APPENDIX 'F'

GEOTECHNICAL REPORT

Quality Engineering | Valued Relationships

Morrison Hershfield

2016 Local Streets Package 16-R-02a
Sub-Surface Investigation

Prepared for:

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

Distribution:

Ron Bruce, P.Eng.

Project Number:
0035-032-00

Date:
March 10, 2016
Final Report

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TREK GEOTECHNICAL

Quality Engineering | Valued Relationships

March 10, 2016 Our File No. 0035-032-00

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

RE: 2016 Local Streets Package 16-R-02a
Sub-Surface Investigation Report

TREK Geotechnical Inc. is pleased to submit our report for the sub-surface investigations for the 2016 Local Streets Package 16-R-02a.

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

cc: Paul Bevel, B.Sc., (TREK Geotechnical)

Revision History

Revision No.	Author	Issue Date	Description
0	PB	March 10, 2016	Final Report

Authorization Signatures

Prepared By:

Paul Bevel, B.Sc.

PROVINCE OF MANITOBA
N. FERREIRA
Member
March 10 2016

Reviewed By:

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

APEGM
Certificate of Authorization
Trek Geotechnical Inc.
No. 4877 Date: March 10, 2016

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1.0 Introduction

This report summarizes the results of the sub-surface investigation completed for the 2016 Local Streets Package 16-R-02a project. The streets included Mathers Avenue, Jessie Avenue, Cockburn Street and Scotland Avenue. The information collected describes the pavement structure of the existing road as well as the soil stratigraphy beneath the pavement structure.

2.0 Sub-Surface Investigation and Laboratory Program

For each street test holes were drilled approximately every 50m of street length with specific locations shown on Figure 01 to Figure 04. The test holes were drilled in order to determine sub-surface conditions for the reconstruction of the road segment.

The sub-surface investigation was conducted between February 9, 2016 and February 16, 2016. The test holes were drilled to a depth of 3.1 m below road surface by Paddock Drilling Ltd. using their BRAT 22-R truck mounted drill rig equipped with 125 mm diameter solid stem augers. The pavement structure (asphalt or concrete) was cored by Paul Bevel, B.Sc. of TREK Geotechnical Inc. (TREK) using a portable coring press equipped with a hollow 150 mm diameter diamond core drill bit. The sub-surface conditions were observed during drilling and visually classified by Jodi Neumann of TREK. Other pertinent information such as groundwater and drilling conditions were also recorded during the drilling investigation. Disturbed (auger cuttings) 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.

The laboratory testing program consisted of moisture content determination, Atterberg limits, and grain size analysis (mechanical sieve and hydrometer methods). Information gathered for each street is included in separate appendices (Appendix A to D). The information provided in the Appendices includes test hole logs, laboratory testing summary tables and results, and photos of the concrete cores.

Test hole locations noted on the test hole logs and shown on Figure 01 to Figure 04 are based on measured distances from the nearest address, 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 032 00
Morrison Hershfield
Mathers Avenue

Tabloid (279mm x 432mm)

PLOT: 3/9/2016 5:17:46 PM

FILE NAME: FIG 001 2016-03-09 Site Plan 0_B_HA 0035 032 00.dwg

0 7.5 15 22.5 30m
SCALE : 1:750 (279mm x 432mm)

Figure 01A
Test Hole Site Plan

TREK GEOTECHNICAL

0035 032 00
Morrison Hershfield
Mathers Avenue

Tabloid (279mm x 432mm)

PLOT: 3/9/2016 5:18:08 PM

FILE NAME: FIG 001 2016-03-09 Site Plan 0_B_HA 0035 032 00.dwg

0 7.5 15 22.5 30m
SCALE : 1:750 (279mm x 432mm)

Figure 01B
Test Hole Site Plan

TREK GEOTECHNICAL

0035 032 00
Morrion Hershfield
Jessie Avenue

Tabloid (279mm x 432mm)

PLOT: 3/9/2016 5:04:54 PM

FILE NAME: FIG 002 2016-03-09 Site Plan 0_C_HA 1000 0035 032 00.dwg

0 6 12 18 24m
SCALE : 1:600 (279mm x 432mm)

Figure 02
Test Hole Location Plan

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0035 032 00
Morrison Hershfield
Cockburn Street

Tabloid (279mm x 432mm)

PLOT: 3/10/2016 11:16:22 AM

FILE NAME: FIG 004 2016-03-10 Site Plan 0_C_HA 0035 032 00.dwg

KYLEMORE AVE

WALKER AVE

RATHGAR AVE

COCKBURN ST S

TH01

TH02

TH03

TH04

MH Cover

0 4 8 12 16m
SCALE : 1:400 (279mm x 432mm)

Figure 03
Test Hole Location Plan

TREK GEOTECHNICAL

0035 032 00
Morrison Hershfield
Schotland Avenue

Tabloid (279mm x 432mm)

PLOT: 3/10/2016 11:19:48 AM

FILE NAME: FIG 005 2016-03-10 Site Plan 0_C_HA 0035 032 00.dwg

0 1.5 3 4.5 6m
SCALE : 1:150 (279mm x 432mm)

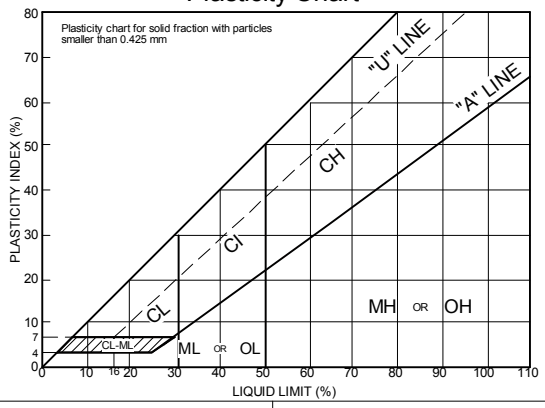
Figure 04
Test Hole Location Plan

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

Appendix A

Test Hole Logs, Summary Table & Lab Data – Mathers Avenue

Sub-Surface Log

Test Hole TH16-01

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	12 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (216mm thick)		
		CLAY (FILL) - silty - mottled black and brown - frozen, moist and firm when thawed, high plasticity		G81
0.5		SILT AND CLAY - trace fine sand, trace organics - brown - frozen, moist and firm when thawed - low plasticity		G82
1.0				
		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - frozen to 1.5m, moist and firm to stiff when thawed - high plasticity - silt seam (<25mm thick) at 1.5m		G83
1.5				
				G84
2.0				
				G85
2.5				G86
				G87
3.0		End of Hole at 3.0m 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) — Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○: 0 50 100 150 200 250

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.4m at completion of drilling.
4) Test hole located 20m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.5m north of south curb. U14 (5523859m N, 629978m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-02
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	11 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (220mm thick)		
		CLAY (FILL) - silty, trace sand, trace organics - dark brown - frozen, moist and firm when thawed - high plasticity	Grab	G48
0.5		CLAY AND SILT - trace fine sand, brown, frozen, moist and firm when thawed, intermediate plasticity	Grab	G49
1.0		SILT - trace clay, trace fine sand, brown - frozen to 1.2 m, moist and firm when thawed - no to low plasticity	Grab	G50
1.5			Grab	G51
		CLAY - silty, trace silt inclusions (<10mm dia.), trace sand, trace oxidation - brown - moist, stiff - high plasticity - silt seam (<25mm thick) below 1.8m	Grab	G52
2.0		- firm below 2.1m	Grab	G53
2.5			Grab	G54
			Grab	G55
3.0		End of Hole at 3.0m 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 ○

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.0m at completion of drilling.
4) Test hole located 65m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.5m south of north curb. U14 (5523881m N, 630024m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-03
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	12 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (223mm thick)		
		CLAY (FILL) - silty, trace silt inclusions (<3mm dia.), trace gravel (10mm dia.), trace oxidation - dark brown - frozen, moist and soft when thawed - high plasticity	G	G73
0.5		CLAY - silty, trace sand, trace oxidation - light brown - frozen to 1.5m, moist and firm when thawed - high plasticity	G	G74
1.0			G	G75
			G	G76
1.5		- trace silt inclusions (<10mm dia.), dark brown below 1.7m	G	G77
2.0			G	G78
2.5			G	G79
			G	G80
3.0		End of Hole at 3.0m 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 ○

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 3.0m at completion of drilling.
4) Test hole located 122m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.5m north of south curb. U14 (5523870m N, 630080m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-04
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	11 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (208mm thick)		
		CLAY (FILL) - silty, trace sand, trace oxidation, trace rootlets - mottled black and brown - frozen, moist and firm when thawed - high plasticity	G	G40
0.5			G	G41
		CLAY - silty, trace silt inclusions (<5mm dia.), trace sand - dark brown - frozen to 1.5m, moist and firm to stiff when thawed - high plasticity	G	G42
		- trace silt inclusions (<10mm dia,), brown below 1.4m	G	G43
1.5			G	G44
2.0			G	G45
			G	G46
2.5			G	G47
3.0		End of Hole at 3.0m 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 ○

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.1m at completion of drilling.
4) Test hole located 166m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.1m south of north curb. U14 (5523875m N, 630125m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-05
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	12 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (226mm thick)		
		ORGANIC CLAY (FILL) - silty, trace coarse sand, trace gravel (<8m dia.) - brownish black - frozen, moist and soft when thawed - high plasticity		G64 G65
0.5		CLAY - silty, trace silt seams (<1mm thick), trace oxidation, trace rootlets - light brown - frozen to 1.5m, moist and firm to stiff when thawed - high plasticity		G66
1.0		- trace silt inclusions (<10m dia.), no silt seams, dark brown below 1.1m		G67
1.5				G68
2.0				G69
2.5				G70
3.0				G71

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 3.0m in CLAY

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.4m at completion of drilling.
4) Test hole located 222m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.5m north of south curb. U14 (5523869m N, 630180m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-06
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	12 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (220mm thick)		
		CLAY (FILL) - silty, trace sand, trace sand inclusions (<20mm dia.), trace gravel (<10mm dia.) - blackish brown, frozen, moist and stiff when thawed, high plasticity		G56
0.5		SILT - some clay, trace fine sand - light brown - frozen to 0.9m, moist and firm when thawed - intermediate plasticity		G57
1.0		SILT - trace clay, trace fine sand - light brown - moist, firm - no to low plasticity		G58
				G59
1.5				
		CLAY - silty, some silt inclusions (<25mm dia.), trace sand, trace oxidation - brown - moist, firm - high plasticity - trace silt inclustions (<10mm dia.) below 1.8m		G60
2.0		- stiff below 2.1m		G61
2.5				G62
				G63
3.0		End of Hole at 3.0m 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 ○

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.1m at completion of drilling.
4) Test hole located 266m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.1m north of south curb. U14 (5523866m N, 630225m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-07
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	11 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (204mm thick)		
		CLAY - silty, trace sand, trace oxidation - dark brown - frozen to 1.5m, moist and and firm when thawed - high plasticity	G	G29
0.5			G	G30
			G	G31
1.0			G	G32
			G	G33
1.5		- trace silt inclusions (<10mm dia.) below 1.5m	G	G34
			G	G35
2.0			G	G36
			G	G37
2.5			G	G39
3.0		End of Hole at 3.0m 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)

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

0 50 100 150 200 250

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.4m at completion of drilling.
4) Test hole located 315m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.2m north of south curb. U14 (5523864m N, 630273m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-08
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	11 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (228mm thick)		
		CLAY (FILL) - silty, trace silt inclusions (<10mm dia.), trace sand - mottled brown and dark brown - frozen, moist and firm when thawed - high plasticity		G20
0.5				G21
		CLAY - silty, some silt inclusions (<15mm dia.), trace sand - light brown - frozen, moist and firm when thawed - high plasticity		G22
1.0		SILT - trace clay, trace fine sand, trace oxidaton - light brown - moist, firm - low plasticity		G23
1.5		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, stiff to very stiff - high plasticity		G24
				G25
2.0		- stiff below 2.1m		G26
2.5		- firm below 2.4m		G27
				G28
3.0		End of Hole at 3.0m 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 ○

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 1.5m at completion of drilling.
4) Test hole located 381m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.0m south of north curb. U14 (5523868m N, 630340m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-09

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	11 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/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 - (220mm thick)				
		CLAY (FILL) - silty, trace coarse sand, trace gravel (<20mm dia), dark brown, frozen, no sample recovery				
0.5		CLAY - silty,trace sand - light brown - frozen, moist and firm when thawed, intermediate plasticity		G12A		
		SILT - clayey, trace fine sand, light brown, frozen, moist and firm when thawed, intermediate plasticity		G13A		
1.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - frozen to 1.5m, moist and firm to stiff when thawed - high plasticity		G14A		
				G15A		
1.5		- silt seam (<50mm thick) at 1.7m				
				G16A		
2.0				G17A		
2.5				G18A		
				G19A		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.3m at completion of drilling.
4) Test hole located 432m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.0m north of south curb. U14 (5523860m N, 630391m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH16-10

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	11 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (209mm thick)		
		ORGANIC CLAY (FILL) - silty, trace coarse sand, trace gravel (<20mm dia) - black - frozen, moist and firm when thawed - high plasticity		G11
0.5		CLAY - silty, trace sand, trace oxidaton - brown - frozen, moist and firm when thawed - high plasticity		G12
1.0				G13
		- trace silt inclusions (<10mm dia.), stiff below 1.2m		G14
1.5				G15
		SILT - some clay, trace sand, trace oxidation - brown, moist, compact, low plasticity		G16
2.0		CLAY - silty, trace silt inclusions (<15mm dia.) - brown - moist, stiff - high plasticity		G17
2.5		- firm to stiff below 2.4m		G18
		- firm below 2.7m		G19
3.0		End of Hole at 3.0m 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) — Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○: 0 50 100 150 200 250

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 1.4m at completion of drilling.
4) Test hole located 484m east of manhole at the intersection of Mathers Ave. and Campbell St., 2.1m south of north curb. U14 (5523865m N, 630443m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-02-26 LOCAL STREETS PKG. 16-R-02 MATHERS 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-11

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Mathers Ave. - Between Campbell St. and Oak St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	11 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		CONCRETE - (220mm thick)		
		CLAY (FILL) - silty, trace coarse sand, trace gravel (<12mm dia.), trace oxidaton - black - frozen, moist and firm when thawed - high plasticity		G01
0.5				G02
1.0				G03
		- mottled black and brown below 1.1m		
		CLAY - silty, trace silt inclusions (<10mm dia.) - greyish brown - frozen, moist and firm to stiff when thawed - high plasticity		G04
1.5				G05
		- some organic clay, trace rootlets, soft below 1.7m		G06
				G07
2.0				G08
2.5				G09
		- trace oxidation , brown, firm below 2.7m		G10
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 Hole at 3.0m in CLAY

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.0m at completion of drilling.
4) Test hole located 536m east of manhole at the intersection of Mathers Ave. and Campbell St., 1.9m north of south curb. U14 (5523865m N, 630443m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Local Streets Package 16-R-02
Sub-Surface Investigation
Mathers 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)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH16-01	UTM: 5523859 N, 629978 E 20m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.5m north from south curb	N/A		Concrete	216											
						CLAY (FILL)	0.3	0.5	27							
						SILT AND CLAY	0.9	1.1	28	0	5	57	38	15	36	21
						CLAY	1.2	1.4	31							
						CLAY	1.8	2.0	47							
						CLAY	2.1	2.3	53							
						CLAY	2.4	2.6	54							
						CLAY	2.7	2.9	55							
TH16-02	UTM: 5523881 N, 630024 E 65m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.5m south from north curb	N/A		Concrete	220											
						CLAY (FILL)	0.3	0.5	27							
						CLAY AND SILT	0.8	0.9	26							
						SILT	1.1	1.2	25							
						SILT	1.2	1.5	24							
						CLAY	1.8	2.0	44							
						CLAY	2.1	2.3	49							
						CLAY	2.4	2.6	51							
						CLAY	2.7	2.9	52							
TH16-03	UTM: 5523870 N, 630080 E 122m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.5m north from south curb	N/A		Concrete	223											
						CLAY (FILL)	0.3	0.5	27							
						CLAY	0.6	0.8	30							
						CLAY	0.9	1.1	27							
						CLAY	1.2	1.4	36							
						CLAY	1.8	2.0	44							
						CLAY	2.1	2.3	50							
						CLAY	2.4	2.6	50							
						CLAY	2.7	2.9	54							
TH16-04	UTM: 5523875, 630125 E 166m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.1m south from north curb	N/A		Concrete	208											
						CLAY (FILL)	0.3	0.5	29							
						CLAY (FILL)	0.5	0.6	32							
						CLAY	0.9	1.1	34							
						CLAY	1.4	1.5	38							
						CLAY	1.8	2.0	46							
						CLAY	2.1	2.3	50							
						CLAY	2.4	2.6	55							
						CLAY	2.7	2.9	58							

Local Streets Package 16-R-02
Sub-Surface Investigation
Mathers 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)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH16-05	UTM: 5523869 N, 630180 E 222m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.5m north from south curb	N/A		Concrete	226											
						ORGANIC CLAY (FILL)	0.2	0.3	32							
						ORGANIC CLAY (FILL)	0.3	0.5	30							
						CLAY	0.6	1.1	25							
						CLAY	1.2	1.4	30							
						CLAY	1.8	2.0	46							
						CLAY	2.1	2.3	50							
						CLAY	2.4	2.6	50							
						CLAY	2.7	2.9	50							
TH16-06	UTM: 5523866 N, 630225 E 266m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.1m north from south curb	N/A		Concrete	220											
						CLAY (FILL)	0.3	0.5	28							
						SILT AND CLAY	0.6	0.8	26							
						SILT	0.9	1.1	21							
						SILT	1.2	1.4	21							
						CLAY	1.8	2.0	40							
						CLAY	2.1	2.3	43							
						CLAY	2.4	2.6	47							
						CLAY	2.7	2.9	52							
TH16-07	UTM: 5523864 N, 630273 E 315m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.2m north from south curb	N/A			204											
						CLAY	0.3	0.5	35							
						CLAY	0.5	0.6	36							
						CLAY	0.6	0.8	35							
						CLAY	0.9	1.1	34							
						CLAY	1.2	1.4	39							
						CLAY	1.5	1.7	45							
						CLAY	1.8	2.0	49							
						CLAY	2.1	2.3	56							
						CLAY	2.4	2.6	57							
						CLAY	2.7	2.9	54							
TH16-08	UTM: 5523868 N, 630340 E 381m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.0m south from north curb	N/A		Concrete	228											
						CLAY (FILL)	0.3	0.5	28							
						CLAY (FILL)	0.5	0.6	28							
						CLAY	0.9	1.1	28							
						SILT	1.2	1.5	21							
						CLAY	1.5	1.7	41							
						CLAY	1.8	2.0	43							
						CLAY	2.1	2.3	47							
						CLAY	2.4	2.6	52							
						CLAY	2.7	2.9	52							

Local Streets Package 16-R-02
Sub-Surface Investigation
Mathers 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)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH15-09	UTM: 5523860 N, 630391 E 432m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.0m north from south curb	N/A		Concrete	220											
						CLAY AND SILT	0.3	0.5	42	0	3	28	69	19	62	43
						SILT	0.6	0.8	28	0	2	65	33	16	34	18
						CLAY	0.9	1.1	36							
						CLAY	1.2	1.4	39							
						CLAY	1.8	2.0	47							
						CLAY	2.1	2.3	51							
						CLAY	2.4	2.6	53							
						CLAY	2.7	2.9	52							
TH15-10	UTM: 5523865 N, 630443 E 484m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 2.1m south from north curb	N/A		Concrete	209											
						ORGANIC CLAY (FILL)	0.3	0.5	17							
						CLAY	0.6	0.8	34							
						CLAY	0.9	1.1	32							
						CLAY	1.2	1.4	31							
						CLAY	1.5	1.7	38							
						SILT	1.8	2.0	37							
						CLAY	2.1	2.3	48							
						CLAY	2.4	2.6	49							
						CLAY	2.7	2.9	51							
TH15-11	UTM: 5523859 N, 630494 E 536m east from MH cover at center of intersection of Mathers Ave & Campbell St, & 1.9m north from south curb	N/A		Concrete	220											
						CLAY (FILL)	0.2	0.5	29							
						CLAY (FILL)	0.6	0.8	38							
						CLAY (FILL)	0.9	1.1	38							
						CLAY	1.4	1.5	31	0	6	24	70	21	73	52
						CLAY	1.5	1.7	39							
						CLAY	1.7	1.8	49							
						CLAY	1.8	2.0	44							
						CLAY	2.1	2.3	50							
						CLAY	2.4	2.6	47							
						CLAY	2.7	2.9	51							

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Mathers Ave.

Sample Date 11-Feb-16
Test Date 23-Feb-16
Technician LI

Test Pit	TH16-11	TH16-11	TH16-11	TH16-11	TH16-11	TH16-11
Depth (m)	0.3 - 0.3	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.7 - 1.8
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	D3	AB67	AB49	AB47	AB50	AA01
Mass of tare	8.2	6.6	6.6	6.7	6.6	6.6
Mass wet + tare	276.9	306.6	310.4	365.9	306.1	290.3
Mass dry + tare	215.9	224.7	226.2	281.1	222.3	196.9
Mass water	61.0	81.9	84.2	84.8	83.8	93.4
Mass dry soil	207.7	218.1	219.6	274.4	215.7	190.3
Moisture %	29.4%	37.6%	38.3%	30.9%	38.9%	49.1%

Test Pit	TH16-11	TH16-11	TH16-11	TH16-11	TH16-10	TH16-10
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.6 - 0.8
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	E25	N115	F141	W94	W90	N28
Mass of tare	8.8	8.6	8.4	8.6	8.4	8.3
Mass wet + tare	302.2	306.4	316.6	307.4	336.2	311.8
Mass dry + tare	213.1	207.0	217.8	206.4	288.2	234.8
Mass water	89.1	99.4	98.8	101.0	48.0	77.0
Mass dry soil	204.3	198.4	209.4	197.8	279.8	226.5
Moisture %	43.6%	50.1%	47.2%	51.1%	17.2%	34.0%

Test Pit	TH16-10	TH16-10	TH16-10	TH16-10	TH16-10	TH16-10
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	D20	K4	F65	E12	E28	E120
Mass of tare	8.4	8.5	8.5	8.5	8.5	8.7
Mass wet + tare	338.3	335.6	313.7	318.8	316.9	311.8
Mass dry + tare	259.2	258.1	229.7	234.8	217.1	212.6
Mass water	79.1	77.5	84.0	84.0	99.8	99.2
Mass dry soil	250.8	249.6	221.2	226.3	208.6	203.9
Moisture %	31.5%	31.0%	38.0%	37.1%	47.8%	48.7%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Mathers Ave.

Sample Date 11-Feb-16
Test Date 23-Feb-16
Technician LI

Test Pit	TH16-10	TH16-09	TH16-09	TH16-09	TH16-09	TH16-09
Depth (m)	2.7 - 2.9	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.8 - 2.0
Sample #	G19	G12A	G13A	G14A	G15A	G16A
Tare ID	W81	K16	F56	AC23	N75	W85
Mass of tare	8.6	8.5	8.4	6.6	8.4	8.6
Mass wet + tare	325.1	319.8	367.3	308.6	329.2	313.7
Mass dry + tare	218.6	227.5	289.7	229.0	238.8	216.9
Mass water	106.5	92.3	77.6	79.6	90.4	96.8
Mass dry soil	210.0	219.0	281.3	222.4	230.4	208.3
Moisture %	50.7%	42.1%	27.6%	35.8%	39.2%	46.5%

Test Pit	TH16-09	TH16-09	TH16-09	TH16-08	TH16-08	TH16-08
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.5 - 0.6	0.9 - 1.1
Sample #	G17A	G18A	G19A	G20	G21	G22
Tare ID	E52	AC14	AC20	AA02	Z27	AB62
Mass of tare	8.5	6.7	6.6	6.8	8.6	6.6
Mass wet + tare	316.0	300.0	329.9	288.0	311.9	305.3
Mass dry + tare	212.0	199.0	219.5	225.9	245.7	239.4
Mass water	104.0	101.0	110.4	62.1	66.2	65.9
Mass dry soil	203.5	192.3	212.9	219.1	237.1	232.8
Moisture %	51.1%	52.5%	51.9%	28.3%	27.9%	28.3%

Test Pit	TH16-08	TH16-08	TH16-08	TH16-08	TH16-08	TH16-08
Depth (m)	1.2 - 1.5	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G23	G24	G25	G26	G27	G28
Tare ID	AB08	AA03	AB19	A36	E41	F129
Mass of tare	6.8	6.7	6.6	8.2	8.5	8.5
Mass wet + tare	390.1	319.0	292.8	263.7	261.2	284.5
Mass dry + tare	323.7	228.7	206.7	182.0	174.5	190.1
Mass water	66.4	90.3	86.1	81.7	86.7	94.4
Mass dry soil	316.9	222.0	200.1	173.8	166.0	181.6
Moisture %	21.0%	40.7%	43.0%	47.0%	52.2%	52.0%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Mathers Ave.

Sample Date 11-Feb-16
Test Date 23-Feb-16
Technician LI

Test Pit	TH16-07	TH16-07	TH16-07	TH16-07	TH16-07	TH16-07
Depth (m)	0.3 - 0.5	0.5 - 0.6	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7
Sample #	G29	G30	G31	G32	G33	G34
Tare ID	F15	N13	Z128	E117	F17	E125
Mass of tare	8.6	8.5	8.5	8.2	8.5	8.4
Mass wet + tare	264.5	282.3	272.4	283.4	302.0	294.5
Mass dry + tare	198.6	210.6	203.4	214.4	220.4	205.1
Mass water	65.9	71.7	69.0	69.0	81.6	89.4
Mass dry soil	190.0	202.1	194.9	206.2	211.9	196.7
Moisture %	34.7%	35.5%	35.4%	33.5%	38.5%	45.4%

Test Pit	TH16-07	TH16-07	TH16-07	TH16-07	TH16-06	TH16-06
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	0.3 - 0.5	0.6 - 0.8
Sample #	G35	G36	G37	G38	G56	G57
Tare ID	H66	E84	N57	N62	A20	N59
Mass of tare	8.5	8.5	8.5	8.5	8.7	8.3
Mass wet + tare	313.2	318.0	290.6	288.4	321.3	235.4
Mass dry + tare	212.7	207.3	188.7	190.6	252.5	188.4
Mass water	100.5	110.7	101.9	97.8	68.8	47.0
Mass dry soil	204.2	198.8	180.2	182.1	243.8	180.1
Moisture %	49.2%	55.7%	56.5%	53.7%	28.2%	26.1%

Test Pit	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G58	G59	G60	G61	G62	G63
Tare ID	Z19	F91	W76	Z113	H1	H52
Mass of tare	8.6	8.3	8.4	8.4	8.3	8.5
Mass wet + tare	348.4	443.7	330.5	309.7	330.6	318.0
Mass dry + tare	288.6	367.6	237.9	219.2	227.5	212.1
Mass water	59.8	76.1	92.6	90.5	103.1	105.9
Mass dry soil	280.0	359.3	229.5	210.8	219.2	203.6
Moisture %	21.4%	21.2%	40.3%	42.9%	47.0%	52.0%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Mathers Ave.

Sample Date 11-Feb-16
Test Date 23-Feb-16
Technician LI

Test Pit	TH16-05	TH16-05	TH16-05	TH16-05	TH16-05	TH16-05
Depth (m)	0.2 - 0.3	0.3 - 0.5	0.6 - 1.1	1.2 - 1.4	1.8 - 2.0	2.1 - 2.3
Sample #	G64	G65	G66	G67	G68	G69
Tare ID	AC04	P37	K16	AC07	AC05	E15
Mass of tare	6.6	8.4	8.5	6.7	6.7	8.7
Mass wet + tare	308.0	279.4	364.0	364.1	328.1	310.9
Mass dry + tare	235.6	216.4	292.2	282.5	227.4	210.2
Mass water	72.4	63.0	71.8	81.6	100.7	100.8
Mass dry soil	229.0	208.0	283.7	275.8	220.7	201.5
Moisture %	31.6%	30.3%	25.3%	29.6%	45.6%	50.0%

Test Pit	TH16-05	TH16-05	TH16-04	TH16-04	TH16-04	TH16-04
Depth (m)	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.5 - 0.6	0.9 - 1.1	1.4 - 1.5
Sample #	G70	G71	G40	G41	G42	G43
Tare ID	E143	H68	C4	W104	D11	F108
Mass of tare	8.4	8.5	8.5	8.5	8.6	8.3
Mass wet + tare	297.4	296.4	262.9	274.3	269.9	278.1
Mass dry + tare	201.3	201.0	205.7	209.3	204.2	204.0
Mass water	96.1	95.4	57.2	65.0	65.7	74.1
Mass dry soil	192.9	192.5	197.2	200.8	195.6	195.7
Moisture %	49.8%	49.6%	29.0%	32.4%	33.6%	37.9%

Test Pit	TH16-04	TH16-04	TH16-04	TH16-04	TH16-03	TH16-03
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.6 - 0.8
Sample #	G44	G45	G46	G47	G73	G74
Tare ID	F24	F142	F19	F31	N61	Z77
Mass of tare	8.5	8.4	8.4	8.4	8.3	8.3
Mass wet + tare	321.2	291.2	308.9	316.5	248.4	284.5
Mass dry + tare	223.1	197.2	201.8	204.0	197.2	221.0
Mass water	98.1	94.0	107.1	112.5	51.2	63.5
Mass dry soil	214.6	188.8	193.4	195.6	188.9	212.7
Moisture %	45.7%	49.8%	55.4%	57.5%	27.1%	29.9%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Mathers Ave.

Sample Date 11-Feb-16
Test Date 23-Feb-16
Technician LI

Test Pit	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	0.9 - 1.1	1.2 - 1.4	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G75	G76	G77	G78	G79	G80
Tare ID	Z66	P33	Z132	AB47	E26	Z04
Mass of tare	8.4	8.5	8.5	6.6	8.6	8.4
Mass wet + tare	279.8	293.6	280.9	283.1	279.2	289.7
Mass dry + tare	222.5	217.9	198.2	191.6	189.5	191.6
Mass water	57.3	75.8	82.7	91.5	89.7	98.1
Mass dry soil	214.1	209.4	189.7	185.0	180.9	183.2
Moisture %	26.8%	36.2%	43.6%	49.5%	49.6%	53.5%

Test Pit	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02
Depth (m)	0.3 - 0.5	0.8 - 0.9	1.1 - 1.2	1.2 - 1.5	1.8 - 2.0	2.1 - 2.3
Sample #	G48	G49	G50	G51	G52	G53
Tare ID	D8	K13	Z15	E110	N41	Z16
Mass of tare	8.5	8.5	8.6	8.6	8.4	8.4
Mass wet + tare	307.9	360.5	293.2	379.2	295.1	328.8
Mass dry + tare	244.9	288.5	237.2	306.8	208.0	222.9
Mass water	63.0	72.0	56.0	72.4	87.1	105.9
Mass dry soil	236.4	280.0	228.6	298.2	199.6	214.5
Moisture %	26.6%	25.7%	24.5%	24.3%	43.6%	49.4%

Test Pit	TH16-02	TH16-02	TH16-01	TH16-01	TH16-01	TH16-01
Depth (m)	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.9 - 1.1	1.2 - 1.4	1.8 - 2.0
Sample #	G54	G55	G81	G82	G83	G84
Tare ID	Z70	W69	AB32	W79	Z106	AC26
Mass of tare	8.5	8.4	6.7	8.6	8.4	6.5
Mass wet + tare	334.1	292.7	441.8	303.4	280.6	289.8
Mass dry + tare	223.5	195.9	350.1	239.0	216.2	198.7
Mass water	110.6	96.8	91.7	64.4	64.4	91.1
Mass dry soil	215.0	187.5	343.4	230.4	207.8	192.2
Moisture %	51.4%	51.6%	26.7%	28.0%	31.0%	47.4%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Mathers Ave.

Sample Date 11-Feb-16
Test Date 23-Feb-16
Technician LI

Test Pit	TH16-01	TH16-01	TH16-01			
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9			
Sample #	G85	G86	G87			
Tare ID	AA15	E105	F144			
Mass of tare	6.6	8.5	8.4			
Mass wet + tare	319.2	322.8	312.2			
Mass dry + tare	211.4	212.2	204.1			
Mass water	107.8	110.6	108.1			
Mass dry soil	204.8	203.7	195.7			
Moisture %	52.6%	54.3%	55.2%			

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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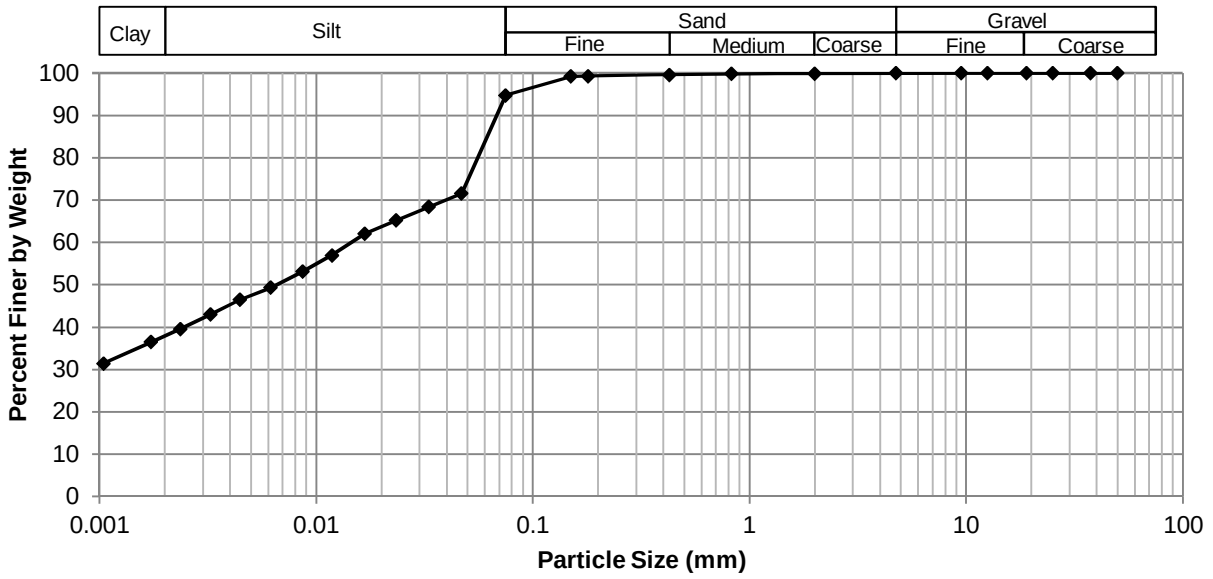
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16 - 01
Sample #	G82
Depth (m)	0.9 - 1.1
Sample Date	11-Feb-16
Test Date	7-Mar-16
Technician	LI / JB

Gravel	0.0%
Sand	5.2%
Silt	57.0%
Clay	37.8%

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	94.79
37.5	100.00	2.00	99.93	0.0468	71.56
25.0	100.00	0.825	99.79	0.0331	68.38
19.0	100.00	0.425	99.62	0.0234	65.21
12.5	100.00	0.180	99.28	0.0167	62.04
9.50	100.00	0.150	99.19	0.0118	56.96
4.75	100.00	0.075	94.79	0.0086	53.15
				0.0062	49.34
				0.0044	46.49
				0.0033	43.00
				0.0024	39.63
				0.0017	36.49
				0.0010	31.45

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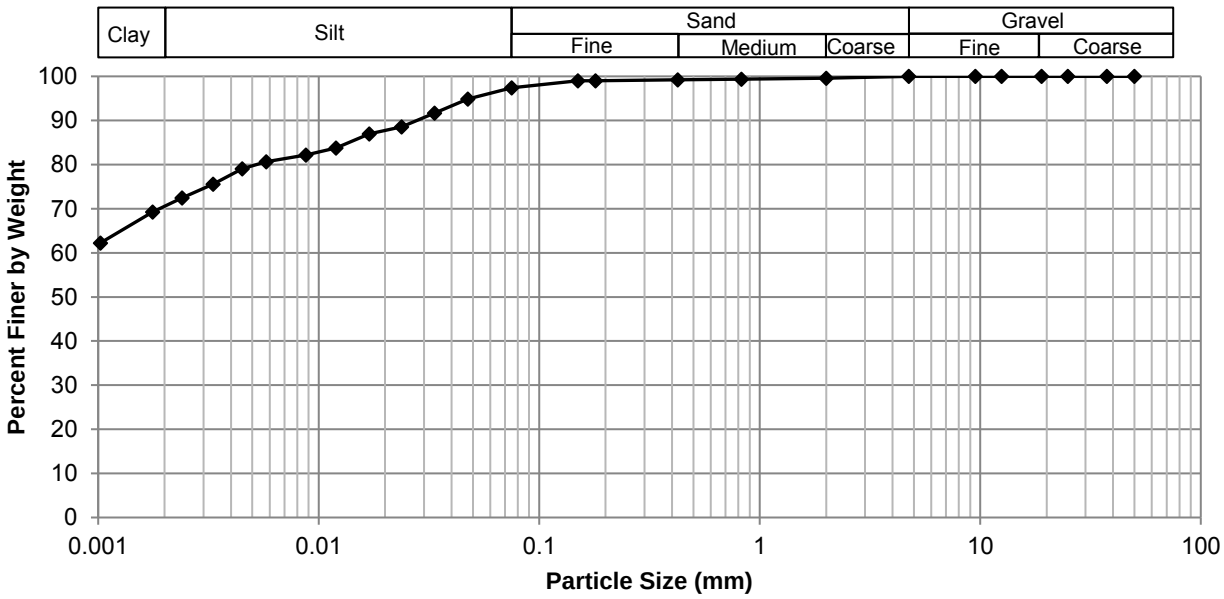
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16-09
Sample #	G12A
Depth (m)	0.3 - 0.5
Sample Date	11-Feb-16
Test Date	25-Feb-16
Technician	LI / JB

Gravel	0.0%
Sand	2.6%
Silt	27.0%
Clay	70.4%

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	97.44
37.5	100.00	2.00	99.57	0.0475	94.85
25.0	100.00	0.825	99.34	0.0336	91.69
19.0	100.00	0.425	99.21	0.0237	88.53
12.5	100.00	0.180	99.03	0.0170	86.95
9.50	100.00	0.150	99.00	0.0120	83.79
4.75	100.00	0.075	97.44	0.0088	82.20
				0.0058	80.62
				0.0045	79.04
				0.0033	75.61
				0.0024	72.45
				0.0018	69.28
				0.0010	62.25

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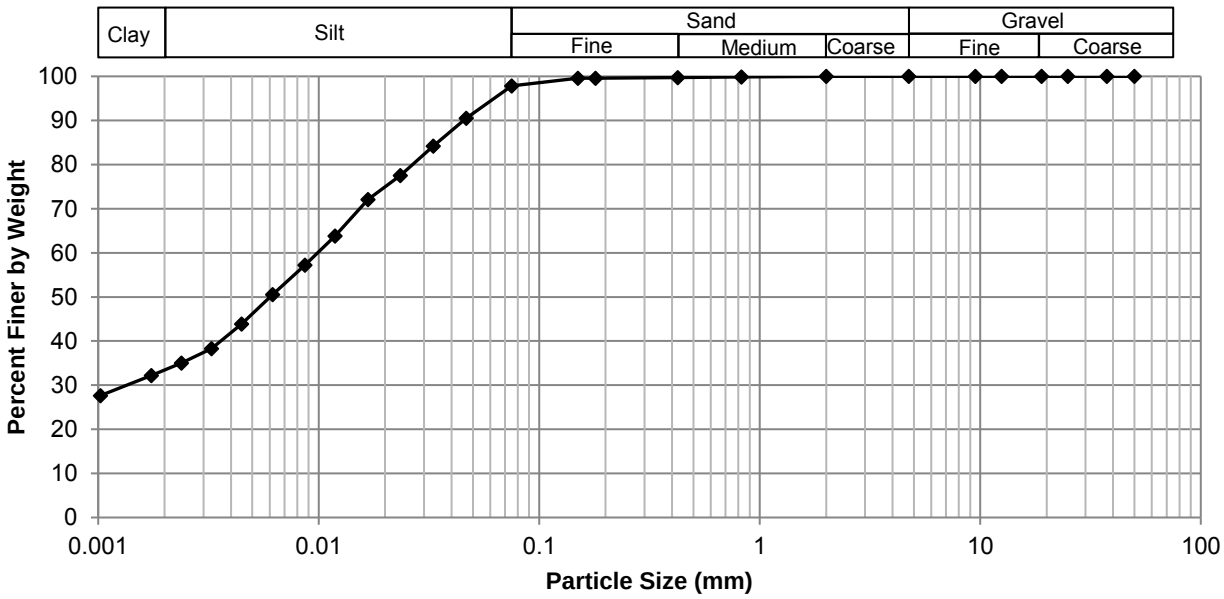
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hersfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16 - 09
Sample #	G13A
Depth (m)	0.6 - 0.8
Sample Date	11-Feb-16
Test Date	4-Mar-16
Technician	LI / JB

Gravel	0.0%
Sand	2.1%
Silt	64.6%
Clay	33.3%

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	97.86
37.5	100.00	2.00	100.00	0.0468	90.54
25.0	100.00	0.825	99.86	0.0331	84.19
19.0	100.00	0.425	99.76	0.0235	77.51
12.5	100.00	0.180	99.59	0.0168	72.11
9.50	100.00	0.150	99.55	0.0118	63.85
4.75	100.00	0.075	97.86	0.0087	57.18
				0.0062	50.52
				0.0045	43.85
				0.0033	38.32
				0.0024	34.99
				0.0017	32.17
				0.0010	27.65

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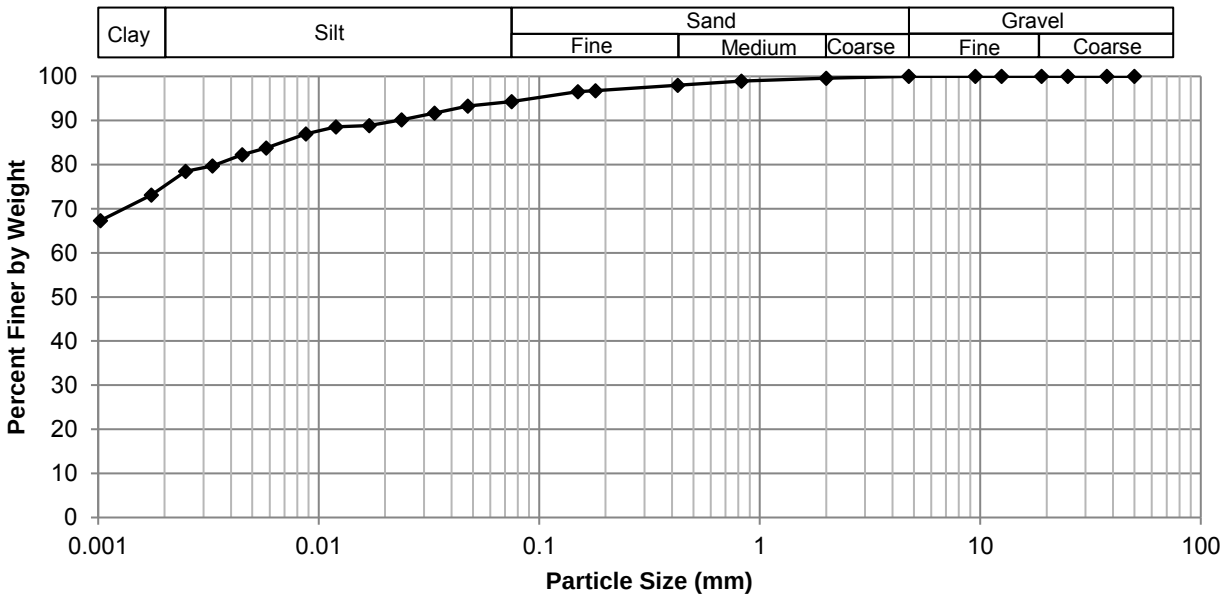
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16-11
Sample #	G04
Depth (m)	1.4 - 1.5
Sample Date	11-Feb-16
Test Date	25-Feb-16
Technician	LI / JB

Gravel	0.0%
Sand	5.7%
Silt	19.4%
Clay	74.9%

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	94.32
37.5	100.00	2.00	99.59	0.0475	93.29
25.0	100.00	0.825	98.95	0.0336	91.71
19.0	100.00	0.425	98.00	0.0237	90.13
12.5	100.00	0.180	96.78	0.0170	88.86
9.50	100.00	0.150	96.52	0.0120	88.54
4.75	100.00	0.075	94.32	0.0088	86.96
				0.0058	83.80
				0.0045	82.22
				0.0033	79.69
				0.0025	78.47
				0.0017	73.09
				0.0010	67.32

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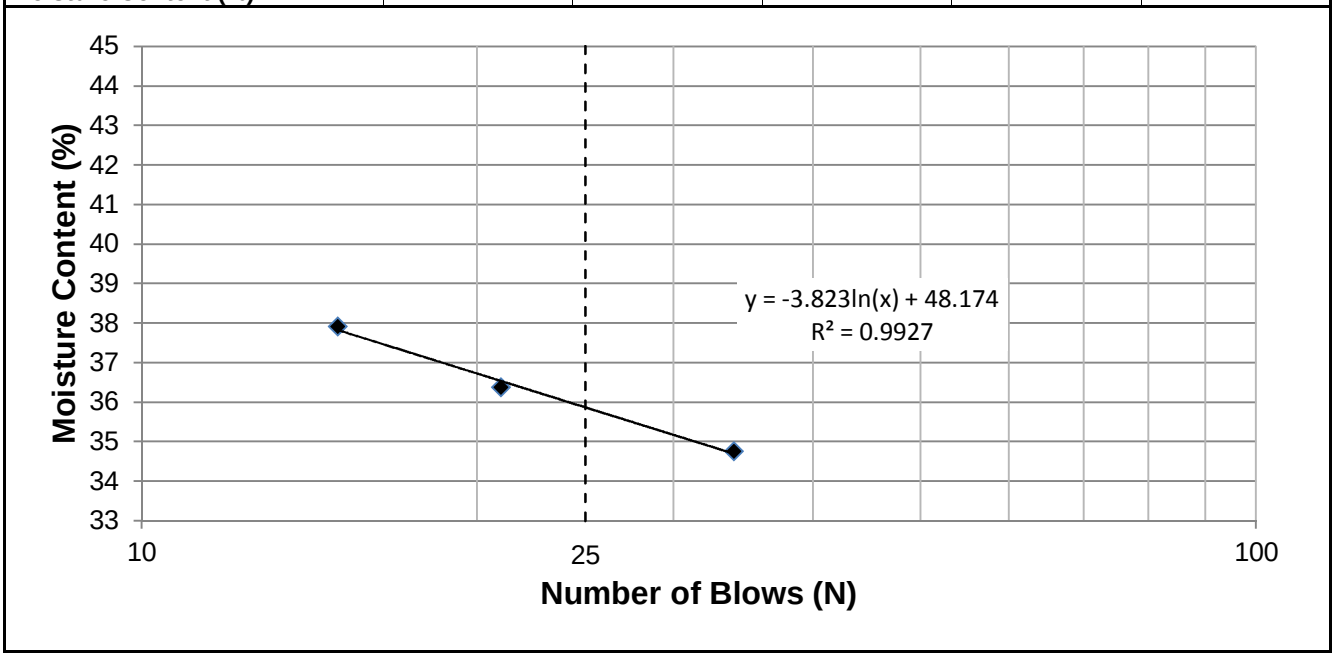
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16-01
Sample #	G82
Depth (m)	0.9 - 1.1
Sample Date	11-Feb-16
Test Date	07-Mar-16
Technician	LI

Liquid Limit	36
Plastic Limit	15
Plasticity Index	21

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	21	15	34		
Mass Wet Soil + Tare (g)	21.547	25.037	26.407		
Mass Dry Soil + Tare (g)	19.577	22.007	23.136		
Mass Tare (g)	14.162	14.015	13.725		
Mass Water (g)	1.970	3.030	3.271		
Mass Dry Soil (g)	5.415	7.992	9.411		
Moisture Content (%)	36.380	37.913	34.757		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	20.775	22.850			
Mass Dry Soil + Tare (g)	19.934	21.747			
Mass Tare (g)	14.162	14.260			
Mass Water (g)	0.841	1.103			
Mass Dry Soil (g)	5.772	7.487			
Moisture Content (%)	14.570	14.732			

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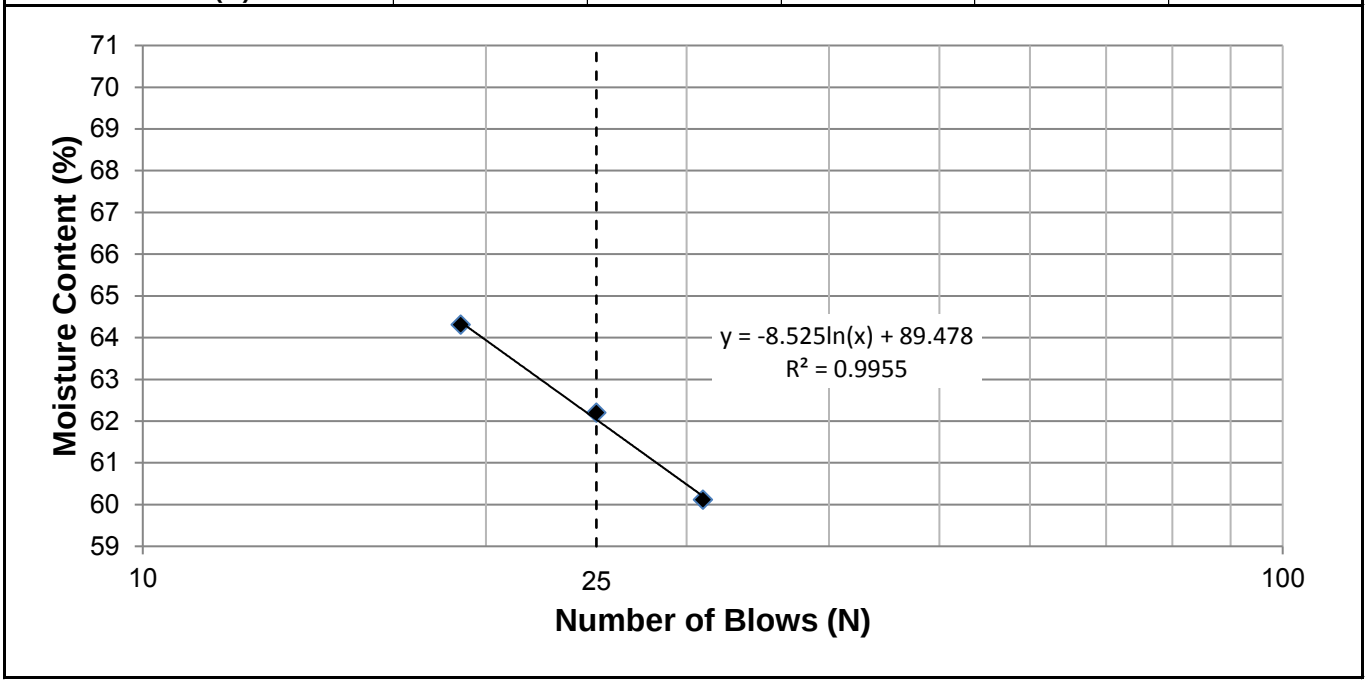
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16-09
Sample #	G12A
Depth (m)	0.3 - 0.5
Sample Date	11-Feb-16
Test Date	29-Feb-16
Technician	LI / JB

Liquid Limit	62
Plastic Limit	19
Plasticity Index	43

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	31	25	19		
Mass Wet Soil + Tare (g)	25.495	24.363	26.617		
Mass Dry Soil + Tare (g)	21.185	20.419	21.780		
Mass Tare (g)	14.015	14.078	14.258		
Mass Water (g)	4.310	3.944	4.837		
Mass Dry Soil (g)	7.170	6.341	7.522		
Moisture Content (%)	60.112	62.198	64.305		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	16.970	17.011			
Mass Dry Soil + Tare (g)	16.527	16.560			
Mass Tare (g)	14.144	14.199			
Mass Water (g)	0.443	0.451			
Mass Dry Soil (g)	2.383	2.361			
Moisture Content (%)	18.590	19.102			

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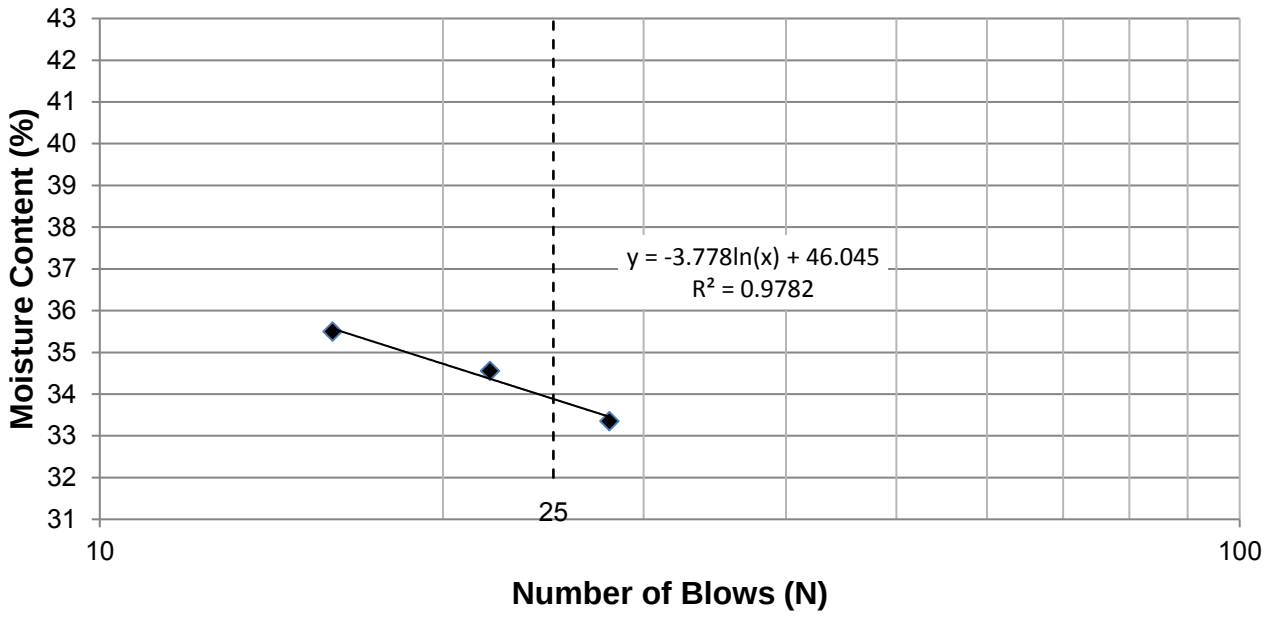
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16-09
Sample #	G13A
Depth (m)	0.6 - 0.8
Sample Date	11-Feb-16
Test Date	07-Mar-16
Technician	LI / JB

Liquid Limit	34
Plastic Limit	16
Plasticity Index	18

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	28	22	16		
Mass Wet Soil + Tare (g)	21.397	21.099	22.062		
Mass Dry Soil + Tare (g)	19.587	19.327	20.028		
Mass Tare (g)	14.160	14.198	14.297		
Mass Water (g)	1.810	1.772	2.034		
Mass Dry Soil (g)	5.427	5.129	5.731		
Moisture Content (%)	33.352	34.549	35.491		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	17.784	17.127			
Mass Dry Soil + Tare (g)	17.273	16.713			
Mass Tare (g)	14.079	14.142			
Mass Water (g)	0.511	0.414			
Mass Dry Soil (g)	3.194	2.571			
Moisture Content (%)	15.999	16.103			

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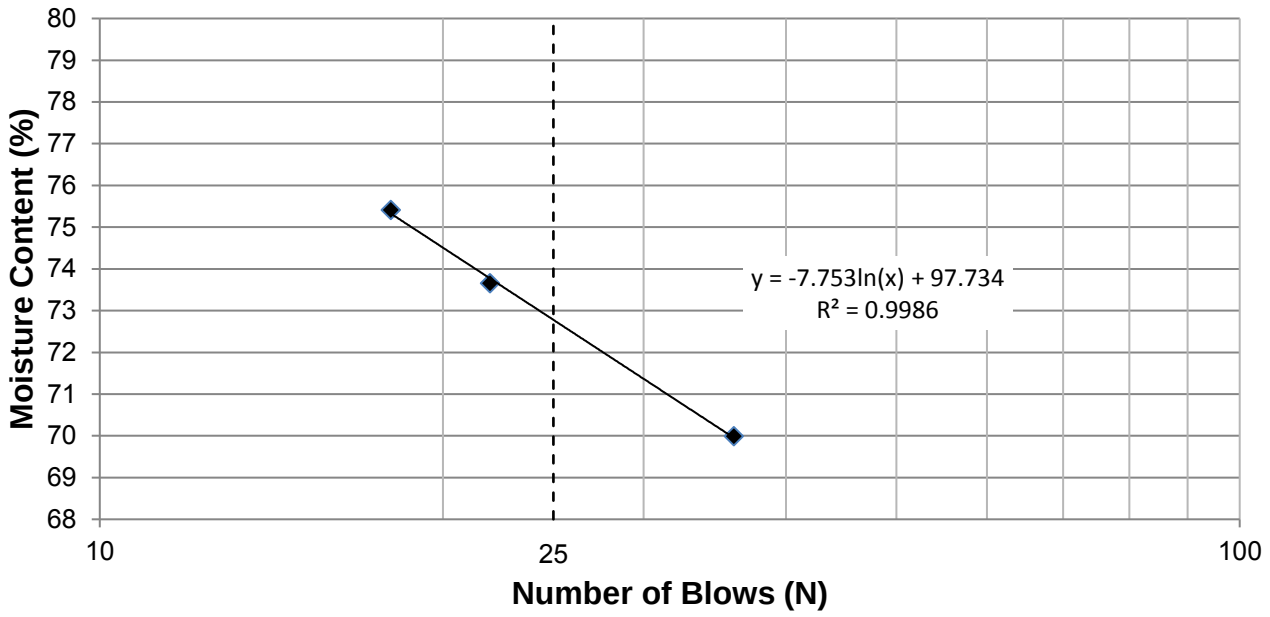
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Mathers Ave.
Test Hole	TH16-11
Sample #	G04
Depth (m)	1.4 - 1.5
Sample Date	11-Feb-16
Test Date	29-Feb-16
Technician	LI / JB

Liquid Limit	73
Plastic Limit	21
Plasticity Index	51

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	36	22	18		
Mass Wet Soil + Tare (g)	26.088	25.854	26.832		
Mass Dry Soil + Tare (g)	21.245	20.953	21.423		
Mass Tare (g)	14.325	14.299	14.250		
Mass Water (g)	4.843	4.901	5.409		
Mass Dry Soil (g)	6.920	6.654	7.173		
Moisture Content (%)	69.986	73.655	75.408		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	17.676	16.920			
Mass Dry Soil + Tare (g)	17.081	16.426			
Mass Tare (g)	14.186	14.021			
Mass Water (g)	0.595	0.494			
Mass Dry Soil (g)	2.895	2.405			
Moisture Content (%)	20.553	20.541			

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

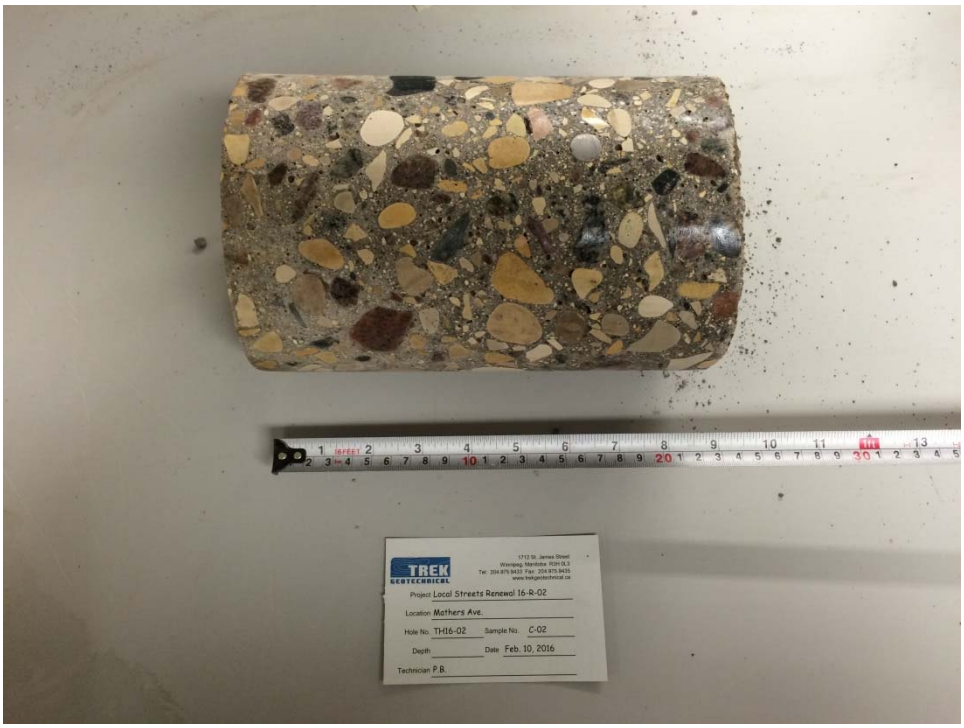


Photo 2: Pavement Core Sample at Test Hole TH16-02

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

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

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

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

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

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

Photo 9: Concrete Core Sample From Test Hole TH15-09

Photo 10: Concrete Core Sample From Test Hole TH15-10

Photo 11: Concrete Core Sample From Test Hole TH15-11

Appendix B

Test Hole Logs, Summary Table & Lab Data – Jessie Avenue

Sub-Surface Log

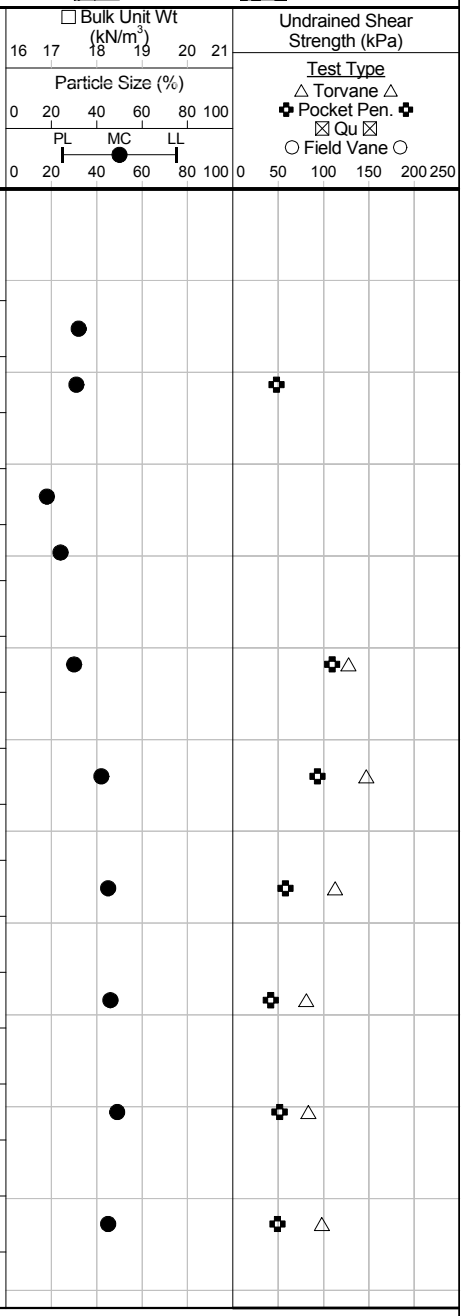
Test Hole TH16-01
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Jessie Ave. - Between Nassau St. N and Daly St. N
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	16 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		ASPHALT - 4 layers (102mm thick)		
		CONCRETE - crumbled (~140mm thick)		
		GRAVEL (FILL) - <25mm dia. gravel, some sand, trace silt, brown, frozen, well graded angular to sub angular, no recovery		
		CLAY (FILL) - some silt, trace sand - brownish black - frozen, moist and firm when thawed - high plasticity		G36 G37
0.5				
		CLAY - some silt, trace silt inclusions (<10mm dia.), trace sand, trace oxidation - brown - frozen to 1.5m, moist and stiff when thawed - high plasticity		G38 G39
1.0				
				G40
1.5		- silt inclusions <10mm dia., stiff to very stiff below 1.5m		G41
		- firm to stiff below 1.8m		G42
2.0				G43
2.5				G44
				G45
3.0				



End of Hole at 3.0m in CLAY

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.3m at completion of drilling.
4) Test hole located at 540 Jessie Ave., 1.5m north of south curb. U14 (5526095m N, 633262m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-01 LOCAL STREETS PKG. 16-R-02 JESSIE 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-02
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Jessie Ave. - Between Nassau St. N and Daly St. N
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	16 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		ASPHALT - 3 layers (80mm thick)		
		CONCRETE - crumbled (~203mm thick)		
		ORGANIC CLAY - some silt, trace sand - blackish brown, frozen, moist and stiff when thawed, high plasticity		G28
0.5		CLAY - some silt - dark brown - frozen to 1.2m, moist and stiff when thawed - high plasticity		G29
				G30
1.0		- stiff to very stiff below 0.9m		G31
		- trace silt inclusions (<10mm dia.), trace medium sand, trace oxidation, brown below 1.2m		G32
1.5		SILT - trace fine sand, trace oxidation - light brown - moist, compact - no plasticity		G32A
2.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, stiff to very stiff - high plasticity		G33
2.5		- firm to stiff below 2.4m		G34
				G35
3.0		End of Hole at 3.0m 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 ○

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.7m at completion of drilling.
4) Test hole located at 571 Jessie Ave., 1.7m south of north curb. U14 (5526079m N, 633217m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-01 LOCAL STREETS PKG. 16-R-02 JESSIE 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-03
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Jessie Ave. - Between Nassau St. N and Daly St. N
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	16 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		ASPHALT - 5 layers (175mm thick)		
		GRAVEL (FILL) - <25mm dia. gravel, some sand, trace silt, brown, frozen, well graded angular to sub angular, no recovery		
		CLAY (FILL) - silty, trace coarse sand, trace gravel (<10mm dia.) - brown - frozen, moist and soft when thawed - high plasticity		G10
0.5				G11
		CLAY - some silt, trace silt inclusions (<10mm dia.), trace gravel (<10mm dia.), trace rootlets - brown - frozen to 1.5m, moist and firm to stiff when thawed - high plasticity		G12
1.0				G13
				G14
1.5		- trace oxidation below 1.5m		G15
				G16
2.0		- silt seam (<75mm thick) at 2.0m		G17
				G18
2.5				G19
3.0		End of Hole at 3.0m in CLAY		

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.1m at completion of drilling.
4) Test hole located at property line between 588 & 590 Jessie Ave., 1.5m north of south curb. U14 (5526049m N, 633178m E).

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 ○

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-01 LOCAL STREETS PKG. 16-R-02 JESSIE 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-04

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Jessie Ave. - Between Nassau St. N and Daly St. N
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	16 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/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 - 3 layers (125mm thick)				
		CONCREETE - (90mm thick)				
		GRAVEL (FILL) - <25mm dia. gravel, some sand, trace silt, brown, frozen, well graded angular to sub angular, no recovery				
		CLAY (FILL) - some silt, some silt inclusions (<20mm dia.), trace sand, trace gravel (<15mm dia.), dark brown, frozen, moist and firm when thawed, high plasticity		G20		
0.5		CLAY - some silt, some organic clay - brownish black - frozen, moist and firm when thawed - high plasticity		G21		
		SILT - clayey, trace sand - light brown - frozen to 1.2m, moist and soft when thawed - intermediate plasticity		G22		
1.0		SILT - trace fine sand - light brown - moist, compact - no plasticity		G23		
1.5		CLAY - silty, trace silt inclusions (<15mm dia.), trace sand, trace oxidation - brown - moist, stiff - high plasticity		G24		
2.0		- silt seam (<25mm thick) at 2.0m		G25		
2.5				G26		
				G27		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.6m at completion of drilling.
4) Test hole located at property line between 597 & 601 Jessie Ave., 1.5m south of north curb. U14 (5526036m N, 633140m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

Sub-Surface Log

Test Hole TH16-05
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Jessie Ave. - Between Nassau St. N and Daly St. N
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Street Level
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	16 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		ASPHALT - 4 layers (155mm thick)		
		CONCRETE - crumbled (~100mm thick)		
		CLAY (FILL) - some silt, gravelly (<15mm dia.), some coarse sand, brown, frozen, moist and firm when thawed, high plasticity - no gravel, trace silt inclusions (<10mm dia.), trace oxidation below 0.3m		G01 G02
0.5		CLAY - some silt, trace fine sand, trace oxidation - blackish brown - frozen, moist and frim when thawed - high plasticity		G03
		SILT - clayey, trace sand - light brown - frozen to 1.2m, moist and soft when thawed - intermediate plasticity		G04
1.0				
		SILT - trace fine sand - brown - moist, compact - no plasticity		G05
1.5				
		CLAY - silty, trace silt inclusions (<10mm dia.), trace sand, trace oxidation - brown - moist, stiff - high plasticity		G06
2.0				G07
2.5				G08
		- silt seam (<75mm thick) at 2.7m		G09
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 Hole at 3.0m in CLAY

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.6m at completion of drilling.
4) Test hole located 4m west from west property line at 612 Jessie Ave., 1.5m north of south curb. U14 (5526005m N, 633102m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-01 LOCAL STREETS PKG. 16-R-02 JESSIE 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Local Streets Package 16-R-02
Sub-Surface Investigation
Jessie 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)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH16-01	UTM: 5526095 N, 633262 E At building address 540, 1.5 m north from south curb	Asphalt	102	Concrete	140											
						GRAVEL (FILL)	0.3	0.5	32							
						CLAY (FILL)	0.5	0.6	31							
						CLAY	0.8	0.9	18							
						CLAY	0.9	1.1	24							
						CLAY	1.2	1.4	30							
						CLAY	1.5	1.7	42							
						CLAY	1.8	2.0	45							
						CLAY	2.1	2.3	46							
						CLAY	2.4	2.6	49							
						CLAY	2.7	2.9	45							
TH16-02	UTM: 5526079 N, 633217 E At building address 571, 1.7 m south from north curb	Asphalt	80	Concrete	203											
						ORGANIC CLAY	0.3	0.5	36	0	4	26	70	23	77	54
						CLAY	0.5	0.6	35	0	0	23	77	22	83	61
						CLAY	0.8	0.9	29							
						CLAY	0.9	1.1	28							
						CLAY	1.2	1.4	23							
						SILT	1.5	2.0	20							
						CLAY	2.1	2.3	40							
						CLAY	2.4	2.6	45							
						CLAY	2.7	2.9	47							
TH16-03	UTM: 5526049 N, 633178 E At property line between building address 588 & 590, 1.5 m north from south curb	Asphalt	175	N/A												
						CLAY (FILL)	0.4	0.5	37							
						CLAY (FILL)	0.5	0.6	40							
						CLAY	0.8	0.9	39							
						CLAY	0.9	1.1	38							
						CLAY	1.2	1.4	34							
						CLAY	1.5	1.7	44							
						CLAY	1.8	2.0	47							
						CLAY	2.1	2.3	50							
						CLAY	2.4	2.6	50							
						CLAY	2.7	2.9	52							

Local Streets Package 16-R-02
Sub-Surface Investigation
Jessie 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)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH16-04	UTM: 5526036 N, 633140 E At property line between building address 597 & 601, 1.5 m south from north curb	Asphalt	125	Concrete	90											
						CLAY (FILL)	0.3	0.5	32							
						CLAY	0.5	0.6	36							
						SILT	0.8	0.9	31	0	6	63	31	16	33	17
						SILT	1.2	1.5	20							
						CLAY	1.8	2.0	42							
						CLAY	2.1	2.3	48							
						CLAY	2.4	2.6	51							
						CLAY	2.7	2.9	52							
TH16-05	UTM: 5526005 N, 633102 E 4m west from west property line at building address 612, 1.5 m north from south curb	Asphalt	155	Concrete	100											
						CLAY (FILL)	0.3	0.3	26							
						CLAY (FILL)	0.3	0.5	37							
						CLAY	0.6	0.8	33							
						SILT	0.8	0.9	31							
						SILT	1.2	1.4	21							
						CLAY	1.8	2.0	33							
						CLAY	2.1	2.3	42							
						CLAY	2.4	2.6	45							
						CLAY	2.7	2.9	45							

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Street Pkg. 16-R-02, Jessie Ave.

Sample Date 16-Feb-16
Test Date 02-Mar-16
Technician L.I. / J.B.

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01
Depth (m)	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7
Sample #	G36	G37	G38	G39	G40	G41
Tare ID	AB07	AC03	AB14	Z91	Z103	F33
Mass of tare	6.6	6.5	6.5	8.6	8.3	8.6
Mass wet + tare	242.7	281.3	273.5	284.9	328.6	273.1
Mass dry + tare	186.2	216.0	232.9	230.7	253.9	195.0
Mass water	56.5	65.3	40.6	54.2	74.7	78.2
Mass dry soil	179.6	209.5	226.4	222.1	245.6	186.4
Moisture %	31.5%	31.2%	17.9%	24.4%	30.4%	41.9%

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-02	TH16-02
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.5 - 0.6
Sample #	G42	G43	G44	G45	G28	G29
Tare ID	N104	F123	F67	W82	Z121	Z67
Mass of tare	8.4	8.4	8.4	8.6	8.3	8.5
Mass wet + tare	283.3	277.1	310.4	320.6	299.4	279.7
Mass dry + tare	197.4	192.9	210.5	223.8	222.1	209.0
Mass water	85.9	84.2	99.9	96.9	77.3	70.7
Mass dry soil	189.0	184.5	202.1	215.2	213.8	200.5
Moisture %	45.4%	45.6%	49.4%	45.0%	36.2%	35.3%

Test Pit	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02
Depth (m)	0.8 - 0.9	0.9 - 1.1	1.2 - 1.4	1.5 - 2.0	2.1 - 2.3	2.4 - 2.6
Sample #	G30	G31	G32	G32A	G33	G34
Tare ID	W100	D34	W84	F117	E85	E48
Mass of tare	8.5	8.5	8.3	8.4	8.6	8.5
Mass wet + tare	276.6	317.8	313.9	434.7	279.8	293.9
Mass dry + tare	216.0	249.7	256.9	364.9	202.4	206.0
Mass water	60.6	68.1	57.0	69.8	77.4	87.9
Mass dry soil	207.5	241.2	248.6	356.5	193.8	197.5
Moisture %	29.2%	28.2%	22.9%	19.6%	39.9%	44.5%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Street Pkg. 16-R-02, Jessie Ave.

Sample Date 16-Feb-16
Test Date 02-Mar-16
Technician L.I. / J.B.

Test Pit	TH16-02	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	2.7 - 2.9	0.4 - 0.5	0.5 - 0.6	0.8 - 0.9	0.9 - 1.1	1.2 - 1.4
Sample #	G35	G10	G11	G12	G13	G14
Tare ID	Z110	K25	E138	N93	Z25	Z109
Mass of tare	8.7	8.6	8.5	8.5	8.2	8.4
Mass wet + tare	304.1	297.5	277.6	274.4	287.6	262.3
Mass dry + tare	209.2	219.0	200.9	199.3	211.4	197.3
Mass water	94.9	78.5	76.7	75.1	76.2	65.0
Mass dry soil	200.5	210.4	192.4	190.8	203.2	188.9
Moisture %	47.3%	37.3%	39.9%	39.4%	37.5%	34.4%

Test Pit	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03	TH16-04
Depth (m)	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5
Sample #	G15	G16	G17	G18	G19	G20
Tare ID	P13	Z104	Z115	N64	E3	D50
Mass of tare	8.4	8.5	8.4	8.4	8.3	8.3
Mass wet + tare	330.8	281.4	320.1	295.3	279.1	310.0
Mass dry + tare	232.4	194.5	216.2	200.2	186.1	237.6
Mass water	98.4	86.9	103.9	95.1	93.0	72.4
Mass dry soil	224.0	186.0	207.8	191.8	177.8	229.3
Moisture %	43.9%	46.7%	50.0%	49.6%	52.3%	31.6%

Test Pit	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04
Depth (m)	0.5 - 0.6	0.8 - 0.9	1.2 - 1.5	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6
Sample #	G21	G22	G23	G24	G25	G26
Tare ID	K20	W23	H17	Z85	Z99	E10
Mass of tare	8.5	8.4	8.4	8.3	8.4	8.6
Mass wet + tare	316.4	292.4	310.3	314.5	278.2	289.7
Mass dry + tare	234.2	226.0	260.9	223.4	190.9	194.3
Mass water	82.2	66.4	49.4	91.1	87.3	95.4
Mass dry soil	225.7	217.6	252.5	215.1	182.5	185.7
Moisture %	36.4%	30.5%	19.6%	42.4%	47.8%	51.4%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Street Pkg. 16-R-02, Jessie Ave.

Sample Date 16-Feb-16
Test Date 02-Mar-16
Technician L.I. / J.B.

Test Pit	TH16-04	TH16-05	TH16-05	TH16-05	TH16-05	TH16-05
Depth (m)	2.7 - 2.9	0.2 - 0.3	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	1.2 - 1.4
Sample #	G27	G01	G02	G03	G04	G05
Tare ID	A18	W01	Z54	H6	Z04	F99
Mass of tare	8.5	8.3	8.4	8.5	8.5	8.6
Mass wet + tare	275.8	171.0	288.0	326.5	338.1	386.9
Mass dry + tare	184.2	137.9	213.0	246.8	259.5	322.4
Mass water	91.6	33.1	75.0	79.7	78.6	64.5
Mass dry soil	175.7	129.6	204.6	238.3	251.0	313.8
Moisture %	52.1%	25.5%	36.7%	33.4%	31.3%	20.6%

Test Pit	TH16-05	TH16-05	TH16-05	TH16-05		
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9		
Sample #	G06	G07	G08	G09		
Tare ID	D40	N101	K3	AB74		
Mass of tare	8.2	8.5	8.5	6.6		
Mass wet + tare	289.2	286.8	310.9	285.5		
Mass dry + tare	219.0	204.0	217.7	198.6		
Mass water	70.2	82.8	93.2	86.9		
Mass dry soil	210.8	195.5	209.2	192.0		
Moisture %	33.3%	42.4%	44.6%	45.3%		

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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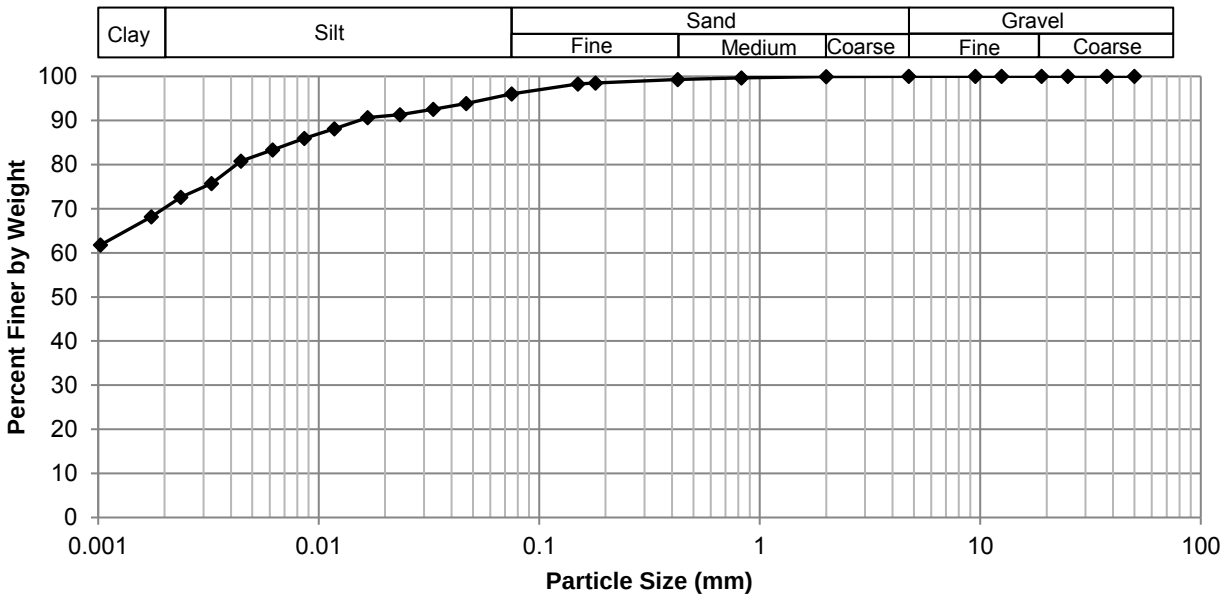
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Jessie Ave.
Test Hole	TH16 - 02
Sample #	G28
Depth (m)	0.3 - 0.5
Sample Date	16-Feb-16
Test Date	4-Mar-16
Technician	LI / JB

Gravel	0.0%
Sand	4.0%
Silt	26.0%
Clay	70.0%

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	96.04
37.5	100.00	2.00	99.95	0.0468	93.85
25.0	100.00	0.825	99.68	0.0331	92.58
19.0	100.00	0.425	99.26	0.0234	91.31
12.5	100.00	0.180	98.46	0.0167	90.67
9.50	100.00	0.150	98.27	0.0118	88.13
4.75	100.00	0.075	96.04	0.0086	85.91
				0.0062	83.36
				0.0044	80.82
				0.0033	75.75
				0.0024	72.58
				0.0017	68.20
				0.0010	61.78

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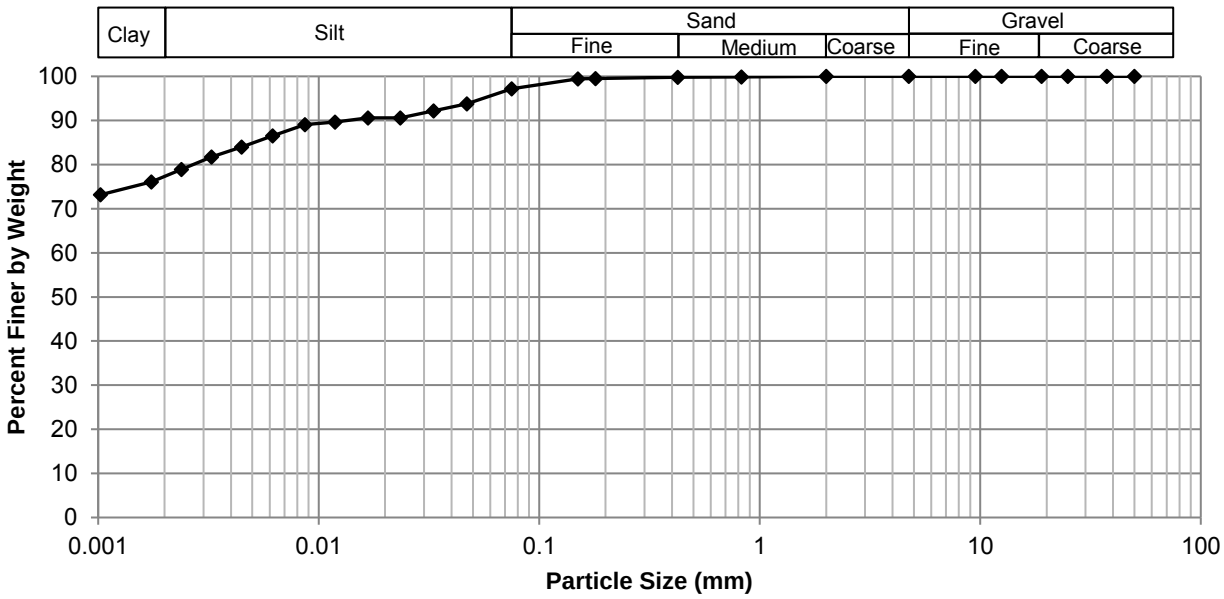
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Jessie Ave.
Test Hole	TH16 - 02
Sample #	G29
Depth (m)	0.5 - 0.6
Sample Date	16-Feb-16
Test Date	4-Mar-16
Technician	LI / JB

Gravel	0.0%
Sand	0.0%
Silt	22.8%
Clay	77.2%

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	97.21
37.5	100.00	2.00	100.00	0.0469	93.80
25.0	100.00	0.825	99.90	0.0332	92.21
19.0	100.00	0.425	99.79	0.0235	90.62
12.5	100.00	0.180	99.53	0.0168	90.62
9.50	100.00	0.150	99.47	0.0118	89.67
4.75	100.00	0.075	97.21	0.0087	89.04
				0.0062	86.50
				0.0045	83.96
				0.0033	81.74
				0.0024	78.91
				0.0017	76.09
				0.0010	73.16

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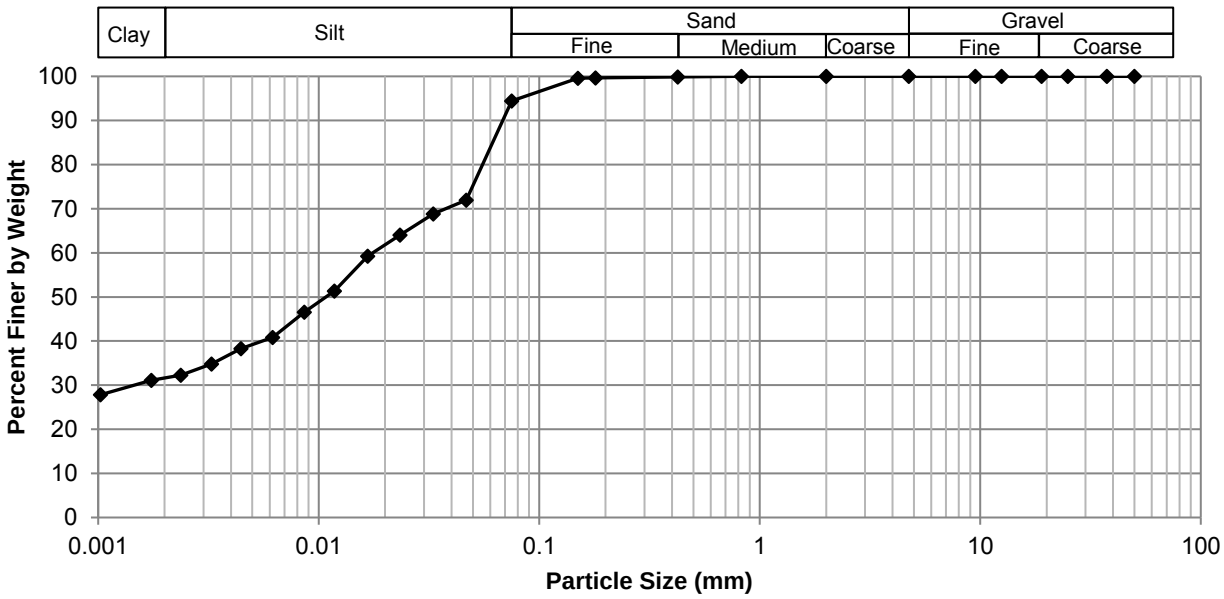
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Jessie Ave.
Test Hole	TH16 - 04
Sample #	G22
Depth (m)	0.8 - 0.9
Sample Date	16-Feb-16
Test Date	4-Mar-16
Technician	LI / JB

Gravel	0.0%
Sand	5.6%
Silt	62.9%
Clay	31.5%

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	94.42
37.5	100.00	2.00	100.00	0.0468	71.98
25.0	100.00	0.825	99.98	0.0331	68.80
19.0	100.00	0.425	99.88	0.0234	64.04
12.5	100.00	0.180	99.63	0.0167	59.28
9.50	100.00	0.150	99.58	0.0118	51.34
4.75	100.00	0.075	94.42	0.0086	46.57
				0.0062	40.85
				0.0044	38.31
				0.0033	34.82
				0.0024	32.28
				0.0017	31.08
				0.0010	27.83

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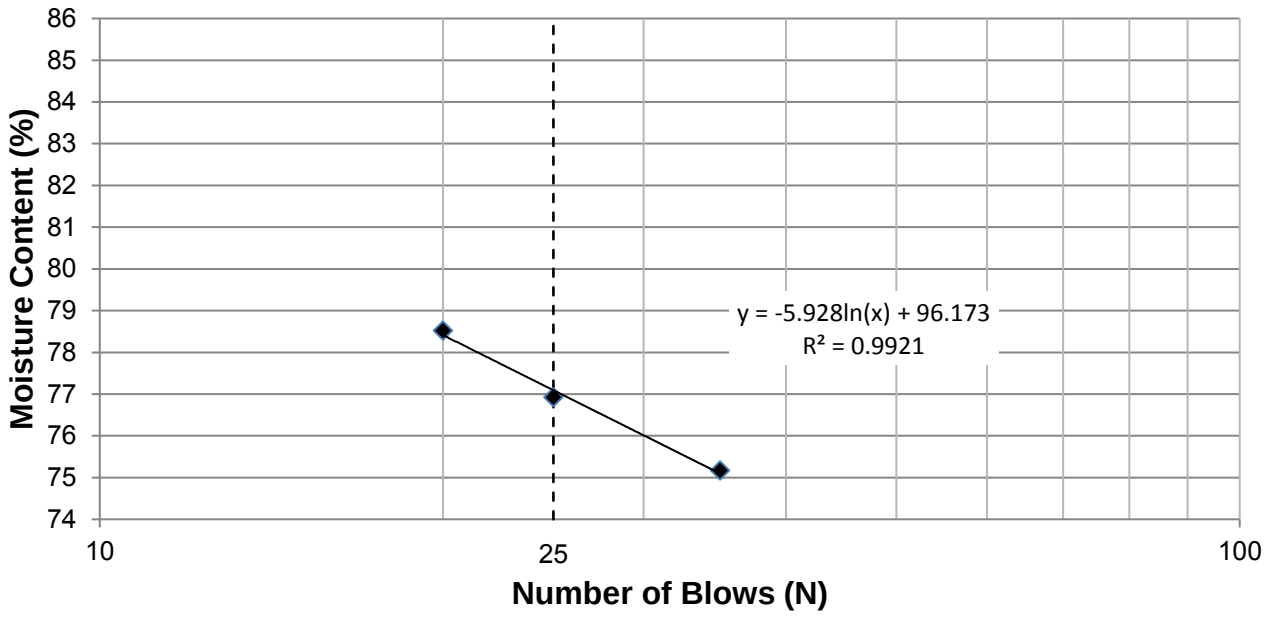
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Jessie Ave.
Test Hole	TH16-02
Sample #	G28
Depth (m)	0.3 - 0.5
Sample Date	16-Feb-16
Test Date	05-Mar-16
Technician	LI

Liquid Limit	77
Plastic Limit	23
Plasticity Index	54

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	25	20		
Mass Wet Soil + Tare (g)	24.218	24.962	24.597		
Mass Dry Soil + Tare (g)	19.917	20.249	19.882		
Mass Tare (g)	14.195	14.122	13.877		
Mass Water (g)	4.301	4.713	4.715		
Mass Dry Soil (g)	5.722	6.127	6.005		
Moisture Content (%)	75.166	76.922	78.518		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	16.314	16.493			
Mass Dry Soil + Tare (g)	15.882	16.137			
Mass Tare (g)	14.019	14.566			
Mass Water (g)	0.432	0.356			
Mass Dry Soil (g)	1.863	1.571			
Moisture Content (%)	23.188	22.661			

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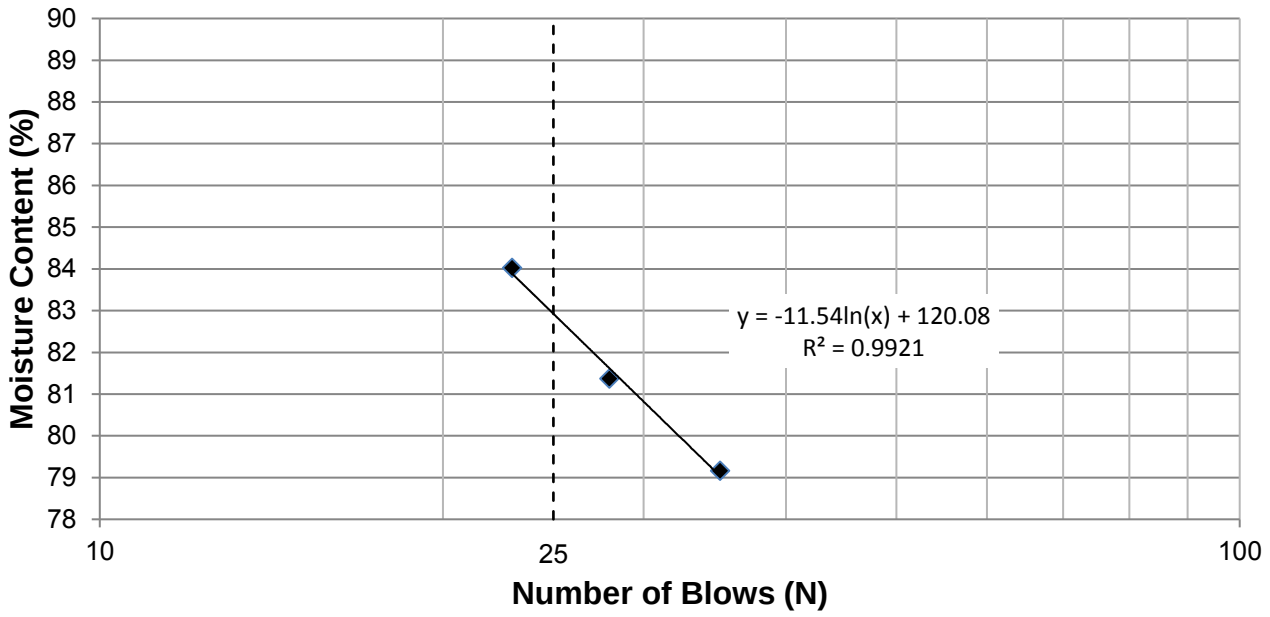
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Jessie Ave.
Test Hole	TH16-02
Sample #	G29
Depth (m)	0.5 - 0.6
Sample Date	16-Feb-16
Test Date	05-Mar-16
Technician	LI

Liquid Limit	83
Plastic Limit	22
Plasticity Index	61

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	23	35	28		
Mass Wet Soil + Tare (g)	23.816	22.298	24.021		
Mass Dry Soil + Tare (g)	19.452	18.614	19.484		
Mass Tare (g)	14.258	13.960	13.908		
Mass Water (g)	4.364	3.684	4.537		
Mass Dry Soil (g)	5.194	4.654	5.576		
Moisture Content (%)	84.020	79.158	81.367		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	16.798	16.844			
Mass Dry Soil + Tare (g)	16.293	16.352			
Mass Tare (g)	14.017	14.123			
Mass Water (g)	0.505	0.492			
Mass Dry Soil (g)	2.276	2.229			
Moisture Content (%)	22.188	22.073			

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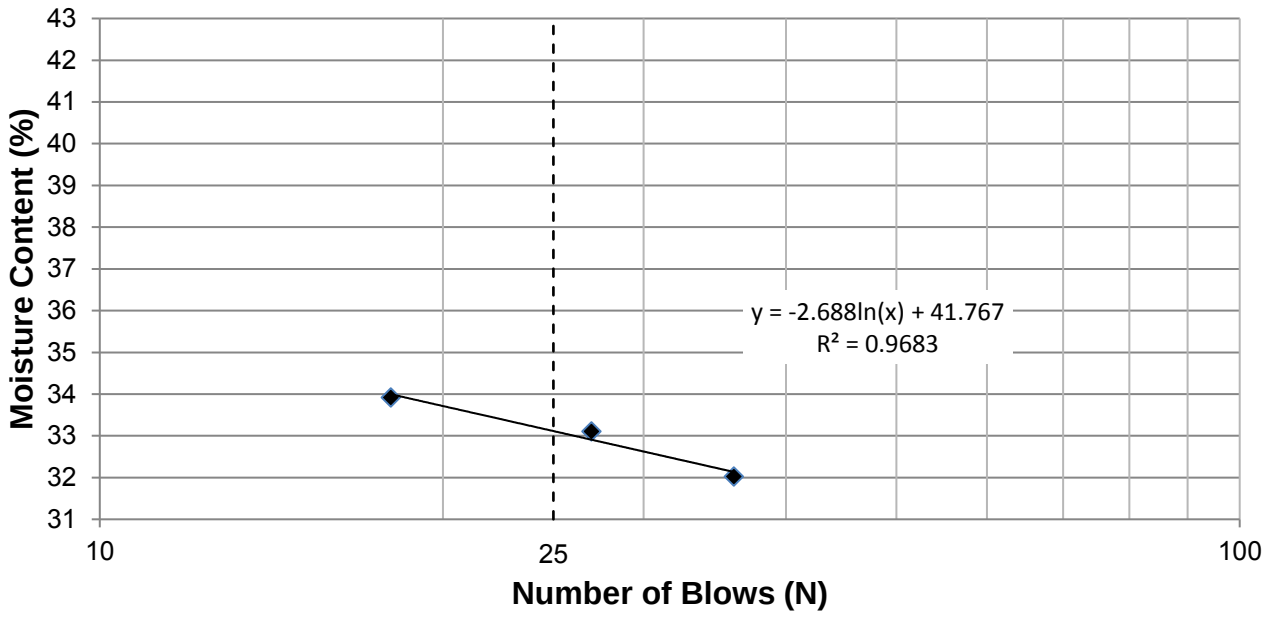
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Jessie Ave
Test Hole	TH16-04
Sample #	G22
Depth (m)	0.8 - 0.9
Sample Date	16-Feb-16
Test Date	04-Mar-16
Technician	LI

Liquid Limit	33
Plastic Limit	16
Plasticity Index	17

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	18	27	36		
Mass Wet Soil + Tare (g)	23.720	23.434	22.211		
Mass Dry Soil + Tare (g)	21.240	21.095	20.219		
Mass Tare (g)	13.928	14.029	13.998		
Mass Water (g)	2.480	2.339	1.992		
Mass Dry Soil (g)	7.312	7.066	6.221		
Moisture Content (%)	33.917	33.102	32.021		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	17.956	16.775			
Mass Dry Soil + Tare (g)	17.413	16.390			
Mass Tare (g)	14.038	14.066			
Mass Water (g)	0.543	0.385			
Mass Dry Soil (g)	3.375	2.324			
Moisture Content (%)	16.089	16.566			

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

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

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

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

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

Appendix C

Test Hole Logs, Summary Table & Lab Data – Cockburn Street

Sub-Surface Log

Test Hole TH16-01
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Cockburn St. S Between Kylemore Ave. and Rathgar Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	9 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number
		ASPHALT - (130mm thick)		
		CONCRETE - (144mm thick)		
		SAND (FILL) - gravelly (<10mm dia.), trace silt - light brown - frozen, dry to moist and compact when thawed - angular to subangular		G01
0.5		- dark brown, trace clay below 0.4m		G02
		CLAY (FILL) - silty, gravely, trace sand, trace rubble - dark brown - frozen, moist and soft when thawed - low plasticity		G03
1.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace coarse sand - brown - frozen to 1.5m, moist and stiff when thawed - high plasticity		G04
1.5		- mottled brown and dark brown below 1.8m		G05
2.0		SILT - clayey, trace sand, trace oxidation, light brown, moist, soft, intermediate plasticity		G06
		CLAY - silty, trace silt inclusions (<10mm dia.), trace sand, trace precipitates - brown - moist, firm to stiff - high plasticity		G07
2.5				G08
3.0		End of Hole at 3.0m 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 ○

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 3.0m at completion of drilling.
4) Test hole located 17m north of manhole at the intersection of Cockburn St. and Rathgar Ave., 1.8m west of east curb. U14 (5524578m N, 633474m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-03 LOCAL STREETS PKG. 16-R-02 COCKBURN 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-02
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Cockburn St. S Between Kylemore Ave. and Rathgar Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	9 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/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 - (195mm thick)				
		ORGANIC CLAY - silty, trace oxidation, trace organics (rootlets) - mottled black and dark brown - frozen, moist and stiff when thawed - high plasticity		G09		
0.5				G10		
		SILT - clayey, trace sand, trace oxidation - light brown - frozen, moist and soft when thawed - intermeidate plasticity		G11		
1.0						
		CLAY - silty, trace silt inclusions (<15mm dia.), trace sand - brown - frozen to 1.5m, moist and stiff to very stiff when thawed - high plasticity		G12		
1.5						
		- silt seam at 1.8m (25mm thick) - firm to stiff below 1.8m		G13		
2.0				G14		
2.5				G15		
				G16		
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.3m at completion of drilling.
4) Test hole located 55m north of manhole at the intersection of Cockburn St. and Rathgar Ave., 1.7m east of west curb. U14 (5524601m N, 633448m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-03 LOCAL STREETS PKG. 16-R-02 COCKBURN 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-03
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Cockburn St. S Between Kylemore Ave. and Rathgar Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	9 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/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
		CONCRETE - (210mm thick)				
		CLAY AND GRAVEL (FILL) - <20mm dia. gravel, silty, trace sand, brown, frozen, moist when thawed, no recovery				
		ORGANIC CLAY - silty, trace sand - black - frozen, moist and firm when thawed - high plasticity		G17		
0.5				G18		
		SILT - clayey, trace sand, trace oxidation - light brown - frozen, moist and soft when thawed - intermediate plasticity		G19		
1.0						
		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - frozen to 1.5m, moist and stiff when thawed		G20	PL MC LL	Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○
1.5						
		- silt seam (<50mm thick) at 1.8m		G21		
2.0						
		firm to stiff below 2.1m		G22		
2.5				G23		
				G24		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.6m at completion of drilling.
4) Test hole located 94m north of manhole at the intersection of Cockburn St. and Rathgar Ave., 1.8m west of east curb. U14 (5524645m N, 633438m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-03 LOCAL STREETS PKG. 16-R-02 COCKBURN 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-04

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Cockburn St. S Between Kylemore Ave. and Rathgar Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	9 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/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 - (200mm thick)				
		ORGANIC CLAY - silty, trace sand inclusions (<5mm dia.), trace oxidation, trace organics (roots) - mottled black and brown - frozen, moist and firm when thawed - high plasticity		G25	●	
0.5		- black below 0.6m		G26	●	✤ △
1.0		SILT - clayey, trace sand - light brown - frozen, moist and soft when thawed - intermediate plasticity		G27	●	✤
1.5		CLAY - silty, trace silt inclusions (<10mm dia.), trace sand - brown - frozen to 1.5m, moist and very stiff when thawed - high plasticity - firm to stiff below 1.5m		G28	●	✤
				G29	●	✤
2.0				G30	●	✤
		- SILT seam (<25mm thick) at 2.3m		G31	●	✤ △
2.5				G32	●	✤ △
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.0m at completion of drilling.
4) Test hole located 135m north of manhole at the intersection of Cockburn St. and Rathgar Ave., 1.8m east of west curb. U14 (5524679m N, 633405m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-03 LOCAL STREETS PKG. 16-R-02 COCKBURN 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Local Streets Package 16-R-02
Sub-Surface Investigation
Cockburn Street

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)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH16-01	UTM: 5524578 N, 633474 E 17m north from MH cover at center of intersection of Cockburn St & Rathgar Ave, & 1.8m west from east curb	Asphalt	130	Concrete	144											
						SAND (FILL)	0.3	0.5	6							
						SAND (FILL)	0.6	0.8	10							
						CLAY (FILL)	0.8	0.9	15							
						CLAY	1.2	1.4	37							
						CLAY	1.8	2.0	46							
						SILT	2.1	2.2	41							
						CLAY	2.3	2.4	51							
						CLAY	2.7	2.9	51							
TH16-02	UTM: 5524601 N, 633448 E 55m north from MH cover at center of intersection of Cockburn St & Rathgar Ave, & 1.7m east from west curb	N/A		Concrete	195											
						SAND (FILL)	0.3	0.5	35							
						SAND (FILL)	0.6	0.8	33							
						CLAY (FILL)	0.8	0.9	24	0	7	74	19	15	27	12
						CLAY	1.4	1.5	31							
						CLAY	1.8	2.0	41							
						CLAY AND SILT	2.1	2.3	49							
						CLAY	2.4	2.6	53							
						CLAY	2.7	2.9	52							
TH16-03	UTM: 5524645 N, 633438 E 94m north from MH cover at center of intersection of Cockburn St & Rathgar Ave, & 1.8m west from east curb	N/A		Concrete	210											
						ORGANIC CLAY	0.3	0.5	38							
						ORGANIC CLAY	0.5	0.6	34							
						CLAY AND SILT	0.8	0.9	27							
						CLAY	1.4	1.5	40	0	1	22	77	25	94	69
						CLAY	1.8	1.9	44							
						CLAY	2.1	2.3	51							
						CLAY	2.4	2.6	54							
						CLAY	2.9	3.0	56							
TH16-04	UTM: 5524679 N, 633405 E 135m north from MH cover at center of intersection of Cockburn St & Rathgar Ave, & 1.8m east from west curb	N/A		Concrete	200											
						ORGANIC CLAY	0.3	0.5	38							
						ORGANIC CLAY	0.6	0.8	36							
						CLAY AND SILT	1.1	1.2	21	0	4	66	30	16	34	18
						CLAY	1.4	1.5	29							
						CLAY	1.5	1.7	41							
						CLAY	2.1	2.3	49							
						CLAY	2.4	2.6	55							
						CLAY	2.7	2.9	53							

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Cockburn St.

Sample Date 09-Feb-16
Test Date 12-Feb-16
Technician L.I. / J.B.

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01
Depth (m)	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	1.2 - 1.4	1.8 - 2.0	2.1 - 2.2
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	H26	N95	W33	F83	E44	Z01
Mass of tare	8.3	8.4	8.5	8.5	8.5	8.4
Mass wet + tare	276.1	293.4	301.2	288.5	300.0	299.5
Mass dry + tare	260.1	267.5	263.3	212.6	207.7	215.5
Mass water	16.0	25.9	37.9	75.9	92.3	84.0
Mass dry soil	251.8	259.1	254.8	204.1	199.2	207.1
Moisture %	6.4%	10.0%	14.9%	37.2%	46.3%	40.6%

Test Pit	TH16-01	TH16-01	TH16-02	TH16-02	TH16-02	TH16-02
Depth (m)	2.3 - 2.4	2.7 - 2.9	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	1.4 - 1.5
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	F43	W14	W15	A25	D8	F62
Mass of tare	8.5	8.3	8.3	8.6	8.5	8.4
Mass wet + tare	319.9	346.8	294.4	292.6	362.5	297.7
Mass dry + tare	214.5	232.2	220.7	222.3	294.5	228.6
Mass water	105.4	114.6	73.7	70.3	68.0	69.1
Mass dry soil	206.0	223.9	212.4	213.7	286.0	220.2
Moisture %	51.2%	51.2%	34.7%	32.9%	23.8%	31.4%

Test Pit	TH16-02	TH16-02	TH16-02	TH16-02	TH16-03	TH16-03
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.5 - 0.6
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	F37	W26	H90	N87	E95	F95
Mass of tare	8.3	8.4	8.3	8.4	8.4	8.4
Mass wet + tare	332.6	301.7	309.0	300.6	262.9	282.5
Mass dry + tare	237.8	205.2	205.4	200.6	193.3	212.4
Mass water	94.8	96.5	103.6	100.0	69.6	70.1
Mass dry soil	229.5	196.8	197.1	192.2	184.9	204.0
Moisture %	41.3%	49.0%	52.6%	52.0%	37.6%	34.4%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Streets Package 16-R-02, Cockburn St.

Sample Date 09-Feb-16
Test Date 12-Feb-16
Technician L.I. / J.B.

Test Pit	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	0.8 - 0.9	1.2 - 1.4	1.8 - 1.9	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	F12	E15	W45	H50	W46	Z58
Mass of tare	8.8	8.8	8.4	8.4	8.6	8.7
Mass wet + tare	303.9	255.4	278.0	266.0	282.5	256.0
Mass dry + tare	241.3	184.9	195.2	179.0	187.0	167.8
Mass water	62.6	70.5	82.8	87.0	95.5	88.2
Mass dry soil	232.5	176.1	186.8	170.6	178.4	159.1
Moisture %	26.9%	40.0%	44.3%	51.0%	53.5%	55.5%

Test Pit	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04
Depth (m)	0.3 - 0.5	0.6 - 0.8	1.1 - 1.2	1.4 - 1.5	1.5 - 1.7	2.1 - 2.3
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	Z12	N96	W12	A17	E56	F14
Mass of tare	8.502	8.617	8.43	8.742	8.575	8.605
Mass wet + tare	311.3	273.5	286.7	270.8	285.6	260.1
Mass dry + tare	227.8	203.2	238.3	212.0	205.2	178.0
Mass water	83.5	70.3	48.4	58.8	80.4	82.2
Mass dry soil	219.3	194.6	229.8	203.3	196.6	169.3
Moisture %	38.1%	36.1%	21.1%	28.9%	40.9%	48.5%

Test Pit	TH16-04	TH16-04				
Depth (m)	2.4 - 2.6	2.7 - 2.9				
Sample #	G31	G32				
Tare ID	F1	A1111				
Mass of tare	8.494	8.461				
Mass wet + tare	264.8	271.1				
Mass dry + tare	173.5	179.7				
Mass water	91.3	91.4				
Mass dry soil	165.0	171.2				
Moisture %	55.3%	53.4%				

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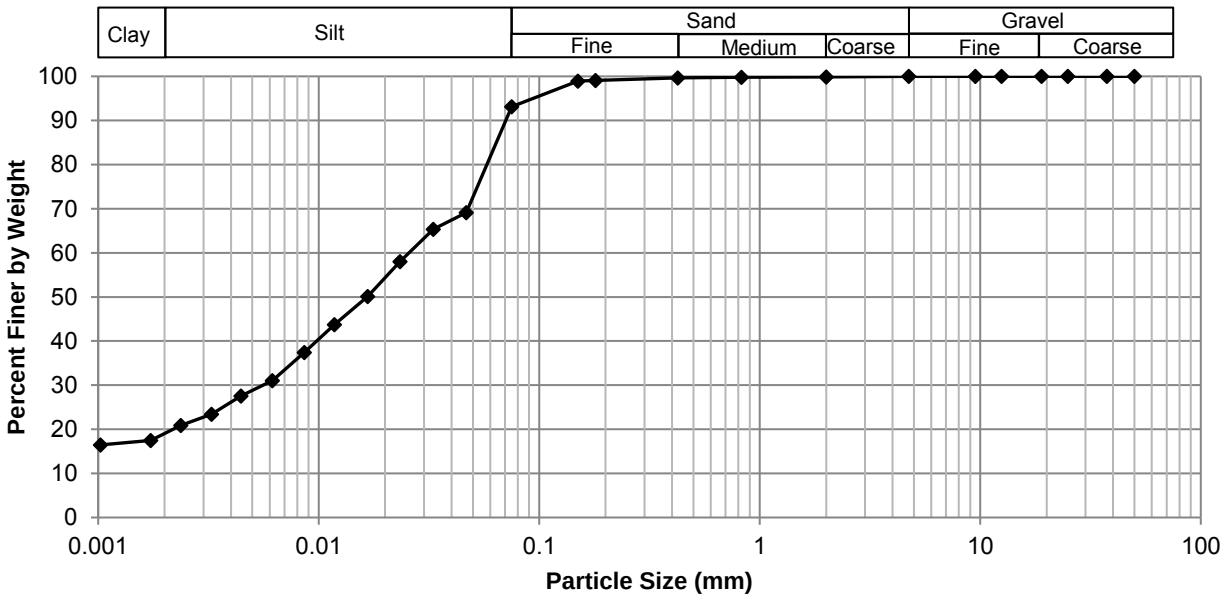
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Cockburn St.
Test Hole	TH16-02
Sample #	G11
Depth (m)	0.8 - 0.9
Sample Date	9-Feb-16
Test Date	22-Feb-16
Technician	LI

Gravel	0.0%
Sand	6.9%
Silt	74.2%
Clay	18.9%

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	93.11
37.5	100.00	2.00	99.88	0.0468	69.12
25.0	100.00	0.825	99.83	0.0331	65.31
19.0	100.00	0.425	99.69	0.0234	58.02
12.5	100.00	0.180	99.08	0.0167	50.09
9.50	100.00	0.150	98.90	0.0118	43.75
4.75	100.00	0.075	93.11	0.0086	37.40
				0.0062	31.06
				0.0044	27.56
				0.0033	23.44
				0.0024	20.90
				0.0017	17.44
				0.0010	16.45

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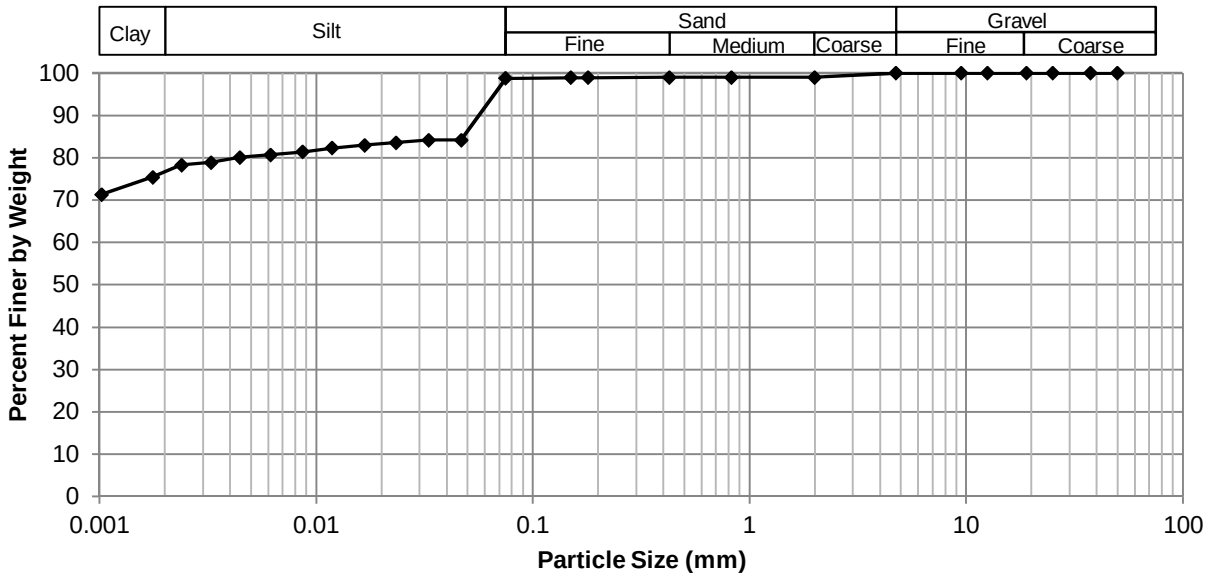
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Cockburn St.
Test Hole	TH16-03
Sample #	G20
Depth (m)	1.2 - 1.4
Sample Date	9-Feb-16
Test Date	22-Feb-16
Technician	LI / JB

Gravel	0.0%
Sand	1.2%
Silt	22.3%
Clay	76.5%

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	98.79
37.5	100.00	2.00	98.97	0.0468	84.20
25.0	100.00	0.825	98.97	0.0331	84.20
19.0	100.00	0.425	98.96	0.0234	83.58
12.5	100.00	0.180	98.94	0.0167	82.95
9.50	100.00	0.150	98.93	0.0118	82.32
4.75	100.00	0.075	98.79	0.0087	81.36
				0.0062	80.73
				0.0044	80.11
				0.0033	78.86
				0.0024	78.25
				0.0018	75.43
				0.0010	71.31

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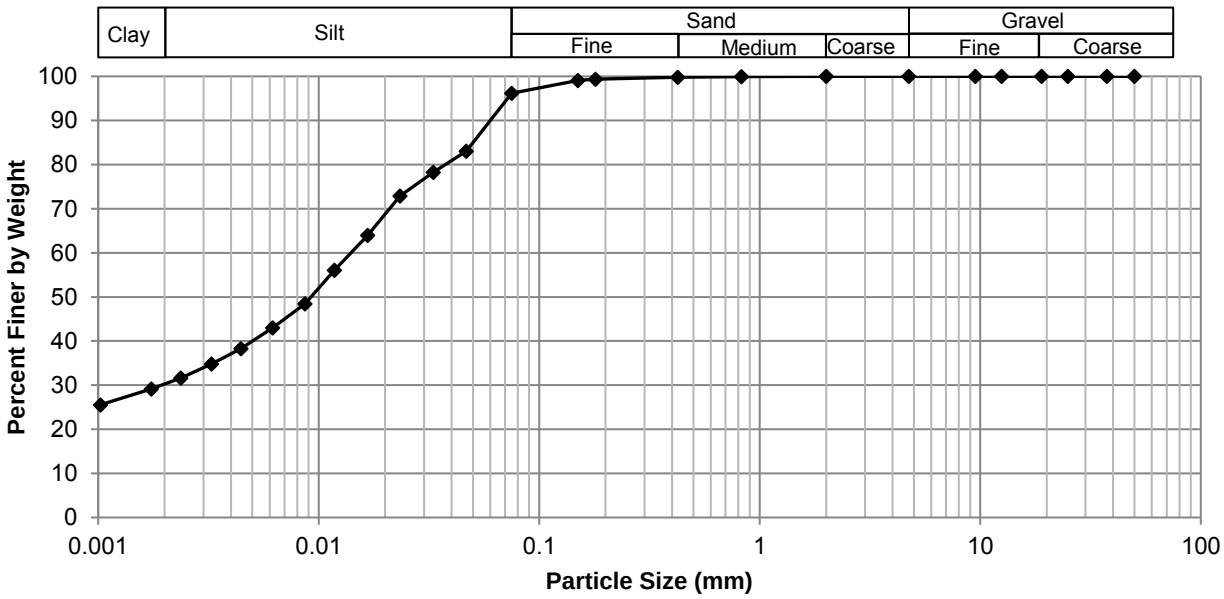
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Cockburn St.
Test Hole	TH16 - 04
Sample #	G27
Depth (m)	1.1 - 1.2
Sample Date	9-Feb-16
Test Date	4-Mar-16
Technician	JB LI

Gravel	0.0%
Sand	3.8%
Silt	66.1%
Clay	30.1%

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	96.16
37.5	100.00	2.00	100.00	0.0468	83.05
25.0	100.00	0.825	99.92	0.0331	78.28
19.0	100.00	0.425	99.81	0.0234	72.89
12.5	100.00	0.180	99.40	0.0167	63.99
9.50	100.00	0.150	99.09	0.0118	56.05
4.75	100.00	0.075	96.16	0.0087	48.42
				0.0062	43.02
				0.0044	38.26
				0.0033	34.77
				0.0024	31.60
				0.0017	29.13
				0.0010	25.56

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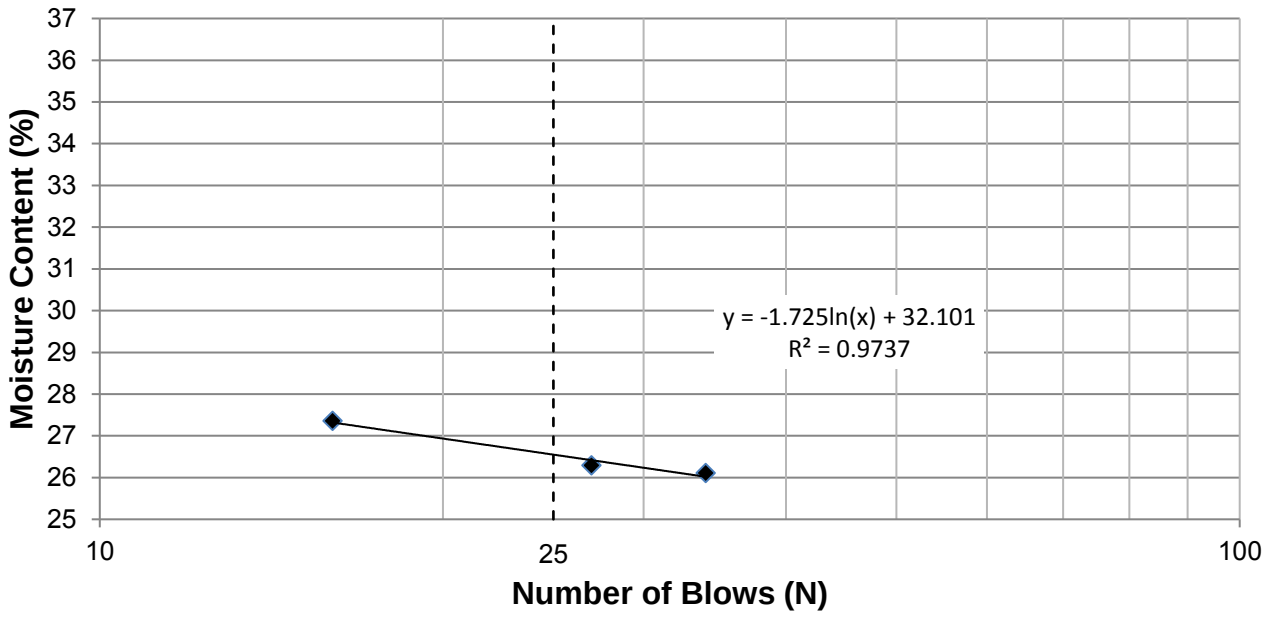
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Cockburn Ave.
Test Hole	TH16-02
Sample #	G11
Depth (m)	0.8 - 0.9
Sample Date	09-Feb-16
Test Date	23-Feb-16
Technician	JB / LI

Liquid Limit	27
Plastic Limit	15
Plasticity Index	12

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	16	27	34		
Mass Wet Soil + Tare (g)	25.575	26.883	25.749		
Mass Dry Soil + Tare (g)	23.103	24.261	23.322		
Mass Tare (g)	14.067	14.289	14.025		
Mass Water (g)	2.472	2.622	2.427		
Mass Dry Soil (g)	9.036	9.972	9.297		
Moisture Content (%)	27.357	26.294	26.105		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.010	20.304			
Mass Dry Soil + Tare (g)	20.159	19.504			
Mass Tare (g)	14.362	14.043			
Mass Water (g)	0.851	0.800			
Mass Dry Soil (g)	5.797	5.461			
Moisture Content (%)	14.680	14.649			

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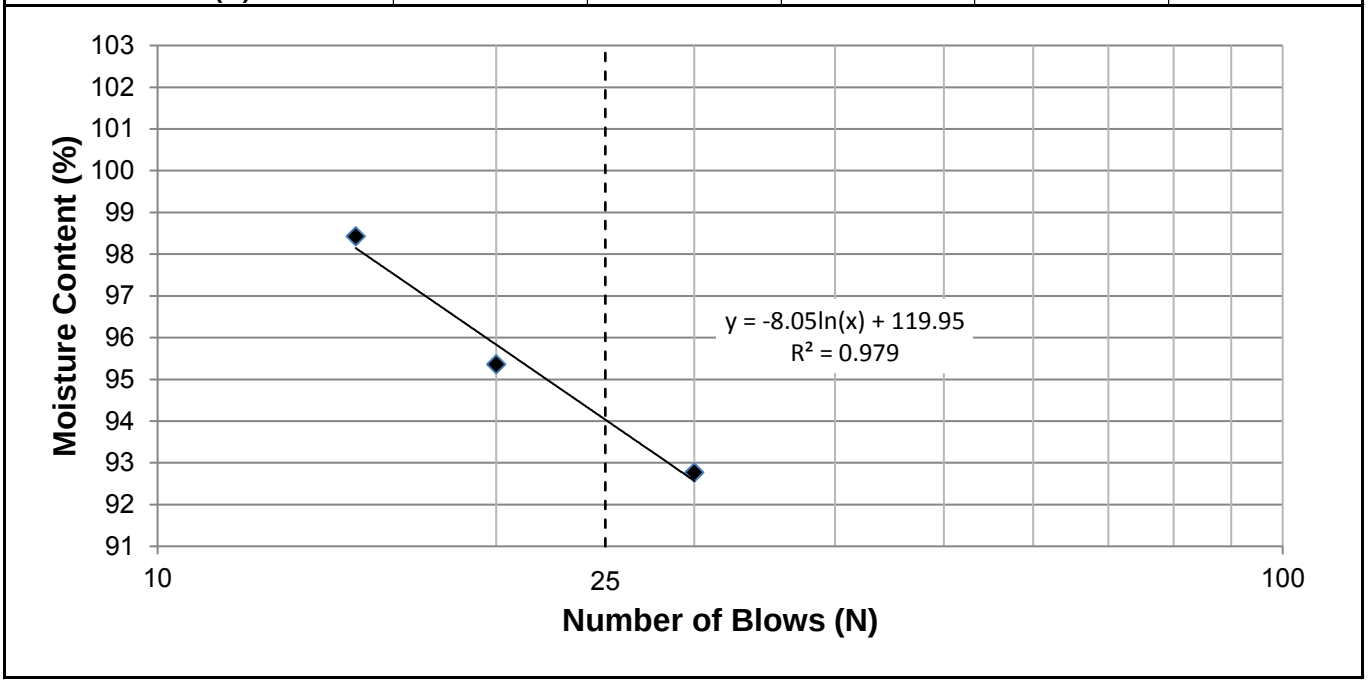
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Cockburn St.
Test Hole	TH16-03
Sample #	G20
Depth (m)	1.2 - 1.4
Sample Date	09-Feb-16
Test Date	23-Feb-16
Technician	JB / LI

Liquid Limit	94
Plastic Limit	25
Plasticity Index	69

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	15	30	20		
Mass Wet Soil + Tare (g)	26.211	26.161	27.013		
Mass Dry Soil + Tare (g)	20.222	20.419	20.706		
Mass Tare (g)	14.137	14.229	14.092		
Mass Water (g)	5.989	5.742	6.307		
Mass Dry Soil (g)	6.085	6.190	6.614		
Moisture Content (%)	98.422	92.763	95.358		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	17.895	18.837			
Mass Dry Soil + Tare (g)	17.178	17.934			
Mass Tare (g)	14.306	14.257			
Mass Water (g)	0.717	0.903			
Mass Dry Soil (g)	2.872	3.677			
Moisture Content (%)	24.965	24.558			

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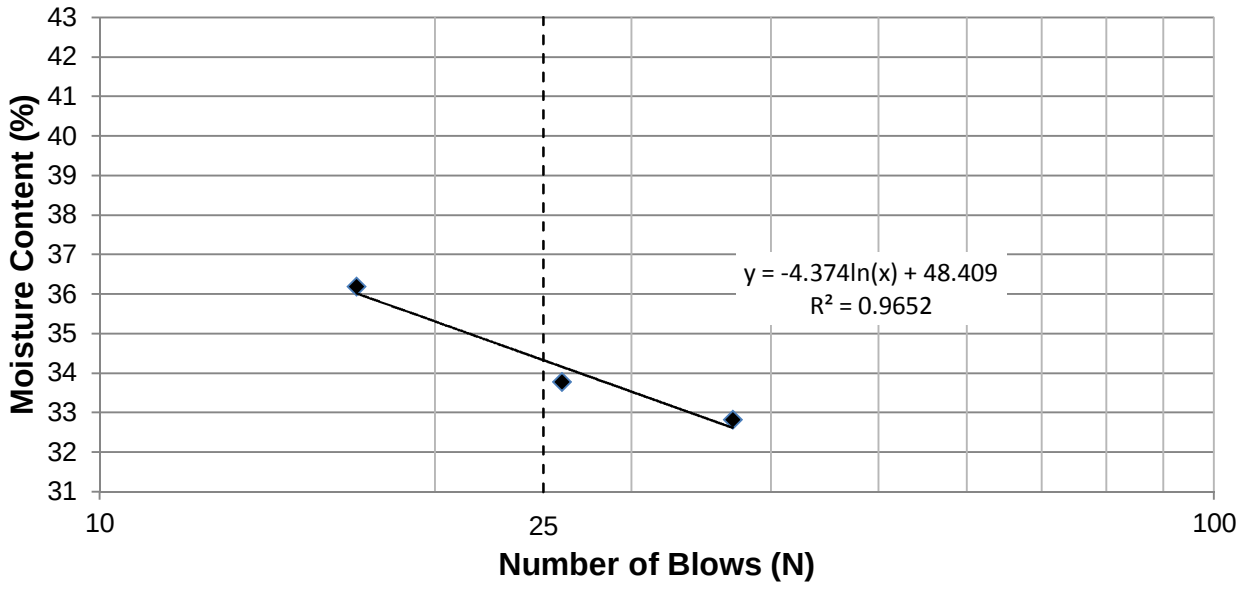
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 15-R-02, Cockburn St.
Test Hole	TH16-04
Sample #	G27
Depth (m)	1.1 - 1.2
Sample Date	09-Feb-16
Test Date	05-Mar-16
Technician	LI

Liquid Limit	34
Plastic Limit	16
Plasticity Index	18

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	26	37	17		
Mass Wet Soil + Tare (g)	23.678	24.471	28.179		
Mass Dry Soil + Tare (g)	21.232	21.904	24.440		
Mass Tare (g)	13.992	14.082	14.107		
Mass Water (g)	2.446	2.567	3.739		
Mass Dry Soil (g)	7.240	7.822	10.333		
Moisture Content (%)	33.785	32.818	36.185		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.109	22.031			
Mass Dry Soil + Tare (g)	20.142	20.957			
Mass Tare (g)	14.010	14.106			
Mass Water (g)	0.967	1.074			
Mass Dry Soil (g)	6.132	6.851			
Moisture Content (%)	15.770	15.677			

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

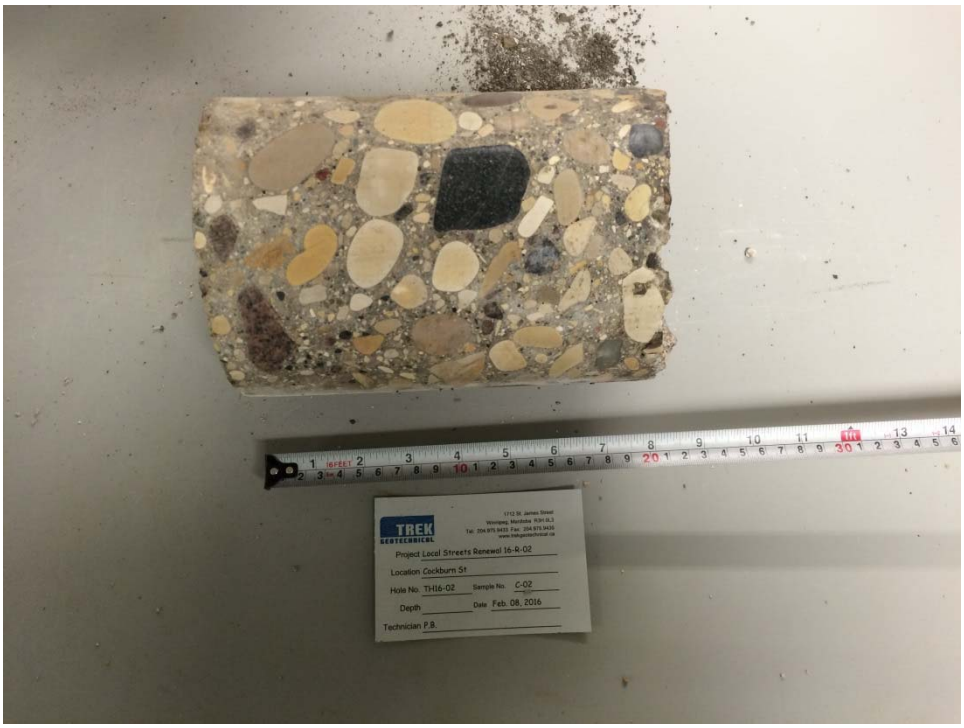


Photo 2: Pavement Core Sample at Test Hole TH16-02

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

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

Appendix D

Test Hole Logs, Summary Table & Lab Data – Scotland Avenue

Sub-Surface Log

Test Hole TH16-01
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Scotland Ave. - Between Wentworth St. & 865 Scotland Ave
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	16 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/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 - (20mm thick)				
		CONCRETE - (~240mm thick)				
		GRAVEL (FILL)				
		CLAY - silty, trace sand - brown, frozen, moist and firm to stiff when thawed, high plasticity - trace silt inclusions (<10mm dia.), trace sand inclusions (<15mm dia.), trace gravel (<10mm dia.) below 0.5m		G01		
0.5				G02		
		CLAY - silty, some silt lenses - light brown - frozen, moist and stiff when thawed - high plasticity		G03		
1.0						
		CLAY - silty, trace oxidation - mottled brown and dark brown - frozen to 1.5m, moist and stiff to very stiff when thawed - high plasticity		G04		
1.5		- stiff below 1.5m		G05		
2.0		- silt seam (<50mm thick) at 2.0m - trace silt inclusions (<3mm dia.) below 2.1m - firm to stiff below 2.1m		G06		
				G07		
2.5				G08		
				G09		
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 1.8m at completion of drilling.
4) Test hole located at 857 Scotland, 1.8m south of north curb. 14u (5525072m N, 632588m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-04 LOCAL STREETS PKG. 16-R-02 SCOTLAND 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Sub-Surface Log

Test Hole TH16-02
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02a	**Location:**	Scotland Ave. - Between Wentworth St. & 865 Scotland Ave
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	16 February 2016

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

Particle Size Legend: Fines | Clay | Silt | Sand | Gravel | Cobbles | Boulders

Depth (m)	Soil Symbol	MATERIAL DESCRIPTION	Sample Type	Sample Number	Bulk Unit Wt (kN/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 - (55mm thick)				
		CONCRETE - crumbled (~152mm thick)				
		ORGANIC CLAY - some silt, trace silt inclusions (<5mm dia.), trace sand, trace gravel (<10mm dia.) - black - frozen, moist and firm when thawed - high plasticity		G10		
0.5		- no gravel below 0.6m		G11		
1.0		- some silt inclusions (<30mm dia.) below 1.1m		G12		
		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation, trace precipitates - brown - frozen to 1.5m, moist and very stiff when thawed - high plasticity		G13		
1.5		- firm to stiff below 1.5m		G14		
				G15		
2.0				G16		
2.5				G17		
				G18		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
3) Test hole open to 2.4m at completion of drilling.
4) Test hole located 3m east of east property line of 865 Scotland Ave., 1.8m north of south curb. 14U (5525056m N, 632561m E).

Logged By: Jodi Neumann **Reviewed By:** Nelson Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-04 LOCAL STREETS PKG. 16-R-02 SCOTLAND 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 10/3/16

Local Streets Package 16-R-02
Sub-Surface Investigation
Scotland 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)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH16-01	UTM: 5525072 N, 632588 E At building address 857, 1.8m south from north curb	Asphalt	20	Concrete	240											
						CLAY	0.3	0.5	34	0	1	30	69	19	61	42
						CLAY	0.5	0.6	35							
						CLAY	0.6	0.8	40							
						CLAY	1.1	1.2	40							
						CLAY	1.5	1.7	41							
						CLAY	2.0	2.1	34							
						CLAY	2.1	2.3	46							
						CLAY	2.4	2.6	49							
						CLAY			50							
TH16-02	UTM: 5525056 N, 632561 E 3m east of east property line of building address 865, 1.8m north from south curb	Asphalt	55	Concrete	152		0.0	0.0								
						ORGANIC CLAY	0.3	0.5	30							
						ORGANIC CLAY	0.6	0.8	36	0	15	25	60	20	66	46
						ORGANIC CLAY	0.9	1.1	28							
						CLAY	1.2	1.4	32							
						CLAY	1.5	1.7	47							
						CLAY	1.8	2.0	52							
						CLAY	2.1	2.3	51							
						CLAY	2.4	2.6	50							
						CLAY	2.7	2.9	54							

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Moisture Content Report
ASTM D2216-98

Project No. 0035-032-00
Client Morrison Hershfield
Project 2016 Local Street Pkg. 16-R-02, Scotland Ave.

Sample Date 16-Feb-16
Test Date 02-Mar-16
Technician L.I. / J.B.

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01
Depth (m)	0.3 - 0.5	0.5 - 0.6	0.6 - 0.8	1.1 - 1.2	1.5 - 1.7	2.0 - 2.1
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	K31	W80	N107	Z45	Z93	H38
Mass of tare	8.4	8.5	8.4	8.4	8.4	8.4
Mass wet + tare	303.6	278.2	327.6	329.7	327.6	336.3
Mass dry + tare	228.8	208.7	236.4	237.4	235.2	253.1
Mass water	74.8	69.5	91.2	92.3	92.4	83.2
Mass dry soil	220.4	200.2	228.0	229.0	226.8	244.7
Moisture %	33.9%	34.7%	40.0%	40.3%	40.7%	34.0%

Test Pit	TH16-01	TH16-01	TH16-01	TH16-02	TH16-02	TH16-02
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.2 - 0.5	0.6 - 0.8	0.9 - 1.1
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	C7	Z36	F134	D33	Z89	W09
Mass of tare	8.4	8.5	8.4	8.3	8.3	8.6
Mass wet + tare	343	280.5	307.5	254.4	309	286.8
Mass dry + tare	237.1	190.6	207.5	197.0	230.0	225.5
Mass water	105.9	89.9	100.0	57.4	79.0	61.3
Mass dry soil	228.7	182.1	199.1	188.7	221.7	216.9
Moisture %	46.3%	49.4%	50.2%	30.4%	35.6%	28.3%

Test Pit	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02
Depth (m)	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	H15	Z131	E46	F81	E99	Z95
Mass of tare	8.4	8.4	8.5	8.6	8.5	8.6
Mass wet + tare	330.7	297.8	292.5	293.7	302.3	303.2
Mass dry + tare	252.0	205.2	195.7	197.2	204.4	200.2
Mass water	78.7	92.6	96.8	96.5	97.9	103.0
Mass dry soil	243.6	196.8	187.2	188.6	195.9	191.6
Moisture %	32.3%	47.1%	51.7%	51.2%	50.0%	53.8%

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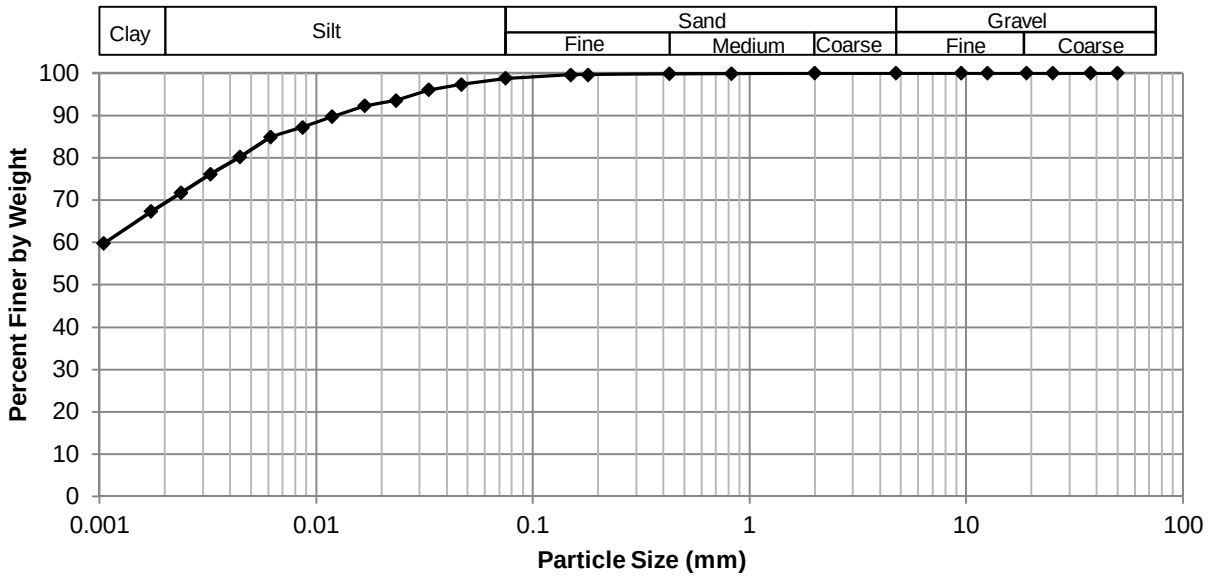
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Scotland Ave.
Test Hole	TH16 - 01
Sample #	G01
Depth (m)	0.3 - 0.5
Sample Date	16-Feb-16
Test Date	7-Mar-16
Technician	LI / JB

Gravel	0.0%
Sand	1.3%
Silt	29.6%
Clay	69.2%

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	98.74
37.5	100.00	2.00	100.00	0.0468	97.33
25.0	100.00	0.825	99.91	0.0331	96.06
19.0	100.00	0.425	99.80	0.0234	93.52
12.5	100.00	0.180	99.63	0.0167	92.25
9.50	100.00	0.150	99.57	0.0118	89.71
4.75	100.00	0.075	98.74	0.0086	87.17
				0.0062	84.94
				0.0044	80.18
				0.0033	76.18
				0.0024	71.74
				0.0017	67.32
				0.0010	59.74

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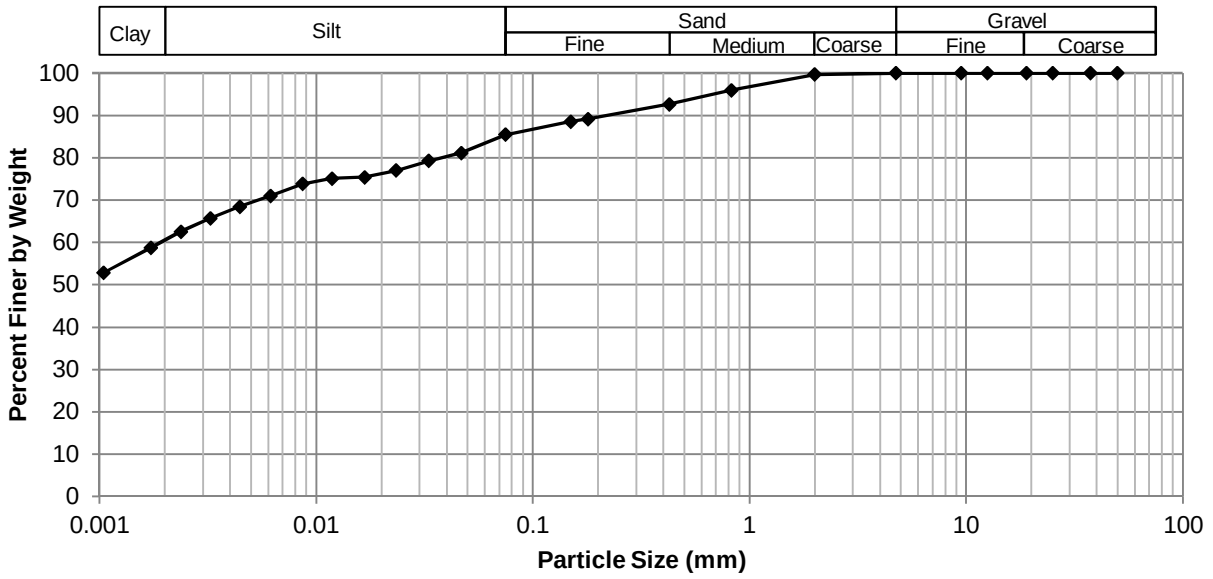
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Scotland Ave.
Test Hole	TH16 - 02
Sample #	G11
Depth (m)	0.6 - 0.8
Sample Date	16-Feb-16
Test Date	7-Mar-16
Technician	LI / JB

Gravel	0.0%
Sand	14.5%
Silt	25.0%
Clay	60.4%

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	85.45
37.5	100.00	2.00	99.65	0.0468	81.13
25.0	100.00	0.825	95.96	0.0331	79.23
19.0	100.00	0.425	92.61	0.0234	77.02
12.5	100.00	0.180	89.17	0.0167	75.44
9.50	100.00	0.150	88.57	0.0118	75.12
4.75	100.00	0.075	85.45	0.0086	73.85
				0.0062	71.01
				0.0044	68.47
				0.0033	65.75
				0.0024	62.59
				0.0017	58.82
				0.0010	52.85

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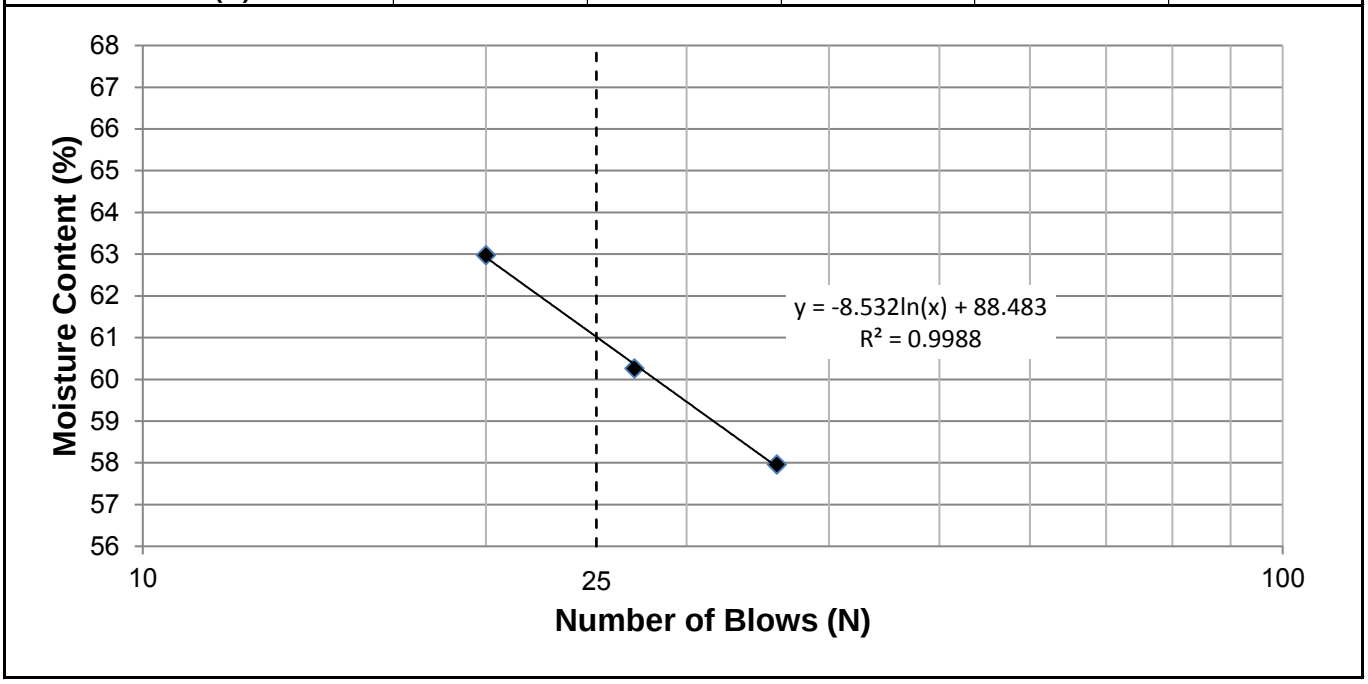
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Scotland Ave.
Test Hole	TH16 - 01
Sample #	G01
Depth (m)	0.3 - 0.5
Sample Date	16-Feb-16
Test Date	07-Mar-16
Technician	LI / JB

Liquid Limit	61
Plastic Limit	19
Plasticity Index	42

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	36	27	20		
Mass Wet Soil + Tare (g)	23.569	25.466	24.248		
Mass Dry Soil + Tare (g)	20.099	21.167	20.345		
Mass Tare (g)	14.112	14.033	14.147		
Mass Water (g)	3.470	4.299	3.903		
Mass Dry Soil (g)	5.987	7.134	6.198		
Moisture Content (%)	57.959	60.261	62.972		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	24.377	23.769			
Mass Dry Soil + Tare (g)	22.769	22.194			
Mass Tare (g)	14.230	13.996			
Mass Water (g)	1.608	1.575			
Mass Dry Soil (g)	8.539	8.198			
Moisture Content (%)	18.831	19.212			

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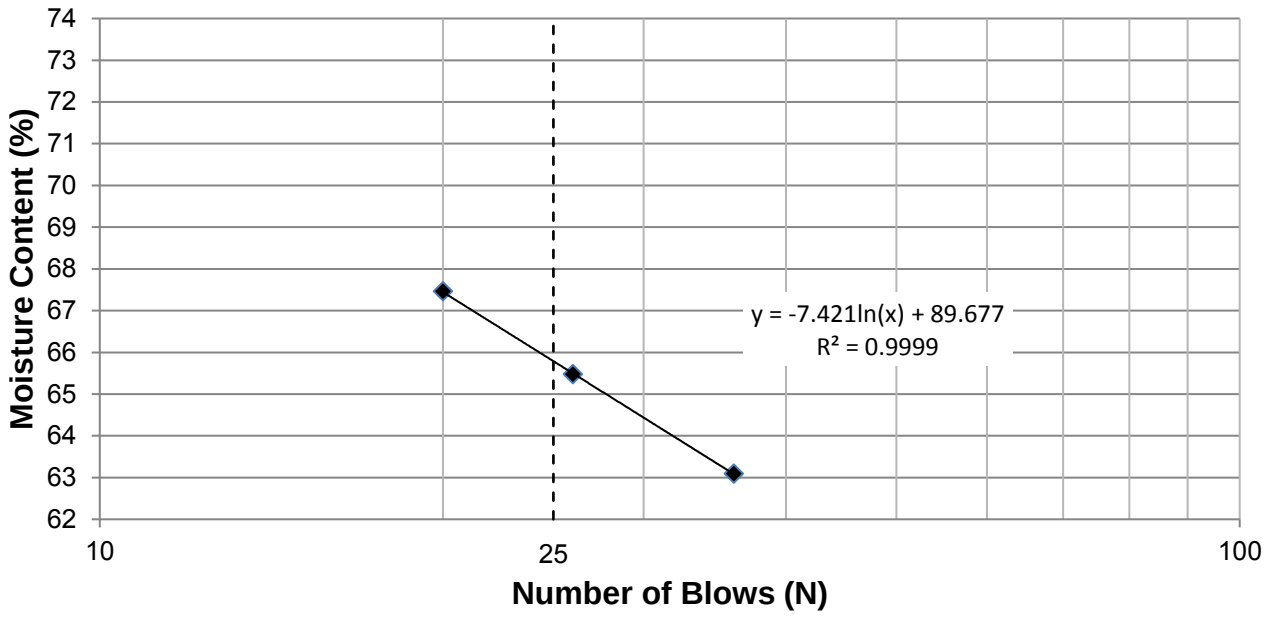
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02, Scotland Ave.
Test Hole	TH16 - 02
Sample #	G11
Depth (m)	0.6 - 0.8
Sample Date	16-Feb-16
Test Date	07-Mar-16
Technician	JB

Liquid Limit	66
Plastic Limit	20
Plasticity Index	46

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	36	26	20		
Mass Wet Soil + Tare (g)	26.303	24.456	24.364		
Mass Dry Soil + Tare (g)	21.595	20.422	20.241		
Mass Tare (g)	14.133	14.261	14.129		
Mass Water (g)	4.708	4.034	4.123		
Mass Dry Soil (g)	7.462	6.161	6.112		
Moisture Content (%)	63.093	65.476	67.457		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	20.600	19.672			
Mass Dry Soil + Tare (g)	19.539	18.758			
Mass Tare (g)	14.224	13.987			
Mass Water (g)	1.061	0.914			
Mass Dry Soil (g)	5.315	4.771			
Moisture Content (%)	19.962	19.157			

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

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