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Peterborough, Ontario K9J 6X7
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Our ref: 11220832-01

12 April 2021

Consolidated Fastfrate (Ottawa) Holdings Inc.
c/o Pierre Courteau
CBRE Limited
333 Preston Street, 7th Floor
Ottawa, Ontario K1S 5N4

Re: Terrain Analysis, Septic Assessment and Percolation Rate Evaluation
Proposed Commercial Development
Rideau Road and Somme Street
Gloucester Con 6 from Rideau River, Lot 26, Ottawa, Ontario

Dear Mr. Courteau:

1. Introduction

GHD Limited (GHD) is pleased to provide you (the Client) with the following letter documenting excavation activities completed in the general locations of a proposed septic tile bed and stormwater pond. The locations were requested by CIMA. This letter documents the soil and groundwater conditions encountered also provides a summary of approximate percolation rate (T-time) values based upon soil collected from the test pit locations. Additional information regarding the terrain of the above noted property can be gleaned from the Geotechnical Investigation report.

The general location is illustrated on the Site Location Plan, Figure 1. The test pit locations are illustrated on the Test Pit Location Plan, Figure 2.

2. Field Activities

Test pits were advanced under the supervision of GHD on March 31, 2021. The test pits were excavated at five (5) locations to depths ranging from 2.4 to 3.4 m. The soil stratigraphy consisted of fill at each location described as gravelly sand with silt trace clay to a silty sand with gravel and clay. Fill was observed to the bottom of each test pit. The fill also included a mix of asphalt, bricks and concrete at each location. Refusal was encountered at 2.4 m at TP-1 due to asphalt. Test pit logs are provided in Appendix A.

Soil samples were collected from each test pit. Hydrometer testing was conducted at GHD's laboratory. The grain size data, included in Appendix A, indicated:

– 18 – 41% gravel; 36 – 47% sand; 12 – 23% silt; and, 4 – 12% clay size particles by weight.

Groundwater seepage was encountered at each test pit. The shallow groundwater was observed between 1.8 and 2.4 metres below ground surface (mbgs). Test pits TP-2, TP-3, TP-4 and TP-5 encountered groundwater at 1.8 mbgs.

Based upon the Supplementary Guidelines to the Ontario Building Code 1997, the percolation rate is estimated (based upon the gradation test results only) to have an average value of 12 to 20 min/cm with a medium permeability.

3. Conclusions and Recommendations

Due to the inconsistency of the fill materials observed and shallow groundwater seepage encountered it is recommended the septic disposal system be a fully raised bed absorption trench leaching bed. It is recommended prior to placement if the imported fill that any surficial organics be removed from the tile bed and mantle area. It is also suggested that that the existing fill material be compacted to ensure uneven settlement of the tiles does not occur.

The waste disposal system should meet Ontario Regulation 350/06 made under the Building Code Act, 1992 and incorporate the following design features:

1. Organics should be stripped from the area of the leaching bed and downgradient mantle.
2. The exposed subgrade below the tile bed should be trimmed and scarified, and provided with a gentle slope of 0.5% in the direction of the mantle.
3. The tile bed should be constructed as a fully raised leaching type bed up to the full height of at least 1 m above existing grade. The raised bed should consist of clean, granular fill capable of providing an in-place T-time of 4 to 8 min/cm.
4. The mantle should be constructed along the downgradient margin of the raised bed. Each mantle should extend along the full width of the bed and for a minimum of 15 m downgradient from the bed. The mantle should consist of similar granular fill raised to a minimum of 250 mm above the surrounding grade. Surface runoff should be diverted away from the leaching bed by means of proper site drainage.
5. The waste disposal system should be kept clear of surface drainage swales, roof leader drains, and other sources of surface water.
6. The tile bed should be kept away from shade trees and a healthy cover of vegetation should be developed and maintained over the bed to promote evapotranspiration.
7. When sighting a tile bed on sloping ground, it is recommended that procedures outlined in the Building Code be followed closely.
8. Minimum set back distances from septic tank (plus 2 times height raised):
    - Building – 1.5 m
    - Drilled well – 15 m
    - Property line – 3 m
    - Open water course – 15 m
9. Minimum set back distances from septic tile bed (plus 2 times height raised):
    - Building – 5 m
    - Drilled well, properly sealed – 15 m
    - Open water course – 15 m
    - Property line – 3 m
    - Shallow well – 30 m
10. The layout, design and construction of the waste disposal bed should be subject to inspection by experienced hydrogeologic personnel.

We trust that this report meets your immediate requirements. Should you have any questions, please contact our office.

Regards

GHD

PROFESSIONAL GEOSCIENTIST
LIMITED MEMBER
ROBERT W. NECK
2262
ONTARIO

Robert Neck, M.Eng., P.Geo. (Limited)
Project Manager

Nyle McIlveen, P. Eng
Senior Engineer

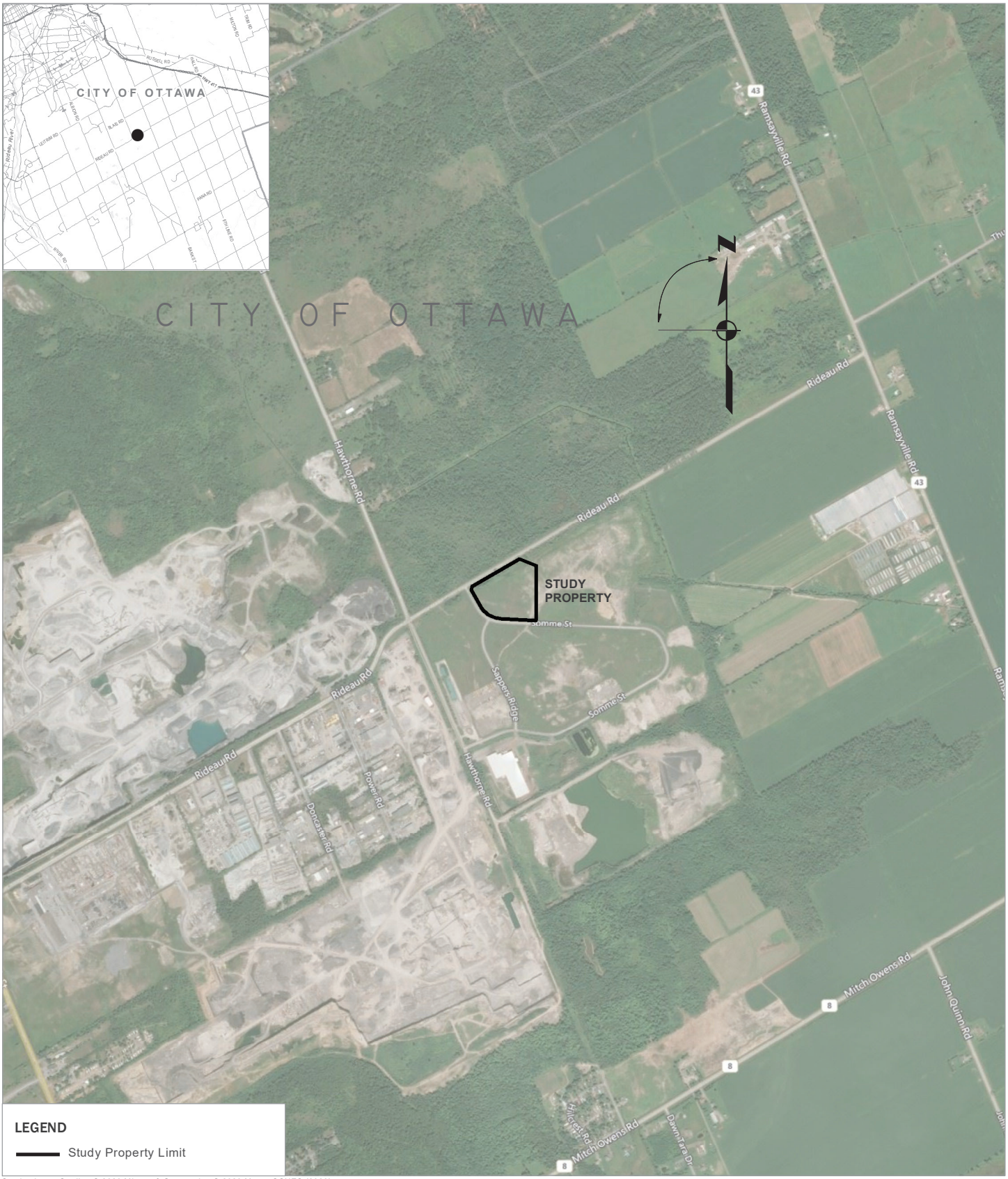
LICENSED PROFESSIONAL ENGINEER
N. C. McILVEEN
PROVINCE OF ONTARIO

Encl.: Appendix A (Test Pit Logs and Gradation Results)

Email to Pierre Courteau
Cc: Christian Lavoie-Lebel (Christian.Lavoie-Lebel@cima.ca)

Attachment 1

Figures



NAD83, MTM Zone 9
1 cm : 200 meters

Meters
0 220 440 880

ATTRIBUTION STATEMENTS

K:\GIS_PROJECTS\GHD\CA-

Consolidated Fastfrate (Ottawa) Holdings Inc.

RIDEAU ROAD & SOMME STREET
CITY OF OTTAWA
ONTARIO

SEPTIC ASSESSMENT
SITE LOCATION PLAN

Project No.	11220832-01
Revision No.	1
Date	Apr 2021

FIGURE 1

NAD83, MTM Zone 9
1 cm : 16 meters

Meters
0 15 30 60

ATTRIBUTION STATEMENTS

K:\GIS_PROJECTS\GHD\CA-

Consolidated Fastfrate (Ottawa) Holdings Inc.

RIDEAU ROAD & SOMME STREET
CITY OF OTTAWA
ONTARIO

SEPTIC ASSESSMENT
TEST HOLE LOCATION PLAN

Project No.	11220832-01
Revision No.	1
Date	Apr 2021

FIGURE 2

Appendix A

Test Pit Logs and Gradation Results

REFERENCE No.: 11220832 ENCLOSURE No.: A-1

TEST HOLE No.: TP-1
ELEVATION: Existing grade

TEST HOLE REPORT

Page: 1 of 1

CLIENT: Consolidated Fastfrate
PROJECT: Septic Assessment
LOGGED BY: J. Scott DATE: 31 March 2021
EXCAVATION COMPANY: Goldie Mohr Ltd. METHOD: Backhoe
NOTES: 18T E: 456548 N: 5017167

LEGEND
GS - GRAB SAMPLE
▼ - WATER LEVEL

Depth (ft)	Depth (m)	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Moisture Content (%)	Shear test (Cu) / Sensitivity (S) / Water content (%) / Atterberg limits (%)	COMMENTS
		0.0		GROUND SURFACE				
				TOPSOIL (178mm)				
		0.2		**SM** - Gravelly sand (fill), with silt, trace clay, concrete, brick, asphalt, compact, brown, moist				- Test pit open upon completion
1	0.5							
2					GS-1	--		- GS-1 37% Gravel 47% Sand 12% Silt 4% Clay
3	1.0							
4								
5	1.5							
6		1.8		With clay, loose	GS-2	--		- GS-2 41% Gravel 36% Sand 16% Silt 7% Clay
7	2.0	2.1		Wet				- Groundwater infiltration observed at approximately 2.1 mbgs
8	2.5	2.4		END OF TEST HOLE				- Refusal at 2.4m (asphalt)
9								
10	3.0							
11								
12	3.5							
13	4.0							
14								
	4.5							

TEST HOLE LOG GEOTECH 11220832 TEST PIT GINT LOGS.GPJ GEOLOGIC.GDT 12/4/21

REFERENCE No.: 11220832 ENCLOSURE No.: A-2

TEST HOLE No.: TP-2
ELEVATION: Existing grade

TEST HOLE REPORT

Page: 1 of 1

CLIENT: Consolidated Fastfrate
PROJECT: Septic Assessment
LOGGED BY: J. Scott DATE: 31 March 2021
EXCAVATION COMPANY: Goldie Mohr Ltd. METHOD: Backhoe
NOTES: 18T E: 456572 N: 5017175

LEGEND
GS - GRAB SAMPLE
▼ - WATER LEVEL

Depth ft	Depth m	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Moisture Content %	Shear test (Cu) △ Field / Sensitivity (S) □ Lab / ○ Water content (%) / W_p W_l Atterberg limits (%) 10 20 30 40 50 60 70 80 90	COMMENTS
		0.0		GROUND SURFACE				
		0.1		**TOPSOIL** (102mm)				
1	0.5			**SM** - Gravelly sand (fill), with silt, concrete, brick, asphalt, brown, moist				- Test pit open upon completion
3	1.0				GS-1	--		
5	1.5							
6	2.0	1.8		Wet				- Groundwater infiltration observed at approximately 1.8 mbgs
9	2.5	2.7		END OF TEST HOLE				
10	3.0							
11	3.5							
12								
13	4.0							
14	4.5							

TEST HOLE LOG GEOTECH 11220832 TEST PIT GINT LOGS.GPJ GEOLOGIC.GDT 12/4/21

REFERENCE No.: 11220832 ENCLOSURE No.: A-3

TEST HOLE No.: TP-3
ELEVATION: Existing grade

TEST HOLE REPORT

Page: 1 of 1

CLIENT: Consolidated Fastfrate
PROJECT: Septic Assessment
LOGGED BY: J. Scott DATE: 31 March 2021
EXCAVATION COMPANY: Goldie Mohr Ltd. METHOD: Backhoe
NOTES: 18T E: 456599 N: 5017156

LEGEND
GS - GRAB SAMPLE
▼ - WATER LEVEL

Depth (ft)	Depth (m)	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Moisture Content (%)
		0.0		GROUND SURFACE		
		0.2		**TOPSOIL** (152 mm)		
				SM - Gravelly sand (fill), with silt, concrete, asphalt, brown, moist		
		1.2		Grey, cobbles	GS-1	--
		1.8		Wet		
		3.0		END OF TEST HOLE	GS-2	--

Shear test (Cu) △ Field ☐ Lab
Sensitivity (S)
○ Water content (%)
Atterberg limits (%) w_p w_l
10 20 30 40 50 60 70 80 90

COMMENTS

— 0.2 m

- Test pit open upon completion
- Groundwater infiltration observed at approximately 1.8 mbgs
- 50 mm diameter monitoring well installed to 2.7 mbgs

TEST HOLE LOG GEOTECH 11220832 TEST PIT GINT LOGS.GPJ GEOLOGIC.GDT 12/4/21

REFERENCE No.: 11220832 ENCLOSURE No.: A-4

TEST HOLE REPORT

TEST HOLE No.: TP-4
ELEVATION: Existing grade

Page: 1 of 1

CLIENT: Consolidated Fastfrate
PROJECT: Septic Assessment
LOGGED BY: J. Scott DATE: 31 March 2021
EXCAVATION COMPANY: Goldie Mohr Ltd. METHOD: Backhoe
NOTES: 18T E: 456656 N: 5017172

LEGEND
GS - GRAB SAMPLE
▼ - WATER LEVEL

Depth (ft)	Depth (m)	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Moisture Content (%)	COMMENTS
		0.0		GROUND SURFACE			
		0.1		**TOPSOIL** (102mm)			
				SM - Gravelly sand (fill), with silt, with clay, concrete, asphalt, brown, moist			
1	0.5						- Test pit open upon completion
2							
3	1.0				GS-1	--	- GS-1 32% Gravel 44% Sand 17% Silt 7% Clay
4							
5	1.5						
6		1.8		Wet			- Groundwater infiltration observed at approximately 1.8 mbgs
7	2.0						
8							
9	2.5						
10					GS-2	--	
11	3.0	3.4		END OF TEST HOLE			
12	3.5						
13							
14	4.0						
	4.5						

Shear test (Cu) △ Field
Sensitivity (S) □ Lab
○ Water content (%)
w_p w_l Atterberg limits (%)

10 20 30 40 50 60 70 80 90

TEST HOLE LOG GEOTECH 11220832 TEST PIT GINT LOGS.GPJ GEOLOGIC.GDT 12/4/21

REFERENCE No.: 11220832 ENCLOSURE No.: A-5

TEST HOLE No.: TP-5
ELEVATION: Existing grade

TEST HOLE REPORT

Page: 1 of 1

CLIENT: Consolidated Fastfrate
PROJECT: Septic Assessment
LOGGED BY: J. Scott DATE: 31 March 2021
EXCAVATION COMPANY: Goldie Mohr Ltd. METHOD: Backhoe
NOTES: 18T E: 456601 N: 5017160

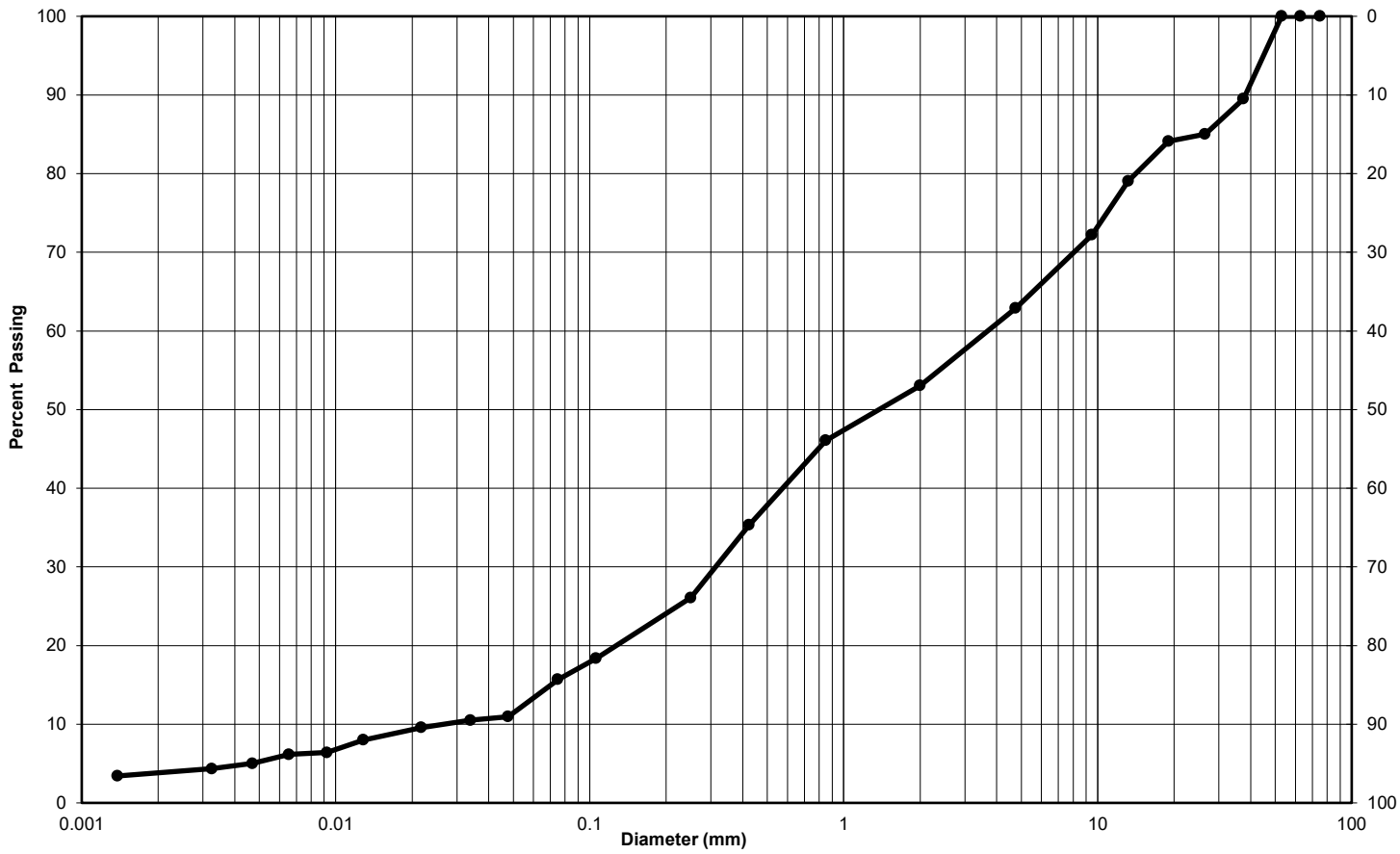
LEGEND
GS - GRAB SAMPLE
▼ - WATER LEVEL

Depth ft	Depth m	m Below Existing Grade	Stratigraphy	DESCRIPTION OF SOIL AND BEDROCK	Type and Number	Moisture Content %	Shear test (Cu) △ Field / Sensitivity (S) □ Lab; ○ Water content (%); w_p w_l Atterberg limits (%) 10 20 30 40 50 60 70 80 90	COMMENTS
		0.0		GROUND SURFACE				
		0.1		**TOPSOIL** (102mm)				
				SM - Silty sand (fill), with gravel, with clay, with asphalt, concrete, brown, moist				
1	0.5							- Test pit open upon completion
2								
3	1.0				GS-1	--		
4		1.2		Grey				
5	1.5							
6		1.8		Wet				- Groundwater infiltration observed at approximately 1.8 mbgs
7	2.0							
8								
9	2.5				GS-2	--		- GS2 18% Gravel 47% Sand 23% Silt 12% Clay
10	3.0	3.0		END OF TEST HOLE				
11								
12	3.5							
13	4.0							
14								
	4.5							

TEST HOLE LOG GEOTECH 11220832 TEST PIT GINT LOGS.GPJ GEOLOGIC.GDT 12/4/21

Particle-Size Analysis of Soils (Geotechnical) (USCS) (ASTM D422)

Client:	Consolidated Fastfrate	**Lab No.:**	SS-21-25
Project/Site:	Rideau Street & Somme Street, Ottawa, ON	**Project No.:**	11220832
Borehole no.:	TP1	Sample no.:	GS1
Depth:	0.6 - 0.9 m	Enclosure:	A-6



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Unified Soil Classification System					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
	37	47	16
Silt-size particles (%):	12		
Clay-size particles (%) (<0.002mm):	4		

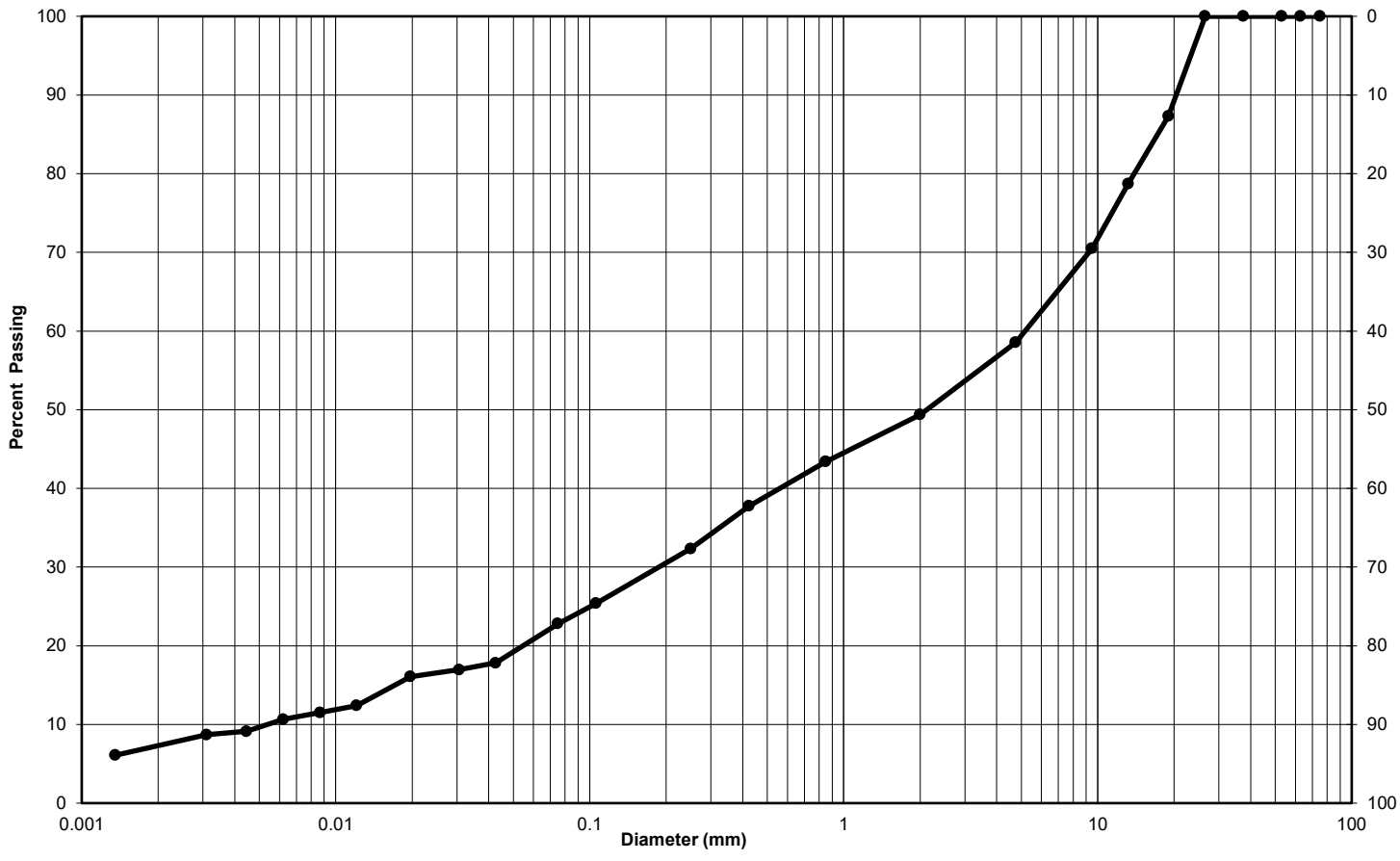
Remarks: Moisture Content = 7.1% as per, ASTM D2216.

Performed by:	Josh Sullivan	**Date:**	April 7, 2021
Verified by:	Joe Sullivan	**Date:**	April 7, 2021

Particle-Size Analysis of Soils (Geotechnical) (USCS) (ASTM D422)

Client:	Consolidated Fastfrate	**Lab No.:**	SS-21-25
Project/Site:	Rideau Street & Somme Street, Ottawa, ON	**Project No.:**	11220832

Borehole no.:	TP1	Sample no.:	GS2
Depth:	1.8 - 2.1 m	Enclosure:	A-7



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Unified Soil Classification System					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
	41	36	23
Silt-size particles (%):	16		
Clay-size particles (%) (<0.002mm):	7		

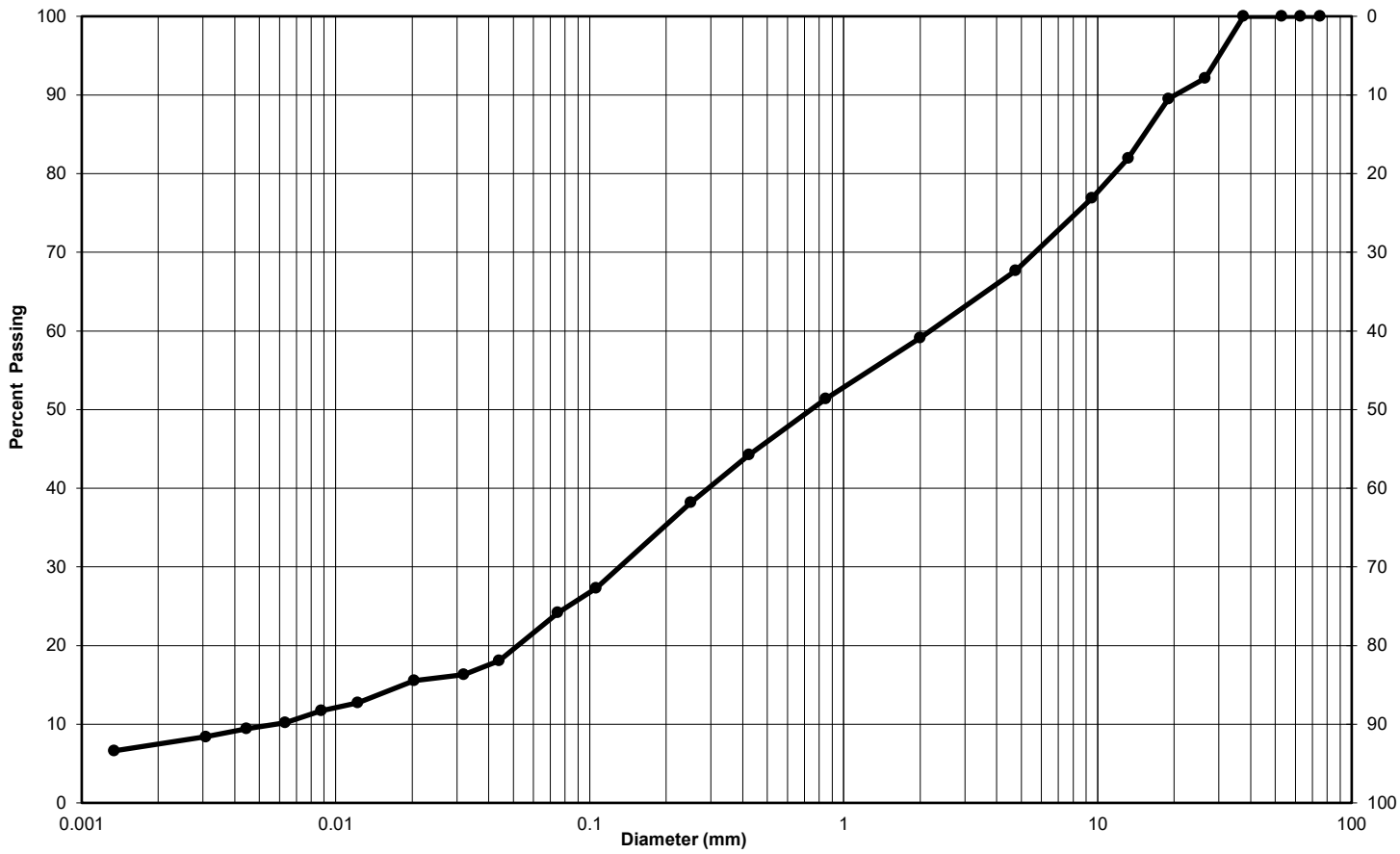
Remarks: Moisture Content = 8.7% as per, ASTM D2216.

Performed by:	Josh Sullivan	**Date:**	April 7, 2021
Verified by:	Joe Sullivan	**Date:**	April 7, 2021

Particle-Size Analysis of Soils (Geotechnical) (USCS) (ASTM D422)

Client:	Consolidated Fastfrate	**Lab No.:**	SS-21-25
Project/Site:	Rideau Street & Somme Street, Ottawa, ON	**Project No.:**	11220832

Borehole no.:	TP4	Sample no.:	GS1
Depth:	0.9 - 1.2 m	Enclosure:	A-8



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Unified Soil Classification System					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
	32	44	24
Silt-size particles (%):	17		
Clay-size particles (%) (<0.002mm):	7		

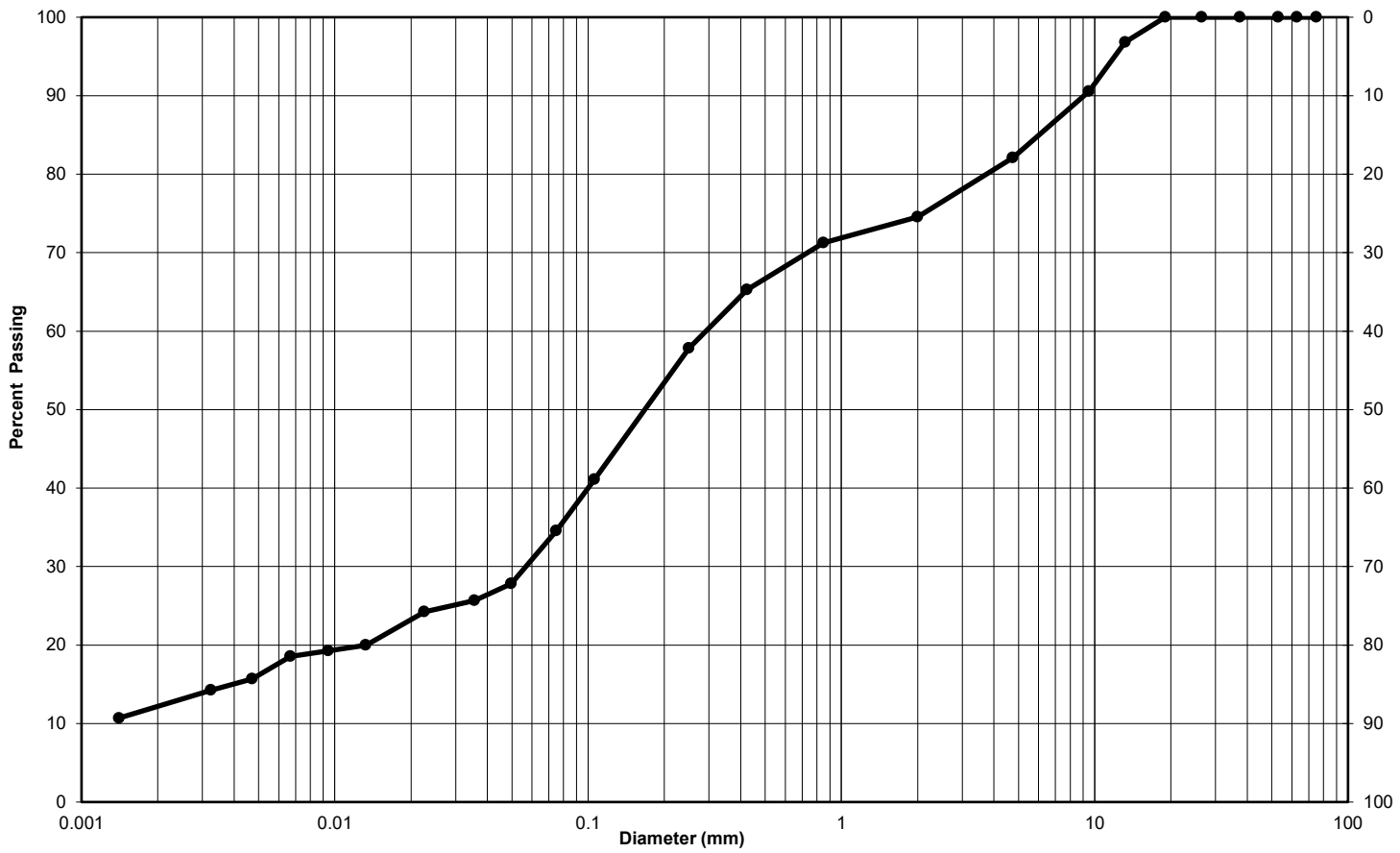
Remarks: Moisture Content = 10.6% as per, ASTM D2216.

Performed by:	Josh Sullivan	**Date:**	April 7, 2021
Verified by:	Joe Sullivan	**Date:**	April 7, 2021

Particle-Size Analysis of Soils (Geotechnical) (USCS) (ASTM D422)

Client:	Consolidated Fastfrate	**Lab No.:**	SS-21-25
Project/Site:	Rideau Street & Somme Street, Ottawa, ON	**Project No.:**	11220832

Borehole no.:	TP5	Sample no.:	GS2
Depth:	2.75 - 3.05 m	Enclosure:	A-9



Clay & Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse
Unified Soil Classification System					

Soil Description	Gravel (%)	Sand (%)	Clay & Silt (%)
	18	47	35
Silt-size particles (%):	23		
Clay-size particles (%) (<0.002mm):	12		

Remarks: Moisture Content = 22.4% as per, ASTM D2216.

Performed by:	Josh Sullivan	**Date:**	April 7, 2021
Verified by:	Joe Sullivan	**Date:**	April 7, 2021

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