APPENDIX 'G'

GEOTECHNICAL REPORT

Quality Engineering | Valued Relationships

Morrison Hershfield

2019 Regional Streets 19-C-02

Prepared for:

Morrison Hershfield
25 Scurfield Blvd, Unit 1
Winnipeg, MB R3Y 1G4
Attention: Ron Bruce

Distribution:

Ron Bruce, P.Eng.

Project Number:
0035 064 00

Date:
July 18, 2018
Final Report

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TREK GEOTECHNICAL Quality Engineering | Valued Relationships

July 18, 2018 Our File No. 0035 058 00

Ron Bruce, P.Eng.
Morrison Hershfield
25 Scurfield Blvd, Unit 1
Winnipeg, MB R3Y 1G4

RE: Road Investigation Report for
2019 Regional Streets 19-C-02

TREK Geotechnical Inc. is pleased to submit our report for the road investigations for the 2019 Regional Streets 19-C-02

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	July 18, 2018	Final Report

Authorization Signatures

Prepared By:

Angela Fidler-Kliewer C.Tech.

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 Regional Street Package 19-C-02 project. The road investigation was completed on Inkster Blvd between Milner Street and Fife Street. The information collected describes the pavement structure of the existing road as well as the soil stratigraphy beneath the pavement structure.

2.0 Road Investigation and Laboratory Program

The road investigation included a combination of coring pavement and drilling of ten test holes along the east and west bound lanes at the locations shown on Figure 01 (attached). The road investigation was conducted between June 18, 2018 and June 21, 2018. The pavement structure was cored by Harsimran Singh of TREK Geotechnical Inc. (TREK) using a portable coring press equipped with a hollow 150 mm diameter diamond core drill bit. The test holes were drilled to a depth of 3.0 m below road surface by Paddock Drilling Ltd. using a truck mounted drill rig equipped with 125 mm diameter solid stem augers. The sub-surface conditions were observed during drilling and visually classified by Harsimran Singh 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 our laboratory.

The laboratory testing program consisted of moisture content determination, Atterberg limits, and grain size analysis (mechanical sieve and hydrometer methods) on select samples between 0.5 and 1.0 m below the bottom of pavement. Information gathered is provided in Appendix A and includes test hole logs, laboratory testing summary tables and results, and photos of the pavement cores.

Core and test hole locations noted on the summary tables and test hole logs are based on UTM coordinates obtained using a hand-held GPS and on their location relative to the nearest address, and measured distances from the edge of pavement or other permanent features.

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 064 00
Morrison Hershfield
Regional Street 19-C-02

0 50 100 150 m

SCALE = 1 : 2 500 (216 mm x 279 mm)

LEGEND: TEST HOLE (TREK, 2018)

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

Figure 01
Test Hole Location Plan

ANSI full bleed A (11.00 x 8.50 Inches)

FIG.001 2018-07-11 Regional Street 19-C -02 0 A SL 0035 064 00 2019.dwg, 7/11/2018 9:29:57 AM

Appendix A

Inkster Blvd, between Milner St. and Fife St.

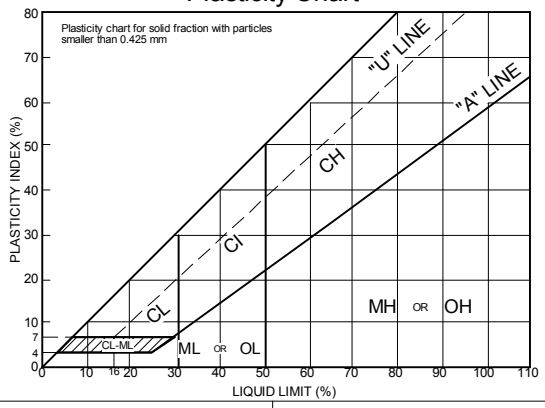
Test Hole Logs, Summary Table, Lab Data and Photographs of Pavement Core Samples

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*
			GP		Poorly-graded gravels, gravel-sand mixtures, little or no fines	$C_U = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
		Gravel with fines (Appreciable amount of fines)	GM		Silty gravels, gravel-sand-silt mixtures	Not meeting all gradation requirements for GW
			GC		Clayey gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4 / Atterberg limits above "A" line or P.I. greater than 7 / Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
	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 / Atterberg limits above "A" line or P.I. greater than 7 / Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			SC		Clayey sands, sand-clay mixtures	
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
	Sand		
	Coarse	#10 to #4	2.00 to 4.75
	Medium	#40 to #10	0.425 to 2.00
	Fine	#200 to #40	0.075 to 0.425
	Silt or Clay	< #200	< 0.075

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

* 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:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533717, E-631539
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 115 mm thick		
		CONCRETE - 180 mm thick		
0.5		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity		G01
				G02
1.0		SILT AND CLAY - trace sand - grey - moist, stiff - high plasticity		G03
		CLAY - silty - grey - moist, very stiff - high plasticity - trace silt inclusions (< 10 mm diam.), soft below 1.5 m		G04
1.5				G05
2.0				G06
2.5				G07
3.0		- firm below 2.7 m		

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

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

END OF TEST HOLE AT 3.1 m IN CLAY
1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 26.0 m West of Fife Street and Inkster Boulevard intersection, 1.0 m South of North curb at 1360 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-02
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533737, E-631486
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 135 mm thick		
		CONCRETE - 220 mm thick		
0.5		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity		G08
				G09
1.0				G10
		CLAY - silty - grey - moist, very stiff - high plasticity		G11
1.5		- trace silt inclusions (< 10 mm diam.), firm below 1.5 m		G12
		- soft below 1.8 m		G13
2.0				
2.5				G14
		- firm below 2.7 m		
3.0				

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 TEST HOLE AT 3.1 m IN CLAY
1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 126.0 m West of Fife Street and Inkster Boulevard intersection, 1.2 m North of South curb between 1360 and 1330 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-03

Client:	Morrison Hershfield	**Project Number:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533773, E-631404
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 110 mm thick		
		CONCRETE - 160 mm thick		
0.5		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity		G15
				G16
1.0				G17
				G18
1.5		CLAY - silty - grey - moist, firm - high plasticity		G19
		- trace silt inclusions (< 10 mm diam.), soft below 1.8 m		G20
2.0				
2.5				G21
3.0				

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 TEST HOLE AT 3.1 m IN CLAY

1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 40.0 m East of Bunting Street and Inkster Boulevard intersection, 1.6 m North of South curb at 1330 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH18-04
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533834, E-631276
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 140 mm thick		
		CONCRETE - 210 mm thick		
0.5		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity	Grab (G)	G22
			Grab (G)	G23
1.0			Grab (G)	G24
			Grab (G)	G25
1.5		CLAY - silty, trace silt incusions (< 10 mm diam.) - grey - moist, firm - high plasticity	Grab (G)	G26
2.0			Grab (G)	G27
2.5			Grab (G)	G28
3.0		END OF TEST HOLE AT 3.1 m IN CLAY		

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 ○

1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 100.0 m West of Bunting Street and Inkster Boulevard intersection, 1.5 North of South curb at 1300 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-05
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533893, E-631157
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 90 mm thick		
		CONCRETE - 195 mm thick		
0.5		SILT - some clay, trace sand - brown - moist, soft - low plasticity	G	G29
			G	G30
1.0			G	G31
			G	G32
1.5		CLAY - silty, trace silt incusions (< 10 mm diam.) - grey - moist, firm - high plasticity	G	G33
2.0			G	G34
2.5			G	G35
3.0				

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

END OF TEST HOLE AT 3.1 m IN CLAY
1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 28.0 m East of Milner Street and Inkster Boulevard intersection, 1.4 South of North curb at 1280 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-06
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533874, E-631152
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 100 mm thick		
		CONCRETE - 195 mm thick		
0.5		SILT - some clay, trace sand - brown - moist, soft - low plasticity		G36
				G37
1.0				G38
				G39
1.5		CLAY - silty, trace silt incusions (< 5 mm diam.) - grey - moist, stiff - high plasticity - trace silt inclusions (< 10 mm diam.), soft below 1.8 m		G40
2.0				G41
2.5		- firm below 2.4 m		G42
3.0				

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 TEST HOLE AT 3.1 m IN CLAY
1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 20.0 m East of Milner Street and Inkster Boulevard intersection, 1.4 South of North curb at 1280 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-07
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533829, E-631241
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 160 mm thick		
		CONCRETE - 140 mm thick		
0.5		CLAY - Silty, trace sand, trace organics - black - moist, stiff - high plasticity		G43
				G44
1.0		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity		G45
				G46
1.5		CLAY - silty - grey - moist, firm - high plasticity - trace silt inclusions (< 5 mm diam.), soft below 1.8 m		G47
2.0				G48
2.5		- trace oxidation below 2.4 m		G49
3.0		END OF TEST HOLE AT 3.1 m IN CLAY		

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

1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 128.0 m East of Milner Street and Inkster Boulevard intersection, 1.4 South of North curb at 1301 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-08
1 of 1

Client: Morrison Hershfield
Project Number: 0035-064-00
Project Name: 2019 Regional Streets C-02 (Inkster Boulevard)
Location: UTM N-5533797, E-631309
Contractor: Maple Leaf Drilling Ltd.
Ground Elevation: Top of Pavement
Method: GeoProbe 7822DT, 125 mm solid stem augers
Date Drilled: June 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
		ASPHALT - 120 mm thick		
		CONCRETE - 160 mm thick		
0.5		CLAY - silty, trace sand, trace organics - black - moist, very stiff - high plasticity	Grab (G)	G50
		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity	Grab (G)	G51
1.0			Grab (G)	G52
1.5			Grab (G)	G53
		CLAY - silty - grey - moist, stiff - high plasticity - trace silt inclusions (< 5 mm diam.), firm below 1.8 m	Grab (G)	G54
2.0			Grab (G)	G55
2.5		- trace silt inclusions (< 10 mm diam.), soft below 2.4 m	Grab (G)	G56
3.0				

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 TEST HOLE AT 3.1 m IN CLAY
1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 52.0 m West of Bunting Street and Inkster Boulevard intersection, 1.3 South of North curb at 1315 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-09
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-064-00
Project Name:	2019 Regional Streets C-02 (Inkster Boulevard)	**Location:**	UTM N-5533740, E-631426
Contractor:	Maple Leaf Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	GeoProbe 7822DT, 125 mm solid stem augers	**Date Drilled:**	June 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
		ASPHALT - 90 mm thick		
		CONCRETE - 180 mm thick		
0.5		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity		G57
				G58
1.0		- moist to wet below 0.9 m		G59
				G60
1.5		CLAY - silty, trace silt inclusions (<10 mm diam.) - grey - moist, stiff - high plasticity		G61
2.0		- firm below 1.8 m		G62
2.5		- soft below 2.4 m		G63
3.0				

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

END OF TEST HOLE AT 3.1 m IN CLAY
1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 52.0 m East of Bunting Street and Inkster Boulevard intersection, 1.4 South of North curb at 1331 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

Sub-Surface Log

Test Hole TH18-10
1 of 1

Client: Morrison Hershfield
Project Number: 0035-064-00
Project Name: 2019 Regional Streets C-02 (Inkster Boulevard)
Location: UTM N-5533704, E-631509
Contractor: Maple Leaf Drilling Ltd.
Ground Elevation: Top of Pavement
Method: GeoProbe 7822DT, 125 mm solid stem augers
Date Drilled: June 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
		ASPHALT - 85 mm thick		
		CONCRETE - 225 mm thick		
0.5		CLAY - silty, trace sand, trace organics - black - moist, firm - high plasticity	Grab	G64
		SILT - clayey, trace sand - brown - moist, soft - intermediate plasticity	Grab	G65
1.0			Grab	G66
1.5			Grab	G67
		CLAY - silty, trace silt inclusions (<10 mm diam.) - grey - moist, firm - high plasticity - soft below 1.8 m	Grab	G68
2.0			Grab	G69
2.5			Grab	G70
3.0				

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

END OF TEST HOLE AT 3.1 m IN CLAY
1) No seepage or sloughing.
2) Test hole backfilled with auger cuttings, bentonite chips, sand and cold patch asphalt.
3) Test hole located at 47.0 m West of Fife Street and Inkster Boulevard intersection, 4.0 South of North curb at 1331 Inkster Boulevard.

Logged By: Harsimran Singh **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2018-07-04_REGIONAL STREET 19-C-02_0395-004-00_0_A_HS.GPJ TREK GEOTECHNICAL.GDT 7/11/18

TREK GEOTECHNICAL

2019 Regional Streets 19-C-02
Road Investigation
Inkster Blvd.

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 : 5533717 N, 631539 E Located at 26.0 m West of Fife Street and Inkster Boulevard intersection, 1.0 m South of North curb at 1360 Inkster Boulevard.	Asphalt	115	Concrete	180	Silt	0.4	0.5	20							
						Silt	0.7	0.8	22	24	70	6		14	34	20
						Silt and Clay	1.0	1.1	27	62	35	3		17	55	38
						Clay	1.2	1.4	31							
						Clay	1.6	1.7	43							
						Clay	1.9	2.0	54							
						Clay	2.5	2.6	50							
TH18-02	UTM : 5533737 N, 631486 E Located at 126.0 m West of Fife Street and Inkster Boulevard intersection, 1.0 m North of South curb between 1360 and 1330 Inkster Boulevard.	Asphalt	135	Concrete	220	Silt	0.4	0.6	19							
						Silt	0.7	0.9	21							
						Silt	1.0	1.2	22							
						Clay	1.3	1.5	29							
						Clay	1.6	1.8	54							
						Clay	1.9	2.1	43							
						Clay	2.5	2.7	56							
TH18-03	UTM : 5533773 N, 631404 E Located at 40.0 m East of Bunting Street and Inkster Boulevard intersection, 1.6 m North of South curb at 1330 Inkster Boulevard.	Asphalt	110	Concrete	160	Silt	0.4	0.6	20							
						Silt	0.7	0.9	21							
						Silt	1.0	1.2	20							
						Silt	1.2	1.4	23							
						Clay	1.6	1.7	50							
						Clay	1.9	2.0	50							
						Clay	2.5	2.7	52							
TH18-04	UTM : 5533834 N, 631276 E Located at 100.0 m West of Bunting Street and Inkster Boulevard intersection, 1.5 m North of South curb at 1300 Inkster Boulevard.	Asphalt	140	Concrete	210	Silt	0.4	0.6	20							
						Silt	0.7	0.9	19							
						Silt	1.0	1.2	19							
						Silt	1.3	1.5	22							
						Clay	1.6	1.8	47							
						Clay	1.9	2.1	48							
						Clay	2.5	2.7	51							
TH18-05	UTM : 5533893 N, 631157 E Located at 28.0 m East of Milner Street and Inkster Boulevard intersection, 1.4 m South of North curb at 1280 Inkster Boulevard.	Asphalt	90	Concrete	195	Silt	0.4	0.6	22	18	77	5		16	27	10
						Silt	0.7	0.9	21							
						Silt	1.0	1.2	21							
						Silt	1.3	1.5	23							
						Clay	1.6	1.8	45							
						Clay	1.9	2.1	52							
						Clay	2.5	2.7	50							

2019 Regional Streets 19-C-02
Road Investigation
Inkster Blvd.

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
TH18-06	UTM : 5533874 N, 631152 E Located at 20.0 m East of Milner Street and Inkster Boulevard intersection, 1.4 m South North curb at 1280 Inkster Boulevard.	Asphalt	100	Concrete	190	Silt	0.4	0.6	20							
						Silt	0.7	0.9	19							
						Silt	1.0	1.2	20							
						Clay	1.3	1.5	23							
						Clay	1.6	1.8	39							
						Clay	1.9	2.1	43							
						Clay	2.5	2.7	52							
TH18-07	UTM : 5533829 N, 631241 E Located at 128.0 m East of Milner Street and Inkster Boulevard intersection, 1.4 m South of North curb at 1301 Inkster Boulevard.	Asphalt	160	Concrete	140	Clay	0.4	0.6	30	60	34	6		20	72	52
						Clay	0.7	0.9	27							
						Silt	1.0	1.2	20							
						Silt	1.3	1.5	20							
						Clay	1.6	1.8	32							
						Clay	1.9	2.1	44							
						Clay	2.5	2.7	33							
TH18-08	UTM : 5533797 N, 631309 E Located at 52.0 m West of Bunting Street and Inkster Boulevard intersection, 1.3 m South of North curb at 1315 Inkster Boulevard.	Asphalt	120	Concrete	160	Clay	0.4	0.6	25							
						Silt	0.7	0.9	18							
						Silt	1.0	1.2	20							
						Silt	1.3	1.5	21							
						Clay	1.6	1.8	34							
						Silt	1.9	2.1	41							
						Clay	2.5	2.7	43							
TH18-09	UTM : 5533740 N, 631426 E Located at 52.0 m East of Bunting Street and Inkster Boulevard intersection, 1.4 m South of North curb at 1331 Inkster Boulevard.	Asphalt	90	Concrete	180	Silt	0.4	0.6	18							
						Silt	0.7	0.9	17							
						Silt	1.0	1.2	20							
						Silt	1.3	1.5	22							
						Clay	1.6	1.8	37							
						Clay	1.9	2.1	49							
						Clay	2.5	2.7	45							
TH18-10	UTM : 5533704 N, 631509 E Located at 47.0 m West of Fife Street and Inkster Boulevard intersection, 4.0 m South of North curb at 1331 Inkster Boulevard.	Asphalt	85	Concrete	225	Clay	0.4	0.6	17							
						Silt	0.7	0.9	26							
						Silt	1.0	1.2	24							
						Silt	1.3	1.5	24							
						Clay	1.6	1.8	41							
						Clay	1.9	2.1	43							
						Clay	2.5	2.7	58							

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Moisture Content Report
ASTM D2216-10

Project No. 0035-064-00
Client Morrison Hershfield
Project 2019 Regional Streets C-02 (Inkster Boulevard)

Sample Date 20-Jun-18
Test Date 4-Jul-18
Technician NM

Test Pit	TH18-01	TH18-01	TH18-01	TH18-01	TH18-01	TH18-01
Depth (m)	0.4 - 0.5	0.7 - 0.8	1.0 - 1.1	1.2 - 1.4	1.6 - 1.7	1.9 - 2.0
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	AC29	AC01	Z66	Z15	F8	Z97
Mass of tare	7.5	7.0	8.3	8.5	8.7	8.6
Mass wet + tare	248.0	518.5	489.9	193.6	206.8	236.5
Mass dry + tare	207.6	425.5	387.7	150.0	147.3	156.2
Mass water	40.4	93.0	102.2	43.6	59.5	80.3
Mass dry soil	200.1	418.5	379.4	141.5	138.6	147.6
Moisture %	20.2%	22.2%	26.9%	30.8%	42.9%	54.4%

Test Pit	TH18-01	TH18-02	TH18-02	TH18-02	TH18-02	TH18-02
Depth (m)	2.5 - 2.6	0.4 - 0.6	0.7 - 0.9	1.0 - 1.2	1.3 - 1.5	1.6 - 1.8
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	E107	F46	E102	AB66	C12	P27
Mass of tare	8.5	8.5	8.6	6.6	8.4	8.6
Mass wet + tare	202.5	260.2	249.9	349.4	279.3	172.2
Mass dry + tare	138.0	220.5	208.5	288.1	218.1	114.6
Mass water	64.5	39.7	41.4	61.3	61.2	57.6
Mass dry soil	129.5	212.0	199.9	281.5	209.7	106.0
Moisture %	49.8%	18.7%	20.7%	21.8%	29.2%	54.3%

Test Pit	TH18-02	TH18-02	TH18-03	TH18-03	TH18-03	TH18-03
Depth (m)	1.9 - 2.1	2.5 - 2.7	0.4 - 0.6	0.7 - 0.9	1.0 - 1.2	1.2 - 1.4
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	H9	H43	AA19	D10	Z77	N57
Mass of tare	8.8	8.6	6.8	8.6	8.5	8.7
Mass wet + tare	188.8	161.7	286.8	221.8	227.6	266.4
Mass dry + tare	134.8	107.0	240.9	185.3	190.9	219.0
Mass water	54.0	54.7	45.9	36.5	36.7	47.4
Mass dry soil	126.0	98.4	234.1	176.7	182.4	210.3
Moisture %	42.9%	55.6%	19.6%	20.7%	20.1%	22.5%

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Moisture Content Report
ASTM D2216-10

Project No. 0035-064-00
Client Morrison Hershfield
Project 2019 Regional Streets C-02 (Inkster Boulevard)

Sample Date 20-Jun-18
Test Date 4-Jul-18
Technician NM

Test Pit	TH18-03	TH18-03	TH18-03	TH18-04	TH18-04	TH18-04
Depth (m)	1.6 - 1.7	1.9 - 2.0	2.5 - 2.7	0.4 - 0.6	0.7 - 0.9	1.0 - 1.2
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	W63	F19	F85	AB83	E143	N34
Mass of tare	8.5	8.7	8.7	6.6	8.8	8.8
Mass wet + tare	172.7	177.6	196.8	195.8	189.0	337.6
Mass dry + tare	118.3	121.4	132.1	164.4	159.8	284.3
Mass water	54.4	56.2	64.7	31.4	29.2	53.3
Mass dry soil	109.8	112.7	123.4	157.8	151.0	275.5
Moisture %	49.5%	49.9%	52.4%	19.9%	19.3%	19.3%

Test Pit	TH18-04	TH18-04	TH18-04	TH18-04	TH18-05	TH18-05
Depth (m)	1.3 - 1.5	1.6 - 1.8	1.9 - 2.1	2.5 - 2.7	0.4 - 0.6	0.7 - 0.9
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	F21	AB12	N53	AB36	W47	AC02
Mass of tare	8.4	6.6	8.4	6.6	8.4	6.6
Mass wet + tare	254.8	154.0	191.0	123.6	547.1	284.6
Mass dry + tare	211.1	107.2	131.8	84.3	449.3	235.9
Mass water	43.7	46.8	59.2	39.3	97.8	48.7
Mass dry soil	202.7	100.6	123.4	77.7	440.9	229.3
Moisture %	21.6%	46.5%	48.0%	50.6%	22.2%	21.2%

Test Pit	TH18-05	TH18-05	TH18-05	TH18-05	TH18-05	TH18-06
Depth (m)	1.0 - 1.2	1.3 - 1.5	1.6 - 1.8	1.9 - 2.1	2.5 - 2.7	0.4 - 0.6
Sample #	G31	G32	G33	G34	G35	G36
Tare ID	E131	F70	E20	F151	N93	Z100
Mass of tare	8.6	8.5	8.9	8.4	8.7	8.4
Mass wet + tare	238.4	290.7	188.0	187.0	175.4	386.6
Mass dry + tare	199.1	238.0	132.6	125.7	120.6	323.8
Mass water	39.3	52.7	55.4	61.3	54.8	62.8
Mass dry soil	190.5	229.5	123.7	117.3	111.9	315.4
Moisture %	20.6%	23.0%	44.8%	52.3%	49.0%	19.9%

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Moisture Content Report
ASTM D2216-10

Project No. 0035-064-00
Client Morrison Hershfield
Project 2019 Regional Streets C-02 (Inkster Boulevard)

Sample Date 20-Jun-18
Test Date 4-Jul-18
Technician NM

Test Pit	TH18-06	TH18-06	TH18-06	TH18-06	TH18-06	TH18-06
Depth (m)	0.7 - 0.9	1.0 - 1.2	1.3 - 1.5	1.6 - 1.8	1.9 - 2.1	2.5 - 2.7
Sample #	G37	G38	G39	G40	G41	G42
Tare ID	Z53	AA17	AB47	AC09	Z96	N32
Mass of tare	8.4	7.0	7.0	6.6	8.8	8.4
Mass wet + tare	252.6	239.0	225.2	166.2	223.8	175.6
Mass dry + tare	213.8	201.1	184.0	121.8	159.5	118.4
Mass water	38.8	37.9	41.2	44.4	64.3	57.2
Mass dry soil	205.4	194.1	177.0	115.2	150.7	110.0
Moisture %	18.9%	19.5%	23.3%	38.5%	42.7%	52.0%

Test Pit	TH18-07	TH18-07	TH18-07	TH18-07	TH18-07	TH18-07
Depth (m)	0.4 - 0.6	0.7 - 0.9	1.0 - 1.2	1.3 - 1.5	1.6 - 1.8	1.9 - 2.1
Sample #	G43	G44	G45	G46	G47	G48
Tare ID	K13	N58	K26	F37	W51	N11
Mass of tare	8.6	8.4	8.6	8.7	8.6	8.7
Mass wet + tare	475.3	267.1	261.8	246.6	183.7	167.7
Mass dry + tare	367.8	211.9	219.2	206.5	141.4	118.8
Mass water	107.5	55.2	42.6	40.1	42.3	48.9
Mass dry soil	359.2	203.5	210.6	197.8	132.8	110.1
Moisture %	29.9%	27.1%	20.2%	20.3%	31.9%	44.4%

Test Pit	TH18-07	TH18-08	TH18-08	TH18-08	TH18-08	TH18-08
Depth (m)	2.5 - 2.7	0.4 - 0.6	0.7 - 0.9	1.0 - 1.2	1.3 - 1.5	1.6 - 1.8
Sample #	G49	G50	G51	G52	G53	G54
Tare ID	Z82	W104	C28	W23	Z94	P33
Mass of tare	8.5	8.5	8.4	8.6	8.2	8.5
Mass wet + tare	171.6	190.5	230.6	254.2	248.6	166.2
Mass dry + tare	131.3	154.4	196.8	213.5	207.0	126.3
Mass water	40.3	36.1	33.8	40.7	41.6	39.9
Mass dry soil	122.8	145.9	188.4	204.9	198.8	117.8
Moisture %	32.8%	24.7%	17.9%	19.9%	20.9%	33.9%

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Moisture Content Report
ASTM D2216-10

Project No. 0035-064-00
Client Morrison Hershfield
Project 2019 Regional Streets C-02 (Inkster Boulevard)

Sample Date 20-Jun-18
Test Date 4-Jul-18
Technician NM

Test Pit	TH18-08	TH18-08	TH18-09	TH18-09	TH18-09	TH18-09
Depth (m)	1.9 - 2.1	2.5 - 2.7	0.4 - 0.6	0.7 - 0.9	1.0 - 1.2	1.3 - 1.5
Sample #	G55	G56	G57	G58	G59	G60
Tare ID	P28	K27	AB33	Z34	H4	E108
Mass of tare	8.6	8.6	6.7	8.6	8.4	8.6
Mass wet + tare	156.7	156.4	273.5	267.3	240.8	253.7
Mass dry + tare	113.4	112.0	233.0	229.5	202.3	210.0
Mass water	43.3	44.4	40.5	37.8	38.5	43.7
Mass dry soil	104.8	103.4	226.3	220.9	193.9	201.4
Moisture %	41.3%	42.9%	17.9%	17.1%	19.9%	21.7%

Test Pit	TH18-09	TH18-09	TH18-09	TH18-10	TH18-10	TH18-10
Depth (m)	1.6 - 1.8	1.9 - 2.1	2.5 - 2.7	0.4 - 0.6	0.7 - 0.9	1.0 - 1.2
Sample #	G61	G62	G63	G64	G65	G66
Tare ID	D45	F81	C21	N60	N69	D25
Mass of tare	8.7	8.8	8.1	8.8	9.1	9.1
Mass wet + tare	156.0	168.6	175.8	215.9	237.4	217.6
Mass dry + tare	115.9	115.9	124.0	186.5	190.5	177.9
Mass water	40.1	52.7	51.8	29.4	46.9	39.7
Mass dry soil	107.2	107.1	115.9	177.7	181.4	168.8
Moisture %	37.4%	49.2%	44.7%	16.5%	25.9%	23.5%

Test Pit	TH18-10	TH18-10	TH18-10	TH18-10		
Depth (m)	1.3 - 1.5	1.6 - 1.8	1.9 - 2.1	2.5 - 2.7		
Sample #	G67	G68	G69	G70		
Tare ID	F105	F90	E39	F126		
Mass of tare	8.3	8.7	8.7	8.7		
Mass wet + tare	224.4	183.3	147.8	151.6		
Mass dry + tare	183.1	132.6	105.7	99.0		
Mass water	41.3	50.7	42.1	52.6		
Mass dry soil	174.8	123.9	97.0	90.3		
Moisture %	23.6%	40.9%	43.4%	58.3%		

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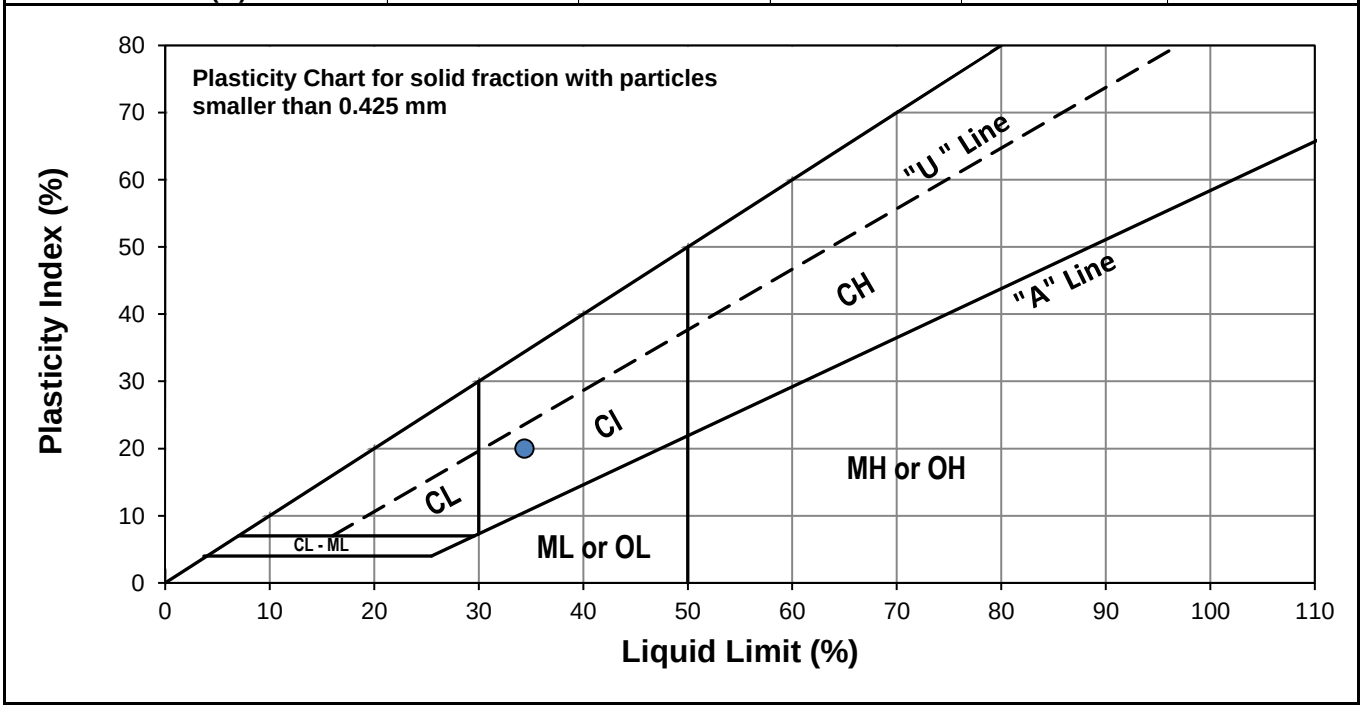
Atterberg Limits
ASTM D4318-10e1

Project No.	00035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-01
Sample #	G02
Depth (m)	0.7 - 0.8
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Liquid Limit	34
Plastic Limit	14
Plasticity Index	20

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	18	27	32		
Mass Wet Soil + Tare (g)	29.800	29.178	28.891		
Mass Dry Soil + Tare (g)	25.680	25.349	25.224		
Mass Tare (g)	14.127	14.060	14.298		
Mass Water (g)	4.120	3.829	3.667		
Mass Dry Soil (g)	11.553	11.289	10.926		
Moisture Content (%)	35.662	33.918	33.562		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	21.226	20.962			
Mass Wet Soil + Tare (g)	20.329	20.125			
Mass Dry Soil + Tare (g)	14.071	14.324			
Mass Water (g)	0.897	0.837			
Mass Dry Soil (g)	6.258	5.801			
Moisture Content (%)	14.334	14.429			

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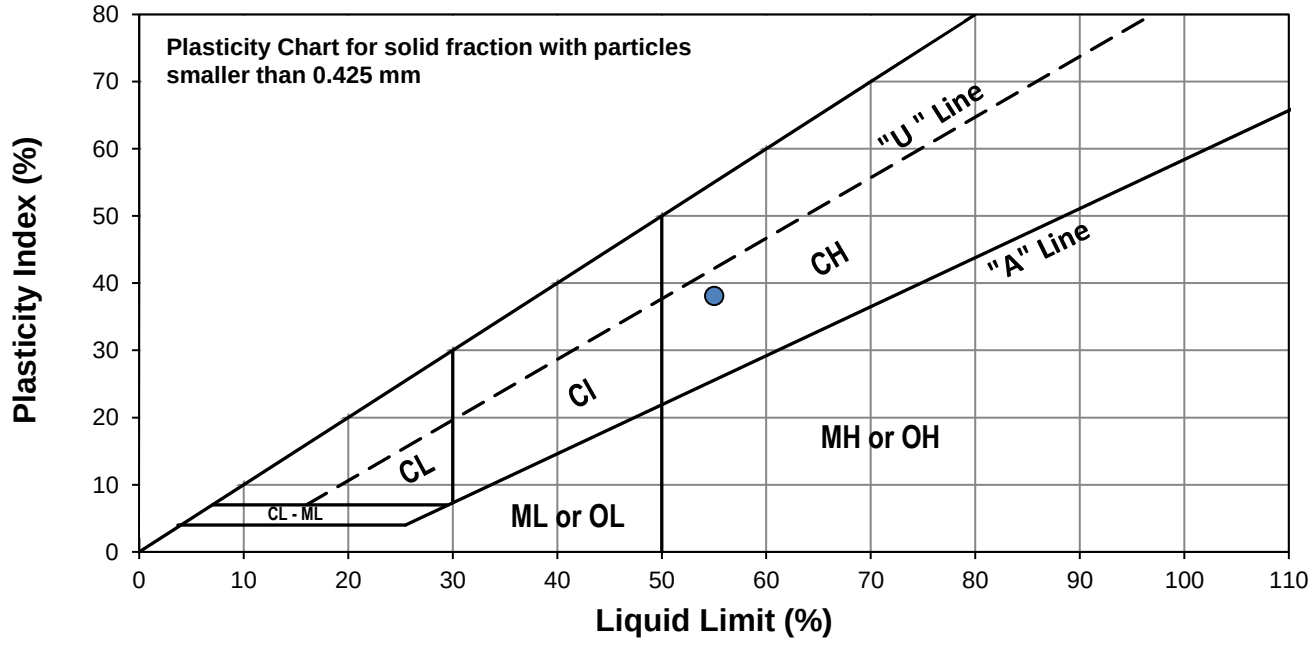
Atterberg Limits
ASTM D4318-10e1

Project No.	00035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-01
Sample #	G03
Depth (m)	1.0 - 1.1
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Liquid Limit	55
Plastic Limit	17
Plasticity Index	38

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	16	24	32		
Mass Wet Soil + Tare (g)	28.407	27.013	28.578		
Mass Dry Soil + Tare (g)	23.089	22.287	23.658		
Mass Tare (g)	14.024	13.734	14.387		
Mass Water (g)	5.318	4.726	4.920		
Mass Dry Soil (g)	9.065	8.553	9.271		
Moisture Content (%)	58.665	55.255	53.069		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	20.762	20.315			
Mass Wet Soil + Tare (g)	19.784	19.390			
Mass Dry Soil + Tare (g)	13.934	14.007			
Mass Water (g)	0.978	0.925			
Mass Dry Soil (g)	5.850	5.383			
Moisture Content (%)	16.718	17.184			

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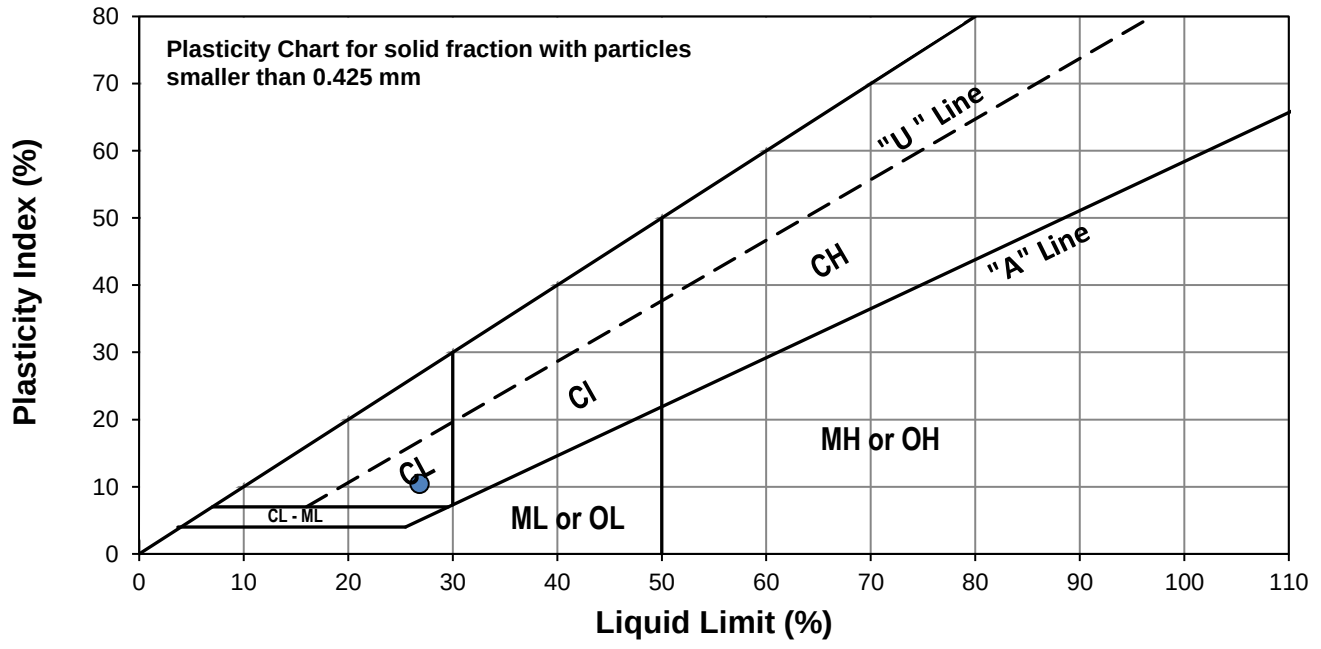
Atterberg Limits
ASTM D4318-10e1

Project No.	00035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-05
Sample #	G29
Depth (m)	0.4 - 0.6
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Liquid Limit	27
Plastic Limit	16
Plasticity Index	10

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	19	26	35		
Mass Wet Soil + Tare (g)	32.094	32.384	29.932		
Mass Dry Soil + Tare (g)	28.163	28.530	26.660		
Mass Tare (g)	14.101	14.050	13.812		
Mass Water (g)	3.931	3.854	3.272		
Mass Dry Soil (g)	14.062	14.480	12.848		
Moisture Content (%)	27.955	26.616	25.467		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	20.604	21.256			
Mass Wet Soil + Tare (g)	19.673	20.273			
Mass Dry Soil + Tare (g)	14.050	14.246			
Mass Water (g)	0.931	0.983			
Mass Dry Soil (g)	5.623	6.027			
Moisture Content (%)	16.557	16.310			

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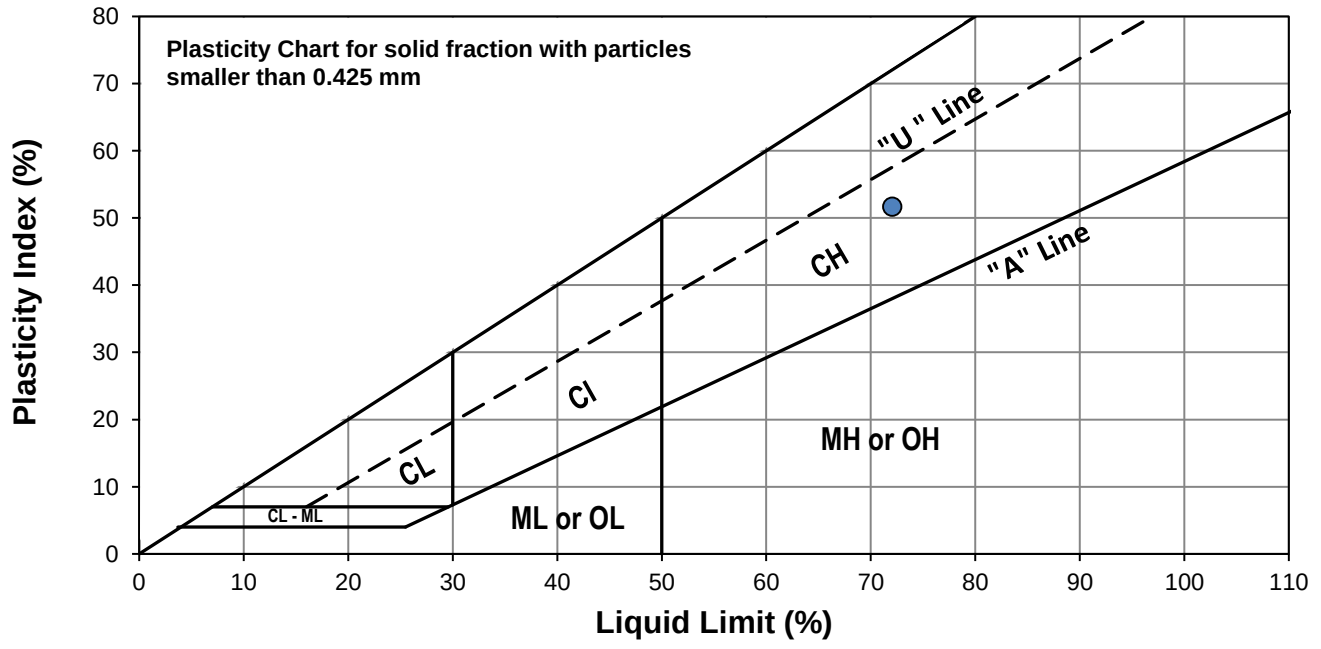
Atterberg Limits
ASTM D4318-10e1

Project No.	00035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-07
Sample #	G43
Depth (m)	0.4 - 0.6
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Liquid Limit	72
Plastic Limit	20
Plasticity Index	52

Liquid Limit

Trial #	1	2	3		
Number of Blows (N)	19	28	34		
Mass Wet Soil + Tare (g)	25.656	31.487	24.618		
Mass Dry Soil + Tare (g)	20.761	24.356	20.349		
Mass Tare (g)	14.156	14.373	14.203		
Mass Water (g)	4.895	7.131	4.269		
Mass Dry Soil (g)	6.605	9.983	6.146		
Moisture Content (%)	74.111	71.431	69.460		



Plastic Limit

Trial #	1	2	3	4	5
Mass Tare (g)	20.183	20.051			
Mass Wet Soil + Tare (g)	19.167	19.034			
Mass Dry Soil + Tare (g)	14.150	14.087			
Mass Water (g)	1.016	1.017			
Mass Dry Soil (g)	5.017	4.947			
Moisture Content (%)	20.251	20.558			

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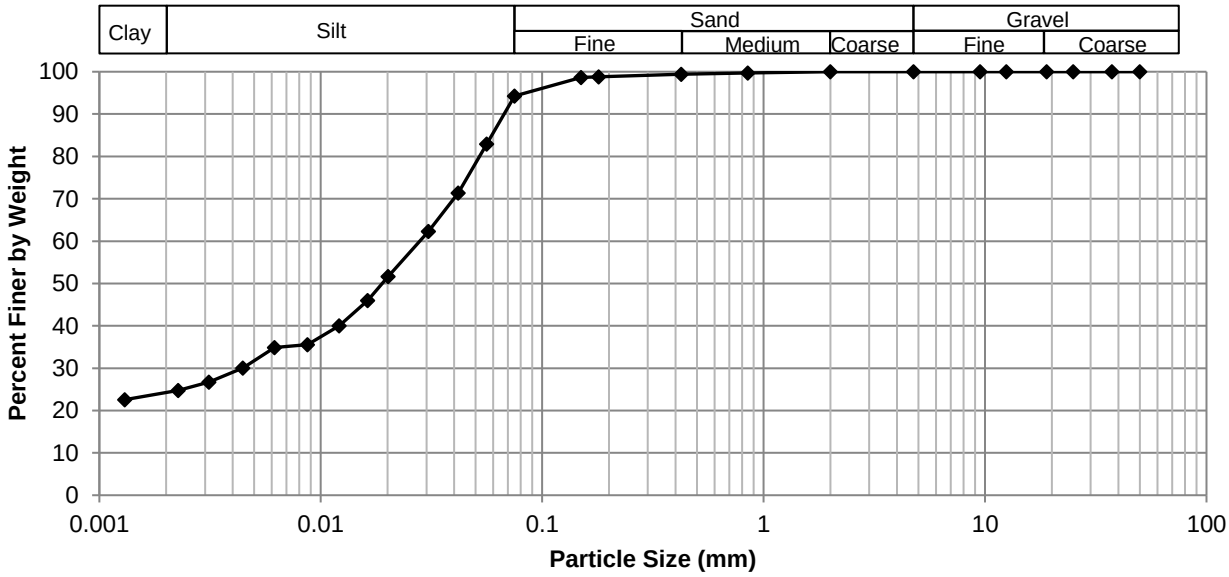
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-01
Sample #	G02
Depth (m)	0.7 - 0.8
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Gravel	0.0%
Sand	5.7%
Silt	70.1%
Clay	24.1%

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	94.28
37.5	100.00	2.00	100.00	0.0562	82.90
25.0	100.00	0.850	99.71	0.0418	71.34
19.0	100.00	0.425	99.44	0.0306	62.27
12.5	100.00	0.180	98.83	0.0202	51.64
9.50	100.00	0.150	98.64	0.0163	45.96
4.75	100.00	0.075	94.28	0.0121	40.01
				0.0087	35.58
				0.0062	34.85
				0.0045	30.05
				0.0031	26.70
				0.0023	24.77
				0.0013	22.56

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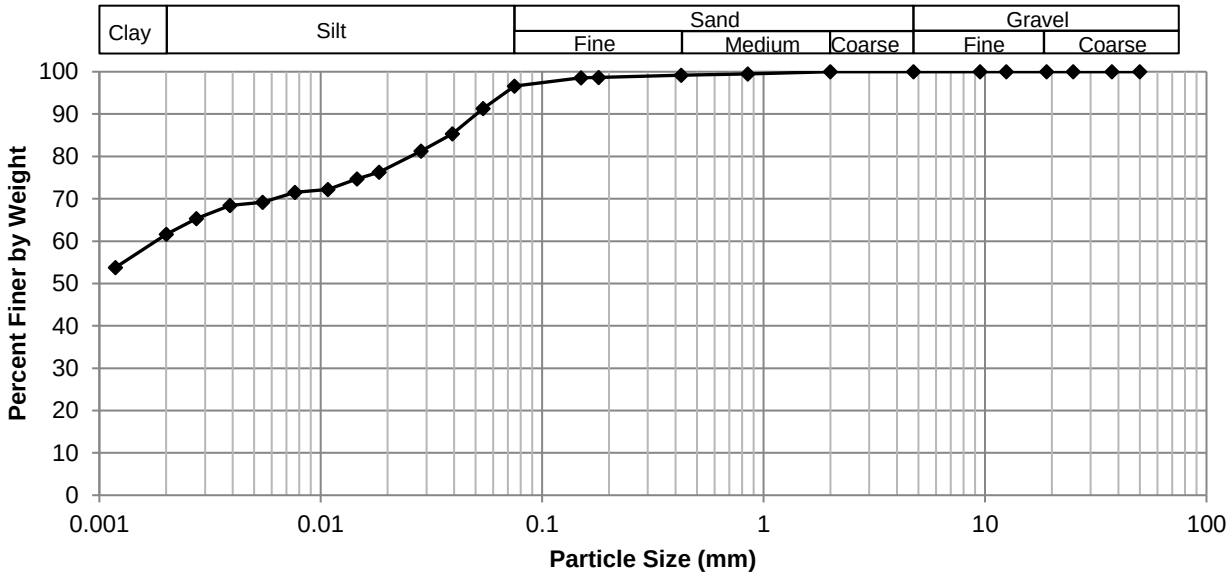
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-01
Sample #	G03
Depth (m)	1.0 - 1.1
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Gravel	0.0%
Sand	3.4%
Silt	35.1%
Clay	61.5%

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	96.64
37.5	100.00	2.00	100.00	0.0542	91.29
25.0	100.00	0.850	99.50	0.0394	85.35
19.0	100.00	0.425	99.15	0.0284	81.28
12.5	100.00	0.180	98.68	0.0184	76.28
9.50	100.00	0.150	98.56	0.0146	74.72
4.75	100.00	0.075	96.64	0.0108	72.21
				0.0077	71.52
				0.0055	69.18
				0.0039	68.40
				0.0027	65.29
				0.0020	61.62
				0.0012	53.77

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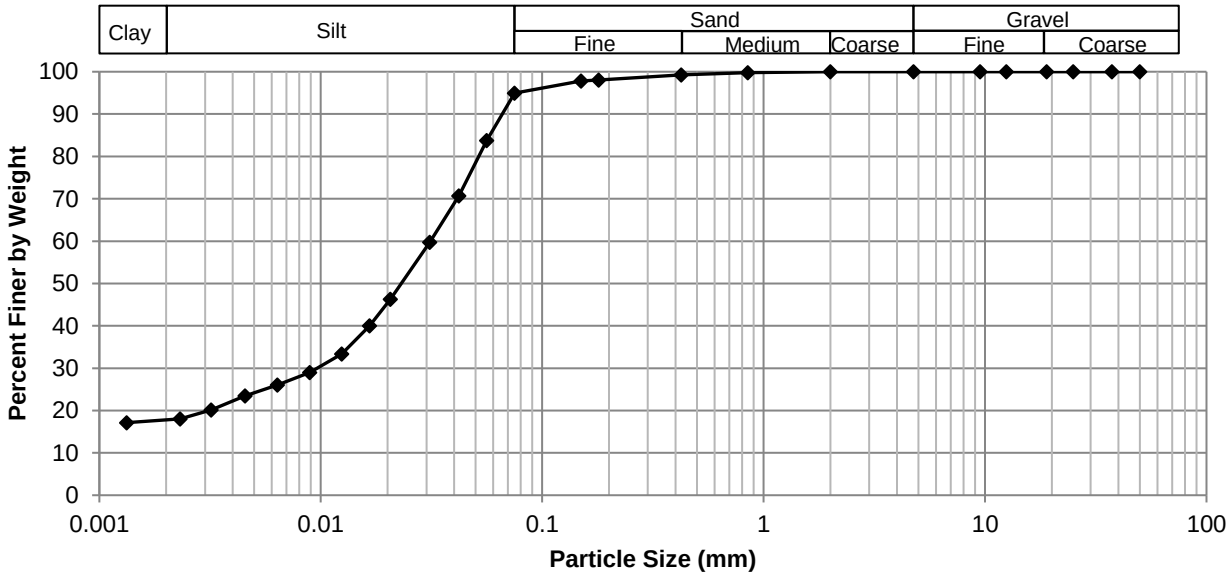
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-05
Sample #	G29
Depth (m)	0.4 - 0.6
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Gravel	0.0%
Sand	5.0%
Silt	77.2%
Clay	17.7%

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	94.95
37.5	100.00	2.00	100.00	0.0562	83.80
25.0	100.00	0.850	99.81	0.0421	70.67
19.0	100.00	0.425	99.25	0.0311	59.72
12.5	100.00	0.180	98.08	0.0206	46.28
9.50	100.00	0.150	97.80	0.0166	40.03
4.75	100.00	0.075	94.95	0.0124	33.39
				0.0089	29.02
				0.0064	26.07
				0.0046	23.44
				0.0032	20.12
				0.0023	17.99
				0.0013	17.14

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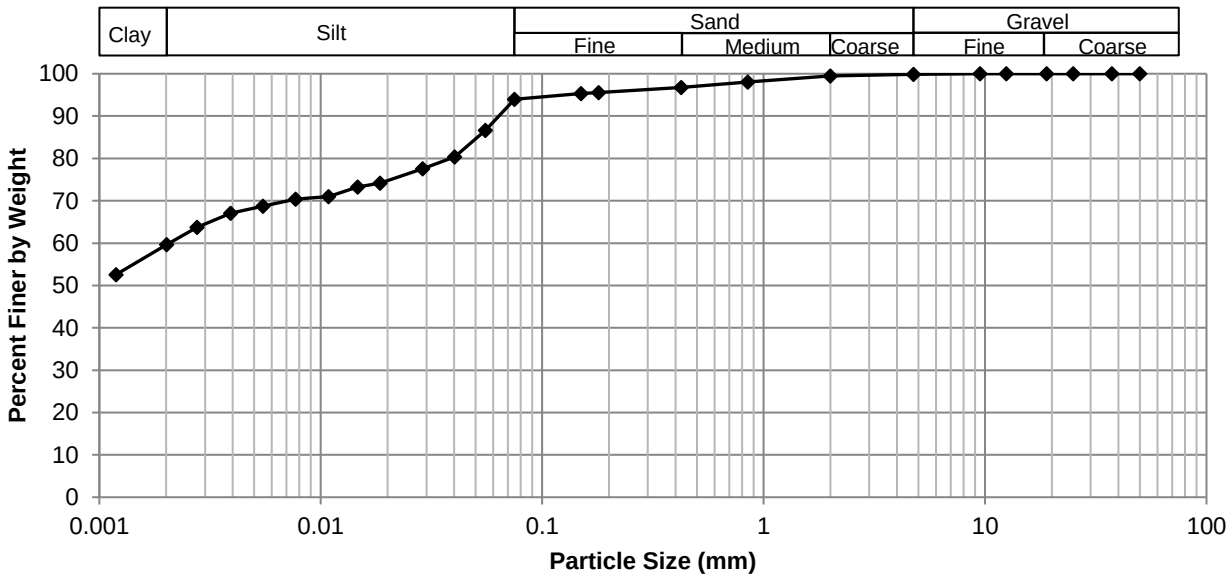
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-064-00
Client	Morrison Hershfield
Project	2019 Regional Streets C-02 (Inkster Boulevard)
Test Hole	TH18-07
Sample #	G43
Depth (m)	0.4 - 0.6
Sample Date	20-Jun-18
Test Date	6-Jul-18
Technician	NM

Gravel	0.2%
Sand	5.9%
Silt	34.4%
Clay	59.5%

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	99.82	0.0750	93.94
37.5	100.00	2.00	99.48	0.0554	86.61
25.0	100.00	0.850	98.04	0.0403	80.38
19.0	100.00	0.425	96.79	0.0289	77.59
12.5	100.00	0.180	95.54	0.0185	74.16
9.50	100.00	0.150	95.33	0.0147	73.23
4.75	99.82	0.075	93.94	0.0109	71.00
				0.0077	70.38
				0.0055	68.71
				0.0039	67.05
				0.0028	63.77
				0.0020	59.64
				0.0012	52.59

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