APPENDIX 'A'

GEOTECHNICAL REPORT

Quality Engineering | Valued Relationships

Morrison Hershfield

19-B-01 Fermor Reconstruction

Prepared for:

Morrison Hershfield
1-59 Scurfield Boulevard
Winnipeg, MB R3Y 1V2
Attention: Bruce Biglow, P. Eng

Project Number:
0035 075 00

Date:
December 20, 2018
Final Report

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TREK GEOTECHNICAL Quality Engineering | Valued Relationships

December 20, 2018 Our File No. 0035 075 00

Mr. Ron Bruce, P. Eng
Morrison Hershfield
1-59 Scurfield Boulevard
Winnipeg, Manitoba, R3Y 1V2

RE: Sub-Surface Investigation Report for
19-B-01 Fermor Reconstruction

TREK Geotechnical Inc. is pleased to submit our report for the sub-surface investigations for the 19-B-01 Fermor Reconstruction project.

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:

Nelson John Ferreira, Ph.D., P. Eng.
Geotechnical Engineer, Principal
Tel: 204.975.9433 ext. 103

cc: Angela Fidler-Kliewer C.Tech. (TREK Geotechnical)

Revision History

Revision No.	Author	Issue Date	Description
0	AFK	December 20, 2018	Draft Report

Authorization Signatures

Prepared By:

Angela Fidler-Kliewer, C. Tech
Manager of Laboratory and Field Services

PROVINCE OF MANITOBA
N. J. FERREIRA
Member
22892
REGISTERED PROFESSIONAL ENGINEER

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
TREK GEOTECHNICAL INC.
No. 4877 Date: Dec. 20, 2018

Reviewed By:

Nelson John Ferreira, Ph.D., P.Eng.
Geotechnical Engineer

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1.0 Introduction

This report summarizes the results of the road investigation completed for the 19-B-01 Fermor Reconstruction project. The test holes were located along Fermor Avenue, Niakwa Rd East, Lagimodiere Blvd and Dawson Rd South. The information collected describes the pavement structure of the existing road as well as the soil stratigraphy beneath the pavement structure at select locations.

2.0 Road Investigation and Laboratory Program

The investigation included coring of pavement or a combination of coring and drilling test holes. Nine test holes were drilled off existing roads on natural ground. Morrison Hershfield selected the investigation locations as shown on Figure 01 to Figure 05 (attached). Table 01 below summarizes the investigation program for each street.

Table 01: Road Investigation Program

Local Alley	# of Locations	Investigation
Fermor Avenue	27	18 Test Holes on existing road and 9 off the existing road alignment
Niakwa Rd East	1	Test Hole
Lagimodiere Blvd	1 2	Test Hole Pavement Cores Only
Dawson Rd South	1	Test Hole

The road investigation was conducted between November 14, 2018 and November 26, 2018. The pavement structure (asphalt and/or concrete) was cored by Jashan Bhullar of TREK Geotechnical Inc. (TREK) using a portable coring press equipped with a hollow 150 mm diameter diamond core drill bit. Eighteen of the test holes were drilled to a depth of 3.0 m below road surface by Maple Leaf Drilling Ltd. using a truck mounted drill rig equipped with 125 mm diameter solid stem augers except for TH18-04 and TH18-07 which were drilled to 9.1 m below ground. Ten test holes were drilled using a 50 mm diameter hand auger to 2.0 m below ground. The sub-surface conditions were observed during drilling and visually classified by Dawn Sellick of TREK. Other pertinent information such as groundwater and drilling conditions were also recorded during the drilling investigation. Disturbed (auger cuttings) samples retrieved during the sub-surface investigation were transported to TREK's material testing laboratory for further testing. Core samples were also retrieved and logged at TREK's material testing laboratory.

Core and test hole locations noted on the summary tables and test hole logs are based on their location relative to the nearest address, and measured distances from the edge of pavement or other permanent features.

The laboratory testing program consisted of moisture content determination on all samples, as well as Atterberg limits, and grain size analysis (mechanical sieve and hydrometer methods) on select samples between 0.5 and 1.0 m below pavement. Laboratory testing results are included on the test hole logs in Appendix A, while the individual test results are included in Appendix B with a summary table. Photos of the asphalt and concrete pavement cores are included in Appendix C. Summary table and photos of additional asphalt and concrete pavement cores are included in Appendix D.

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 Morrison Hershfield (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

TREK GEOTECHNICAL

0035 075 00
Morrison Hershfield
19-B-01 Fermor Avenue Reconstruction

0 10 20 30 40 50 m
SCALE = 1 : 1 000 (279 mm x 432 mm)

LEGEND:
- TEST HOLE (TREK, NOVEMBER 2018)
- PAVEMENT CORE (TREK, NOVEMBER 2018)

NOTES:
1. AERIAL PHOTOGRAPH FROM CITY OF WINNIPEG 2016

Figure 01
TEST HOLE LOCATION PLAN

FIGURE 01
FIGURE 02

Z:\Projects\0035 Morrison Hershfield\0035 075 00 19-B-01 Fermor Ave Reconstruction\3 Survey and Dwg\3.4 CAD\3.4.3 Working Folder\Fig_2018-12-06_Fermor Ave_0_A_DW_0035 075 00.dwg, 12/12/2018 8:37:12 AM (11.00 x 17.00 Inches)

TREK GEOTECHNICAL

0035 075 00
Morrison Hershfield
19-B-01 Fermor Avenue Reconstruction

0 10 20 30 40 50 m
SCALE = 1 : 1 000 (279 mm x 432 mm)

LEGEND: TEST HOLE (TREK, NOVEMBER 2018)

NOTES:
1. AERIAL PHOTOGRAPH FROM CITY OF WINNIPEG 2016

Figure 02
TEST HOLE LOCATION PLAN

Z:\Projects\0035 Morrison Hershfield\0035 075 00 19-B-01 Fermor Ave Reconstruction\3 Survey and Dwg\3.4 CAD\3.4.3 Working Folder\Fig_2018-12-06_Fermor Ave_0_A_DW_0035 075 00.dwg, 12/11/2018 11:53:18 PM, (11.00 x 17.00 Inches)

TREK GEOTECHNICAL

0035 075 00
Morrison Hershfield
19-B-01 Fermor Avenue Reconstruction

0 10 20 30 40 50 m
SCALE = 1 : 1 000 (279 mm x 432 mm)

LEGEND: TEST HOLE (TREK, NOVEMBER 2018)

NOTES:
1. AERIAL PHOTOGRAPH FROM CITY OF WINNIPEG 2016

Figure 03
TEST HOLE LOCATION PLAN

TREK GEOTECHNICAL

0035 075 00
Morrison Hershfield
19-B-01 Fermor Avenue Reconstruction

0 10 20 30 40 50 m
SCALE = 1 : 1 000 (279 mm x 432 mm)

LEGEND: TEST HOLE (TREK, NOVEMBER 2018)

NOTES:
1. AERIAL PHOTOGRAPH FROM CITY OF WINNIPEG 2016

Figure 04
TEST HOLE LOCATION PLAN

NIAKWA ROAD EAST

FERMOR AVENUE / TRAN CANADA HWY 1

PLESSIS ROAD

TH18-22

TH18-23

TH18-24

TH18-25

FIGURE 04

FIGURE 05

0 10 20 30 40 50 m

SCALE = 1 : 1 000 (279 mm x 432 mm)

LEGEND: TEST HOLE (TREK, NOVEMBER 2018)

NOTES:
1. AERIAL PHOTOGRAPH FROM CITY OF WINNIPEG 2016

Figure 05
TEST HOLE LOCATION PLAN

Appendix A

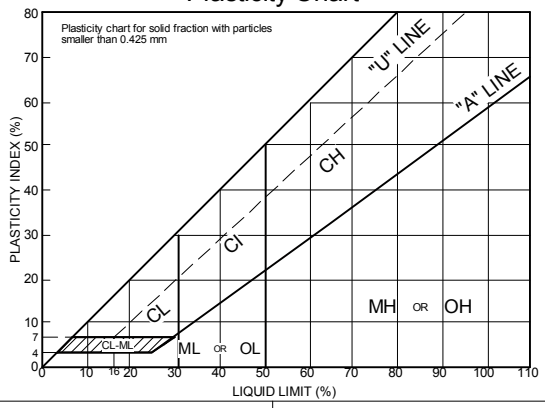
Test Hole Logs

EXPLANATION OF FIELD AND LABORATORY TESTING

GENERAL NOTES

1. 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.
2. 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.
3. 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
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)	Clean gravel (Little or no fines)	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..... Borderline case4s 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
			GP		Poorly-graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW
		Gravel with fines (Appreciable amount of fines)	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
			GC		Clayey gravels, gravel-sand-silt mixtures	Atterberg limits above "A" line or P.I. greater than 7
	Sands (More than half of coarse fraction is smaller than 4.75 mm)	Clean sands (Little or no 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
			SP		Poorly-graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM		Silty sands, 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
			SC		Clayey sands, sand-clay mixtures	Atterberg limits above "A" line or P.I. greater than 7
Fine-Grained soils (More than half the material is smaller than No. 200 sieve size)	Silts 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
			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	
	Silts and Clays (Liquid limit greater than 50)		MH		Inorganic silts, micaceous or distomaceous fine sandy or silty soils, organic silts	
			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



Particle Size			Material
ASTM Sieve sizes	mm		
#10 to #4	2.00 to 4.75		Sand
#40 to #10	0.425 to 2.00		Coarse
#200 to #40	0.075 to 0.425		Medium
< #200	< 0.075		Fine
			Silt or Clay

Particle Size			Material
ASTM Sieve Sizes	mm		
> 12 in.	> 300		Boulders
3 in. to 12 in.	75 to 300		Cobbles
3/4 in. to 3 in.	19 to 75		Gravel
#4 to 3/4 in.	4.75 to 19		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

EXPLANATION OF FIELD AND LABORATORY TESTING

LEGEND OF ABBREVIATIONS AND SYMBOLS

LL - Liquid Limit (%)
PL - Plastic Limit (%)
PI - Plasticity Index (%)
MC - Moisture Content (%)
SPT - Standard Penetration Test
RQD - Rock Quality Designation
Qu - Unconfined Compression
Su - Undrained Shear Strength
VW - Vibrating Wire Piezometer
SI - Slope Inclinometer

▽ Water Level at Time of Drilling

▼ Water Level at End of Drilling

▼ Water Level After Drilling as Indicated on Test Hole Logs

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:

Descriptive Terms	SPT (N) (Blows/300 mm)
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:

Descriptive Terms	SPT (N) (Blows/300 mm)
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:

Descriptive Terms	Undrained Shear Strength (kPa)
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 TH18-01
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524424, E-639861
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 21, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 95 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel				
		CONCRETE - 225 mm thick				
0.5		CLAY (FILL) - silty, trace sand, trace gravel (<20 mm diam.), grey, moist, soft, high plasticity		G60		
		CLAY - silty, trace sand - grey - moist, stiff - high plasticity		G61		
1.0		- stiff to very stiff below 0.9 m		G62		
		- trace silt inclusions (<5 mm diam.) below 1.2 m		G63		
1.5		- mottled dark grey to black, trace sand below 1.5 m		G64		
				G65		
2.0						
2.5						
3.0		SILT AND CLAY - light brown, moist, soft, high plasticity		G66		

END OF HOLE AT DEPTH 3.0 m IN SILT AND CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, bentonite chips and cold patch asphalt.
3) Test hole located in Eastbound lane, 5.5 m South of North edge of road and 319 m West of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-02
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524427, E-639969
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 21, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL	Undrained Shear Strength (kPa) Test Type: Torvane, Pocket Pen., Qu, Field Vane 0 50 100 150 200 250
		ASPHALT - 95 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel				
		CONCRETE - 210 mm thick				
0.5		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.) - dark grey - moist, stiff - high plasticity		G67		
		CLAY - silty, trace sand - dark grey - moist, stiff to very stiff - high plasticity		G68		
1.0				G69		
1.5				G70		
		- trace silt inclusions (<10 mm diam.) below 1.7 m		G71		
2.0				G72		
2.5		SILT AND CLAY - trace sand - light brown - moist, soft - high plasticity		G73		
3.0						

END OF HOLE AT DEPTH 3.0 m IN SILT AND CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, bentonite chips and cold patch asphalt.
3) Test hole located in Eastbound lane, 4.9 m South of North edge of road and 215 m West of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-03
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524428, E-640074
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 21, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 110 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel				
		CONCRETE - 200 mm thick				
0.5		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.) - mottled dark grey to black - moist, very stiff - high plasticity		G74		
				G75		
1.0		ORGANIC CLAY (TOPSOIL) - silty, trace coarse sand - dark grey - moist, very stiff - high plasticity		G76		
1.5		- trace gravel (<10 mm diam.), trace organics, black, very stiff to stiff below 1.4 m.		G77		
		- no gravel below 1.6 m.		G78		
2.0		CLAY - silty - mottled grey to black - moist, stiff - high plasticity		G79		
2.5						
3.0		- mottled grey to black to grey below 2.9 m.		G80		

END OF HOLE AT DEPTH 3.0 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, bentonite chips and cold patch asphalt.
3) Test hole located in Eastbound lane, 9.3 m South of North edge of road and 113 m West of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-04

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524439, E-640126
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 21, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL	Undrained Shear Strength (kPa) 0 50 100 150 200 250
		ASPHALT - 190 mm thick				
		CONCRETE - 190 mm thick				
		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.) - grey - moist, stiff - high plasticity		G81		
0.5				G82		
		- stiff to very stiff below 0.76 m.				
1.0		- grey to dark grey, no gravel below .91 m.		G83		
		ORGANIC CLAY (TOPSOIL) - trace sand - mottled grey to black - moist, very stiff - high plasticity		G84		
1.5		- trace gravel (<10 mm diam.)		G85		
		CLAY - silty, trace sand - grey - moist, stiff - high plasticity		G86		
2.0						
		- no sand below 2.3 m.		G87		
2.5						
3.0		SILT - some clay - light brown, moist, soft, low plasticity		G88		
		CLAY - silty, trace silt inclusions (<5 mm diam.) - grey - moist, firm - high plasticity				
3.5				G89		
4.0						

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-04
2 of 2

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
5.0				T90
5.5				G91
6.0				
6.5				
7.0		- trace silt inclusions (<10 mm diam.), grey to brown, soft below 6.8 m.		G92
7.5				
8.0				T93
8.5				
9.0				G94

Bulk Unit Wt (kN/m³): 16 17 18 19 20 21
Particle Size (%): 0 20 40 60 80 100
PL MC LL: 0 20 40 60 80 100
Undrained Shear Strength (kPa): 0 50 100 150 200 250
Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○

END OF HOLE AT DEPTH 9.1 m IN CLAY
1) Seepage below 7.1 m depth.
2) Sloughing below 3.9 m depth.
3) Test hole backfilled with auger cuttings, bentonite chips and cold patch asphalt.
4) Test hole located in Eastbound lane, 1.7 m South of North edge of road and 54 m West of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-05
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524432, E-640170
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 21, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✿ Pocket Pen. ✿ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 90 mm thick				
		CONCRETE - 210 mm thick				
0.5		CLAY (FILL) - silty, trace sand - mottled grey to black - moist, very stiff - high plasticity		G95	●	✿△
				G96	●	△ ✿
1.0				G97	●	△✿
		ORGANIC CLAY (TOPSOIL) - silty, trace sand - black - moist, very stiff, high plasticity		G98	●	△✿
1.5		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.), black, moist, very stiff, high plasticity - mottled grey to black to grey below 1.7 m.		G99	●	△✿
2.0		CLAY - silty - brown - moist, very stiff - high plasticity		G100	●	△ ✿
2.5		SILT AND CLAY - trace sand - light brown - moist, firm - high plasticity		G101	●	✿△
3.0						

END OF HOLE AT DEPTH 3.0 m IN SILT AND CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, bentonite chips and cold patch asphalt.
3) Test hole located in Eastbound lane, 3.7 m North of yieldcurb and 14 m West of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-06
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524433, E-640220
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	50 mm Hand Auger	**Date Drilled:**	November 26, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✿ Pocket Pen. ✿ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 40 mm thick				
		CONCRETE - 200 mm thick				
		SAND (FILL) - trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular, "Pit Run," <20 mm diam.		G233		
0.5		CLAY - silty, trace sand, trace gravel (<20 mm diam.) - dark grey - moist, soft - high plasticity - soft to stiff below 0.8 m.		G234		
				G235		
1.0				G236		
				G237		
1.5		- trace organics below 1.5 m.		G238		
				G239		
2.0						

END OF HOLE AT DEPTH 2.1 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Eastbound lane, 3 m North of South edge of road and 13.5 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-07

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524439, E-640261
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21	Particle Size (%) 0 20 40 60 80 100	PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 35 mm thick						
		CONCRETE - 205 mm thick						
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel						
		CLAY (FILL) - silty, trace sand, trace gravel (<10 mm diam.), trace organics - dark grey - moist, firm - high plasticity		G123				
0.5		- firm to stiff below 0.6 m.		G124				
1.0		- dark grey to black, no gravel below .91 m.		G125				
		- no sand below 1.2 m.		G126				
1.5		ORGANIC CLAY (TOPSOIL) - silty, trace sand, trace gravel (<10 mm diam.), trace organics - black - moist, stiff - high plasticity		G127				
2.0		- trace silt layer (<20 mm diam.), stiff to firm below 1.8 m.		G128				
		CLAY - silty - grey - moist, stiff - high plasticity		G129				
2.5								
		- stiff to firm, trace coarse sand below 1.8 m.		G130				
3.0								
3.5								
4.0		- firm to stiff below 4.0 m.						

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-07

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
5.0				T131
5.5				
6.0		- trace precipitates (sulphate, <5 mm diam.), soft to stiff below 5.9 m.		G132
6.5				
7.0				
7.5				
8.0				T133
8.5				
9.0		- grey to brown below 8.8 m.		G134

Bulk Unit Wt (kN/m³): 16 17 18 19 20 21

Particle Size (%): 0 20 40 60 80 100

PL MC LL: 0 20 40 60 80 100

Undrained Shear Strength (kPa): 0 50 100 150 200 250

Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○

END OF HOLE AT DEPTH 9.1 m IN CLAY

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, bentonite chips and cold patch asphalt.
3) Test hole located in Eastbound lane, 1.6 m South of North edge of road and 47 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-08
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524434, E-640357
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 70 mm thick				
		CONCRETE - 215 mm thick				
0.5		SAND AND GRAVEL (FILL) - <20 mm diam. limestone, trace silt, trace clay - light brown to grey - moist, compact - well graded, sub-angular to angular gravel		G135	●	
		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.) - dark grey - moist, stiff, high plasticity		G136	●	△ ✤
1.0		ORGANIC CLAY (TOPSOIL) - silty, trace coarse sand, trace organics, trace oxidation - mottled dark grey to black - moist, stiff, high plasticity		G137	●	△ ✤
1.5		CLAY - silty, trace sand - grey - moist, stiff - high plasticity		G138	●	△ ✤
				G139	●	△ ✤
2.0		- trace precipitates (sulphate, <10 mm diam)		G140	●	△ ✤
		- grey to brown below 2.3 m.		G141	●	△ ✤
2.5						
3.0						

END OF HOLE AT DEPTH 3.0 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Eastbound lane, 10.5 m South of North edge of road and 142 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-09

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524458, E-640457
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 70 mm thick				
		CONCRETE - 225 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G210	●	
0.5		CLAY (FILL) - silty, trace sand, trace gravel (<10 mm diam.) - mottled dark grey to black - moist, very stiff - high plasticity		G211	●	✤ △
				G212	●	✤ △
1.0		ORGANIC CLAY (TOPSOIL) - silty, trace sand, trace organics - black - moist, soft - low plasticity		G213	●	✤ △
1.5		CLAY - silty, trace sand - grey - moist, firm - high plasticity		G214	●	✤ △
				G215	●	✤ △
2.0				G216	●	✤ △
2.5		- grey to brown, soft to firm below 2.4 m.				
3.0						

END OF HOLE AT DEPTH 3.0 m IN CLAY

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Eastbound lane, 6 m North of meridiancurb and 100 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-10
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524431, E-640497
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 95 mm thick				
		SAND AND GRAVEL (FILL) - <20 mm diam. limestone, trace silt, trace clay - light brown to grey - moist, compact - well graded, sub-angular to angular gravel		G217	●	
				G218	●	
0.5				G219	●	
1.0				G220	●	
				G221	●	
1.5		CLAY - silty, trace sand, trace gravel (< 20 mm diameter) - brown - moist, firm - high plasticity		G222	●	✤
				G223	●	△✤
2.0						
2.5						
3.0						

END OF HOLE AT DEPTH 3.0 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Eastbound lane, 1.5 m South of North edge of road and 129 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-11
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524438, E-640565
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 14, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		CLAY - silty, trace sand, trace gravel (<15 mm diam.) - mottled brown to grey - frozen to 0.1 m, moist and soft when thawed - high plasticity		G01		
		- soft to firm below 0.3 m.		G02		
0.5		- mottled brown to grey below 0.6 m.		G03		
				G04		
1.0		- firm to stiff, trace organics below 1.07 m.		G05		
				G06		
1.5				G07		
		- trace silt inclusions (<5 mm diam.) below 1.8 m.		G08		
2.0		END OF HOLE AT DEPTH 2.1 m IN CLAY				

1) Seepage below 0.8 m depth.
2) No sloughing observed.
3) Test hole backfilled with auger cuttings.
4) Test hole located 6 m South of outside edge of Fermor Avenue Eastbound lane and 360 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-12
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524460, E-640659
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: Torvane, Pocket Pen., Qu, Field Vane 0 50 100 150 200 250
		ASPHALT - 65 mm thick				
		CONCRETE - 205 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G203	●	
0.5		CLAY (FILL) - silty, trace sand - mottled black to grey - moist, stiff - high plasticity		G204	●	△ ✤
				G205	●	△ ✤
1.0		ORGANIC CLAY (TOPSOIL) - trace sand - black - moist, very stiff - low plasticity		G206	●	✤
1.5		CLAY - silty, trace sand - grey - moist, very stiff - high plasticity		G207	●	△ ✤
		- trace precipitates (sulphate, <10 mm diam.) below 1.7 m.		G208	●	✤ △
2.0				G209	●	✤ △
2.5		- grey to brown below 2.3 m.				
3.0		END OF HOLE AT DEPTH 3.0 m IN CLAY				

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Westbound lane, 3 m South of North edge of road and 300 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-13
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524442, E-640759
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 14, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL	Undrained Shear Strength (kPa) 0 50 100 150 200 250
		CLAY - silty, trace sand, trace gravel (<15 mm diam.), trace organics - grey - frozen to 0.1 m, moist and firm when thawed - high plasticity		G09		
		- mottled grey to dark grey, no gravel below 0.3 m.		G10		
0.5				G11		
		- grey to brown below 0.9 m.		G12		
1.0				G13		
		- trace silt inclusions (<5 mm diam.) below 1.5 m.		G14		
1.5						
		- firm to stiff below 1.8 m.		G15		
2.0						

END OF HOLE AT DEPTH 2.1 m IN CLAY
1) Seepage below 1.4 m depth.
2) No sloughing observed.
3) Test hole backfilled with auger cuttings.
4) Test hole located 8.3 m South of outside edge of Fermor Avenue Eastbound lane and 556 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-14
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524465, E-640859
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL	Undrained Shear Strength (kPa) Test Type: Torvane, Pocket Pen., Qu, Field Vane 0 50 100 150 200 250
		ASPHALT - 70 mm thick				
		CONCRETE - 200 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G196		
0.5		CLAY (FILL) - silty, trace sand - grey - moist, stiff - high plasticity		G197		
1.0				G198		
		ORGANIC CLAY (TOPSOIL) - trace sand, trace organics - black - moist, very stiff - low plasticity		G199		
1.5		CLAY - silty, trace sand - grey - moist, firm - high plasticity		G200		
				G201		
2.0						
2.5				G202		
3.0		END OF HOLE AT DEPTH 3.0 m IN CLAY				

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Westbound lane, 1.9 m South of North edge of road and 496 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-15
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524450, E-640959
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 14, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		CLAY - silty, trace sand, trace organics - grey - frozen to 0.1 m, moist and stiff when thawed - high plasticity		G16		
0.5				G17		
		SILT AND CLAY - trace organics - light brown - moist, soft - medium plasticity		G18		
1.0		CLAY - silty, trace silt inclusions (<10 mm diam.) - grey - moist, stiff - high plasticity		G19		
				G20		
1.5				G21		
		- stiff to firm below 1.8 m.		G22		
2.0		END OF HOLE AT DEPTH 2.0 m IN CLAY				

1) Seepage below 0.6 m depth
2) Water level at 0.2 m depth immediately after drilling.
3) No sloughing observed.
4) Test hole backfilled with auger cuttings.
5) Test hole located 9 m South of outside edge of Fermor Avenue Eastbound lane and 759 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-16
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524495, E-640993
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		CONCRETE - 180 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G165	●	
0.5		CLAY (FILL) - trace sand, trace gravel (<30 mm diam.) - black - moist, stiff - high plasticity		G166	●	
				G167	●	△
1.0				G168	●	△ ✤
		CLAY - silty, trace sand, trace silt inclusions (<5 mm diam.) - grey - moist, stiff - high plasticity		G169	●	△ ✤
1.5		- grey to brown below 1.7 m.		G170	●	△ ✤
2.0				G171	●	△ ✤
		SILT AND CLAY - light brown, moist, soft, high plasticity		G172	●	△ ✤
2.5		CLAY - silty, trace precipitates (sulphates, <5 mm diam.) - brown - moist, firm - high plasticity		G173	●	✤
3.0						

END OF HOLE AT DEPTH 3.0 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Southbound lane, 2.8 m East of West edge of Niakwa Rd. and 21 m North of Fermor Avenue Westbound Lane.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-17

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524398, E-640997
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 21, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
0.0		CLAY (FILL) - silty, trace sand, trace organics - brown - frozen to 0.3 m, moist and firm when thawed - high plasticity		G102		
0.5		- firm to stiff below 0.3 m.		G103		
		CLAY - silty, trace sand - brown - moist, stiff - high plasticity		G104		
1.0				G105		
		- brown to light brown below 1.2 m.		G106		
1.5		SILT AND CLAY - trace oxidation - light brown - moist, firm - high plasticity		G107		
		CLAY - silty - grey - moist, stiff - high plasticity		G108		
2.0				G109		
2.5		SILT AND CLAY - trace oxidation - light brown - moist, firm - high plasticity				
		CLAY - silty, trace silt inclusions (<5 mm diam.) - brown - moist, firm - high plasticity		G110		
3.0						
3.5						
4.0						

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-17
2 of 2

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
5.0				T111
5.5				
6.0				G112
6.5				
7.0		- firm to soft below 6.8 m.		G113
7.5				
8.0				T114
8.5				
9.0				G115

Bulk Unit Wt (kN/m³): 16 17 18 19 20 21
Particle Size (%): 0 20 40 60 80 100
PL MC LL: 0 20 40 60 80 100
Undrained Shear Strength (kPa): 0 50 100 150 200 250
Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○

END OF HOLE AT DEPTH 9.1 m IN CLAY
1) Seepage below 3.0 m depth.
2) Water level at 4.6 m depth immediately after drilling.
3) Sloughing below 7.0 m depth.
4) Test hole backfilled with auger cuttings.
5) Test hole located in 69 m South of outside edge of Eastbound lane and 11 m East of Niakwa Road East.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-18

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524470, E-641063
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: Torvane, Pocket Pen., Qu, Field Vane 0 50 100 150 200 250
		ASPHALT - 70 mm thick				
		CONCRETE - 200 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G188	●	
0.5		CLAY (FILL) - silty, trace sand - grey - moist, stiff - high plasticity		G189	●	△ ✤
1.0		ORGANIC CLAY (TOPSOIL) - trace sand, trace organics - black - moist, firm - low plasticity		G190	●	△ ✤
				G191	●	△ ✤
1.5		CLAY - silty - grey - moist, firm - high plasticity		G192	●	△ ✤
				G193	●	△ ✤
2.0						
		SILT AND CLAY - light grey - moist, soft - high plasticity		G194	●	△✤
2.5						
		CLAY - silty - brown - moist, stiff, high plasticity		G195	●	△✤
3.0						

END OF HOLE AT DEPTH 3.0 m IN CLAY

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Westbound lane, 2.2 m South of North edge of road and 694 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-19
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524451, E-641158
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 14, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		CLAY - silty, trace sand, trace organics - grey - frozen to 0.1 m, moist and firm when thawed - high plasticity		G23		
0.5				G24		
		- firm to stiff below 0.6 m.		G25		
1.0		- no organics, silt inclusions (<5 mm diam.) below 0.9 m.		G26		
		- no sand below 1.2 m.		G27		
1.5				G28		
		- stiff to firm below 1.8 m.		G29		
2.0		END OF HOLE AT DEPTH 2.0 m IN CLAY				

1) Seepage below 0 m depth.
2) No sloughing observed.
3) Test hole backfilled with auger cuttings.
4) Test hole located 10 m South of outside edge of Fermor Avenue Eastbound lane and 957 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-20
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524473, E-641249
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: Torvane, Pocket Pen., Qu, Field Vane 0 50 100 150 200 250
		ASPHALT - 60 mm thick				
		CONCRETE - 210 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G181		
0.5		CLAY (FILL) - silty, trace sand, trace gravel (<10 mm diam.) - dark grey - moist, stiff - high plasticity		G182		
1.0				G183		
				G184		
1.5		ORGANIC CLAY (TOPSOIL) - trace sand, trace organics, trace silt inclusions (<5 mm diam.) - black - moist, firm - low plasticity		G185		
				G186		
		CLAY - silty, trace sand, trace organics - mottled grey to black - moist, stiff - high plasticity		G187		
2.0						
2.5						
3.0						

END OF HOLE AT DEPTH 3.0 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Westbound lane, 6.5 m South of North edge of road and 886 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-21
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524456, E-641358
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 14, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.), trace organics - mottled grey to black - frozen to 0.1 m, moist and firm when thawed, high plasticity		G30		
0.5		CLAY - silty, trace sand - grey - moist, stiff - high plasticity - stiff to very stiff below 0.6 m.		G31		
				G32		
1.0		SILT AND CLAY - trace silt inclusions (<5 mm diameter) - light brown - moist, firm, intermediate to high plasticity		G33		
		CLAY - silty, trace silt inclusions (<5 mm diameter) - grey - moist, stiff - high plasticity		G34		
1.5				G35		
				G36		
2.0		END OF HOLE AT DEPTH 2.0 m IN CLAY				

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings.
3) Test hole located 8.8 m South of outside edge of Fermor Avenue Eastbound lane and 1156 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-22

Client: Morrison Hershfield
Project Number: 0035-075-00
Project Name: 19-B-01 - Fermor Avenue Reconstruction
Location: UTM N-5524466, E-641462
Contractor: Maple Leaf Drilling
Ground Elevation: Top of Pavement
Method: 125mm Solid Stem Auger, B40 Mobile Truck Mount
Date Drilled: November 22, 2018

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/m³) 16 17 18 19 20 21	Particle Size (%) 0 20 40 60 80 100	PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 45 mm thick						
		CONCRETE - 205 mm thick						
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G174	●			
0.5		CLAY (FILL) - silty, trace sand - brown - moist, stiff - high plasticity		G175	●			△ ✤
		- trace silt inclusions (<5 mm diam.) below 0.7 m.		G176	●			△ ✤
1.0				G177	●			△ ✤
1.5		ORGANIC CLAY (TOPSOIL) - trace organics - black - moist, soft, low plasticity		G178	●			△ ✤
		CLAY - silty - grey - moist, stiff - high plasticity		G179	●			△ ✤
2.0								
2.5		SILT AND CLAY - light brown - moist, firm - high plasticity		G180	●			△
3.0								

END OF HOLE AT DEPTH 3.0 m IN SILT AND CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Westbound lane, 2 m South of North edge of road and 1091 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-23
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524428, E-641575
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 120 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay - light brown to grey - moist, compact - poorly graded, sub-angular to angular gravel		G142		
0.5		CLAY (FILL) - silty, trace sand - grey - moist, stiff - high plasticity		G143		
1.0				G144		
				G145		
1.5		- trace gravel (<10 mm diam.), grey to mottled grey to black below 1.5 m.		G146		
				G147		
2.0		SILT AND CLAY - trace sand - light brown - moist, soft, high plasticity		G148		
		CLAY - silty - brown - moist, stiff - high plasticity		G149		
2.5						
3.0		END OF HOLE AT DEPTH 3.0 m IN CLAY				

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Eastbound lane, 2 m North of South edge of road and 1200 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-24

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524422, E-641665
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL	Undrained Shear Strength (kPa) Test Type: Torvane, Pocket Pen., Qu, Field Vane 0 50 100 150 200 250
		ASPHALT - 85 mm thick				
		CONCRETE - 205 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G158		
0.5		CLAY (FILL) - silty, trace sand, grey, moist, soft, high plasticity		G159		
		CLAY - silty, trace sand - brown - moist, very stiff - high plasticity		G160		
1.0				G161		
				G162		
1.5		- brown to grey, trace gravel (<10 mm diam.) below 1.6 m.		G163		
2.0						
2.5						
		- grey to brown below 2.9 m.		G164		
3.0		END OF HOLE AT DEPTH 3.0 m IN CLAY				

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Westbound lane, 4.7 m South of North edge of road and 1296 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-25
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524391, E-641764
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21	Particle Size (%) 0 20 40 60 80 100	PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 90 mm thick						
		CONCRETE - 210 mm thick						
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G150				
0.5		CLAY - silty, trace sand - brown - moist, very stiff - high plasticity		G151				
				G152				
1.0				G153				
		- brown to grey below 1.4 m.		G154				
1.5				G155				
				G156				
2.0								
2.5		SILT AND CLAY - light brown - moist, soft - low plasticity		G157				
3.0								

END OF HOLE AT DEPTH 3.0 m IN SILT AND CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Eastbound lane, 4.7 m North of South edge of road and 1405 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-26
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524362, E-640208
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) 0 50 100 150 200 250 — Test Type: △ Torvane △, ✤ Pocket Pen. ✤, ☒ Qu ☒, ○ Field Vane ○
		ASPHALT - 70 mm thick				
		CONCRETE - 210 mm thick				
		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.), trace oxidation - mottled grey to dark grey - moist, firm - high plasticity		G116	●	△ ✤
0.5		CLAY - trace silt laminations (<5 mm thick), trace oxidation - brown - moist, very stiff - high plasticity		G117	●	△ ✤
1.0		- mottled grey to dark grey, firm to stiff below 0.9 m.		G118	●	△ ✤
		- dark grey to brown below 1.2 m.		G119	●	△ ✤
1.5				G120	●	△ ✤
				G121	●	△ ✤
2.0						
2.5						
3.0		SILT - trace clay, light brown, moist, soft, low plasticity		G122	●	△

END OF HOLE AT DEPTH 3.0 m IN SILT
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located in Northbound lane, 1.4 m West of East edge of road and 71 m South of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-27
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524383, E-640292
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 20, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G51		
		CLAY (FILL) - silty, trace sand, trace gravel (<15 mm diam.), trace organics - black - moist, firm - high plasticity		G53		
0.5		- black to mottled black to grey, no gravel, no sand below 0.3 m.		G54		
		CLAY - silty - grey - moist, stiff - high plasticity		G55		
1.0		- trace orgainics below 0.9 m.		G56		
		- trace silt inclusions (<5 mm diameter), stiff to very stiff below 1.8 m.		G57		
1.5		- no organics, stiff to very stiff below 1.5 m.		G58		
		- trace precipitates (sulphate, <10 mm diam.) below 1.8 m.		G59		
2.0						

END OF HOLE AT DEPTH 2.1 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings and sand.
3) Test hole located 55 m South of outside edge of Fermor Avenue Eastbound lane and 85 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-28
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524271, E-640588
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, B40 Mobile Truck Mount	**Date Drilled:**	November 22, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL	Undrained Shear Strength (kPa) Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		ASPHALT - 90 mm thick				
		SAND (FILL) - gravelly, trace silt, trace clay, light brown to grey, moist, compact, poorly graded, sub-angular to angular gravel		G224		
0.5				G225		
		CLAY - silty - brown - moist, stiff - high plasticity		G226		
1.0				G227		
				G228		
1.5				G229		
				G230		
2.0						
2.5		SILT AND CLAY - grey, moist, firm, high plasticity		G231		
		CLAY - silty - brown - moist, firm - high plasticity		G232		
3.0						

END OF HOLE AT DEPTH 3.0 m IN CLAY
1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings, gravel and cold patch asphalt.
3) Test hole located 3.6 m South of outside edge of Westbound lane of Dawson Road South and 5 m West of Northbound curb of Royal Mint Drive.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-29
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524335, E-640619
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 20, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		CLAY (FILL) - silty, trace organics - mottled grey to black - frozen to 0.1 m, moist and firm when thawed, high plasticity		G44		
0.5		CLAY - silty - grey - moist, stiff - high plasticity		G45		
				G46		
1.0		- trace silt inclusions (<5 mm diam.) below 0.9 m.		G47		
		- stiff to very stiff below 1.2 m.		G48		
1.5				G49		
		SILT AND CLAY - trace sand, light brown, moist, stiff, intermediate plasticity		G50		
2.0						

END OF HOLE AT DEPTH 2.1 m IN SILT AND CLAY
1) Seepage below 2.0 m depth.
2) No sloughing observed.
3) Test hole backfilled with auger cuttings.
4) Test hole located 127 m South of outside edge of Fermor Avenue Eastbound lane and 414 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Sub-Surface Log

Test Hole TH18-30
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-075-00
Project Name:	19-B-01 - Fermor Avenue Reconstruction	**Location:**	UTM N-5524395, E-640623
Contractor:	Maple Leaf Drilling	**Ground Elevation:**	Existing Ground
Method:	50 mm Hand Auger	**Date Drilled:**	November 20, 2018

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/m³) 16 17 18 19 20 21 / Particle Size (%) 0 20 40 60 80 100 / PL MC LL 0 20 40 60 80 100	Undrained Shear Strength (kPa) Test Type △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○ 0 50 100 150 200 250
		CLAY (FILL) - silty, trace sand, trace gravel, trace organics - mottled dark grey to black - frozen to 0.1 m, moist and firm when thawed - high plasticity		G37		△ ✤
0.5		CLAY - silty - grey - moist, stiff - high plasticity		G38		△ ✤
		- stiff to very stiff below 0.6 m.		G39		△ ✤
1.0				G40		✤
		- trace silt inclusions (<5 mm diam.).		G41		✤ △
1.5		- grey to brown below 1.5 m.		G42		✤
		- very stiff to stiff below 1.8 m.		G43		△ ✤
2.0		END OF HOLE AT DEPTH 2.1 m IN CLAY				

1) No seepage or sloughing observed.
2) Test hole backfilled with auger cuttings.
3) Test hole located 55 m South of outside edge of Fermor Avenue Eastbound lane and 419 m East of Fermor Avenue and Lagimodiere Boulevard intersection.

Logged By: Dawn Sellick **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-12-05_FERMOR AVE RECONS_0035-075-00_0_B_DS.GPJ TREK GEOTECHNICAL.GDT 12/20/18

Appendix B

Summary Table & Lab Testing Results

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Fermor Avenue

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-01	UTM : 5524424 N, 639861 E Located in Eastbound land, 5.5 m South of Median curb and 319 m West of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	95	Limestone	80	Clay (Fill)	0.4	0.5	11							
				Concrete	225	Clay	0.6	0.8	32	75	21	3	0	23	85	62
						Clay	0.9	1.1	28							
						Clay	1.2	1.4	30							
						Clay	1.5	1.7	35							
						Clay	1.8	2.0	31							
						Silt and Clay	2.9	3	29							
TH18-02	UTM : 5524427 N, 639969 E Located in Eastbound lane, 4.9 m South of Median curb and 215.2 m West of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	95	Limestone	95	Clay (Fill)	0.3	0.6	21							
				Concrete	210	Clay	0.8	0.9	26							
						Clay	1.1	1.2	33							
						Clay	1.4	1.5	30							
						Clay	1.7	1.8	34							
						Clay	2.0	2.1	36							
						Silt and Clay	2.6	2.7	36							
TH18-03	UTM : 5524428 N, 640074 E Located in Eastbound lane, 9.3 m South of Median curb and 113 m West of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	110	Limestone	90	Clay (Fill)	0.5	0.6	20.9							
				Concrete	200	Clay (Fill)	0.8	0.9	39							
						Organic Clay (Topsoil)	1.1	1.2	29							
						Organic Clay (Topsoil)	1.4	1.5	33							
						Organic Clay (Topsoil)	1.7	1.8	35							
						Clay	2.0	2.1	33							
						Clay	2.9	3.0	33							
TH18-04	UTM : 5524439 N, 640126 E Located in Eastbound land, 1.7 m South of Median curb and 54 m West of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	190	Concrete	190	Clay (Fill)	0.4	0.5	16							
						Clay (Fill)	0.6	0.8	32	74	22	4	0	25	86	62
						Clay (Fill)	0.9	1.1	29							
						Organic Clay (Topsoil)	1.2	1.4	34							
						Organic Clay (Topsoil)	1.5	1.7	33							
						Clay	1.8	2.0	33							
						Clay	2.3	2.4	31							
						Silt	3.0	3.2	26							
						Clay	3.7	3.8	38							
						Clay	4.6	5.2	52							
						Clay	5.3	5.6	55							
						Clay	6.9	7.0	48							
						Clay	7.6	8.4	49							
						Clay	9.0	9.1	54							

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Fermor Avenue

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-05	UTM : 5524432 N, 640170 E Located in Eastbound lane, 3.7 m North of outside edge of road and 14 m West of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	90	Concrete	210	Clay (Fill)	0.3	1	30							
						Clay (Fill)	0.6	1	31							
						Clay (Fill)	0.9	1	34							
						Organic Clay (Topsoil)	1.2	1	35							
						Clay (Fill)	1.5	2	35							
						Clay	1.8	2	32							
						Silt and Clay	2.4	3	32							
											%Fines					
TH18-06	UTM : 5524433 N, 640220 E Located in Eastbound lane, 3.0 m North of outside edge of road and 13 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	40	Concrete	200	Sand (Fill)	0.2	0.5	3		8	48	44			
						Clay	0.5	0.6	25							
						Clay	0.6	0.8	34							
						Clay	0.9	1.1	32							
						Clay	1.2	1.4	36							
						Clay	1.5	1.7	36							
						Clay	1.8	2.0	37							
TH18-07	UTM : 5524439 N, 640261 E Located in Eastbound lane, 1.6 m South of Median curb and 47.2 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	35	Concrete	205	Clay (Fill)	0.0	0.5	26							
						Clay (Fill)	0.6	0.8	34							
						Clay (Fill)	0.9	1.1	33							
						Clay (Fill)	1.2	1.4	37							
						Organic Clay (Topsoil)	1.5	1.7	38							
						Organic Clay (Topsoil)	1.8	2.0	33							
						Clay	2.1	2.3	31							
						Clay	2.9	3.0	30							
						Clay	4.6	5.3	56							
						Clay	5.9	6.1	51							
						Clay	7.6	8.4	44							
						Clay	8.8	9.1	45							
TH18-08	UTM : 5524434 N, 640357 E Located in Eastbound lane, 10.5 m South of Median curb and 142 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	70	Concrete	215	Sand and Gravel (Fill)	0.2	0.6	4							
						Clay (Fill)	0.8	0.9	30	65	30	4	1	23	73	50
						Organic Clay (Topsoil)	1.1	1.2	37							
						Clay	1.4	1.5	38							
						Clay	1.7	1.8	35							
						Clay	2.0	2.1	35							
						Clay	2.3	2.4	41							

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Fermor Avenue

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-09	UTM : 5524458 N, 640457 E Located in Eastbound lane, 6 m North of Median curb and 100 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	70	Concrete	225	Sand (Fill)	0.3	0.5	5							
						Clay (Fill)	0.5	0.6	28							
						Clay (Fill)	0.8	0.9	28							
						Organic Clay (Topsoil)	1.1	1.2	47							
						Clay	1.4	1.5	37							
						Clay	1.7	1.8	37							
						Clay	2.0	2.1	37							
TH18-10	UTM : 5524431 N, 640497 E Located in Eastbound lane, 1.5 m South of yield curb and 129 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	95	Concrete	N/A	Sand and Gravel (Fill)	0.1	0.3	5							
						Sand and Gravel (Fill)	0.3	0.5	5		%Fines					
						Sand and Gravel (Fill)	0.6	0.8	4		26	46	28			
						Sand and Gravel (Fill)	0.9	1.1	4							
						Sand and Gravel (Fill)	1.2	1.4	9							
						Clay	1.5	1.7	34							
						Clay	1.8	2.0	31							
TH18-11	UTM : 5524438 N, 640565 E Located at 5.6 m South of outside edge of Fermor Avenue Eastbound lane and 360 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Clay	0.1	0.2	27							
						Clay	0.3	0.5	35							
						Clay	0.6	0.8	24							
						Clay	0.8	0.9	22							
						Clay	0.9	1.1	41							
						Clay	1.2	1.4	38							
						Clay	1.5	1.7	41							
						Clay	1.8	2.0	43							
TH18-12	UTM : 5524460 N, 640659 E Located in Westbound lane, 3 m South of outside edge of road and 300 East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	65	Concrete	205	Sand (Fill)	0.3	0.5	5							
						Clay (Fill)	0.5	0.6	28							
						Clay (Fill)	0.8	0.9	37	71	26	3	0	29	80	52
						Organic Clay (Topsoil)	1.1	1.2	47							
						Clay	1.4	1.5	34							
						Clay	1.7	1.8	34							
						Clay	2.0	2.1	33							
TH18-13	UTM : 5524442 N, 640759 E Located 8.3 m South of outside edge of Fermor Avenue Eastbound lane and 556 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Clay	0.1	0.2	29							
						Clay	0.3	0.5	41							
						Clay	0.6	0.8	41							
						Clay	0.9	1.1	40							
						Clay	1.2	1.4	40							
						Clay	1.5	1.7	45							
						Clay	1.8	2.0	51							

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Fermor Avenue

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-14	UTM : 5524465 N, 640859 E Located in Westbound lane, 1.9 m South of outside edge of road and 496 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	70	Concrete	200	Sand (Fill)	0.3	0.5	3							
						Clay (Fill)	0.6	0.8	28	63	36	2	0	22	67	45
						Clay (Fill)	0.9	1.1	29							
						Organic Clay (Topsoil)	1.2	1.4	33							
						Clay	1.5	1.7	32							
						Clay	1.8	2.0	32							
						Clay	2.6	2.7	37							
TH18-15	UTM : 5524450 N, 640959 E Located in Eastbound lane, 8.8 m South of outside edge of road and 759 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Clay	0.1	0.2	36.4							
						Clay	0.3	0.5	36							
						Silt and Clay	0.6	0.8	40							
						Clay	0.9	1.1	43							
						Clay	1.2	1.4	41							
						Clay	1.5	1.7	45							
						Clay	1.8	2.0	50							
TH18-16	UTM : 5524495 N, 640993 E Located in Southbound lane of Niakwa Road East, 2.8 m East of outside edge of road and 21.4 m North of outside edge of Westbound lane of Fermor Ave.	Asphalt	N/A	Concrete	180	Sand (Fill)	0.2	0.5	6							
						Clay (Fill)	0.5	0.6	6							
						Clay (Fill)	0.8	0.9	11							
						Clay (Fill)	1.1	1.2	37							
						Clay	1.4	1.5	33							
						Clay	1.7	1.8	31							
						Clay	2.0	2.1	30							
						Silt and Clay	2.3	2.4	25							
						Clay	2.4	2.6	38							
TH18-17	UTM : 5524398 N, 640997 E Located at 68.7 m South of outside edge of Fermor Avenue Eastbound lane and 11.8 m East of outside edge of Southbound lane of Niakwa Road East.	N/A	N/A	N/A	N/A	Clay (Fill)	0.1	0.2	45							
						Clay (Fill)	0.3	0.5	38							
						Clay	0.6	0.8	38							
						Clay	0.9	1.1	31							
						Clay	1.2	1.4	28							
						Silt and Clay	1.5	1.7	33							
						Clay	1.8	2.0	42							
						Silt and Clay	2.1	2.3	28							
						Clay	2.9	3.0	50							
						Clay	4.6	5.3	46							
						Clay	5.9	6.1	46							
						Clay	6.9	7.0	54							
						Clay	7.6	8.4	55							
						Clay	8.8	9.1	59							

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Fermor Avenue

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-18	UTM : 5524470 N, 641063 E Located in Westbound lane, 2.2 m South of North edge of road and 694 m East of of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	70	Concrete	200	Sand (Fill)	0.3	0.5	7							
						Clay (Fill)	0.6	0.8	31	72	26	1	0	26	76	51
						Organic Clay (Topsoil)	0.9	1.1	43							
						Organic Clay (Topsoil)	1.2	1.4	38							
						Clay	1.5	1.7	33							
						Clay	1.8	2.0	31							
						Silt and Clay	2.3	2.4	26							
						Clay	2.7	2.9	40							
TH18-19	UTM : 5524451 N, 641158 E Located 10 m South of outside edge of Fermor Avenue and 957 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Clay	0.1	0.2	4							
						Clay	0.4	0.5	31							
						Clay	0.7	0.9	26							
						Clay	1.0	1.2	34							
						Clay	1.3	1.5	38							
						Clay	1.6	1.8	34							
						Clay	2.2	2.4	46							
											%Fines					
TH18-20	UTM : 5524473 N, 641249 E Located in Westbound lane, 6.5 m South of outside edge of Westbound lane and 886 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	60	Concrete	210	Sand (Fill)	0.3	0.5	4		12	58	30			
						Clay (Fill)	0.6	0.8	29							
						Clay (Fill)	0.9	1.1	31							
						Clay (Fill)	1.2	1.4	26							
						Organic Clay (Topsoil)	1.4	1.5	44							
						Clay	1.7	1.8	33							
						Clay	2.0	2.1	34							
TH18-21	UTM : 5524456 N, 641358 E Located in Eastbound lane, 8.8 m South of outside edge of road and 1156 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Clay (Fill)	0.1	0.2	45							
						Clay	0.3	0.5	38							
						Clay	0.6	0.8	28							
						Silt and Clay	0.9	1.1	31	37	61	2	0	20	52	32
						Clay	1.2	1.4	33							
						Clay	1.5	1.7	43							
						Clay	1.8	2.0	44							
TH18-22	UTM : 5524466 N, 641462 E Located in Westbound lane, 2.0 m South of outside edge of road and 1091 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	45	Concrete	205	Sand (Fill)	0.4	0.5	6.5							
						Clay (Fill)	0.6	0.8	27							
						Clay (Fill)	0.9	1.1	27							
						Clay (Fill)	1.2	1.4	28							
						Organic Clay (Topsoil)	1.5	1.7	40							
						Clay	1.8	2.0	30							
						Silt and Clay	2.6	2.7	26							

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Fermor Avenue

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-23	UTM : 5524428 N, 641575 E Located in Eastbound lane, 2 m North of outside edge of road and 1200 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	120	Concrete	N/A	Sand (Fill)	0.3	0.5	5		14	72	15			
						Clay (Fill)	0.6	0.8	27	65	34	2	0	21	70	50
						Clay (Fill)	0.9	1.1	26							
						Clay (Fill)	1.2	1.4	26							
						Clay (Fill)	1.5	1.7	20							
						Clay (Fill)	1.8	2.0	22							
						Silt and Clay	2.0	2.1	24							
						Clay	2.3	2.4	28							
TH18-24	UTM : 5524422 N, 641665 E Located in Westbound lane, 4.7 m South of outside edge of road and 1296 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	85	Concrete	205	Sand (Fill)	0.4	0.5	2.1							
						Clay (Fill)	0.5	0.6	25	58	39	3	0	23	69	46
						Clay	0.8	0.9	26							
						Clay	1.1	1.2	25							
						Clay	1.4	1.5	28							
						Clay	1.7	1.8	31							
						Clay	2.9	3.0	41							
TH18-25	UTM : 5524391 N, 641764 E Located in Eastbound lane, 4.7 m North of outside edge of road and 1405 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	90	Concrete	210	Sand (Fill)	0.4	0.5	5							
						Clay	0.5	0.6	23							
						Clay	0.8	0.9	24							
						Clay	1.1	1.2	28							
						Clay	1.4	1.5	31							
						Clay	1.7	1.8	31							
						Clay	2.0	2.1	31							
						Silt and Clay	2.6	2.7	26							
TH18-26	UTM : 5524362 N, 640208 E Located in Northbound turning lane, 1.4 m West of outside edge of road on Lagimodiere Blvd and 70.6 m South of Fermor Ave. and Lagimodiere Blvd. intersection.	Asphalt	70	Concrete	210	Clay (Fill)	0.1	0.2	4							
						Clay	0.4	0.5	31							
						Clay	0.7	0.9	26							
						Clay	1.0	1.2	34							
						Clay	1.3	1.5	38							
						Clay	1.6	1.8	34							
						Silt	2.2	2.4	46							
TH18-27	UTM : 5524383 N, 640292 E Located at 55 m South of outside edge of Fermor Avenue Eastbound lane and 85 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Sand (Fill)	0.0	0.1	4.4							
						Clay (Fill)	0.1	0.2	46							
						Clay (Fill)	0.3	0.5	52							
						Clay	0.6	0.8	39							
						Clay	0.9	1.1	41							
						Clay	1.2	1.4	40							
						Clay	1.5	1.7	45							
						Clay	1.8	2.0	42							

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Fermor Avenue

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-29	UTM : 5524335 N, 640619 E Located at 127 m South of outside edge of Fermor Avenue Eastbound lane and 414 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Clay (Fill)	0.1	0.2	50							
						Clay	0.3	0.5	43							
						Clay	0.6	0.8	37							
						Clay	0.9	1.1	32							
						Clay	1.2	1.4	32							
						Clay	1.5	1.7	35							
						Silt and Clay	1.8	2.0	24							
TH18-30	UTM : 5524395 N, 640623 E Located at 55 m South of outside edge of Fermor Avenue Eastbound lane and 419 m East of Fermor Ave. and Lagimodiere Blvd. intersection.	N/A	N/A	N/A	N/A	Clay (Fill)	0.1	0.2	43							
						Clay	0.3	0.5	36							
						Clay	0.6	0.8	32							
						Clay	0.9	1.1	31							
						Clay	1.2	1.4	38							
						Clay	1.5	1.7	40							
						Clay	1.8	2.0	44							

19-B-01 Fermor Reconstruction
Sub-Surface Investigation
Dawson Rd South

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Plastic	Liquid	Plasticity Index
TH18-28	UTM : 5524271 N, 640588 E Located at 3.6 m South of outside edge of Westbound lane of Dawson Road South and 5 m West of Northbound curb of Royal Mint Drive.	Asphalt	90	Concrete	N/A	Sand (Fill)	0.1	0.5	5							
						Sand (Fill)	0.5	0.6	4							
						Clay	0.8	0.9	34	74	25	1	0	25	77	52
						Clay	1.1	1.2	33							
						Clay	1.4	1.5	33							
						Clay	1.7	1.8	34							
						Clay	2.0	2.1	33							
						Silt and Clay	2.4	2.6	26							
						Clay	2.6	2.7	41							

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Moisture Content Report
ASTM D2216-10

Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-11	TH18-11	TH18-11	TH18-11	TH18-11	TH18-11
Depth (m)	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	0.9 - 1.1	1.2 - 1.4
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	F154	K37	N104	H59	F126	E28
Mass of tare	8.5	8.4	8.5	8.6	8.4	8.3
Mass wet + tare	243.5	236.7	203.1	237.2	242.2	220.0
Mass dry + tare	193.7	191.7	166.1	196.2	174.7	161.8
Mass water	49.8	45.0	37.0	41.0	67.5	58.2
Mass dry soil	185.2	183.3	157.6	187.6	166.3	153.5
Moisture %	26.9%	24.5%	23.5%	21.9%	40.6%	37.9%

Test Pit	TH18-11	TH18-11	TH18-13	TH18-13	TH18-13	TH18-13
Depth (m)	1.5 - 1.7	1.8 - 2.0	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	A106	F73	AC09	F19	E53	K10
Mass of tare	8.2	8.5	6.8	8.6	8.5	8.5
Mass wet + tare	324.4	165	163.3	219.4	191.9	178.6
Mass dry + tare	232.3	118.1	128.2	158.5	138.5	129.9
Mass water	92.1	46.9	35.1	60.9	53.4	48.7
Mass dry soil	224.1	109.6	121.4	149.9	130.0	121.4
Moisture %	41.1%	42.8%	28.9%	40.6%	41.1%	40.1%

Test Pit	TH18-13	TH18-13	TH18-13	TH18-15	TH18-15	TH18-15
Depth (m)	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	W08	AC33	F110	Z39	A3	AC06
Mass of tare	8.5	6.8	8.2	8.5	8.5	6.8
Mass wet + tare	313.9	242.0	181.5	170.4	231.9	212.7
Mass dry + tare	226.2	168.9	123.0	127.2	172.6	154.3
Mass water	87.7	73.1	58.5	43.2	59.3	58.4
Mass dry soil	217.7	162.1	114.8	118.7	164.1	147.5
Moisture %	40.3%	45.1%	51.0%	36.4%	36.1%	39.6%

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Project No. 0035-075-00
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Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
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Technician BMH

Test Pit	TH18-15	TH18-15	TH18-15	TH18-15	TH18-19	TH18-19
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	0.1 - 0.2	0.3 - 0.5
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	AB47	F117	Z68	AA03	Z87	N06
Mass of tare	6.7	8.4	8.4	6.8	8.5	8.6
Mass wet + tare	214.4	224.9	191.1	193.7	271.7	187.6
Mass dry + tare	152.0	161.5	134.1	131.2	195.0	137.6
Mass water	62.4	63.4	57.0	62.5	76.7	50.0
Mass dry soil	145.3	153.1	125.7	124.4	186.5	129.0
Moisture %	42.9%	41.4%	45.3%	50.2%	41.1%	38.8%

Test Pit	TH18-19	TH18-19	TH18-19	TH18-19	TH18-19	TH18-21
Depth (m)	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	0.1 - 0.2
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	F95	F11	P34	D30	P07	E91
Mass of tare	8.4	8.7	8.6	8.3	8.3	8.5
Mass wet + tare	198.4	205.5	164.4	190.6	162.8	179.2
Mass dry + tare	141.2	144.8	111.7	127.8	105.4	126.6
Mass water	57.2	60.7	52.7	62.8	57.4	52.6
Mass dry soil	132.8	136.1	103.1	119.5	97.1	118.1
Moisture %	43.1%	44.6%	51.1%	52.6%	59.1%	44.5%

Test Pit	TH18-21	TH18-21	TH18-21	TH18-21	TH18-21	TH18-21
Depth (m)	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0
Sample #	G31	G32	G33	G34	G35	G36
Tare ID	H55	E24	H25	W47	A8	Z105
Mass of tare	8.4	8.6	8.3	8.6	8.0	8.4
Mass wet + tare	224.3	206.4	439.3	170.9	187.9	180.8
Mass dry + tare	165.4	163.7	337.3	131.1	134.1	128.4
Mass water	58.9	42.7	102.0	39.8	53.8	52.4
Mass dry soil	157.0	155.1	329.0	122.5	126.1	120.0
Moisture %	37.5%	27.5%	31.0%	32.5%	42.7%	43.7%

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Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
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Technician BMH

Test Pit	TH18-30	TH18-30	TH18-30	TH18-30	TH18-30	TH18-30
Depth (m)	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7
Sample #	G37	G38	G39	G40	G41	G42
Tare ID	9.1	8.7	8.9	8.7	8.3	8.4
Mass of tare	9.1	8.7	8.9	8.7	8.3	8.4
Mass wet + tare	220.8	203.1	286.7	290.9	193.8	187.5
Mass dry + tare	157.3	152.0	220.1	225.0	143.1	136.3
Mass water	63.5	51.1	66.6	65.9	50.7	51.2
Mass dry soil	148.2	143.3	211.2	216.3	134.8	127.9
Moisture %	42.8%	35.7%	31.5%	30.5%	37.6%	40.0%

Test Pit	TH18-30	TH18-29	TH18-29	TH18-29	TH18-29	TH18-29
Depth (m)	1.8 - 2.0	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4
Sample #	G43	G44	G45	G46	G47	G48
Tare ID	8.7	P10	E138	A13	Z19	AB38
Mass of tare	8.7	8.6	8.9	8.4	8.8	6.7
Mass wet + tare	224.5	196.6	252.4	195.5	198.5	255.8
Mass dry + tare	158.6	134.2	179.7	144.6	152.2	196.1
Mass water	65.9	62.4	72.7	50.9	46.3	59.7
Mass dry soil	149.9	125.6	170.8	136.2	143.4	189.4
Moisture %	44.0%	49.7%	42.6%	37.4%	32.3%	31.5%

Test Pit	TH18-29	TH18-29	TH18-27	TH18-27	TH18-27	TH18-27
Depth (m)	1.5 - 1.7	1.8 - 2.0	0.0 - 0.1	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8
Sample #	G49	G50	G51	G53	G54	G55
Tare ID	P30	N40	E40	Z09	AB81	AB09
Mass of tare	8.4	8.5	8.6	8.4	6.8	6.7
Mass wet + tare	181.0	249.5	290.0	233.6	148.2	259.5
Mass dry + tare	136.6	202.2	278.1	163.1	100.0	188.9
Mass water	44.4	47.3	11.9	70.5	48.2	70.6
Mass dry soil	128.2	193.7	269.5	154.7	93.2	182.2
Moisture %	34.6%	24.4%	4.4%	45.6%	51.7%	38.7%

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Project 19-B-01 Fermor Ave

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Technician BMH

Test Pit	TH18-27	TH18-27	TH18-27	TH18-27	TH18-01	TH18-01
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	0.4 - 0.5	0.6 - 0.8
Sample #	G56	G57	G58	G59	G60	G61
Tare ID	K4	AB27	Z34	N42	C6	AB011
Mass of tare	8.5	6.7	8.6	8.5	8.4	6.7
Mass wet + tare	244.6	321.8	277.3	193.9	316.8	386.2
Mass dry + tare	176.5	231.7	194.3	138.9	286.9	294.4
Mass water	68.1	90.1	83.0	55.0	29.9	91.8
Mass dry soil	168.0	225.0	185.7	130.4	278.5	287.7
Moisture %	40.5%	40.0%	44.7%	42.2%	10.7%	31.9%

Test Pit	TH18-01	TH18-01	TH18-01	TH18-01	TH18-01	TH18-02
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.9 - 3.0	0.3 - 0.6
Sample #	G62	G63	G64	G65	G66	G67
Tare ID	Z72	N05	W75	Z31	AB51	C20
Mass of tare	9.1	8.6	8.6	8.5	6.7	8.4
Mass wet + tare	214.2	222.6	232.1	192.1	151.9	241.3
Mass dry + tare	169.6	173.0	174.7	149.1	119.1	201.3
Mass water	44.6	49.6	57.4	43.0	32.8	40.0
Mass dry soil	160.5	164.4	166.1	140.6	112.4	192.9
Moisture %	27.8%	30.2%	34.6%	30.6%	29.2%	20.7%

Test Pit	TH18-02	TH18-02	TH18-02	TH18-02	TH18-02	TH18-02
Depth (m)	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8	2.0 - 2.1	2.6 - 2.7
Sample #	G68	G69	G70	G71	G72	G73
Tare ID	Z75	Z77	E135	W17	E112	AB74
Mass of tare	8.4	8.5	8.4	8.7	8.6	7.1
Mass wet + tare	259.0	235.2	230.1	249.8	243.9	229.6
Mass dry + tare	207.4	179.5	179.4	188.8	182.3	171.0
Mass water	51.6	55.7	50.7	61.0	61.6	58.6
Mass dry soil	199.0	171.0	171.0	180.1	173.7	163.9
Moisture %	25.9%	32.6%	29.6%	33.9%	35.5%	35.8%

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Project No. 0035-075-00
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Project 19-B-01 Fermor Ave

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Test Pit	TH18-03	TH18-03	TH18-03	TH18-03	TH18-03	TH18-03
Depth (m)	0.5 - 0.6	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8	2.0 - 2.1
Sample #	G74	G75	G76	G77	G78	G79
Tare ID	H25	N04	AA13	E116	AB08	D28
Mass of tare	8.4	8.7	6.7	8.5	6.8	8.5
Mass wet + tare	242.0	230.2	209.6	252.6	195.6	172.0
Mass dry + tare	201.6	168.0	164.5	191.5	146.5	131.9
Mass water	40.4	62.2	45.1	61.1	49.1	40.1
Mass dry soil	193.2	159.3	157.8	183.0	139.7	123.4
Moisture %	20.9%	39.0%	28.6%	33.4%	35.1%	32.5%

Test Pit	TH18-03	TH18-04	TH18-04	TH18-04	TH18-04	TH18-04
Depth (m)	2.9 - 3.0	0.4 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7
Sample #	G80	G81	G82	G83	G84	G85
Tare ID	A1	Z37	F142	E119	Z01	Z41
Mass of tare	8.2	8.4	8.5	8.6	8.5	8.6
Mass wet + tare	191.3	187.1	380.3	293.8	266.2	264.0
Mass dry + tare	146.0	161.9	291.3	229.7	200.5	200.3
Mass water	45.3	25.2	89.0	64.1	65.7	63.7
Mass dry soil	137.8	153.5	282.8	221.1	192.0	191.7
Moisture %	32.9%	16.4%	31.5%	29.0%	34.2%	33.2%

Test Pit	TH18-04	TH18-04	TH18-04	TH18-04	TH18-04	TH18-04
Depth (m)	1.8 - 2.0	2.3 - 2.4	3.0 - 3.2	3.7 - 3.8	5.3 - 5.6	6.9 - 7.0
Sample #	G86	G87	G88	G89	G91	G92
Tare ID	AC08	AB26	Z98	P06	AB28	W96
Mass of tare	6.8	6.7	8.5	8.5	6.8	8.8
Mass wet + tare	265.3	255.2	341.2	233.8	225.7	192.0
Mass dry + tare	200.7	196.8	272.9	172.4	147.8	132.9
Mass water	64.6	58.4	68.3	61.4	77.9	59.1
Mass dry soil	193.9	190.1	264.4	163.9	141.0	124.1
Moisture %	33.3%	30.7%	25.8%	37.5%	55.2%	47.6%

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Test Pit	TH18-04	TH18-05	TH18-05	TH18-05	TH18-05	TH18-05
Depth (m)	9.0 - 9.1	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7
Sample #	G94	G95	G96	G97	G98	G99
Tare ID	Z59	W05	P17	AC16	P36	N37
Mass of tare	8.5	8.4	8.5	6.8	8.4	8.6
Mass wet + tare	226.2	276.1	238.0	288.5	235.8	283.1
Mass dry + tare	149.7	214.8	184.0	217.5	177.5	211.3
Mass water	76.5	61.3	54.0	71.0	58.3	71.8
Mass dry soil	141.2	206.4	175.5	210.7	169.1	202.7
Moisture %	54.2%	29.7%	30.8%	33.7%	34.5%	35.4%

Test Pit	TH18-05	TH18-05	TH18-17	TH18-17	TH18-17	TH18-17
Depth (m)	1.8 - 2.0	2.4 - 2.6	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1
Sample #	G100	G101	G102	G103	G104	G105
Tare ID	Z07	Z63	E33	D40	H78	AC07
Mass of tare	8.7	8.5	8.6	8.3	8.4	6.8
Mass wet + tare	323.2	285.3	188.2	211.8	171	174
Mass dry + tare	246.3	218	132.5	155.3	126.1	134.7
Mass water	76.9	67.3	55.7	56.5	44.9	39.3
Mass dry soil	237.6	209.5	123.9	147.0	117.7	127.9
Moisture %	32.4%	32.1%	45.0%	38.4%	38.1%	30.7%

Test Pit	TH18-17	TH18-17	TH18-17	TH18-17	TH18-17	TH18-17
Depth (m)	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.9 - 3.0	5.9 - 6.1
Sample #	G106	G107	G108	G109	G110	G112
Tare ID	AB33	K27	Z130	Z70	E62	E79
Mass of tare	6.7	8.5	8.4	8.6	8.4	8.7
Mass wet + tare	249	259.2	204	266.9	208.7	187
Mass dry + tare	195.6	197.1	146	210.8	141.9	130.8
Mass water	53.4	62.1	58.0	56.1	66.8	56.2
Mass dry soil	188.9	188.6	137.6	202.2	133.5	122.1
Moisture %	28.3%	32.9%	42.2%	27.7%	50.0%	46.0%

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Test Pit	TH18-17	TH18-17	TH18-26	TH18-26	TH18-26	TH18-26
Depth (m)	6.9 - 7.0	8.8 - 9.1	0.2 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4
Sample #	G113	G115	G116	G117	G118	G119
Tare ID	W07	E100	E121	E12	F127	E114
Mass of tare	8.6	8.5	8.5	8.9	8.3	8.7
Mass wet + tare	219.4	168.4	194.6	246.4	274	232.3
Mass dry + tare	145.5	108.9	157.8	193.6	213	181.2
Mass water	73.9	59.5	36.8	52.8	61.0	51.1
Mass dry soil	136.9	100.4	149.3	184.7	204.7	172.5
Moisture %	54.0%	59.3%	24.6%	28.6%	29.8%	29.6%

Test Pit	TH18-26	TH18-26	TH18-26	TH18-07	TH18-07	TH18-07
Depth (m)	1.5 - 1.7	1.8 - 2.0	2.9 - 3.0	0.0 - 0.5	0.6 - 0.8	0.9 - 1.1
Sample #	G120	G121	G122	G123	G124	G125
Tare ID	F146	AB42	H65	F69	Q01	K35
Mass of tare	8.3	6.8	8.6	8.5	8.5	8.5
Mass wet + tare	332.7	214.7	244.7	257	184.2	196
Mass dry + tare	259.8	165.8	196.4	206.2	139.5	149.2
Mass water	72.9	48.9	48.3	50.8	44.7	46.8
Mass dry soil	251.5	159.0	187.8	197.7	131.0	140.7
Moisture %	29.0%	30.8%	25.7%	25.7%	34.1%	33.3%

Test Pit	TH18-07	TH18-07	TH18-07	TH18-07	TH18-07	TH18-07
Depth (m)	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.9 - 3.0	5.9 - 6.1
Sample #	G126	G127	G128	G129	G130	G132
Tare ID	F137	AB44	N38	N39	F21	N11
Mass of tare	8.5	6.7	8.7	8.4	8.5	8.5
Mass wet + tare	203.4	205.8	211.6	207.7	320.9	239.8
Mass dry + tare	150.3	151.1	161.5	160.1	249.5	161.4
Mass water	53.1	54.7	50.1	47.6	71.4	78.4
Mass dry soil	141.8	144.4	152.8	151.7	241.0	152.9
Moisture %	37.4%	37.9%	32.8%	31.4%	29.6%	51.3%

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Moisture Content Report
ASTM D2216-10

Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-07	TH18-08	TH18-08	TH18-08	TH18-08	TH18-08
Depth (m)	8.8 - 9.1	0.2 - 0.6	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8
Sample #	G134	G135	G136	G137	G138	G139
Tare ID	AA15	F99	K20	P11	D47	W45
Mass of tare	6.7	8.5	8.6	8.4	8.6	8.4
Mass wet + tare	271.7	327.7	370.7	217.9	228.6	291
Mass dry + tare	189.3	315.8	287.2	161	168.2	218
Mass water	82.4	11.9	83.5	56.9	60.4	73.0
Mass dry soil	182.6	307.3	278.6	152.6	159.6	209.6
Moisture %	45.1%	3.9%	30.0%	37.3%	37.8%	34.8%

Test Pit	TH18-08	TH18-08	TH18-23	TH18-23	TH18-23	TH18-23
Depth (m)	2.0 - 2.1	2.3 - 2.4	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4
Sample #	G140	G141	G142	G143	G144	G145
Tare ID	E136	Z73	F121	C4	W101	A25
Mass of tare	8.4	8.5	8.6	8.5	8.7	8.6
Mass wet + tare	217.4	250	512.8	405.5	231.8	234
Mass dry + tare	163.4	179.5	488.7	321.7	186.7	187.4
Mass water	54.0	70.5	24.1	83.8	45.1	46.6
Mass dry soil	155.0	171.0	480.1	313.2	178.0	178.8
Moisture %	34.8%	41.2%	5.0%	26.8%	25.3%	26.1%

Test Pit	TH18-23	TH18-23	TH18-23	TH18-23	TH18-25	TH18-25
Depth (m)	1.5 - 1.7	1.8 - 2.0	2.0 - 2.1	2.3 - 2.4	0.4 - 0.5	0.5 - 0.6
Sample #	G146	G147	G148	G149	G150	G151
Tare ID	Z58	Z15	F89	AB65	W80	AB53
Mass of tare	8.7	8.5	8.7	6.6	9	6.9
Mass wet + tare	275	296.4	246.3	221.3	370.6	218.6
Mass dry + tare	230	244.7	200.7	173.8	352.4	179.2
Mass water	45.0	51.7	45.6	47.5	18.2	39.4
Mass dry soil	221.3	236.2	192.0	167.2	343.4	172.3
Moisture %	20.3%	21.9%	23.8%	28.4%	5.3%	22.9%

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Moisture Content Report
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Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-25	TH18-25	TH18-25	TH18-25	TH18-25	TH18-25
Depth (m)	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8	2.0 - 2.1	2.6 - 2.7
Sample #	G152	G153	G154	G155	G156	G157
Tare ID	W48	F17	AB11	E107	AA14	F135
Mass of tare	8.3	8.7	7	8.6	6.9	8.6
Mass wet + tare	244.5	199	179.4	360	313.4	270.5
Mass dry + tare	199.2	157.7	138.3	277.3	241	216.6
Mass water	45.3	41.3	41.1	82.7	72.4	53.9
Mass dry soil	190.9	149.0	131.3	268.7	234.1	208.0
Moisture %	23.7%	27.7%	31.3%	30.8%	30.9%	25.9%

Test Pit	TH18-24	TH18-24	TH18-24	TH18-24	TH18-24	TH18-24
Depth (m)	0.4 - 0.5	0.5 - 0.6	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8
Sample #	G158	G159	G160	G161	G162	G163
Tare ID	AB92	H67	AA22	Z32	H4	Z06
Mass of tare	6.7	8.5	6.9	8.7	8.4	8.6
Mass wet + tare	306.9	185.7	223.9	252.7	287	242
Mass dry + tare	300.8	150.2	179.2	203.9	225.8	186.9
Mass water	6.1	35.5	44.7	48.8	61.2	55.1
Mass dry soil	294.1	141.7	172.3	195.2	217.4	178.3
Moisture %	2.1%	25.1%	25.9%	25.0%	28.2%	30.9%

Test Pit	TH18-24	TH18-16	TH18-16	TH18-16	TH18-16	TH18-16
Depth (m)	2.9 - 3.0	0.2 - 0.5	0.5 - 0.6	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5
Sample #	G164	G165	G166	G167	G168	G169
Tare ID	F128	Z91	D26	A6	A102	AB54
Mass of tare	9.1	8.6	8.7	8.2	8.6	6.7
Mass wet + tare	208.4	297.9	364.9	362.2	272.9	246
Mass dry + tare	150.7	282.7	344.4	326.5	201.7	187.3
Mass water	57.7	15.2	20.5	35.7	71.2	58.7
Mass dry soil	141.6	274.1	335.7	318.3	193.1	180.6
Moisture %	40.7%	5.5%	6.1%	11.2%	36.9%	32.5%

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Moisture Content Report
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Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-16	TH18-16	TH18-16	TH18-16	TH18-22	TH18-22
Depth (m)	1.7 - 1.8	2.0 - 2.1	2.3 - 2.4	2.4 - 2.6	0.4 - 0.5	0.6 - 0.8
Sample #	G170	G171	G172	G173	G174	G175
Tare ID	E108	H73	W89	W09	Z02	Z18
Mass of tare	8.6	8.5	8.6	8.8	8.8	9.1
Mass wet + tare	206.2	224.5	247.4	221.7	339.3	242.3
Mass dry + tare	159.8	174.4	199	163.3	319	193.2
Mass water	46.4	50.1	48.4	58.4	20.3	49.1
Mass dry soil	151.2	165.9	190.4	154.5	310.2	184.1
Moisture %	30.7%	30.2%	25.4%	37.8%	6.5%	26.7%

Test Pit	TH18-22	TH18-22	TH18-22	TH18-22	TH18-22	TH18-20
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.6 - 2.7	0.3 - 0.5
Sample #	G176	G177	G178	G179	G180	G181
Tare ID	N59	F37	AB11	K39	W65	AB06
Mass of tare	8.6	8.5	6.6	8.4	8.5	6.7
Mass wet + tare	244	215.8	197.7	265.7	223.5	689.3
Mass dry + tare	193.6	170.3	143.2	206.8	179.2	665.9
Mass water	50.4	45.5	54.5	58.9	44.3	23.4
Mass dry soil	185.0	161.8	136.6	198.4	170.7	659.2
Moisture %	27.2%	28.1%	39.9%	29.7%	26.0%	3.5%

Test Pit	TH18-20	TH18-20	TH18-20	TH18-20	TH18-20	TH18-20
Depth (m)	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.4 - 1.5	1.7 - 1.8	2.0 - 2.1
Sample #	G182	G183	G184	G185	G186	G187
Tare ID	E6	A104	AB16	E109	N28	AC03
Mass of tare	8.3	8.5	6.6	8.5	8.3	6.6
Mass wet + tare	185.3	225.3	265.7	206.8	190.7	299.6
Mass dry + tare	146	173.7	212.5	145.9	145.6	225.8
Mass water	39.3	51.6	53.2	60.9	45.1	73.8
Mass dry soil	137.7	165.2	205.9	137.4	137.3	219.2
Moisture %	28.5%	31.2%	25.8%	44.3%	32.8%	33.7%

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Moisture Content Report
ASTM D2216-10

Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-18	TH18-18	TH18-18	TH18-18	TH18-18	TH18-18
Depth (m)	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0
Sample #	G188	G189	G190	G191	G192	G193
Tare ID	P31	N31	F41	E56	F1	F97
Mass of tare	8.5	8.5	8.6	8.8	8.8	8.5
Mass wet + tare	256.8	419.3	299.8	216.2	243.3	305.7
Mass dry + tare	241.3	322.1	212.6	159.1	184.8	235
Mass water	15.5	97.2	87.2	57.1	58.5	70.7
Mass dry soil	232.8	313.6	204.0	150.3	176.0	226.5
Moisture %	6.7%	31.0%	42.7%	38.0%	33.2%	31.2%

Test Pit	TH18-18	TH18-18	TH18-14	TH18-14	TH18-14	TH18-14
Depth (m)	2.3 - 2.4	2.7 - 2.9	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4
Sample #	G194	G195	G196	G197	G198	G199
Tare ID	AC31	AA10	N74	N25	H24	AB69
Mass of tare	6.8	6.8	8.6	8.6	8.5	7
Mass wet + tare	283.1	285.6	244.2	488.4	374.2	296.2
Mass dry + tare	225.6	206.1	237.3	384.4	292.7	224.1
Mass water	57.5	79.5	6.9	104.0	81.5	72.1
Mass dry soil	218.8	199.3	228.7	375.8	284.2	217.1
Moisture %	26.3%	39.9%	3.0%	27.7%	28.7%	33.2%

Test Pit	TH18-14	TH18-14	TH18-14	TH18-12	TH18-12	TH18-12
Depth (m)	1.5 - 1.7	1.8 - 2.0	2.6 - 2.7	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9
Sample #	G200	G201	G202	G203	G204	G205
Tare ID	H21	AC20	A14	Z33	Z109	K5
Mass of tare	8.6	6.8	8.4	8.6	8.6	8.6
Mass wet + tare	247.4	234.4	293.4	321.6	330.2	414.6
Mass dry + tare	190.1	179	216.1	307.5	260	305.4
Mass water	57.3	55.4	77.3	14.1	70.2	109.2
Mass dry soil	181.5	172.2	207.7	298.9	251.4	296.8
Moisture %	31.6%	32.2%	37.2%	4.7%	27.9%	36.8%

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Moisture Content Report
ASTM D2216-10

Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-12	TH18-12	TH18-12	TH18-12	TH18-09	TH18-09
Depth (m)	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8	2.0 - 2.1	0.3 - 0.5	0.5 - 0.6
Sample #	G206	G207	G208	G209	G210	G211
Tare ID	P85	H12	E22	A103	AB40	K30
Mass of tare	8.6	8.6	9	8.6	6.6	8.6
Mass wet + tare	238.8	359.6	352.8	347.4	261.6	338.8
Mass dry + tare	165.2	269.7	265.6	262.8	250.3	268.7
Mass water	73.6	89.9	87.2	84.6	11.3	70.1
Mass dry soil	156.6	261.1	256.6	254.2	243.7	260.1
Moisture %	47.0%	34.4%	34.0%	33.3%	4.6%	27.0%

Test Pit	TH18-09	TH18-09	TH18-09	TH18-09	TH18-09	TH18-10
Depth (m)	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8	2.0 - 2.1	0.1 - 0.3
Sample #	G212	G213	G214	G215	G216	G217
Tare ID	N48	AA05	N35	F98	AC02	A17
Mass of tare	9	6.6	8.4	8.6	6.6	8.6
Mass wet + tare	316.6	268.8	331	327.6	308.2	288.3
Mass dry + tare	249.1	185.1	243.6	241.3	226.6	274.7
Mass water	67.5	83.7	87.4	86.3	81.6	13.6
Mass dry soil	240.1	178.5	235.2	232.7	220.0	266.1
Moisture %	28.1%	46.9%	37.2%	37.1%	37.1%	5.1%

Test Pit	TH18-10	TH18-10	TH18-10	TH18-10	TH18-10	TH18-10
Depth (m)	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0
Sample #	G218	G219	G220	G221	G222	G223
Tare ID	E27	E1	Z25	F91	K12	AB90
Mass of tare	8.6	8.4	8.4	8.4	8.8	6.8
Mass wet + tare	383.7	592.7	294.5	281.1	264.1	295.2
Mass dry + tare	367.1	569	284.1	259.8	199.6	226.5
Mass water	16.6	23.7	10.4	21.3	64.5	68.7
Mass dry soil	358.5	560.6	275.7	251.4	190.8	219.7
Moisture %	4.6%	4.2%	3.8%	8.5%	33.8%	31.3%

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Moisture Content Report
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Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-28	TH18-28	TH18-28	TH18-28	TH18-28	TH18-28
Depth (m)	0.1 - 0.5	0.5 - 0.6	0.8 - 0.9	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8
Sample #	G224	G225	G226	G227	G228	G229
Tare ID	W92	W27	E55	AC34	Z94	E41
Mass of tare	8.6	8.3	8.7	6.4	8.4	8.5
Mass wet + tare	298.1	328	385.7	315.5	279.7	286.9
Mass dry + tare	284.6	314.5	289.3	238.2	211.7	215.6
Mass water	13.5	13.5	96.4	77.3	68.0	71.3
Mass dry soil	276.0	306.2	280.6	231.8	203.3	207.1
Moisture %	4.9%	4.4%	34.4%	33.3%	33.4%	34.4%

Test Pit	TH18-28	TH18-28	TH18-28	TH18-06	TH18-06	TH18-06
Depth (m)	2.0 - 2.1	2.4 - 2.6	2.6 - 2.7	0.2 - 0.5	0.5 - 0.6	0.6 - 0.8
Sample #	G230	G231	G232	G233	G234	G235
Tare ID	W01	Z140	F75	Z81	K22	F63
Mass of tare	8.4	8.7	8.6	8.4	8.4	8.4
Mass wet + tare	307.5	296.2	243.3	725.2	255.6	270
Mass dry + tare	233.7	236.4	174.9	702.7	206.7	203.7
Mass water	73.8	59.8	68.4	22.5	48.9	66.3
Mass dry soil	225.3	227.7	166.3	694.3	198.3	195.3
Moisture %	32.8%	26.3%	41.1%	3.2%	24.7%	33.9%

Test Pit	TH18-06	TH18-06	TH18-06	TH18-06	TH18-04	TH18-04
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	4.6 - 5.3	7.6 - 8.4
Sample #	G236	G237	G238	G239	T90	T93
Tare ID	F151	E81	AB94	N105	F71	AB58
Mass of tare	8.4	8.6	7	9	8.4	6.8
Mass wet + tare	286.6	304.8	306.6	324	230.8	182.6
Mass dry + tare	218.6	226	226.6	239.5	155.2	124.6
Mass water	68.0	78.8	80.0	84.5	75.6	58.0
Mass dry soil	210.2	217.4	219.6	230.5	146.8	117.8
Moisture %	32.4%	36.2%	36.4%	36.7%	51.5%	49.2%

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Moisture Content Report
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Project No. 0035-075-00
Client Morrison Hershfield
Project 19-B-01 Fermor Ave

Sample Date 14-Nov-18
Test Date 29-Nov-18
Technician BMH

Test Pit	TH18-07	TH18-07	TH18-17	TH18-17		
Depth (m)	4.6 - 5.3	7.6 - 8.4	4.6 - 5.3	7.6 - 8.4		
Sample #	T131	T104	T111	T114		
Tare ID	AB48	F52	C17	N54		
Mass of tare	6.8	8.4	8.8	8.4		
Mass wet + tare	192.6	229.4	180.4	240.8		
Mass dry + tare	125.8	162	126.4	158		
Mass water	66.8	67.4	54.0	82.8		
Mass dry soil	119.0	153.6	117.6	149.6		
Moisture %	56.1%	43.9%	45.9%	55.3%		

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 %						

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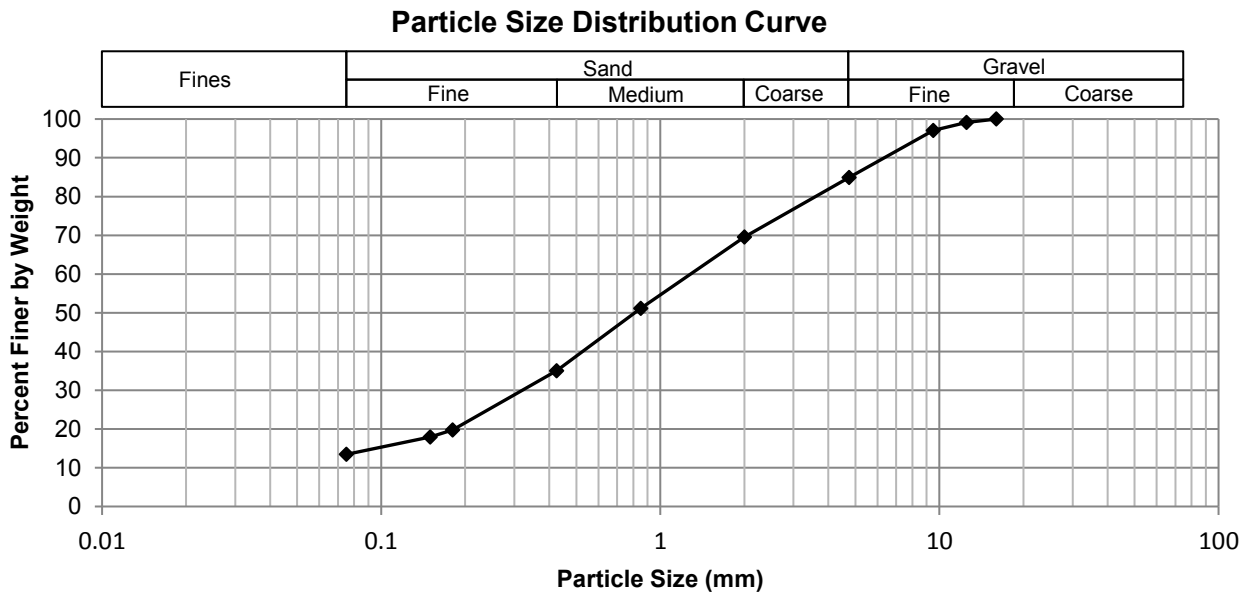
Grain Size Analysis (Sieve Method)
ASTM C136-14

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Sample #	G142
Source	Fermor Ave.
Soil Desc.	Sand - some gravel
Date Sampled	23-Nov-18
Date Tested	4-Dec-18
Technician	KG

Gravel %	15.1
Sand %	71.5
Fines %	13.5



Sieve Number	Sieve Opening (mm)	Percent Passing	Specification (Min-Max)
5/8"	16.0	100	-
1/2"	12.5	99	-
3/8"	9.50	97	-
no. 4	4.75	85	-
no. 10	2.00	70	-
no. 20	0.850	51	-
no. 40	0.425	35	-
no. 80	0.180	20	-
no. 100	0.150	18	-
no. 200	0.075	13	-

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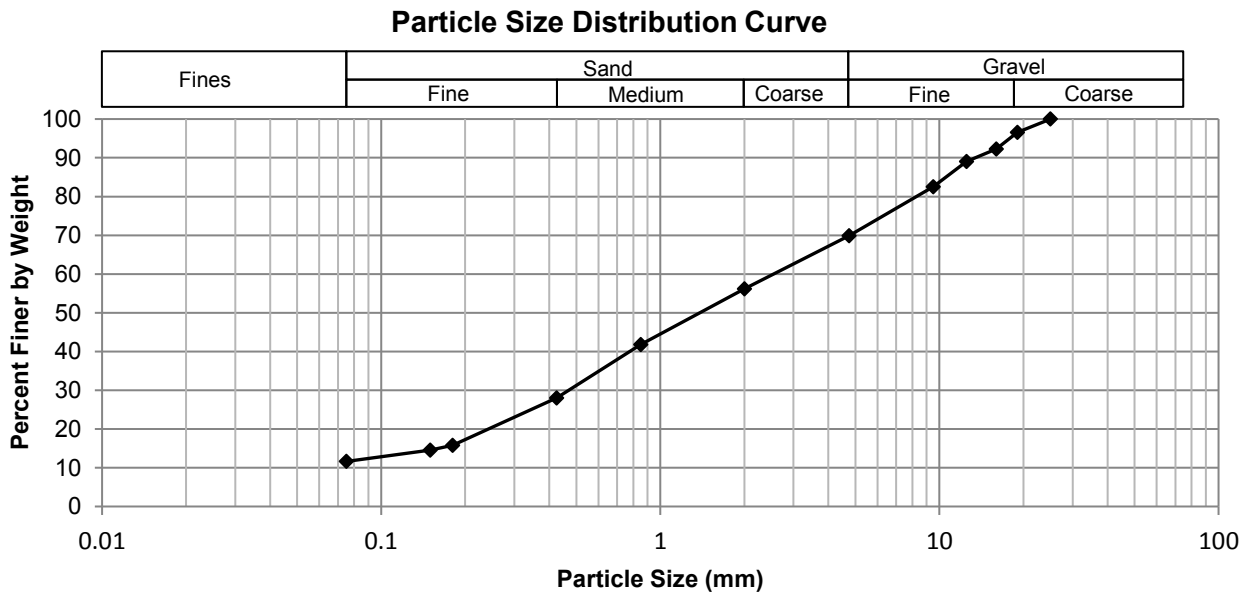
Grain Size Analysis (Sieve Method)
ASTM C136-14

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Sample #	G181
Source	Fermor Ave.
Soil Desc.	Sand & Gravel
Date Sampled	23-Nov-18
Date Tested	4-Dec-18
Technician	KG

Gravel %	30.1
Sand %	58.3
Fines %	11.6



Sieve Number	Sieve Opening (mm)	Percent Passing	Specification (Min-Max)
1"	25.0	100	-
3/4"	19.0	97	-
5/8"	16.0	92	-
1/2"	12.5	89	-
3/8"	9.50	83	-
no. 4	4.75	70	-
no. 10	2.00	56	-
no. 20	0.850	42	-
no. 40	0.425	28	-
no. 80	0.180	16	-
no. 100	0.150	15	-
no. 200	0.075	12	-

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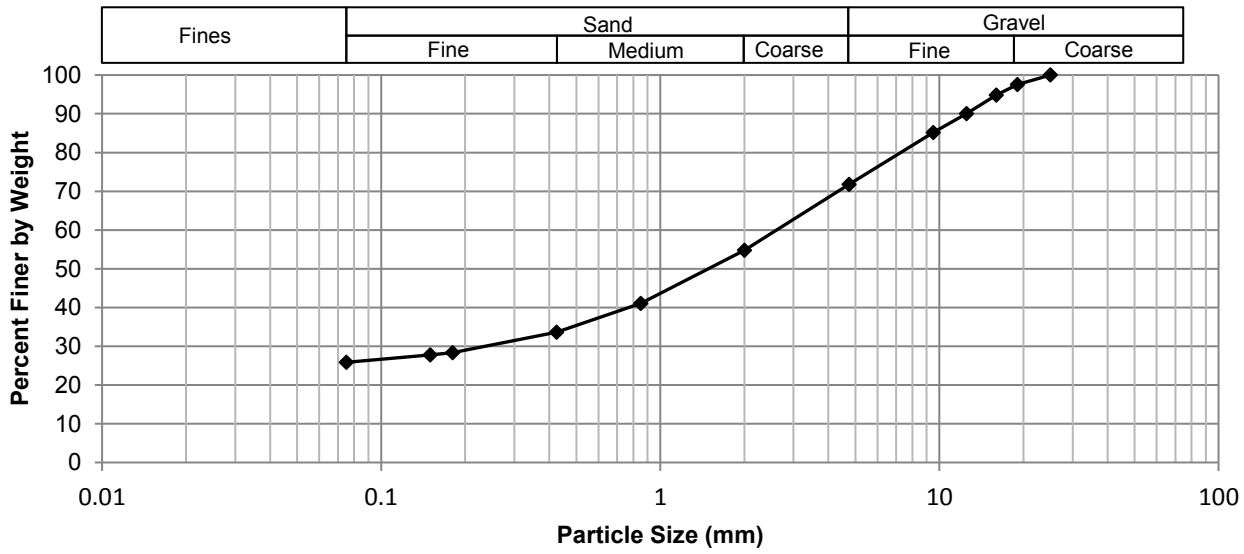
Grain Size Analysis (Sieve Method)
ASTM C136-14

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Sample #	G219
Source	Fermor Ave.
Soil Desc.	Sand & Gravel
Date Sampled	23-Nov-18
Date Tested	4-Dec-18
Technician	KG

Gravel %	28.2
Sand %	46.0
Fines %	25.9



Sieve Number	Sieve Opening (mm)	Percent Passing	Specification (Min-Max)
1"	25.0	100	-
3/4"	19.0	98	-
5/8"	16.0	95	-
1/2"	12.5	90	-
3/8"	9.50	85	-
no. 4	4.75	72	-
no. 10	2.00	55	-
no. 20	0.850	41	-
no. 40	0.425	34	-
no. 80	0.180	28	-
no. 100	0.150	28	-
no. 200	0.075	26	-

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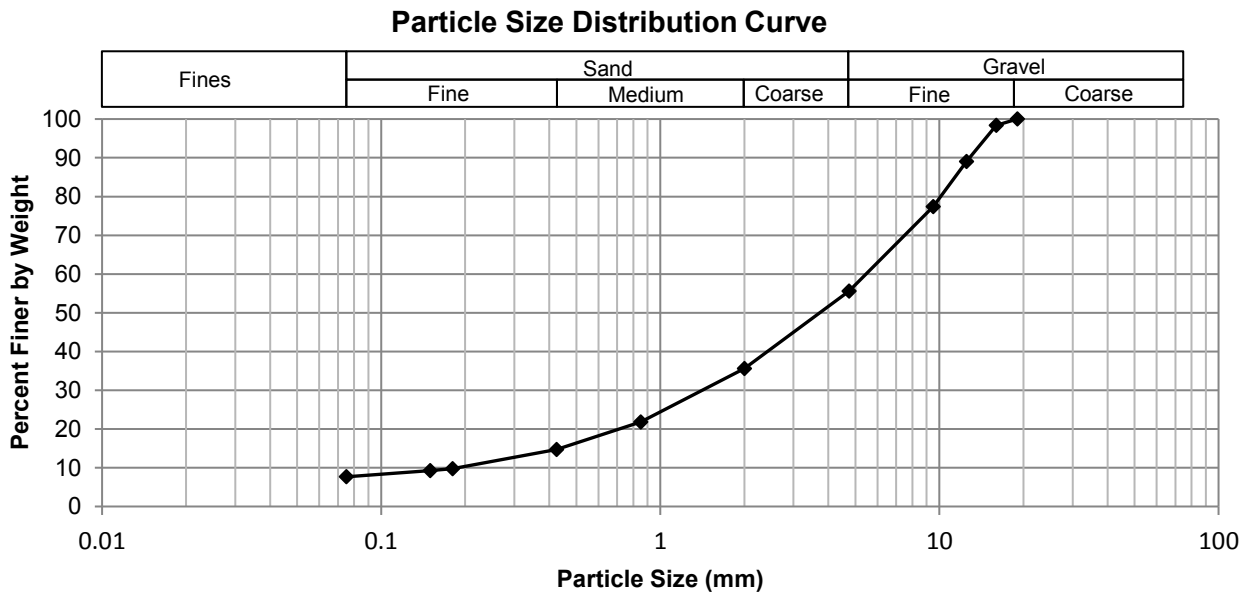
Grain Size Analysis (Sieve Method)
ASTM C136-14

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Sample #	G233
Source	Fermor Ave.
Soil Desc.	Sand & Gravel
Date Sampled	26-Nov-18
Date Tested	4-Dec-18
Technician	KG

Gravel %	44.4
Sand %	47.9
Fines %	7.7



Sieve Number	Sieve Opening (mm)	Percent Passing	Specification (Min-Max)
3/4"	19.0	100	-
5/8"	16.0	98	-
1/2"	12.5	89	-
3/8"	9.50	77	-
no. 4	4.75	56	-
no. 10	2.00	36	-
no. 20	0.850	22	-
no. 40	0.425	15	-
no. 80	0.180	9.8	-
no. 100	0.150	9.2	-
no. 200	0.075	7.7	-

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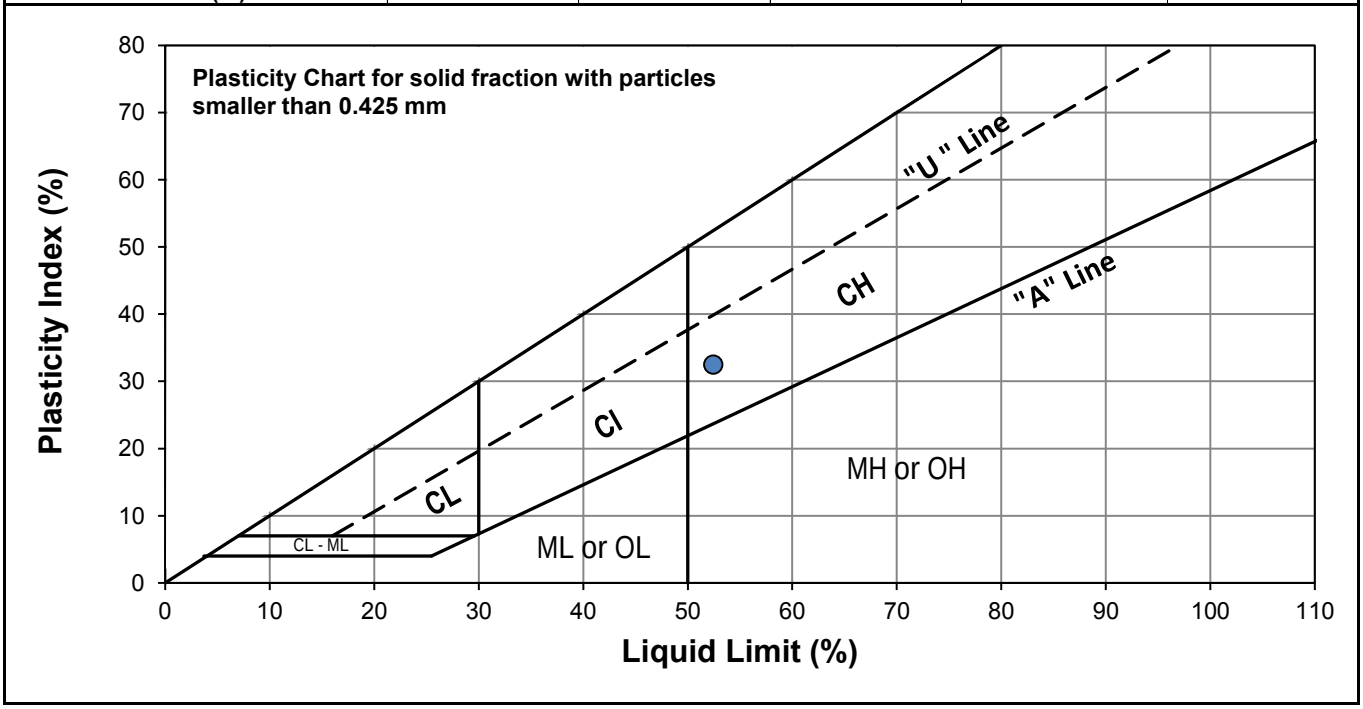
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-21
Sample #	G33
Depth (m)	0.9 - 1.1
Sample Date	14-Nov-18
Test Date	4-Dec-18
Technician	DS

Liquid Limit	52
Plastic Limit	20
Plasticity Index	32

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	17	24	35		
Mass Wet Soil + Tare (g)	23.525	22.664	24.338		
Mass Dry Soil + Tare (g)	20.061	19.728	20.922		
Mass Tare (g)	13.700	14.153	14.177		
Mass Water (g)	3.464	2.936	3.416		
Mass Dry Soil (g)	6.361	5.575	6.745		
Moisture Content (%)	54.457	52.664	50.645		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	27.574	27.163			
Mass Wet Soil + Tare (g)	25.282	25.017			
Mass Dry Soil + Tare (g)	14.002	14.065			
Mass Water (g)	2.292	2.146			
Mass Dry Soil (g)	11.280	10.952			
Moisture Content (%)	20.319	19.595			

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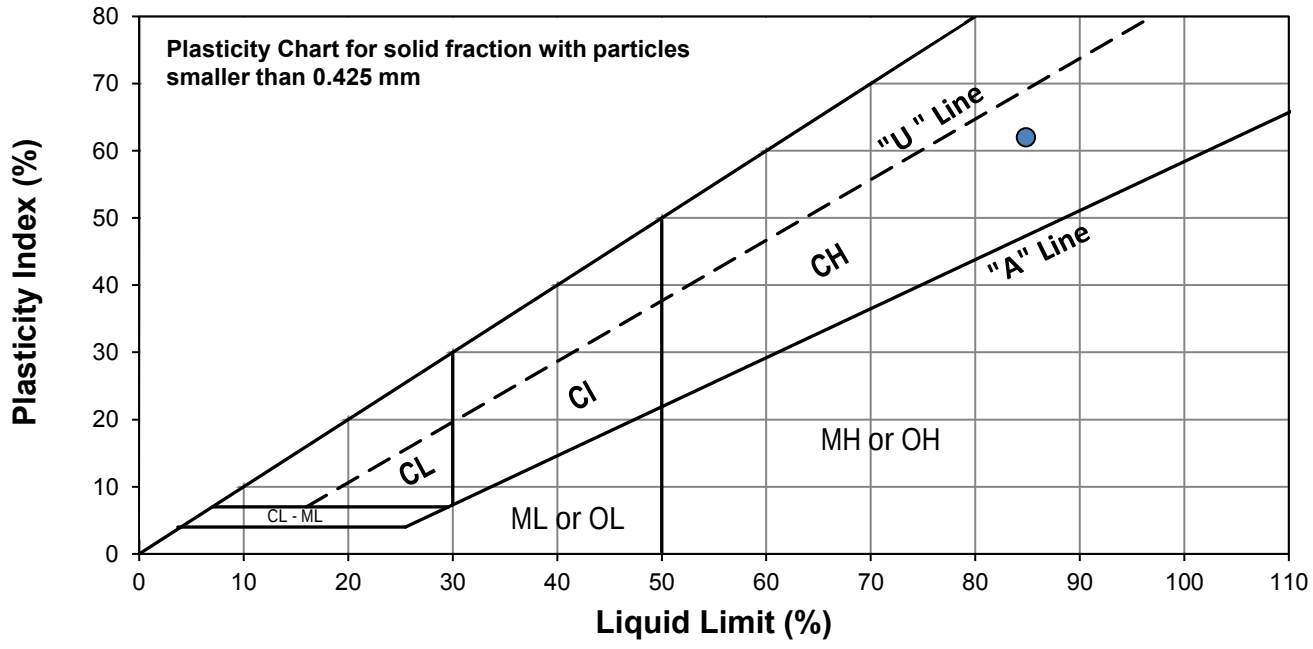
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-01
Sample #	G61
Depth (m)	0.6 - 0.8
Sample Date	21-Nov-18
Test Date	5-Dec-18
Technician	JB

Liquid Limit	85
Plastic Limit	23
Plasticity Index	62

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	19	28	31		
Mass Wet Soil + Tare (g)	22.675	22.936	24.375		
Mass Dry Soil + Tare (g)	18.668	18.903	19.802		
Mass Tare (g)	14.079	14.088	14.291		
Mass Water (g)	4.007	4.033	4.573		
Mass Dry Soil (g)	4.589	4.815	5.511		
Moisture Content (%)	87.317	83.759	82.979		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	23.494	24.730			
Mass Wet Soil + Tare (g)	21.698	22.714			
Mass Dry Soil + Tare (g)	13.764	13.986			
Mass Water (g)	1.796	2.016			
Mass Dry Soil (g)	7.934	8.728			
Moisture Content (%)	22.637	23.098			

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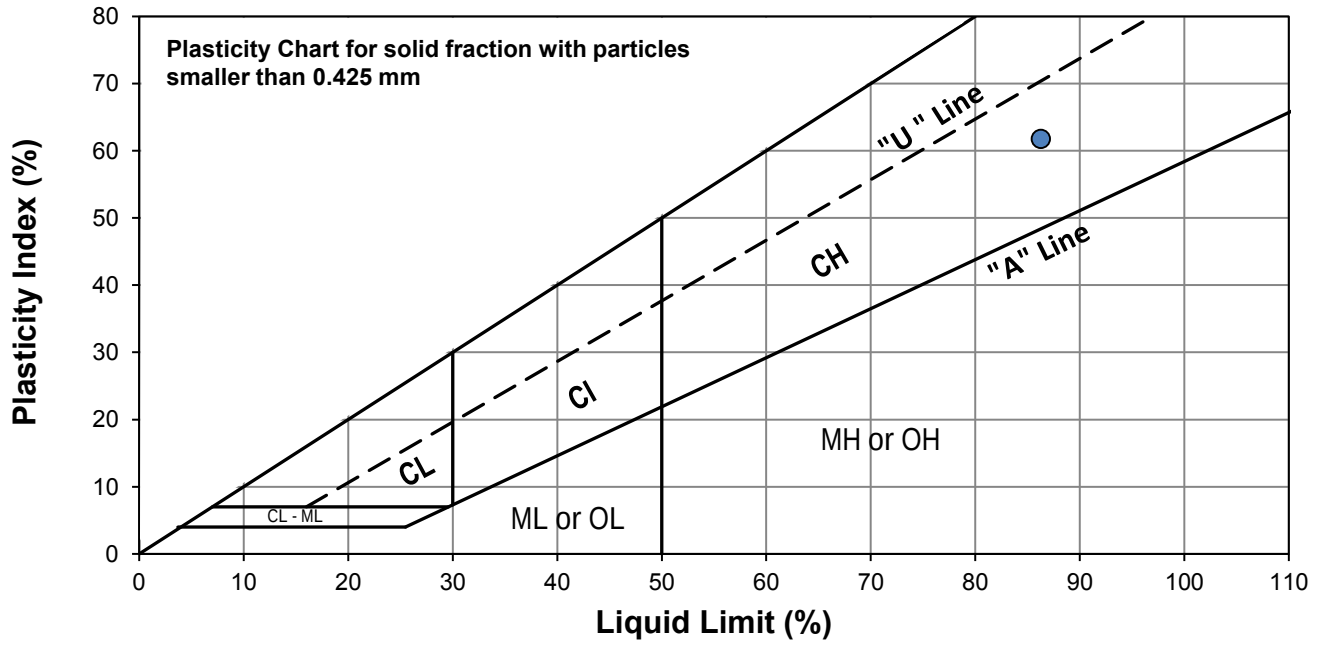
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-04
Sample #	G82
Depth (m)	0.6 - 0.8
Sample Date	21-Nov-18
Test Date	4-Dec-18
Technician	DS

Liquid Limit	86
Plastic Limit	25
Plasticity Index	62

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	19	24	32		
Mass Wet Soil + Tare (g)	22.840	22.112	22.266		
Mass Dry Soil + Tare (g)	18.650	18.334	18.583		
Mass Tare (g)	13.924	13.971	14.208		
Mass Water (g)	4.190	3.778	3.683		
Mass Dry Soil (g)	4.726	4.363	4.375		
Moisture Content (%)	88.658	86.592	84.183		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	24.034	25.860			
Mass Wet Soil + Tare (g)	22.094	23.541			
Mass Dry Soil + Tare (g)	14.210	14.065			
Mass Water (g)	1.940	2.319			
Mass Dry Soil (g)	7.884	9.476			
Moisture Content (%)	24.607	24.472			

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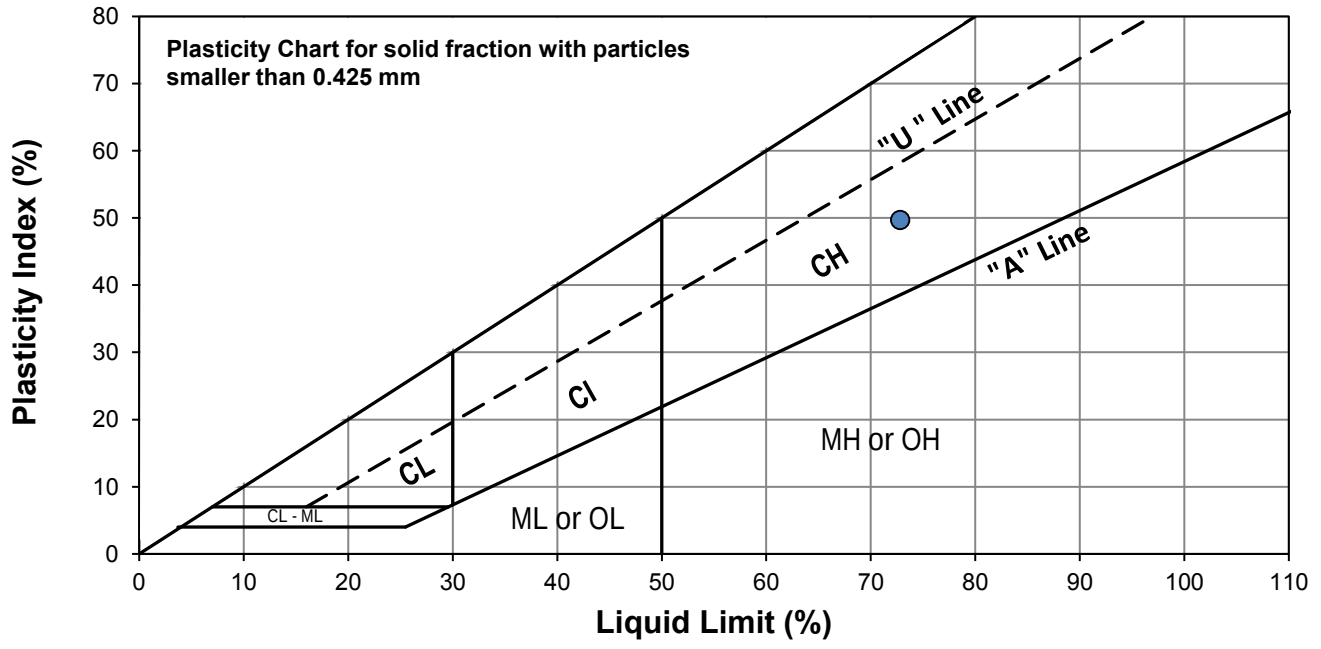
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-08
Sample #	G136
Depth (m)	0.8 - 0.9
Sample Date	22-Nov-18
Test Date	5-Dec-18
Technician	DS

Liquid Limit	73
Plastic Limit	23
Plasticity Index	50

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	17	23	35		
Mass Wet Soil + Tare (g)	24.408	23.035	22.853		
Mass Dry Soil + Tare (g)	20.011	19.349	19.128		
Mass Tare (g)	14.171	14.308	13.869		
Mass Water (g)	4.397	3.686	3.725		
Mass Dry Soil (g)	5.840	5.041	5.259		
Moisture Content (%)	75.291	73.120	70.831		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	28.510	27.950			
Mass Wet Soil + Tare (g)	25.860	25.346			
Mass Dry Soil + Tare (g)	14.282	14.216			
Mass Water (g)	2.650	2.604			
Mass Dry Soil (g)	11.578	11.130			
Moisture Content (%)	22.888	23.396			

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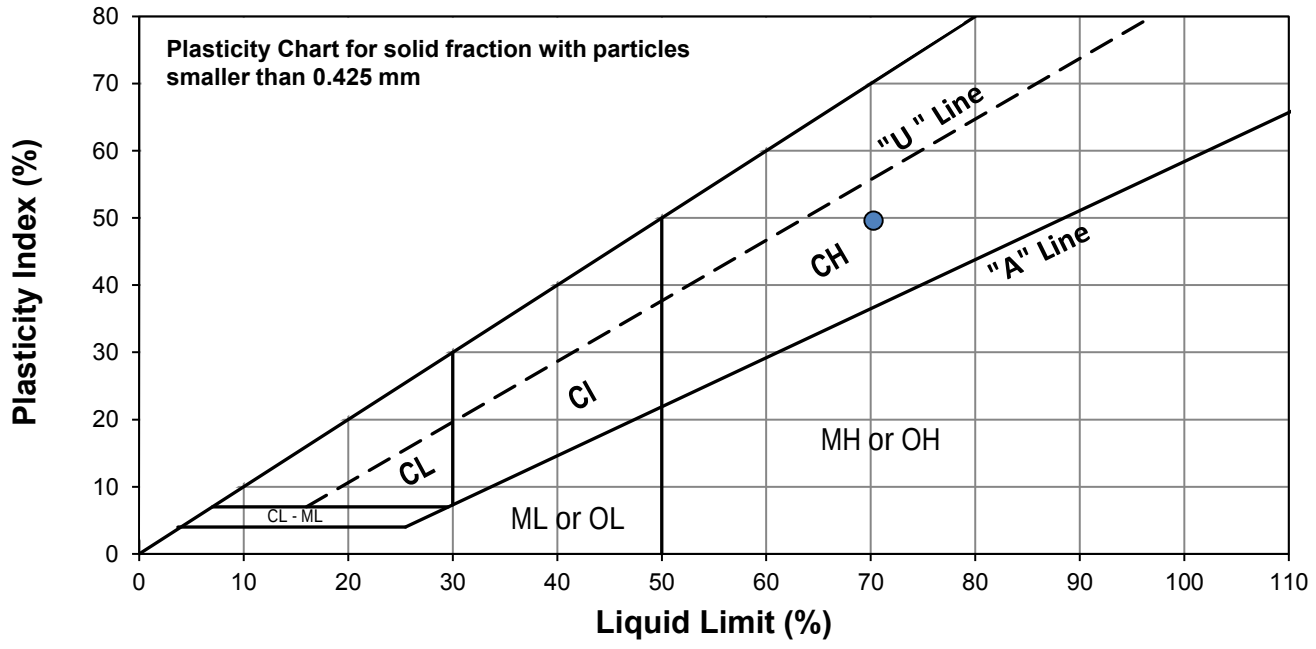
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-23
Sample #	G143
Depth (m)	0.6 - 0.8
Sample Date	22-Nov-18
Test Date	5-Dec-18
Technician	DS

Liquid Limit	70
Plastic Limit	21
Plasticity Index	50

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	17	28	34		
Mass Wet Soil + Tare (g)	22.966	23.283	22.882		
Mass Dry Soil + Tare (g)	19.195	19.518	19.316		
Mass Tare (g)	14.045	14.092	14.063		
Mass Water (g)	3.771	3.765	3.566		
Mass Dry Soil (g)	5.150	5.426	5.253		
Moisture Content (%)	73.223	69.388	67.885		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	25.094	23.812			
Mass Wet Soil + Tare (g)	23.191	22.153			
Mass Dry Soil + Tare (g)	13.974	14.125			
Mass Water (g)	1.903	1.659			
Mass Dry Soil (g)	9.217	8.028			
Moisture Content (%)	20.647	20.665			

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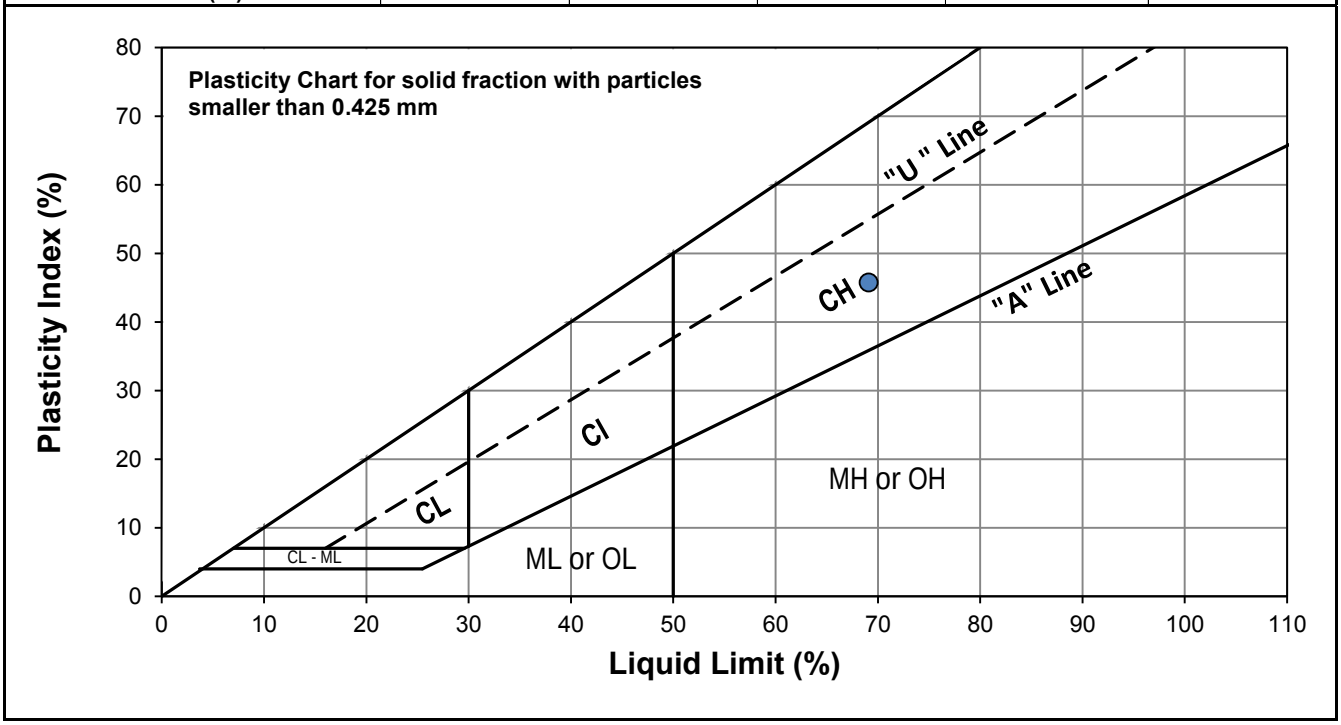
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-24
Sample #	G159
Depth (m)	0.5 - 0.6
Sample Date	23-Nov-18
Test Date	10-Dec-18
Technician	DS

Liquid Limit	69
Plastic Limit	23
Plasticity Index	46

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	18	22	31		
Mass Wet Soil + Tare (g)	24.207	25.732	23.336		
Mass Dry Soil + Tare (g)	19.968	21.000	19.636		
Mass Tare (g)	14.198	14.340	14.039		
Mass Water (g)	4.239	4.732	3.700		
Mass Dry Soil (g)	5.770	6.660	5.597		
Moisture Content (%)	73.466	71.051	66.107		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	20.097	19.199			
Mass Wet Soil + Tare (g)	18.932	18.233			
Mass Dry Soil + Tare (g)	13.980	14.083			
Mass Water (g)	1.165	0.966			
Mass Dry Soil (g)	4.952	4.150			
Moisture Content (%)	23.526	23.277			

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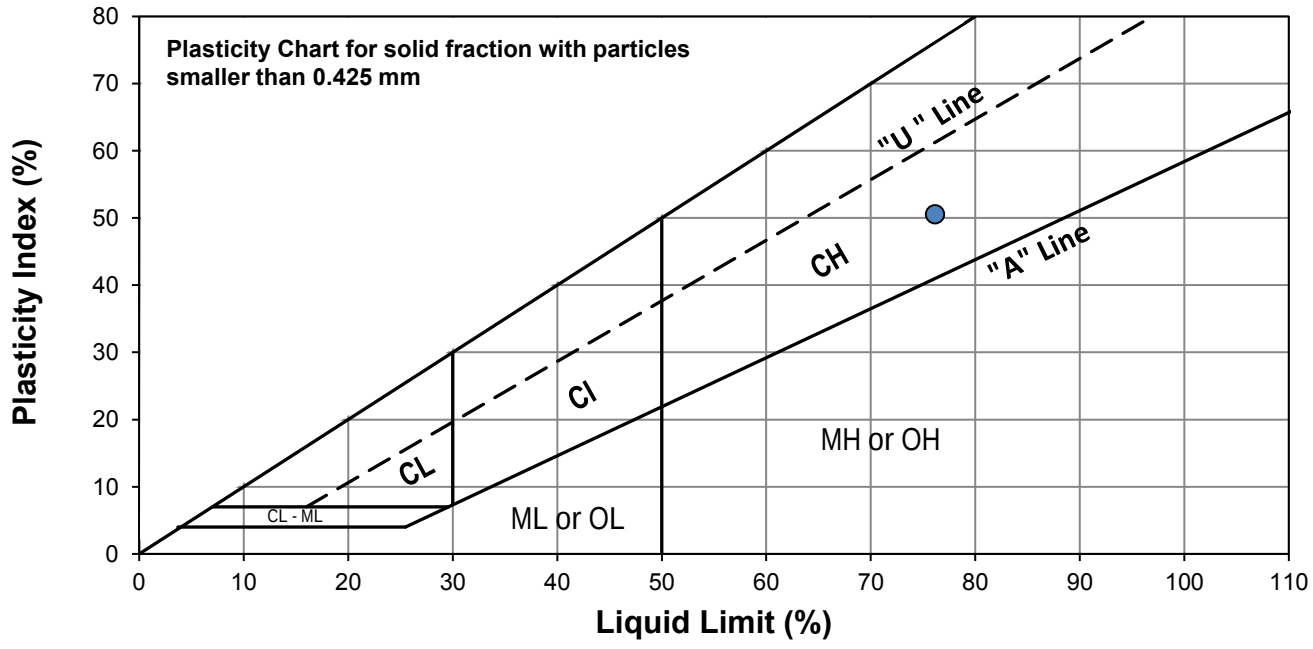
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-18
Sample #	G189
Depth (m)	0.6 - 0.8
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	JB

Liquid Limit	76
Plastic Limit	26
Plasticity Index	51

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	17	25	32		
Mass Wet Soil + Tare (g)	22.856	22.730	21.789		
Mass Dry Soil + Tare (g)	19.109	18.989	18.455		
Mass Tare (g)	14.378	14.053	13.981		
Mass Water (g)	3.747	3.741	3.334		
Mass Dry Soil (g)	4.731	4.936	4.474		
Moisture Content (%)	79.201	75.790	74.519		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	21.657	20.155			
Mass Wet Soil + Tare (g)	20.068	18.943			
Mass Dry Soil + Tare (g)	13.971	14.123			
Mass Water (g)	1.589	1.212			
Mass Dry Soil (g)	6.097	4.820			
Moisture Content (%)	26.062	25.145			

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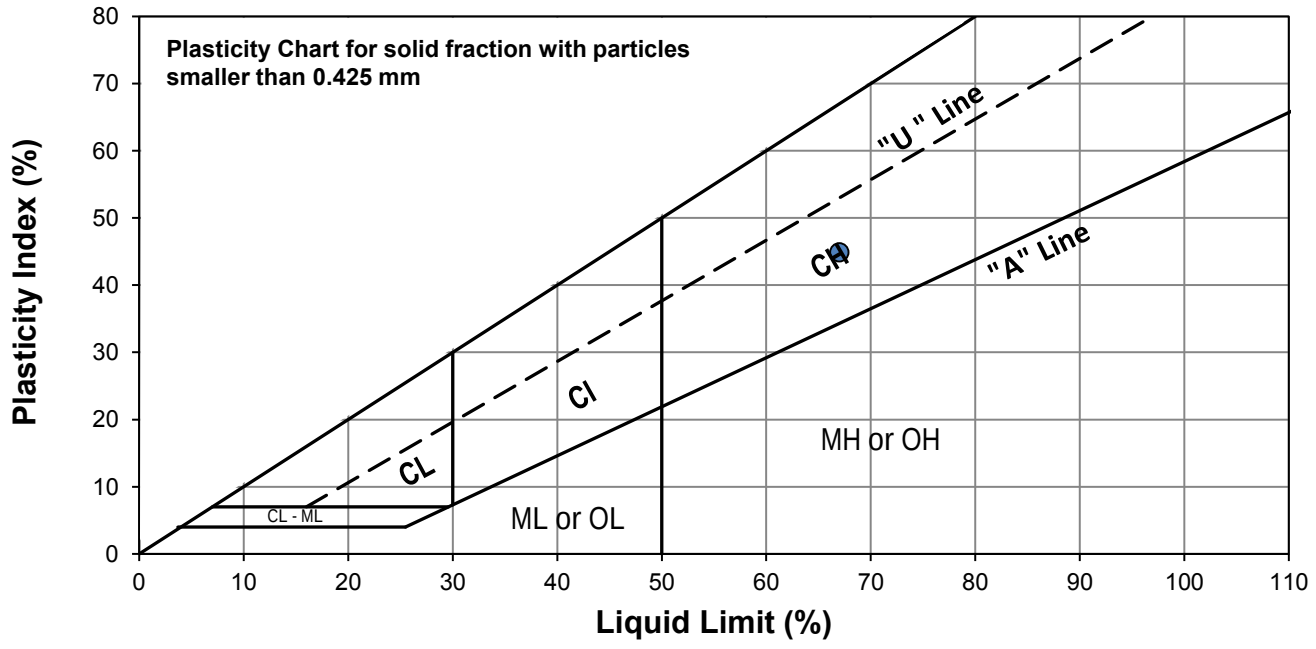
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-14
Sample #	G197
Depth (m)	0.8 - 0.9
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	DS

Liquid Limit	67
Plastic Limit	22
Plasticity Index	45

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	15	26	35		
Mass Wet Soil + Tare (g)	21.855	22.878	23.287		
Mass Dry Soil + Tare (g)	18.680	19.432	19.668		
Mass Tare (g)	14.206	14.250	14.059		
Mass Water (g)	3.175	3.446	3.619		
Mass Dry Soil (g)	4.474	5.182	5.609		
Moisture Content (%)	70.966	66.499	64.521		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	21.178	20.385			
Mass Wet Soil + Tare (g)	19.887	19.232			
Mass Dry Soil + Tare (g)	13.996	14.064			
Mass Water (g)	1.291	1.153			
Mass Dry Soil (g)	5.891	5.168			
Moisture Content (%)	21.915	22.310			

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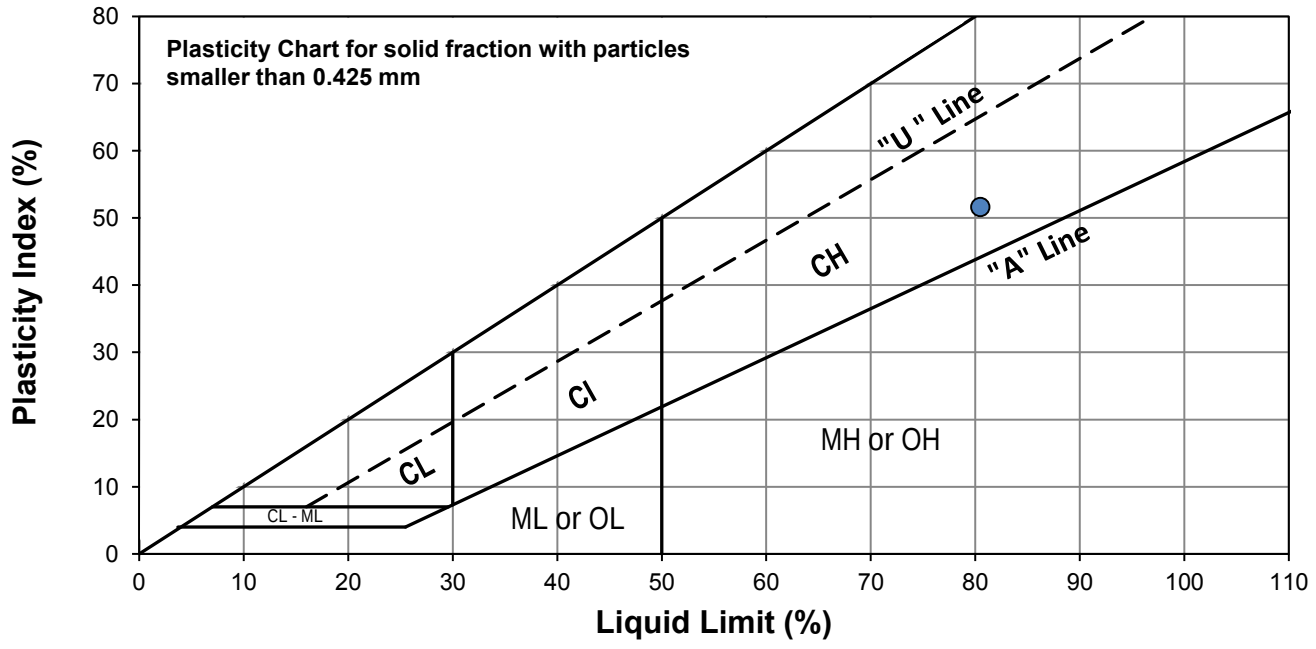
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-12
Sample #	G205
Depth (m)	0.8 - 0.9
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	DS

Liquid Limit	80
Plastic Limit	29
Plasticity Index	52

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	17	23	31		
Mass Wet Soil + Tare (g)	23.549	22.987	24.553		
Mass Dry Soil + Tare (g)	19.265	19.065	20.013		
Mass Tare (g)	14.123	14.214	14.272		
Mass Water (g)	4.284	3.922	4.540		
Mass Dry Soil (g)	5.142	4.851	5.741		
Moisture Content (%)	83.314	80.849	79.080		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	25.111	25.954			
Mass Wet Soil + Tare (g)	22.622	23.343			
Mass Dry Soil + Tare (g)	14.023	14.277			
Mass Water (g)	2.489	2.611			
Mass Dry Soil (g)	8.599	9.066			
Moisture Content (%)	28.945	28.800			

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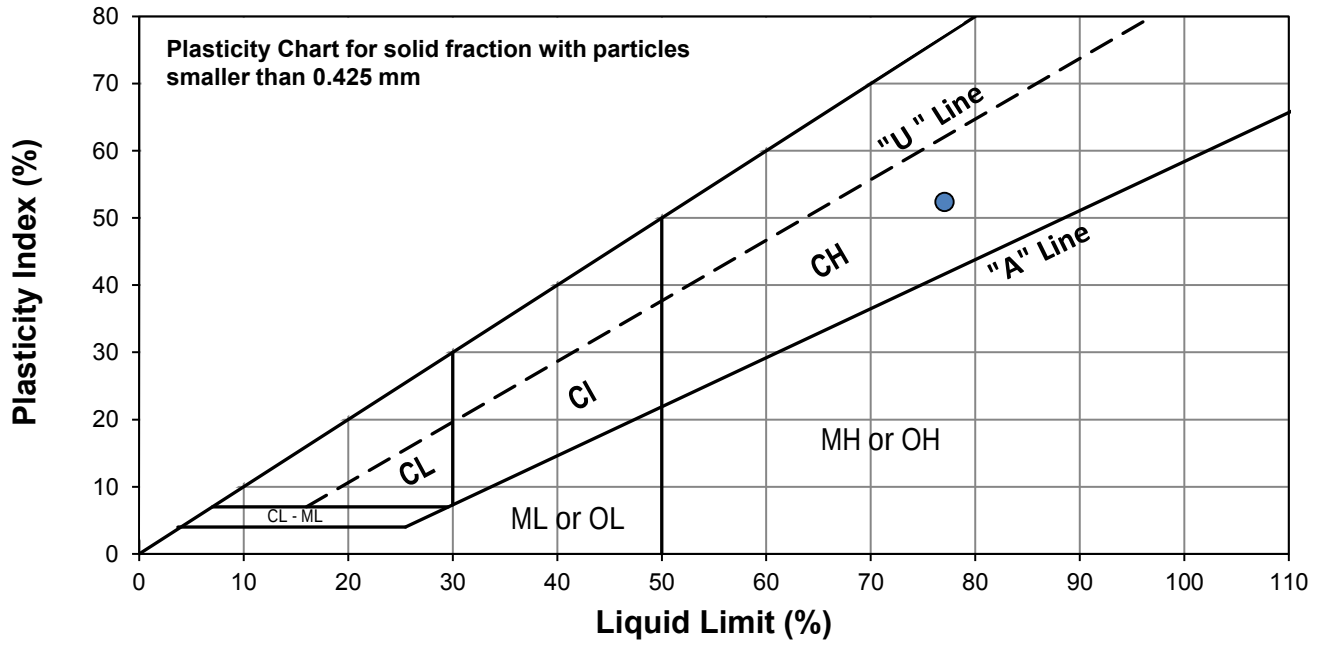
Atterberg Limits
ASTM D4318-10e1

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave
Test Hole	TH18-28
Sample #	G226
Depth (m)	0.8 - 0.9
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	DS

Liquid Limit	77
Plastic Limit	25
Plasticity Index	52

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	17	27	32		
Mass Wet Soil + Tare (g)	23.485	22.072	23.690		
Mass Dry Soil + Tare (g)	19.368	18.714	19.549		
Mass Tare (g)	14.198	14.340	14.039		
Mass Water (g)	4.117	3.358	4.141		
Mass Dry Soil (g)	5.170	4.374	5.510		
Moisture Content (%)	79.632	76.772	75.154		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	28.155	24.810			
Mass Wet Soil + Tare (g)	25.390	22.700			
Mass Dry Soil + Tare (g)	14.201	14.125			
Mass Water (g)	2.765	2.110			
Mass Dry Soil (g)	11.189	8.575			
Moisture Content (%)	24.712	24.606			

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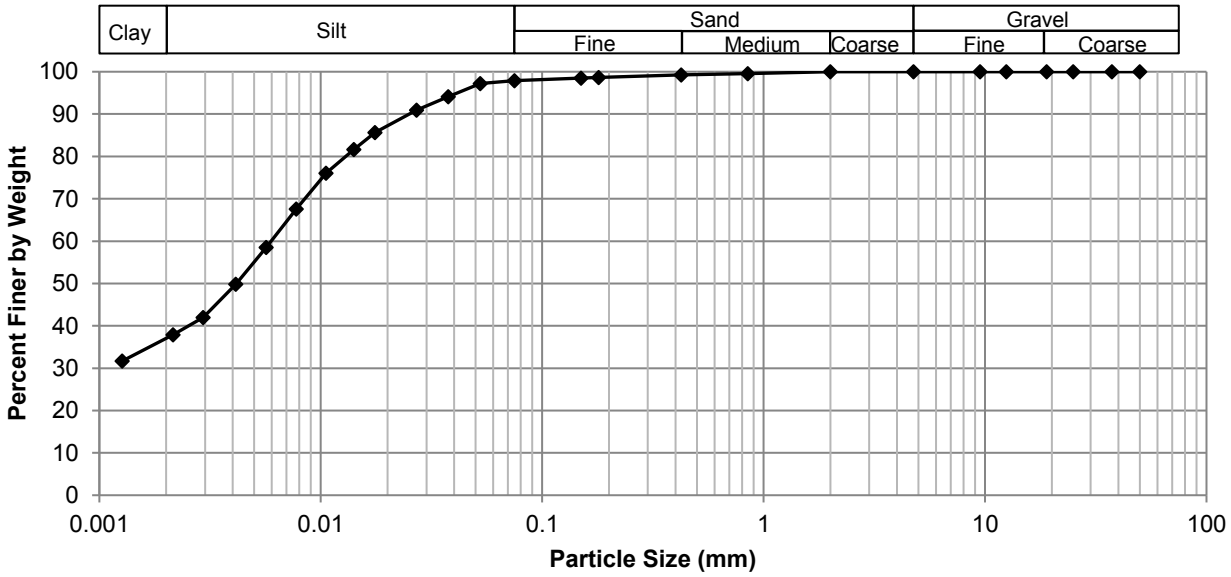
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-21
Sample #	G33
Depth (m)	0.9 - 1.1
Sample Date	14-Nov-18
Test Date	30-Nov-18
Technician	JB

Gravel	0.0%
Sand	2.1%
Silt	60.9%
Clay	37.1%

Particle Size Distribution Curve



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	97.93
37.5	100.00	2.00	100.00	0.0525	97.21
25.0	100.00	0.850	99.57	0.0377	94.08
19.0	100.00	0.425	99.23	0.0271	90.96
12.5	100.00	0.180	98.63	0.0176	85.65
9.50	100.00	0.150	98.50	0.0141	81.66
4.75	100.00	0.075	97.93	0.0106	76.04
				0.0077	67.61
				0.0057	58.55
				0.0041	49.80
				0.0029	41.99
				0.0022	37.93
				0.0013	31.69

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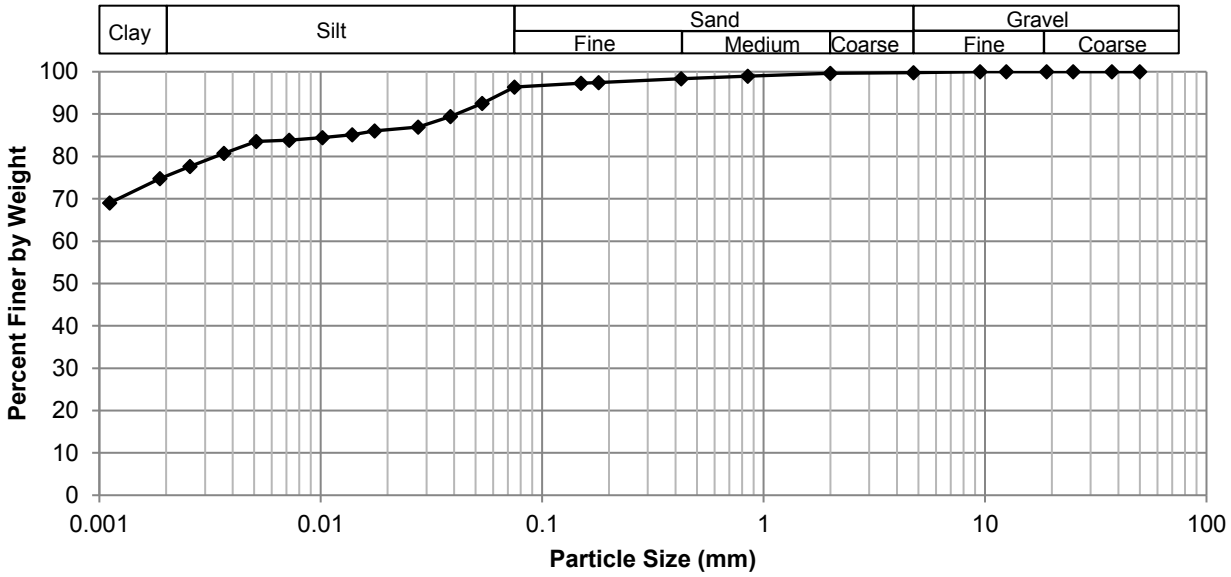
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-01
Sample #	G61
Depth (m)	0.6 - 0.8
Sample Date	21-Nov-18
Test Date	4-Dec-18
Technician	KG

Gravel	0.2%
Sand	3.4%
Silt	21.1%
Clay	75.3%

Particle Size Distribution Curve



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	99.80	0.0750	96.40
37.5	100.00	2.00	99.64	0.0537	92.52
25.0	100.00	0.850	98.99	0.0385	89.40
19.0	100.00	0.425	98.34	0.0276	86.91
12.5	100.00	0.180	97.46	0.0175	86.03
9.50	100.00	0.150	97.32	0.0139	85.10
4.75	99.80	0.075	96.40	0.0102	84.47
				0.0072	83.85
				0.0051	83.54
				0.0037	80.73
				0.0026	77.62
				0.0019	74.76
				0.0011	69.04

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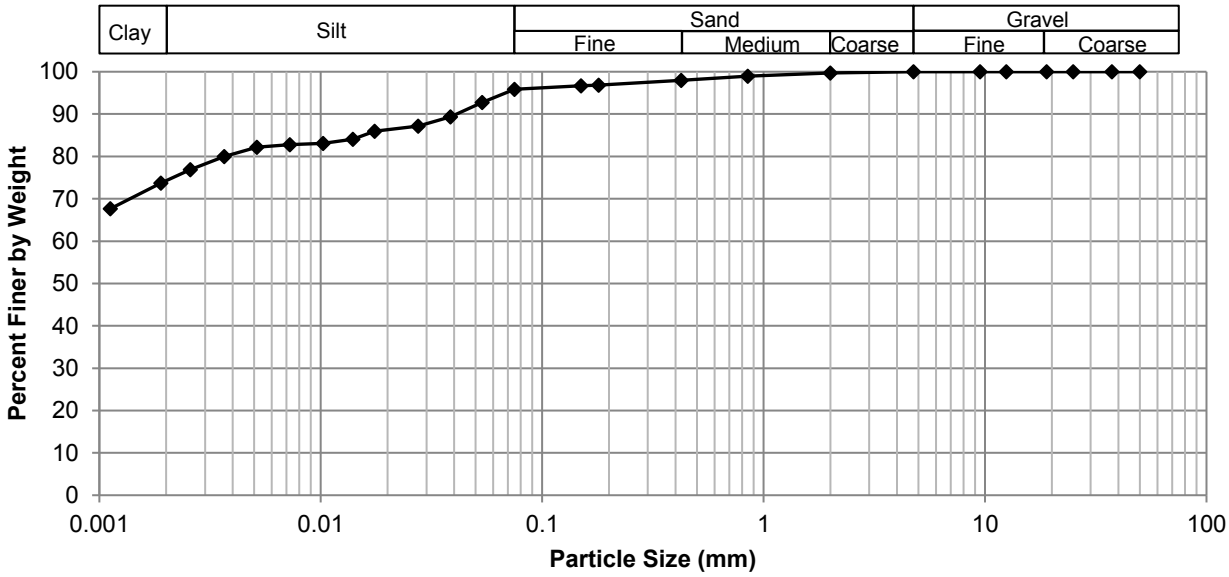
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-04
Sample #	G82
Depth (m)	0.6 - 0.8
Sample Date	21-Nov-18
Test Date	4-Dec-18
Technician	KG

Gravel	0.0%
Sand	4.1%
Silt	21.6%
Clay	74.3%

Particle Size Distribution Curve



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	95.89
37.5	100.00	2.00	99.72	0.0536	92.78
25.0	100.00	0.850	98.92	0.0385	89.36
19.0	100.00	0.425	97.99	0.0275	87.17
12.5	100.00	0.180	96.86	0.0175	85.93
9.50	100.00	0.150	96.70	0.0140	84.06
4.75	100.00	0.075	95.89	0.0102	83.12
				0.0073	82.81
				0.0051	82.19
				0.0037	80.00
				0.0026	76.89
				0.0019	73.70
				0.0011	67.65

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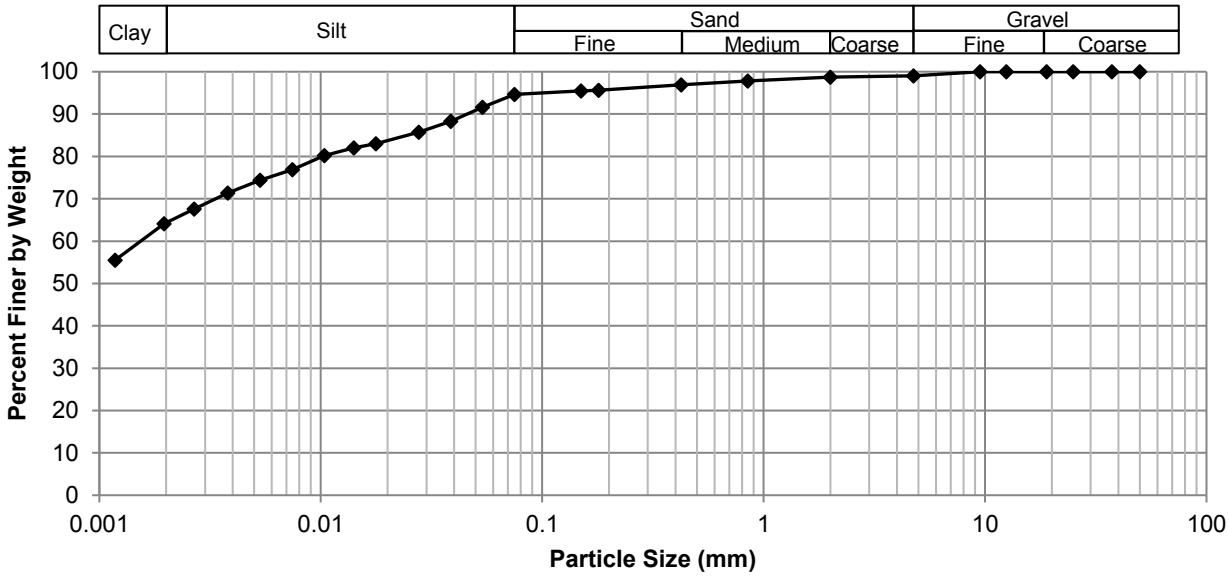
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-08
Sample #	G136
Depth (m)	0.8 - 0.9
Sample Date	22-Nov-18
Test Date	5-Dec-18
Technician	KG

Gravel	0.9%
Sand	4.4%
Silt	29.5%
Clay	65.2%

Particle Size Distribution Curve



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	99.06	0.0750	94.66
37.5	100.00	2.00	98.75	0.0538	91.62
25.0	100.00	0.850	97.84	0.0387	88.30
19.0	100.00	0.425	96.89	0.0277	85.75
12.5	100.00	0.180	95.64	0.0178	82.97
9.50	100.00	0.150	95.45	0.0141	82.05
4.75	99.06	0.075	94.66	0.0104	80.20
				0.0074	76.87
				0.0053	74.40
				0.0038	71.39
				0.0027	67.61
				0.0020	64.14
				0.0012	55.51

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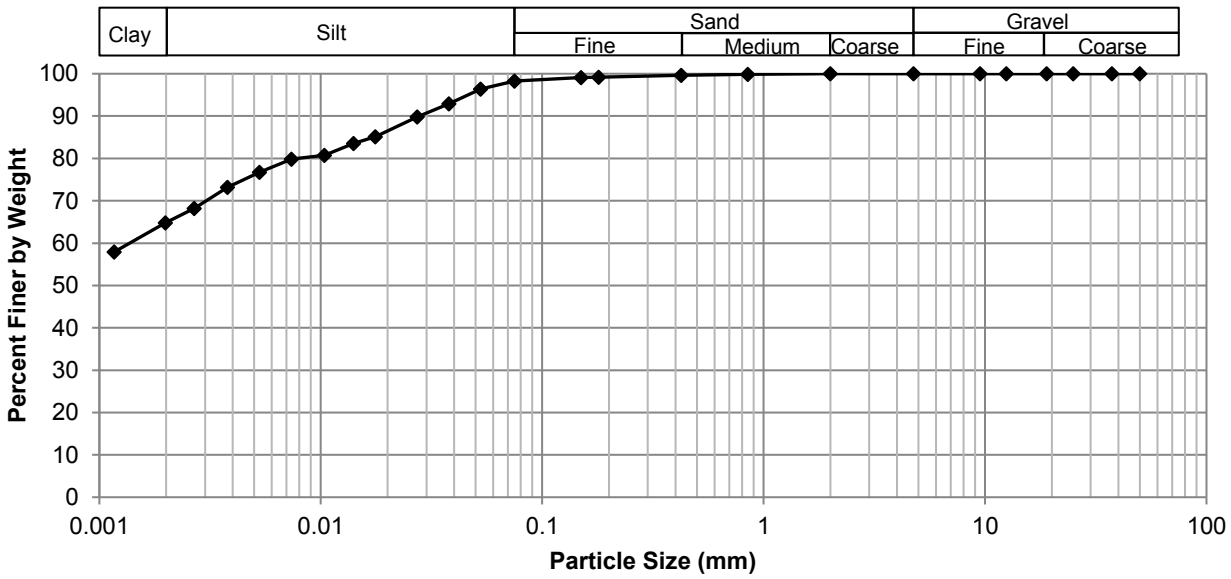
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-23
Sample #	G143
Depth (m)	0.6 - 0.8
Sample Date	22-Nov-18
Test Date	5-Dec-18
Technician	KG

Gravel	0.0%
Sand	1.7%
Silt	33.5%
Clay	64.8%

Particle Size Distribution Curve



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	98.30
37.5	100.00	2.00	99.97	0.0528	96.35
25.0	100.00	0.850	99.83	0.0380	92.91
19.0	100.00	0.425	99.66	0.0273	89.78
12.5	100.00	0.180	99.21	0.0176	85.09
9.50	100.00	0.150	99.10	0.0140	83.53
4.75	100.00	0.075	98.30	0.0104	80.72
				0.0074	79.84
				0.0053	76.72
				0.0038	73.21
				0.0027	68.21
				0.0020	64.78
				0.0012	57.95

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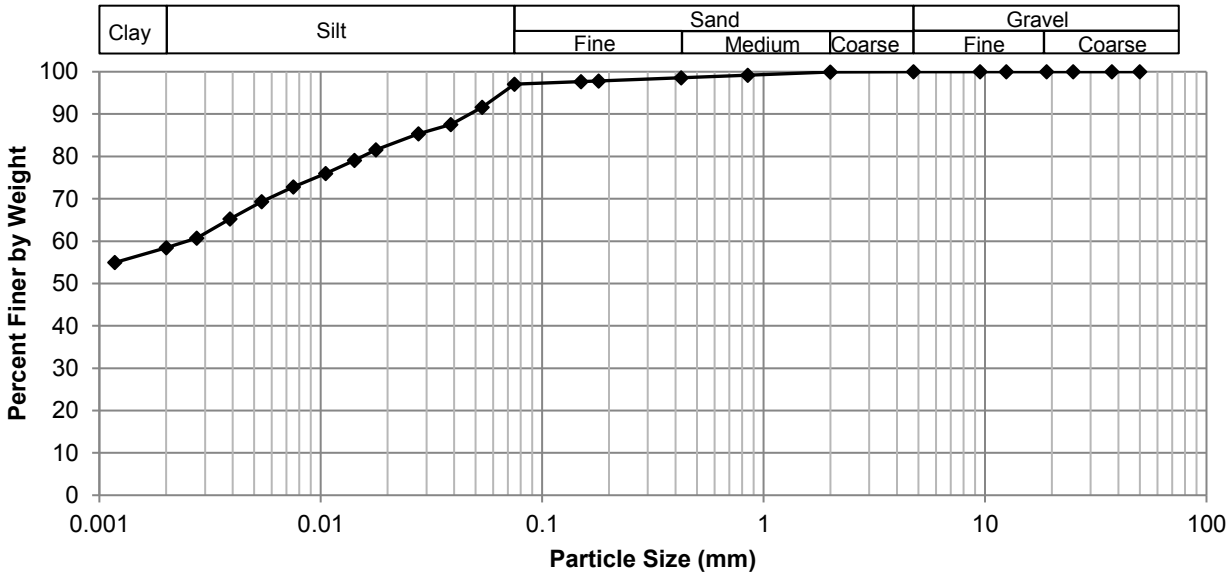
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-24
Sample #	G159
Depth (m)	0.5 - 0.6
Sample Date	14-Nov-18
Test Date	11-Dec-18
Technician	BMH

Gravel	0.0%
Sand	3.0%
Silt	38.6%
Clay	58.4%

Particle Size Distribution Curve



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	97.04
37.5	100.00	2.00	99.97	0.0536	91.59
25.0	100.00	0.850	99.20	0.0387	87.53
19.0	100.00	0.425	98.59	0.0276	85.34
12.5	100.00	0.180	97.83	0.0178	81.59
9.50	100.00	0.150	97.70	0.0142	79.09
4.75	100.00	0.075	97.04	0.0105	75.96
				0.0075	72.84
				0.0054	69.34
				0.0039	65.23
				0.0028	60.69
				0.0020	58.44
				0.0012	54.95

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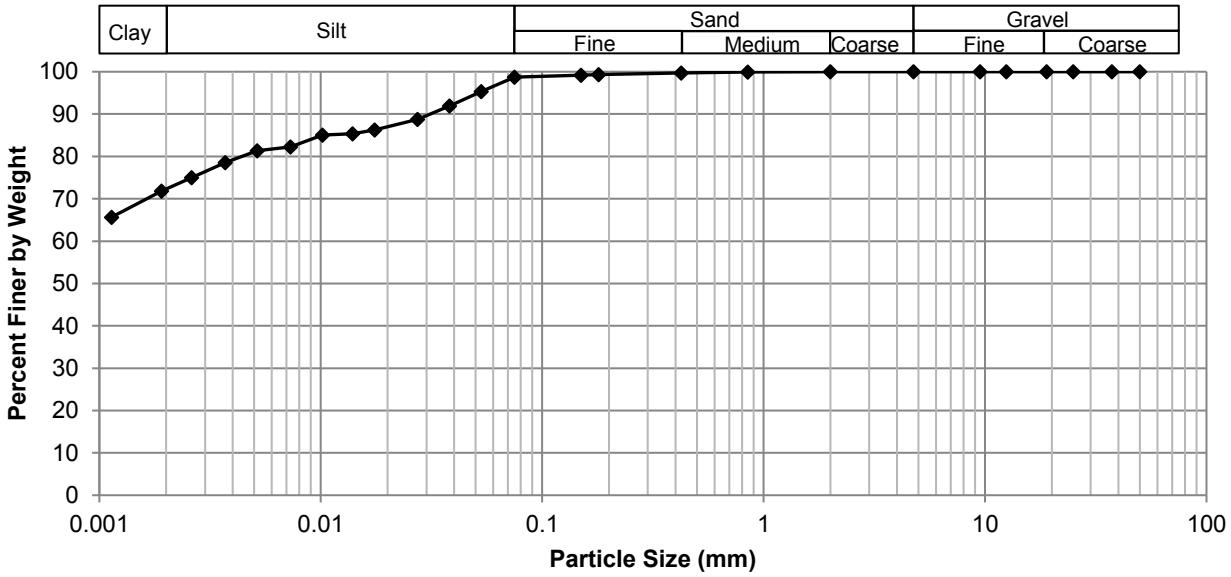
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-18
Sample #	G189
Depth (m)	0.6 - 0.8
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	KG

Gravel	0.0%
Sand	1.3%
Silt	26.4%
Clay	72.3%

Particle Size Distribution Curve



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	98.71
37.5	100.00	2.00	100.00	0.0531	95.35
25.0	100.00	0.850	99.92	0.0382	91.91
19.0	100.00	0.425	99.71	0.0274	88.79
12.5	100.00	0.180	99.30	0.0175	86.28
9.50	100.00	0.150	99.20	0.0139	85.35
4.75	100.00	0.075	98.71	0.0102	85.03
				0.0073	82.22
				0.0052	81.36
				0.0037	78.54
				0.0026	75.03
				0.0019	71.83
				0.0011	65.66

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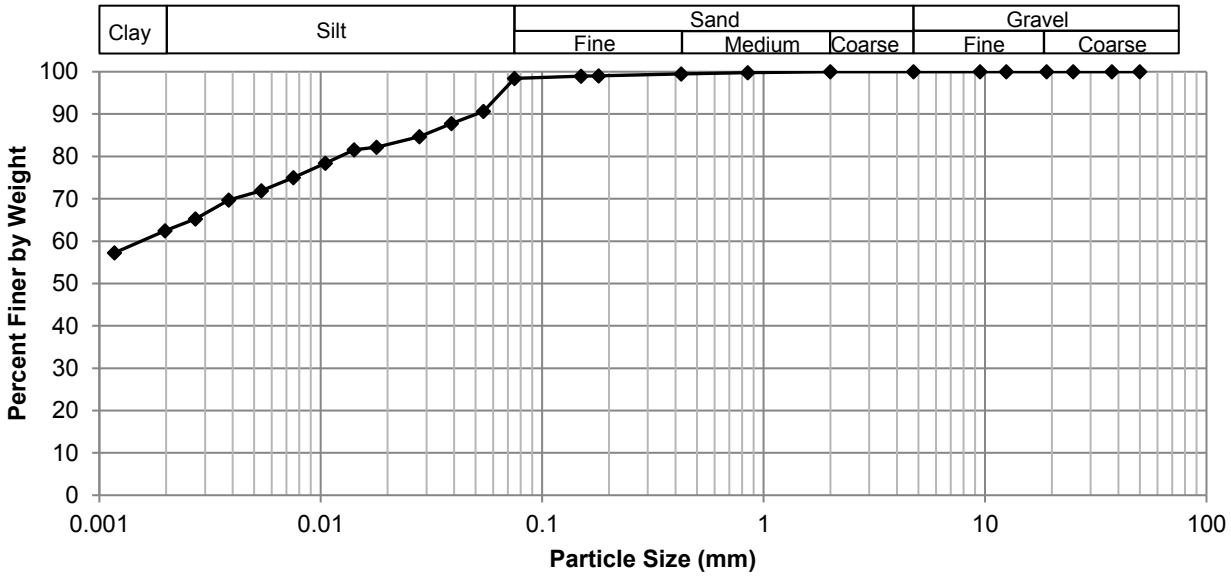
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-14
Sample #	G197
Depth (m)	0.6 - 0.8
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	KG

Gravel	0.0%
Sand	1.6%
Silt	35.8%
Clay	62.6%

Particle Size Distribution Curve



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	98.39
37.5	100.00	2.00	100.00	0.0543	90.61
25.0	100.00	0.850	99.77	0.0390	87.80
19.0	100.00	0.425	99.48	0.0280	84.67
12.5	100.00	0.180	99.02	0.0179	82.17
9.50	100.00	0.150	98.92	0.0142	81.54
4.75	100.00	0.075	98.39	0.0105	78.42
				0.0075	74.98
				0.0054	71.91
				0.0038	69.72
				0.0027	65.29
				0.0020	62.47
				0.0012	57.25

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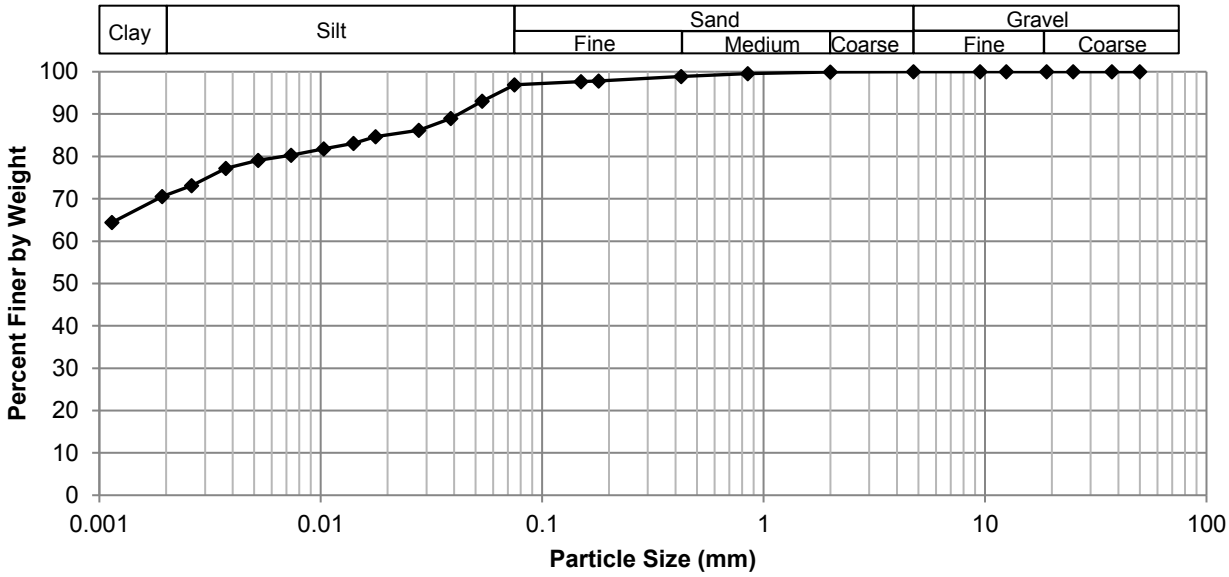
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-12
Sample #	G205
Depth (m)	0.8 - 0.9
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	KG

Gravel	0.0%
Sand	3.1%
Silt	26.0%
Clay	70.9%

Particle Size Distribution Curve



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	96.89
37.5	100.00	2.00	99.96	0.0537	93.08
25.0	100.00	0.850	99.59	0.0387	89.01
19.0	100.00	0.425	98.88	0.0277	86.20
12.5	100.00	0.180	97.84	0.0177	84.64
9.50	100.00	0.150	97.67	0.0141	83.08
4.75	100.00	0.075	96.89	0.0103	81.83
				0.0074	80.26
				0.0052	79.07
				0.0037	77.19
				0.0026	73.07
				0.0019	70.52
				0.0011	64.42

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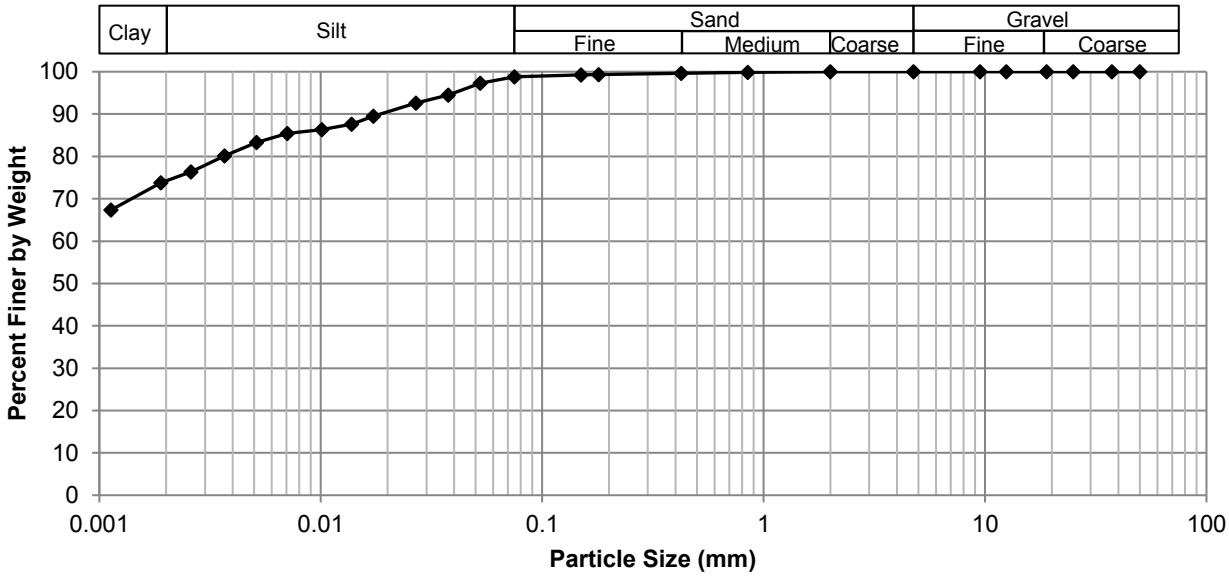
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-075-00
Client	Morrison Hershfield
Project	19-B-01 Fermor Ave.
Test Hole	TH18-28
Sample #	G226
Depth (m)	0.8 - 0.9
Sample Date	23-Nov-18
Test Date	5-Dec-18
Technician	KG

Gravel	0.0%
Sand	1.2%
Silt	24.6%
Clay	74.2%

Particle Size Distribution Curve



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	98.79
37.5	100.00	2.00	100.00	0.0525	97.31
25.0	100.00	0.850	99.83	0.0377	94.49
19.0	100.00	0.425	99.64	0.0269	92.62
12.5	100.00	0.180	99.35	0.0173	89.49
9.50	100.00	0.150	99.28	0.0138	87.62
4.75	100.00	0.075	98.79	0.0101	86.37
				0.0071	85.43
				0.0051	83.30
				0.0037	80.11
				0.0026	76.36
				0.0019	73.79
				0.0011	67.34

Appendix C

Photographs of Pavement Core Samples

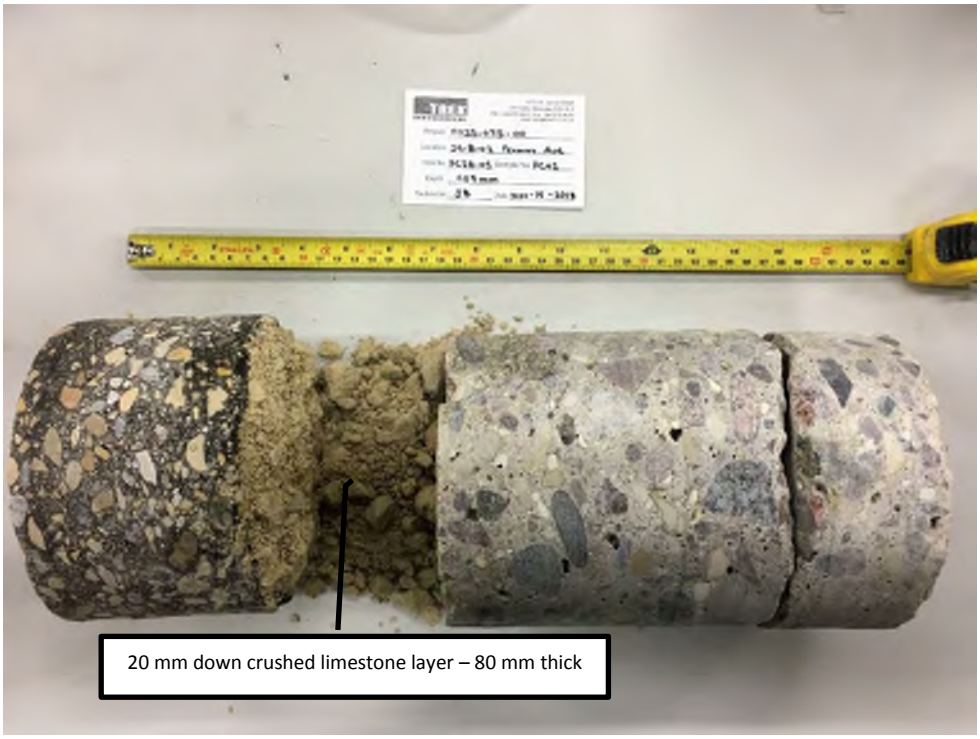


Photo 1: Pavement Core Sample at Test Hole TH18-01

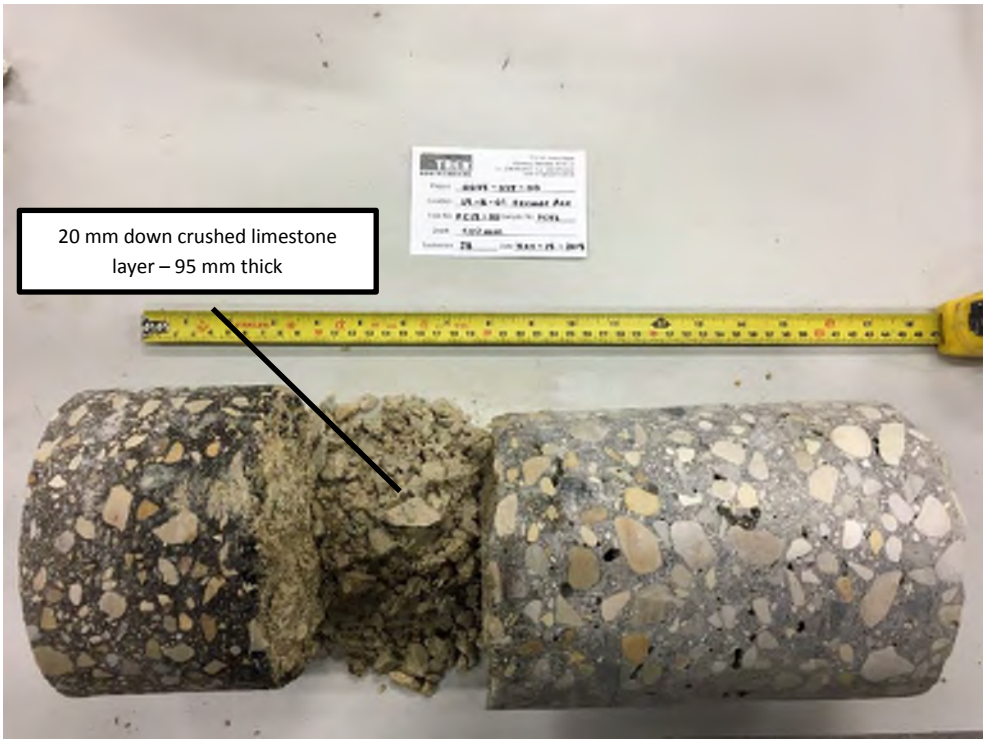


Photo 2: Pavement Core Sample at Test Hole TH18-02

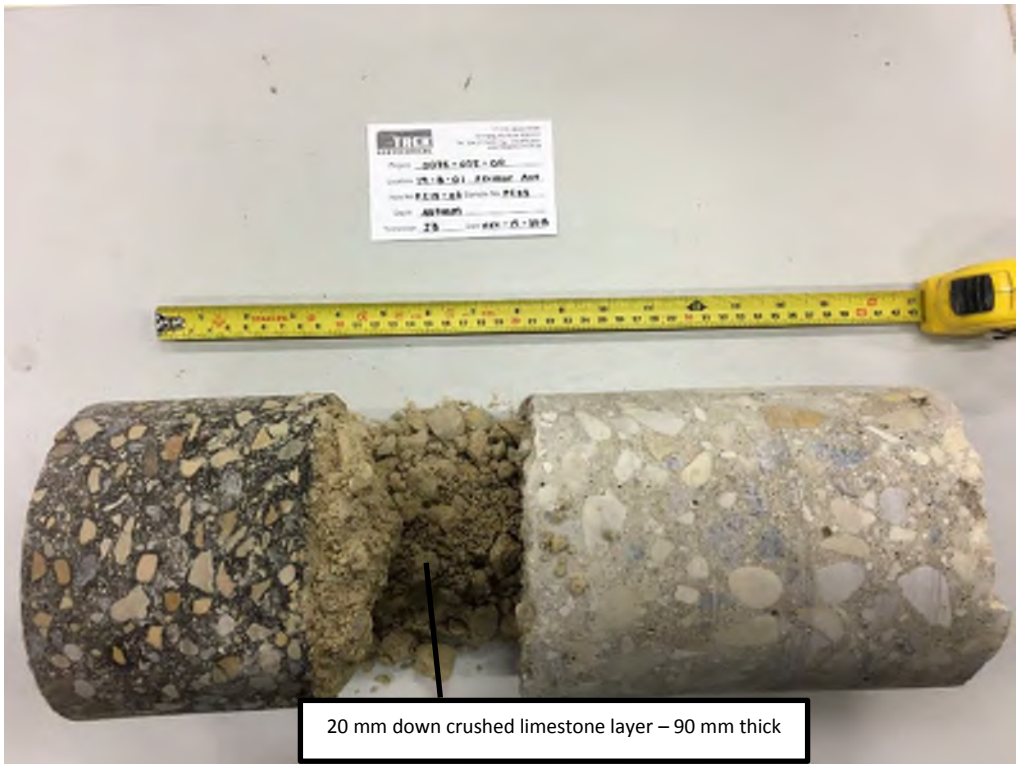


Photo 3: Pavement Core Sample at Test Hole TH18-03

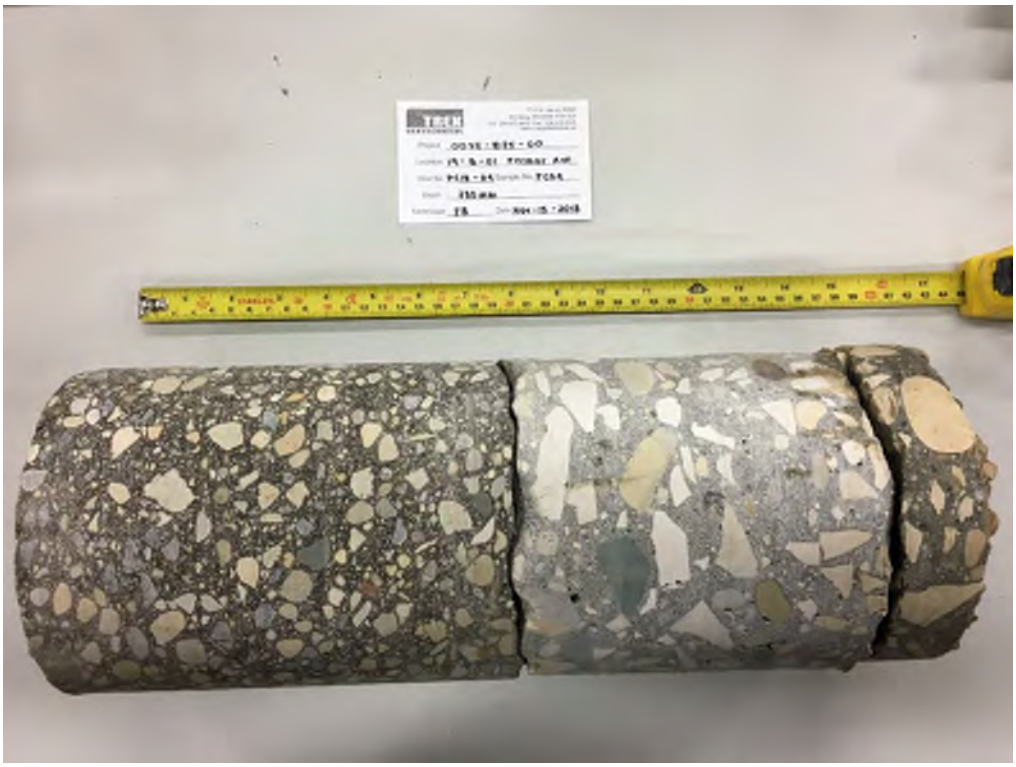


Photo 4: Pavement Core Sample at Test Hole TH18-04

Photo 5: Pavement Core Sample at Test Hole TH18-05

Photo 6: Pavement Core Sample at Test Hole TH18-06

Photo 7: Pavement Core Sample at Test Hole TH18-07

Photo 8: Pavement Core Sample at Test Hole TH18-08

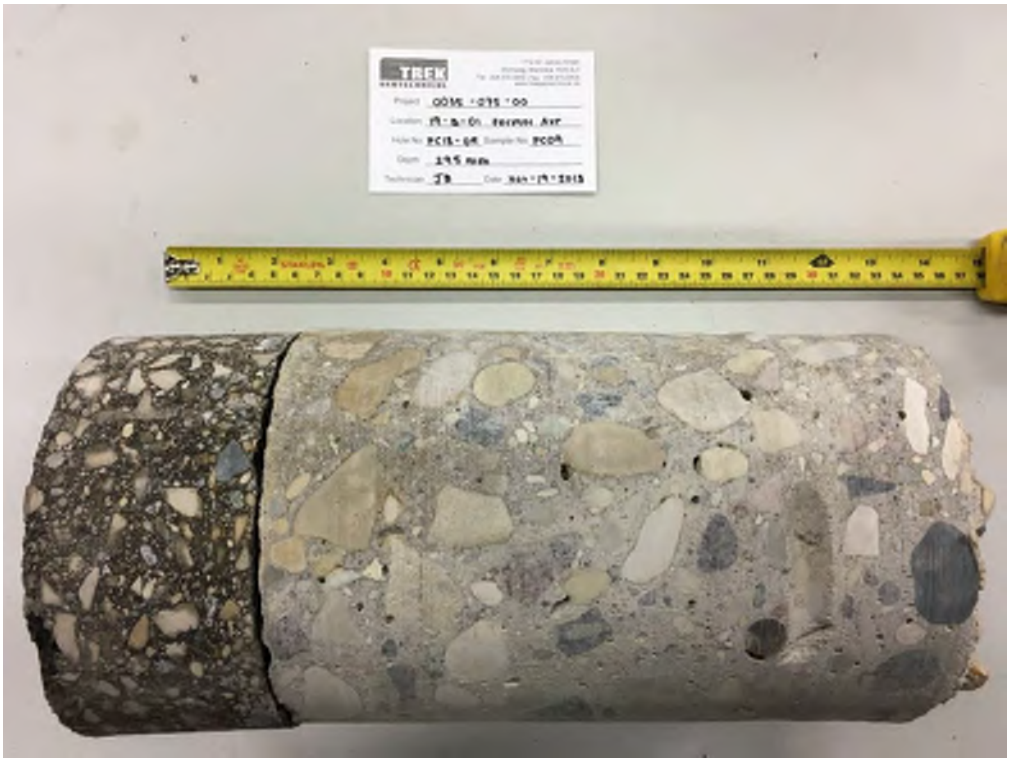


Photo 9: Pavement Core Sample at Test Hole TH18-09

Photo 10: Pavement Core Sample at Test Hole TH18-10

Photo 11: Pavement Core Sample at Test Hole TH18-12

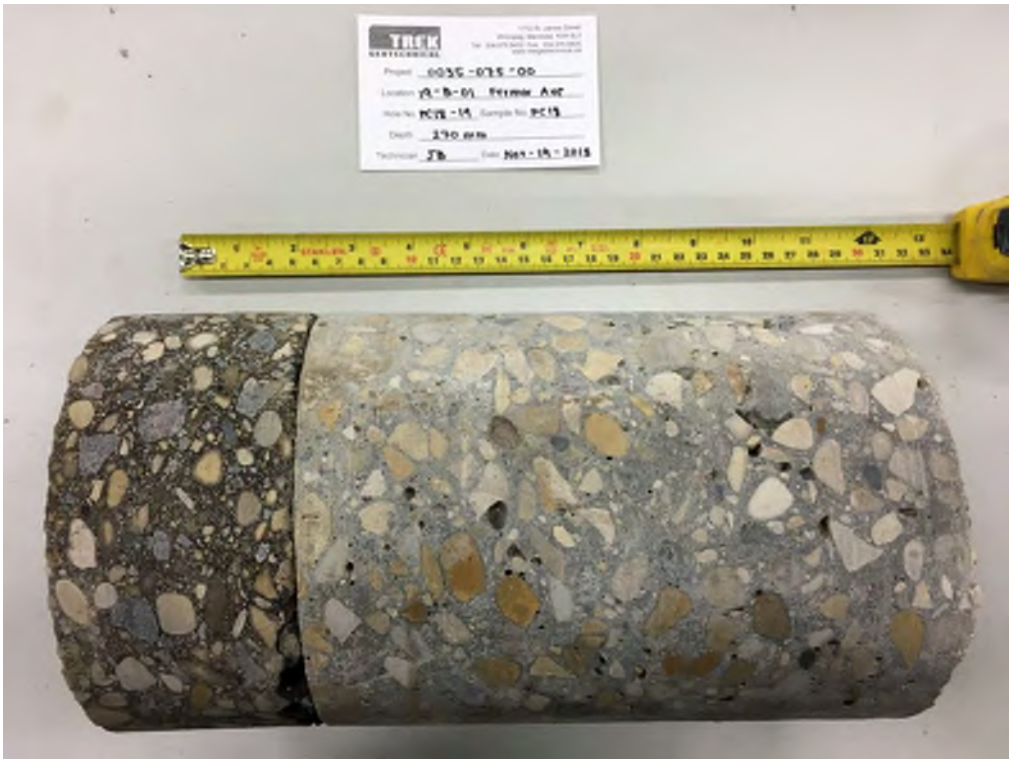


Photo 12: Pavement Core Sample at Test Hole TH18-14

Photo 13: Pavement Core Sample at Test Hole TH18-16

Photo 14: Pavement Core Sample at Test Hole TH18-18

Photo 15: Pavement Core Sample at Test Hole TH18-20

Photo 16: Pavement Core Sample at Test Hole TH18-22

Photo 17: Pavement Core Sample at Test Hole TH18-23

Photo 18: Pavement Core Sample at Test Hole TH18-24

Photo 19: Pavement Core Sample at Test Hole TH18-25

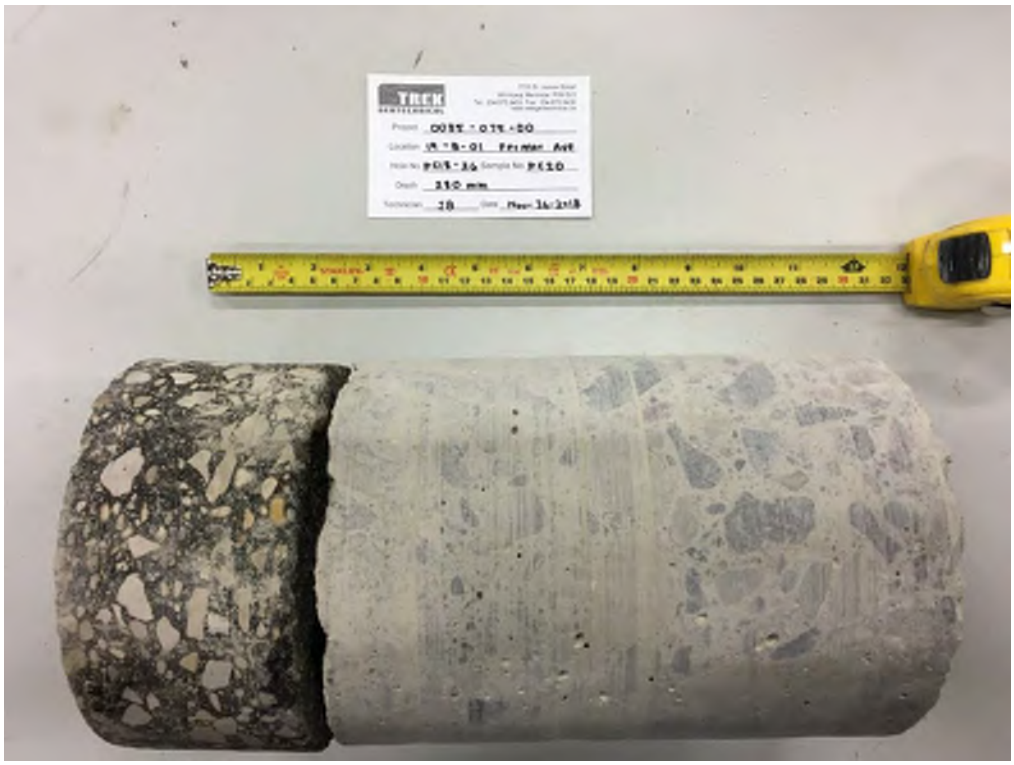


Photo 20: Pavement Core Sample at Test Hole TH18-26

Appendix D

Lagmodiere Blvd
Summary Table & Pavement Core Photographs

19-B-01 Fermor Reconstruction
Road Investigation
Fermor Ave

Pavement Core No.	Pavement Core Location	Pavement Surface		Pavement Structure Material	
		Type	Thickness (mm)	Type	Thickness (mm)
PC18-01	Located in Southbound lane, 2.8 m East of yield curb and 15 m North of Fermor Avenue and Lagimodiere Boulevard Intersection, UTM N5524470 E0640186	Asphalt	100	Concrete	220
PC18-02	Located in Northbound lane, 2.5 m West of yield curb and 16.3 m North of Fermor Avenue and Lagimodiere Boulevard Intersection, UTM N5524471 E0640204	Asphalt	30	Concrete	215

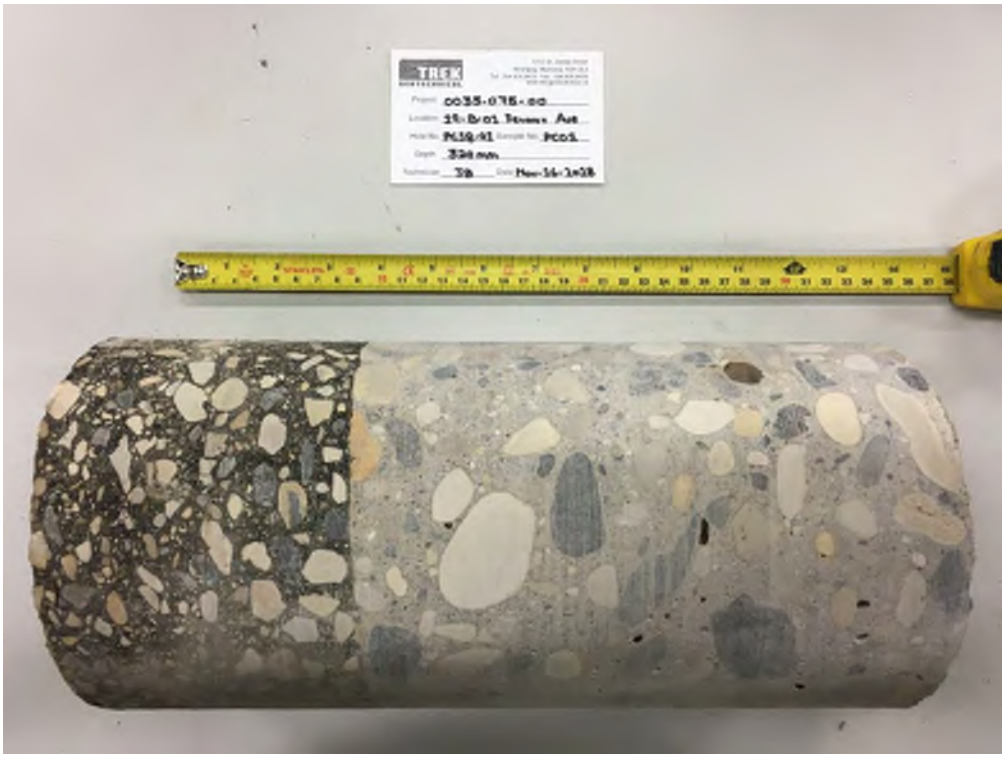


Photo 1: Pavement Core Sample at Test Hole PC18-01

Photo 2: Pavement Core Sample at Test Hole PC18-02

TREK GEOTECHNICAL Quality Engineering | Valued Relationships

January 21, 2019 Our File No. 0035 075 00

Ron Bruce, P. Eng.
Morrison Hershfield
Suite 1, 59 Scurfield Blvd
Winnipeg, MB.
R3Y 1V2

RE Lab Analysis – 19-B-01 Fermor Reconstruction

Attached are the laboratory testing results for the above noted project on Clay (Fill) material from Test holes on Fermor Avenue. The material was sampled by TREK Geotechnical during a Sub-Surface Investigation on November 23, 2018. This report contains California Bearing Ratio (CBR) test results on three samples. Table 01 below indicates the combination of samples tested.

Table 01

Sample #	Source	Soil Description	Samples Mixed	
L19-006-1	Royal Mint Rd	Clay	TH18-28	G226, G227
			TH18-29	G45, G46, G47
			TH18-30	G38, G39, G40
L19-006-2	Fermor EB	Clay	TH18-13	G10, G11, G12
			TH18-15	G17, G19
			TH18-19	G25, G26
			TH18-21	G31, G32
L19-006-3	Fermor WB	Clay Fill	TH18-12	G204, G205
			TH18-14	G197, G198
			TH18-18	G189
			TH18-20	G182, G183
			TH18-22	G175, G176
			TH18-24	G159

If you have any questions or require additional information or clarifications, please contact Angela at 204.792.8458.

Kind Regards,

Angela Fidler-Kliewer

TREK Geotechnical

Review Control:

Prepared By: BMH	*Reviewed By:* AFK	*Checked By:* SH

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California Bearing Ratio Test Data Sheet

ASTM D1883-16

Project No.	0035-075-00	**Source**	Mint Road
Client	Morrison Hershfield	**Material**	Clay Fill
Project	19-B-01 Fermor Reconstruction	**Sample Date**	November 23, 2018
Sample #	L19-006-1	**Test Date**	January 14, 2019
		Technician	BMH

Proctor Results (ASTM D698)

Maximum Dry Density	1442	kg/m3
Optimum Moisture Content	28.6	%
Material Retained on 19 mm Sieve	0.0	%

CBR Sample Compaction

Dry Density	1363	kg/m3
Initial Moisture Content	32.0	%
Relative Density	94.5	% SPMDD

Soaking Results

Surcharge		kg
Swell	0.8	%
Moisture Content in top 25 mm	41.7	%
Immersion Period	96	h

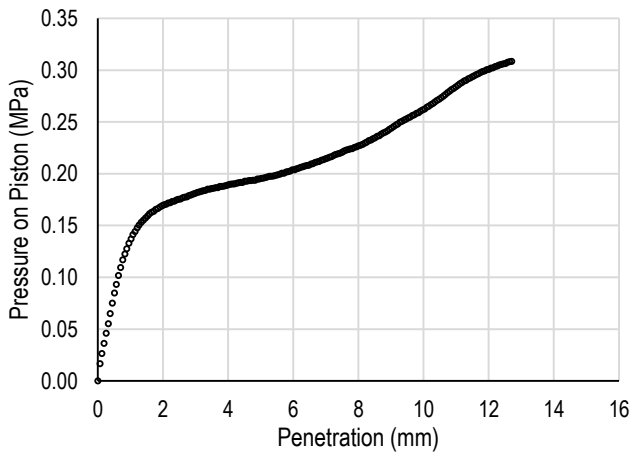
CBR Results

CBR at 2.54 mm	2.5	%
CBR at 5.08 mm	1.9	%
Zero Correction	0	mm

Test Data

Penetration (mm)	Measured Pressure (MPa)	Corrected Pressure (MPa)
0.64	0.10	0.10
1.27	0.15	0.15
1.91	0.17	0.17
2.54	0.18	0.18
3.18	0.18	0.18
3.81	0.19	0.19
4.45	0.19	0.19
5.08	0.20	0.20
7.62	0.22	0.22
10.16	0.27	0.27
12.70	0.31	0.31

Load/Penetration Curve



Comments:

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California Bearing Ratio Test Data Sheet

ASTM D1883-16

Project No.	0035-075-00	**Source**	Fermor Eastbound Test Holes
Client	Morrison Hershfield	**Material**	Clay Fill
Project	19-B-01 Fermor Reconstruction	**Sample Date**	November 23, 2018
Sample #	L19-006-2	**Test Date**	January 14, 2019
		Technician	BMH

Proctor Results (ASTM D698)

Maximum Dry Density	1436	kg/m3
Optimum Moisture Content	29.8	%
Material Retained on 19 mm Sieve	0.0	%

CBR Sample Compaction

Dry Density	1348	kg/m3
Initial Moisture Content	33.8	%
Relative Density	93.9	% SPMDD

Soaking Results

Surcharge		kg
Swell	0.8	%
Moisture Content in top 25 mm	43.8	%
Immersion Period	96	h

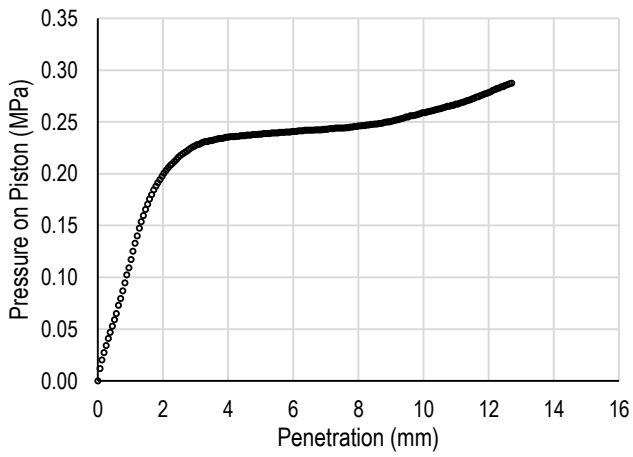
CBR Results

CBR at 2.54 mm	3.2	%
CBR at 5.08 mm	2.3	%
Zero Correction	0	mm

Test Data

Penetration (mm)	Measured Pressure (MPa)	Corrected Pressure (MPa)
0.64	0.07	0.07
1.27	0.15	0.15
1.91	0.19	0.19
2.54	0.22	0.22
3.18	0.23	0.23
3.81	0.23	0.23
4.45	0.24	0.24
5.08	0.24	0.24
7.62	0.24	0.24
10.16	0.26	0.26
12.70	0.29	0.29

Load/Penetration Curve



Comments:

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California Bearing Ratio Test Data Sheet

ASTM D1883-16

Project No.	0035-075-00	**Source**	Fermor Westbound Test Holes
Client	Morrison Hershfield	**Material**	Clay Fill
Project	19-B-01 Fermor Reconstruction	**Sample Date**	November 23, 2018
Sample #	L19-006-3	**Test Date**	January 14, 2019
		Technician	BMH

Proctor Results (ASTM D698)

Maximum Dry Density	1473	kg/m3
Optimum Moisture Content	26.9	%
Material Retained on 19 mm Sieve	0.0	%

CBR Sample Compaction

Dry Density	1424	kg/m3
Initial Moisture Content	30.4	%
Relative Density	96.7	% SPMDD

Soaking Results

Surcharge		kg
Swell	0.8	%
Moisture Content in top 25 mm	36.1	%
Immersion Period	96	h

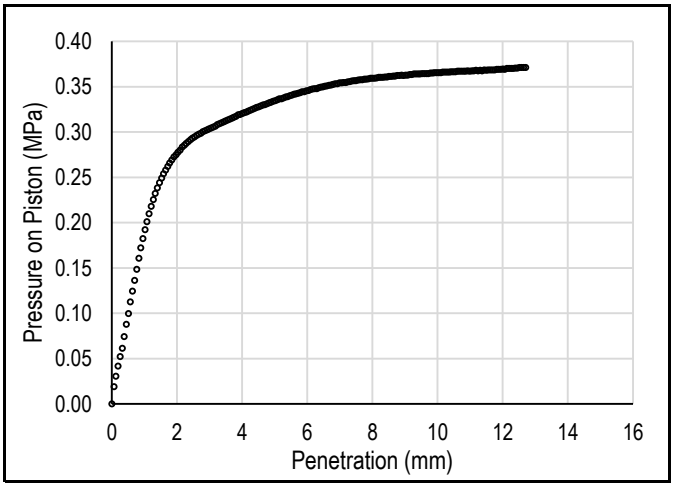
CBR Results

CBR at 2.54 mm	4.3	%
CBR at 5.08 mm	3.3	%
Zero Correction	0	mm

Test Data

Penetration (mm)	Measured Pressure (MPa)	Corrected Pressure (MPa)
0.64	0.13	0.13
1.27	0.23	0.23
1.91	0.27	0.27
2.54	0.29	0.29
3.18	0.31	0.31
3.81	0.32	0.32
4.45	0.33	0.33
5.08	0.34	0.34
7.62	0.36	0.36
10.16	0.37	0.37
12.70	0.37	0.37

Load/Penetration Curve



Comments: