BE A QUALIFIED ELECTRICAL CONTRACTOR.
- ACCESS LIDS SHALL INCLUDE SAFETY DEVICES AS PER CSA B66-21

FORCEMAIN (TO SHALLOW BURIED TRENCH) 5)

- 2 x 50mm@ SCH40 PVC FORCEMAINS SHALL BE USED TO CARRY THE EFFLUENT FROM THE TREATMENT UNIT TO THE 9)
- THE FORCEMAINS SHALL BE INSTALLED TO GRAVITY DRAIN TO TREATMENT UNIT AND OVERLAY WITH 50mm T x 600mm W WITH INSULATION BOARDS.
- FORCEMAIN SHALL BE INSTALLED ON A 150mm THICK LAYER OF COMPACTED SAND BEDDING

DISPOSAL FIELD

- THE DISPOSAL FIELD SHALL CONSIST OF SHALLOW BURIED TRENCHES (SBT) USING QUICK 4 EQ24 LOW PROFILE INFILTRATOR CHAMBERS
- SBT LENGTH REQUIRED = Q/50 = 4000/75 = 53.3 LINEAR METERS/1.22 = 43.7 CHAMBERS. USE 4 RUNS OF 11 CHAMBERS, 44 CHAMBERS TOTAL (13.42m LENGTH EACH RUN) FOR A TOTAL LENGTH OF 53.7 LINEAR
- REMOVE ALL EXISTING TOPSOIL. FILL AND ANY ORGANIC MATERIAL AND SUBEXCAVATE TO AT LEAST ELEVATION 78.25m ACTUAL FILL REMOVAL WILL BE TO APPROXIMATELY 75.9m±, WHICHEVER IS GREATER. ESTABLISH THE SPECIFIED CONTACT LEVEL WITH SELECT SAND FILL, WHERE REQUIRED
- SCARIFY THE BASE AND SIDES OF EXCAVATED AREA USING A HAND RAKE. DO NOT WALK ON THE SCARIFIED SURFACES. ESTABLISH THE SPECIFIED CONTACT LEVEL, ELEV. 78.55m, WITH LEACHING BED FILL OVER THE APPROVED SUBGRADE SURFACE
- LEACHING BED SAND FILL SHALL BE UNIFORM SAND WITH GRADING LIMITS SIMILAR TO 100% PASSING 13.2mm SIEVE, LESS THAN 5% PASSING 0.075mm SIEVE AND HAVING A PERCOLATION RATE OF 6 TO 8 min/cm
- PREPARE THE 25mmØ PVC SCH 40 PRESSURE PIPE BY DRILLING 3mmØ HOLES @ 900mm SPACINGS ALONG THE TOP OF THE PIPE (I.E. 12 O'CLOCK POSITION). THE FIRST HOLE SHALL BE LOCATED 450mm FROM THE MANIFOLD. DRILL A 3mmØ (1/8"Ø) DRAIN HOLE NEAR THE START. END OF EACH RUN AND EVERY 5TH HOLE. THE DRAIN HOLES SHOULD
- BE LOCATED AT THE 6 O'CLOCK POSITION. AN ORIFICE SHIELD SHALL BE INSTALLED OVER EACH DRAIN HOLE THE PRESSURE PIPE SHALL BE INSTALLED ONTO THE PREPARED SAND LAYER @ DESIGN ELEVATION AND IN THE
- CONFIGURATION AS SPECIFIED ON THE PLAN VIEW PIPES SHALL REST ON ORIFICE SHIFLDS THE PRESSURE SYSTEM MUST BE TESTED AND SQUIRT HEIGHTS VERIFIED PRIOR TO INSTALLING THE CHAMBERS.
- RUN THE PRESSURE PIPE THROUGH THE END PLATE OF THE CHAMBER PLACE THE FIRST CHAMBER OVER THE PIPE AND ENSURE THE HOLES IN THE PRESSURE PIPE ARE FACING UP (I.E. 12)
- O'CLOCK POSITION). INSERT THE END PLATE TO THE FIRST CHAMBER.
- CONNECT EACH SUBSEQUENT CHAMBER TO THE END OF THE PROCEEDING CHAMBER. ENSURE THAT THE CHAMBERS ARE PROPERLY INTERLOCKED AS PER MANUFACTURER'S REQUIREMENTS. ATTACH AN END PLATE TO THE END OF EACH CHAMBER RUN.
- TO ALLOW FOR SERVICING, IT IS RECOMMENDED THAT THE END OF EACH PRESSURE PIPE BE SLEEVED THROUGH THE END PLATE AND BE FITTED WITH A 25mm@ PVC LONG RADIUS 90° SWEEP C/W 1-25mm@ PVC FPT x SLIP FIT ADAPTER AND 1-MPT PVC END CAP, COVER CLEAN-OUT ASSEMBLY WITH 150mmØ IRRIGATION VALVE COVER (OR APPROVED EQUAL)

- BACKELL THE CHAMBERS IN LIFTS LISING SELECT SAND FILL BACKELL MUST CONSIST OF SELECT SAND FILL FOLLOWER BY 100mm OF SANDY TOPSOIL IT IS RECOMMENDED THAT THE LEACHING BED AREA BE SODDED AS SOON AS POSSIBLE. START BACKFILLING AT THE JOINTS, COMPACT THE BACKFILL ALONG THE SIDE OF THE CHAMBERS BY WALKING ALONG
- THE EDGES OF THE TRENCHES. THE GROUND SURFACE OVER THE LEACHING BED SHOULD BE CROWNED TO SHED SURFACE WATER AND SODDE

MINIMUM CLEARANCE DISTANCE FROM LEACHING BED 7)

- 7.1m FROM ANY PROPERTY LINE
- 9.1m FROM ANY STRUCTURE
- 19.1m FROM ANY EXISTING DRILLED WELL

MINIMUM CLEARANCE DISTANCE FROM TANK(S)

- 1.5m FROM ANY STRUCTURE
- 15 0m FROM ANY DRILLED OR DUG WELL
- 3.0m FROM ANY PROPERTY LINE

GENERAL

- SNOW STORAGE SHALL NOT BE LOCATED OVER PROPOSED SEWAGE SYSTEM.
- THE SEWAGE SYSTEM HAS NOT BEEN DESIGNED TO SUPPORT TRAFFIC LOADING
- THE BACKFILLING OF THE SEWAGE SYSTEM SHOULD MINIMIZE THE RISK OF OVER COMPACTION WITH THE USE RUBBER TRACKED EQUIPMENT AND BY AVOIDING THE CREATION OF ANY CONSTRUCTION ROUTES OR PATHWAYS OVER THE SYSTEM.
- ANY NEW IRRIGATION / SPRINKLER SYSTEM SHOULD NOT BE USED IN PROXIMITY OF THE PROPOSED SEWAGE SYSTEM. ENSURE WALKWAYS AND/OR SHRUBBERY ARE NOT PLACED WITHIN PROXIMITY OF THE TANKAGE.
- THE BACKWASH WATERS FROM ANY WATER TREATMENT UNIT. SUCH AS WATER SOFTENER, SHOULD NOT DISCHARG INTO THE SEWAGE SYSTEM.
- THE SEWAGE SYSTEM HAS NOT BEEN DESIGNED FOR THE USE OF A GARBAGE DISPOSAL
- SEWAGE SYSTEM INSTALLER SHALL BE QUALIFIED AND REGISTERED UNDER PART 8 OF THE ONTARIO BUILDING CODI AND SHALL BE AN AUTHORIZED WATERLOO TREATMENT SYSTEM INSTALLER
- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH THE LATEST BY-LAWS. CODES AND REGULATIONS.
- CONTRACTOR SHALL REVIEW DRAWINGS IN DETAIL AND SHALL INFORM THE CONSULTANT OF ANY ERRORS AND/O OMISSIONS ON DESIGN DRAWINGS IMMEDIATELY.
- CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE AND PROTECT ALL EXISTING UNDERGROUND SERVICES. CONTRACTOR SHALL VISIT THE SITE AND REVIEW ALL DOCUMENTATION TO BECOME FAMILIAR WITH THE SITE ANI SUBSURFACE SOIL CONDITIONS TO DETERMINE SUITABLE METHODS OF CONSTRUCTION.
- THE MANUFACTURER PROVIDES A LIMITED WARRANTY OF THE SYSTEM COMPONENTS. THE OWNER OF THE SYSTEM MUST SIGN A MAINTENANCE AGREEMENT WITH THE MANUFACTURER'S REPRESENTATIVE. THE SYSTEM OWNER I RESPONSIBLE FOR THE ANNUAL FEES ASSOCIATED WITH THE MAINTENANCE.
- THE FIRM OF PATERSON GROUP INC. HAS PROVIDED DESIGN SERVICES ONLY FOR THE SUBJECT SEWAGE SYSTEM. TH DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES AND OUR INTERPRETATIO OF PART 8 OF THE ONTARIO BUILDING CODE
- THE PROPERTY LINE / SEPARATION DISTANCES SHOULD BE CONFIRMED PRIOR TO CONSTRUCTION
- CONSTRUCTION INSPECTIONS DURING THE INSTALLATION OF THE SEWAGE SYSTEM MAY BE REQUIRED BY THI REGULATING AUTHORITY AND ARE STRONGLY RECOMMENDED BY THIS FIRM. IF THIS FIRM IS TO COMPLETE ANY CONSTRUCTION INSPECTION(S), ADDITIONAL FEES MAY BE APPLIED. CONFIRMATION OF PAYMENT WILL BE REQUIRED PRIOR TO THE INSPECTION.
- THE TEST HOLE INFORMATION PROVIDED, IS INTENDED TO BE USED FOR DESIGN PURPOSES ONLY, AND SHOULD NOT B RELIED UPON FOR CONSTRUCTION PURPOSES. IF DISCREPANCIES ARE FOUND DURING THE CONSTRUCTION PROCESS IT IS THE CLIENT'S RESPONSIBILITY TO CONTACT THIS FIRM TO MAKE ANY NECESSARY COMMENTS OR REVISIONS ADDITIONAL REVISIONS ARE NOT CONSIDERED PART OF THE DESIGN WORKS AND WILL BE CONSIDERED AS A



19/09/24	Revised System Location 2	
22/08/24	Revised Dispersal Bed	1
14/08/24	Issued for Preliminary Review	0
DD/MM/YY	DESCRIPTION	REV.

Consultant



Client:

DAY AND ROSS TRANSPORTATION

Project:

PROPOSED CROSS **DOCK BUILDING**

5510 BOUNDARY ROAD OTTAWA (CARLSBAD SPRINGS), ONTARIO

Drawing:

SEWAGE SYSTEM DETAIL & NOTES

Scale:	Drawn by:
N.T.S.	KB
Date: 09/2024	Checked by: HV

PH4942-2(rev.2)

p:\autocad drawings\hydrogeology\ph49xx\ph4942 - day and ross transportation - 5510 boundary road\ph4942-2(rev.2).dwg

