APPENDIX 'F'

GEOTECHNICAL REPORT

Quality Engineering | Valued Relationships

Morrison Hershfield Ltd.

2016 Local Streets Package 16-R-02b
Geotechnical Investigation Report

Prepared for:

Mr. Ron Bruce, P.Eng.
Morrison Hershfield Ltd.
59 Scurfield Blvd, Unit 1
Winnipeg, Manitoba
R3Y 1G4

Project Number:
0035-032-00

Date: March 21, 2016

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Quality Engineering | Valued Relationships

March 21, 2016 Our File No. 0035-032-00

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

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

TREK Geotechnical Inc. is pleased to submit our Final Report for the sub-surface investigations for the above noted project.

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

Sincerely,

TREK Geotechnical Inc.
Per:

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

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

Revision History

Revision No.	Author	Issue Date	Description
0	PB	March 21, 2016	Final Report

Authorization Signatures

Prepared By:

Paul Bevel, B.Sc.

Reviewed By:

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

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

APEGM
Certificate of Authorization
Trek Geotechnical Inc.
No. 4877 Date: Mar 21, 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-02b project. The streets included Trottier Bay, Sony Place, Hector Bay, Yale Avenue and South Drive. 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 05. 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 17, 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 E). 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 05 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
Trottier Bay

Tabloid (279mm x 432mm)

PLOT: 3/16/2016 4:28:12 PM

FILE NAME: FIG 01 2016-03-16 Site Plan 0_A_HA 0035 032 00.dwg

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

Figure 01
Test Hole Location Plan

TREK GEOTECHNICAL

0035 032 00
Morrison Hershfield
Sony Place

Tabloid (279mm x 432mm)

PLOT: 3/16/2016 4:27:32 PM

FILE NAME: FIG 02 2016-03-16 Site Plan 0_A_HA 0035 032 00.dwg

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

Figure 02
Test Hole Location Plan

TREK GEOTECHNICAL

0035 032 00
Morrison Hershfield
Hector Avenue

Tabloid (279mm x 432mm)

PLOT: 3/16/2016 4:02:03 PM

FILE NAME: FIG 03 2016-03-16 Site Plan 0_B_HA 0035 032 00.dwg

HECTOR AVE

WILTON ST

HECTOR BAY E

W End
TH05
TH04
TH03
TH02
TH01
E End

100 MM
150 PVC 1986
150 AC 1956
200 PVC 1984
4.3
3.0

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

Figure 03
Test Hole Location Plan

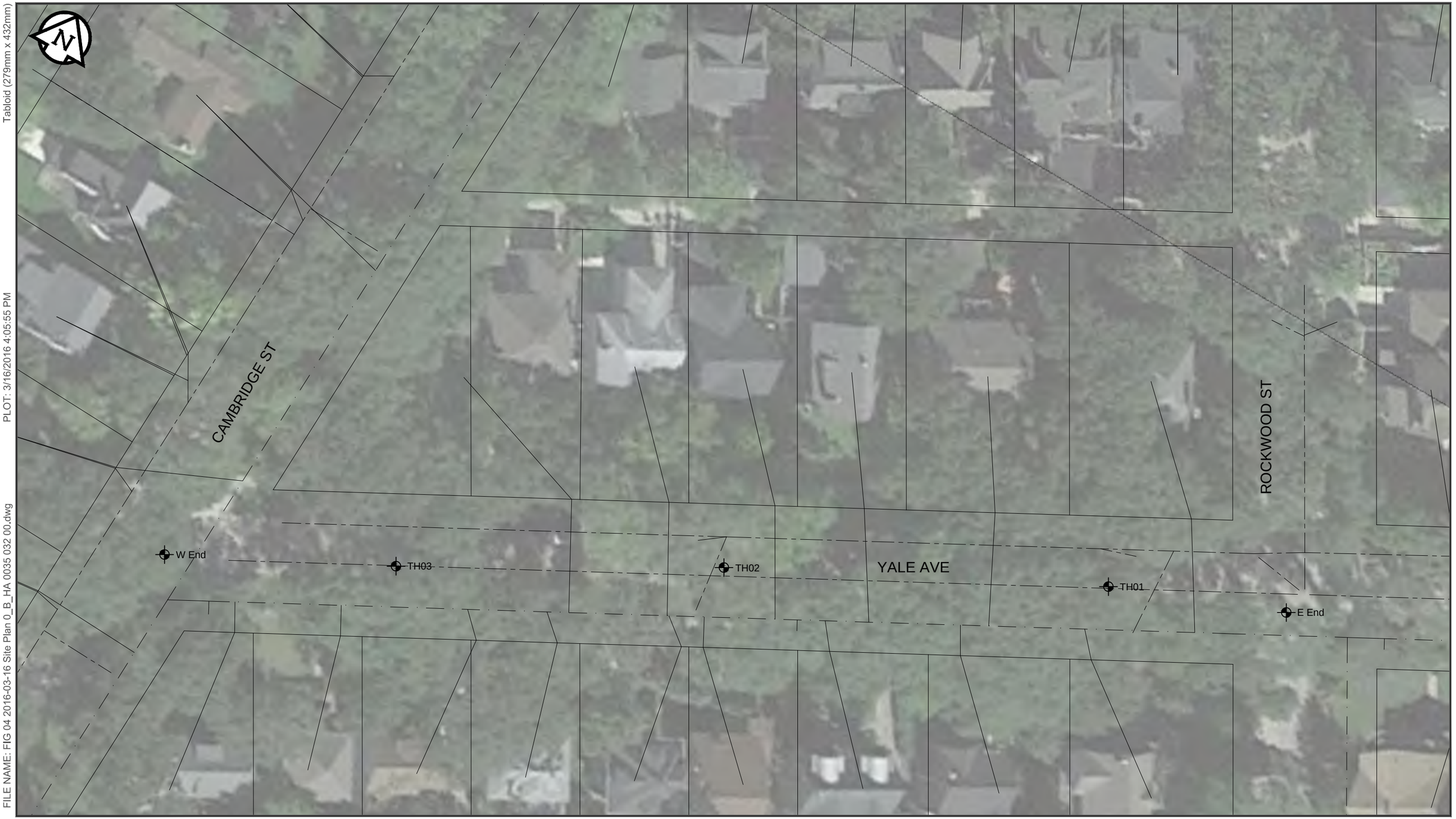
TREK GEOTECHNICAL

0035 032 00
Morrison Hershfield
Yale Avenue

Tabloid (279mm x 432mm)

PLOT: 3/16/2016 4:05:55 PM

FILE NAME: FIG 04 2016-03-16 Site Plan 0_B_HA 0035 032 00.dwg



0 5 10 15 20m
SCALE : 1:500 (279mm x 432mm)

Figure 04
Test Hole Location Plan

TREK GEOTECHNICAL

0035 0032 00
Morrison Hershfield
South Drive

Tabloid (279mm x 432mm)

PLOT: 4/5/2016 10:00:40 AM

FILE NAME: FIG 05 2016-04-05 Site Plan 0_B_HA 0035 032 00.dwg

0 10 20 30 40m
SCALE : 1:1000 (279mm x 432mm)

LEGEND :

TEST HOLE (TREK, 2016)

NOTES :

1. BACKGROUND IMAGE FROM THE CITY OF WINNIPEG

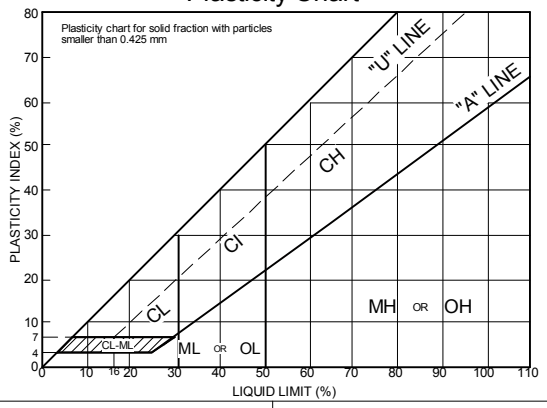
Figure 05
Site Plan

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 – Trottier Bay

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-02b	**Location:**	Trottier Bay, East and West end at Chevrier Blvd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		CONCRETE - (155mm thick)		
		CLAY (FILL) - silty, gravelly (<25mm dia.) - brown - frozen, moist to wet and soft when thawed - high plasticity	Grab (G)	G01
			Grab (G)	G02
0.5		CLAY - silty, trace sand - mottled black and brown - frozen to 1.5m, moist and firm when thawed - high plasticity - dark brown below 0.6m	Grab (G)	G03
			Grab (G)	G04
1.0			Grab (G)	G05
			Grab (G)	G06
1.5		- firm to stiff below 2.5m	Grab (G)	G07
		SILT - clayey, trace oxidation - brown, moist, firm, low plasticity	Grab (G)	G08
2.0		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, stiff to very stiff - high plasticity	Grab (G)	G09
2.5			Grab (G)	G10
3.0			Grab (G)	G11

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

End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 2.3m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 14U (5521009m N, 631978m E), 1.8m east from west curb

Logged By: Jodi Neumann **Reviewed By:** N.J Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-08 LOCAL STREETS PKG. 16-R-02 TROTTIER 0035-032-00_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Trottier Bay, East and West end at Chevrier Blvd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		ASPHALT - (80mm thick)				
		CONCRETE - (100mm thick)				
		CLAY (FILL) - silty, trace sand, trace gravel (<20mm dia.) - dark brown - frozen, moist and firm when thawed - high plasticity		G12		
0.5						
		CLAY - some silt, trace sand - dark brown - frozen, moist and stiff when thawed - high plasticity		G13		
1.0				G14		
		- trace silt inclusions (<3mm dia.), mottled brown and dark brown below 1.2m		G15		
1.5				G16		
		SILT - trace clay, trace sand, mottled grey and brown, moist, firm, low plasticity		G17		
		CLAY - silty, trace silt inclusions (<15mm dia.) - brown - moist, stiff to very stiff - high plasticity		G18		
2.0						
		- firm to stiff below 2.2m		G19		
2.5				G20		
				G21		
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 2.4m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 14U (5520972m N, 632004m E), 1.7m west from east curb

Logged By: Jodi Neumann **Reviewed By:** N.J Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-08 LOCAL STREETS PKG. 16-R-02 TROTTIER 0035-032-00_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Trottier Bay, East and West end at Chevrier Blvd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		CONCRETE - (146mm thick)		
		CLAY (FILL) - gravelly (<20mm dia.), some sand - brown - frozen, wet and soft when thawed - intermediate plasticity		G22
0.5		SAND AND GRAVEL (FILL) - <10mm dia. gravel, trace silt, brown, frozen, moist and compact when thawed, well graded, angular to sub angular		G23
				G24
		CLAY (FILL) - silty, trace organic clay, trace coarse sand, trace gravel (<15mm dia.), brown, frozen, moist and firm when thawed, high plasticity		G25
1.0		CLAY - silty, trace silt inclusions (<10m dia.), trace sand - dark brown, frozen, moist and firm to stiff when thawed, high plasticity		G26
		SILT - trace clay, trace sand, brown, frozen, moist and firm when thawed, low plasticity		G27
		CLAY - silty, trace silt inclusions (<15mm dia.) - brown - frozen to 1.5m, moist and stiff when thawed - high plasticity		G28
1.5				G29
				G30
2.0		- firm to stiff below 2.2m		G31
2.5				G32
				G33
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) Test hole sloughed to 2.1m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 14U (5520945m N, 632042m E), 1.7m north from south curb

Logged By: Jodi Neumann **Reviewed By:** N.J Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-08 LOCAL STREETS PKG. 16-R-02 TROTTIER 0035-032-00_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Trottier Bay, East and West end at Chevrier Blvd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		CONCRETE - (215mm thick)		
		CLAY AND SAND (FILL) - trace gravel (<10mm dia.) - brown - frozen, moist and firm when thawed - low plasticity	Grab	G34
0.5		CLAY - silty, trace sand - brown - frozen, moist and firm when thawed - high plasticity	Grab	G35
			Grab	G36
1.0			Grab	G37
1.5		SILT - trace clay, trace sand, mottled grey and brown, frozen, moist and firm when thawed, low plasticity	Grab	G38
		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, firm to stiff - high plasticity	Grab	G39
2.0			Grab	G40
2.5			Grab	G41
			Grab	G42
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) Test hole sloughed to 1.6m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 14U (5520972m N, 632080m E), 5.0m north from south curb

Logged By: Jodi Neumann **Reviewed By:** N.J Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-08 LOCAL STREETS PKG. 16-R-02 TROTTIER 0035-032-00_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Trottier Bay, East and West end at Chevrier Blvd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		CONCRETE - (155mm thick)		
		CLAY (FILL) - silty, gravelly (<25mm dia.), trace sand - brown - frozen, moist and soft when thawed - intermediate plasticity		G43
0.5		CLAY - silty, trace organic clay, trace precipitates - brown - frozen, moist and firm when thawed - high plasticity		G44
		- no organic clay, trace silt inclusions (<25mm dia.), trace coarse sand, trace gravel (<5mm dia.) below 0.6m		G45
1.0				G46
		-no gravel, no precipitates, no sand, silt inclusions <10mm dia., below 1.2m		G47
1.5		SILT - clayey, trace oxidation - brown, moist, stiff, intermediate plasticity		G48
2.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, stiff to very stiff - high plasticity		G49
2.5				G50
3.0				G51

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) Test hole sloughed to 2.3m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 14U (5520995m N, 632128m E), 2.4m south from north curb

Logged By: Jodi Neumann **Reviewed By:** N.J Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-08 LOCAL STREETS PKG. 16-R-02 TROTTIER 0035-032-00_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Trottier Bay, East and West end at Chevrier Blvd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		CONCRETE - (156m thick)		
		CLAY (FILL) - silty, gravelly (<25mm dia.), trace coarse sand, trace organics (rootlets) - dark brown - frozen, moist and firm when thawed - high plasticity		G52
0.5				G53
1.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace organics (rootlets) - brown - frozen to 1.5m, moist and firm when thawed - high plasticity		G54
				G55
		- stiff below 1.4m		G56
1.5				G57
2.0		SILT - clayey, trace sand, trace oxidation - brown, moist, firm, intermediate plasticity		G58
		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, stiff - high plasticity -firm to stiff below 2.3m		G59
2.5				G60
3.0				G61

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) Test hole sloughed to 2.3m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 14U (5521035m N, 632139m E), 2.1m east from west curb

Logged By: Jodi Neumann **Reviewed By:** N.J Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-08 LOCAL STREETS PKG. 16-R-02 TROTTIER 0035-032-00_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Trottier Bay, East and West end at Chevrier Blvd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		CONCRETE - (178mm thick)		
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist and compact when thawed, well graded, angular to sub angular		G62
		CLAY (FILL) - silty, some gravel (<10mm dia.), trace silt inclusions (<5mm dia.), trace sand - brown - frozen, moist and firm when thawed, intermidiate plasticity		G63
0.5		SAND AND GRAVEL (FILL) - <10mm dia. gravel, brown, frozen, moist and compact when thawed, well graded angular to sub angular		G64
		CLAY - silty, trace sand, trace gravel (<10mm dia), trace organics (rootlets) - mottled black and brown - frozen to 1.5m, moist and stiff when thawed - high plasticity		G65
1.0		- trace silt inclusions (<25mm dia.), trace organic clay, trace oxidation below 1.2m		G66
1.5		- firm to stiff below 1.5m		G67
		- silt seam (<75mm thick) at 1.7m		
		- no organic clay, no gravel, <10mm dia. silt inclusions, brown below 1.8m		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) Test hole sloughed to 2.6m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 14U (5521082m N, 632119m E), 2.0m west from east curb

Logged By: Jodi Neumann **Reviewed By:** N.J Ferreira **Project Engineer:** Nelson Ferreira

SUB-SURFACE LOG LOGS 2016-03-08 LOCAL STREETS PKG. 16-R-02 TROTTIER 0035-032-00_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Trottier Bay

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	14U (5521009m N, 631978m E), 1.8m east from west curb	N/A		CONCRETE	155											
						CLAY (FILL)	0.2	0.3	43							
						CLAY (FILL)	0.3	0.5	41.8							
						CLAY (FILL)	0.5	0.6	30.3							
						CLAY (FILL)	0.6	0.8	29							
						CLAY	0.9	1.1	30	0	4	29	67	20	69	49
						CLAY	1.2	1.4	31							
						CLAY	1.5	1.7	43							
						SILT	1.7	1.8	38							
						CLAY	2.1	2.3	42							
						CLAY	2.4	2.6	47							
						CLAY	2.9	3.0	49							
TH16-02	14U (5520972m N, 632004m E), 1.7m west from east curb	ASPHALT	80	CONCRETE	100											
						CLAY (FILL)	0.3	0.5	39							
						CLAY	0.6	0.8	38	0	1	18	81	23	88	65
						CLAY	0.9	1.1	32							
						CLAY	1.2	1.4	42							
						CLAY	1.5	1.7	46							
						SILT	1.7	1.8	39							
						CLAY	1.8	2.0	48							
						CLAY	2.1	2.3	50							
						CLAY	2.4	2.6	55							
						CLAY	2.9	3.0	56							
TH16-03	14U (5520945m N, 632042m E), 1.7m north from south curb	N/A		CONCRETE	146											
						CLAY (FILL)	0.3	0.5	42							
						SAND AND GRAVEL (FILL)	0.6	0.7	10							
						CLAY (FILL)	0.7	0.8	19							
						CLAY (FILL)	0.8	0.9	27							
						CLAY	0.9	1.1	43							
						SILT	1.1	1.2	39							
						CLAY	1.2	1.4	45							
						CLAY	1.5	1.7	45							
						CLAY	1.8	2.0	52							
						CLAY	2.1	2.3	55							
						CLAY	2.4	2.6	55							
						CLAY	2.9	3.0	59							

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Trottier Bay

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	14U (5520972m N, 632080m E), 5.0m north from south curb	N/A		CONCRETE	215		0.0	0.0								
						CLAY AND SAND (FILL)	0.3	0.5	14							
						CLAY	0.6	0.8	35	0	4	32	64	22	69	47
						CLAY	0.8	1.1	38							
						CLAY	0.9	1.5	42							
						SILT	1.5	2.0	39							
						CLAY	1.8	2.3	48							
						CLAY	2.1	2.6	52							
						CLAY	2.4	2.9	52							
						CLAY	2.7	2.9	56							
TH16-05	14U (5520995m N, 632128m E), 2.4m south from north curb	N/A		CONCRETE	155		0.0	0.0								
						CLAY (FILL)	0.3	0.5	35							
						CLAY	0.5	0.6	26							
						CLAY	0.8	0.9	30							
						CLAY	0.9	1.1	33							
						CLAY	1.4	1.5	37							
						SILT	1.8	2.0	39							
						CLAY	2.1	2.3	47							
						CLAY	2.4	2.6	50							
						CLAY	2.9	3.0	51							
TH16-06	14U (5521035m N, 632139m E), 2.1m east from west curb	N/A		CONCRETE	156		0.0	0.0								
						CLAY (FILL)	0.3	0.5	26							
						CLAY (FILL)	0.6	0.8	23							
						CLAY	0.9	1.1	30							
						CLAY	1.2	1.4	30							
						CLAY	1.4	1.5	32							
						CLAY	1.5	1.7	38							
						SILT	2.0	2.1	39							
						CLAY	2.3	2.4	49							
						CLAY	2.4	2.6	52							
						CLAY	2.9	3.0	52							

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Trottier Bay

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
TH16-07	14U (5521082m N, 632119m E), 2.0m west from east curb	N/A		CONCRETE	178		0.0	0.0								
						GRAVEL (FILL)	0.2	0.2	10							
						CLAY (FILL)	0.3	0.5	26							
						SAND AND GRAVEL (FILL)	0.6	0.7	7							
						CLAY	0.8	0.9	27							
						CLAY	1.2	1.4	35							
						CLAY	1.5	1.7	34							
						CLAY	1.8	2.0	47							
						CLAY	2.1	2.3	49							
						CLAY	2.4	2.6	52							
						CLAY	2.9	3.0	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-02b, Trottier Bay

Sample Date 09-Feb-16
Test Date 11-Feb-16
Technician Lochart Inglis/ Jashan Bhullar

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01
Depth (m)	0.2 - 0.3	0.3 - 0.5	0.5 - 0.6	0.6 - 0.8	0.9 - 1.1	1.4 - 1.5
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	F27	Z10	W75	A28	E28	F87
Mass of tare	8.3	8.4	8.3	8.6	8.4	8.3
Mass wet + tare	425.3	330.2	317.0	268.5	303.8	302.4
Mass dry + tare	299.9	235.4	245.2	210.0	234.9	233.1
Mass water	125.4	94.8	71.8	58.5	68.9	69.3
Mass dry soil	291.6	227.0	236.9	201.4	226.5	224.8
Moisture %	43.0%	41.8%	30.3%	29.0%	30.4%	30.8%

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01	TH16-02
Depth (m)	1.5 - 1.7	1.7 - 1.8	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	0.3 - 0.5
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	F128	F51	H46	A16	H3	N03
Mass of tare	8.5	8.3	8.3	8.5	8.4	8.5
Mass wet + tare	303.4	324	303.9	307.2	305.4	299.2
Mass dry + tare	214.5	237.3	215.9	211.2	207.3	218.4
Mass water	88.9	86.7	88.0	96.0	98.1	80.8
Mass dry soil	206.0	229.0	207.6	202.7	198.9	209.9
Moisture %	43.2%	37.9%	42.4%	47.4%	49.3%	38.5%

Test Pit	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02
Depth (m)	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.7 - 1.8	1.8 - 2.0
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	A108	P20	H56	E16	E109	F50
Mass of tare	8.3	8.7	8.5	8.8	8.5	8.6
Mass wet + tare	290.4	299.1	308.7	300.2	311.9	301.7
Mass dry + tare	213.1	228.3	219.9	208.3	227.3	206.7
Mass water	77.3	70.8	88.8	91.9	84.6	95.0
Mass dry soil	204.8	219.6	211.4	199.5	218.8	198.1
Moisture %	37.7%	32.2%	42.0%	46.1%	38.7%	48.0%

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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-02b, Trottier Bay

Sample Date 09-Feb-16
Test Date 11-Feb-16
Technician Lochart Inglis/ Jashan Bhullar

Test Pit	TH16-02	TH16-02	TH16-02	TH16-03	TH16-03	TH16-03
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	0.3 - 0.5	0.6 - 0.7	0.7 - 0.8
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	H33	F29	N26	Z78	N99	W41
Mass of tare	8.7	8.2	8.4	8.6	8.4	8.6
Mass wet + tare	308.2	304.2	308.5	330.3	355.9	281.7
Mass dry + tare	208.2	199.1	201.4	235.9	323.4	237.9
Mass water	100.0	105.1	107.1	94.4	32.5	43.8
Mass dry soil	199.5	190.9	193.0	227.3	315.0	229.3
Moisture %	50.1%	55.1%	55.5%	41.5%	10.3%	19.1%

Test Pit	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	0.8 - 0.9	0.9 - 1.1	1.1 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	H12	P36	E134	F30	N49	H61
Mass of tare	8.8	8.5	8.3	8.3	8.3	8.5
Mass wet + tare	293.2	300.6	104.3	310.1	314.3	304.5
Mass dry + tare	232.1	212.9	77.5	216.1	219.3	203.9
Mass water	61.1	87.7	26.8	94.0	95.0	100.6
Mass dry soil	223.3	204.4	69.2	207.8	211.0	195.4
Moisture %	27.4%	42.9%	38.7%	45.2%	45.0%	51.5%

Test Pit	TH16-03	TH16-03	TH16-03	TH16-04	TH16-04	TH16-04
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9
Sample #	G31	G32	G33	G34	G35	G36
Tare ID	N43	W86	F127	A105	W37	E39
Mass of tare	8.7	8.5	8.4	8.5	8.3	8.5
Mass wet + tare	275.6	276.7	308.4	301.8	301.1	371.4
Mass dry + tare	180.8	182.0	197.6	265.9	225.3	272.2
Mass water	94.8	94.7	110.8	35.9	75.8	99.2
Mass dry soil	172.1	173.5	189.2	257.4	217.0	263.7
Moisture %	55.1%	54.6%	58.6%	13.9%	34.9%	37.6%

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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-02b, Trottier Bay

Sample Date 09-Feb-16
Test Date 11-Feb-16
Technician Lochart Inglis/ Jashan Bhullar

Test Pit	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04
Depth (m)	0.9 - 1.1	1.4 - 1.5	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G37	G38	G39	G40	G41	G42
Tare ID	E66	Z57	F45	F451	P21	Z130
Mass of tare	8.4	8.4	8.2	8.3	8.5	8.3
Mass wet + tare	345.3	267.1	304.5	292.0	314.8	301.4
Mass dry + tare	245.1	195.1	208.5	194.9	210.7	196.5
Mass water	100.2	72.0	96.0	97.1	104.1	104.9
Mass dry soil	236.7	186.7	200.3	186.6	202.2	188.2
Moisture %	42.3%	38.6%	47.9%	52.0%	51.5%	55.7%

Test Pit	TH16-05	TH16-05	TH16-05	TH16-05	TH16-05	TH16-05
Depth (m)	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9	0.9 - 1.1	1.4 - 1.5	1.8 - 2.0
Sample #	G43	G44	G45	G46	G47	G48
Tare ID	K36	F150	A1	H10	Z08	H50
Mass of tare	8.5	8.2	8	8.7	8.3	8.4
Mass wet + tare	289.1	317.0	251.4	271.8	295.7	244.6
Mass dry + tare	216.4	252.8	194.8	207.2	218.8	178.5
Mass water	72.7	64.2	56.6	64.6	76.9	66.1
Mass dry soil	207.9	244.6	186.8	198.5	210.5	170.1
Moisture %	35.0%	26.2%	30.3%	32.5%	36.5%	38.9%

Test Pit	TH16-05	TH16-05	TH16-05	TH16-06	TH16-06	TH16-06
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1
Sample #	G49	G50	G51	G52	G53	G54
Tare ID	P85	N65	W35	A7	D29	P36
Mass of tare	8.5	8.5	8.3	8.2	8.2	8.4
Mass wet + tare	260.6	271.6	254.2	252.2	271.4	278.4
Mass dry + tare	180.0	184.0	170.8	201.8	221.9	216.4
Mass water	80.6	87.6	83.4	50.4	49.5	62.0
Mass dry soil	171.5	175.5	162.5	193.6	213.7	208.0
Moisture %	47.0%	49.9%	51.3%	26.0%	23.2%	29.8%

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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-02b, Trottier Bay

Sample Date 09-Feb-16
Test Date 11-Feb-16
Technician Lochart Inglis/ Jashan Bhullar

Test Pit	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06
Depth (m)	1.2 - 1.4	1.4 - 1.5	1.5 - 1.7	2.0 - 2.1	2.3 - 2.4	2.4 - 2.6
Sample #	G55	G56	G57	G58	G59	G60
Tare ID	F58	N08	F147	A24	H47	E93
Mass of tare	8.6	8.7	8.3	8.5	8.7	8.6
Mass wet + tare	262.9	256.9	256.2	254.4	274.9	271.7
Mass dry + tare	203.9	196.7	187.9	185.4	187.1	182.1
Mass water	59.0	60.2	68.3	69.0	87.8	89.6
Mass dry soil	195.3	188.0	179.6	176.9	178.4	173.5
Moisture %	30.2%	32.0%	38.0%	39.0%	49.2%	51.6%

Test Pit	TH16-06	TH16-07	TH16-07	TH16-07	TH16-07	TH16-07
Depth (m)	2.9 - 3.0	0.2 - 0.3	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	1.2 - 1.4
Sample #	G61	G62	G63	G64	G65	G66
Tare ID	W28	E53	N109	H14	W57	W08
Mass of tare	8.6	8.5	9	8.6	8.5	8.6
Mass wet + tare	275.2	277.9	283.1	265.9	253.6	300.5
Mass dry + tare	183.9	254.1	226.1	249.0	201.6	224.7
Mass water	91.3	23.8	57.0	16.9	52.0	75.8
Mass dry soil	175.3	245.6	217.1	240.4	193.1	216.1
Moisture %	52.1%	9.7%	26.3%	7.0%	26.9%	35.1%

Test Pit	TH16-07	TH16-07	TH16-07	TH16-07	TH16-07	
Depth (m)	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	
Sample #	G67	G68	G69	G70	G71	
Tare ID	C22	E50	E33	E68	H30	
Mass of tare	8.7	9.1	8.6	8.4	8.4	
Mass wet + tare	286.6	260.9	274.3	273.8	288.8	
Mass dry + tare	216.7	180.9	187.0	183.2	192.1	
Mass water	69.9	80.0	87.3	90.6	96.7	
Mass dry soil	208.0	171.8	178.4	174.8	183.7	
Moisture %	33.6%	46.6%	48.9%	51.8%	52.6%	

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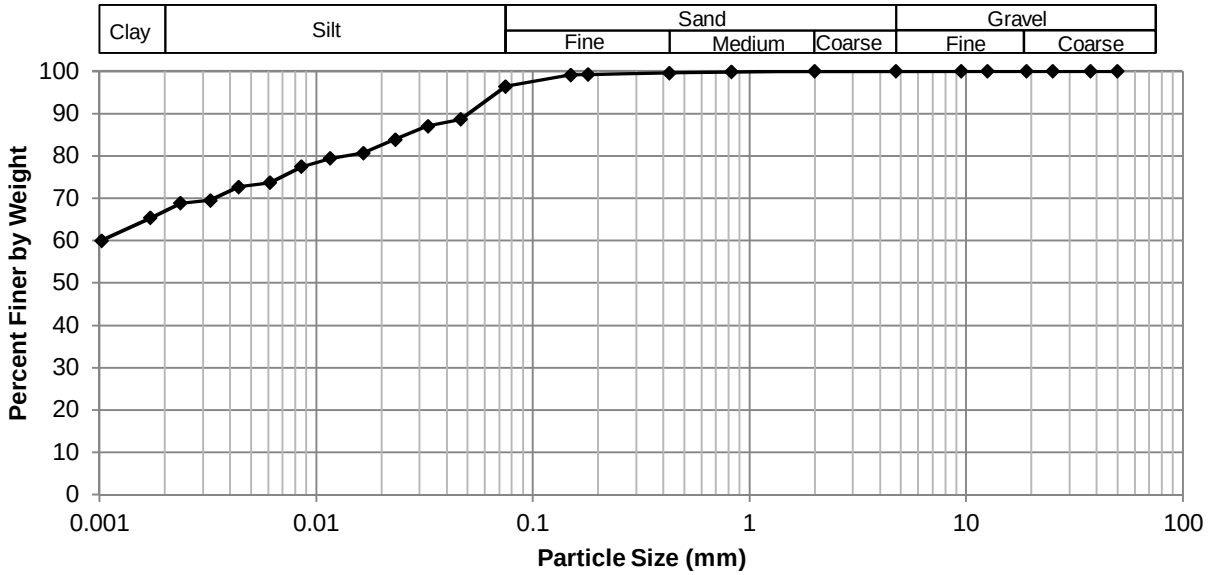
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Trottier Bay
Test Hole	TH16-01
Sample #	G05
Depth (m)	0.9 - 1.1
Sample Date	9-Feb-16
Test Date	18-Feb-16
Technician	LI

Gravel	0.0%
Sand	3.6%
Silt	29.5%
Clay	66.9%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	96.44
37.5	100.00	2.00	100.00	0.0464	88.61
25.0	100.00	0.825	99.82	0.0328	87.02
19.0	100.00	0.425	99.57	0.0232	83.84
12.5	100.00	0.180	99.24	0.0166	80.67
9.50	100.00	0.150	99.15	0.0116	79.46
4.75	100.00	0.075	96.44	0.0086	77.49
				0.0061	73.68
				0.0044	72.73
				0.0032	69.52
				0.0024	68.87
				0.0017	65.39
				0.0010	59.99

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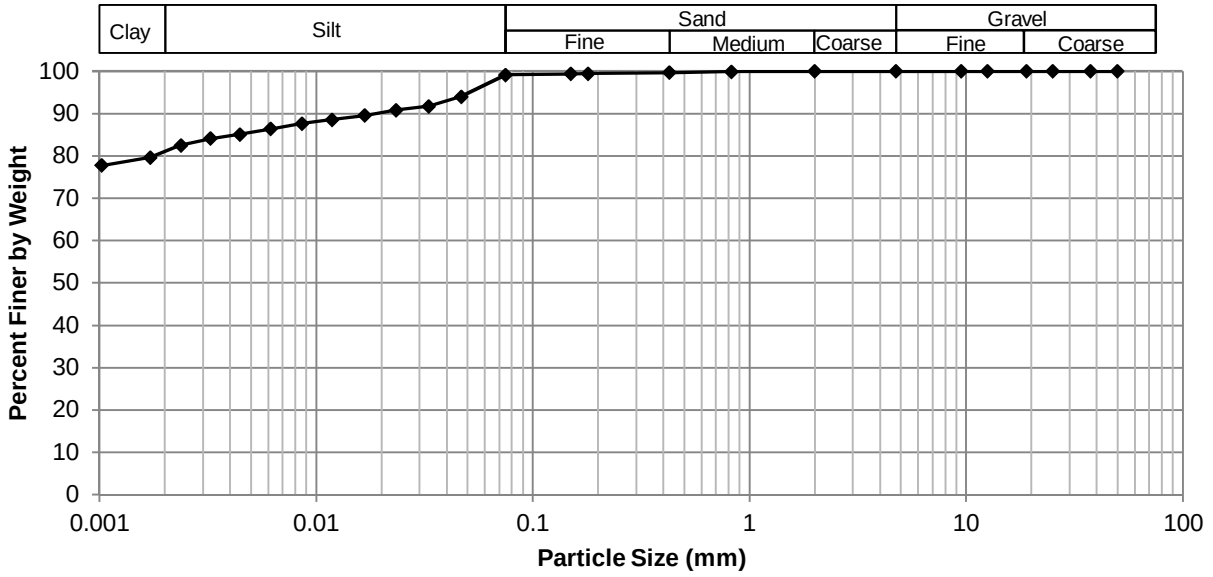
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Trottier Bay
Test Hole	TH16-02
Sample #	G13
Depth (m)	1.5 - 1.7
Sample Date	9-Feb-16
Test Date	18-Feb-16
Technician	LI

Gravel	0.0%
Sand	0.9%
Silt	18.2%
Clay	80.9%

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	99.12
37.5	100.00	2.00	100.00	0.0468	93.97
25.0	100.00	0.825	99.88	0.0331	91.75
19.0	100.00	0.425	99.71	0.0234	90.80
12.5	100.00	0.180	99.43	0.0167	89.53
9.50	100.00	0.150	99.37	0.0118	88.57
4.75	100.00	0.075	99.12	0.0086	87.62
				0.0062	86.35
				0.0044	85.08
				0.0033	84.11
				0.0024	82.53
				0.0017	79.68
				0.0010	77.76

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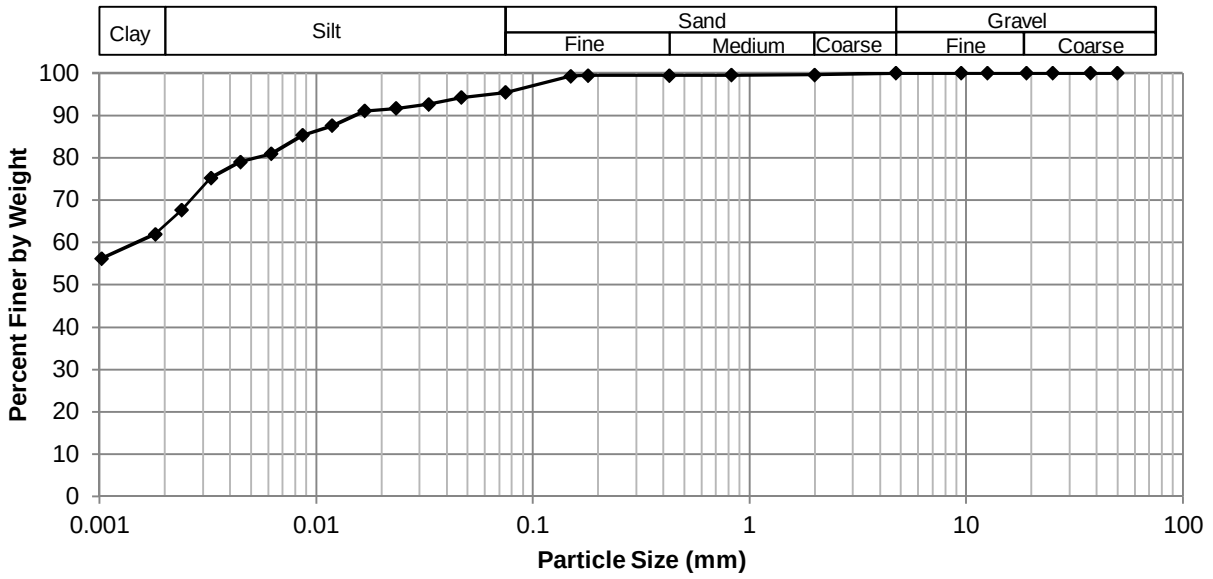
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Trottier Bay
Test Hole	TH16-04
Sample #	G35
Depth (m)	0.6 - 0.8
Sample Date	9-Feb-16
Test Date	18-Feb-16
Technician	LI

Gravel	0.0%
Sand	4.6%
Silt	31.6%
Clay	63.9%

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	95.44
37.5	100.00	2.00	99.58	0.0468	94.21
25.0	100.00	0.825	99.53	0.0331	92.62
19.0	100.00	0.425	99.48	0.0234	91.68
12.5	100.00	0.180	99.41	0.0167	91.04
9.50	100.00	0.150	99.32	0.0118	87.55
4.75	100.00	0.075	95.44	0.0087	85.34
				0.0062	80.92
				0.0045	79.02
				0.0033	75.23
				0.0024	67.66
				0.0018	61.97
				0.0010	56.26

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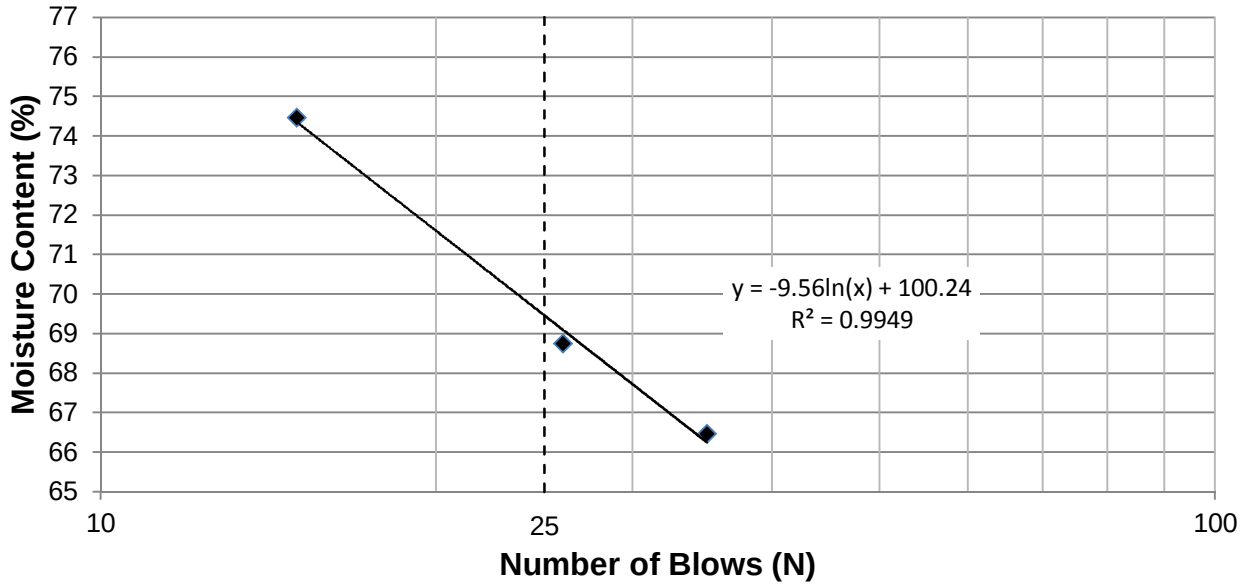
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Trottier Bay
Test Hole	TH16-01
Sample #	G05
Depth (m)	0.91-1.07
Sample Date	09-Feb-16
Test Date	19-Feb-16
Technician	JB

Liquid Limit	69
Plastic Limit	20
Plasticity Index	50

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	15	26		
Mass Wet Soil + Tare (g)	25.058	27.114	25.106		
Mass Dry Soil + Tare (g)	20.642	21.573	20.659		
Mass Tare (g)	13.998	14.132	14.191		
Mass Water (g)	4.416	5.541	4.447		
Mass Dry Soil (g)	6.644	7.441	6.468		
Moisture Content (%)	66.466	74.466	68.754		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.388	16.971	17.870		
Mass Dry Soil + Tare (g)	20.260	16.501	17.230		
Mass Tare (g)	14.113	14.177	14.096		
Mass Water (g)	1.128	0.470	0.640		
Mass Dry Soil (g)	6.147	2.324	3.134		
Moisture Content (%)	18.350	20.224	20.421		

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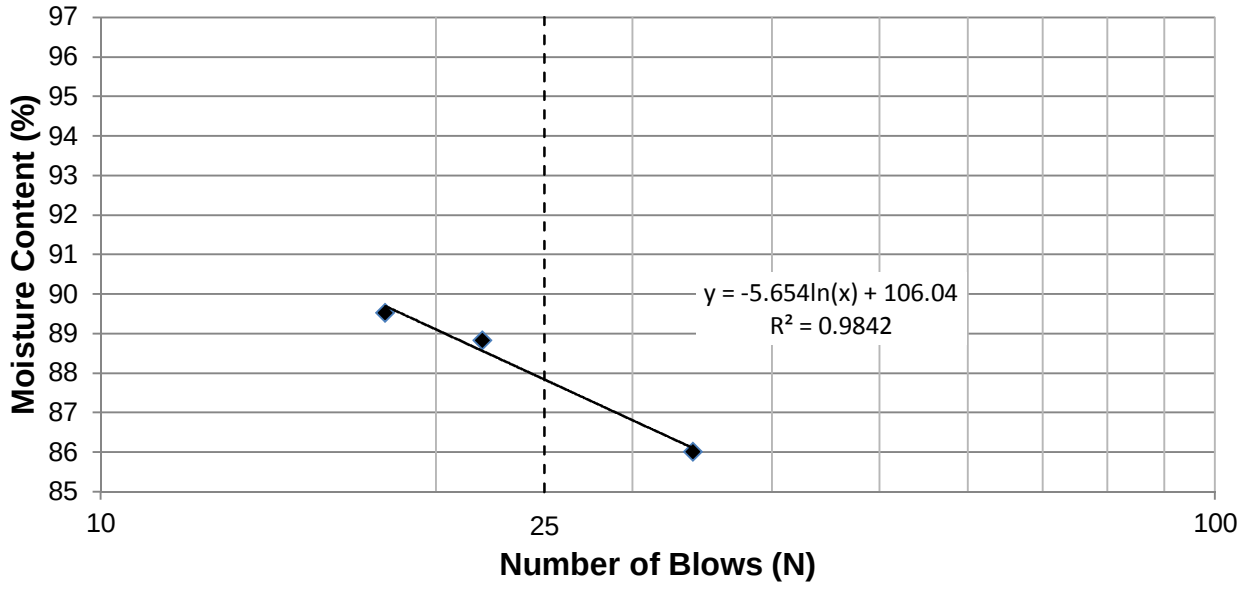
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Trottier Bay
Test Hole	TH16-02
Sample #	G13
Depth (m)	0.6 - 0.8
Sample Date	09-Feb-16
Test Date	19-Feb-16
Technician	LI

Liquid Limit	88
Plastic Limit	23
Plasticity Index	65

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	34	22	18		
Mass Wet Soil + Tare (g)	23.700	23.741	23.971		
Mass Dry Soil + Tare (g)	19.307	19.114	19.214		
Mass Tare (g)	14.200	13.905	13.900		
Mass Water (g)	4.393	4.627	4.757		
Mass Dry Soil (g)	5.107	5.209	5.314		
Moisture Content (%)	86.019	88.827	89.518		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	17.250	18.480			
Mass Dry Soil + Tare (g)	16.658	17.718			
Mass Tare (g)	14.100	14.400			
Mass Water (g)	0.592	0.762			
Mass Dry Soil (g)	2.558	3.318			
Moisture Content (%)	23.143	22.966			

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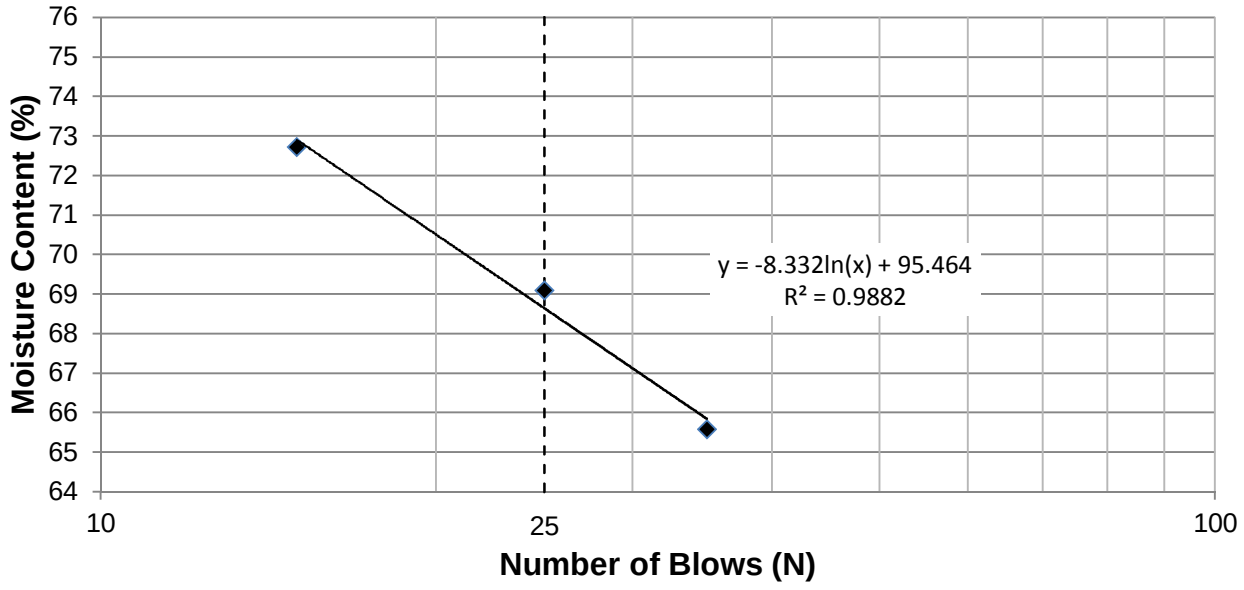
Atterberg Limits
ASTM D4318

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Trottier Bay
Test Hole	TH16-04
Sample #	G35
Depth (m)	0.6 - 0.8
Sample Date	09-Feb-16
Test Date	25-Feb-16
Technician	LI

Liquid Limit	69
Plastic Limit	22
Plasticity Index	47

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	25	15	35		
Mass Wet Soil + Tare (g)	23.250	25.555	24.977		
Mass Dry Soil + Tare (g)	19.506	20.772	20.686		
Mass Tare (g)	14.087	14.195	14.142		
Mass Water (g)	3.744	4.783	4.291		
Mass Dry Soil (g)	5.419	6.577	6.544		
Moisture Content (%)	69.090	72.723	65.572		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	17.208	18.190			
Mass Dry Soil + Tare (g)	16.618	17.491			
Mass Tare (g)	13.995	14.162			
Mass Water (g)	0.590	0.699			
Mass Dry Soil (g)	2.623	3.329			
Moisture Content (%)	22.493	20.997			

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

Appendix B

Test Hole Logs, Summary Table & Lab Data – Sony Place

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-02b	**Location:**	Sony Place, between Irene St. and Hamelin St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	10 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 (145mm thick)		
		GRAVEL (FILL) - <15mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist, insufficient recovery for sample		G01
		CLAY (FILL) - silty, trace sand, trace gravel (<20mm dia.), trace organics - mottled light brown and dark brown - frozen, moist and soft to firm when thawed, high plasticity		G03
0.5		ORGANIC CLAY - silty, trace sand - black, frozen, moist and soft to firm when thawed, high plasticity		G02
		CLAY - silty, trace silt inclusions (<10mm dia.) - brown, frozen, moist and stiff when thawed, high plasticity		G04
		SILT - some clay, trace organics - brown - frozen, moist and soft when thawed - low plasticity		G05
1.0		CLAY - silty, trace sand - dark brown - frozen to 1.5m, moist and stiff to very stiff when thawed - high plasticity		G06
1.5		- firm to stiff below 1.6m		G07
		CLAY AND SILT - trace sand, trace oxidation - brown - moist, stiff - intermediate plasticity		G08
2.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, firm to stiff - high plasticity		G09
2.5				G10
3.0				G11

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) Test hole sloughed to 2.4m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located 25m west from intersection of Sony Pl. and Irene St. (west curb), 1.8m south from north curb. 14U (5522030m N, 631709m E).

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

SUB-SURFACE LOG LOGS 2016-03-10 LOCAL STREETS PKG. 16-R-02 SONY 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Sony Place, between Irene St. and Hamelin St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	10 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 (130mm thick)		
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist and compact when thawed, well graded, angular to sub angular		G12
		CLAY (FILL) - silty, trace gravel (<25mm dia.), trace sand, trace gravel (<25mm dia.) - brown - frozen, moist and soft when thawed - high plasticity		G13
0.5		-stiff below 0.6m		G14
		CLAY - silty, trace sand - dark brown - frozen to 1.5m, moist and stiff when thawed - high plasticity		G15
1.0				G16
1.5		- trace silt inclusions (<10mm dia.), light brown below 1.5m		
		CLAY AND SILT - trace sand, trace oxidation - brown - moist, stiff - low to intermediate plasticity		G17
2.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, stiff - high plasticity		G18
2.5				G19
				G20
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) Test hole sloughed to 1.4m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located 71m west from intersection of Sony Pl. and Irene St. (west curb), 6.2m south from north curb. 14U (5522006m N, 631668m E).

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

SUB-SURFACE LOG LOGS 2016-03-10 LOCAL STREETS PKG. 16-R-02 SONY 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Sony Place, between Irene St. and Hamelin St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	10 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 (152mm thick)		
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist and compact when thawed, well graded, angular to sub angular		G21
		CLAY (FILL) - silty, some sand, trace gravel (<20mm dia.) - dark brown - frozen, moist and stiff to very stiff when thawed - high plasticity		G22
0.5		ORGANIC CLAY - silty, trace sand - black - frozen, moist and firm when thawed - high plasticity		G23
				G24
1.0		CLAY - silty, trace sand, trace oxidation - brown - frozen to 1.5m, moist and stiff when thawed - high plasticity		G25
				G26
1.5		- trace silt inclusions (<10mm dia.) below 1.7m		
2.0				G27
				G28
2.5				G29
				G30
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) Test hole sloughed to 2.1m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located 120m west from intersection of Sony Pl. and Irene St. (west curb), 2.0m south from north curb. 14U (5521984m N, 631626m E).

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

SUB-SURFACE LOG LOGS 2016-03-10 LOCAL STREETS PKG. 16-R-02 SONY 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

Sub-Surface Log

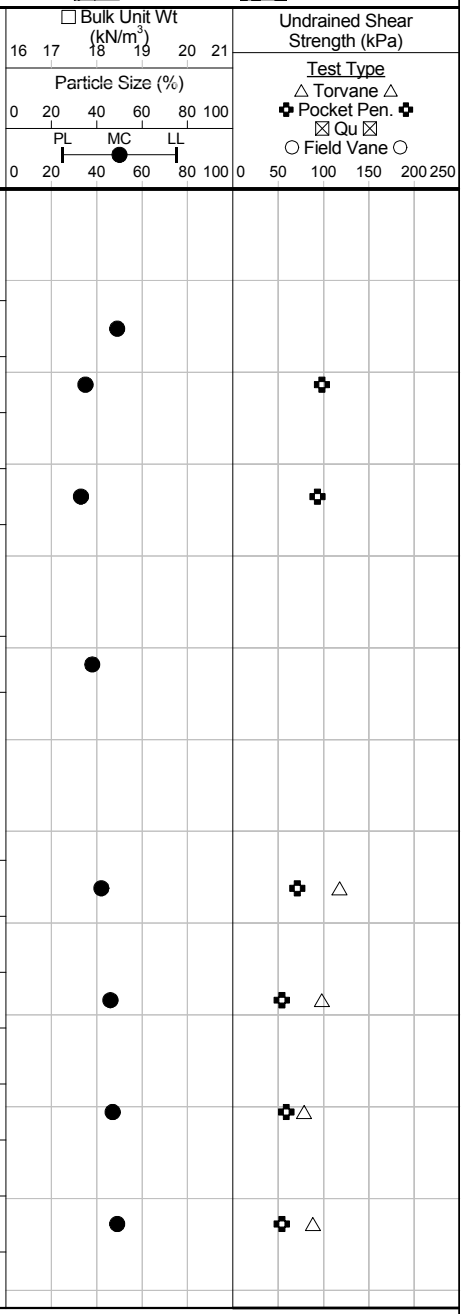
Test Hole TH16-04
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02b	**Location:**	Sony Place, between Irene St. and Hamelin St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	10 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 (108mm thick)		
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist, well graded, angular to sub angular, insufficient recovery for sample		
		CLAY (FILL) - silty, some sand, trace gravel (<25mm dia.), trace organics, brown, frozen, moist and firm when thawed, high plasticity		G31
0.5		ORGANIC CLAY - silty, trace sand - black, frozen, moist and soft when thawed, high plasticity		G32
		CLAY - silty, trace sand - mottled black and brown - frozen to 1.5m, moist and stiff when thawed - high plasticity		G33
1.0		- dark brown below 0.9m		
				G34
1.5				
		- trace silt inclusions (<10mm dia.) below 1.8m		G35
2.0				G36
2.5				G37
				G38
3.0				



End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 1.9m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located 170m west from intersection of Sony Pl. and Irene St. (west curb), 6.5m south from north curb. 14U (5521960m N, 631581m E).

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

SUB-SURFACE LOG LOGS 2016-03-10 LOCAL STREETS PKG. 16-R-02 SONY 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Sony Place, between Irene St. and Hamelin St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	10 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 (112mm thick)		
		GRAVEL (FILL) - <50mm dia. gravel, trace sand, brown, frozen, moist, angular to sub angular, insufficient recovery for sample		
		CLAY (FILL) - silty, some sand, trace gravel (<10mm dia.), trace rubble (brick fragments) - brown - frozen, moist and firm to stiff when thawed - high plasticity		G40
0.5				G41
		CLAY - silty, trace sand, trace organics (rootlets) - mottled dark brown and black - frozen to 1.5m, moist and stiff when thawed - high plasticity		G42
1.0		- no organics below 0.9m, dark brown		G43
				G44
1.5				G45
2.0		CLAY AND SILT - trace sand, trace oxidation - light brown, moist, firm, low to intermediate plasticity		G46
		CLAY - silty, trace silt inclusions (<10mm dia.), trace sand, trace oxidation - brown - moist, stiff - high plasticity		G47
2.5				G48
				G49
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) Test hole sloughed to 2.0m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located 215m west from intersection of Sony Pl. and Irene St. (west curb), 2.0m south from north curb. 14U (5521937m N, 631541m E).

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

SUB-SURFACE LOG LOGS 2016-03-10 LOCAL STREETS PKG. 16-R-02 SONY 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

Sub-Surface Log

Test Hole TH16-06

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02b	**Location:**	Sony Place, between Irene St. and Hamelin St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	10 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 (120mm thick)		
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist and compact when thawed, well graded, angular to sub angular		G50
		CLAY (FILL) - silty, trace sand, trace gravel (<10mm dia.), trace organics, trace rubble - mottled black and dark brown - frozen, moist and soft when thawed - high plasticity		G51
0.5		CLAY - silty, - mottled black and dark brown - frozen, moist and soft when thawed - high plasticity		G52
				G53
1.0				G54
		SILT - trace clay - brown - frozen to 1.5m, moist and firm when thawed - low plasticity		G55
1.5				G56
		CLAY - silty, trace silt inclusions (<10mm dia.), trace sand, trace oxidation - brown, moist, stiff, high plasticity		G57
		SILT - trace clay - brown, moist, firm, low plasticity		G58
2.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidaion, trace sand - brown - moist, stiff - high plasticity		G59
2.5				G60
				G61
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) Test hole sloughed to 2.7m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located 260m west from intersection of Sony Pl. and Irene St. (west curb), 6.5m south from north curb. 14U (5521916m N, 631502m E).

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

SUB-SURFACE LOG LOGS 2016-03-10 LOCAL STREETS PKG. 16-R-02 SONY 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Sony Place, between Irene St. and Hamelin St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	10 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 (148mm thick)		
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist and compact when thawed, well graded, angular to sub angular	Grab (G)	G62
		CLAY (FILL) - silty, trace sand, trace gravel (<10mm dia.), trace organics - mottled black and dark brown - frozen, moist and soft when thawed, high plasticity	Grab (G)	G63
0.5		ORGANIC CLAY - silty, trace sand, trace rootlets - black, frozen, moist and firm when thawed, high plasticity	Grab (G)	G64
		CLAY - silty, trace sand, trace oxidation - greyish brown - frozen to 1.5m, moist and stiff when thawed - high plasticity	Grab (G)	G65
			Grab (G)	G66
1.0				
			Grab (G)	G67
1.5		- silt seam (<50mm thick) at 1.5m - trace silt inclusions, brown below 1.5m		
			Grab (G)	G68
2.0				
			Grab (G)	G69
2.5			Grab (G)	G70
			Grab (G)	G71
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) Test hole sloughed to 1.5m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located 307m west from intersection of Sony Pl. and Irene St. (west curb), 1.9m south from north curb. 14U (5521894m N, 631461m E).

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

SUB-SURFACE LOG LOGS 2016-03-10 LOCAL STREETS PKG. 16-R-02 SONY 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Sony Place

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: 14U 5522030 N, 631709 E 25m west from intersection of Sony Pl. and Irene St. (west curb), 1.8m south from north curb	N/A		CONCRETE	145											
						CLAY (FILL)	0.2	0.3	34.9							
						CLAY (FILL)	0.0	0.0	32.6							
						ORGANIC CLAY	0.3	0.5	33.6							
						CLAY	0.6	0.8	29.9	0	2	21	77	25	71	47
						SILT	0.8	0.9	24	0	3	74	23	17	28	11
						CLAY	1.1	1.2	38							
						CLAY	1.5	1.7	42							
						CLAY AND SILT	1.8	2.1	41							
						CLAY	2.1	2.3	42							
						CLAY	2.4	2.6	41							
						CLAY	2.9	3.0	50							
TH16-02	UTM: 14U 5522006 N, 631668 E 71m west from intersection of Sony Pl. and Irene St. (west curb), 6.2m south from north curb.	N/A		CONCRETE	130											
						GRAVEL (FILL)	0.2	0.2	10							
						CLAY (FILL)	0.3	0.5	54							
						CLAY (FILL)	0.6	0.8	29							
						CLAY	0.8	0.9	31							
						CLAY	1.2	1.4	37							
						CLAY AND SILT	1.7	1.8	37							
						CLAY	2.1	2.3	45							
						CLAY	2.4	2.6	46							
						CLAY	2.7	2.9	52							
TH16-03	UTM: 5521984 N, 631626 E 120m west from intersection of Sony Pl. and Irene St. (west curb), 2.0m south from north curb.	N/A		CONCRETE	152											
						GRAVEL (FILL)	0.2	0.2	10							
						CLAY (FILL)	0.3	0.5	34							
						ORGANIC CLAY	0.6	0.8	34							
						ORGANIC CLAY	0.8	0.9	31							
						CLAY	1.1	1.2	28	0	5	31	64	19	62	42
						CLAY	1.4	1.5	29							
						CLAY	2.0	2.1	38							
						CLAY	2.1	2.3	45							
						CLAY	2.4	2.6	46							
						CLAY	2.7	2.9	49							

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Sony Place

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: 5521960 N, 631581 E 170m west from intersection of Sony Pl. and Irene St. (west curb), 6.5m south from north curb.	N/A		CONCRETE	108											
						CLAY (FILL)	0.3	0.5	49							
						ORGANIC CLAY	0.5	0.6	35							
						CLAY	0.8	0.9	33							
						CLAY	1.2	1.4	38							
						CLAY	1.8	2.0	42							
						CLAY	2.1	2.3	46							
						CLAY	2.4	2.6	47							
						CLAY	2.7	2.9	49							
TH16-05	UTM: 5521937 N, 631541 E 215m west from intersection of Sony Pl. and Irene St. (west curb), 2.0m south from north curb	N/A		CONCRETE	112											
						GRAVEL (FILL)	0.1	0.2	N/A							
						CLAY (FILL)	0.3	0.5	25							
						CLAY (FILL)	0.6	0.8	22							
						CLAY	0.8	0.9	33							
						CLAY	0.9	1.1	30							
						CLAY	1.2	1.4	27							
						CLAY	1.5	1.7	39							
						CLAY AND SILT	2.0	2.1	39							
						CLAY	2.1	2.3	43							
						CLAY	2.4	2.6	46							
						CLAY	2.7	2.9	48							
TH16-06	UTM: 5521916 N, 631502 E 260m west from intersection of Sony Pl. and Irene St. (west curb), 6.5m south from north curb	N/A		CONCRETE	120											
						GRAVEL (FILL)	0.1	0.2	9							
						CLAY (FILL)	0.3	0.5	39							
						CLAY (FILL)	0.6	0.7	35							
						CLAY (FILL)	0.8	0.9	39							
						CLAY (FILL)	0.9	1.1	33							
						SILT	1.2	1.5	23							
						SILT	1.5	1.7	34							
						CLAY	1.7	1.8	39							
						SILT	1.8	2.0	38							
						CLAY	2.1	2.3	42							
						CLAY	2.4	2.6	45							
						CLAY	2.7	2.9	50							

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Sony Place

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
TH16-07	UTM: 5521894 N, 631461 E 307m west from intersection of Sony Pl. and Irene St. (west curb), 1.9m south from north curb	N/A		CONCRETE	148											
						GRAVEL (FILL)	0.2	0.3	6							
						CLAY (FILL)	0.3	0.5	30							
						ORGANIC CLAY	0.5	0.6	37	0	2	18	80	24	75	51
						CLAY	0.6	0.8	39							
						CLAY	0.8	0.9	37							
						CLAY	1.2	1.4	37							
						CLAY	1.8	2.0	42							
						CLAY	2.1	2.3	45							
						CLAY	2.4	2.6	48							
						CLAY	2.7	2.9	49							

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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-02b Sony Place

Sample Date 10-Feb-16
Test Date 09-Mar-16
Technician LI

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01
Depth (m)	0.2 - 0.3	0.3 - 0.5	0.5 - 0.6	0.6 - 0.8	0.8 - 0.9	1.1 - 1.2
Sample #	G01	G03	G02	G04	G05	G06
Tare ID	AA08	AB37	AB35	AB16	AB36	AB28
Mass of tare	6.6	6.6	6.7	6.6	6.6	6.8
Mass wet + tare	328.9	279.6	311.3	307.3	306.8	282.8
Mass dry + tare	245.6	212.5	234.7	238.0	247.9	206.2
Mass water	83.3	67.1	76.6	69.3	59.0	76.6
Mass dry soil	239.0	205.9	228.0	231.4	241.3	199.5
Moisture %	34.9%	32.6%	33.6%	29.9%	24.4%	38.4%

Test Pit	TH16-01	TH16-01	TH16-01	TH16-01	TH16-01	TH16-02
Depth (m)	1.5 - 1.7	1.8 - 2.1	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	0.2 - 0.2
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	AB22	AA07	AA04	Z49	AB33	C17
Mass of tare	6.6	6.5	6.8	8.5	6.6	8.4
Mass wet + tare	307.6	324.7	263.3	372.4	294	80.5
Mass dry + tare	218.4	233.0	187.0	266.3	198.0	73.8
Mass water	89.2	91.7	76.3	106.1	96.0	6.7
Mass dry soil	211.8	226.5	180.2	257.8	191.4	65.4
Moisture %	42.1%	40.5%	42.3%	41.2%	50.2%	10.2%

Test Pit	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02	TH16-02
Depth (m)	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	1.2 - 1.4	1.7 - 1.8	2.1 - 2.3
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	AC01	D38	AC02	AA18	F73	F145
Mass of tare	6.6	8.5	6.6	6.6	8.5	8.7
Mass wet + tare	278.1	319.8	333.0	300.9	287.3	281.1
Mass dry + tare	182.5	249.3	255.3	222.1	211.7	197.0
Mass water	95.6	70.5	77.7	78.8	75.6	84.2
Mass dry soil	175.9	240.8	248.7	215.5	203.2	188.3
Moisture %	54.3%	29.3%	31.2%	36.6%	37.2%	44.7%

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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-02b Sony Place

Sample Date 10-Feb-16
Test Date 09-Mar-16
Technician LI

Test Pit	TH16-02	TH16-02	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	2.4 - 2.6	2.7 - 2.9	0.2 - 0.2	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	K7	Z60	H50	E91	N16	A13
Mass of tare	8.6	8.3	8.4	8.7	8.7	8.3
Mass wet + tare	307.5	300.4	283.5	262.9	327.2	291.0
Mass dry + tare	213.8	200.8	258.7	199.0	247.1	224.6
Mass water	93.7	99.6	24.8	64.0	80.1	66.4
Mass dry soil	205.2	192.5	250.3	190.3	238.4	216.3
Moisture %	45.7%	51.7%	9.9%	33.6%	33.6%	30.7%

Test Pit	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	1.1 - 1.2	1.4 - 1.5	2.0 - 2.1	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	H10	E31	W06	Z30	D23	E22
Mass of tare	8.6	8.4	8.4	8.4	8.9	8.6
Mass wet + tare	285.9	328.6	294.1	275.4	274.5	303.4
Mass dry + tare	225.9	256.0	215.1	192.1	190.3	207.1
Mass water	60.0	72.6	79.0	83.3	84.2	96.3
Mass dry soil	217.3	247.6	206.7	183.7	181.5	198.5
Moisture %	27.6%	29.3%	38.2%	45.3%	46.4%	48.5%

Test Pit	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04	TH16-04
Depth (m)	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9	1.2 - 1.4	1.8 - 2.0	2.1 - 2.3
Sample #	G31	G32	G33	G34	G35	G36
Tare ID	F69	Z57	C21	W23	C25	AA10
Mass of tare	8.5	8.4	8.4	8.4	8.3	6.6
Mass wet + tare	239.6	276.7	284.9	280.8	327.9	401.2
Mass dry + tare	163.3	207.2	216.1	206.1	233.2	277.6
Mass water	76.3	69.5	68.8	74.7	94.7	123.6
Mass dry soil	154.8	198.8	207.7	197.7	224.9	271.0
Moisture %	49.3%	35.0%	33.1%	37.8%	42.1%	45.6%

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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-02b Sony Place

Sample Date 10-Feb-16
Test Date 09-Mar-16
Technician LI

Test Pit	TH16-04	TH16-04	TH16-05	TH16-05	TH16-05	TH16-05
Depth (m)	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	0.9 - 1.1
Sample #	G37	G38	G40	G41	G42	G43
Tare ID	W12	AC08	AC10	Z39	AC15	E47
Mass of tare	8.4	6.6	6.5	8.5	6.8	8.6
Mass wet + tare	318.8	352.2	293.6	287.0	321.3	338.1
Mass dry + tare	219.3	239.3	236.0	237.5	243.2	262.7
Mass water	99.5	112.9	57.6	49.5	78.1	75.4
Mass dry soil	210.9	232.7	229.5	229.0	236.4	254.1
Moisture %	47.2%	48.5%	25.1%	21.6%	33.0%	29.7%

Test Pit	TH16-05	TH16-05	TH16-05	TH16-05	TH16-05	TH16-05
Depth (m)	1.2 - 1.4	1.5 - 1.7	2.0 - 2.1	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G44	G45	G46	G47	G48	G49
Tare ID	H29	AB68	F47	H2	W56	Z64
Mass of tare	8.4	6.7	8.6	8.4	8.5	8.3
Mass wet + tare	326.9	319.5	286.8	309.6	292.0	282.3
Mass dry + tare	258.5	232.1	209.1	219.2	202.6	194.0
Mass water	68.4	87.4	77.7	90.4	89.4	88.3
Mass dry soil	250.1	225.4	200.5	210.8	194.1	185.7
Moisture %	27.3%	38.8%	38.8%	42.9%	46.1%	47.5%

Test Pit	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06
Depth (m)	0.1 - 0.2	0.3 - 0.5	0.6 - 0.7	0.8 - 0.9	0.9 - 1.1	1.2 - 1.5
Sample #	G50	G51	G52	G53	G54	G55
Tare ID	F128	AB75	AC33	F90	N60	AB73
Mass of tare	8.5	6.6	6.7	8.3	8.4	6.6
Mass wet + tare	382.1	320.5	307.3	276.8	335.0	430.2
Mass dry + tare	349.9	233.0	229.0	201.9	254.9	352.3
Mass water	32.2	87.5	78.3	74.9	80.1	77.9
Mass dry soil	341.4	226.4	222.3	193.6	246.5	345.7
Moisture %	9.4%	38.6%	35.2%	38.7%	32.5%	22.5%

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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-02b Sony Place

Sample Date 10-Feb-16
Test Date 09-Mar-16
Technician LI

Test Pit	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06	TH16-06
Depth (m)	1.5 - 1.7	1.7 - 1.8	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G56	G57	G58	G59	G60	G61
Tare ID	E90	AB56	F26	P01	E113	A101
Mass of tare	8.7	6.65	8.3	8.8	8.5	8.7
Mass wet + tare	343.7	290.4	261.6	289.4	279.3	300.6
Mass dry + tare	259.7	211.1	191.7	206.2	194.8	202.9
Mass water	84.0	79.3	69.9	83.2	84.5	97.7
Mass dry soil	251.0	204.5	183.4	197.4	186.3	194.2
Moisture %	33.5%	38.8%	38.1%	42.1%	45.4%	50.3%

Test Pit	TH16-07	TH16-07	TH16-07	TH16-07	TH16-07	TH16-07
Depth (m)	0.2 - 0.2	0.3 - 0.5	0.5 - 0.6	0.6 - 0.8	0.8 - 0.9	1.2 - 1.4
Sample #	G62	G63	G64	G65	G66	G67
Tare ID	W63	D48	E2	E75	W51	F451
Mass of tare	8.4	8.4	8.5	8.5	8.5	8.3
Mass wet + tare	304.0	304.7	301.3	282.7	266.2	339.1
Mass dry + tare	288.0	236.1	221.9	206.2	196.7	249.6
Mass water	16.0	68.6	79.4	76.5	69.5	89.5
Mass dry soil	279.6	227.7	213.4	197.7	188.2	241.3
Moisture %	5.7%	30.1%	37.2%	38.7%	36.9%	37.1%

Test Pit	TH16-07	TH16-07	TH16-07	TH16-07		
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9		
Sample #	G68	G69	G70	G71		
Tare ID	W95	F56	K31	Z47		
Mass of tare	8.3	8.4	8.4	8.6		
Mass wet + tare	323.3	292.6	300.8	294.4		
Mass dry + tare	229.8	204.7	206.3	201.1		
Mass water	93.5	87.9	94.5	93.3		
Mass dry soil	221.5	196.3	197.9	192.5		
Moisture %	42.2%	44.8%	47.8%	48.5%		

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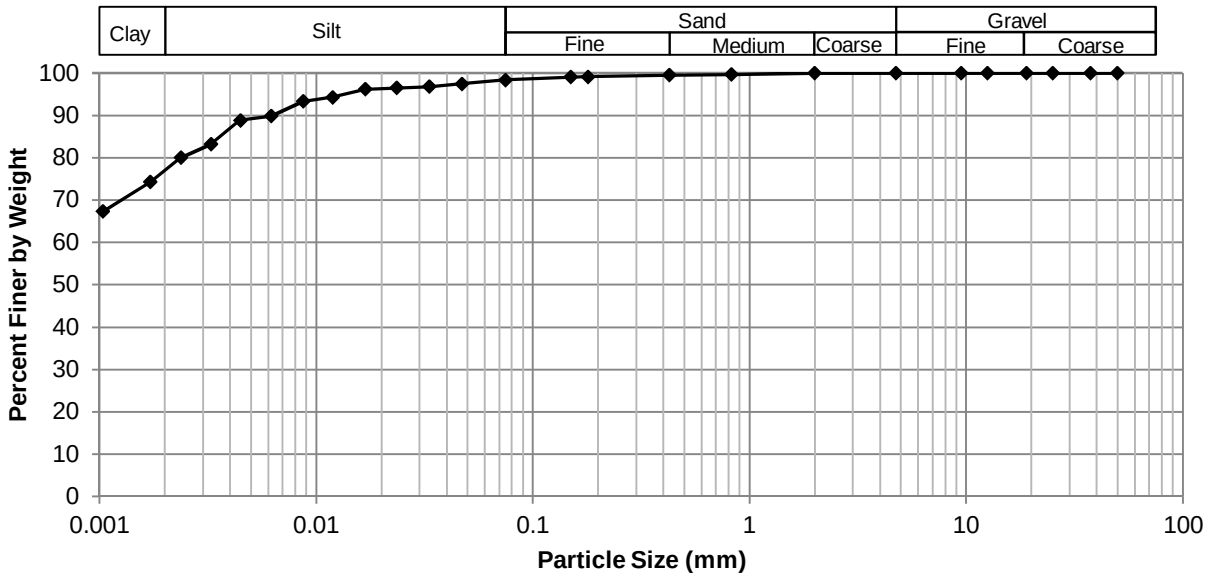
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	TH16 - 01
Sample #	G04
Depth (m)	0.6 - 0.8
Sample Date	10-Feb-16
Test Date	14-Mar-16
Technician	JW

Gravel	0.0%
Sand	1.6%
Silt	21.6%
Clay	76.8%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	98.40
37.5	100.00	2.00	100.00	0.0471	97.46
25.0	100.00	0.825	99.70	0.0333	96.82
19.0	100.00	0.425	99.49	0.0236	96.51
12.5	100.00	0.180	99.15	0.0168	96.19
9.50	100.00	0.150	99.07	0.0119	94.28
4.75	100.00	0.075	98.40	0.0087	93.33
				0.0062	89.84
				0.0045	88.89
				0.0033	83.17
				0.0024	79.99
				0.0017	74.28
				0.0010	67.32

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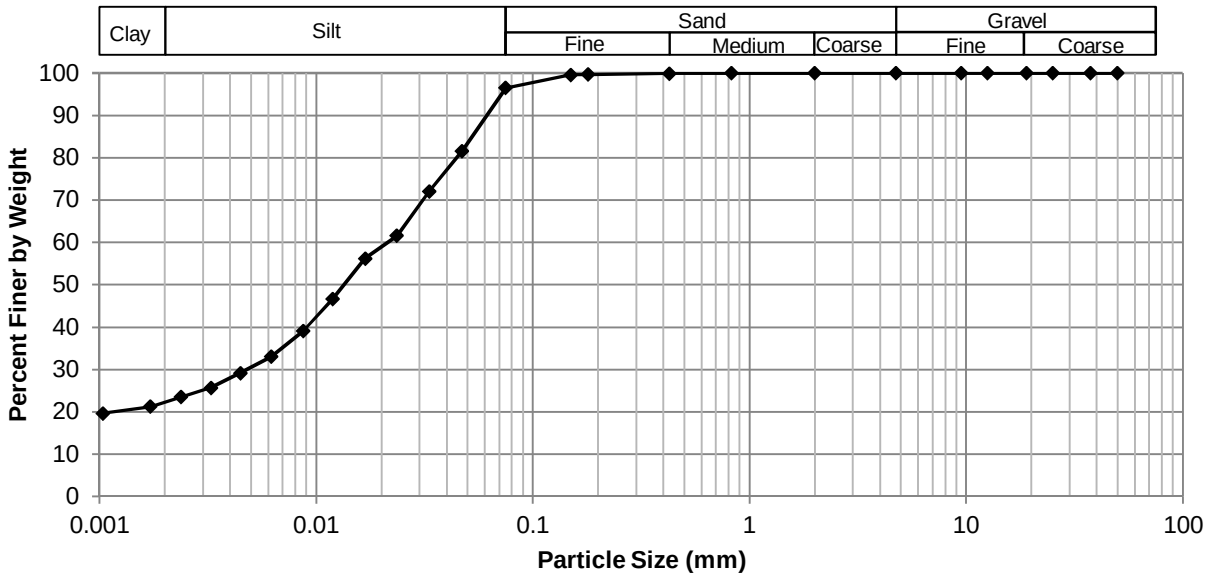
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	TH16-01
Sample #	G05
Depth (m)	0.8 - 0.9
Sample Date	10-Feb-16
Test Date	14-Mar-16
Technician	J.B./JW

Gravel	0.0%
Sand	3.5%
Silt	73.6%
Clay	22.9%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	96.48
37.5	100.00	2.00	100.00	0.0471	81.60
25.0	100.00	0.825	99.98	0.0333	72.07
19.0	100.00	0.425	99.91	0.0236	61.59
12.5	100.00	0.180	99.67	0.0168	56.19
9.50	100.00	0.150	99.60	0.0119	46.66
4.75	100.00	0.075	96.48	0.0087	39.04
				0.0062	33.00
				0.0045	29.19
				0.0033	25.70
				0.0024	23.47
				0.0017	21.25
				0.0010	19.69

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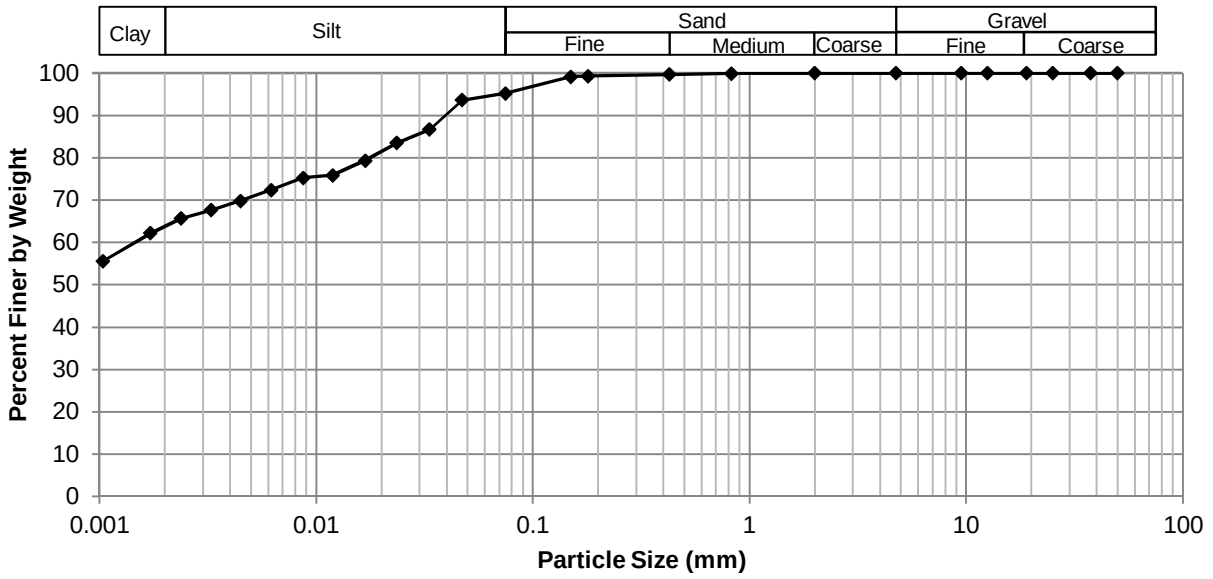
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	TH16 - 03
Sample #	G25
Depth (m)	1.1 - 1.2
Sample Date	10-Feb-16
Test Date	14-Mar-16
Technician	JW

Gravel	0.0%
Sand	4.8%
Silt	31.5%
Clay	63.7%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	95.24
37.5	100.00	2.00	100.00	0.0471	93.65
25.0	100.00	0.825	99.88	0.0333	86.66
19.0	100.00	0.425	99.70	0.0236	83.49
12.5	100.00	0.180	99.26	0.0168	79.36
9.50	100.00	0.150	99.13	0.0119	75.87
4.75	100.00	0.075	95.24	0.0087	75.23
				0.0062	72.37
				0.0045	69.83
				0.0033	67.61
				0.0024	65.70
				0.0017	62.21
				0.0010	55.57

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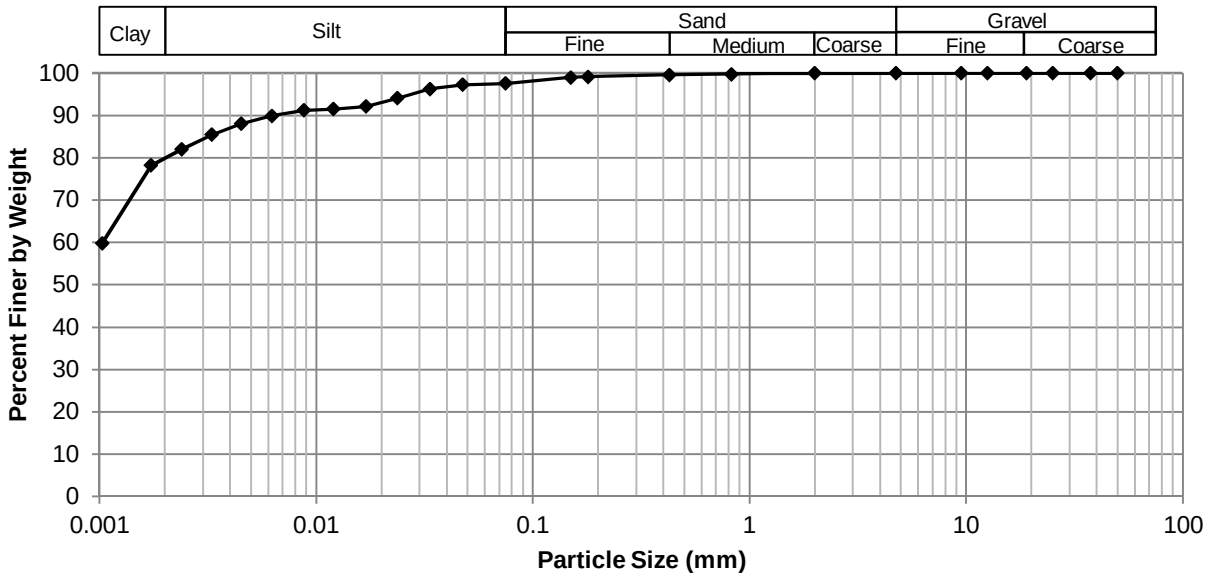
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035 032 00
Client	Morriosn Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	Th16 - 07
Sample #	G64
Depth (m)	0.3 - 0.5
Sample Date	10-Feb-16
Test Date	14-Mar-16
Technician	JW

Gravel	0.0%
Sand	2.5%
Silt	17.8%
Clay	79.7%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	97.52
37.5	100.00	2.00	100.00	0.0475	97.23
25.0	100.00	0.825	99.76	0.0336	96.28
19.0	100.00	0.425	99.59	0.0237	94.06
12.5	100.00	0.180	99.13	0.0170	92.15
9.50	100.00	0.150	98.99	0.0120	91.52
4.75	100.00	0.075	97.52	0.0088	91.20
				0.0062	89.93
				0.0045	88.02
				0.0033	85.48
				0.0024	81.99
				0.0017	78.18
				0.0010	59.76

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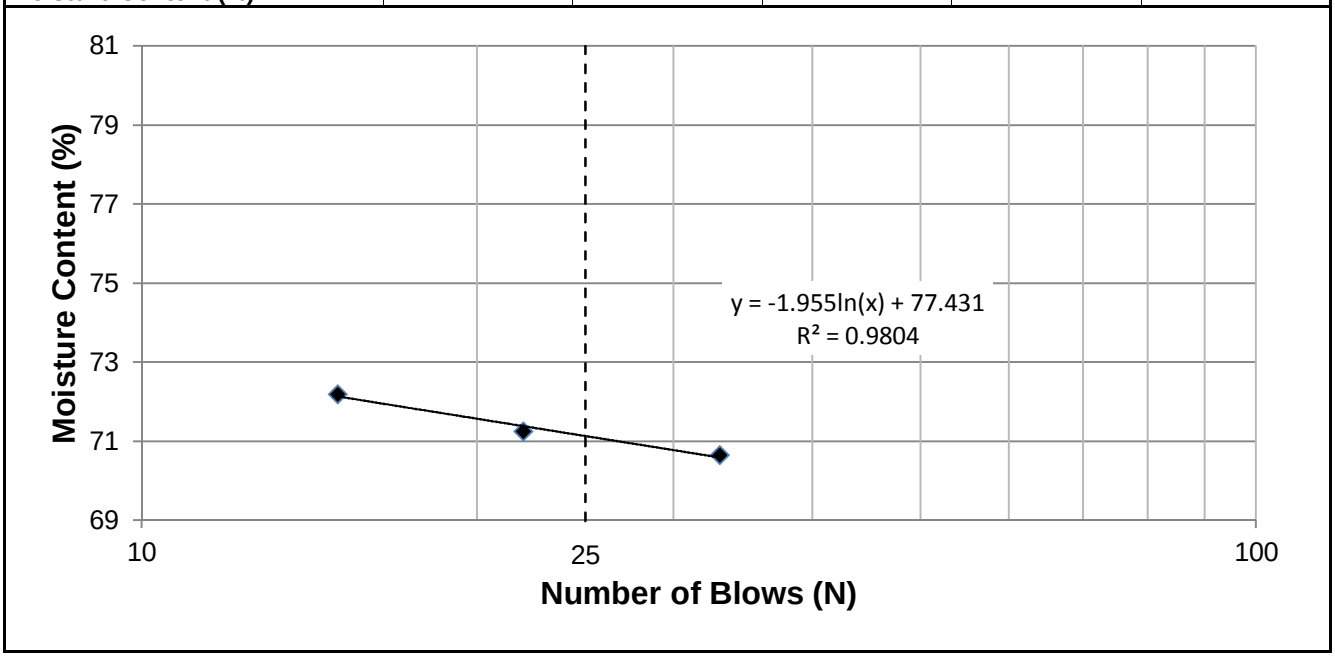
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	TH16-01
Sample #	G04
Depth (m)	0.6 - 0.8
Sample Date	
Test Date	10-Mar-16
Technician	JW/JB

Liquid Limit	71
Plastic Limit	25
Plasticity Index	47

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	33	22	15		
Mass Wet Soil + Tare (g)	22.891	24.015	22.094		
Mass Dry Soil + Tare (g)	19.306	19.899	18.710		
Mass Tare (g)	14.232	14.123	14.023		
Mass Water (g)	3.585	4.116	3.384		
Mass Dry Soil (g)	5.074	5.776	4.687		
Moisture Content (%)	70.654	71.260	72.200		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.538	21.149			
Mass Dry Soil + Tare (g)	20.053	19.766			
Mass Tare (g)	13.999	14.146			
Mass Water (g)	1.485	1.383			
Mass Dry Soil (g)	6.054	5.620			
Moisture Content (%)	24.529	24.609			

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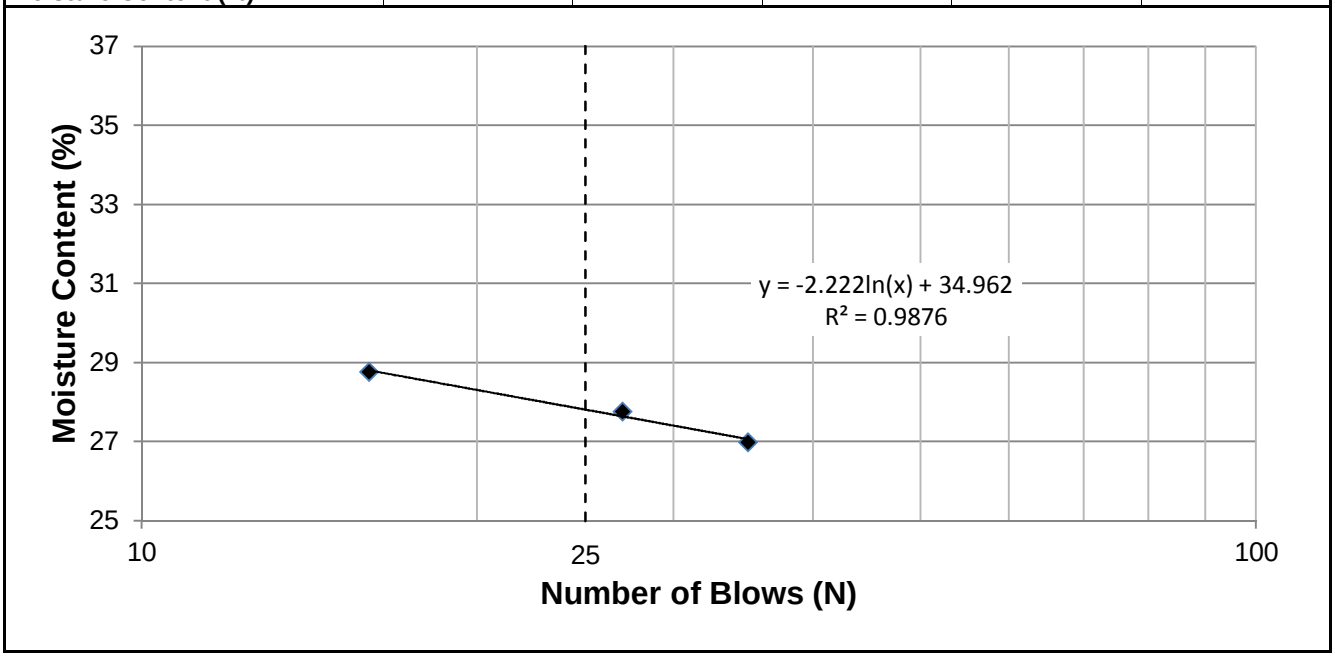
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	TH16-01
Sample #	G05
Depth (m)	0.76-0.91
Sample Date	
Test Date	14-Mar-16
Technician	JW/JB

Liquid Limit	28
Plastic Limit	17
Plasticity Index	11

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	16	27	35		
Mass Wet Soil + Tare (g)	23.170	24.474	24.940		
Mass Dry Soil + Tare (g)	21.153	22.213	22.622		
Mass Tare (g)	14.141	14.066	14.033		
Mass Water (g)	2.017	2.261	2.318		
Mass Dry Soil (g)	7.012	8.147	8.589		
Moisture Content (%)	28.765	27.753	26.988		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	25.666	28.288			
Mass Dry Soil + Tare (g)	23.986	26.258			
Mass Tare (g)	14.124	14.171			
Mass Water (g)	1.680	2.030			
Mass Dry Soil (g)	9.862	12.087			
Moisture Content (%)	17.035	16.795			

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Atterberg Limits
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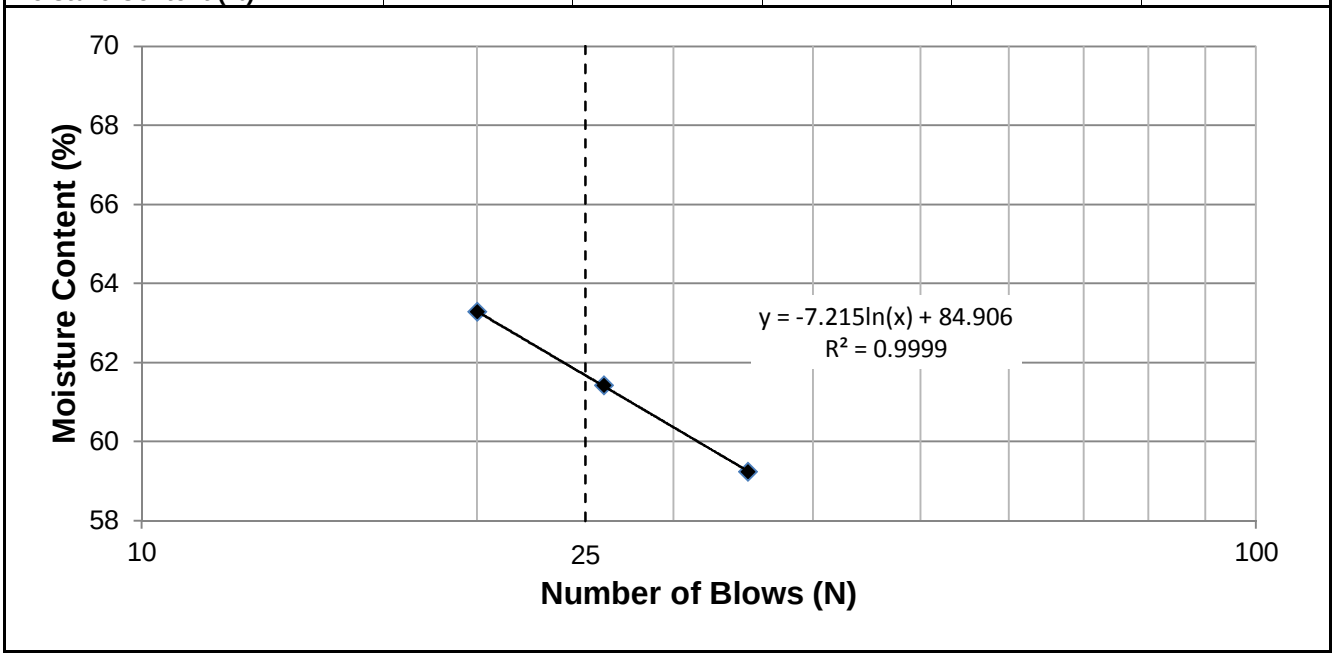
Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	TH16-03
Sample #	G25
Depth (m)	1.1-1.2
Sample Date	
Test Date	14-Mar-16
Technician	JW/JB

Liquid Limit	62
Plastic Limit	19
Plasticity Index	42

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	26	20		
Mass Wet Soil + Tare (g)	22.423	21.368	21.123		
Mass Dry Soil + Tare (g)	19.289	18.552	18.376		
Mass Tare (g)	13.999	13.967	14.035		
Mass Water (g)	3.134	2.816	2.747		
Mass Dry Soil (g)	5.290	4.585	4.341		
Moisture Content (%)	59.244	61.418	63.280		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.221	21.187			
Mass Dry Soil + Tare (g)	20.058	20.006			
Mass Tare (g)	13.971	14.002			
Mass Water (g)	1.163	1.181			
Mass Dry Soil (g)	6.087	6.004			
Moisture Content (%)	19.106	19.670			

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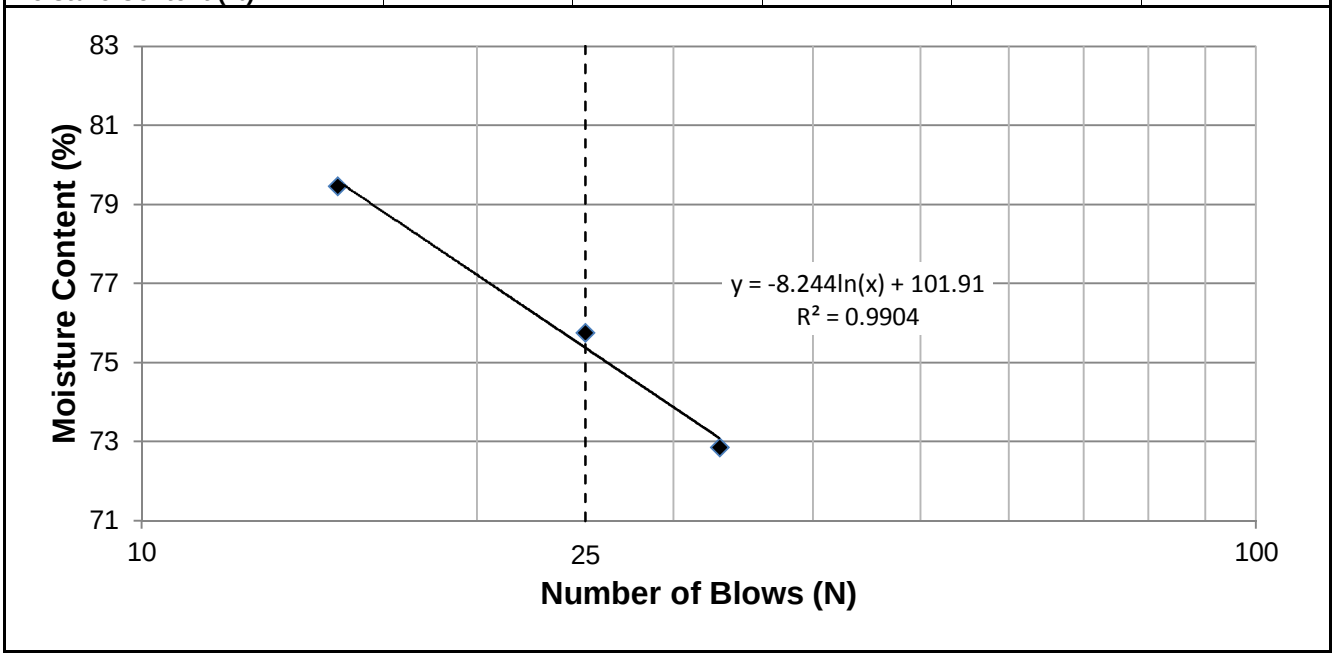
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Sony Place
Test Hole	TH16-07
Sample #	G64
Depth (m)	1.1-1.2
Sample Date	0.45-0.61
Test Date	14-Mar-16
Technician	JW/JB

Liquid Limit	75
Plastic Limit	24
Plasticity Index	51

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	33	25	15		
Mass Wet Soil + Tare (g)	22.423	21.513	21.695		
Mass Dry Soil + Tare (g)	18.884	18.340	18.295		
Mass Tare (g)	14.026	14.151	14.016		
Mass Water (g)	3.539	3.173	3.400		
Mass Dry Soil (g)	4.858	4.189	4.279		
Moisture Content (%)	72.849	75.746	79.458		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.089	23.344			
Mass Dry Soil + Tare (g)	19.695	21.488			
Mass Tare (g)	13.916	14.019			
Mass Water (g)	1.394	1.856			
Mass Dry Soil (g)	5.779	7.469			
Moisture Content (%)	24.122	24.849			

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

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

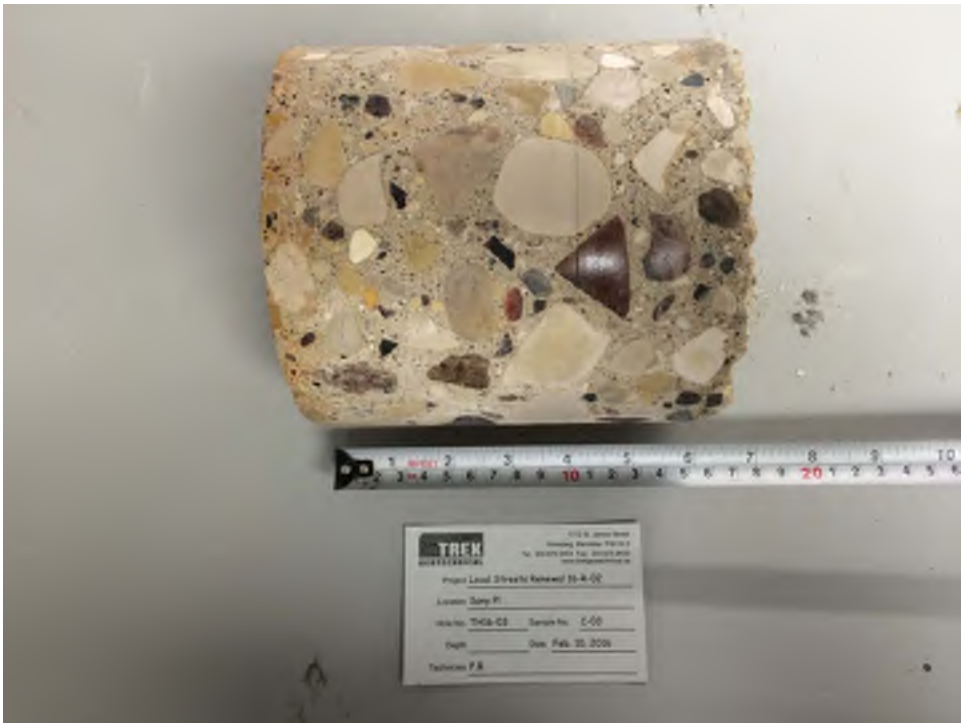


Photo 3: Pavement Core Sample at Test Hole TH16-03

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

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

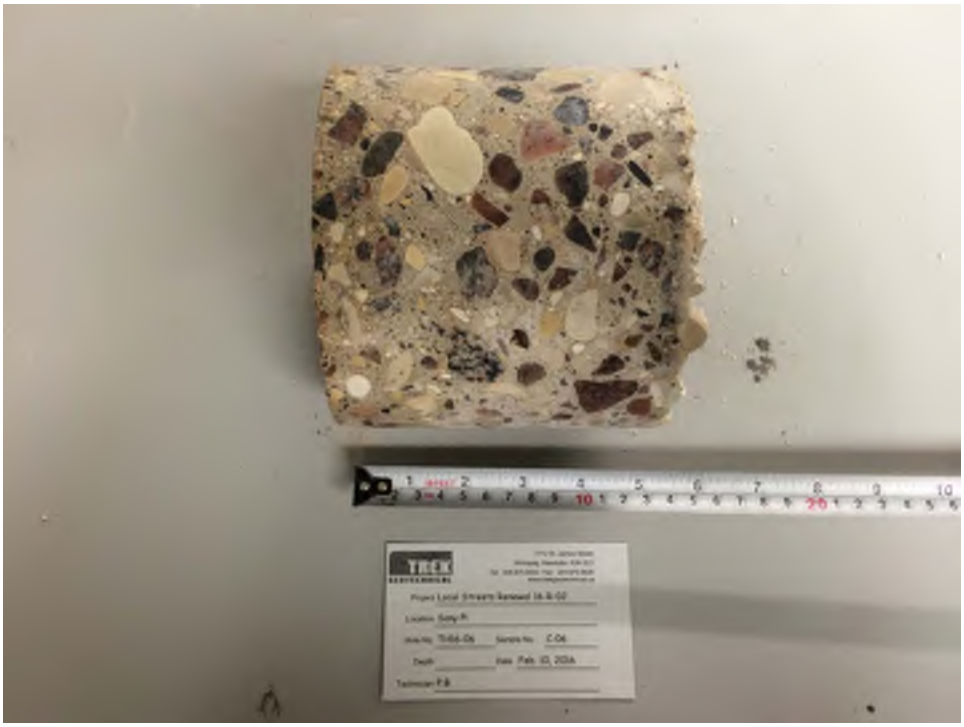


Photo 6: Pavement Core Sample at Test Hole TH16-06

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

Appendix C

Test Hole Logs, Summary Table & Lab Data – Hector 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-02b	**Location:**	Hector Avenue between Wilton St. and Hector Bay E.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		ASPHALT (25mm thick)				
		CONCRETE (175mm thick)				
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace clay, trace silt, brown, frozen, moist when thawed, insufficent recovery for sample				
		CLAY (FILL) - silty, trace gravel (<20mm dia.), trace sand, trace organics - mottled black and grey, frozen, moist and soft when thawed, high plasticity		G27	●	
0.5		CLAY - silty, trace silt inclusions (<5mm dia.) - dark brown - frozen to 1.5m, moist and stiff to very stiff when thawed - high plasticity		G28	●	✤ △
				G29	●	✤ △
1.0				G30	●	✤ △
		- brown - trace silt inclusions (<10mm dia.), trace oxidation 1.2 to 2.0m		G31	●	△✤
1.5		- stiff below 1.8m				
				G32	●	✤△
2.0				G33	●	✤ △
2.5				G34	●	✤ △
				G35	●	✤△
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) Test hole sloughed to 2.4m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at house number 1024, 2.2m south from north curb. U14 (5524439m N, 632129m E).

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

SUB-SURFACE LOG LOGS 2016-03-13 LOCAL STREETS PKG. 16-R-02B HECTOR 0035-032-00REVD_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Hector Avenue between Wilton St. and Hector Bay E.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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	Undrained Shear Strength (kPa) 0 50 100 150 200 250
		ASPHALT (15mm thick)				
		CONCRETE (185mm thick)				
		GRAVEL (FILL) - <20mm dia. gravel, some sand, trace silt, trace clay, brown frozen, moist and compact when thawed				
		CLAY (FILL) - silty, trace sand - dark brown - frozen, moist and very stiff when thawed - high plasticity		G19		
0.5				G20		
		CLAY AND SILT - trace sand - dark brown - frozen to 1.5m, moist and firm when thawed, high plasticity		G21		
1.0		SILT - trace clay, trace sand, trace oxidation - light brown - moist, soft - low plasticity		G22		
1.5				G23		
2.0		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, stiff to very stiff - high plasticity		G24		
2.5				G25		
				G26		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) Test hole sloughed to 1.4m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at house number 1036, 2.5m north from south curb. U14 (5524413m N, 632089m E).

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

SUB-SURFACE LOG LOGS 2016-03-13 LOCAL STREETS PKG. 16-R-02B HECTOR 0035-032-00REVD_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Hector Avenue between Wilton St. and Hector Bay E.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		ASPHALT (20mm thick)		
		CONCRETE (200mm thick)		
		CLAY (FILL) - some gravel (<20mm dia.), trace silt, trace sand, brown, frozen, moist, insufficent recovery for sample	G	G09
		ORGANIC CLAY - silty, black, frozen, moist and soft to firm when thawed, high plasticity	G	G10a
0.5		CLAY AND SILT - trace sand - brown, frozen - moist and firm when thawed - high plasticity	G	G10b
			G	G11
		SILT - trace clay, trace oxidation - brown - frozen to 1.5m, moist and soft to firm when thawed - low plasticity	G	G12
1.0			G	G13
1.5			G	G14
		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, stiff to very stiff - high plasticity	G	G15
2.0			G	G16
2.5			G	G17
			G	G18
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) Test hole sloughed to 2.1m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at house number 1050, 2.2m south from north curb. U14 (5524396m N, 632051m E).

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

SUB-SURFACE LOG LOGS 2016-03-13 LOCAL STREETS PKG. 16-R-02B HECTOR 0035-032-00REVD_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

Sub-Surface Log

Test Hole TH16-04

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02b	**Location:**	Hector Avenue between Wilton St. and Hector Bay E.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		ASPHALT (50mm thick)				
		CONCRETE (155mm thick)				
		CLAY (FILL) - silty, trace gravel (<5mm dia.), trace sand - brown - frozen, moist and firm when thawed - intermediate to high plasticity		G01		
0.5		CLAY - silty - mottled greyish brown and black - frozen to 1.5m, moist firm to stiff when thawed - high plasticity		G02		
1.0		- dark brown below 0.8m		G03		
		- trace silt inclusions (<5mm dia.) 1.2m-1.8m - brown		G04		
1.5				G05		
2.0		- firm to stiff below 2.2m		G06		
2.5				G07		
				G08		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) Test hole sloughed to 2.4m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at house number 1052, 2.2m north from south curb. U14 (5524370m N, 632013m 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-02b	**Location:**	Hector Avenue between Wilton St. and Hector Bay E.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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
		ASPHALT (145mm thick)		
		CONCRETE (135mm thick)		
		CLAY (FILL) - silty, trace sand, trace gravel (<15mm dia.) - mottled black and brown - frozen, moist and soft to firm when thawed - high plasticity		G36
0.5				G37
				G38
		CLAY - silty, trace silt inclusions (<10mm dia.) - dark brown - frozen to 1.6m, moist and stiff when thawed - high plasticity		G39
1.0				G40
		- stiff to very stiff below 1.4m		
1.5				G42
		SILT - trace to some clay, trace oxidation, light brown, moist, firm, low placticity		G43
		CLAY - silty, trace oxidation - brown - moist, stiff to very stiff - high plasticity		
2.5				G44
				G45
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) Test hole sloughed to 2.2m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at house number 1140, 1.6m south from north curb. U14 (5524350m N, 631968m E).

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

SUB-SURFACE LOG LOGS 2016-03-13 LOCAL STREETS PKG. 16-R-02B HECTOR 0035-032-00REVD_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Hector 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: 14U 5524439m N, 632129m E At house number 1024, 2.2m south from north curb	ASPHALT	25	CONCRETE	175											
						CLAY (FILL)	0.3	0.5	28							
						CLAY	0.5	0.6	27							
						CLAY	0.8	0.9	30							
						CLAY	1.1	1.2	28							
						CLAY	1.2	1.5	36							
						CLAY	1.8	2.0	40							
						CLAY	2.1	2.3	44							
						CLAY	2.4	2.6	43							
						CLAY	2.7	2.9	48							
TH16-02	UTM: 14U 5524413m N, 632089m E At house number 1036, 2.5m north from south curb	ASPHALT	15	CONCRETE	185											
						CLAY (FILL)	0.3	0.5	28							
						CLAY (FILL)	0.6	0.8	27							
						SILT AND CLAY	0.8	0.9	26	0	3	49	48	20	46	26
						SILT	1.1	1.5	16							
						SILT	1.8	2.0	19							
						CLAY	2.1	2.3	42							
						CLAY	2.4	2.6	43							
						CLAY	2.7	2.9	50							
TH16-03	UTM: 14U 5524396m N, 632051m E At house number 1050, 2.2m south from north curb	ASPHALT	20	CONCRETE	200											
						ORGANIC CLAY	0.3	0.4	31							
						ORGANIC CLAY	0.4	0.5	32							
						CLAY AND SILT	0.5	0.6	28							
						CLAY AND SILT	0.6	0.8	27	0	4	45	51	18	52	35
						SILT	0.8	0.9	26							
						SILT	0.9	1.1	25							
						SILT	1.1	1.5	21							
						CLAY	1.8	2.0	35							
						CLAY	2.1	2.3	42							
						CLAY	2.4	2.6	43							
						CLAY	2.7	2.9	48							

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Hector 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: 14U 5524370m N, 632013m E At house number 1052, 2.2m north from south curb	ASPHALT	50	CONCRETE	155											
						CLAY (FILL)	0.2	0.5	30							
						CLAY	0.6	0.8	30	0	3	35	63	23	69	46
						CLAY	0.9	1.1	28							
						CLAY	1.4	1.5	36							
						CLAY	1.7	1.8	47							
						CLAY	2.1	2.3	48							
						CLAY	2.4	2.6	55							
						CLAY	2.7	2.9	55							
TH16-05	UTM: 14U 5524350m N, 632968m E At house number 1140, 1.6m south from north curb	ASPHALT	145	CONCRETE	135											
						CLAY (FILL)	0.3	0.4								
						CLAY (FILL)	0.5	0.6	39							
						CLAY (FILL)	0.6	0.8	35							
						CLAY	0.9	1.1	35							
						CLAY	1.2	1.4	35							
						CLAY	1.5	1.7	39							
						SILT	2.1	2.2	33							
						CLAY	2.4	2.6	39							
						CLAY	2.7	2.9	43							

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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-02b, Hector Ave

Sample Date 11-Feb-16
Test Date 07-Mar-16
Technician JB

Test Pit	TH16 -04	TH16 -04	TH16 -04	TH16 -04	TH16 -04	TH16 -04
Depth (m)	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.4 - 1.5	1.7 - 1.8	2.1 - 2.3
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	AB40	Z67	Z54	P08	E36	E18
Mass of tare	6.6	8.5	8.4	8.4	8.6	8.4
Mass wet + tare	303.3	345.2	272.7	303.4	293.6	305.2
Mass dry + tare	234.6	266.9	214.6	224.7	203.1	209.6
Mass water	68.7	78.3	58.1	78.7	90.5	95.6
Mass dry soil	228.0	258.4	206.2	216.3	194.5	201.2
Moisture %	30.1%	30.3%	28.2%	36.4%	46.5%	47.5%

Test Pit	TH16 -04	TH16 -04	TH16 -03	TH16 -03	TH16 -03	TH16 -03
Depth (m)	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.5 - 0.6	0.5 - 0.6	0.6 - 0.8
Sample #	G07	G08	G09	G10 (Black)	G10 (Brown)	G11
Tare ID	AB29	Z06	E28	Z85	N101	A18
Mass of tare	6.7	8.4	8.4	8.3	8.5	8.5
Mass wet + tare	300.6	307.4	302.9	232.6	221.4	260.2
Mass dry + tare	196.5	200.9	233.1	178.2	175.5	207.4
Mass water	104.1	106.5	69.8	54.4	45.9	52.8
Mass dry soil	189.8	192.5	224.7	169.9	167.0	198.9
Moisture %	54.8%	55.3%	31.1%	32.0%	27.5%	26.5%

Test Pit	TH16 -03	TH16 -03	TH16 -03	TH16 -03	TH16 -03	TH16 -03
Depth (m)	0.8 - 0.9	0.9 - 1.1	1.1 - 1.5	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6
Sample #	G12	G13	G14	G15	G16	G17
Tare ID	Z103	F99	W82	F123	F33	AB07
Mass of tare	8.3	8.5	8.6	8.4	8.6	6.6
Mass wet + tare	305.4	276.8	448.5	308.7	292.3	320.7
Mass dry + tare	243.8	222.7	372.7	230.4	208.0	225.8
Mass water	61.6	54.1	75.8	78.3	84.3	94.9
Mass dry soil	235.5	214.2	364.1	222.0	199.4	219.2
Moisture %	26.2%	25.3%	20.8%	35.3%	42.3%	43.3%

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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-02b, Hector Ave

Sample Date 11-Feb-16
Test Date 07-Mar-16
Technician JB

Test Pit	TH16 -03	TH16 -02	TH16 -02	TH16 -02	TH16 -02	TH16 -02
Depth (m)	2.7 - 2.9	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	1.1 - 1.5	1.8 - 2.0
Sample #	G18	G19	G20	G21	G22	G23
Tare ID	AC03	W80	E46	E85	Z93	W09
Mass of tare	6.5	8.5	8.5	8.5	8.4	8.7
Mass wet + tare	291.4	308.5	275.7	318.1	334.4	285.7
Mass dry + tare	199.1	242.5	219.7	255.2	290.7	241.3
Mass water	92.3	66.0	56.0	62.9	43.7	44.4
Mass dry soil	192.6	234.0	211.2	246.7	282.3	232.6
Moisture %	47.9%	28.2%	26.5%	25.5%	15.5%	19.1%

Test Pit	TH16 -02	TH16 -02	TH16 -02	TH16 - 01	TH16 - 01	TH16 - 01
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9
Sample #	G24	G25	G26	G27	G28	G29
Tare ID	F117	Z36	F81	P13	Z131	H15
Mass of tare	8.5	8.5	8.5	8.4	8.4	8.5
Mass wet + tare	268.3	297.7	270.0	274.5	272.2	282.7
Mass dry + tare	190.9	210.6	183.2	217.1	216.7	219.3
Mass water	77.4	87.1	86.8	57.4	55.5	63.4
Mass dry soil	182.4	202.1	174.7	208.7	208.3	210.8
Moisture %	42.4%	43.1%	49.7%	27.5%	26.6%	30.1%

Test Pit	TH16 - 01	TH16 - 01	TH16 - 01	TH16 - 01	TH16 - 01	TH16 - 01
Depth (m)	1.1 - 1.2	1.2 - 1.5	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G30	G31	G32	G33	G34	G35
Tare ID	C7	E99	D33	N107	H38	Z45
Mass of tare	8.5	8.5	8.3	8.4	8.5	8.4
Mass wet + tare	255.3	261.0	258.2	264.5	276.7	312.0
Mass dry + tare	201.6	194.1	187.0	186.7	195.9	213.5
Mass water	53.7	66.9	71.2	77.8	80.8	98.5
Mass dry soil	193.1	185.6	178.7	178.3	187.4	205.1
Moisture %	27.8%	36.0%	39.8%	43.6%	43.1%	48.0%

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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-02b, Hector Ave

Sample Date 11-Feb-16
Test Date 07-Mar-16
Technician JB

Test Pit	TH16 - 05	TH16 - 05	TH16 - 05	TH16 - 05	TH16 - 05	TH16 - 05
Depth (m)	0.5 - 0.6	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	2.1 - 2.3
Sample #	G37	G38	G39	G40	G42	G43
Tare ID	K25	E138	Z104	Z95	Z25	N64
Mass of tare	8.6	8.5	8.5	8.6	8.3	8.5
Mass wet + tare	289.6	275.8	286.1	231.4	250.4	292.7
Mass dry + tare	211.5	206.5	214.5	174.3	182.8	223.0
Mass water	78.1	69.3	71.6	57.1	67.6	69.7
Mass dry soil	202.9	198.0	206.0	165.7	174.5	214.5
Moisture %	38.5%	35.0%	34.8%	34.5%	38.7%	32.5%

Test Pit	TH16 - 05	TH16 - 05				
Depth (m)	2.4 - 2.6	2.7 - 2.9				
Sample #	G44	G45				
Tare ID	W84	D34				
Mass of tare	8.4	8.5				
Mass wet + tare	263.2	249.7				
Mass dry + tare	191.3	177.3				
Mass water	71.9	72.4				
Mass dry soil	182.9	168.8				
Moisture %	39.3%	42.9%				

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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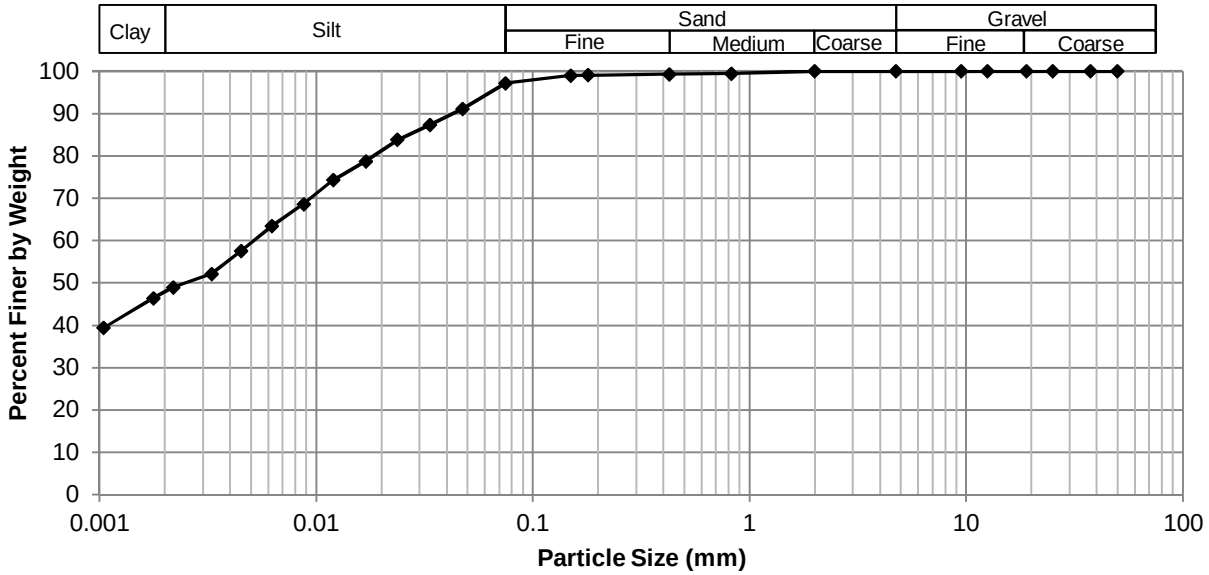
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Hector Avenue
Test Hole	TH16-02
Sample #	G21
Depth (m)	0.8 - 0.9
Sample Date	11-Feb-16
Test Date	14-Mar-16
Technician	LI

Gravel	0.0%
Sand	2.8%
Silt	49.3%
Clay	47.8%

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	97.16
37.5	100.00	2.00	100.00	0.0475	91.13
25.0	100.00	0.825	99.45	0.0336	87.32
19.0	100.00	0.425	99.27	0.0237	83.83
12.5	100.00	0.180	99.07	0.0170	78.75
9.50	100.00	0.150	99.01	0.0120	74.30
4.75	100.00	0.075	97.16	0.0088	68.59
				0.0062	63.51
				0.0045	57.47
				0.0033	52.13
				0.0022	48.96
				0.0018	46.42
				0.0010	39.42

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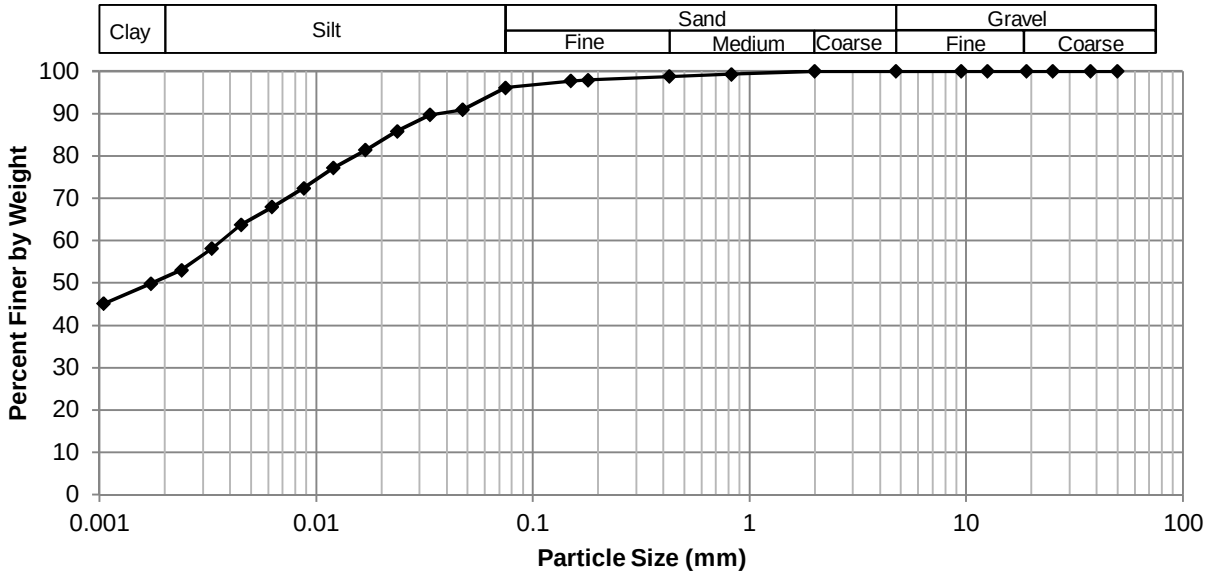
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Hector Avenue
Test Hole	TH16-03
Sample #	G11
Depth (m)	0.6 - 0.8
Sample Date	11-Feb-16
Test Date	14-Mar-16
Technician	LI

Gravel	0.0%
Sand	3.9%
Silt	44.9%
Clay	51.2%

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	96.14
37.5	100.00	2.00	100.00	0.0473	90.93
25.0	100.00	0.825	99.31	0.0335	89.66
19.0	100.00	0.425	98.76	0.0237	85.85
12.5	100.00	0.180	97.92	0.0169	81.40
9.50	100.00	0.150	97.69	0.0120	77.16
4.75	100.00	0.075	96.14	0.0088	72.40
				0.0062	67.95
				0.0045	63.77
				0.0033	58.11
				0.0024	53.08
				0.0017	49.91
				0.0010	45.13

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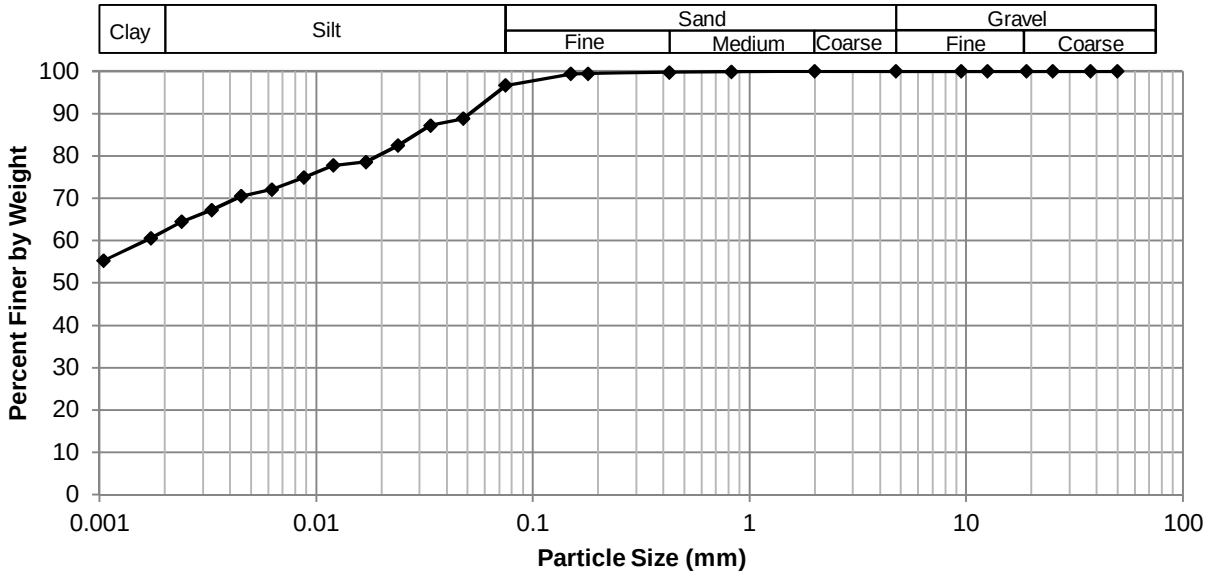
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Hector Avenue
Test Hole	TH16-04
Sample #	G02
Depth (m)	0.6 - 0.8
Sample Date	11-Feb-16
Test Date	14-Mar-16
Technician	LI

Gravel	0.0%
Sand	3.4%
Silt	34.4%
Clay	62.2%

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	96.64
37.5	100.00	2.00	99.96	0.0476	88.77
25.0	100.00	0.825	99.87	0.0337	87.18
19.0	100.00	0.425	99.76	0.0238	82.42
12.5	100.00	0.180	99.44	0.0170	78.61
9.50	100.00	0.150	99.36	0.0120	77.77
4.75	100.00	0.075	96.64	0.0088	74.91
				0.0062	72.05
				0.0045	70.47
				0.0033	67.29
				0.0024	64.49
				0.0017	60.63
				0.0010	55.27

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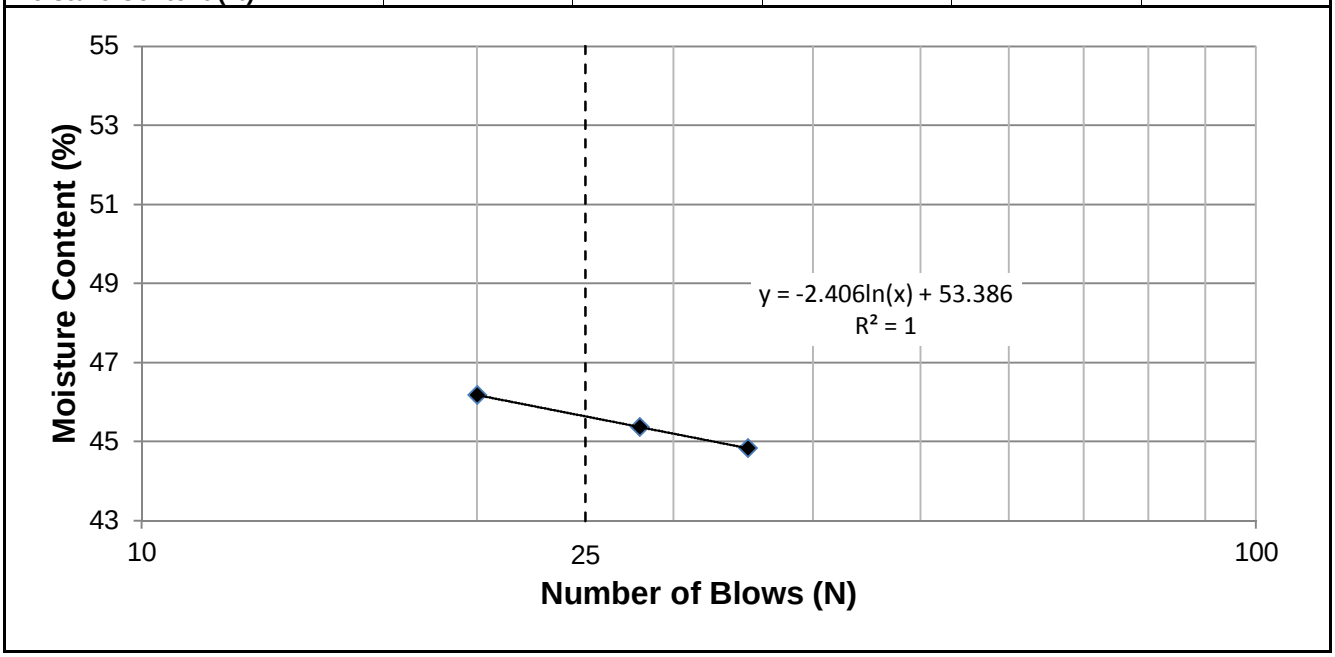
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Hector Avenue
Test Hole	TH16-02
Sample #	G21
Depth (m)	0.76-0.92
Sample Date	
Test Date	11-Mar-16
Technician	JW/JB

Liquid Limit	46
Plastic Limit	20
Plasticity Index	26

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	28	20		
Mass Wet Soil + Tare (g)	22.791	23.308	25.350		
Mass Dry Soil + Tare (g)	20.140	20.470	21.839		
Mass Tare (g)	14.227	14.214	14.236		
Mass Water (g)	2.651	2.838	3.511		
Mass Dry Soil (g)	5.913	6.256	7.603		
Moisture Content (%)	44.833	45.364	46.179		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	28.048	27.108			
Mass Dry Soil + Tare (g)	25.739	24.999			
Mass Tare (g)	14.044	14.142			
Mass Water (g)	2.309	2.109			
Mass Dry Soil (g)	11.695	10.857			
Moisture Content (%)	19.743	19.425			

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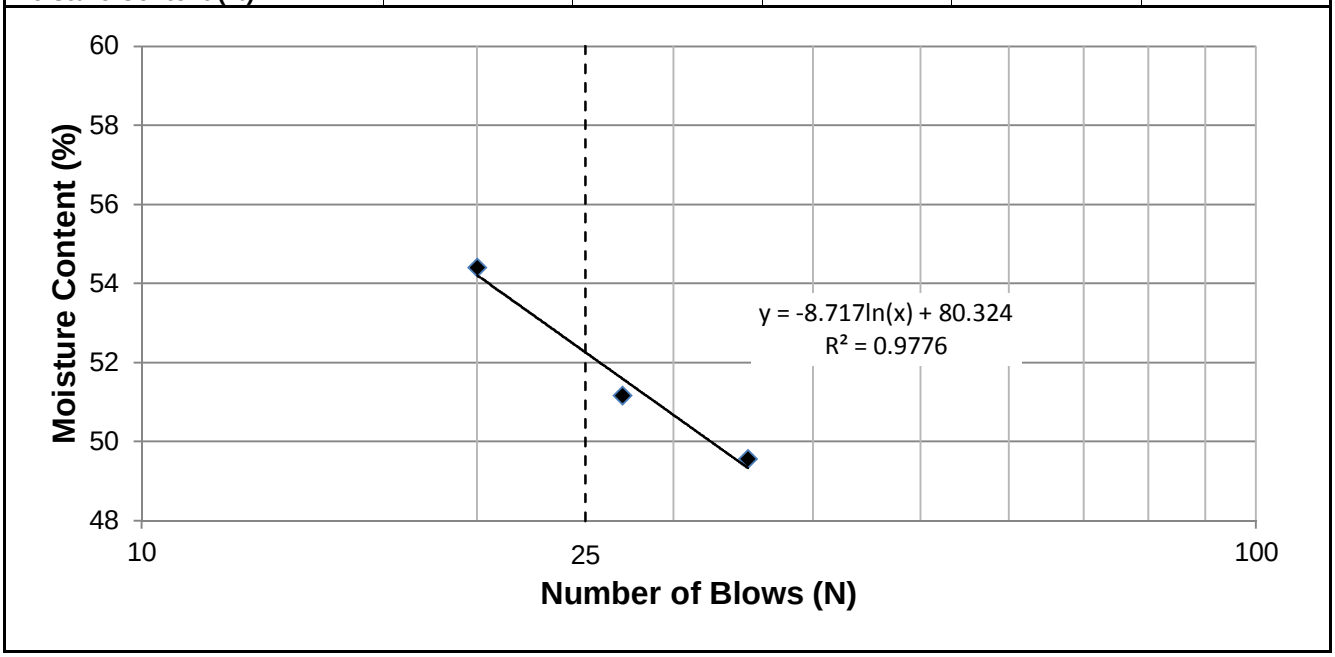
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Hector Avenue
Test Hole	TH16-03
Sample #	G11
Depth (m)	0.61-0.76
Sample Date	
Test Date	12-Mar-16
Technician	JW/JB

Liquid Limit	52
Plastic Limit	18
Plasticity Index	35

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	27	20		
Mass Wet Soil + Tare (g)	23.525	23.071	20.994		
Mass Dry Soil + Tare (g)	20.432	20.090	18.568		
Mass Tare (g)	14.191	14.264	14.109		
Mass Water (g)	3.093	2.981	2.426		
Mass Dry Soil (g)	6.241	5.826	4.459		
Moisture Content (%)	49.559	51.167	54.407		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	23.007	21.100			
Mass Dry Soil + Tare (g)	21.672	20.031			
Mass Tare (g)	14.169	14.001			
Mass Water (g)	1.335	1.069			
Mass Dry Soil (g)	7.503	6.030			
Moisture Content (%)	17.793	17.728			

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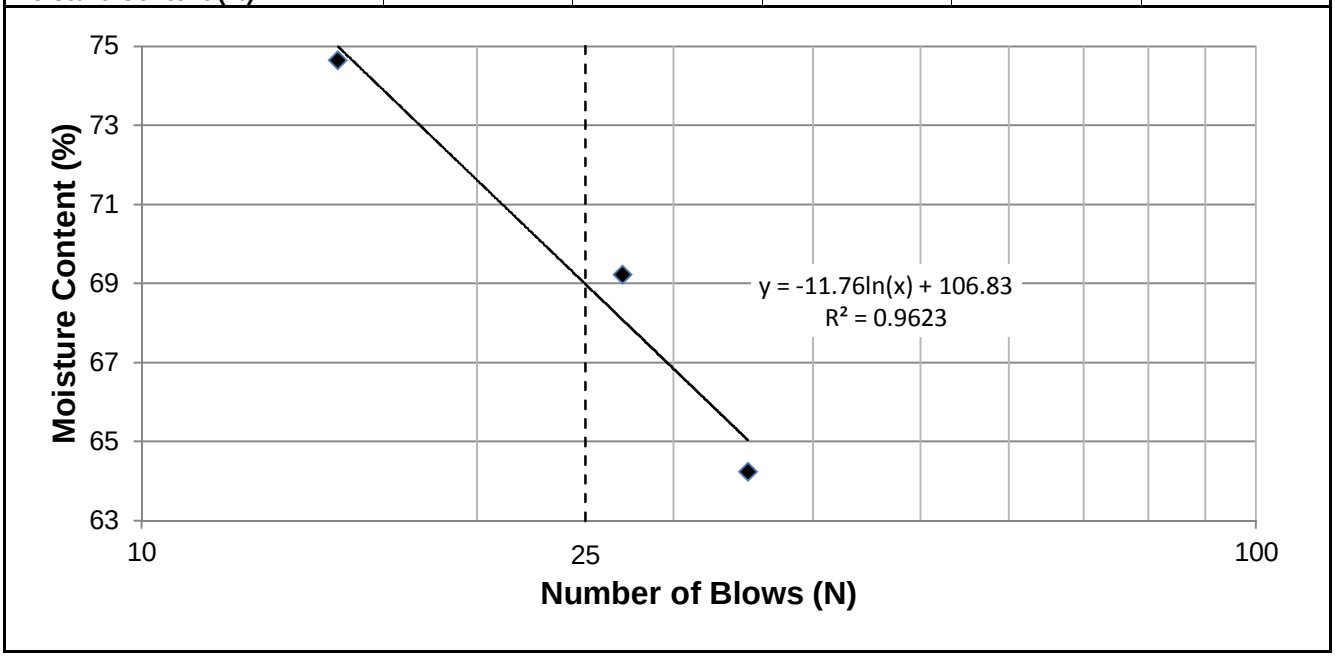
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Hector Avenue
Test Hole	TH16-04
Sample #	G02
Depth (m)	0.71-0.77
Sample Date	
Test Date	15-Mar-16
Technician	JW/JB

Liquid Limit	69
Plastic Limit	23
Plasticity Index	46

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	27	15		
Mass Wet Soil + Tare (g)	22.464	24.920	23.147		
Mass Dry Soil + Tare (g)	19.228	20.561	19.284		
Mass Tare (g)	14.191	14.264	14.109		
Mass Water (g)	3.236	4.359	3.863		
Mass Dry Soil (g)	5.037	6.297	5.175		
Moisture Content (%)	64.245	69.223	74.647		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	22.635	21.986			
Mass Dry Soil + Tare (g)	21.041	20.532			
Mass Tare (g)	14.028	14.086			
Mass Water (g)	1.594	1.454			
Mass Dry Soil (g)	7.013	6.446			
Moisture Content (%)	22.729	22.557			

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 D

Test Hole Logs, Summary Table & Lab Data – Yale 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-02b	**Location:**	Yale Avenue, between Rockwood St. and Cambridge St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
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 (70mm thick)		
		CONCRETE (160mm thick)		
		GRAVEL (FILL) - <25mm dia. gravel, trace silt, trace sand, brown, frozen, moist, insufficient recovery for sample, well graded, angular to sub angular		
		CLAY (FILL) - silty, trace to some organics (rootlets) - mottled black and brown, frozen, moist and firm when thawed, high plasticity	G	G01
0.5		SILT AND CLAY - trace rootlets - brown - frozen, moist and soft when thawed - intermediate plasticity	G	G02
			G	G03
1.0		SILT - trace sand - brown - frozen, moist and compact when thawed - no plasticity	G	G04
1.5		CLAY - some silt seams (<3mm thick) - brown - moist, stiff to firm - high plasticity	G	G05
		- no silt seams, trace silt inclusions (<10mm dia.), trace oxidation below 1.8m	G	G06
2.0			G	G07
2.5			G	G08
			G	G09
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) Test hole sloughed to 2.1m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at house number 320, 2.0m north from south curb. 14U (5525591m N, 631299m E).

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

SUB-SURFACE LOG LOGS 2016-03-010 LOCAL STREETS PKG. 16-R-02 YALE 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

Sub-Surface Log

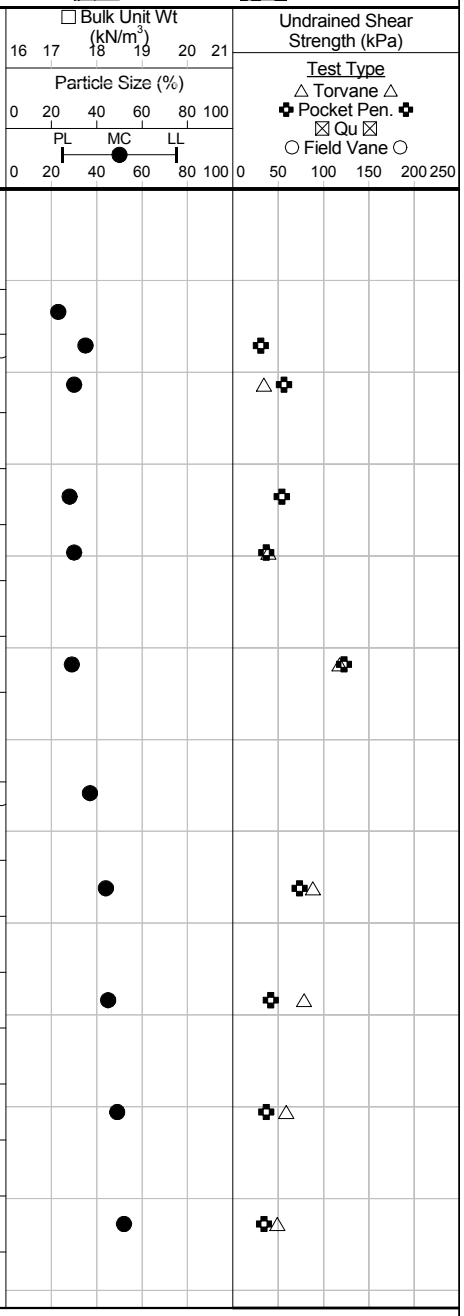
Test Hole TH16-02
1 of 1

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02b	**Location:**	Yale Avenue, between Rockwood St. and Cambridge St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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 (150mm thick)		
		CONCRETE (150mm thick)		
		CLAY (FILL) - silty, some sand, trace gravel (<20mm dia.) - mottled black and brown, frozen, moist and firm when thawed, high plasticity		G10
				G11
0.5		CLAY - silty, trace sand - black - frozen to 1.5m, moist and firm to stiff when thawed - high plasticity		G12
		-dark brown below 0.75m		G13
1.0				G14
				G15
1.5				
		SIIT - some clay, brown, moist, stiff, intermediate plasticity		G16
		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, stiff - high plasticity		G17
2.0				
		-firm to stiff below 2.2m		G18
2.5				G19
				G20
3.0				



End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 1.8m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at house number 345, 2.4m south from north curb. U14 (5525570m N, 631251m E).

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

SUB-SURFACE LOG LOGS 2016-03-010 LOCAL STREETS PKG. 16-R-02 YALE 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	Yale Avenue, between Rockwood St. and Cambridge St.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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 (85mm thick)				
		CONCRETE (155mm thick)				
		GRAVEL AND CLAY (FILL) - <50mm dia. gravel, some sand, trace silt - mottled black and brown, frozen, moist and soft to firm when thawed, low plasticity		G21		
		ORGANIC CLAY - silty, trace sand, trace roots - black, frozen, moist and firm when thawed, high plasticity		G22		
0.5		CLAY - silty, trace oxidaton, trace rootlets - dark brown - frozen, moist and stiff when thawed - high plasticity		G23		
				G24		
1.0		SILT AND CLAY - trace sand - brown, frozen, moist and stiff when thawed, high plasticity		G25		
		SILT - trace sand - brown - moist, dense, - low to no plasticity		G26		
1.5		CLAY - silty, trace silt inclusions (<5mm dia.) - brown, moist, stiff, high plasticity		G27		
		SILT - some clay, trace sand - brown - moist, firm - intermediate plasticity		G28		
2.0				G29		
		CLAY - silty, trace silt inclusions (<15mm dia.) - brown - moist, stiff - high plasticity				
2.5				G30		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) Test hole sloughed to 2.1m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at property line between house number 356 & 360, 2.1m north from south curb. U14 (5525541m N, 631208m E).

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

SUB-SURFACE LOG LOGS 2016-03-010 LOCAL STREETS PKG. 16-R-02 YALE 0035-032-00_JN.GPJ TREK GEOTECHNICAL.GDT 21/3/16

2016 Local Streets Package 16-R-02b
Sub-Surface Investigation
Yale 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: U14 (5525591m N, 631299m E) At house number 320, 2.0m north from south curb	ASPHALT	70	CONCRETE	160											
						GRAVEL (FILL)	0.2	0.3	-							
						CLAY (FILL)	0.3	0.5	36							
						CLAY AND SILT	0.5	0.6	30	0	6	57	37	16	35	19
						CLAY AND SILT	0.8	0.9	25							
						SILT	1.1	1.4	18							
						CLAY	1.5	1.7	26							
						CLAY	1.8	2.0	28							
						CLAY	2.1	2.3	46							
						CLAY	2.4	2.6	44							
						CLAY	2.7	2.9	45							
TH16-02	UTM: U14 (5525570m N, 631251m E) At house number 345, 2.4m south from north curb	ASPHALT	150	CONCRETE	150											
						CLAY (FILL)	0.3	0.4	23							
						CLAY	0.4	0.5	35							
						CLAY	0.5	0.6	30							
						CLAY	0.8	0.9	28							
						CLAY	0.9	1.1	30							
						CLAY	1.2	1.4	29							
						SILT	1.6	1.7	37							
						CLAY	1.8	2.0	44							
						CLAY	2.1	2.3	45							
						CLAY	2.4	2.6	49							
						CLAY	2.7	2.9	52							
TH16-03	UTM: U14 (5525541m N, 631208m E) At property line between house number 356 & 360, 2.1m north from south curb	ASPHALT	85	CONCRETE	155											
						GRAVEL AND CLAY (FILL)	0.2	0.3	18							
						ORGANIC CLAY	0.3	0.5	32	0	6	33	61	22	59	37
						CLAY	0.5	0.6	33							
						CLAY	0.8	0.9	30							
						SILT AND CLAY	1.1	1.2	25							
						SILT	1.2	1.5	14							
						CLAY	1.5	1.7	33							
						SILT	1.8	2.0	21							
						SILT	2.1	2.3	20							
						CLAY	2.7	2.9	37							

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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-02b, Yale Avenue

Sample Date 17-Feb-16
Test Date 08-Mar-16
Technician LI/JB

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	1.1 - 1.4	1.5 - 1.7	1.8 - 2.0
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	W24	W48	F112	N38	H9	D6
Mass of tare	8.4	8.4	8.2	8.4	8.5	8.3
Mass wet + tare	311.3	304.3	303.6	276.1	306.8	315.0
Mass dry + tare	231.5	236.3	244.4	235.3	245.0	248.3
Mass water	79.8	68.0	59.2	40.8	61.8	66.7
Mass dry soil	223.1	227.9	236.2	226.9	236.5	240.0
Moisture %	35.8%	29.8%	25.1%	18.0%	26.1%	27.8%

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	0.3 - 0.4	0.4 - 0.5	0.5 - 0.6
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	E76	W40	Z771	H55	N24	N27
Mass of tare	8.4	8.4	8.5	8.4	8.6	8.5
Mass wet + tare	277.7	227.9	275.3	252.2	294	278.2
Mass dry + tare	193.5	161.1	192.8	207.3	220.0	216.1
Mass water	84.2	66.8	82.5	44.9	74.0	62.1
Mass dry soil	185.1	152.7	184.3	198.9	211.4	207.6
Moisture %	45.5%	43.7%	44.8%	22.6%	35.0%	29.9%

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	1.6 - 1.7	1.8 - 2.0	2.1 - 2.3
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	Z119	AC29	AC12	F111	AC13	AC09
Mass of tare	8.6	6.7	6.5	8.1	6.7	6.6
Mass wet + tare	238.9	255.9	278.4	256.0	272.7	252.2
Mass dry + tare	187.9	198.3	217.5	189.3	191.7	175.9
Mass water	51.0	57.6	60.9	66.7	81.0	76.3
Mass dry soil	179.3	191.6	211.0	181.2	185.0	169.3
Moisture %	28.4%	30.1%	28.9%	36.8%	43.8%	45.1%

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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-02b, Yale Avenue

Sample Date 17-Feb-16
Test Date 08-Mar-16
Technician LI/JB

Test Pit	TH16-02	TH16-02	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	2.4 - 2.6	2.7 - 2.9	0.2 - 0.3	0.3 - 0.5	0.5 - 0.6	0.8 - 0.9
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	AB11	AC39	W79	AA05	Z121	F98
Mass of tare	6.6	6.6	8.5	6.5	8.3	8.2
Mass wet + tare	267.3	271.4	97.4	211.9	275.1	295.8
Mass dry + tare	182.0	180.3	83.9	162.3	208.9	229.1
Mass water	85.3	91.1	13.5	49.7	66.2	66.7
Mass dry soil	175.4	173.7	75.4	155.8	200.6	220.9
Moisture %	48.6%	52.4%	17.9%	31.9%	33.0%	30.2%

Test Pit	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03	TH16-03
Depth (m)	1.1 - 1.2	1.2 - 1.5	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3	2.7 - 2.9
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	W27	W69	AB64	AA12	AB93	AB87
Mass of tare	8.2	8.4	6.6	6.8	6.7	6.6
Mass wet + tare	377.4	271.6	271.7	322.8	314.9	284.5
Mass dry + tare	303.7	238.4	206.5	268.0	263.1	209.8
Mass water	73.7	33.2	65.2	54.8	51.8	74.7
Mass dry soil	295.5	230.0	199.9	261.2	256.4	203.2
Moisture %	24.9%	14.4%	32.6%	21.0%	20.2%	36.8%

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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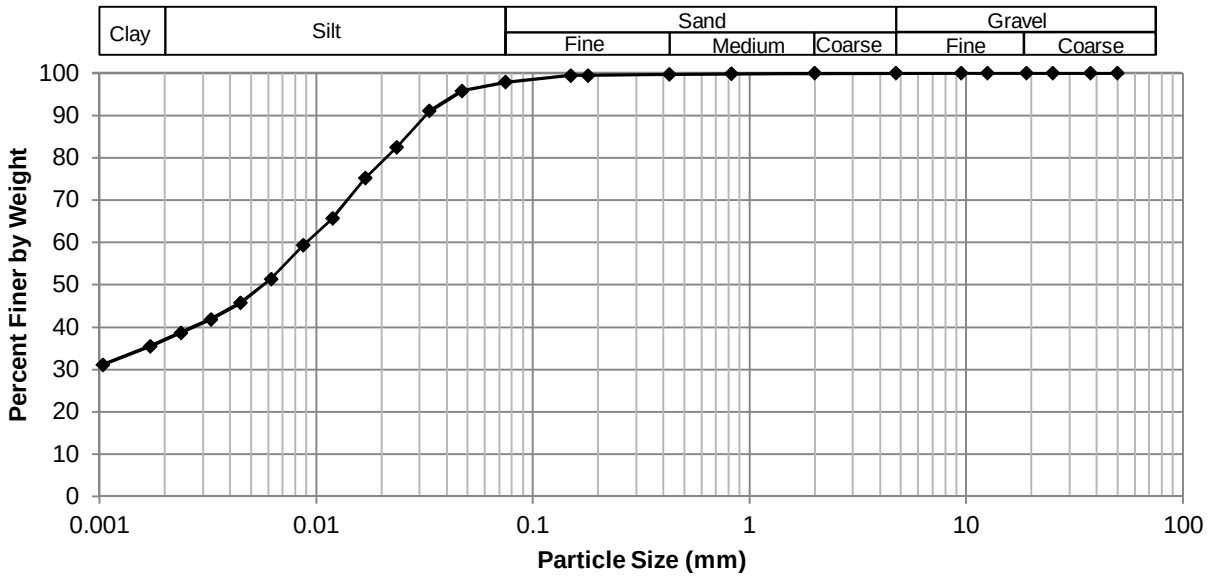
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035 - 032 - 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Yale Avenue
Test Hole	TH16 - 01
Sample #	G02
Depth (m)	0.5 - 0.6
Sample Date	17-Feb-16
Test Date	14-Mar-16
Technician	JW / JB

Gravel	0.0%
Sand	6.3%
Silt	56.8%
Clay	36.9%

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	97.83
37.5	100.00	2.00	99.98	0.0471	95.85
25.0	100.00	0.825	99.82	0.0333	91.09
19.0	100.00	0.425	99.66	0.0236	82.51
12.5	100.00	0.180	99.46	0.0168	75.21
9.50	100.00	0.150	99.41	0.0119	65.69
4.75	100.00	0.075	97.83	0.0087	59.34
				0.0062	51.40
				0.0045	45.69
				0.0033	41.88
				0.0024	38.70
				0.0017	35.53
				0.0010	31.11

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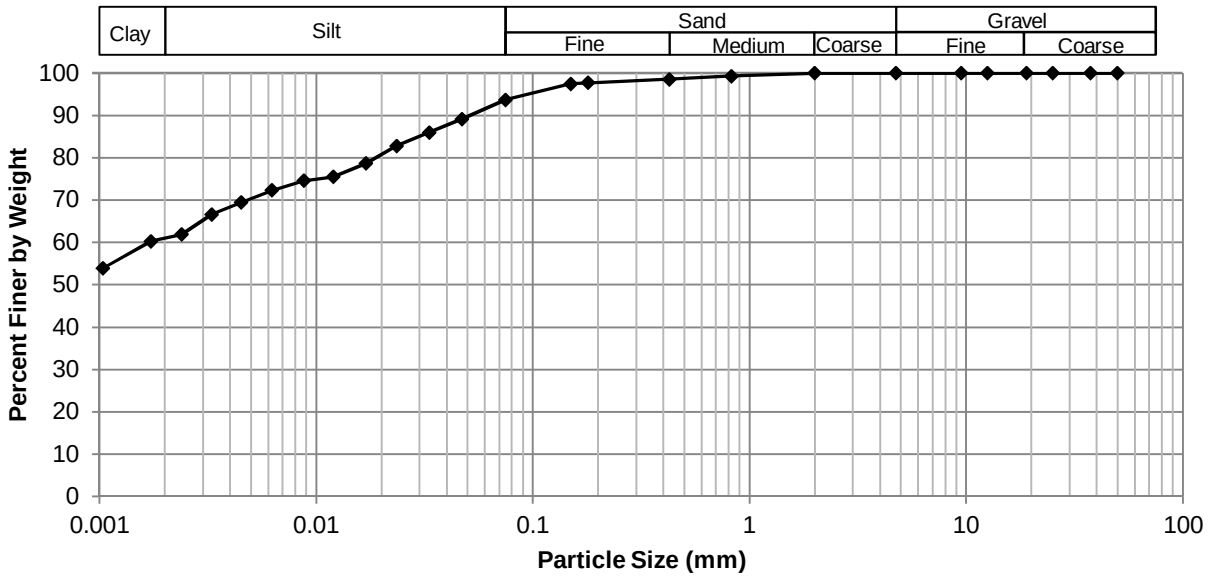
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035 - 032 - 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Yale Avenue
Test Hole	TH16 - 03
Sample #	G22
Depth (m)	0.3 - 0.5
Sample Date	17-Feb-16
Test Date	14-Mar-16
Technician	JW / JB

Gravel	0.0%
Sand	6.3%
Silt	32.8%
Clay	60.9%

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	93.69
37.5	100.00	2.00	99.98	0.0471	89.13
25.0	100.00	0.825	99.32	0.0333	85.96
19.0	100.00	0.425	98.55	0.0236	82.78
12.5	100.00	0.180	97.67	0.0170	78.68
9.50	100.00	0.150	97.46	0.0120	75.51
4.75	100.00	0.075	93.69	0.0088	74.56
				0.0062	72.33
				0.0045	69.48
				0.0033	66.62
				0.0024	61.86
				0.0017	60.27
				0.0010	53.92

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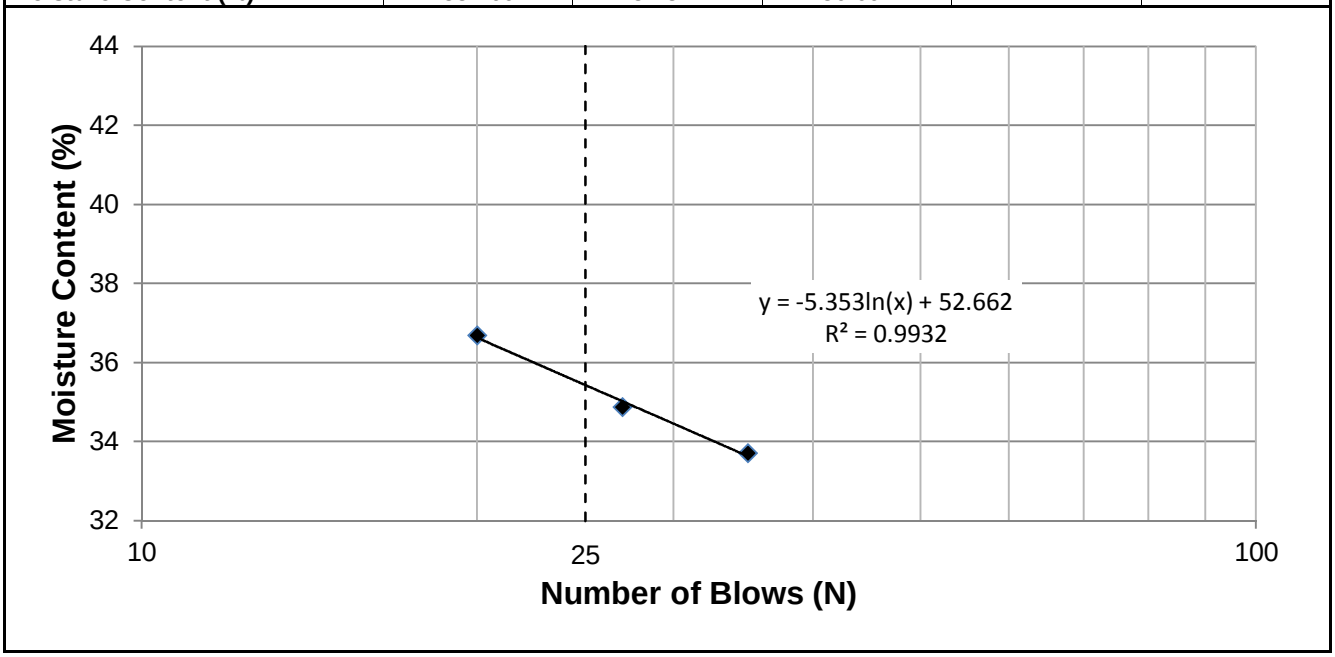
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Yale Avenue
Test Hole	TH16-01
Sample #	G02
Depth (m)	0.46-0.61
Sample Date	16-Feb-16
Test Date	14-Mar-16
Technician	JW/JB

Liquid Limit	35
Plastic Limit	16
Plasticity Index	19

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	27	20		
Mass Wet Soil + Tare (g)	22.516	21.655	23.318		
Mass Dry Soil + Tare (g)	20.390	19.697	20.821		
Mass Tare (g)	14.083	14.083	14.016		
Mass Water (g)	2.126	1.958	2.497		
Mass Dry Soil (g)	6.307	5.614	6.805		
Moisture Content (%)	33.709	34.877	36.694		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	27.839	27.971			
Mass Dry Soil + Tare (g)	25.901	26.054			
Mass Tare (g)	14.043	14.014			
Mass Water (g)	1.938	1.917			
Mass Dry Soil (g)	11.858	12.040			
Moisture Content (%)	16.343	15.922			

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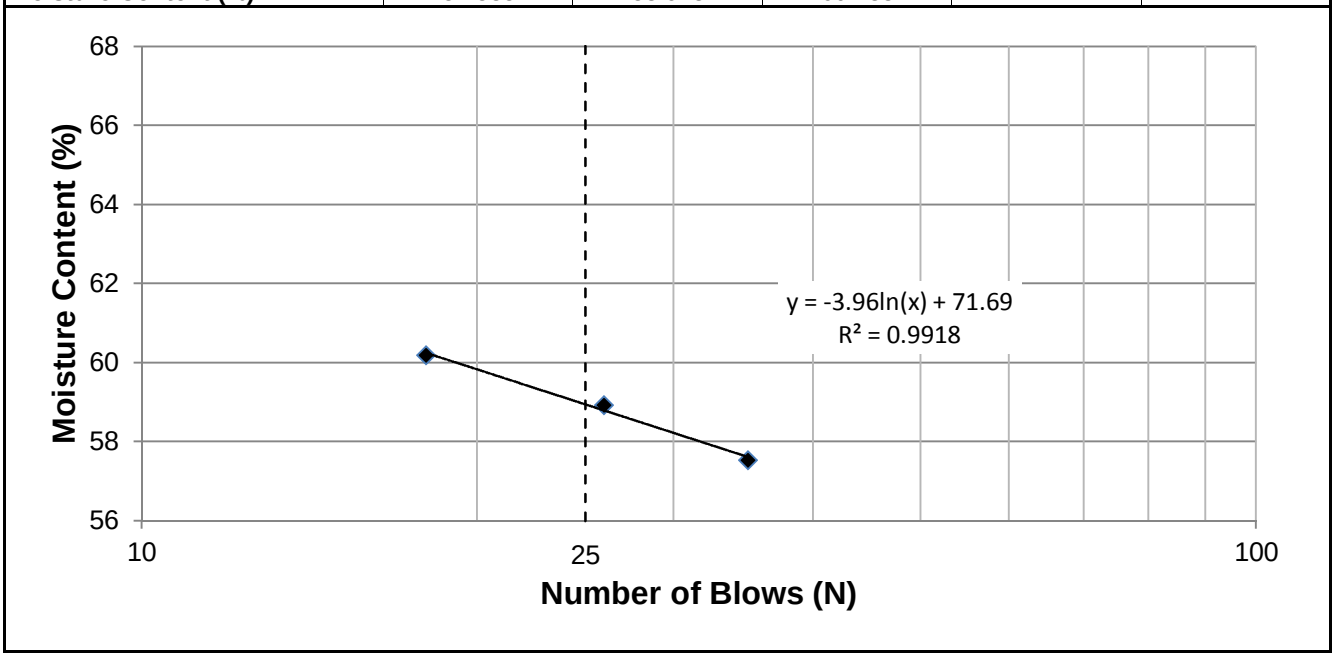
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, Yale Avenue
Test Hole	TH16-03
Sample #	G22
Depth (m)	0.31-0.46
Sample Date	16-Feb-16
Test Date	14-Mar-16
Technician	JW/JB

Liquid Limit	59
Plastic Limit	22
Plasticity Index	37

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	26	18		
Mass Wet Soil + Tare (g)	22.329	22.125	22.648		
Mass Dry Soil + Tare (g)	19.355	19.158	19.427		
Mass Tare (g)	14.186	14.123	14.075		
Mass Water (g)	2.974	2.967	3.221		
Mass Dry Soil (g)	5.169	5.035	5.352		
Moisture Content (%)	57.535	58.928	60.183		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	22.000	23.130			
Mass Dry Soil + Tare (g)	20.534	21.491			
Mass Tare (g)	13.997	14.129			
Mass Water (g)	1.466	1.639			
Mass Dry Soil (g)	6.537	7.362			
Moisture Content (%)	22.426	22.263			

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

Appendix E

Test Hole Logs, Summary Table & Lab Data – South Drive

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-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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
		ASPHALT - (70mm thick)				
		SAND (FILL) - some gravel (<20mm dia.), trace clay, trace silt, brown, moist, compact		G67		
		CLAY (FILL) - silty, trace gravel (<10mm dia.), - dark brown - frozen, moist and firm when thawed - high plasticity		G68		
0.5				G69		
		SILT AND CLAY - trace sand - brown - frozen to 1.3m, moist and soft when thawed - low plasticity		G70		
1.0				G71		
1.5				G72		
		CLAY -silty, trace silt inclusions (<10mm dia.) - brown - moist, stiff - high plasticity		G73		
2.0				G74		
2.5				G75		
				G76		
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 2.3m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 799 South Drive, 1.8m west from east curb. U14 (5522366m N, 633671m E).

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

SUB-SURFACE LOG LOGS 2016-03-14 LOCAL STREETS PKG. 16-R-02B SOUTH DR 0035-032-00 REVC_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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
		ASPHALT - (97mm thick)				
		SAND AND GRAVEL (FILL) - <15mm dia. gravel, trace clay, trace silt, brown, moist, compact		G01		
		CLAY (FILL) - some gravel (<15mm dia.), trace sand - brown - frozen, moist and firm to stiff when thawed - high plasticity		G02		
0.5		CLAY - silty - dark brown - frozen to 1.7m, moist and firm when thawed - high plasticity		G03		
1.0				G04		
				G05		
1.5						
		CLAY - trace to some silt - brown - moist, firm to stiff - high plasticity		G06		
2.0				G07		
2.5				G08		
				G09		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) Test hole sloughed to 2.1m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 793 South Drive, 2.0m east from west curb. U14 (5522405m N, 633670m E).

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

SUB-SURFACE LOG LOGS 2016-03-14 LOCAL STREETS PKG. 16-R-02B SOUTH DR 0035-032-00 REVC_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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 - (80mm thick)				
		SAND (FILL) - some gravel (<15mm dia.), trace clay, trace silt, brown, moist, compact		G10	●	
		CLAY (FILL) - some gravel (<10mm dia.), trace silt, trace sand, dark brown, moist, firm, intermediate plasticity		G11	●	
0.5		CLAY - silty - dark brown - frozen to 1.5m, firm when thawed - high plasticity		G12	●	✤
		- firm to stiff below 0.8m		G13	●	✤ △
1.0						
				G14	●	
1.5						
		SILT - some clay - brown, moist and stiff, low to intermediate plasticity		G15	●	
		CLAY - silty, trace silt inclusions (<10mm dia.) - brown - moist, firm to stiff - high plasticity		G16	●	✤ △
2.0				G17	●	✤ △
2.5				G18	●	✤ △
				G19	●	✤ △
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 2.6m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 790 South Drive, 1.8m west from east curb. U14 (5522444m N, 633676m E).

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

SUB-SURFACE LOG LOGS 2016-03-14 LOCAL STREETS PKG. 16-R-02B SOUTH DR 0035-032-00 REVC_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

Sub-Surface Log

Test Hole TH16-04

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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
		ASPHALT - (130mm thick)				
		SAND (FILL) - silty, some clay, some gravel (<10mm dia.), brown, compact, moist		G20		
		CLAY (FILL) - trace sand, trace gravel, (<10mm dia.), - dark brown, moist and firm when thawed - high plasticity		G21		
0.5		CLAY - silty - brown - frozen to 1.3m, moist and firm to stiff when thawed - high plasticity		G22		
1.0				G23		
				G24		
		- dark grey below 1.4m, trace silt				
1.5						
		- stiff below 1.9m		G25		
2.0						
		SILT - some clay - brown, moist, firm, intermediate plasticity		G26		
		CLAY - silty, trace silt inclusions (<10mm dia.), trace oxidation - brown - moist, firm to stiff - high plasticity		G27		
2.5				G28		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) Test hole sloughed to 2.3m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 781 South Drive, 1.7m east from west curb. U14 (5522484m N, 633676m 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-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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 / Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○
		ASPHALT - (140mm thick)				
		SAND (FILL) - silty, some clay, some gravel (<20mm dia.), brown, compact, moist		G29		
		CLAY (FILL) - silty, some gravel (<15mm dia.), trace sand - dark brown, frozen, moist and firm when thawed, high plasticity		G30		
0.5		CLAY - silty - dark brown - frozen to 1.5m, moist and firm to stiff when thawed - high plasticity		G31		
1.0				G32		
				G33		
1.5		- trace silt inclusions (<10mm dia.), stiff, below 1.6m		G34		
		SILT - some clay - brown, moist and firm, intermediate plasticity		G35		
2.0		CLAY - silty, - brown - moist and stiff - high plasticity		G36		
2.5				G37		
		- firm to stiff below 2.6m		G38		
3.0		End of Hole at 3.0m in CLAY				

Notes:
1) Test hole sloughed to 2.7m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 780 South Drive, 1.6m west from east curb. U14 (5522516m N, 633682m E).

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

SUB-SURFACE LOG LOGS 2016-03-14 LOCAL STREETS PKG. 16-R-02B SOUTH DR 0035-032-00 REVC_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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 - (85mm thick)				
		CLAY (FILL) - silty, some gravel (<20mm dia.), trace sand, brown, frozen, moist and firm when thawed, high plasticity				
		CLAY - silty - mottled dark brown and black - frozen to 1.5m, moist and firm when thawed - high plasticity		G39	●	
				G40	●	
0.5				G41	●	✤ △
		- dark brown below 0.7m				
1.0				G42	●	✤
		SILT - trace to some clay - brown - moist and firm - intermediate plasticity		G43	●	
1.5						
		CLAY - silty, - brown - moist, stiff - high plasticity		G44	●	✤ △
2.0				G45	●	✤
		- trace silt inclusions (<5mm dia.) below 2.3m				
2.5				G46	●	✤ △
				G47	●	✤ △
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 1.7m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 769 South Drive, 1.7m east from west curb. U14 (5522563m N, 633682m E).

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

SUB-SURFACE LOG LOGS 2016-03-14 LOCAL STREETS PKG. 16-R-02B SOUTH DR 0035-032-00 REVC_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

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-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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
		ASPHALT - (140mm thick)				
		CLAY (FILL) - some sand, some gravel (<15mm dia.), trace silt, brown, frozen, moist and firm when thawed, intermediate plasticity	Grab	G48	●	✤
0.5		CLAY - silty - brown - frozen to 1.6m, moist and soft to firm when thawed - high plasticity	Grab	G49	PL ● MC LL	✤
1.0			Grab	G50	●	✤
			Grab	G51	●	✤ △
1.5		- stiff below 1.4m				
		- some silt, firm to stiff below 1.8m	Grab	G52	●	✤ △
2.0			Grab	G53	●	✤ △
2.5			Grab	G54	●	✤ △
			Grab	G55	●	✤ △
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 2.1m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 762 South Drive, 1.5m west from east curb. U14 (5522603m N, 633687m E).

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

SUB-SURFACE LOG LOGS 2016-03-14 LOCAL STREETS PKG. 16-R-02B SOUTH DR 0035-032-00 REVC_PB.GPJ TREK GEOTECHNICAL.GDT 21/3/16

Sub-Surface Log

Test Hole TH16-08

Client:	Morrison Hershfield	**Project Number:**	0035-032-00
Project Name:	2016 Local Streets Package 16-R-02b	**Location:**	South Dr. - Between Crane Ave. and Dowker Ave.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Top of Pavement
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 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 - (130mm thick)				
		SAND (FILL) - some gravel (<15mm dia.), trace clay, trace silt, brown, moist, compact		G57		
		CLAY (FILL) - silty, sandy - brown - frozen, moist and firm when thawed - intermediate plasticity		G58		
0.5						
		- trace to some gravel below 0.75m		G59		
		CLAY AND SILT - mottled grey and brown - frozen to 1.6m, moist and firm when thawed - intermediate plasticity		G60		
1.0						
		CLAY - silty, trace silt inclusions (<5mm dia.) - brown - moist and stiff - high plasticity		G61		
				G62		
1.5						
		- trace silt, trace oxidation, very stiff, below 1.7m				
				G63		
2.0						
		SILT - trace to some clay - brown, moist, firm, intermediate plasticity		G64		
		CLAY, silty, trace sand - brown - moist, firm to stiff - high plasticity		g65		
2.5						
				G66		
3.0						

End of Hole at 3.0m in CLAY

Notes:
1) Test hole sloughed to 2.6m below surface.
2) No seapage observed.
3) Test hole backfilled with auger cuttings, bentonite, sand and cold patch asphalt.
4) Test hole located at 759 South Drive, 1.8m east from west curb. U14 (5522644m N, 633687m E).

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

Local Streets Package 16-R-02b
Sub-Surface Investigation
South Drive

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: 14U 5522366 N, 633671 E At house 799 South Drive, 1.8m west from east curb	N/A		ASPHALT	70											
						SAND (FILL)	0.1	0.2	8							
						CLAY (FILL)	0.3	0.5	27							
						CLAY (FILL)	0.6	0.8	28							
						SILT AND CLAY	0.8	0.9	27	0	4	61	35	17	37	20
						SILT AND CLAY	0.9	1.1	36							
						SILT AND CLAY	1.2	1.5	23							
						CLAY	1.8	2.0	37							
						CLAY	2.1	2.3	43							
						CLAY	2.4	2.6	49							
						CLAY	2.7	2.9	50							
TH16-02	UTM: 14U 5522405 N, 633670 E At house 793 South Drive, 2.0m east from west curb	N/A		ASPHALT	97											
						SAND AND GRAVEL (FILL)	0.1	0.2	8							
						CLAY (FILL)	0.3	0.5	17							
						CLAY	0.6	0.8	30							
						CLAY	0.9	1.1	32							
						CLAY	1.4	1.5	35							
						CLAY	1.8	2.0	46							
						CLAY	2.1	2.3	51							
						CLAY	2.4	2.6	45							
						CLAY	2.7	2.9	48							
TH16-03	UTM: 14U 5522444 N, 633676 E At house 790 South Drive, 1.8m west from east curb	N/A		ASPHALT	80											
						SAND (FILL)	0.1	0.2	8							
						CLAY (FILL)	0.3	0.5	18							
						CLAY	0.5	0.6	34							
						CLAY	0.8	0.9	30							
						CLAY	1.4	1.5	33							
						SILT	1.7	1.8	39							
						CLAY	2.0	2.1	45							
						CLAY	2.3	2.4	47							
						CLAY	2.6	2.7	48							
						CLAY	2.7	2.9	50							

Local Streets Package 16-R-02b
Sub-Surface Investigation
South Drive

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: 14U 5522484 N, 633676 E At house 781 South Drive, 1.7m east from west curb	N/A		ASPHALT	130											
						SAND (FILL)	0.2	0.2	11							
						CLAY (FILL)	0.3	0.5	23							
						CLAY	0.6	0.8	33	0	0	34	66	20	63	43
						CLAY	0.9	1.1	36							
						CLAY	1.2	1.4	36							
						CLAY	1.8	2.0	43							
						SILT	2.1	2.3	40							
						CLAY	2.4	2.6	50							
						CLAY	2.7	2.9	50							
TH16-05	UTM: 14U 5522516 N, 633682 E At house 780 South Drive, 1.6m west from east curb	N/A		ASPHALT	140											
						SAND (FILL)	0.2	0.2	8							
						CLAY (FILL)	0.3	0.5	25							
						CLAY	0.6	0.8	36							
						CLAY	0.9	1.1	33							
						CLAY	1.2	1.4	35							
						CLAY	1.5	1.7	40							
						SILT	1.8	2.0	36							
						CLAY	2.1	2.3	44							
						CLAY	2.4	2.6	45							
						CLAY	2.7	2.9	46							
TH16-06	UTM: 14U 5522563 N, 633682 E At house 769 South Drive, 1.7m east from west curb	N/A		ASPHALT	85											
						CLAY	0.2	0.3	19							
						CLAY	0.3	0.5	25							
						CLAY	0.5	0.6	38							
						CLAY	0.9	1.1	30							
						SILT	1.2	1.5	21							
						CLAY	1.8	2.0	37							
						CLAY	2.1	2.3	44							
						CLAY	2.4	2.6	40							
						CLAY	2.7	2.9	47							

Local Streets Package 16-R-02b
Sub-Surface Investigation
South Drive

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
TH16-07	UTM: 14U 5522603 N, 633687 E At house 762 South Drive, 1.5m west from east curb	N/A		ASPHALT	140											
						CLAY (FILL)	0.2	0.5	17							
						CLAY	0.6	0.8	35	0	0	20	80	22	70	47
						CLAY	1.1	1.2	32							
						CLAY	1.2	1.4	34							
						CLAY	1.8	2.0	44							
						CLAY	2.1	2.3	48							
						CLAY	2.4	2.6	51							
						CLAY	2.7	2.9	52							
TH16-08	UTM: 14U 5522644 N, 633687 E At house 759 South Drive, 1.8m east from west curb	N/A		ASPHALT	130											
						SAND (FILL)	0.1	0.2	8							
						CLAY (FILL)	0.3	0.5	29							
						CLAY (FILL)	0.8	0.8	16							
						CLAY AND SILT	0.9	1.1	23							
						CLAY	1.1	1.2	35							
						CLAY	1.2	1.4	38							
						CLAY	1.8	2.0	42							
						SILT	2.1	2.3	63							
						CLAY	2.4	2.6	37							
						CLAY	2.7	2.9	38							

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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-02b, South Drive

Sample Date 17-Feb-16
Test Date 14-Mar-16
Technician JW

Test Pit	TH16 - 02	TH16 - 02	TH16 - 02	TH16 - 02	TH16 - 02	TH16 - 02
Depth (m)	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.4 - 1.5	1.8 - 2.0
Sample #	G01	G03	G02	G04	G05	G06
Tare ID	AC06	AA24	P18	W20	N74	Z106
Mass of tare	6.7	6.7	8.5	8.5	8.5	8.4
Mass wet + tare	260.7	393.5	381.3	363.7	389.0	374.9
Mass dry + tare	242.0	336.3	294.9	276.9	289.7	258.8
Mass water	18.7	57.2	86.4	86.8	99.3	116.1
Mass dry soil	235.3	329.6	286.4	268.4	281.2	250.4
Moisture %	7.9%	17.4%	30.2%	32.3%	35.3%	46.4%

Test Pit	TH16 - 02	TH16 - 02	TH16 - 02	TH16 - 03	TH16 - 03	TH16 - 03
Depth (m)	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.1 - 0.2	0.3 - 0.5	0.5 - 0.6
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	AA22	C10	E135	AB32	Z126	N62
Mass of tare	6.6	8.5	8.3	6.7	8.4	8.4
Mass wet + tare	393.4	380.2	367.2	295.8	304.3	384.6
Mass dry + tare	263.5	264.2	251.6	274.9	258.3	289.4
Mass water	129.9	116.0	115.6	20.9	46.0	95.2
Mass dry soil	256.9	255.7	243.3	268.2	249.9	281.0
Moisture %	50.6%	45.4%	47.5%	7.8%	18.4%	33.9%

Test Pit	TH16 - 03	TH16 - 03	TH16 - 03	TH16 - 03	TH16 - 03	TH16 - 03
Depth (m)	0.8 - 0.9	1.4 - 1.5	1.7 - 1.8	2.0 - 2.1	2.3 - 2.4	2.6 - 2.7
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	N76	Z32	Z22	K23	H13	AC26
Mass of tare	8.5	8.9	8.3	8.5	8.5	6.5
Mass wet + tare	361.7	361.0	363.9	510.8	409.8	407.8
Mass dry + tare	280.8	274.4	264.4	355.1	281.0	277.0
Mass water	80.9	86.6	99.5	155.7	128.8	130.8
Mass dry soil	272.3	265.5	256.1	346.6	272.5	270.5
Moisture %	29.7%	32.6%	38.9%	44.9%	47.3%	48.4%

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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-02b, South Drive

Sample Date 17-Feb-16
Test Date 14-Mar-16
Technician JW

Test Pit	TH16 - 03	TH16 - 04	TH16 - 04	TH16 - 04	TH16 - 04	TH16 - 04
Depth (m)	2.7 - 2.9	0.2 - 0.2	0.3 - 0.5	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	H1	H66	F91	N57	F144	E105
Mass of tare	8.3	8.5	8.4	8.5	8.4	8.6
Mass wet + tare	302.9	280.8	380.7	389.4	381.1	379.5
Mass dry + tare	205.2	254.1	311.7	294.1	283.3	280.8
Mass water	97.7	26.7	69.0	95.3	97.8	98.7
Mass dry soil	196.9	245.6	303.3	285.6	274.9	272.2
Moisture %	49.6%	10.9%	22.7%	33.4%	35.6%	36.3%

Test Pit	TH16 - 04	TH16 - 04	TH16 - 04	TH16 - 04	TH16 - 05	TH16 - 05
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.2 - 0.2	0.3 - 0.5
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	E84	F19	W69	E110	W104	Z70
Mass of tare	8.5	8.5	8.4	9.0	8.6	8.6
Mass wet + tare	391.5	400.6	520.0	364.2	262.9	363.6
Mass dry + tare	275.6	288.6	350.3	246.5	243.5	291.5
Mass water	115.9	112.0	169.7	117.7	19.4	72.1
Mass dry soil	267.1	280.1	341.9	237.5	234.9	282.9
Moisture %	43.4%	40.0%	49.6%	49.6%	8.3%	25.5%

Test Pit	TH16 - 05	TH16 - 05	TH16 - 05	TH16 - 05	TH16 - 05	TH16 - 05
Depth (m)	0.6 - 0.8	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0	2.1 - 2.3
Sample #	G31	G32	G33	G34	G35	G36
Tare ID	D11	D8	K13	C4	F142	H10
Mass of tare	8.6	8.3	8.5	8.3	8.3	8.5
Mass wet + tare	398.0	381.1	388.3	480.7	448.6	427.8
Mass dry + tare	294.5	288.0	290.7	346.2	332.7	300.0
Mass water	103.5	93.1	97.6	134.5	115.9	127.8
Mass dry soil	285.9	279.7	282.2	337.9	324.4	291.5
Moisture %	36.2%	33.3%	34.6%	39.8%	35.7%	43.8%

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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-02b, South Drive

Sample Date 17-Feb-16
Test Date 14-Mar-16
Technician JW

Test Pit	TH16 - 05	TH16 - 05	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 06
Depth (m)	2.4 - 2.6	2.7 - 2.9	0.2 - 0.3	0.3 - 0.5	0.5 - 0.6	0.9 - 1.1
Sample #	G37	G38	G39	G40	G41	G42
Tare ID	W48	AB16	AA05	E2	K16	P33
Mass of tare	8.7	6.5	6.5	8.3	8.5	8.5
Mass wet + tare	389.0	385.3	354.0	370.5	384.0	430.0
Mass dry + tare	270.4	265.6	298.2	298.1	281.1	331.7
Mass water	118.6	119.7	55.8	72.4	102.9	98.3
Mass dry soil	261.7	259.1	291.7	289.8	272.6	323.2
Moisture %	45.3%	46.2%	19.1%	25.0%	37.7%	30.4%

Test Pit	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 06	TH16 - 07
Depth (m)	1.2 - 1.5	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9	0.2 - 0.5
Sample #	G43	G44	G45	G46	G47	G48
Tare ID	Z66	Z77	P37	AC05	Z133	E143
Mass of tare	8.5	8.5	8.5	6.6	8.8	8.4
Mass wet + tare	414.7	400.0	432.1	405.7	385.0	286.9
Mass dry + tare	343.1	295.0	303.2	291.1	264.4	246.5
Mass water	71.6	105.0	128.9	114.6	120.6	40.4
Mass dry soil	334.6	286.5	294.7	284.5	255.6	238.1
Moisture %	21.4%	36.6%	43.7%	40.3%	47.2%	17.0%

Test Pit	TH16 - 07	TH16 - 07	TH16 - 07	TH16 - 07	TH16 - 07	TH16 - 07
Depth (m)	0.6 - 0.8	1.1 - 1.2	1.2 - 1.4	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6
Sample #	G49	G50	G51	G52	G53	G54
Tare ID	AB47	AC04	H17	D50	Z99	H6
Mass of tare	6.7	6.7	8.6	8.5	8.4	8.5
Mass wet + tare	384.8	357.3	373.1	426.6	379.4	364.2
Mass dry + tare	286.4	271.4	280.9	299.1	258.3	244.5
Mass water	98.4	85.9	92.2	127.5	121.1	119.7
Mass dry soil	279.7	264.7	272.3	290.6	249.9	236.0
Moisture %	35.2%	32.5%	33.9%	43.9%	48.5%	50.7%

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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-02b, South Drive

Sample Date 17-Feb-16
Test Date 14-Mar-16
Technician JW

Test Pit	TH16 - 07	TH16 - 08	TH16 - 08	TH16 - 08	TH16 - 08	TH16 - 08
Depth (m)	2.7 - 2.9	0.0 - 0.1	0.1 - 0.2	0.3 - 0.5	0.8 - 0.8	0.9 - 1.1
Sample #	G55	G56	G57	G58	G59	G60
Tare ID	K20	AB99	Z89	A17	H50	Z12
Mass of tare	8.5	8.5	8.5	8.3	8.4	8.5
Mass wet + tare	355.3	196.0	223.1	335.2	172.5	367.8
Mass dry + tare	237.2	190.9	206.9	261.5	150.0	300.0
Mass water	118.1	5.1	16.2	73.7	22.5	67.8
Mass dry soil	228.7	182.4	198.4	253.2	141.6	291.5
Moisture %	51.6%	2.8%	8.2%	29.1%	15.9%	23.3%

Test Pit	TH16 - 08	TH16 - 08	TH16 - 08	TH16 - 08	TH16 - 08	TH16 - 08
Depth (m)	1.1 - 1.2	1.2 - 1.4	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9
Sample #	G61	G62	G63	G64	G65	G66
Tare ID	E44	W46	K4	AB49	N75	AB67
Mass of tare	8.4	8.5	8.4	6.6	8.4	6.6
Mass wet + tare	364.2	389.9	342.7	314.3	360.2	291.7
Mass dry + tare	272.6	285.2	243.2	195.4	265.5	212.6
Mass water	91.6	104.7	99.5	118.9	94.7	79.1
Mass dry soil	264.2	276.7	234.8	188.8	257.1	206.0
Moisture %	34.7%	37.8%	42.4%	63.0%	36.8%	38.4%

Test Pit	TH16 - 01	TH16 - 01	TH16 - 01	TH16 - 01	TH16 - 01	TH16 - 01
Depth (m)	0.1 - 0.2	0.3 - 0.5	0.6 - 0.8	0.8 - 0.9	0.9 - 1.1	1.2 - 1.5
Sample #	G67	G68	G69	G70	G71	G72
Tare ID	F134	Z16	F132	N41	F24	P40
Mass of tare	8.4	8.4	8.7	8.4	8.5	8.6
Mass wet + tare	280.3	384.8	393.0	355.0	396.6	360.3
Mass dry + tare	260.7	305.0	310.0	281.4	294.5	293.9
Mass water	19.6	79.8	83.0	73.6	102.1	66.4
Mass dry soil	252.3	296.6	301.3	273.0	286.0	285.3
Moisture %	7.8%	26.9%	27.5%	27.0%	35.7%	23.3%

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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-02b, South Drive

Sample Date 17-Feb-16
Test Date 14-Mar-16
Technician JW

Test Pit	TH16 - 01	TH16 - 01	TH16 - 01	TH16 - 01		
Depth (m)	1.8 - 2.0	2.1 - 2.3	2.4 - 2.6	2.7 - 2.9		
Sample #	G73	G74	G75	G76		
Tare ID	H45	C15	F116	W84		
Mass of tare	8.6	8.4	8.4	8.4		
Mass wet + tare	363.1	354.4	368.4	369.2		
Mass dry + tare	268.0	250.4	250.8	248.3		
Mass water	95.1	104.0	117.6	120.9		
Mass dry soil	259.4	242.0	242.4	239.9		
Moisture %	36.7%	43.0%	48.5%	50.4%		

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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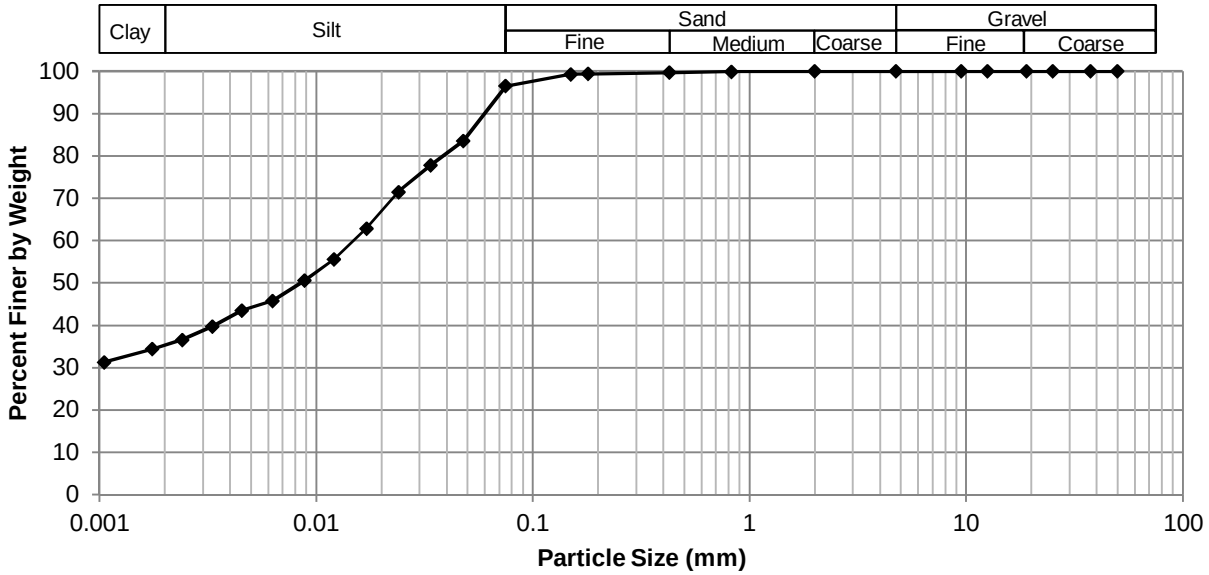
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, South Drive
Test Hole	TH16-01
Sample #	G70
Depth (m)	0.8 - 0.9
Sample Date	17-Feb-16
Test Date	16-Mar-16
Technician	LI

Gravel	0.0%
Sand	3.5%
Silt	61.3%
Clay	35.2%

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	96.50
37.5	100.00	2.00	99.99	0.0479	83.55
25.0	100.00	0.825	99.86	0.0338	77.83
19.0	100.00	0.425	99.70	0.0239	71.48
12.5	100.00	0.180	99.36	0.0171	62.91
9.50	100.00	0.150	99.27	0.0121	55.60
4.75	100.00	0.075	96.50	0.0088	50.52
				0.0063	45.76
				0.0045	43.54
				0.0033	39.73
				0.0024	36.55
				0.0017	34.39
				0.0011	31.29

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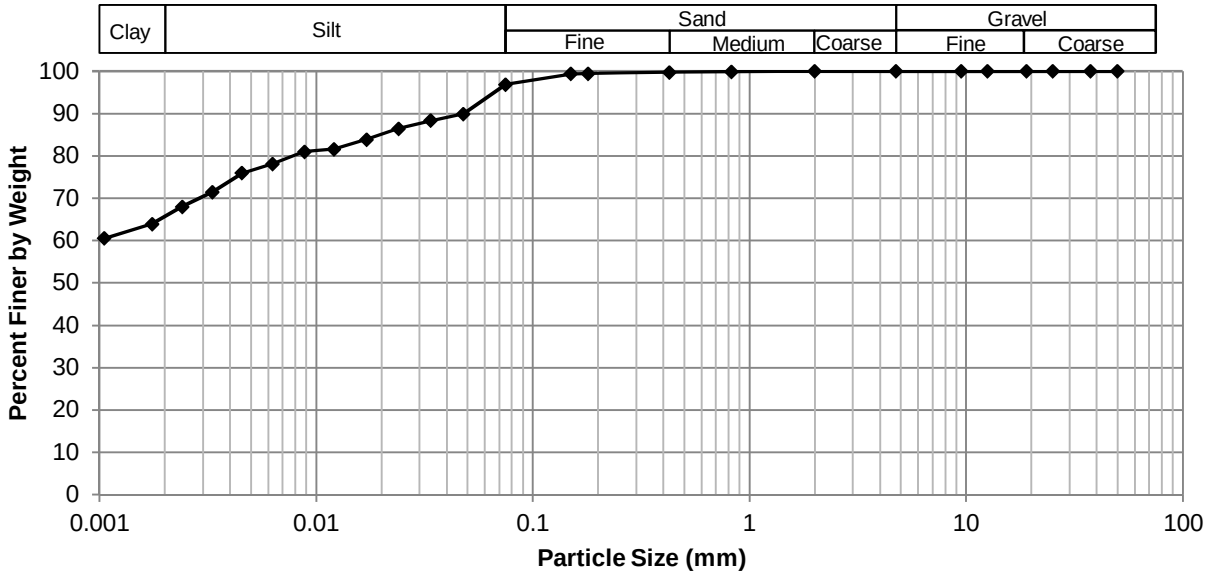
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, South Drive
Test Hole	TH16-04
Sample #	G22
Depth (m)	0.6 - 0.8
Sample Date	17-Feb-16
Test Date	16-Mar-16
Technician	LI

Gravel	0.0%
Sand	0.0%
Silt	34.5%
Clay	65.5%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	96.85
37.5	100.00	2.00	100.00	0.0479	89.90
25.0	100.00	0.825	99.92	0.0338	88.32
19.0	100.00	0.425	99.76	0.0239	86.41
12.5	100.00	0.180	99.45	0.0171	83.87
9.50	100.00	0.150	99.36	0.0121	81.65
4.75	100.00	0.075	96.85	0.0088	81.01
				0.0063	78.15
				0.0045	75.93
				0.0033	71.49
				0.0024	67.99
				0.0017	63.92
				0.0011	60.50

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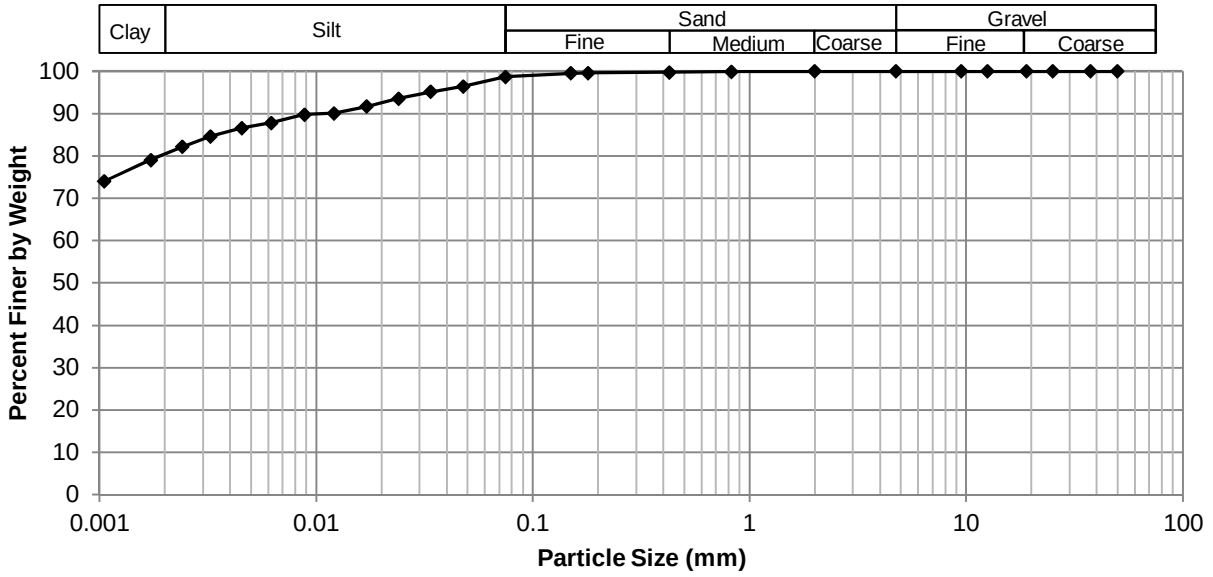
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-032-00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, South Drive
Test Hole	TH16-07
Sample #	G49
Depth (m)	0.6 - 0.8
Sample Date	17-Feb-16
Test Date	16-Mar-16
Technician	LI

Gravel	0.0%
Sand	0.0%
Silt	19.7%
Clay	80.3%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	98.72
37.5	100.00	2.00	99.99	0.0479	96.41
25.0	100.00	0.825	99.89	0.0338	95.14
19.0	100.00	0.425	99.78	0.0239	93.55
12.5	100.00	0.180	99.59	0.0171	91.65
9.50	100.00	0.150	99.54	0.0121	90.06
4.75	100.00	0.075	98.72	0.0088	89.74
				0.0062	87.84
				0.0045	86.57
				0.0033	84.66
				0.0024	82.12
				0.0017	79.01
				0.0011	74.00

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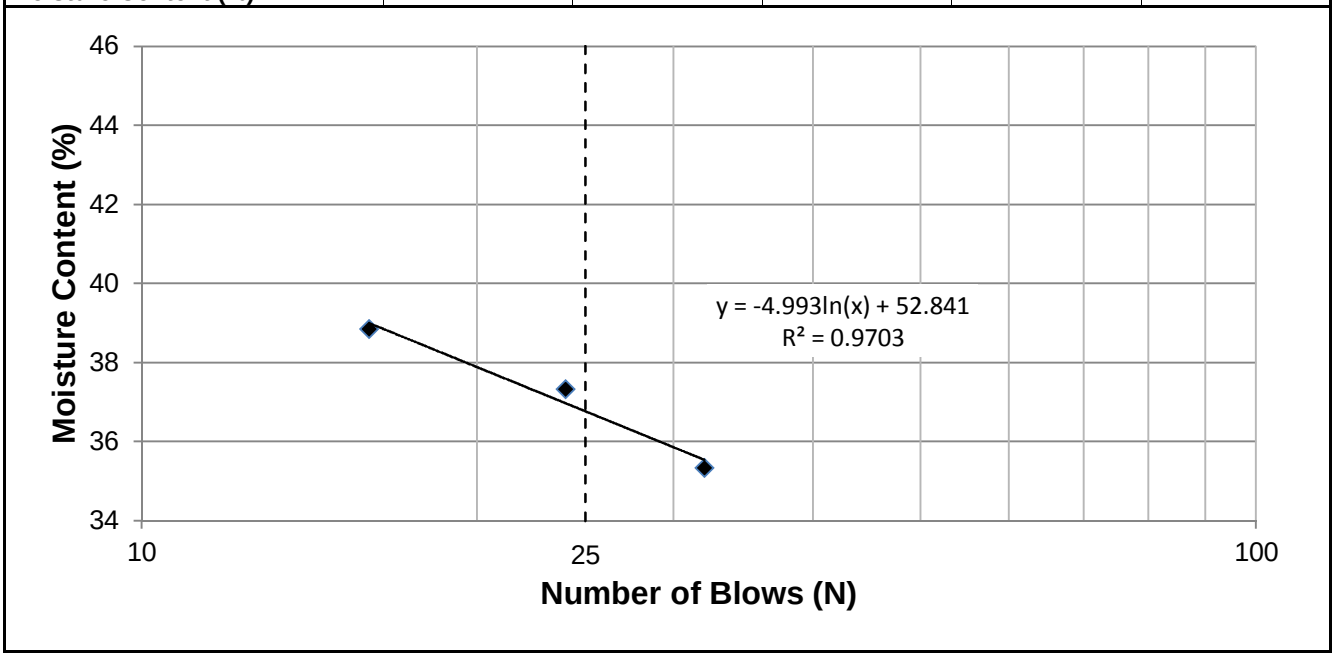
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, South Drive
Test Hole	TH16-01
Sample #	G70
Depth (m)	0.8 - 0.9
Sample Date	
Test Date	16-Mar-16
Technician	JW/JB

Liquid Limit	37
Plastic Limit	17
Plasticity Index	20

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	32	24	16		
Mass Wet Soil + Tare (g)	23.810	24.318	23.254		
Mass Dry Soil + Tare (g)	21.277	21.543	20.673		
Mass Tare (g)	14.108	14.108	14.030		
Mass Water (g)	2.533	2.775	2.581		
Mass Dry Soil (g)	7.169	7.435	6.643		
Moisture Content (%)	35.333	37.323	38.853		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	23.840	23.358			
Mass Dry Soil + Tare (g)	22.401	21.980			
Mass Tare (g)	13.964	13.999			
Mass Water (g)	1.439	1.378			
Mass Dry Soil (g)	8.437	7.981			
Moisture Content (%)	17.056	17.266			

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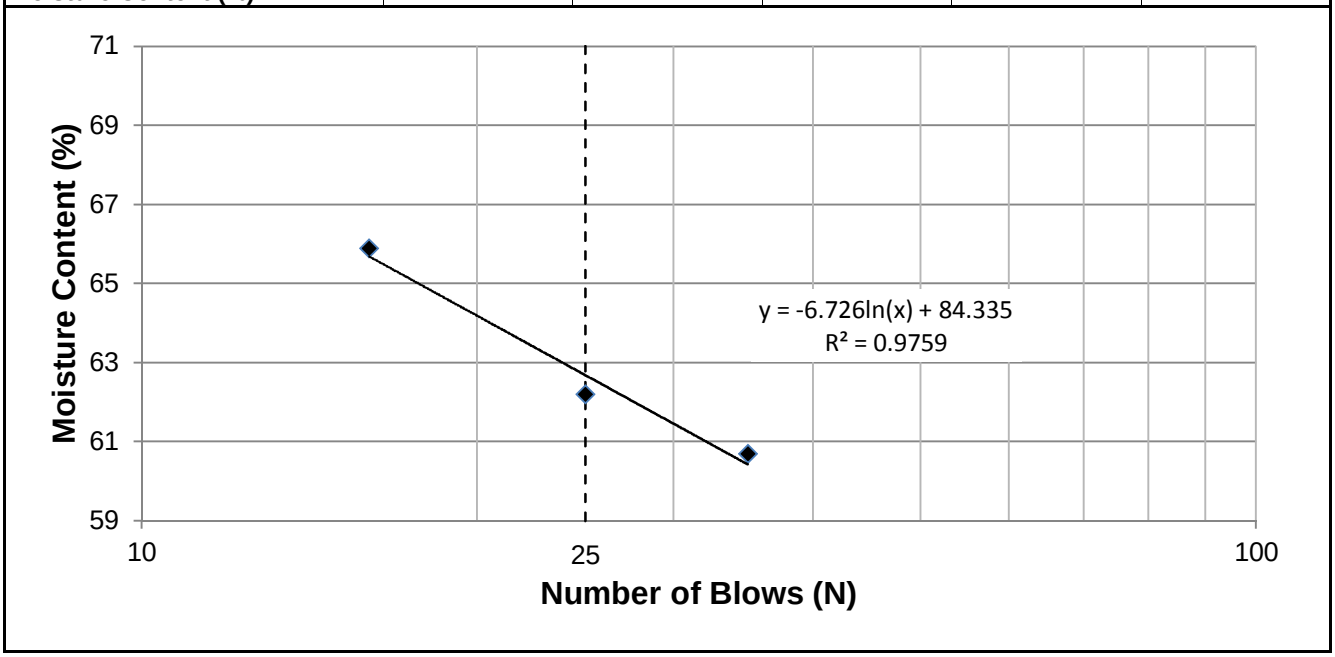
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, South Drive
Test Hole	TH16-04
Sample #	G22
Depth (m)	0.6 - 0.8
Sample Date	
Test Date	14-Mar-16
Technician	JW/JB

Liquid Limit	63
Plastic Limit	20
Plasticity Index	43

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	25	16		
Mass Wet Soil + Tare (g)	22.003	22.006	22.220		
Mass Dry Soil + Tare (g)	18.986	18.994	18.967		
Mass Tare (g)	14.015	14.152	14.030		
Mass Water (g)	3.017	3.012	3.253		
Mass Dry Soil (g)	4.971	4.842	4.937		
Moisture Content (%)	60.692	62.206	65.890		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.634	21.474			
Mass Dry Soil + Tare (g)	20.385	20.267			
Mass Tare (g)	14.207	14.260			
Mass Water (g)	1.249	1.207			
Mass Dry Soil (g)	6.178	6.007			
Moisture Content (%)	20.217	20.093			

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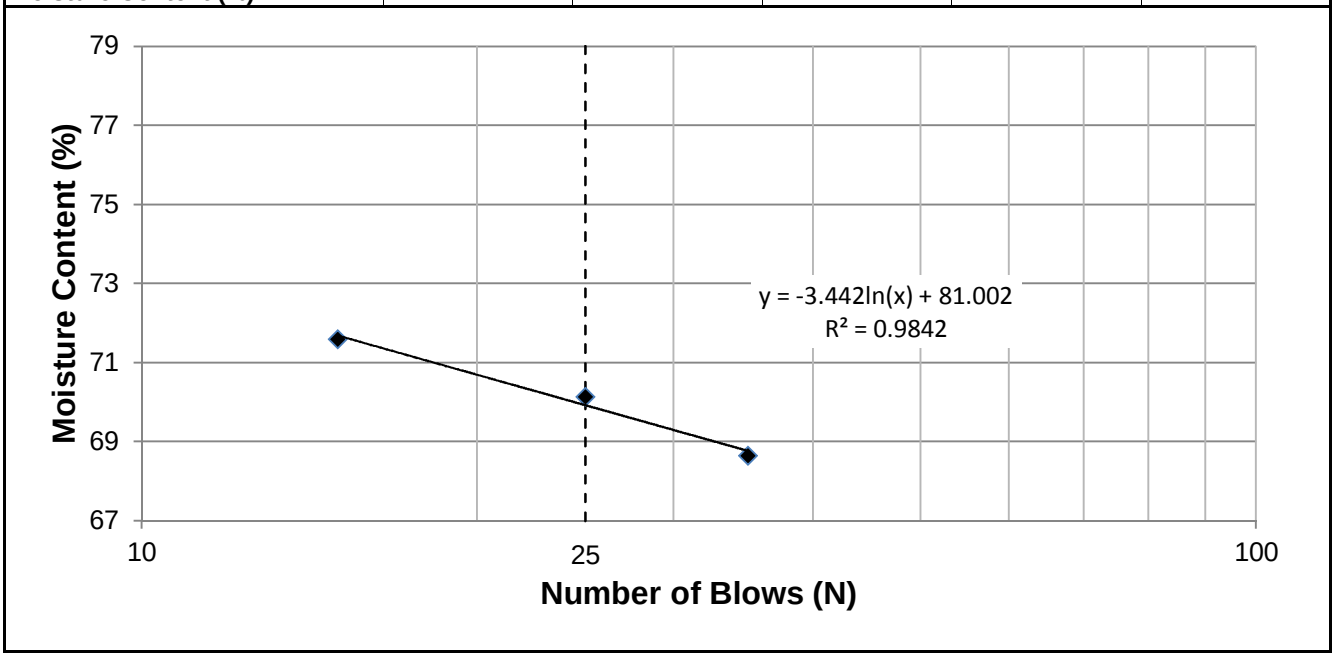
Atterberg Limits
ASTM D4318

Project No.	0035 032 00
Client	Morrison Hershfield
Project	2016 Local Streets Package 16-R-02b, South Drive
Test Hole	TH16-07
Sample #	G49
Depth (m)	0.6 - 0.8
Sample Date	
Test Date	14-Mar-16
Technician	JW/JB

Liquid Limit	70
Plastic Limit	22
Plasticity Index	47

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	35	25	15		
Mass Wet Soil + Tare (g)	21.091	22.480	21.165		
Mass Dry Soil + Tare (g)	18.211	18.983	18.188		
Mass Tare (g)	14.015	13.997	14.030		
Mass Water (g)	2.880	3.497	2.977		
Mass Dry Soil (g)	4.196	4.986	4.158		
Moisture Content (%)	68.637	70.136	71.597		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.252	21.817			
Mass Dry Soil + Tare (g)	19.939	20.437			
Mass Tare (g)	14.184	14.179			
Mass Water (g)	1.313	1.380			
Mass Dry Soil (g)	5.755	6.258			
Moisture Content (%)	22.815	22.052			

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