

APPENDIX 'B'

**GEOTECHNICAL SUB-SURFACE
INVESTIGATION**



Quality Engineering | Valued Relationships

Dillon Consulting Ltd.

Fermor Avenue Over Seine River – St. Anne’s Road to Archibald Street – Sub Surface Investigation

Prepared for:

Dillon Consulting Ltd.
1558 Willson Place
Winnipeg, MB R3T 0Y4
Attention: Mike Lau

Distribution:

Mike Lau, Ph.D., P.Eng.

Project Number:

0022-033-00

Date:

July 11, 2016
Final Report



Quality Engineering | Valued Relationships

July 11, 2016

Our File No. 0022-033-00

Mike Lau, Ph.D., P.Eng.
Dillon Consulting Ltd.
1558 Willson Place
Winnipeg, MB R3T 0Y4

**RE: Sub-Surface Investigation Report for
Fermor Avenue Over Seine River – St. Anne’s Road to Archibald Street
(REVISED)**

TREK Geotechnical Inc. is pleased to submit our report for the sub-surface investigations for Fermor Avenue Rehabilitation and Roadworks – St. Anne’s Road to Archibald Street.

Please contact the undersigned if you have any questions. Thank you for the opportunity to serve you on this assignment.

Sincerely,

TREK Geotechnical Inc.
Per:

A handwritten signature in blue ink, appearing to read "N. Ferreira".

Nelson John Ferreira, M. Sc., P. Eng.
Geotechnical Engineer, Principal
Tel: 204.975.9433 ext. 103

cc:

Revision History

Revision No.	Author	Issue Date	Description
0	JN	June 17, 2016	Final Report
1	PB	July 11, 2016	Revised Final Report

Authorization Signatures

Prepared By:



Paul Bevel, B.Sc., Lab and Field Services Manager

Reviewed By:



Nelson John Ferreira, M. Sc., P. Eng.
Geotechnical Engineer

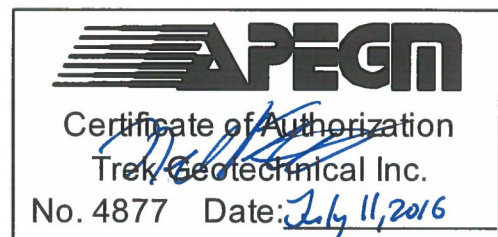


Table of Contents

Letter of Transmittal

Revision History and Authorization Signatures

1.0	Introduction	1
2.0	Sub-Surface Investigation and Laboratory Program	1
3.0	Closure.....	1

List of Figures

Figure 01 Test Hole Location Plan – Fermor Ave.

List of Appendices

Appendix A Test Hole Logs

Appendix B Lab Testing Summary and Lab Testing Results

Appendix C Photographs of Pavement Core Samples

List of Tables

Table 1.0 Estimated CBR Values

1.0 Introduction

This report summarizes the results of the sub-surface investigation completed for the Fermor Ave. Rehabilitation and Roadworks. Information regarding the asphalt, concrete, road base for the existing road and the soil stratigraphy beneath the pavement structure is provided.

2.0 Sub-Surface Investigation and Laboratory Program

A total of 14 test holes were drilled on Fermor Avenue from St. Anne's Road to Archibald Street at the locations shown on Figure 01. The test holes were drilled in order to determine sub-surface conditions for design and reconstruction of the road segment.

The sub-surface investigation was conducted on May 20, 2016. The test holes were drilled to depths ranging from 2.3 m to 3.1 m below the road surface by Maple Leaf Drilling Ltd. using their CME-75 truck mounted drill rig equipped with 125 mm diameter solid stem augers. The pavement structure (asphalt or concrete) was cored by Paul Bevel, B.Sc. of TREK Geotechnical Inc. (TREK) using a portable coring press equipped with a hollow 150 mm diameter diamond core drill bit. The sub-surface conditions were observed during drilling and visually classified by Jodi Neumann, of TREK. Other pertinent information such as groundwater and drilling conditions were also recorded during the drilling investigation. Disturbed (auger cuttings) and relatively undisturbed (Shelby tube) samples retrieved during the sub-surface investigation were transported to TREK's material testing laboratory for further testing. Pavement core samples were also retrieved and logged at TREK's material testing laboratory.

The laboratory testing program consisted of moisture content determination, Atterberg limits, grain size analysis (mechanical sieve and hydrometer methods), and bulk unit weight measurements and unconfined compressive strength testing on Shelby tube samples. The results of the laboratory testing are included on the test hole logs in Appendix A. The laboratory testing results are also summarized and reported separately in Appendix B. Photos of the concrete and asphalt cores are included in Appendix C. Test hole locations noted on the test hole logs and shown on Figure 01 were determined using a handheld GPS.

Undrained shear strength results from unconfined compressive strength testing are summarized in Table 1.0. The undrained shear strength values have been used to estimate a corresponding CBR value based on published relationships.

Table 1.0 Estimated CBR Values from Undrained Shear Strength

Test Hole ID	Sample No.	Location	Soil Type	Depth (m) Below Top of Pavement	Undrained Shear Strength (kPa)	Estimated CBR (%)
TH16-01	T99	U14 5524304m N, 636321m E	SILT	1.9 – 2.0	38.7	1.7
TH16-04	T15	U14 5524460m N, 636522m E	CLAY	1.9 – 2.10	29.3	1.3
TH16-05	T86	U14 5524520m N, 636601m E	ORGANIC CLAY & SILT	1.5 – 1.8	15.7	0.7
TH16-08	T29	U14 5524571m N, 636891m E	CLAY & SILT	1.7 – 1.8	10.3	0.4
TH16-09	T72	U14 5524586m N, 636985m E	CLAY	1.8 – 1.9	26.8	1.2
TH16-12	T44	U14 5524498m N, 637269m E	CLAY	1.8 – 1.9	19.9	0.9
TH16-13	T58	U14 5524468m N, 637364m E	CLAY & SILT	1.8 – 2.0	32.1	1.4

3.0 Closure

The information provided in this report is in accordance with current engineering principles and practices (Standard of Practice). The findings of this report were based on information provided (field investigation, laboratory testing, geometries). Soil conditions are natural deposits that can be highly variable across a site. If sub-surface conditions are different than the conditions previously encountered on-site or those presented here, we should be notified to adjust our findings if necessary.

All information provided in this report is subject to our standard terms and conditions for engineering services, a copy of which is provided to each of our clients with the original scope of work, or a mutually executed standard engineering services agreement. If these conditions are not attached, and you are not already in possession of such terms and conditions, contact our office and you will be promptly provided with a copy.

This report has been prepared by TREK Geotechnical Inc. (the Consultant) for the exclusive use of Dillon Consulting (the Client) and their agents for the work product presented in the report. Any findings or recommendations provided in this report are not to be used or relied upon by any third parties, except as agreed to in writing by the Client and Consultant prior to use.

Figures



LEGEND: TEST HOLE (TREK, MAY 20, 2016)

NOTES: 1. AERIAL IMAGE FROM GOOGLE EARTH AUGUST 24, 2015

FIGURE 01
Test Hole Location Plan

KEY PLAN
SCALE: N.T.S.

Appendix A
Test Hole Logs

GENERAL NOTES

- Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.
- Descriptions on these test hole logs apply only at the specific test hole locations and at the time the test holes were drilled. Variability of soil and groundwater conditions may exist between test hole locations.
- When the following classification terms are used in this report or test hole logs, the primary and secondary soil fractions may be visually estimated.

Major Divisions	USCS Classification	Symbols	Typical Names	Laboratory Classification Criteria		Particle Size		
Coarse-Grained soils (More than half the material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than 4.75 mm)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain size curve, depending on percentage of fines (fraction smaller than No. 200 sieve) coarse-grained soils are classified as follows: Less than 5 percent..... GW, GP, SW, SP More than 12 percent..... GM, GC, SM, SC 6 to 12 percent..... Gm, Gp, Sml, Sp * Borderline classifications requiring dual symbols*	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	ASTM Sieve Sizes #10 to #4 #40 to #10 #200 to #40 < #200		
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW			
	Sands (More than half of coarse fraction is smaller than 4.75 mm)	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols	mm 2.00 to 4.75 0.425 to 2.00 0.075 to 0.425 < 0.075	
		GC	Clayey gravels, gravel-sand-silt mixtures		Atterberg limits above "A" line or P.I. greater than 7			
	Sands with fines (Appreciable amount of fines)	SW	Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3 Not meeting all gradation requirements for SW	Material Sand Coarse Medium Fine Silt or Clay	
		SP	Poorly-graded sands, gravelly sands, little or no fines		Atterberg limits below "A" line or P.I. less than 4			
		SM	Silty sands, sand-silt mixtures		Atterberg limits above "A" line or P.I. greater than 7			
		SC	Clayey sands, sand-clay mixtures					
	Fine-Grained soils (More than half the material is smaller than No. 200 sieve size)	Sils and Clays (Liquid limit less than 50)	ML		Inorganic silts and very fine sands, rock floor, silty or clayey fine sands or clayey silts with slight plasticity		Plasticity Chart Plasticity chart for solid fraction with particles smaller than 0.425 mm	Particle Size ASTM Sieve Sizes mm > 300 75 to 300 19 to 75 4.75 to 19
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
OL			Organic silts and organic silty clays of low plasticity					
Sils and Clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or distomaceous fine sandy or silty soils, organic silts	MH OR OH				
		CH	Inorganic clays of high plasticity, fat clays					
		OH	Organic clays of medium to high plasticity, organic silts					
Highly Organic Soils		Pt	Peat and other highly organic soils	Von Post Classification Limit	Strong colour or odour, and often fibrous texture			Material Boulders Cobbles Gravel Coarse Fine

* Borderline classifications used for soils possessing characteristics of two groups are designated by combinations of groups symbols. For example; GW-GC, well-graded gravel-sand mixture with clay binder.

Other Symbol Types

	Asphalt		Bedrock (undifferentiated)		Cobbles
	Concrete		Limestone Bedrock		Boulders and Cobbles
	Fill		Cemented Shale		Silt Till
			Non-Cemented Shale		Clay Till

LEGEND OF ABBREVIATIONS AND SYMBOLS

LL - Liquid Limit (%)	▽ Water Level at Time of Drilling
PL - Plastic Limit (%)	▼ Water Level at End of Drilling
PI - Plasticity Index (%)	▽ Water Level After Drilling as Indicated on Test Hole Logs
MC - Moisture Content (%)	
SPT - Standard Penetration Test	
RQD- Rock Quality Designation	
Qu - Unconfined Compression	
Su - Undrained Shear Strength	
VW - Vibrating Wire Piezometer	
SI - Slope Incliner	

FRACTION OF SECONDARY SOIL CONSTITUENTS ARE BASED ON THE FOLLOWING TERMINOLOGY

TERM	EXAMPLES	PERCENTAGE
and	and CLAY	35 to 50 percent
"y" or "ey"	clayey, silty	20 to 35 percent
some	some silt	10 to 20 percent
trace	trace gravel	1 to 10 percent

TERMS DESCRIBING CONSISTENCY OR COMPACTION CONDITION

The Standard Penetration Test blow count (N) of a non-cohesive soil can be related to compactness condition as follows:

<u>Descriptive Terms</u>	<u>SPT (N) (Blows/300 mm)</u>
Very loose	< 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	> 50

The Standard Penetration Test blow count (N) of a cohesive soil can be related to its consistency as follows:

<u>Descriptive Terms</u>	<u>SPT (N) (Blows/300 mm)</u>
Very soft	< 2
Soft	2 to 4
Firm	4 to 8
Stiff	8 to 15
Very stiff	15 to 30
Hard	> 30

The undrained shear strength (Su) of a cohesive soil can be related to its consistency as follows:

<u>Descriptive Terms</u>	<u>Undrained Shear Strength (kPa)</u>
Very soft	< 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very stiff	100 to 200
Hard	> 200



Sub-Surface Log

Test Hole TH16-01

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL 0 20 40 60 80 100											
					0	20	40	60	80	100	0	50	100	150	200	250
0.00 - 0.05		ASPHALT - (55mm thick)														
0.05 - 0.10		CONCRETE - (215mm thick)														
0.10 - 0.45		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	G	G95												
0.45 - 1.00		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - brown - moist, firm to stiff - low plasticity	G	G96												
1.00 - 1.50		- wet below 0.9m CLAY - silty, trace silt inclusions (<10mm dia.), trace sand, trace oxidaton - brown - moist, stiff to very stiff - high plasticity	G	G97												
1.50 - 2.00		SILT - some clay, trace sand - brown - moist, firm to stiff - intermediate plasticity	T	T99												

End of Hole at 2.3m in CLAY

Notes:

- 1) No sloughing.
- 2) Seepage below 0.9m from top of pavement.
- 3) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
- 4) Test hole open to 1.5m at completion of drilling.
- 5) Water level measured at 1.5m at completion of drilling
- 6) Test hole located in left turning lane at the intersection of Fermor Ave. and St. Anne's Rd. (U14 5524304m N, 636321m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0_A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-02

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL 0 20 40 60 80 100											
					0	20	40	60	80	100	0	50	100	150	200	250
		ASPHALT - (25mm thick)														
		CONCRETE - (210mm thick)														
0.5		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown - moist, compact - well graded rounded to sub angular		G01	●											
		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - brown - moist, firm to stiff - low plasticity		G02	●							△	⊕			
1.0		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, very stiff - high plasticity		G03		●								⊕	△	
1.5		CLAY AND SILT - trace sand, trace gravel (<20mm dia.) - grey - moist, firm - intermediate plasticity		G05	●											
		CLAY AND SILT - trace sand, trace gravel (<20mm dia.) - grey - moist, firm - intermediate plasticity		G06		●										
2.0		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, very stiff - high plasticity		G07		●										
		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, very stiff - high plasticity		G08			●								⊕	
		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, very stiff - high plasticity		G09				●						△	⊕	
2.5		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, very stiff - high plasticity														
3.0		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, very stiff - high plasticity														

End of Hole at 3.0m in CLAY

Notes:

- 1) No seepage.
- 2) Sloughing between 1.4m to 1.8m below top of pavement.
- 3) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
- 4) Test hole open to 1.5m at completion of drilling.
- 5) Test hole located in the east bound median lane, between St. Anne's Rd. and Archibald St. (U14 5524333m N, 636377m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0 A IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-03

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL 0 20 40 60 80 100											
					0	20	40	60	80	100	0	50	100	150	200	250
0.00 - 0.06		ASPHALT - (96mm thick)														
0.06 - 0.19		CONCRETE - (193mm thick)														
0.19 - 0.40		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown - moist, compact - well graded rounded to sub angular		G87	●											
0.40 - 0.85		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - brown - moist, firm to stiff - low plasticity		G88	●											
0.85 - 1.10				G89	●								△	⊕		
1.10 - 1.80				G90	●								△	⊕		
1.80 - 2.10				G91	●								△	⊕		
2.10 - 2.40		SILT - trace clay, trace sand, trace oxidation - brown - moist, soft - no to low plasticity		G92	●											
2.40 - 3.00		CLAY - silty, trace silt inclusions (<5mm dia.) - brown - moist, stiff to very stiff - high plasticity		G93	●											
				G94	●								⊕	△		

End of Hole at 3.0m in CLAY

Notes:

- 1) No seepage.
- 2) Squeezing below 0.6m from top of pavement.
- 3) Sloughing below 1.1m from top of pavement.
- 4) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
- 5) Test hole open to 1.1m at completion of drilling.
- 6) Test hole located in the west bound curb lane, between St. Anne's Rd. and Archibald St. (U14 5524415m N, 636434m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0 A IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-04

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL											
					0	20	40	60	80	100	0	50	100	150	200	250
0.00 - 0.05		ASPHALT - (91mm thick)														
0.05 - 0.15		CONCRETE - (214mm thick)														
0.15 - 0.35		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	<input checked="" type="checkbox"/>	G10												
0.35 - 0.55		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - brown, moist, stiff, low plasticity	<input checked="" type="checkbox"/>	G11												
0.55 - 0.95		ORGANIC CLAY AND SILT - trace sand, trace gravel (<10mm dia), trace rootlets - black, moist, very stiff, high plasticity	<input checked="" type="checkbox"/>	G12												
0.95 - 1.15		- no gravel below 9.1m - stiff to very stiff below 1.1m	<input checked="" type="checkbox"/>	G13												
1.15 - 1.55		CLAY - silty, trace sand, trace rootlets - grey - moist, stiff to very stiff - high plasticity - firm to stiff below 1.5m	<input checked="" type="checkbox"/>	G14												
1.55 - 2.05			<input checked="" type="checkbox"/>	T15												

End of Hole at 2.3m in CLAY
 Notes:
 1) No sloughing or seepage.
 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
 3) Test hole open to 2.3m at completion of drilling.
 4) Test hole located in the east bound curb lane, between St. Anne's Rd. and Archibald St.
 (U14 5524460m N, 636522m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0_A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-05

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL											
					0	20	40	60	80	100	0	50	100	150	200	250
0.0 - 0.1		ASPHALT - (75mm thick)														
0.1 - 0.3		CONCRETE - (230mm thick)														
0.3 - 0.4		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	G	G81	●											
0.4 - 0.5		CLAY - silty, trace sand - brown - moist, very stiff - low plasticity	G	G82	●							△	⊕			
0.5 - 0.8		- some silt inclusions (<30mm dia.), trace rootlets, mottled black and brown below 0.8m	G	G83	●							△	⊕			
0.8 - 1.0																
1.0 - 1.5		ORGANIC CLAY AND SILT - trace rootlets, trace oxidation - black - moist, very stiff - high plasticity	G	G84	●								⊕			
1.5 - 2.0		- trace silt inclusions, stiff below 1.5m														
2.0 - 2.3			T	T86	□	●						⊗	△	⊕		

End of Hole at 2.3m in CLAY
 Notes:
 1) No sloughing or seepage.
 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
 3) Test hole open to 2.3m at completion of drilling.
 4) Test hole located in the west bound median lane, between St. Anne's Rd. and Archibald St. (U14 5524520m N, 636601m E).

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0 A IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-06

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL											
					0	20	40	60	80	100	0	50	100	150	200	250
0.0 - 0.1		ASPHALT - (126mm thick)														
0.1 - 0.2		CONCRETE - (214mm thick)														
0.2 - 0.4		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	<input checked="" type="checkbox"/>	G16												
0.4 - 0.6		ORGANIC CLAY AND SILT (FILL) - trace rootlets - black - moist, stiff to very stiff - high plasticity	<input checked="" type="checkbox"/>	G17												
0.6 - 0.8		- mottled grey and black below 0.5m	<input checked="" type="checkbox"/>	G18												
0.8 - 1.0		CLAY AND SILT (FILL) - trace sand - grey - moist, stiff - intermediate plasticity	<input checked="" type="checkbox"/>	G19												
1.0 - 1.2			<input checked="" type="checkbox"/>	G20												
1.2 - 1.4		CLAY - silty, trace oxidation - dark grey - moist, stiff to very stiff - high plasticity	<input checked="" type="checkbox"/>	G21												
1.4 - 1.6		- mottled grey and black below 1.5m	<input checked="" type="checkbox"/>	G22												
1.6 - 1.8			<input checked="" type="checkbox"/>	G23												
1.8 - 2.0		ORGANIC CLAY AND SILT - trace rootlets - black - moist, very stiff - high plasticity	<input checked="" type="checkbox"/>	G24												
2.0 - 2.2			<input checked="" type="checkbox"/>	G25												
2.2 - 2.4		CLAY AND SILT - trace sand - grey - moist, firm - intermediate plasticity	<input checked="" type="checkbox"/>													
2.4 - 3.0		CLAY - silty, grey, moist, very stiff, high plasticity, no sample recovery														

End of Hole at 3.0m in CLAY
 Notes:
 1) No seepage.
 2) Sloughing below 2.4m from top of pavement.
 3) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
 4) Test hole open to 2.4m at completion of drilling.
 5) Test hole located in the east bound median lane, between St. Anne's Rd. and Archibald St. (U14 5524547m N, 636699m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0 A _IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-07

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL 0 20 40 60 80 100											
					0	20	40	60	80	100	0	50	100	150	200	250
		ASPHALT - (81mm thick)														
		CONCRETE - (204mm thick)														
		GRAVEL (FILL) - <25mm dia. gravel, sandy, trace silt - brown, moist, compact, well graded rounded to sub angular	<input checked="" type="checkbox"/>	G73												
		CLAY (FILL) - silty, trace sand - mottled black and brown - moist, very stiff - high plasticity	<input checked="" type="checkbox"/>	G74												
		- trace rootlets below 0.9m	<input checked="" type="checkbox"/>	G75												
		- trace gravel (<10mm dia.) below 1.2m	<input checked="" type="checkbox"/>	G76												
			<input checked="" type="checkbox"/>	G77												
		- trace silt inclusions (<25mm dia.), no gravel below 1.8m	<input checked="" type="checkbox"/>	G78												
		ORGANIC CLAY AND SILT - trace rootlets - black - moist, very stiff - high plasticity	<input checked="" type="checkbox"/>	G79												
			<input checked="" type="checkbox"/>	G80												

End of Hole at 3.0m in CLAY

Notes:

- 1) No seepage.
- 2) Sloughing below 1.8m from top of pavement.
- 3) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
- 4) Test hole open to 1.8m at completion of drilling.
- 5) Test hole located in the west bound curb lane, between St. Anne's Rd. and Archibald St. (U14 5524581m N, 636793m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0_A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-08

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL											
					0	20	40	60	80	100	0	50	100	150	200	250
		CONCRETE - (260mm thick)														
		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	<input checked="" type="checkbox"/>	G25A												
0.5		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - brown, moist, stiff, low plasticity	<input checked="" type="checkbox"/>	G26												
1.0		CLAY (FILL) - silty, trace silt inclusions (<10mm dia.), trace sand - brown - moist, stiff - high plasticity	<input checked="" type="checkbox"/>	G27												
1.5		CLAY AND SILT - trace sand - mottled grey and brown - moist, soft to firm - intermediate plasticity	<input checked="" type="checkbox"/>	G28												
2.0			<input checked="" type="checkbox"/>	T29												

End of Hole at 2.3m in CLAY

Notes:

- 1) No sloughing or seepage.
- 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
- 3) Test hole open to 2.3m at completion of drilling.
- 4) Test hole located in the east bound curb lane, between St. Anne's Rd. and Archibald St. (U14 5524571m N, 636891m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0 A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-09

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL											
					0	20	40	60	80	100	0	50	100	150	200	250
0.0 - 0.2		CONCRETE - (241mm thick)														
0.2 - 0.5		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	<input checked="" type="checkbox"/>	G68	●											
0.5 - 1.5		CLAY (FILL) - silty, trace rootlets - mottled brown and black - moist, stiff - high plasticity - firm below 1.1m - very stiff below 1.2m	<input checked="" type="checkbox"/>	G69	●											⊕
			<input checked="" type="checkbox"/>	G70	●											△
			<input checked="" type="checkbox"/>	G71	●											△
1.5 - 2.0		ORGANIC CLAY AND SILT - trace rootlets - black - moist, firm - high plasticity	<input checked="" type="checkbox"/>		●											⊕
2.0 - 2.3		CLAY - silty, trace sand, trace organics (rootlets) - grey - moist, firm to stiff - high plasticity	<input checked="" type="checkbox"/>	T72	●	□										⊕

End of Hole at 2.3m in CLAY
 Notes:
 1) No sloughing or seepage.
 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
 3) Test hole open to 2.3m at completion of drilling.
 4) Test hole located in the west bound median lane, between St. Anne's Rd. and Archibald St. (U14 5524586m N, 636985m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0_A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-10

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL											
					0	20	40	60	80	100	0	50	100	150	200	250
0.0		ASPHALT - (88mm thick)														
0.0		CONCRETE - (202mm thick)														
0.2		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	▲	G30	●											
0.4		CLAY (FILL) - silty, trace sand, trace gravel (<10mm dia.) - brown - moist, very stiff - high plasticity	▲	G31	●								△	⊕		
0.6		- trace rootlets, no gravel, mottled black and grey below 0.9m	▲	G32	●									△	⊕	
0.8		- some silt inclusions (<50mm dia.) below 1.1m	▲	G33	●										⊕	
1.0		ORGANIC CLAY AND SILT - trace silt inclusions (<10mm dia.) - black - moist, very stiff - high plasticity	▲	G34	●										⊕	
1.2			▲	G35	●									△	⊕	
1.4			▲	G36	●									△	⊕	
1.6			▲	G37	●										⊕	
1.8			▲	G38	●										⊕	
2.0		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, very stiff - high plasticity	▲		●											
2.2			▲		●											
2.4			▲		●											
2.6			▲		●											
2.8			▲		●											
3.0			▲		●											

End of Hole at 3.0m in CLAY
 Notes:
 1) No sloughing or seepage.
 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
 3) Test hole open to 3.0m at completion of drilling.
 4) Test hole located in the east bound median lane, between St. Anne's Rd. and Archibald St. (U14 5524567m N, 637084m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0_A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-11

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL 0 20 40 60 80 100											
					0	20	40	60	80	100	0	50	100	150	200	250
		ASPHALT - (105mm thick)														
		CONCRETE - (165mm thick)														
		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular		G59												
0.5		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - brown, moist, very stiff, low plasticity		G60												
		CLAY (FILL) - silty, trace silt inclusions (<30mm dia.), trace sand, trace organics (rootlets), trace oxidation - mottled black and brown - moist, very stiff - high plasticity		G61												
1.0		- with organics, black below 1.1m		G62												
				G63												
				G64												
1.5				G65												
		CLAY - silty, trace rootlets - grey - moist, very stiff - high plasticity		G66												
2.0				G67												
		CLAY AND SILT - trace sand - grey - moist, firm - intermediate plasticity		G66												
2.5				G67												
3.0				G67												

End of Hole at 3.0m in CLAY
 Notes:
 1) No sloughing or seepage.
 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
 3) Test hole open to 3.0m at completion of drilling.
 4) Test hole located in the west bound curb lane, between St. Anne's Rd. and Archibald St. (U14 5524556m N, 637181m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0 A _IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-12

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL											
					0	20	40	60	80	100	0	50	100	150	200	250
0.00 - 0.05		ASPHALT - (68mm thick)														
0.05 - 0.15		CONCRETE - (207mm thick)														
0.15 - 0.45		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	Grab (G)	G39												
0.45 - 0.65		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - brown, moist, stiff, low plasticity	Grab (G)	G40												
0.65 - 0.95		CLAY (FILL) - silty, trace sand - mottled black and brown - moist, stiff - high plasticity	Grab (G)	G41												
0.95 - 1.50		CLAY (FILL) - silty, trace sand - mottled black and brown - moist, stiff - high plasticity	Grab (G)	G42												
1.50 - 2.00		CLAY - silty, trace sand, trace organics (rootlets) - grey - soft to stiff - high plasticity	Shelby Tube (T)	T44												

End of Hole at 2.3m in CLAY

Notes:

- 1) No sloughing or seepage.
- 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
- 3) Test hole open to 2.3m at completion of drilling.
- 4) Test hole located in the east bound curb lane, between St. Anne's Rd. and Archibald St. (U14 5524498m N, 637269m E).

Logged By: Jodi Neumann Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0_A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-13

1 of 1

Client: Dillon Consulting Ltd. Project Number: 0022-033-00
 Project Name: Fermor Over Seine River Location: Fermor Ave. Between Archibald St. and St. Anne's Rd.
 Contractor: Maple Leaf Drilling Ground Elevation: Street Level
 Method: 125 mm Solid Stem Auger, CME-75 Truck Mount Date Drilled: 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL 0 20 40 60 80 100											
					0	20	40	60	80	100	0	50	100	150	200	250
		ASPHALT - (103mm thick)														
		CONCRETE - (202mm thick)														
		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular		G53												
0.5		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - black, moist, very stiff, low plasticity		G54												
		CLAY (FILL) - silty, trace rootlets - mottled grey and black - moist, very stiff - high plasticity - ORGANIC CLAY AND SILT seam (<100mm thick) at 0.7m		G55												
				G56												
				G57												
1.5		CLAY AND SILT - trace sand, trace organics (rootlets) - grey - moist, firm - intermediate plasticity		T58												
2.0																

End of Hole at 2.3m in CLAY
 Notes:
 1) No sloughing or seepage.
 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
 3) Test hole open to 2.3m at completion of drilling.
 4) Test hole located in the west bound median lane, between St. Anne's Rd. and Archibald St.
 (U14 5524468m N, 637364m E).

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0 A IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16



Sub-Surface Log

Test Hole TH16-14

1 of 1

Client: Dillon Consulting Ltd. **Project Number:** 0022-033-00
Project Name: Fermor Over Seine River **Location:** Fermor Ave. Between Archibald St. and St. Anne's Rd.
Contractor: Maple Leaf Drilling **Ground Elevation:** Street Level
Method: 125 mm Solid Stem Auger, CME-75 Truck Mount **Date Drilled:** 20 May 2016

Sample Type: Grab (G) Shelby Tube (T) Split Spoon (SS) Split Barrel (SB) Core (C)

Particle Size Legend: Fines Clay Silt Sand Gravel Cobbles Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/m ³)						Undrained Shear Strength (kPa)					
					16	17	18	19	20	21	Test Type					
					Particle Size (%)											
					0	20	40	60	80	100						
					PL MC LL 0 20 40 60 80 100											
					0	20	40	60	80	100	0	50	100	150	200	250
0.0 - 0.05		ASPHALT - (50mm thick)														
0.05 - 0.15		CONCRETE - (195mm thick)														
0.15 - 0.45		SAND AND GRAVEL (FILL) - <25mm dia. gravel, trace silt - brown, moist, compact, well graded rounded to sub angular	<input checked="" type="checkbox"/>	G45	●											
0.45 - 0.85		SAND (FILL) - some clay, some silt, trace gravel (<25mm dia.) - black, moist, stiff, low plasticity	<input checked="" type="checkbox"/>	G46	●											
0.85 - 1.55		ORGANIC CLAY AND SILT - trace rootlets, trace oxidation - black - moist, very stiff - high plasticity	<input checked="" type="checkbox"/>	G47	●											△
1.55 - 2.15		- trace silt inclusions (<10mm dia.) below 1.5m	<input checked="" type="checkbox"/>	G48	●											△
2.15 - 2.35			<input checked="" type="checkbox"/>	G49	●											△
2.35 - 2.75		CLAY - silty, trace silt inclusions (<10mm dia.), trace rootlets, trace oxidation - brown - moist, very stiff - high plasticity	<input checked="" type="checkbox"/>	G50	●											△
2.75 - 3.00		SILT - trace clay, trace sand - brown - moist, soft - no to low plasticity	<input checked="" type="checkbox"/>	G51	●											△
			<input checked="" type="checkbox"/>	G52	●											

End of Hole at 3.0m in SILT

Notes:

- 1) No sloughing or seepage.
- 2) Test hole backfilled with auger cuttings, gravel, and cold patch asphalt.
- 3) Test hole open to 2.1m at completion of drilling.
- 4) Test hole located in the east bound curb lane, between St. Anne's Rd. and Archibald St. (U14 5524428m N, 637392m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Michael Van Helden

SUB-SURFACE LOG LOGS 2016-05-25 FERMOR OVER SEINE LOGS 0_A_IN 0022-033-00.GPJ TREK GEOTECHNICAL.GDT 11/7/16

Appendix B

Lab Testing Summary and Lab Testing Results



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 1712 St. James Street
 Winnipeg, MB R3H 0L3
 Tel: 204.975.9433 Fax: 204.975.9435

**Moisture Content Report
 ASTM D2216-98**

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Sample Date 20-May-16
Test Date 25-May-16
Technician LI/JB

Test Pit	TH16 - 02	TH16 - 02	TH16 - 02	TH16 - 02	TH16 - 02	TH16 - 02
Depth (m)	0.3 - 0.6	0.6 - 0.8	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8	1.8 - 2.0
Sample #	G01	G02	G03	G05	G06	G07
Tare ID	W41	F127	H12	N49	AA10	W12
Mass of tare	8.6	8.4	8.8	8.4	6.6	8.4
Mass wet + tare	307.1	433.3	377.9	310.5	473.5	309.8
Mass dry + tare	286.7	402.2	283.4	261.3	381.2	235.2
Mass water	20.4	31.1	94.5	49.2	92.3	74.6
Mass dry soil	278.1	393.8	274.6	252.9	374.6	226.8
Moisture %	7.3%	7.9%	34.4%	19.5%	24.6%	32.9%

Test Pit	TH16 - 02	TH16 - 02	TH16 - 04	TH16 - 04	TH16 - 04	TH16 - 04
Depth (m)	2.1 - 2.3	2.6 - 2.7	0.5 - 0.6	0.5 - 0.6	0.8 - 0.9	1.1 - 1.2
Sample #	G08	G09	G10	G11	G12	G13
Tare ID	E90	F69	AC08	Z30	A1	C4
Mass of tare	8.7	8.5	6.5	8.5	8.0	8.5
Mass wet + tare	332.9	358.8	187.7	349.9	292.7	325.9
Mass dry + tare	230.9	240.9	168.5	273.7	222.4	229.9
Mass water	102.0	117.9	19.2	76.2	70.3	96.0
Mass dry soil	222.2	232.4	162.0	265.2	214.4	221.4
Moisture %	45.9%	50.7%	11.9%	28.7%	32.8%	43.4%

Test Pit	TH16 - 04	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 06
Depth (m)	1.4 - 1.5	0.4 - 0.5	0.5 - 0.6	0.6 - 0.8	0.8 - 0.9	1.1 - 1.2
Sample #	G14	G16	G17	G18	G19	G20
Tare ID	P85	N65	F27	F50	F48	K20
Mass of tare	8.6	8.5	8.4	8.6	8.4	8.5
Mass wet + tare	320.3	381.5	337.4	282.5	323.4	308.7
Mass dry + tare	239.6	360.0	261.3	222.1	257.6	242.4
Mass water	80.7	21.5	76.1	60.4	65.8	66.3
Mass dry soil	231.0	351.5	252.9	213.5	249.2	233.9
Moisture %	34.9%	6.1%	30.1%	28.3%	26.4%	28.3%



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**Moisture Content Report
 ASTM D2216-98**

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Sample Date 20-May-16
Test Date 25-May-16
Technician LI/JB

Test Pit	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 08
Depth (m)	1.4 - 1.5	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.6 - 2.7	0.3 - 0.5
Sample #	G21	G22	G23	G24	G25	G25A
Tare ID	AC09	AC29	AA05	N08	W104	F133
Mass of tare	6.7	6.7	6.5	8.7	8.9	8.5
Mass wet + tare	397.9	307.9	279.3	322.5	363.8	347.0
Mass dry + tare	299.8	232.9	210.8	244.6	288.1	326.9
Mass water	98.1	75.0	68.5	77.9	75.7	20.1
Mass dry soil	293.1	226.2	204.3	235.9	279.2	318.4
Moisture %	33.5%	33.2%	33.5%	33.0%	27.1%	6.3%

Test Pit	TH16 - 08	TH16 - 08	TH16 - 08	TH16 - 10	TH16 - 10	TH16 - 10
Depth (m)	0.5 - 0.6	0.9 - 1.1	1.2 - 1.4	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9
Sample #	G26	G27	G28	G30	G31	G32
Tare ID	Z32	D50	F147	C10	H66	Z70
Mass of tare	9.1	8.4	8.3	8.5	8.4	8.6
Mass wet + tare	363.0	319.1	333.3	399.6	352.5	335.5
Mass dry + tare	336.9	238.1	260.8	379.7	281.5	268.9
Mass water	26.1	81.0	72.5	19.9	71.0	66.6
Mass dry soil	327.8	229.7	252.5	371.2	273.1	260.3
Moisture %	8.0%	35.3%	28.7%	5.4%	26.0%	25.6%

Test Pit	TH16 - 10	TH16 - 10	TH16 - 10	TH16 - 10	TH16 - 10	TH16 - 10
Depth (m)	1.1 - 1.2	1.4 - 1.5	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.6 - 2.7
Sample #	G33	G34	G35	G36	G37	G38
Tare ID	F144	E15	H26	D29	W51	N115
Mass of tare	8.8	8.6	8.3	8.2	8.4	8.6
Mass wet + tare	327.7	304.9	320.7	360.8	350.1	321.6
Mass dry + tare	264.4	232.0	251.7	282.2	274.0	246.3
Mass water	63.3	72.9	69.0	78.6	76.1	75.3
Mass dry soil	255.6	223.4	243.4	274.0	265.6	237.7
Moisture %	24.8%	32.6%	28.3%	28.7%	28.7%	31.7%



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Moisture Content Report ASTM D2216-98

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Sample Date 20-May-16
Test Date 25-May-16
Technician LI/ JB

Test Pit	TH16 - 12	TH16 - 12	TH16 - 12	TH16 - 12	TH16 - 12	TH16 - 14
Depth (m)	0.3 - 0.5	0.5 - 0.6	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	0.2 - 0.4
Sample #	G39	G40	G41	G42	G43	G45
Tare ID	N60	W56	E75	F90	A101	W63
Mass of tare	8.4	8.5	8.5	8.3	8.7	8.4
Mass wet + tare	320.1	344.5	334.1	336.7	302.4	319.5
Mass dry + tare	307.3	310.9	261.3	268.1	239.1	304.7
Mass water	12.8	33.6	72.8	68.6	63.3	14.8
Mass dry soil	298.9	302.4	252.8	259.8	230.4	296.3
Moisture %	4.3%	11.1%	28.8%	26.4%	27.5%	5.0%

Test Pit	TH16 - 14	TH16 - 14	TH16 - 14	TH16 - 14	TH16 - 14	TH16 - 14
Depth (m)	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3
Sample #	G46	G47	G48	G49	G50	G51
Tare ID	H10	AC07	H47	E84	D8	F91
Mass of tare	8.5	6.6	8.8	8.5	8.5	8.3
Mass wet + tare	286.1	344.2	301.5	309.0	316.9	331.0
Mass dry + tare	261.1	270.1	237.1	231.0	238.0	263.0
Mass water	25.0	74.1	64.4	78.0	78.9	68.0
Mass dry soil	252.6	263.5	228.3	222.5	229.5	254.7
Moisture %	9.9%	28.1%	28.2%	35.1%	34.4%	26.7%

Test Pit	TH16 - 14	TH16 - 13	TH16 - 13	TH16 - 13	TH16 - 13	TH16 - 13
Depth (m)	2.6 - 2.7	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9	1.1 - 1.2	1.2 - 1.4
Sample #	G52	G53	G54	G55	G56	G57
Tare ID	E105	E36	W48	F64	F19	H79
Mass of tare	8.5	8.5	8.5	8.6	8.4	8.4
Mass wet + tare	479.1	380.9	302.8	323.0	312.3	305.9
Mass dry + tare	388.7	364.0	252.6	236.2	236.7	231.0
Mass water	90.4	16.9	50.2	86.8	75.6	74.9
Mass dry soil	380.2	355.5	244.1	227.6	228.3	222.6
Moisture %	23.8%	4.8%	20.6%	38.1%	33.1%	33.6%



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Sample Date 20-May-16
Test Date 25-May-16
Technician LI/JB

Test Pit	TH16 - 11	TH16 - 11	TH16 - 11	TH16 - 11	TH16 - 11	TH16 - 11
Depth (m)	0.3 - 0.4	0.5 - 0.6	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7
Sample #	G59	G60	G61	G62	G63	G64
Tare ID	Z93	P08	K13	AC03	AB16	AB11
Mass of tare	8.4	8.7	8.5	6.5	6.7	6.7
Mass wet + tare	404.4	333.5	371.8	331.6	302.6	301.3
Mass dry + tare	384.5	282.2	305.1	252.5	225.8	224.9
Mass water	19.9	51.3	66.7	79.1	76.8	76.4
Mass dry soil	376.1	273.5	296.6	246.0	219.1	218.2
Moisture %	5.3%	18.8%	22.5%	32.2%	35.1%	35.0%

Test Pit	TH16 - 11	TH16 - 11	TH16 - 11	TH16 - 09	TH16 - 09	TH16 - 09
Depth (m)	1.8 - 2.0	2.3 - 2.4	2.9 - 3.0	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1
Sample #	G65	G66	G67	G68	G69	G70
Tare ID	E125	AB18	E46	E63	H6	Z66
Mass of tare	8.4	6.6	8.8	8.6	8.5	8.4
Mass wet + tare	264.5	407.6	444.1	350.9	340.1	354.6
Mass dry + tare	200.4	320.5	360.4	328.7	267.5	276.2
Mass water	64.1	87.1	83.7	22.2	72.6	78.4
Mass dry soil	192.0	313.9	351.6	320.1	259.0	267.8
Moisture %	33.4%	27.7%	23.8%	6.9%	28.0%	29.3%

Test Pit	TH16 - 09	TH16 - 07	TH16 - 07	TH16 - 07	TH16 - 07	TH16 - 07
Depth (m)	1.2 - 1.4	0.3 - 0.4	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7
Sample #	G71	G73	G74	G75	G76	G77
Tare ID	F146	F142	E2	E28	E66	H17
Mass of tare	8.5	8.8	8.4	8.4	8.6	8.4
Mass wet + tare	342.2	322.9	344.5	340.7	319.8	331.4
Mass dry + tare	263.7	308.0	267.3	258.6	245.2	256.0
Mass water	78.5	14.9	77.2	82.1	74.6	75.4
Mass dry soil	255.2	299.2	258.9	250.2	236.6	247.6
Moisture %	30.8%	5.0%	29.8%	32.8%	31.5%	30.4%



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Sample Date 20-May-16
Test Date 25-May-16
Technician LI/JB

Test Pit	TH16 - 07	TH16 - 07	TH16 - 07	TH16 - 05	TH16 - 05	TH16 - 05
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.6 - 2.7	0.3 - 0.5	0.5 - 0.6	0.6 - 0.8
Sample #	G78	G79	G80	G81	G82	G83
Tare ID	E31	N107	W80	N85	AC12	AC13
Mass of tare	8.4	8.4	8.45	8.4	6.55	6.7
Mass wet + tare	310.6	360.9	326.6	248.3	360.6	362.1
Mass dry + tare	240.5	273.0	241.2	232.5	285.6	290.1
Mass water	70.1	87.9	85.4	15.8	75.0	72.0
Mass dry soil	232.1	264.6	232.8	224.1	279.1	283.4
Moisture %	30.2%	33.2%	36.7%	7.1%	26.9%	25.4%

Test Pit	TH16 - 05	TH16 - 05	TH16 - 03	TH16 - 03	TH16 - 03	TH16 - 03
Depth (m)	0.9 - 1.1	1.2 - 1.4	0.3 - 0.6	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4
Sample #	G84	G85	G87	G88	G89	G90
Tare ID	D39	W27	F128	Z39	E95	F9
Mass of tare	8.3	8.3	8.5	8.5	8.4	8.7
Mass wet + tare	332.2	324.5	306.4	366.0	392.3	417.7
Mass dry + tare	257.2	245.3	290.8	339.5	359.5	379.5
Mass water	75.0	79.2	15.6	26.5	32.8	38.2
Mass dry soil	248.9	237.0	282.3	331.0	351.1	370.8
Moisture %	30.1%	33.4%	5.5%	8.0%	9.4%	10.3%

Test Pit	TH16 - 03	TH16 - 03	TH16 - 03	TH16 - 03	TH16 - 01	TH16 - 01
Depth (m)	1.5 - 1.7	1.8 - 2.0	2.3 - 2.4	2.6 - 2.7	0.3 - 0.4	0.6 - 0.8
Sample #	G91	G92	G93	G94	G95	G96
Tare ID	Z77	K16	D3	N59	Z57	N114
Mass of tare	8.3	8.5	8.2	8.3	8.4	8.5
Mass wet + tare	397.2	377.2	361.7	334.7	245.2	313.1
Mass dry + tare	342.5	318.0	295.8	257.8	215.3	287.6
Mass water	54.7	59.2	65.9	76.9	29.9	25.5
Mass dry soil	334.2	309.5	287.6	249.5	206.9	279.1
Moisture %	16.4%	19.1%	22.9%	30.8%	14.5%	9.1%



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**Moisture Content Report
 ASTM D2216-98**

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Sample Date 20-May-16
Test Date 25-May-16
Technician LI/JB

Test Pit	TH16 - 01	TH16 - 01			
Depth (m)	0.9 - 1.1	1.2 - 1.4			
Sample #	G97	G98			
Tare ID	F26	W23			
Mass of tare	8.3	8.4			
Mass wet + tare	408.7	316.3			
Mass dry + tare	375.2	242.5			
Mass water	33.5	73.8			
Mass dry soil	366.9	234.1			
Moisture %	9.1%	31.5%			

Test Pit					
Depth (m)					
Sample #					
Tare ID					
Mass of tare					
Mass wet + tare					
Mass dry + tare					
Mass water					
Mass dry soil					
Moisture %					

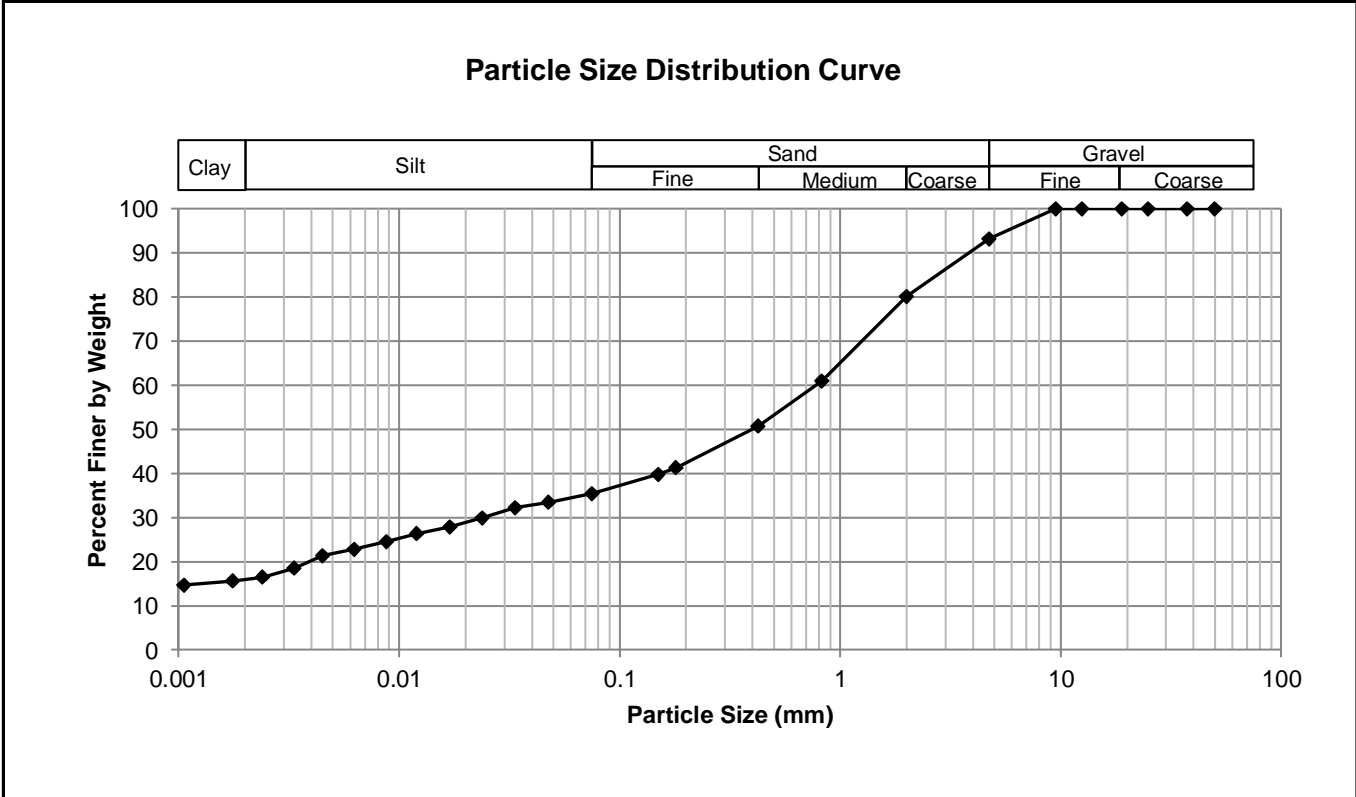
Test Pit					
Depth (m)					
Sample #					
Tare ID					
Mass of tare					
Mass wet + tare					
Mass dry + tare					
Mass water					
Mass dry soil					
Moisture %					



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-03
Sample # G89
Depth (m) 0.9 - 1.1
Sample Date 20-May-16
Test Date 2-Jun-16
Technician LI

Gravel	6.8%
Sand	57.7%
Silt	19.5%
Clay	16.0%



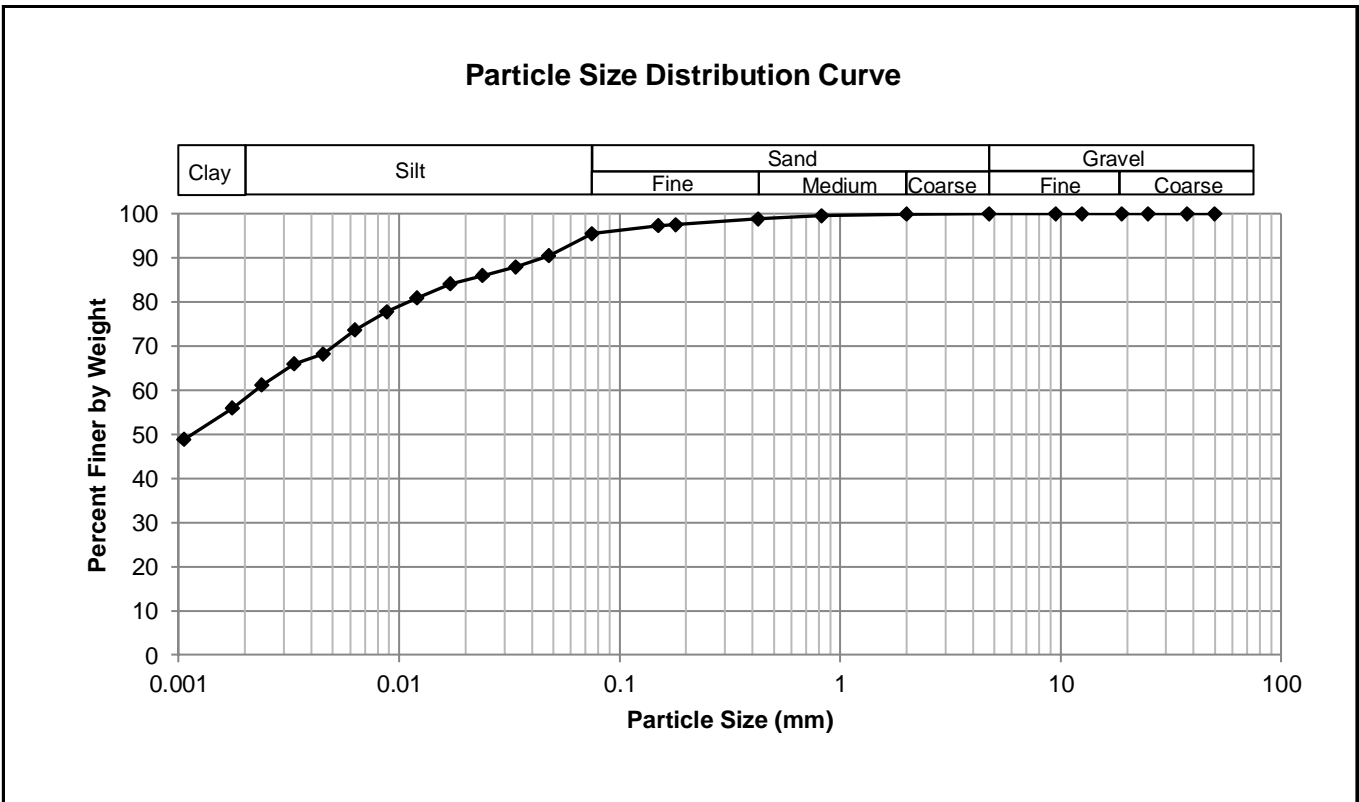
Gravel		Sand		Silt and Clay	
Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing
50.0	100.00	4.75	93.21	0.0750	35.49
37.5	100.00	2.00	80.17	0.0476	33.51
25.0	100.00	0.825	61.02	0.0337	32.24
19.0	100.00	0.425	50.75	0.0238	29.95
12.5	100.00	0.180	41.33	0.0170	27.91
9.50	100.00	0.150	39.82	0.0120	26.38
4.75	93.21	0.075	35.49	0.0088	24.60
				0.0063	22.82
				0.0045	21.42
				0.0033	18.54
				0.0024	16.50
				0.0018	15.65
				0.0011	14.74



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-04
Sample # G13
Depth (m) 1.1 - 1.2
Sample Date 10-May-16
Test Date 2-Jun-16
Technician LI

Gravel	0.0%
Sand	4.5%
Silt	37.5%
Clay	58.0%



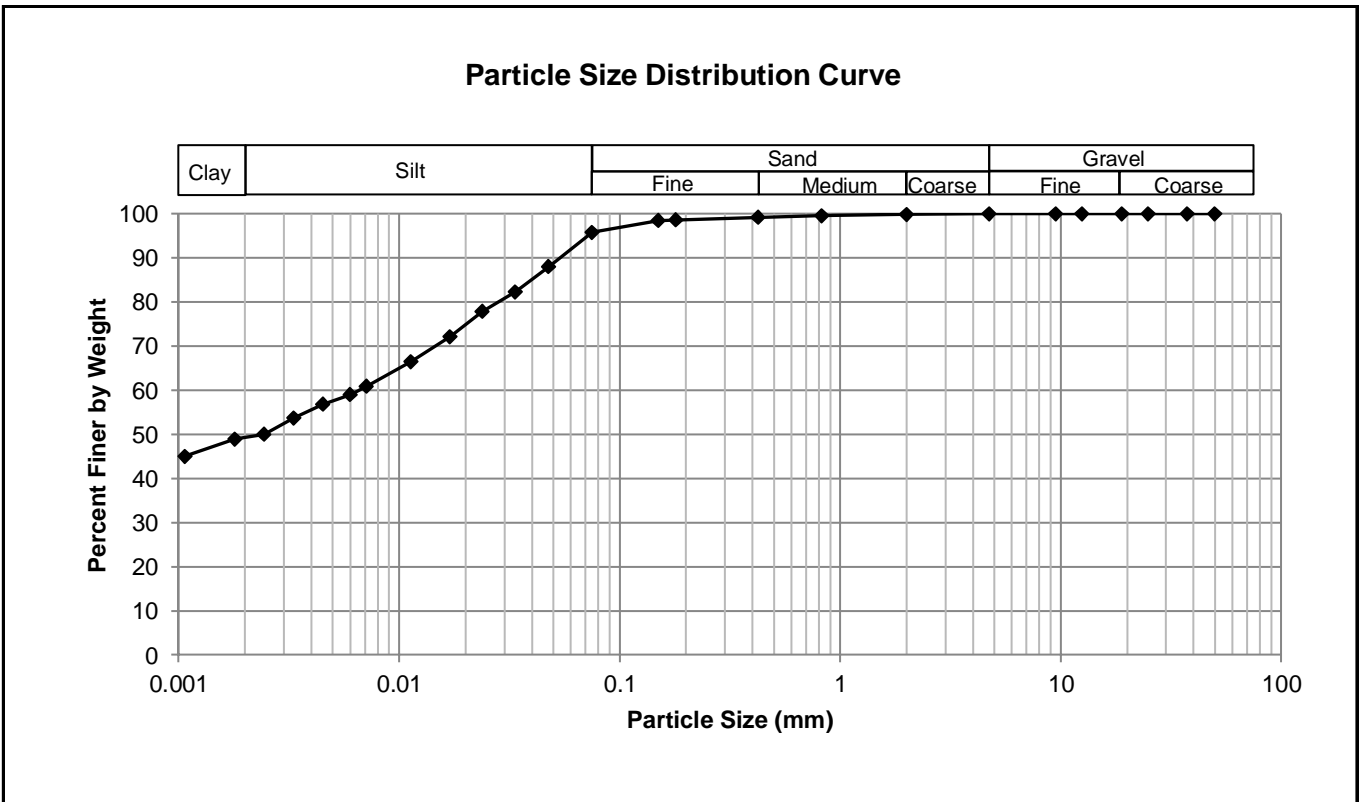
Gravel		Sand		Silt and Clay	
Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing
50.0	100.00	4.75	100.00	0.0750	95.51
37.5	100.00	2.00	99.95	0.0479	90.50
25.0	100.00	0.825	99.61	0.0338	87.96
19.0	100.00	0.425	98.89	0.0239	86.05
12.5	100.00	0.180	97.58	0.0171	84.15
9.50	100.00	0.150	97.32	0.0121	80.97
4.75	100.00	0.075	95.51	0.0088	77.80
				0.0063	73.67
				0.0045	68.28
				0.0033	66.02
				0.0024	61.19
				0.0018	56.01
				0.0011	48.85



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-06
Sample # G20
Depth (m) 1.1 - 1.2
Sample Date 20-May-16
Test Date 2-Jun-16
Technician LI

Gravel	0.0%
Sand	4.2%
Silt	46.5%
Clay	49.3%



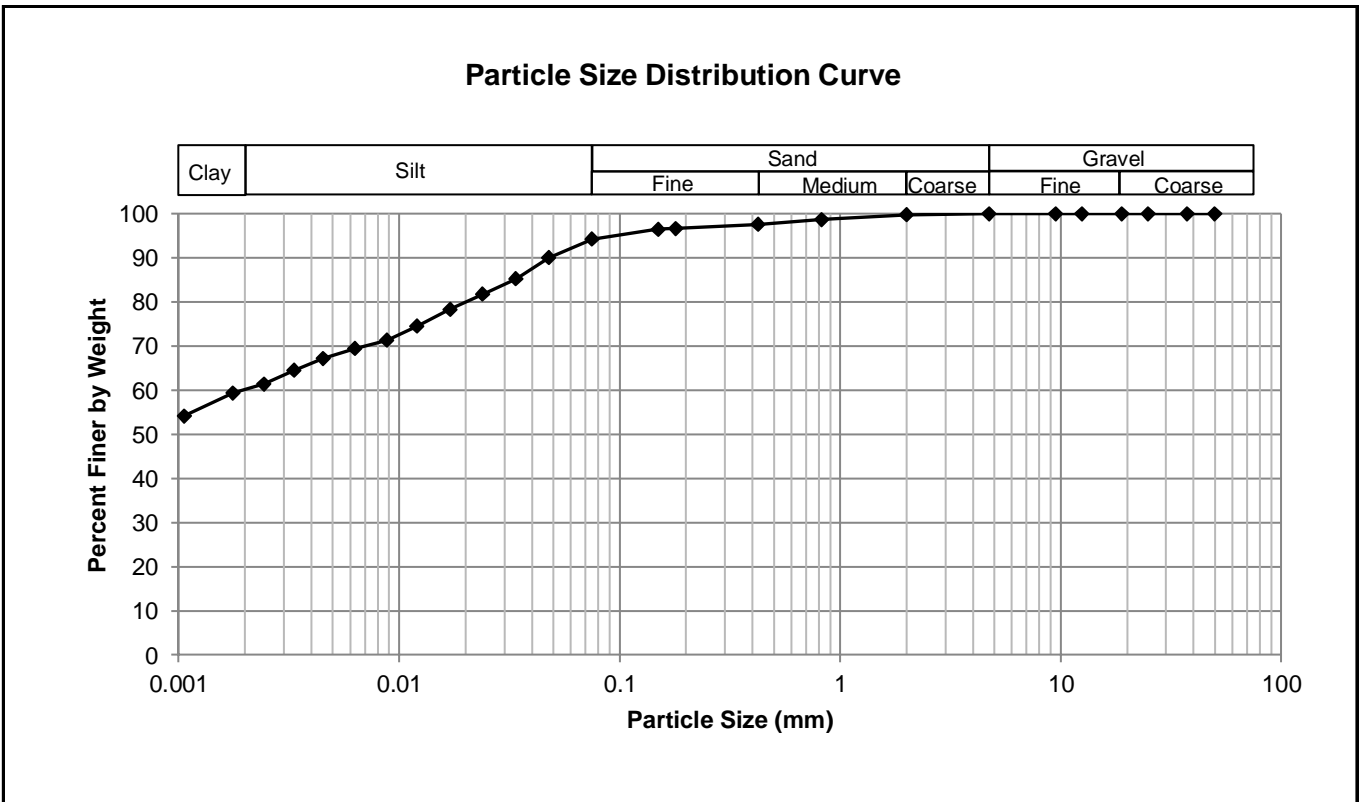
Gravel		Sand		Silt and Clay	
Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing
50.0	100.00	4.75	100.00	0.0750	95.80
37.5	100.00	2.00	99.86	0.0476	88.04
25.0	100.00	0.825	99.57	0.0337	82.33
19.0	100.00	0.425	99.23	0.0238	77.89
12.5	100.00	0.180	98.62	0.0170	72.19
9.50	100.00	0.150	98.46	0.0113	66.48
4.75	100.00	0.075	95.80	0.0071	60.92
				0.0060	59.02
				0.0045	56.86
				0.0033	53.76
				0.0024	50.04
				0.0018	48.98
				0.0011	45.00



Project No. 0022-033-00
Client Dillon Consulting Inc.
Project Fermor Over Seine River

Test Hole TH16-10
Sample # G32
Depth (m) 0.8 - 0.9
Sample Date 20-May-16
Test Date 2-Jun-16
Technician LI

Gravel	0.0%
Sand	5.7%
Silt	34.2%
Clay	60.1%



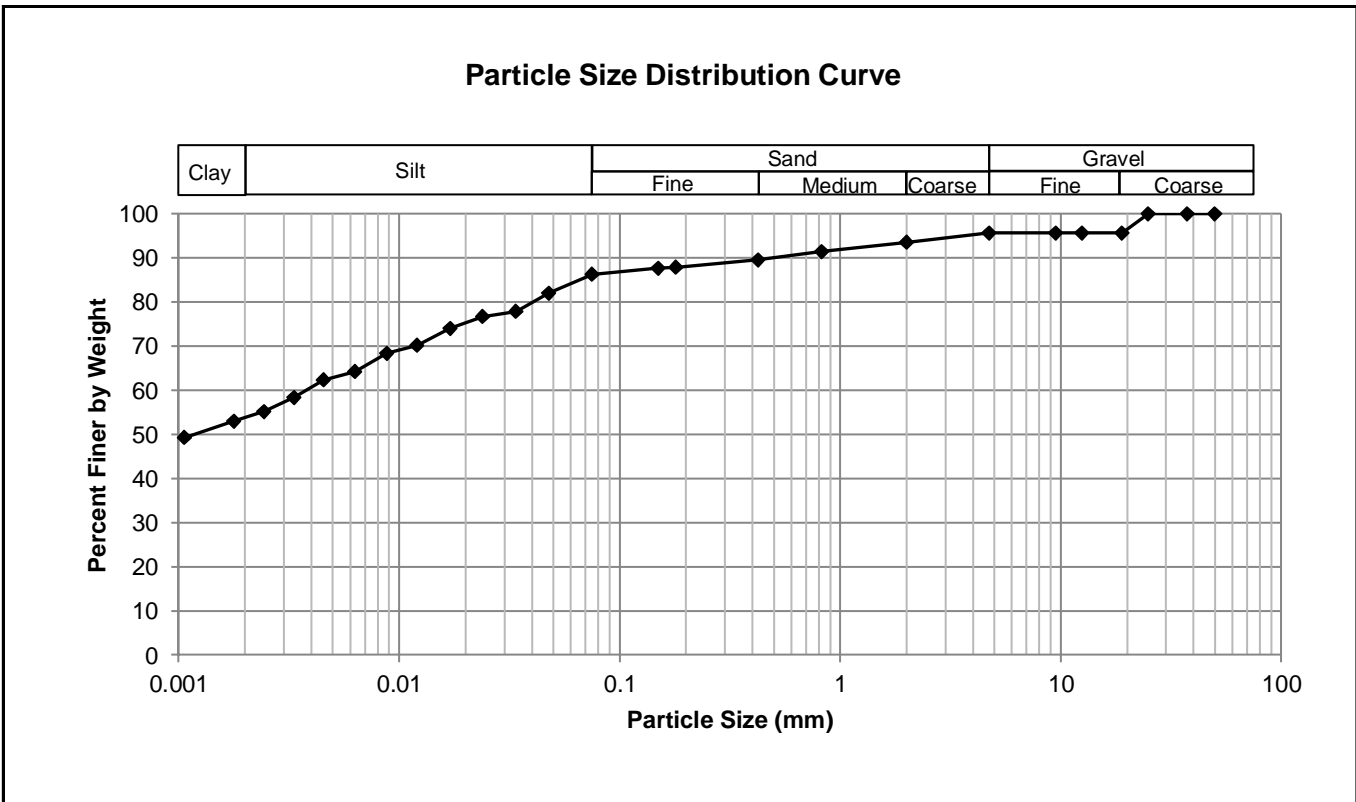
Gravel		Sand		Silt and Clay	
Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing
50.0	100.00	4.75	100.00	0.0750	94.32
37.5	100.00	2.00	99.83	0.0479	90.08
25.0	100.00	0.825	98.72	0.0338	85.32
19.0	100.00	0.425	97.63	0.0239	81.83
12.5	100.00	0.180	96.71	0.0171	78.35
9.50	100.00	0.150	96.50	0.0121	74.54
4.75	100.00	0.075	94.32	0.0088	71.37
				0.0063	69.47
				0.0045	67.25
				0.0033	64.57
				0.0024	61.44
				0.0018	59.43
				0.0011	54.18



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-12
Sample # G42
Depth (m) 0.9 - 1.1
Sample Date 20-May-16
Test Date 2-Jun-16
Technician LI

Gravel	4.4%
Sand	9.3%
Silt	32.6%
Clay	53.8%



Gravel		Sand		Silt and Clay	
Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing	Particle Size (mm)	Percent Passing
50.0	100.00	4.75	95.65	0.0750	86.32
37.5	100.00	2.00	93.59	0.0479	82.06
25.0	100.00	0.825	91.46	0.0338	77.90
19.0	95.65	0.425	89.61	0.0239	76.71
12.5	95.65	0.180	87.93	0.0171	74.04
9.50	95.65	0.150	87.71	0.0121	70.17
4.75	95.65	0.075	86.32	0.0088	68.39
				0.0063	64.23
				0.0045	62.35
				0.0033	58.41
				0.0024	55.22
				0.0018	53.04
				0.0011	49.30



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**Atterberg Limits
 ASTM D4318**

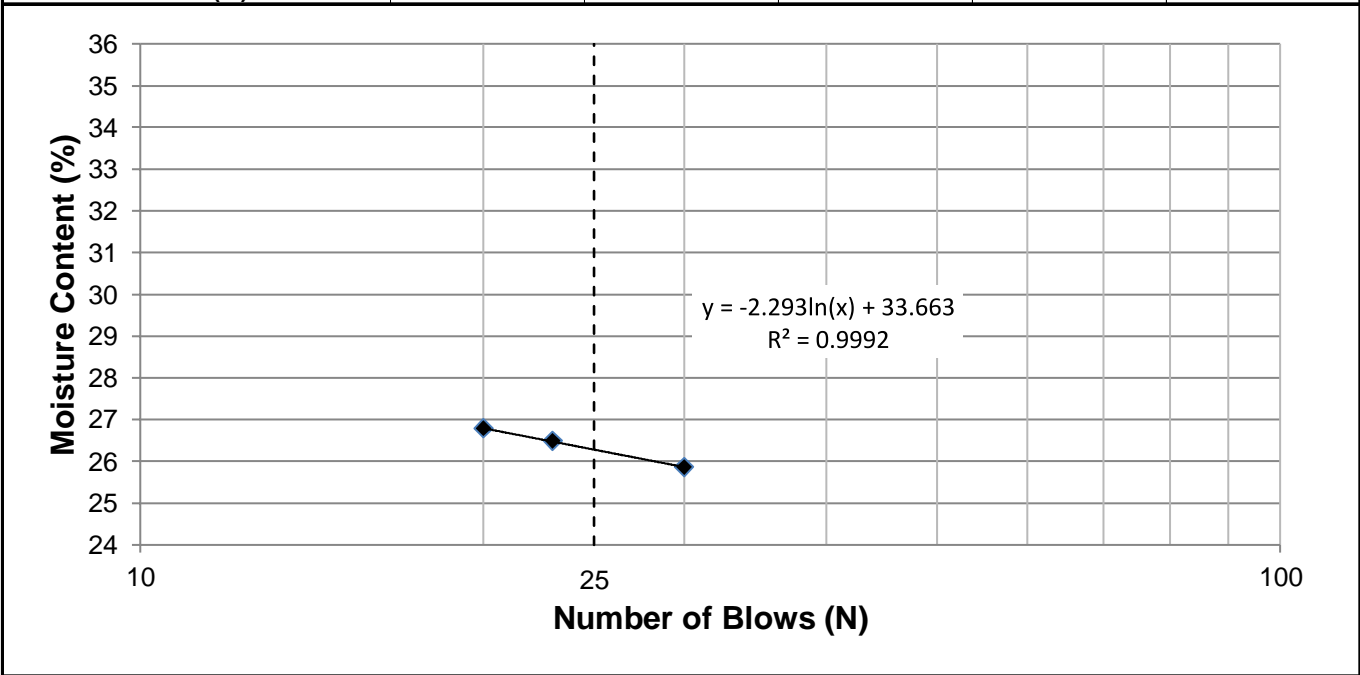
Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-03
Sample # G89
Depth (m) 0.9-1.1
Sample Date 20-May-16
Test Date 09-Jun-16
Technician LI

Liquid Limit	26
Plastic Limit	11
Plasticity Index	15

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	20	30	23		
Mass Wet Soil + Tare (g)	24.278	23.962	25.462		
Mass Dry Soil + Tare (g)	22.108	21.936	23.063		
Mass Tare (g)	14.006	14.101	14.006		
Mass Water (g)	2.170	2.026	2.399		
Mass Dry Soil (g)	8.102	7.835	9.057		
Moisture Content (%)	26.784	25.858	26.488		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	17.298	17.207			
Mass Dry Soil + Tare (g)	16.974	16.918			
Mass Tare (g)	13.999	14.200			
Mass Water (g)	0.324	0.289			
Mass Dry Soil (g)	2.975	2.718			
Moisture Content (%)	10.891	10.633			



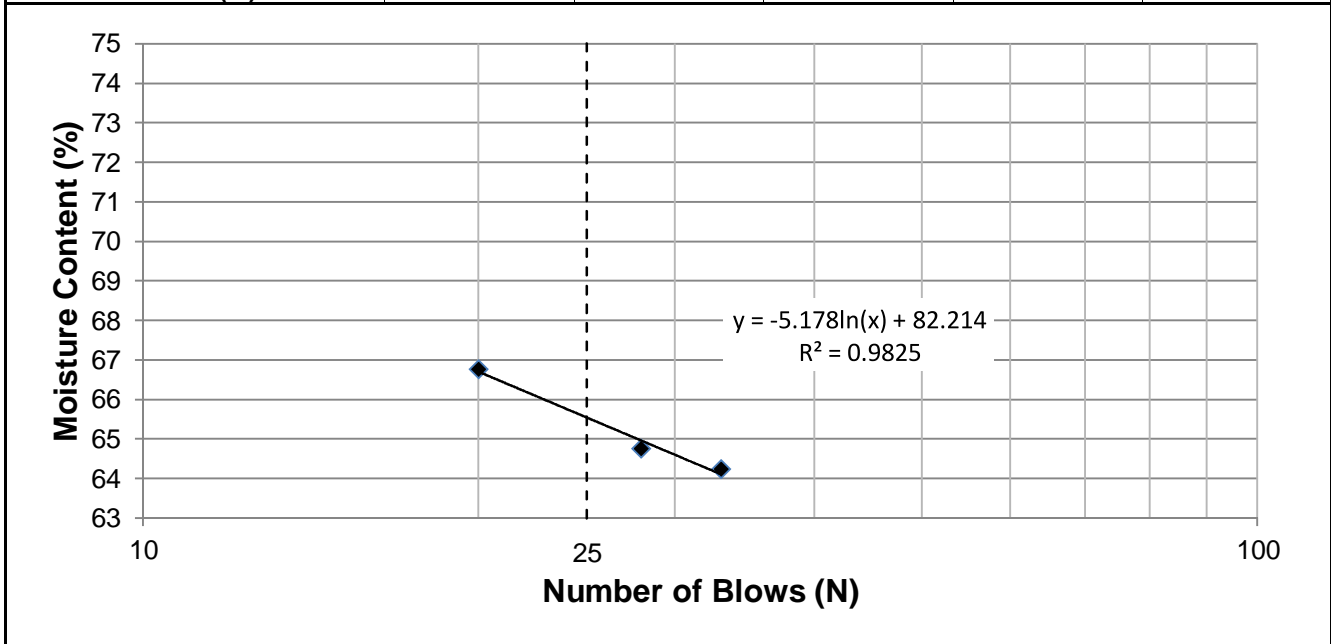
Project No. 0022-033-00
Client Dillion Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16 - 04
Sample # G13
Depth (m) 1.1 - 1.2
Sample Date 20-May-16
Test Date 02-Jun-16
Technician JB

Liquid Limit	66
Plastic Limit	31
Plasticity Index	35

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	20	28	33		
Mass Wet Soil + Tare (g)	21.409	21.988	21.984		
Mass Dry Soil + Tare (g)	18.524	18.864	18.901		
Mass Tare (g)	14.203	14.040	14.102		
Mass Water (g)	2.885	3.124	3.083		
Mass Dry Soil (g)	4.321	4.824	4.799		
Moisture Content (%)	66.767	64.760	64.243		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	24.543	24.646			
Mass Dry Soil + Tare (g)	22.000	22.076			
Mass Tare (g)	13.872	13.932			
Mass Water (g)	2.543	2.570			
Mass Dry Soil (g)	8.128	8.144			
Moisture Content (%)	31.287	31.557			



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**Atterberg Limits
 ASTM D4318**

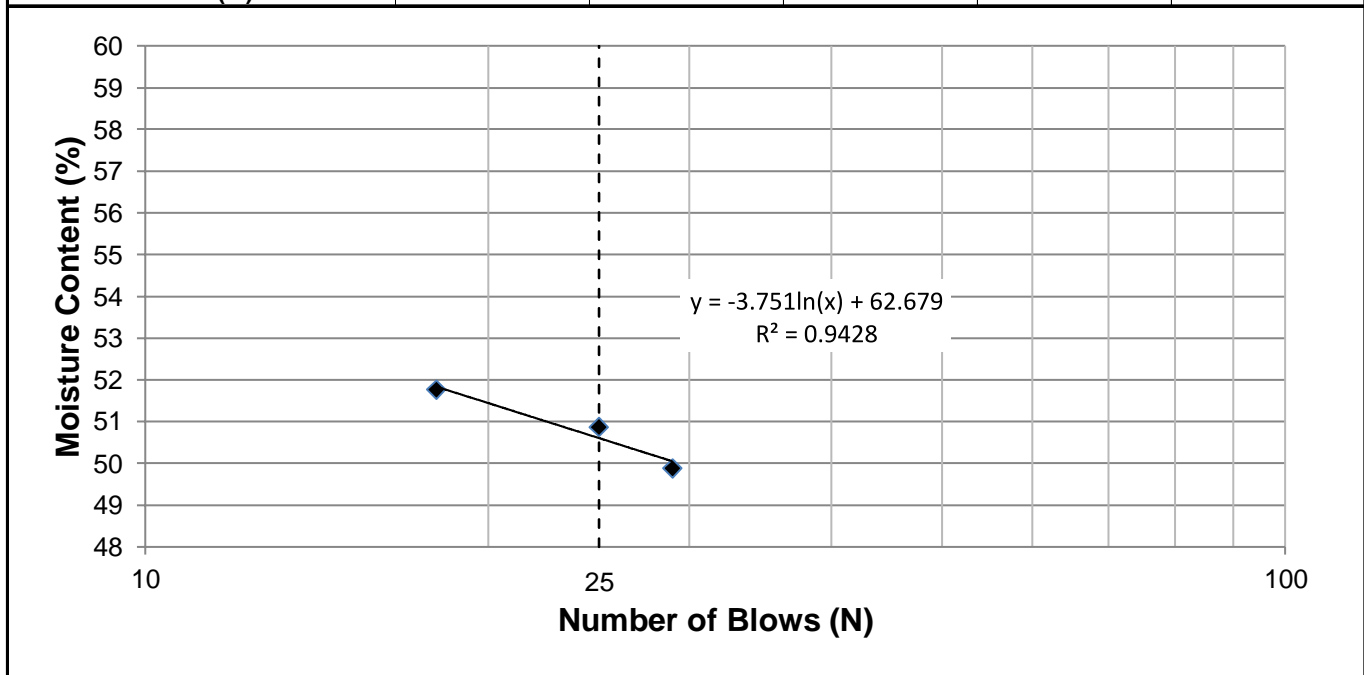
Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-06
Sample # G20
Depth (m) 1.1-1.2
Sample Date 20-May-16
Test Date 08-Jun-16
Technician JB

Liquid Limit	51
Plastic Limit	17
Plasticity Index	34

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	29	25	18		
Mass Wet Soil + Tare (g)	22.379	21.309	23.718		
Mass Dry Soil + Tare (g)	19.614	18.885	20.363		
Mass Tare (g)	14.070	14.119	13.881		
Mass Water (g)	2.765	2.424	3.355		
Mass Dry Soil (g)	5.544	4.766	6.482		
Moisture Content (%)	49.874	50.860	51.759		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	16.482	16.624			
Mass Dry Soil + Tare (g)	16.115	16.276			
Mass Tare (g)	13.983	14.266			
Mass Water (g)	0.367	0.348			
Mass Dry Soil (g)	2.132	2.010			
Moisture Content (%)	17.214	17.313			



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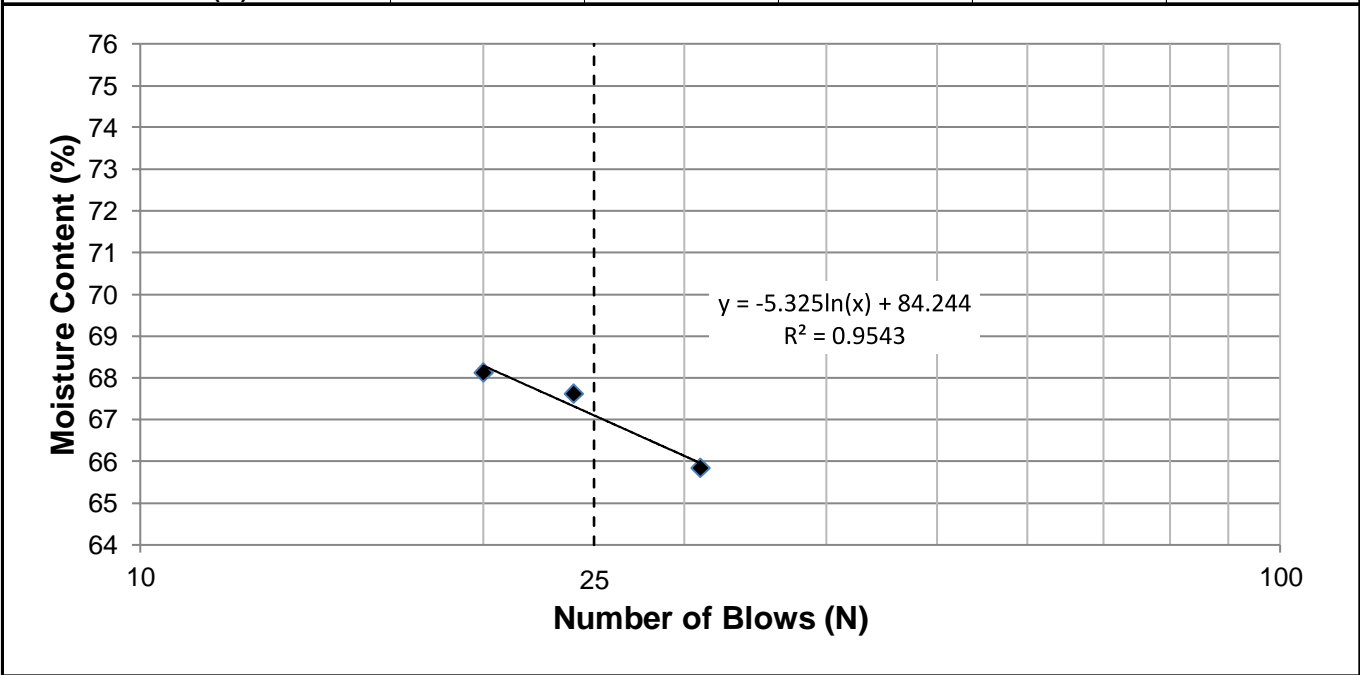
Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-10
Sample # G32
Depth (m) 0.8-0.9
Sample Date 20-May-16
Test Date 08-Jun-16
Technician LI

Liquid Limit	67
Plastic Limit	21
Plasticity Index	46

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	31	24	20		
Mass Wet Soil + Tare (g)	24.847	24.680	26.158		
Mass Dry Soil + Tare (g)	20.544	20.477	21.282		
Mass Tare (g)	14.008	14.261	14.124		
Mass Water (g)	4.303	4.203	4.876		
Mass Dry Soil (g)	6.536	6.216	7.158		
Moisture Content (%)	65.835	67.616	68.120		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	15.919	16.484			
Mass Dry Soil + Tare (g)	15.634	16.097			
Mass Tare (g)	14.239	14.219			
Mass Water (g)	0.285	0.387			
Mass Dry Soil (g)	1.395	1.878			
Moisture Content (%)	20.430	20.607			



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**Atterberg Limits
 ASTM D4318**

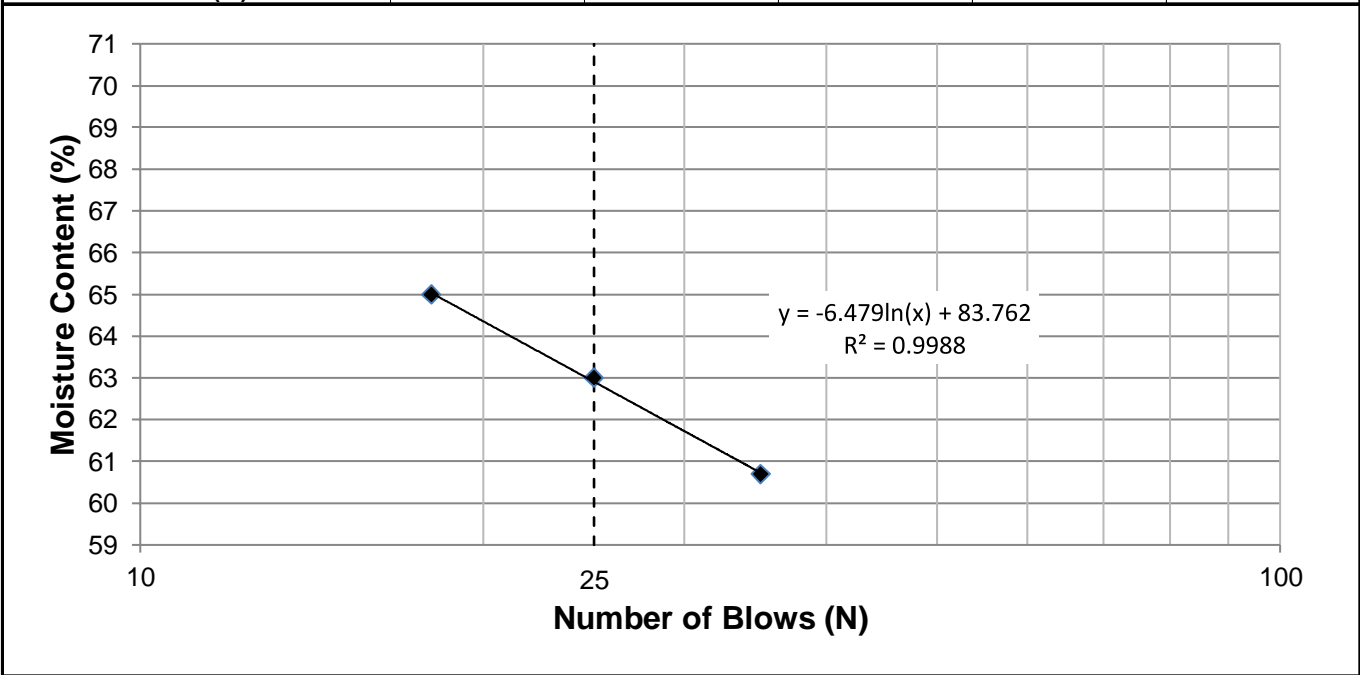
Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-12
Sample # G42
Depth (m) 0.9-1.1
Sample Date 20-May-16
Test Date 09-Jun-16
Technician LI

Liquid Limit	63
Plastic Limit	20
Plasticity Index	43

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	25	18	35		
Mass Wet Soil + Tare (g)	24.461	23.270	24.512		
Mass Dry Soil + Tare (g)	20.464	19.711	20.724		
Mass Tare (g)	14.119	14.235	14.482		
Mass Water (g)	3.997	3.559	3.788		
Mass Dry Soil (g)	6.345	5.476	6.242		
Moisture Content (%)	62.994	64.993	60.686		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	16.009	16.035			
Mass Dry Soil + Tare (g)	15.685	15.699			
Mass Tare (g)	14.058	14.016			
Mass Water (g)	0.324	0.336			
Mass Dry Soil (g)	1.627	1.683			
Moisture Content (%)	19.914	19.964			

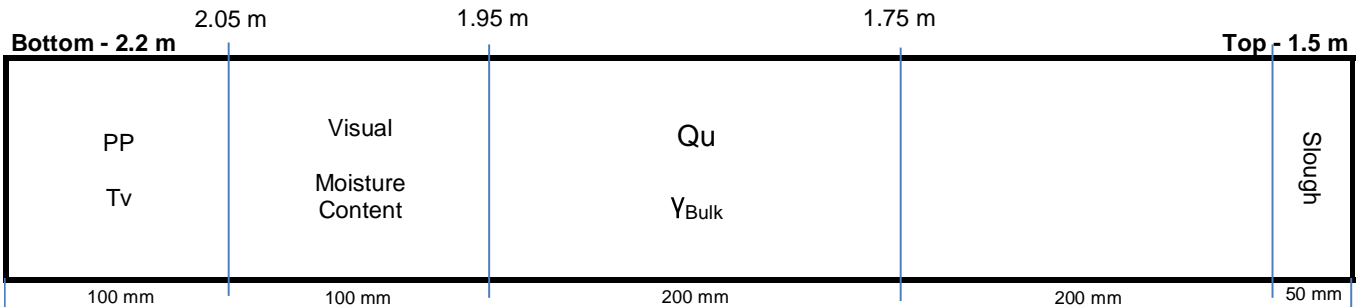


Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-01
Sample # T99
Depth (m) 1.5 - 2.2
Sample Date 20-May-16
Test Date 06-Jun-16
Technician JB

Tube Extraction

Recovery (mm) 650



Visual Classification

Material	SILT
Composition	some clay
	trace sand
Color	brown
Moisture	moist
Consistency	firm to stiff
Plasticity	intermediate plasticity
Structure	varved
Gradation	-

Torvane

Reading	0.53
Vane Size (s,m,l)	m
Undrained Shear Strength (kPa)	52.0

Pocket Penetrometer

Reading	1	1.50
	2	1.25
	3	1.50
	Average	1.42
Undrained Shear Strength (kPa)		69.5

Moisture Content

Tare ID	F132
Mass tare (g)	8.7
Mass wet + tare (g)	520.8
Mass dry + tare (g)	421.1
Moisture %	24.2%

Unit Weight

Bulk Weight (g)	1292.0	
Length (mm)	1	151.13
	2	150.14
	3	150.45
	4	151.36
Average Length (m)		0.151
Diam. (mm)	1	72.36
	2	71.10
	3	72.30
	4	71.96
Average Diameter (m)		0.072

Volume (m³)	6.13E-04
Bulk Unit Weight (kN/m³)	20.7
Bulk Unit Weight (pcf)	131.7
Dry Unit Weight (kN/m³)	16.7
Dry Unit Weight (pcf)	106.0

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-01
Sample # T99
Depth (m) 1.5 - 2.2
Sample Date 20-May-16
Test Date 6-Jun-16
Technician JB

Unconfined Strength

	kPa	ksf
Max q_u	77.5	1.6
Max S_u	38.7	0.8

Specimen Data

Description SILT - some clay, trace sand, brown, moist, firm to stiff, intermediate plasticity, varved

Length	150.8	(mm)	Moisture %	24%
Diameter	71.9	(mm)	Bulk Unit Wt.	20.7 (kN/m ³)
L/D Ratio	2.1		Dry Unit Wt.	16.7 (kN/m ³)
Initial Area	0.00406	(m ²)	Liquid Limit	-
Load Rate	1.00	(%/min)	Plastic Limit	-
			Plasticity Index	-

Undrained Shear Strength Tests

Torvane

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.53	52.0	1.09
Vane Size		
m		

Pocket Penetrometer

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
1.50	73.6	1.54
1.25	61.3	1.28
1.50	73.6	1.54
Average	1.42	69.5
		1.45

Failure Geometry

Sketch:

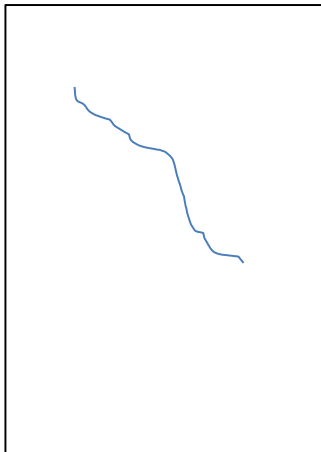
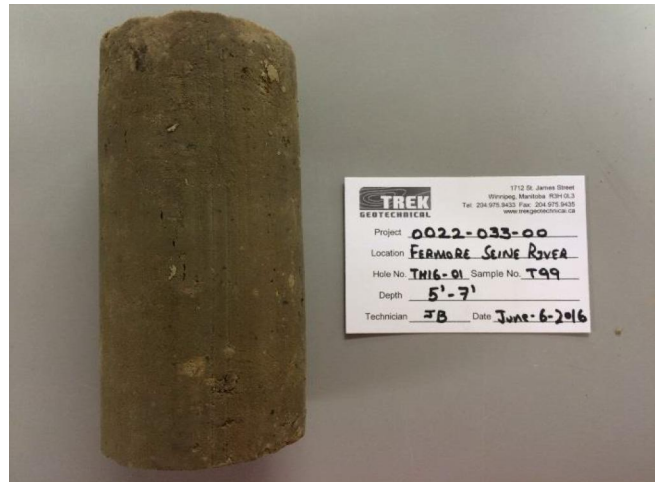


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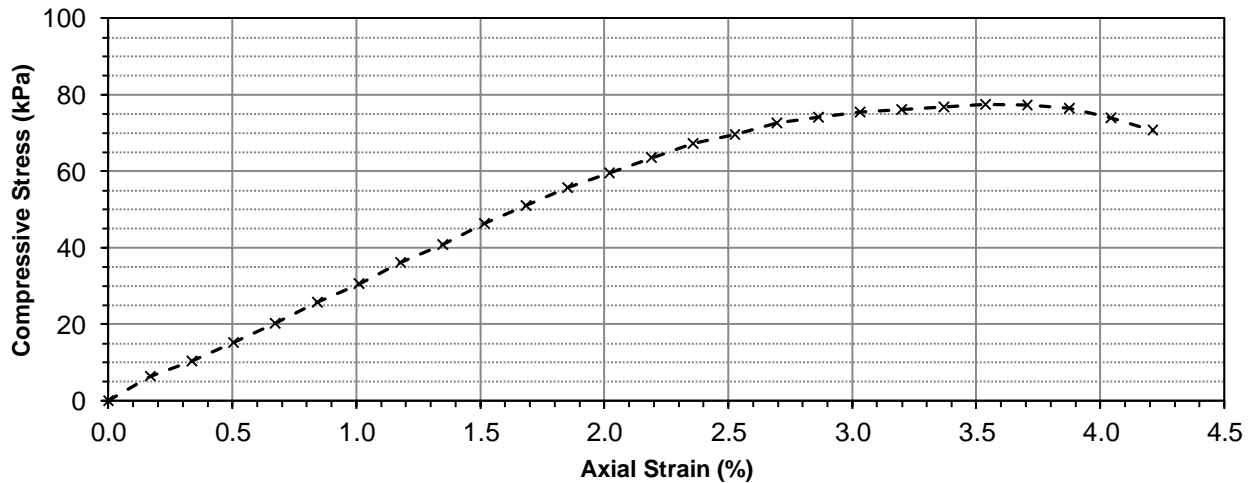


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Project 0022-033-00
 Location FERMOR SEINE RIVER
 Hole No. TH16-01 Sample No. T99
 Depth 5'-7'
 Technician JB Date JUN-6-2016

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Graph



Unconfined Compression Test Data

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
0	0	0.0000	0.00	0.004064	0.0	0.00	0.00
10	8	0.2540	0.17	0.004070	26.2	6.43	3.21
20	13	0.5080	0.34	0.004077	42.5	10.43	5.22
30	19	0.7620	0.51	0.004084	62.2	15.23	7.62
40	25	1.0160	0.67	0.004091	82.4	20.15	10.07
50	32	1.2700	0.84	0.004098	105.5	25.75	12.87
60	38	1.5240	1.01	0.004105	125.3	30.52	15.26
70	45	1.7780	1.18	0.004112	148.3	36.08	18.04
80	51	2.0320	1.35	0.004119	168.1	40.82	20.41
90	58	2.2860	1.52	0.004126	191.2	46.35	23.17
100	64	2.5400	1.68	0.004133	211.0	51.06	25.53
110	70	2.7940	1.85	0.004140	230.8	55.74	27.87
120	75	3.0480	2.02	0.004147	247.3	59.62	29.81
130	80	3.3020	2.19	0.004155	263.8	63.49	31.75
140	85	3.5560	2.36	0.004162	280.2	67.34	33.67
150	88	3.8100	2.53	0.004169	290.2	69.60	34.80
160	92	4.0640	2.70	0.004176	303.3	72.63	36.32
170	94	4.3180	2.86	0.004183	309.9	74.08	37.04
180	96	4.5720	3.03	0.004191	316.5	75.53	37.77
190	97	4.8260	3.20	0.004198	319.8	76.19	38.09
200	98	5.0800	3.37	0.004205	323.1	76.84	38.42
210	99	5.3340	3.54	0.004213	326.4	77.48	38.74
220	99	5.5880	3.71	0.004220	326.4	77.35	38.67
230	98	5.8420	3.87	0.004227	323.1	76.43	38.22



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Unconfined Compressive Strength
ASTM D2166

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Data (cont'd)

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
240	95	6.0960	4.0432	0.004235	313.2	73.96	36.98
250	91	6.3500	4.21	0.004242	300.0	70.72	35.36



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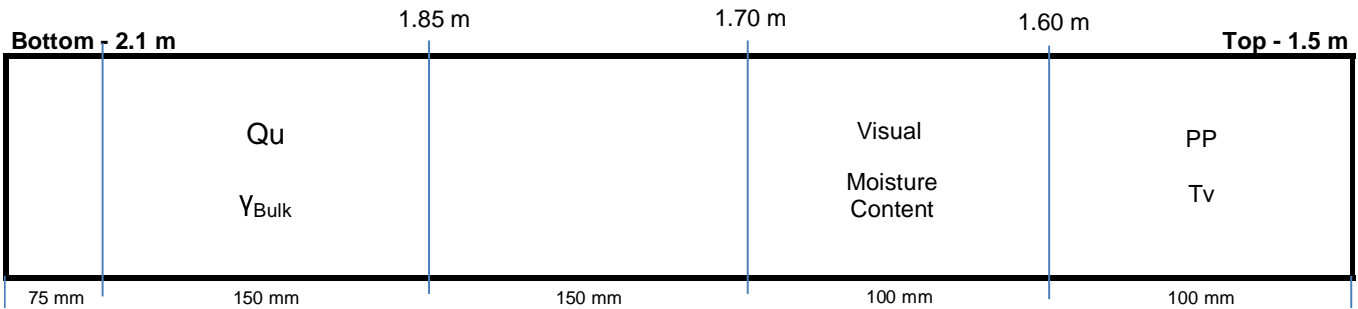
Shelby Tube Visual

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-04
Sample # T15
Depth (m) 1.5 - 2.1
Sample Date 20-May-16
Test Date 27-May-16
Technician LI

Tube Extraction

Recovery (mm) 575



Visual Classification

Material	CLAY
Composition	silty
	trace sand
	trace organics (rootlets)
Color	grey
Moisture	moist
Consistency	firm to stiff
Plasticity	high plasticity
Structure	homogeneous
Gradation	-

Torvane

Reading	0.28
Vane Size (s,m,l)	s
Undrained Shear Strength (kPa)	68.6

Pocket Penetrometer

Reading	1	1.50
	2	1.00
	3	1.00
	Average	1.17
Undrained Shear Strength (kPa)		57.2

Moisture Content

Tare ID	W28
Mass tare (g)	8.6
Mass wet + tare (g)	337.5
Mass dry + tare (g)	259.7
Moisture %	31.0%

Unit Weight

Bulk Weight (g)	1137.5	
Length (mm)	1	145.59
	2	143.80
	3	144.62
	4	146.01
Average Length (m)	0.145	
Diam. (mm)	1	72.55
	2	72.54
	3	71.76
	4	72.17
Average Diameter (m)	0.072	

Volume (m³)	5.95E-04
Bulk Unit Weight (kN/m³)	18.8
Bulk Unit Weight (pcf)	119.4
Dry Unit Weight (kN/m³)	14.3
Dry Unit Weight (pcf)	91.2



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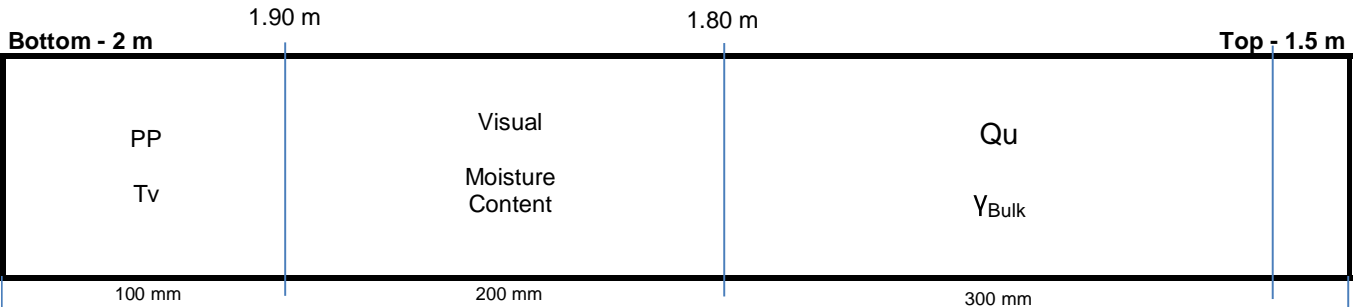
Shelby Tube Visual

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-05
Sample # T86
Depth (m) 1.5 - 2.0
Sample Date 20-May-16
Test Date 06-Jun-16
Technician JB

Tube Extraction

Recovery (mm) 500



Visual Classification

Material CLAY
Composition sitly
 trace silt inclusions (~<9 mmØ)
 trace oxidation
 trace organics (rootlets)

Color black
Moisture moist
Consistency stiff
Plasticity high plasticity
Structure homogeneous/fissures
Gradation -

Torvane

Reading 0.59
Vane Size (s,m,l) m
Undrained Shear Strength (kPa) 57.9

Pocket Penetrometer

Reading
 1 2.30
 2 1.75
 3 1.75
 Average 1.93
Undrained Shear Strength (kPa) 94.8

Moisture Content

Tare ID W26
Mass tare (g) 8.4
Mass wet + tare (g) 383.7
Mass dry + tare (g) 286.9
Moisture % 34.8%

Unit Weight

Bulk Weight (g) 1191.2

Length (mm)	1	154.40
	2	154.40
	3	153.30
	4	154.05
Average Length (m)		0.154

Diam. (mm)	1	75.10
	2	75.57
	3	75.19
	4	75.04
Average Diameter (m)		0.075

Volume (m³) 6.85E-04
Bulk Unit Weight (kN/m³) 17.1
Bulk Unit Weight (pcf) 108.6
Dry Unit Weight (kN/m³) 12.7
Dry Unit Weight (pcf) 80.6

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-05
Sample # T86
Depth (m) 1.5 - 2.0
Sample Date 20-May-16
Test Date 6-Jun-16
Technician JB

Unconfined Strength

	kPa	ksf
Max q_u	31.3	0.7
Max S_u	15.7	0.3

Specimen Data

Description CLAY - silty, trace silt inclusions (~<9 mmØ), trace oxidation, trace organics (rootlets), black, moist, stiff, high plasticity, homogeneous/fissures

Length	154.0	(mm)	Moisture %	35%
Diameter	75.2	(mm)	Bulk Unit Wt.	17.1 (kN/m ³)
L/D Ratio	2.0		Dry Unit Wt.	12.7 (kN/m ³)
Initial Area	0.00444	(m ²)	Liquid Limit	-
Load Rate	1.00	(%/min)	Plastic Limit	-
			Plasticity Index	-

Undrained Shear Strength Tests

Torvane

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.59	57.9	1.21
Vane Size		
m		

Pocket Penetrometer

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
2.30	112.8	2.36
1.75	85.8	1.79
1.75	85.8	1.79
Average	1.93	94.8
	94.8	1.98

Failure Geometry

Sketch:

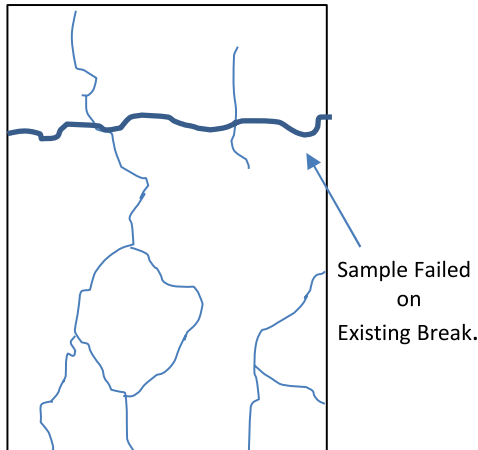
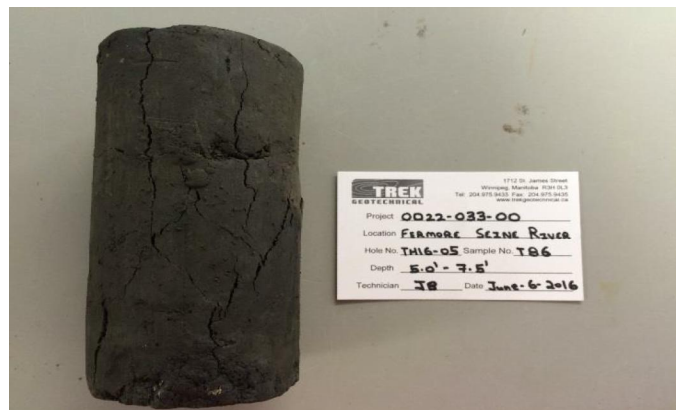
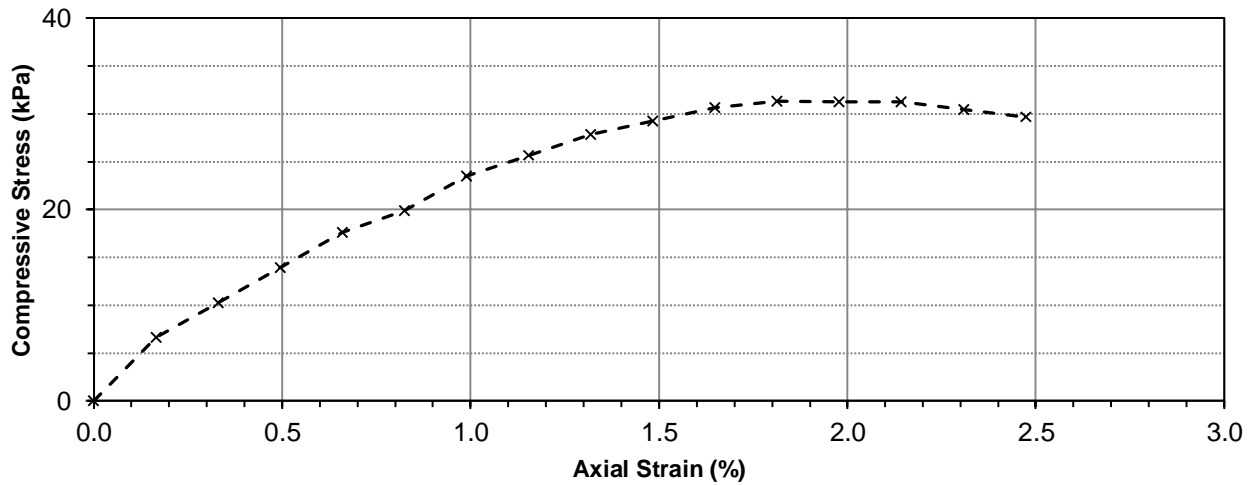


Photo:



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Graph



Unconfined Compression Test Data

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
0	0	0.0000	0.00	0.004444	0.0	0.00	0.00
10	9	0.2540	0.16	0.004452	29.4	6.61	3.31
20	14	0.5080	0.33	0.004459	45.8	10.27	5.14
30	19	0.7620	0.49	0.004467	62.2	13.93	6.96
40	24	1.0160	0.66	0.004474	78.6	17.58	8.79
50	27	1.2700	0.82	0.004481	89.0	19.86	9.93
60	32	1.5240	0.99	0.004489	105.5	23.51	11.75
70	35	1.7780	1.15	0.004496	115.4	25.66	12.83
80	38	2.0320	1.32	0.004504	125.3	27.82	13.91
90	40	2.2860	1.48	0.004511	131.9	29.24	14.62
100	42	2.5400	1.65	0.004519	138.5	30.64	15.32
110	43	2.7940	1.81	0.004527	141.8	31.32	15.66
120	43	3.0480	1.98	0.004534	141.8	31.27	15.63
130	43	3.3020	2.14	0.004542	141.8	31.21	15.61
140	42	3.5560	2.31	0.004549	138.5	30.44	15.22
150	41	3.8100	2.47	0.004557	135.2	29.66	14.83

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-04
Sample # T15
Depth (m) 1.5 - 2.1
Sample Date 20-May-16
Test Date 27-May-16
Technician LI

Unconfined Strength

	kPa	ksf
Max q_u	58.6	1.2
Max S_u	29.3	0.6

Specimen Data

Description CLAY - silty, trace sand, trace organics (rootlets), grey, moist, firm to stiff, high plasticity, homogeneous

Length	145.0	(mm)	Moisture %	31%
Diameter	72.3	(mm)	Bulk Unit Wt.	18.8 (kN/m ³)
L/D Ratio	2.0		Dry Unit Wt.	14.3 (kN/m ³)
Initial Area	0.00410	(m ²)	Liquid Limit	-
Load Rate	1.00	(%/min)	Plastic Limit	-
			Plasticity Index	-

Undrained Shear Strength Tests

Torvane

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.28	68.6	1.43
Vane Size		
s		

Pocket Penetrometer

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
1.50	73.6	1.54
1.00	49.1	1.02
1.00	49.1	1.02
Average	1.17	57.2
		1.20

Failure Geometry

Sketch:

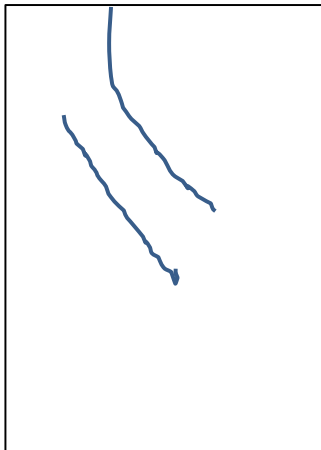
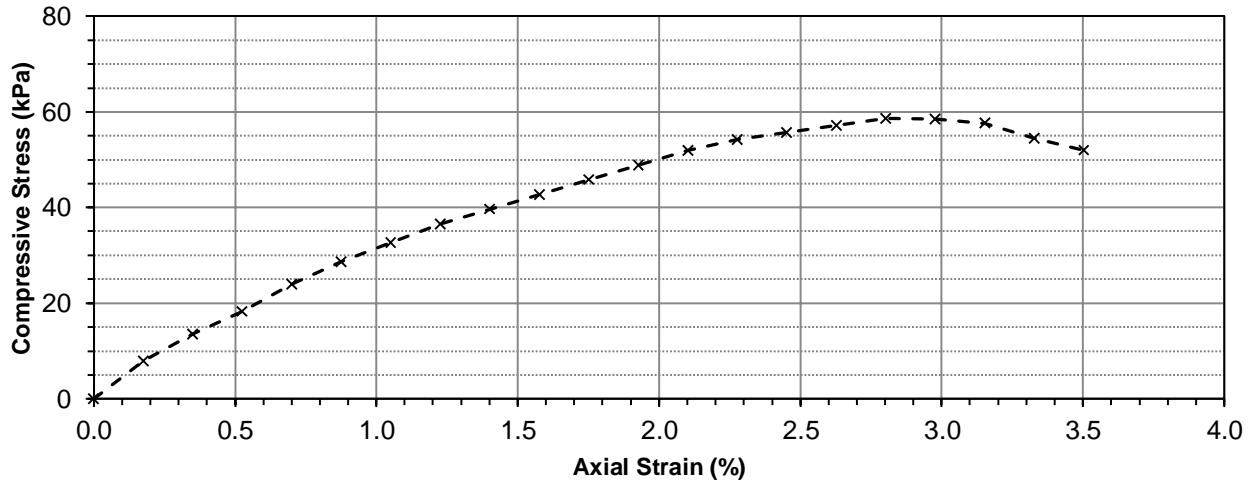


Photo:



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Graph



Unconfined Compression Test Data

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
0	0	0.0000	0.00	0.004100	0.0	0.00	0.00
10	10	0.2540	0.18	0.004108	32.7	7.96	3.98
20	17	0.5080	0.35	0.004115	55.7	13.52	6.76
30	23	0.7620	0.53	0.004122	75.3	18.28	9.14
40	30	1.0160	0.70	0.004129	98.9	23.96	11.98
50	36	1.2700	0.88	0.004137	118.7	28.69	14.34
60	41	1.5240	1.05	0.004144	135.2	32.62	16.31
70	46	1.7780	1.23	0.004151	151.7	36.54	18.27
80	50	2.0320	1.40	0.004159	164.9	39.64	19.82
90	54	2.2860	1.58	0.004166	178.0	42.73	21.37
100	58	2.5400	1.75	0.004174	191.2	45.82	22.91
110	62	2.7940	1.93	0.004181	204.4	48.89	24.44
120	66	3.0480	2.10	0.004188	217.6	51.95	25.98
130	69	3.3020	2.28	0.004196	227.5	54.21	27.11
140	71	3.5560	2.45	0.004203	234.1	55.69	27.85
150	73	3.8100	2.63	0.004211	240.7	57.16	28.58
160	75	4.0640	2.80	0.004219	247.3	58.62	29.31
170	75	4.3180	2.98	0.004226	247.3	58.51	29.25
180	74	4.5720	3.15	0.004234	244.0	57.63	28.81
190	70	4.8260	3.33	0.004242	230.8	54.41	27.20
200	67	5.0800	3.50	0.004249	220.9	51.99	25.99



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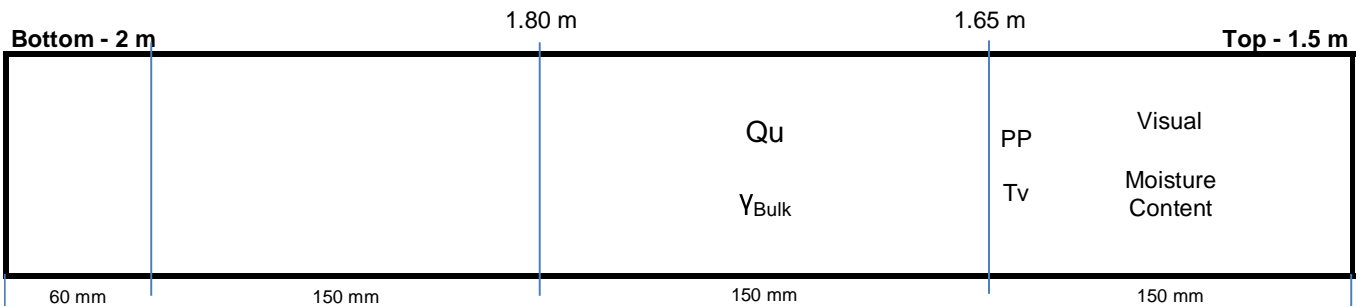
Shelby Tube Visual

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-08
Sample # T29
Depth (m) 1.5 - 2.0
Sample Date 20-May-16
Test Date 27-May-16
Technician LI

Tube Extraction

Recovery (mm) 510



Visual Classification

Material	SILT
Composition	clayey trace sand
Color	mottled grey and brown
Moisture	moist
Consistency	soft to firm
Plasticity	intermediate plasticity
Structure	blocky
Gradation	-

Torvane

Reading	0.10
Vane Size (s,m,l)	s
Undrained Shear Strength (kPa)	24.5

Pocket Penetrometer

Reading	1	0.50
	2	0.50
	3	0.60
	Average	0.53
Undrained Shear Strength (kPa)		26.2

Moisture Content

Tare ID	AB100
Mass tare (g)	6.6
Mass wet + tare (g)	425.9
Mass dry + tare (g)	338.3
Moisture %	26.4%

Unit Weight

Bulk Weight (g)		1151.3
Length (mm)	1	146.12
	2	145.25
	3	146.51
	4	146.31
Average Length (m)		0.146
Diam. (mm)	1	71.47
	2	72.31
	3	71.96
	4	71.56
Average Diameter (m)		0.072

Volume (m³)	5.92E-04
Bulk Unit Weight (kN/m³)	19.1
Bulk Unit Weight (pcf)	121.5
Dry Unit Weight (kN/m³)	15.1
Dry Unit Weight (pcf)	96.1

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-08
Sample # T29
Depth (m) 1.5 - 2.0
Sample Date 20-May-16
Test Date 27-May-16
Technician LI

Unconfined Strength

	kPa	ksf
Max q_u	20.6	0.4
Max S_u	10.3	0.2

Specimen Data

Description SILT - clayey, trace sand, mottled grey and brown, moist, soft to firm, intermediate plasticity, blocky

Length	146.0	(mm)	Moisture %	26%
Diameter	71.8	(mm)	Bulk Unit Wt.	19.1 (kN/m ³)
L/D Ratio	2.0		Dry Unit Wt.	15.1 (kN/m ³)
Initial Area	0.00405	(m ²)	Liquid Limit	-
Load Rate	1.00	(%/min)	Plastic Limit	-
			Plasticity Index	-

Undrained Shear Strength Tests

Torvane

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.10	24.5	0.51
Vane Size		
s		

Pocket Penetrometer

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.50	24.5	0.51
0.50	24.5	0.51
0.60	29.4	0.61
Average	0.53	26.2
		0.55

Failure Geometry

Sketch:

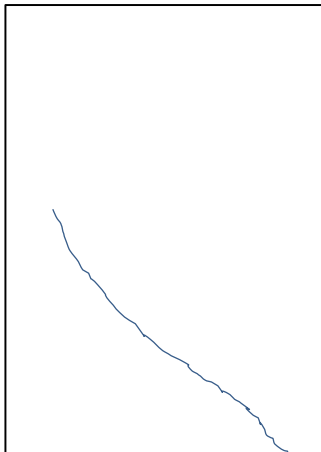
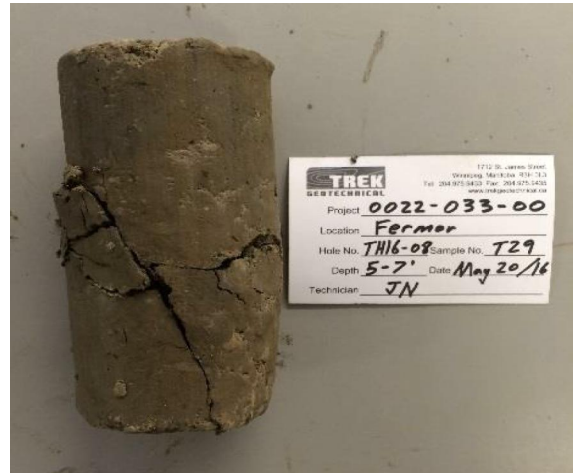
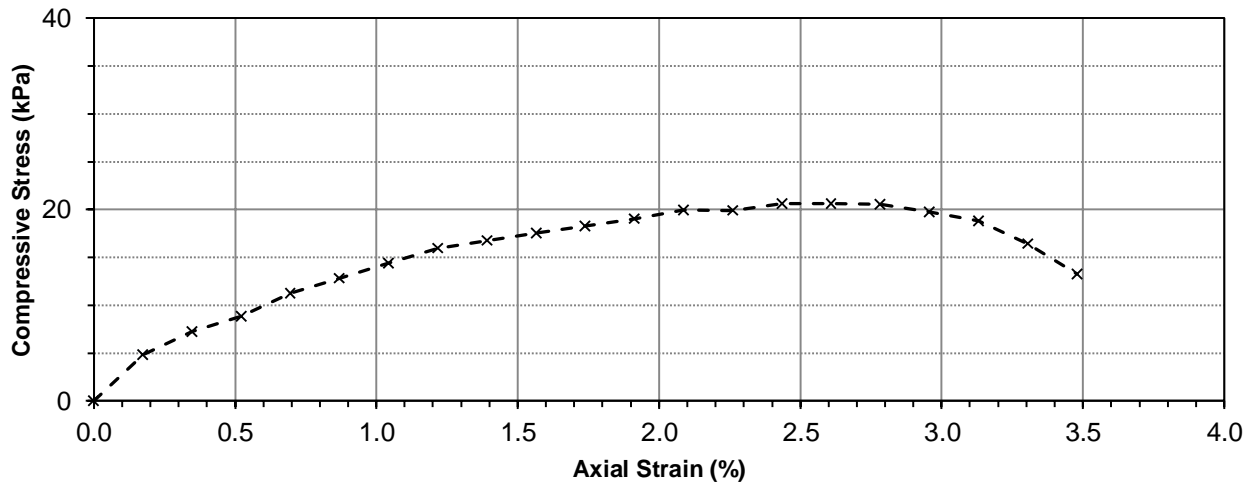


Photo:



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Graph



Unconfined Compression Test Data

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
0	0	0.0000	0.00	0.004052	0.0	0.00	0.00
10	6	0.2540	0.17	0.004059	19.6	4.83	2.42
20	9	0.5080	0.35	0.004066	29.4	7.24	3.62
30	11	0.7620	0.52	0.004073	36.0	8.83	4.42
40	14	1.0160	0.70	0.004080	45.8	11.23	5.61
50	16	1.2700	0.87	0.004087	52.4	12.81	6.41
60	18	1.5240	1.04	0.004094	58.9	14.39	7.20
70	20	1.7780	1.22	0.004102	65.5	15.97	7.98
80	21	2.0320	1.39	0.004109	68.8	16.74	8.37
90	22	2.2860	1.57	0.004116	72.1	17.51	8.75
100	23	2.5400	1.74	0.004123	75.3	18.27	9.14
110	24	2.7940	1.91	0.004131	78.6	19.04	9.52
120	25	3.0480	2.09	0.004138	82.4	19.92	9.96
130	25	3.3020	2.26	0.004145	82.4	19.88	9.94
140	26	3.5560	2.43	0.004153	85.7	20.64	10.32
150	26	3.8100	2.61	0.004160	85.7	20.60	10.30
160	26	4.0640	2.78	0.004168	85.7	20.57	10.28
170	25	4.3180	2.96	0.004175	82.4	19.74	9.87
180	24	4.5720	3.13	0.004183	78.6	18.80	9.40
190	21	4.8260	3.30	0.004190	68.8	16.41	8.21
200	17	5.0800	3.48	0.004198	55.7	13.26	6.63

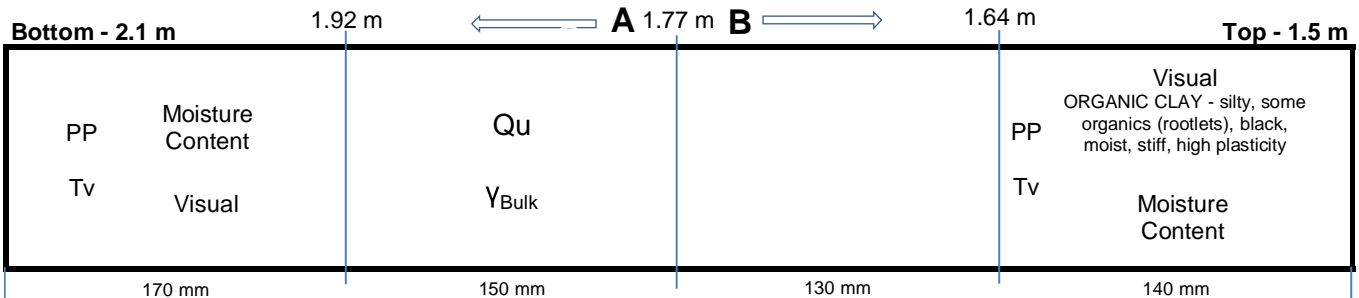


Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-09
Sample # T72
Depth (m) 1.5 - 2.1
Sample Date 20-May-16
Test Date 31-May-16
Technician LI

Tube Extraction

Recovery (mm) 590



Visual Classification - A

Material	CLAY
Composition	silty
	trace sand
	some organics (rootlets)
Color	grey
Moisture	moist
Consistency	firm to stiff
Plasticity	intermediate plasticity
Structure	blocky
Gradation	-

Torvane	B	A
Reading	0.24	0.20
Vane Size (s,m,l)	s	s
Undrained Shear Strength (kPa)	58.8	49.0

Pocket Penetrometer

Reading	1	1.200	1.90
	2	1.300	1.80
	3	1.200	1.75
	Average	1.23	1.82
Undrained Shear Strength (kPa)		60.5	89.1

Moisture Content

	B	A
Tare ID	H53	Z24
Mass tare (g)	8.7	8.5
Mass wet + tare (g)	321.6	365.8
Mass dry + tare (g)	240	279.6
Moisture %	35.3%	31.8%

Unit Weight

	B	A
Bulk Weight (g)		1187.4
Length (mm)	1	150.34
	2	151.05
	3	150.87
	4	150.55
Average Length (m)		0.151

Diam. (mm)	1	72.70
	2	72.48
	3	72.66
	4	72.19
Average Diameter (m)		0.073

Volume (m³)	6.22E-04
Bulk Unit Weight (kN/m³)	18.7
Bulk Unit Weight (pcf)	119.1
Dry Unit Weight (kN/m³)	14.2
Dry Unit Weight (pcf)	90.4

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-09
Sample # T72
Depth (m) 1.5 - 2.1
Sample Date 20-May-16
Test Date 31-May-16
Technician LI

Unconfined Strength

	kPa	ksf
Max q_u	53.6	1.1
Max S_u	26.8	0.6

Specimen Data

Description CLAY - silty, trace sand, some organics (rootlets), grey, moist, firm to stiff, intermediate plasticity, blocky

Length	150.7	(mm)	Moisture %	32%
Diameter	72.5	(mm)	Bulk Unit Wt.	18.7 (kN/m ³)
L/D Ratio	2.1		Dry Unit Wt.	14.2 (kN/m ³)
Initial Area	0.00413	(m ²)	Liquid Limit	-
Load Rate	1.00	(%/min)	Plastic Limit	-
			Plasticity Index	-

Undrained Shear Strength Tests

Torvane

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.20	49.0	1.02
Vane Size		
s		

Pocket Penetrometer

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
1.90	93.2	1.95
1.80	88.3	1.84
1.75	85.8	1.79
Average	1.82	1.86

Failure Geometry

Sketch:

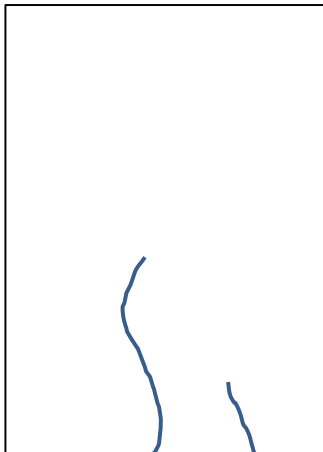
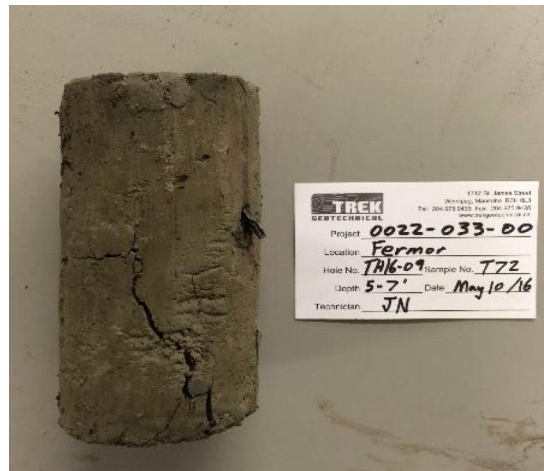
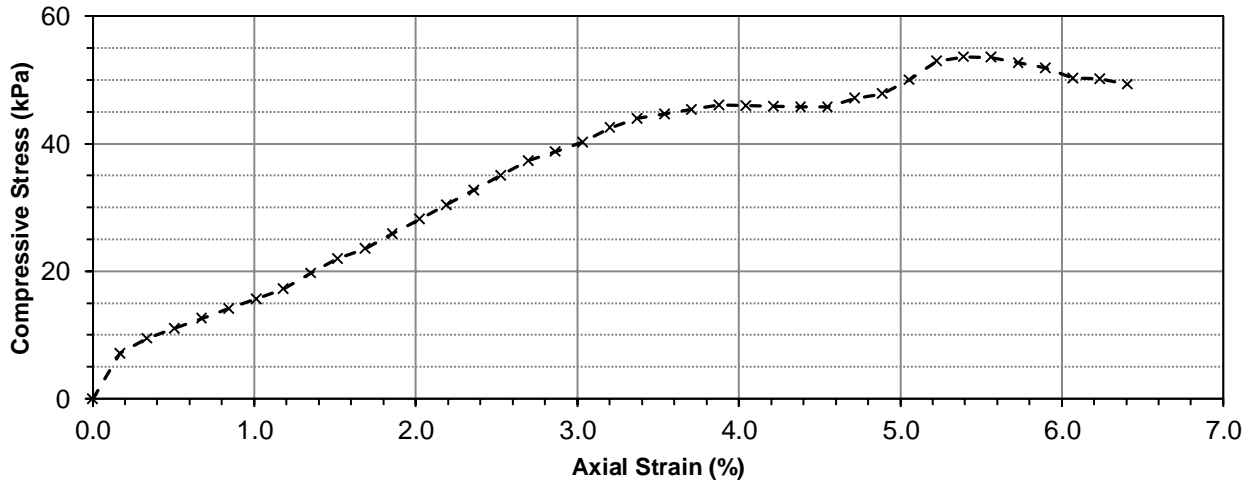


Photo:



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Graph



Unconfined Compression Test Data

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
0	0	0.0000	0.00	0.004129	0.0	0.00	0.00
10	9	0.2540	0.17	0.004136	29.4	7.12	3.56
20	12	0.5080	0.34	0.004143	39.3	9.48	4.74
30	14	0.7620	0.51	0.004150	45.8	11.04	5.52
40	16	1.0160	0.67	0.004157	52.4	12.60	6.30
50	18	1.2700	0.84	0.004164	58.9	14.15	7.08
60	20	1.5240	1.01	0.004171	65.5	15.70	7.85
70	22	1.7780	1.18	0.004178	72.1	17.25	8.62
80	25	2.0320	1.35	0.004186	82.4	19.69	9.85
90	28	2.2860	1.52	0.004193	92.3	22.01	11.01
100	30	2.5400	1.69	0.004200	98.9	23.56	11.78
110	33	2.7940	1.85	0.004207	108.8	25.86	12.93
120	36	3.0480	2.02	0.004214	118.7	28.16	14.08
130	39	3.3020	2.19	0.004222	128.6	30.46	15.23
140	42	3.5560	2.36	0.004229	138.5	32.74	16.37
150	45	3.8100	2.53	0.004236	148.3	35.02	17.51
160	48	4.0640	2.70	0.004244	158.3	37.30	18.65
170	50	4.3180	2.87	0.004251	164.9	38.78	19.39
180	52	4.5720	3.03	0.004258	171.4	40.26	20.13
190	55	4.8260	3.20	0.004266	181.4	42.51	21.26
200	57	5.0800	3.37	0.004273	187.9	43.98	21.99
210	58	5.3340	3.54	0.004281	191.2	44.67	22.34
220	59	5.5880	3.71	0.004288	194.5	45.36	22.68
230	60	5.8420	3.88	0.004296	197.8	46.05	23.02



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Unconfined Compressive Strength
ASTM D2166

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Data (cont'd)

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
240	60	6.0960	4.0451	0.004303	197.8	45.97	22.98
250	60	6.3500	4.21	0.004311	197.8	45.89	22.94
260	60	6.6040	4.38	0.004318	197.8	45.81	22.90
270	60	6.8580	4.55	0.004326	197.8	45.73	22.86
280	62	7.1120	4.72	0.004334	204.4	47.17	23.58
290	63	7.3660	4.89	0.004341	207.7	47.85	23.93
300	66	7.6200	5.06	0.004349	217.6	50.04	25.02
310	70	7.8740	5.22	0.004357	230.8	52.97	26.48
320	71	8.1280	5.39	0.004364	234.1	53.64	26.82
330	71	8.3820	5.56	0.004372	234.1	53.54	26.77
340	70	8.6360	5.73	0.004380	230.8	52.69	26.34
350	69	8.8900	5.90	0.004388	227.5	51.84	25.92
360	67	9.1440	6.07	0.004396	220.9	50.25	25.13
370	67	9.3980	6.24	0.004404	220.9	50.16	25.08
380	66	9.6520	6.40	0.004412	217.6	49.33	24.66

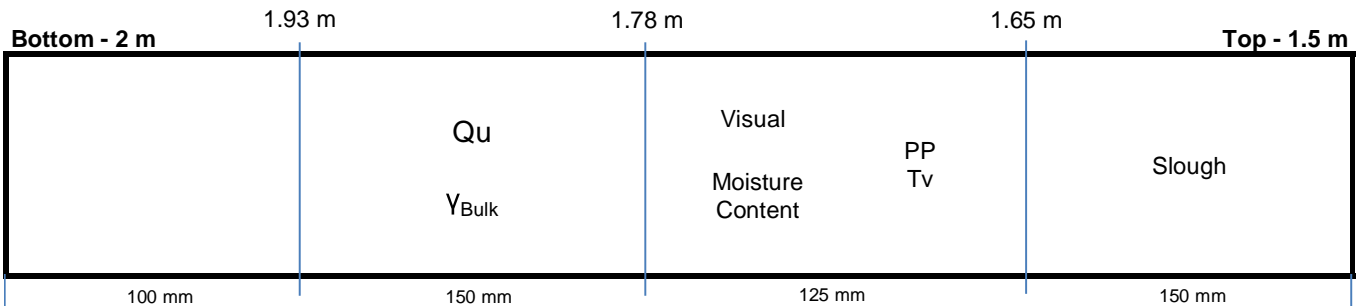


Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-12
Sample # T44
Depth (m) 1.5 - 2.0
Sample Date 20-May-16
Test Date 27-May-16
Technician LI

Tube Extraction

Recovery (mm) 525



Visual Classification

Material	CLAY
Composition	silty
trace sand	
trace organics	
Color	grey
Moisture	moist
Consistency	soft to stiff
Plasticity	high plasticity
Structure	homogeneous
Gradation	-

Torvane

Reading	0.20
Vane Size (s,m,l)	s
Undrained Shear Strength (kPa)	49.0

Pocket Penetrometer

Reading	1	1.50
	2	1.25
	3	1.50
	Average	1.42
Undrained Shear Strength (kPa)		69.5

Moisture Content

Tare ID	F150
Mass tare (g)	8.2
Mass wet + tare (g)	361.3
Mass dry + tare (g)	278.3
Moisture %	30.7%

Unit Weight

Bulk Weight (g)	1132.5	
Length (mm)	1	152.82
	2	153.18
	3	153.10
	4	151.75
Average Length (m)		0.153
Diam. (mm)	1	72.72
	2	72.74
	3	72.23
	4	72.97
Average Diameter (m)		0.073

Volume (m³)	6.33E-04
Bulk Unit Weight (kN/m³)	17.5
Bulk Unit Weight (pcf)	111.6
Dry Unit Weight (kN/m³)	13.4
Dry Unit Weight (pcf)	85.4

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-12
Sample # T44
Depth (m) 1.5 - 2.0
Sample Date 20-May-16
Test Date 27-May-16
Technician LI

Unconfined Strength

	kPa	ksf
Max q_u	39.9	0.8
Max S_u	19.9	0.4

Specimen Data

Description CLAY - silty, trace sand, trace organics, grey, moist, soft to stiff, high plasticity, homogeneous

Length	152.7	(mm)	Moisture %	31%
Diameter	72.7	(mm)	Bulk Unit Wt.	17.5 (kN/m ³)
L/D Ratio	2.1		Dry Unit Wt.	13.4 (kN/m ³)
Initial Area	0.00415	(m ²)	Liquid Limit	-
Load Rate	1.00	(%/min)	Plastic Limit	-
			Plasticity Index	-

Undrained Shear Strength Tests

Torvane

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.20	49.0	1.02
Vane Size		
s		

Pocket Penetrometer

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
1.50	73.6	1.54
1.25	61.3	1.28
1.50	73.6	1.54
Average	1.42	69.5
		1.45

Failure Geometry

Sketch:

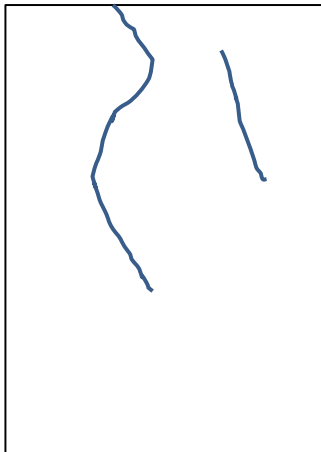


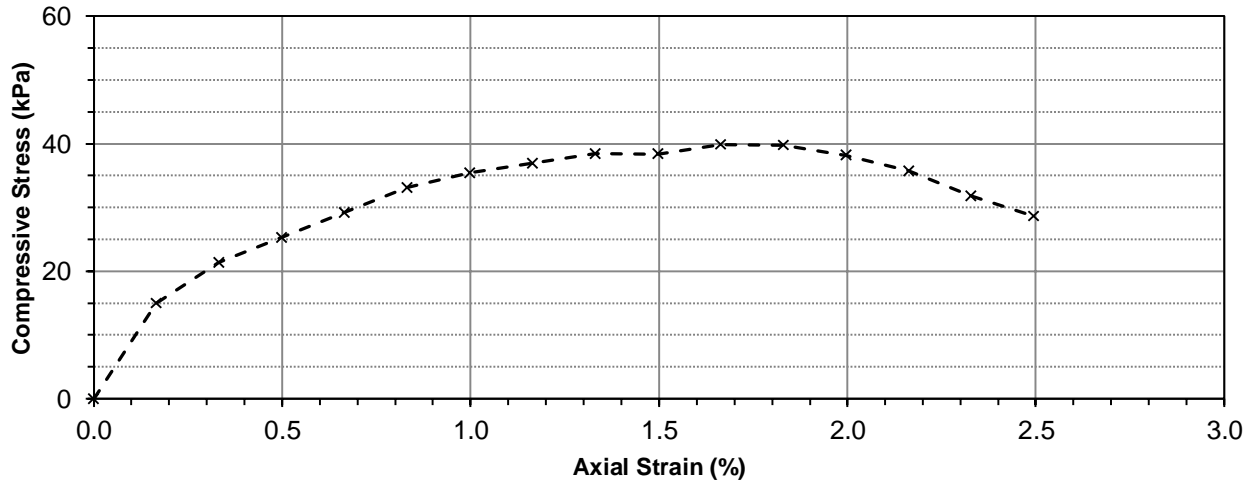
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Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Graph



Unconfined Compression Test Data

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
0	0	0.0000	0.00	0.004147	0.0	0.00	0.00
10	19	0.2540	0.17	0.004154	62.2	14.98	7.49
20	27	0.5080	0.33	0.004161	89.0	21.39	10.70
30	32	0.7620	0.50	0.004168	105.5	25.32	12.66
40	37	1.0160	0.67	0.004175	122.0	29.22	14.61
50	42	1.2700	0.83	0.004182	138.5	33.11	16.56
60	45	1.5240	1.00	0.004189	148.3	35.41	17.71
70	47	1.7780	1.16	0.004196	155.0	36.93	18.47
80	49	2.0320	1.33	0.004203	161.6	38.44	19.22
90	49	2.2860	1.50	0.004210	161.6	38.37	19.19
100	51	2.5400	1.66	0.004217	168.1	39.87	19.94
110	51	2.7940	1.83	0.004224	168.1	39.80	19.90
120	49	3.0480	2.00	0.004232	161.6	38.18	19.09
130	46	3.3020	2.16	0.004239	151.7	35.79	17.89
140	41	3.5560	2.33	0.004246	135.2	31.84	15.92
150	37	3.8100	2.49	0.004253	122.0	28.68	14.34

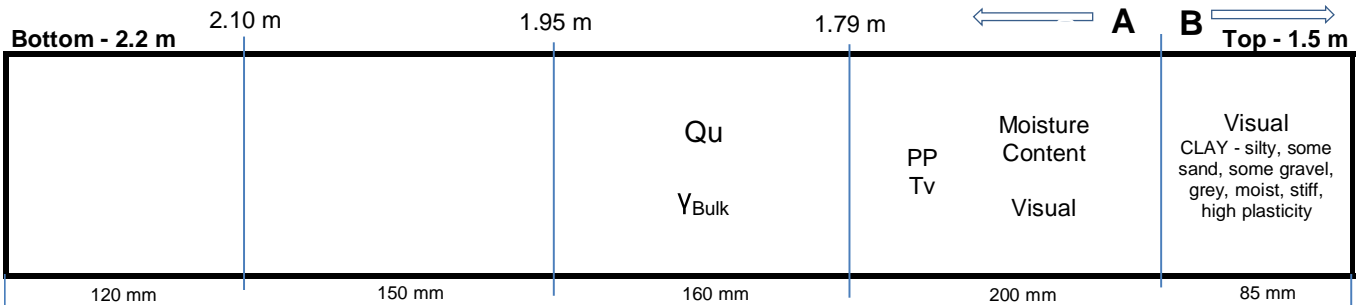


Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-13
Sample # T58
Depth (m) 1.5 - 2.2
Sample Date 20-May-16
Test Date 31-May-16
Technician LI

Tube Extraction

Recovery (mm) 715



Visual Classification - A

Material	SILT
Composition	clayey
trace sand	
trace organics (rootlets)	
Color	grey
Moisture	moist
Consistency	firm
Plasticity	intermediate plasticity
Structure	blocky
Gradation	-

Torvane	B	A
Reading	0.36	0.13
Vane Size (s,m,l)	s	s
Undrained Shear Strength (kPa)	88.3	31.9

Pocket Penetrometer	B	A
Reading	1.600	0.60
	1.750	0.90
	1.200	1.10
Average	1.52	0.87
Undrained Shear Strength (kPa)	74.4	42.5

Moisture Content

	B	A
Tare ID	H69	P04
Mass tare (g)	8.65	8.4
Mass wet + tare (g)	400	418.1
Mass dry + tare (g)	313	339.4
Moisture %	28.6%	23.8%

Unit Weight

	B	A
Bulk Weight (g)		1337.7
Length (mm)	1	153.31
	2	153.52
	3	154.32
	4	153.57
Average Length (m)		0.154

Diam. (mm)	1	73.18
	2	74.87
	3	73.74
	4	72.39
Average Diameter (m)		0.074

Volume (m³)	6.53E-04
Bulk Unit Weight (kN/m³)	20.1
Bulk Unit Weight (pcf)	127.9
Dry Unit Weight (kN/m³)	16.2
Dry Unit Weight (pcf)	103.3

Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Test Hole TH16-13
Sample # T58
Depth (m) 1.5 - 2.2
Sample Date 20-May-16
Test Date 31-May-16
Technician LI

Unconfined Strength

	kPa	ksf
Max q_u	64.2	1.3
Max S_u	32.1	0.7

Specimen Data

Description SILT - clayey, trace sand, trace organics (rootlets), grey, moist, firm, intermediate plasticity, blocky

Length	153.7	(mm)	Moisture %	24%
Diameter	73.5	(mm)	Bulk Unit Wt.	20.1 (kN/m ³)
L/D Ratio	2.1		Dry Unit Wt.	16.2 (kN/m ³)
Initial Area	0.00425	(m ²)	Liquid Limit	-
Load Rate	1.00	(%/min)	Plastic Limit	-
			Plasticity Index	-

Undrained Shear Strength Tests

Torvane

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.13	31.9	0.67
Vane Size		
s		

Pocket Penetrometer

Reading	Undrained Shear Strength	
	kPa	ksf
tsf		
0.60	29.4	0.61
0.90	44.1	0.92
1.10	54.0	1.13
Average	0.87	0.89

Failure Geometry

Sketch:

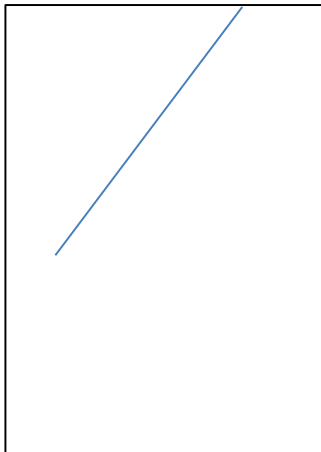
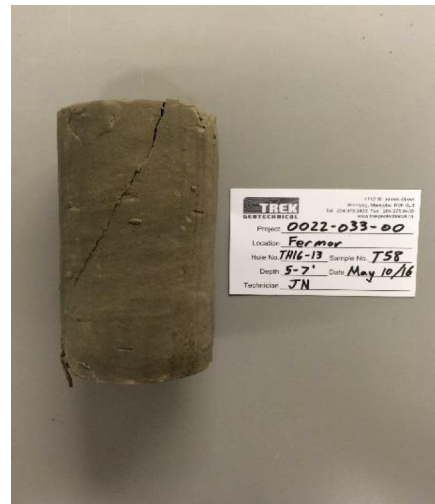
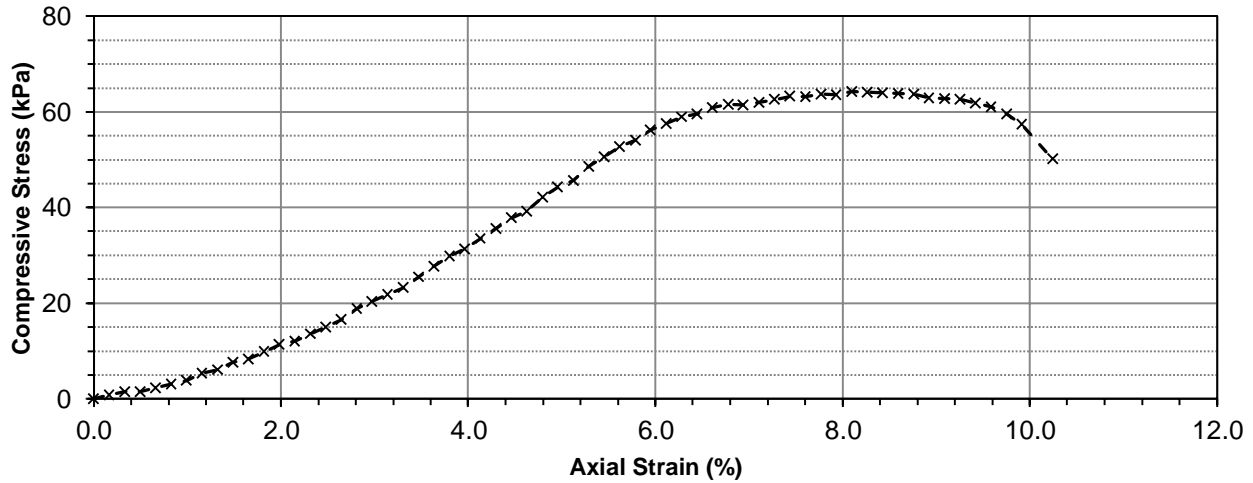


Photo:



Project No. 0022-033-00
Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Graph



Unconfined Compression Test Data

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
0	0	0.0000	0.00	0.004248	0.0	0.00	0.00
10	1	0.2540	0.17	0.004255	3.3	0.77	0.38
20	2	0.5080	0.33	0.004262	6.5	1.53	0.77
30	2	0.7620	0.50	0.004269	6.5	1.53	0.77
40	3	1.0160	0.66	0.004276	9.8	2.29	1.15
50	4	1.2700	0.83	0.004284	13.1	3.05	1.53
60	5	1.5240	0.99	0.004291	16.3	3.81	1.90
70	7	1.7780	1.16	0.004298	22.9	5.33	2.66
80	8	2.0320	1.32	0.004305	26.2	6.08	3.04
90	10	2.2860	1.49	0.004312	32.7	7.58	3.79
100	11	2.5400	1.65	0.004320	36.0	8.33	4.17
110	13	2.7940	1.82	0.004327	42.5	9.83	4.92
120	15	3.0480	1.98	0.004334	49.1	11.33	5.66
130	16	3.3020	2.15	0.004341	52.4	12.06	6.03
140	18	3.5560	2.31	0.004349	58.9	13.55	6.78
150	20	3.8100	2.48	0.004356	65.5	15.04	7.52
160	22	4.0640	2.64	0.004364	72.1	16.51	8.26
170	25	4.3180	2.81	0.004371	82.4	18.86	9.43
180	27	4.5720	2.98	0.004378	89.0	20.33	10.16
190	29	4.8260	3.14	0.004386	95.6	21.80	10.90
200	31	5.0800	3.31	0.004393	102.2	23.27	11.63
210	34	5.3340	3.47	0.004401	112.1	25.47	12.74
220	37	5.5880	3.64	0.004408	122.0	27.67	13.83
230	40	5.8420	3.80	0.004416	131.9	29.87	14.93



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Unconfined Compressive Strength
ASTM D2166

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Client Dillon Consulting Ltd.
Project Fermor Over Seine River

Unconfined Compression Test Data (cont'd)

Deformation Dial Reading	Load Ring Dial Reading	Deflection (mm)	Axial Strain (%)	Corrected Area (m ²)	Axial Load (N)	Compressive Stress, q _u (kPa)	Shear Stress, S _u (kPa)
240	42	6.0960	3.9667	0.004424	138.5	31.30	15.65
250	45	6.3500	4.13	0.004431	148.3	33.48	16.74
260	48	6.6040	4.30	0.004439	158.3	35.66	17.83
270	51	6.8580	4.46	0.004447	168.1	37.81	18.91
280	53	7.1120	4.63	0.004454	174.7	39.23	19.61
290	57	7.3660	4.79	0.004462	187.9	42.12	21.06
300	60	7.6200	4.96	0.004470	197.8	44.26	22.13
310	62	7.8740	5.12	0.004478	204.4	45.65	22.82
320	66	8.1280	5.29	0.004485	217.6	48.52	24.26
330	69	8.3820	5.45	0.004493	227.5	50.63	25.31
340	72	8.6360	5.62	0.004501	237.4	52.74	26.37
350	74	8.8900	5.78	0.004509	244.0	54.11	27.06
360	77	9.1440	5.95	0.004517	253.9	56.20	28.10
370	79	9.3980	6.12	0.004525	260.4	57.56	28.78
380	81	9.6520	6.28	0.004533	267.1	58.92	29.46
390	82	9.9060	6.45	0.004541	270.4	59.54	29.77
400	84	10.1600	6.61	0.004549	276.9	60.88	30.44
410	85	10.4140	6.78	0.004557	280.2	61.50	30.75
420	85	10.6680	6.94	0.004565	280.2	61.39	30.69
430	86	10.9220	7.11	0.004573	283.5	62.00	31.00
440	87	11.1760	7.27	0.004581	286.8	62.61	31.30
450	88	11.4300	7.44	0.004589	290.2	63.22	31.61
460	88	11.6840	7.60	0.004598	290.2	63.11	31.55
470	89	11.9380	7.77	0.004606	293.4	63.71	31.86
480	89	12.1920	7.93	0.004614	293.4	63.60	31.80
490	90	12.4460	8.10	0.004622	296.7	64.20	32.10
500	90	12.7000	8.26	0.004631	296.7	64.08	32.04
510	90	12.9540	8.43	0.004639	296.7	63.96	31.98
520	90	13.2080	8.59	0.004648	296.7	63.85	31.92
530	90	13.4620	8.76	0.004656	296.7	63.73	31.87
540	89	13.7160	8.93	0.004664	293.4	62.91	31.46
550	89	13.9700	9.09	0.004673	293.4	62.80	31.40
560	89	14.2240	9.26	0.004681	293.4	62.68	31.34
570	88	14.4780	9.42	0.004690	290.2	61.87	30.93
580	87	14.7320	9.59	0.004699	286.8	61.05	30.52
590	85	14.9860	9.75	0.004707	280.2	59.53	29.77
600	82	15.2400	9.92	0.004716	270.4	57.33	28.67
620	72	15.7480	10.25	0.004733	237.4	50.16	25.08

Appendix C

Photographs of Pavement Core Samples



Photo 1: Pavement Core Sample at Test Hole TH16-01



Photo 2: Pavement Core Sample at Test Hole TH16-02



Photo 3: Pavement Core Sample at Test Hole TH16-03



Photo 4: Pavement Core Sample at Test Hole TH16-04

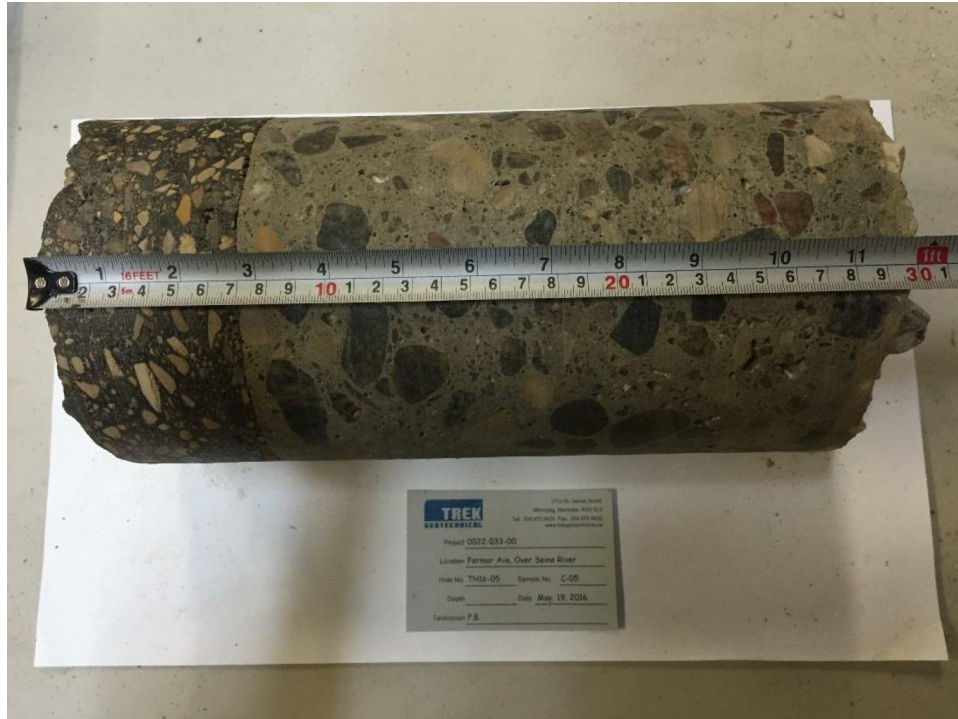


Photo 5: Pavement Core Sample at Test Hole TH16-05



Photo 6: Pavement Core Sample at Test Hole TH16-06



Photo 7: Pavement Core Sample at Test Hole TH16-07



Photo 8: Pavement Core Sample at Test Hole TH16-08



Photo 9: Pavement Core Sample at Test Hole TH16-09



Photo 10: Pavement Core Sample at Test Hole TH16-10



Photo 11: Pavement Core Sample at Test Hole TH16-11



Photo 12: Pavement Core Sample at Test Hole TH16-12

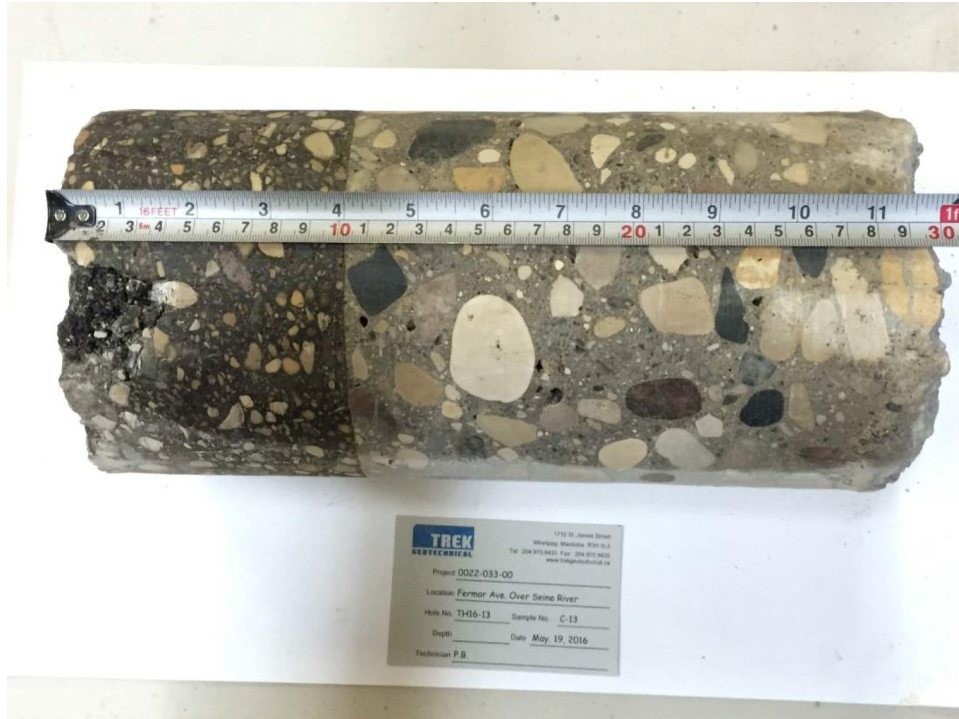


Photo 13: Pavement Core Sample at Test Hole TH16-13



Photo 14: Pavement Core Sample at Test Hole TH16-14