APPENDIX 'A'

GEOTECHNICAL REPORT

Quality Engineering | Valued Relationships

Morrison Hershfield

St. James Street Reconstruction – Portage Avenue to Maroons Road – Sub Surface Investigation

Prepared for:

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

Distribution:

Ron Bruce, P.Eng.

Project Number:
0035-026-00

Date:
December 23, 2015
Final Report

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TREK GEOTECHNICAL

Quality Engineering | Valued Relationships

December 23, 2015

Our File No. 0035-026-00

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

RE: Sub-Surface Investigation Report for
St. James Reconstruction – Portage Avenue to Maroons Road

TREK Geotechnical Inc. is pleased to submit our report for the sub-surface investigations for St. James Reconstruction – Portage Avenue to Maroons Road.

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

Sincerely,

TREK Geotechnical Inc.
Per:

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

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

Revision History

Revision No.	Author	Issue Date	Description
0	PB	December 23, 2015	Final Report

Authorization Signatures

Prepared By:

Paul Bevel, B.Sc.

Reviewed By:

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

PROVINCE OF MANITOBA
N. J. FERREIRA
Member
22892
Dec 23, 2015
REGISTERED PROFESSIONAL ENGINEER

APEGM
Certificate of Authorization
Trek Geotechnical Inc.
No. 4877 Date: Dec 23, 2015

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1.0 Introduction

This report summarizes the results of the sub-surface investigation completed for the St. James Reconstruction – Sub-Surface Geotechnical Investigation. Information regarding the asphalt, concrete, road base for the existing road and the soil stratigraphy beneath the pavement structure is provided.

2.0 Sub-Surface Investigation and Laboratory Program

A total of 12 test holes were drilled on St James Street from Maroons Road to Portage Avenue at the locations shown on Figure 01. The test holes were drilled in order to determine sub-surface conditions for design and reconstruction of the road segment.

The sub-surface investigation was conducted on November 17, 2015. 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, C.E.T. 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). The results of the laboratory testing are included on the test hole logs in Appendix A. The laboratory testing results are also summarized and reported separately in Appendix B. Photos of the concrete and asphalt cores are included in Appendix C.

Test hole locations noted on the test hole logs and shown on Figure 01 are based on measured distances from the nearest curb and from the intersection of Portage Avenue and St. James Street.

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.

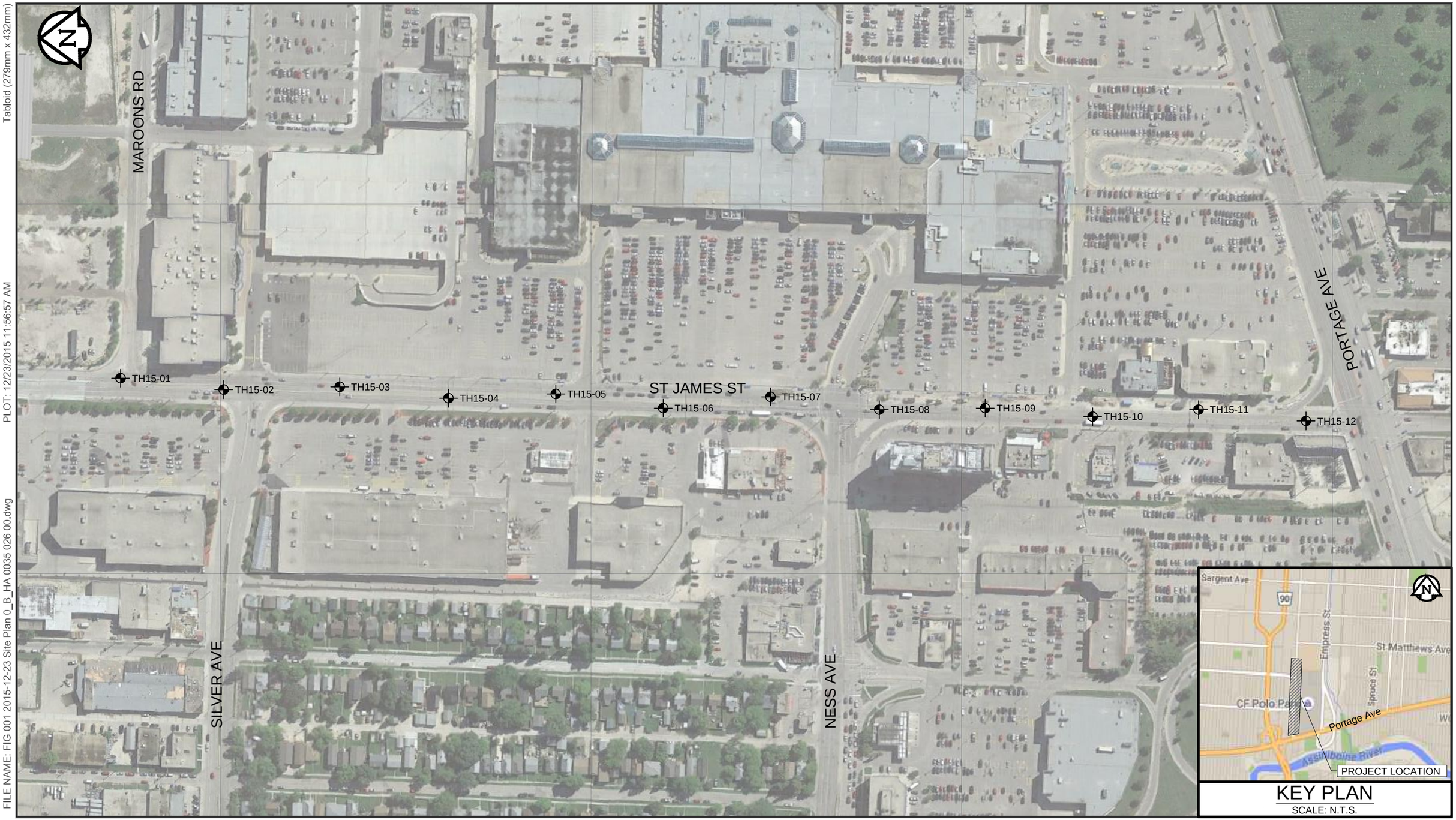
Figures

0035 026 00
Morrison Hershfield Ltd.
St James St. Reconstruction

Tabloid (279mm x 432mm)

PLOT: 12/23/2015 11:56:57 AM

FILE NAME: FIG 001 2015-12-23 Site Plan 0_B_HA 0035 026 00.dwg



KEY PLAN
SCALE: N.T.S.

0 25 50 75 100m
SCALE : 1:2500 (279mm x 432mm)

LEGEND :

TEST HOLE (TREK, 2015)

NOTES :

1. AERIAL IMAGE FROM GOOGLE EARTH AUGUST 24, 2015

Figure 01
Test Hole Location Plan

Appendix A

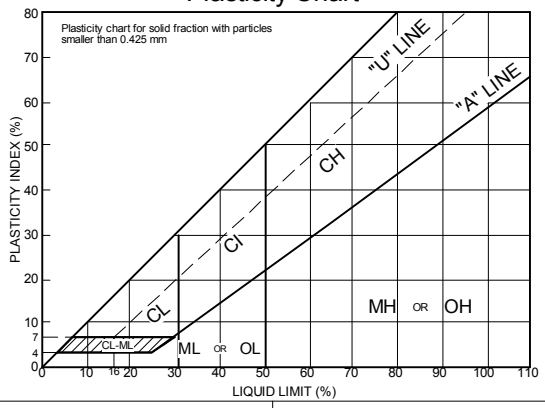
Test Hole Logs

EXPLANATION OF FIELD AND LABORATORY TESTING

GENERAL NOTES

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

Major Divisions			USCS Classification	Symbols	Typical Names	Laboratory Classification Criteria
Coarse-Grained soils (More than half the material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than 4.75 mm)	Clean gravel (Little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain size curve, depending on percentage of fines (fraction smaller than No. 200 sieve) coarse-grained soils are classified as follows: Less than 5 percent..... GW, GP, SW, SP; More than 12 percent..... GM, GC, SM, SC; 6 to 12 percent..... Borderline case4s requiring dual symbols*
			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		
#10 to #4	2.00 to 4.75		Sand
#40 to #10	0.425 to 2.00		Coarse
#200 to #40	0.075 to 0.425		Medium
< #200	< 0.075		Fine
			Silt or Clay

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

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

Other Symbol Types

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

EXPLANATION OF FIELD AND LABORATORY TESTING

LEGEND OF ABBREVIATIONS AND SYMBOLS

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

▽ Water Level at Time of Drilling

▼ Water Level at End of Drilling

▼ Water Level After Drilling as Indicated on Test Hole Logs

FRACTION OF SECONDARY SOIL CONSTITUENTS ARE BASED ON THE FOLLOWING TERMINOLOGY

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

TERMS DESCRIBING CONSISTENCY OR COMPACTION CONDITION

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

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

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

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

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

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

Sub-Surface Log

Test Hole TH15-01
1 of 1

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (77mm thick)				
		CONCRETE - (205mm thick)				
		SAND AND GRAVEL (FILL) - <20mm dia. limestone, trace silt - brown - moist, compact - well graded - sub-angular to angular		G79	●	
0.5		CLAY AND SILT - trace sand, trace gravel (<10mm dia.) - brown - moist, firm - intermediate to high plasticity - no gravel below 0.9m		G80	●	✤
1.0		SILT - some clay - brown - moist to wet, very soft - low plasticity		G81	●	
1.5		CLAY - silty, trace silt inclustions (<5mm dia.), trace oxidation - brown - moist, stiff - high plasticity		G82	●	✤ △
2.0		- SILT seam at 2.0m, <25mm dia.		G83	●	✤ △
2.5				G84	●	✤ △
3.0		END OF TEST HOLE AT 3.0m IN CLAY				

Notes:
1) No sloughing or seepage.
2) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
3) Test hole open to 2.6m at completion of drilling.
4) Test hole located in median north bound lane 852m north of the intersection of Portage Ave. and St. James St., 5.6m west from east curb. U14 (5527735m N, 629222m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Sub-Surface Log

Test Hole TH15-02

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (50mm thick)		
		CONCRETE - (215mm thick)		
		CLAY (FILL) - silty, sandy, trace gravel (<10mm dia.) - grey, moist, soft, high plasticity	G	G01
0.5		SILT - trace clay, trace sand - mottled grey and brown - moist, soft - no to low plasticity - brown below 0.5m	G	G02
1.0		CLAY - silty, trace sand, trace silt inclusions (<10mm dia.), trace gravel (<5mm dia.) - brown - moist, stiff - high plasticity	G	G03
1.5				
2.0		- firm below 2.1m	G	G04
2.5				
3.0			G	G05

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

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

PL MC LL: 0 20 40 60 80 100

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

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

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 3.0m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median south bound lane 777m north of the intersection of Portage Ave. and St. James St., 5.6m east from west curb. U14 (5527663m N, 629214m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Sub-Surface Log

Test Hole TH15-03
1 of 1

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (68mm thick)		
		CONCRETE - (200mm thick)		
		ORGANIC CLAY - silty, some organics, trace sand, trace gravel (<20mm dia.) - black - moist, stiff - high plasticity	G	G71
0.5			G	G72
		CLAY - silty, trace sand, trace oxidation - grey - moist, stiff - high plasticity	G	G73
1.0		SILT - some clay, trace sand, trace oxidation - brown - moist, soft - no to low plasticity	G	G74
1.5		CLAY - silty, trace silt inclustions (<5mm dia.), trace sand - brown - moist, stiff - high plasticity	G	G75
			G	G76
2.0			G	G77
2.5		- firm below 2.6m		
3.0			G	G78

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

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 2.6m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in north bound turning lane 702m north of the intersection of Portage Ave. and St. James St., 9.3m west from east curb. U14 (5527582m N, 629216m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Sub-Surface Log

Test Hole TH15-04
1 of 1

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (45mm thick)		
		CONCRETE - (175mm thick)		
		SAND AND GRAVEL (FILL) - <25mm dia. limestone, trace clay, trace silt, trace sand, grey, moist, compact, well graded fine sand to coarse gravel, sub-angular to angular		G06
		CLAY (FILL) - silty, trace sand, trace gravel (<10mm dia.) - black - moist, very stiff, high plasticity		G07
0.5		SILT - trace clay, trace fine sand, trace oxidation - light brown - moist, firm - no to low plasticity		G08
1.0		- clayey, brown, intermediate plasticity below 0.9m		G09
1.5		CLAY - silty, trace silt inclusions (<5mm dia.), trace oxidation - brown - moist, stiff - high plasticity		G10
2.0				G11
2.5				
3.0				G12

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

Particle Size (%): 0 20 40 60 80 100 — PL MC LL

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

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

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 3.0m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median south bound lane 627m north of the intersection of Portage Ave. and St. James St., 5.6m east from west curb. U14 (5527506m N, 629208m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Sub-Surface Log

Test Hole TH15-05
1 of 1

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (60mm thick)				
		CONCRETE - (195mm thick)				
		SAND (FILL) - trace silt, some gravel (<20mm dia.), trace clay, trace silt - brown - dry to moist, compact - no plasticity - well graded		G65	●	
0.5						
1.0				G66	●	
				G67	●	
1.5						
2.0						
		CLAY - silty - mottled grey and brown - moist, firm - high plasticity		G68	●	✤
2.5		- brown, trace oxidation below 2.4m		G69	●	✤
		- trace silt inclusions (<5mm dia.) below 2.6m				
3.0				G70	●	✤△

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 2.9m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median north bound lane 552m north of the intersection of Portage Ave. and St. James St., 5.6m west from east curb. U14 (5527431m N, 629211m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Sub-Surface Log

Test Hole TH15-06
1 of 1

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (43mm thick)				
		CONCRETE - (180mm thick)				
		CLAY AND GRAVEL (FILL) - <20mm dia. gravel, trace silt, trace sand, trace organics, black, wet, compact, high plasticity, sub-angular to angular		G13	●	
0.5		ORGANIC CLAY - silty, trace sand - black - moist, very stiff - high plasticity		G14	●	△
		CLAY - silty, trace sand, trace silt inclusions (<5mm dia.) - brown - moist, very stiff - high plasticity		G15	●	△ ✤
1.0		- stiff below 1.2m		G16	●	△✤
1.5		SILT AND CLAY - brown, moist to wet, firm to stiff, intermediate to high plasticity		G17	●	✤
		CLAY - silty, trace silt inclustions (<5mm dia.), trace sand, trace oxidation - brown - moist, stiff - high plasticity		G18	●	△✤
2.0				G19	●	✤
2.5						
3.0				G20	●	✤

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 2.6m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median south bound lane 477m north of the intersection of Portage Ave. and St. James St., 5.6m east from west curb. U14 (5527356m N, 629201m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Sub-Surface Log

Test Hole TH15-07

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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
0		ASPHALT - (105mm thick)				
		SAND AND GRAVEL (FILL) - <20mm dia. limestone, trace silt - brown - moist, compact - well graded fine sand to coarse gravel - sub-angular to angular	G	G61	●	
0.5						
1.0			G	G61	●	
1.5			G	G63	●	
2.0			G	G64	●	

END OF TEST HOLE AT 2.3m IN SAND AND GRAVEL (FILL)

Notes:
1) No sloughing or seepage.
2) Test hole open to 1.8m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median north bound lane 402m north of the intersection of Portage Ave. and St. James St., 5.6m west from east curb. U14 (5527281m N, 629209m E).

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

Sub-Surface Log

Test Hole TH15-08

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (103mm thick)		
		CONCRETE - (195mm thick)		
		CLAY AND GRAVEL (FILL) - <20mm dia., trace sand, trace silt, dark brown, wet, stiff, high plasticity, sub-angular to angular		G21
0.5		ORGANIC CLAY - silty, trace sand - black - moist, stiff - high plasticity		G22
1.0				G23
		CLAY - silty, trace sand - dark brown - moist, stiff - high plasticity		G24
1.5		- trace silt inclusions (<5mm dia.), mottled brown and light brown below 1.5m		G25
		SILT - clayey, brown, moist to wet, firm, low plasticity		G26
		CLAY - silty, trace silt inclusions (<5mm dia.), trace fine sand - brown - moist, stiff - high plasticity		G27
2.5		- firm below 2.4m		
3.0				G28

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

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

PL MC LL: 0 20 40 60 80 100

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

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

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 3.0m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median south bound lane 327m north of the intersection of Portage Ave. and St. James St., 5.6m east from west curb. U14 (5527205m N, 629200m E).

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

Sub-Surface Log

Test Hole TH15-09

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (70mm thick)				
		CONCRETE - (220mm thick)				
		SAND AND GRAVEL (FILL) - <20mm dia. limestone, some clay, trace silt - brown, moist, compact, well graded, sub-angular to angular		G53		
0.5		ORGANIC CLAY - silty, trace sand, trace gravel (<20mm dia.), black, moist, soft, high plasticity		G54		
		CLAY - silty, trace fine to coarse sand, trace oxidation - dark brown - moist, very stiff - high plasticity		G55		
1.0				G56		
1.5		- SILT seam at 1.5m, <25mm dia. - trace silt inclusions (<5mm dia.), brown, stiff, below 1.6m		G57		
				G58		
2.0						
				G59		
2.5						
3.0				G60		

END OF TEST HOLE AT 2.4m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 3.0m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median north bound lane 252m north of the intersection of Portage Ave. and St. James St., 5.6m west from east curb. U14 (5527131m N, 629201m E).

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

Sub-Surface Log

Test Hole TH15-10

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (50mm thick)		
		CONCRETE - (200mm thick)		
		CLAY AND GRAVEL (FILL) - trace silt, trace sand, black, moist, compact, high plasticity, sub-angular to angular		G29
0.5		CLAY (FILL) - silty, some sand, trace to some gravel (<10mm dia.) - black - moist, very stiff - high plasticity		G30
				G31
1.0		SILT - trace clay, trace sand, trace oxidation - brown - moist, soft - low plasticity		
				G32
1.5				
		CLAY - silty, trace coarse sand, trace silt inclusions (<5mm dia.) - brown - moist, stiff - high plasticity		G33
2.0				
				G34
2.5				
				G35
3.0				

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

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

PL MC LL: 0 20 40 60 80 100

Undrained Shear Strength (kPa) — Test Type: △ Torvane △ ✤ Pocket Pen. ✤ ☒ Qu ☒ ○ Field Vane ○: 0 50 100 150 200 250

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 3.0m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median south bound lane 177m north of the intersection of Portage Ave. and St. James St., 5.6m east from west curb. U14 (5527056m N, 629195m E).

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

Sub-Surface Log

Test Hole TH15-11
1 of 1

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (58mm thick)		
		CONCRETE - (223mm thick)		
		SAND AND GRAVEL (FILL) - <20mm dia. limestone, trace silt, trace silt - brown - moist, compact - well graded - sub-angular to angular		G45
0.5		CLAY (FILL) - silty, trace sand, trace to some gravel (<20mm dia.) - brown - moist, stiff - high plasticity		G46
1.0				G47
		- trace gravel below 1.4m		G48
1.5		CLAY - silty, trace sand, trace oxidation - brown - moist, stiff - high plasticity		G49
		- SILT seam at 1.8m, <25mm dia.		G50
2.0		- trace silt inclusions (<5mm dia.) below 2.0m		G51
2.5				
3.0				G52

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

END OF TEST HOLE AT 3.0m IN CLAY

Notes:
1) No sloughing or seepage.
2) Test hole open to 2.0m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median north bound lane 102m north of the intersection of Portage Ave. and St. James St., 5.6m west from east curb. U14 (5526982m N, 629200m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Sub-Surface Log

Test Hole TH15-12
1 of 1

Client:	Morrison Hershfeld	**Project Number:**	0035-026-00
Project Name:	St. James St. Reconstruction	**Location:**	St. James St. - Between Portage Ave. and Maroons Rd.
Contractor:	Paddock Drilling Ltd.	**Ground Elevation:**	Existing Ground
Method:	125mm Solid Stem Auger, Brat 22 Truck Mount	**Date Drilled:**	17 November 2015

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 - (44mm thick)				
		CONCRETE - (210mm thick)				
		GRAVEL (FILL) - <20mm dia. limestone, clayey, some sand, trace silt, black, moist, compact, no to low plasticity, sub-angular to angular		G36		
0.5		CLAY (FILL) - some gravel (<20mm dia. limestone), trace sand, trace wood debris - black - moist, very stiff - low plasticity		G37		
				G38		
1.0		SILT - some clay, trace sand, trace oxidation - brown - moist, firm - low plasticity - soft, below 1.2m		G39		
				G40		
1.5				G41		
		CLAY - silty, trace silt inclusions (<5mm dia.), trace sand, trace oxidation - brown - moist, very stiff - high plasticity		G42		
2.0						
				G43		
2.5		SILT - clayey, trace sand, light brown, moist, firm, intermediate plasticity		G44A		
		CLAY - silty, trace silt inclusions (<5mm dia.), trace oxidation - brown - moist, stiff - high plasticity		G44B		
3.0		END OF TEST HOLE AT 3.0m IN CLAY				

Notes:
1) No sloughing or seepage.
2) Test hole open to 2.7m at completion of drilling.
3) Test hole backfilled with auger cuttings, bentonite and cold patch asphalt.
4) Test hole located in median south bound lane 27m north of the intersection of Portage Ave. and St. James St., 5.6m east from west curb. U14 (5526907m N, 629192m E).

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

SUB-SURFACE LOG LOGS 2015-11-25 ST. JAMES ST. RECONSTRUCTION 0035-026-00 REVA_JN.GPJ TREK GEOTECHNICAL.GDT 23/12/15

Appendix B

Lab Testing Summary and Lab Testing Results

St James Street Reconstruction
Maroons Road to Portage Avenue
Sub-Surface Investigation

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH15-01	Northbound median lane, 852m north from north curb of Portage Ave, 5.6m west from east curb	Asphalt	77	Concrete	205											
						SAND AND GRAVEL (FILL)	0.3	0.6	12							
						CLAY AND SILT	0.9	1.1	21	0	17	38	45	15	51	36
						SILT	1.2	1.4	22	0	14	68	18	16	28	12
						CLAY	1.8	2.0	39							
						CLAY	2.1	2.3	50							
						CLAY	2.7	2.9	54							
TH15-02	Southbound median lane, 777m north from north curb of Portage Ave, 5.6m east from west curb	Asphalt	50	Concrete	215											
						CLAY (FILL)	0.3	0.5	15							
						SILT	0.5	0.6	20							
						CLAY	1.1	1.2	29							
						CLAY	2.1	2.3	51							
						CLAY	2.9	3.0	58							
TH15-03	Northbound left turn lane, 702m north from north curb of Portage Ave, 9.3m west from east curb	Asphalt	68	Concrete	200											
						ORGANIC CLAY	0.3	0.5	21							
						ORGANIC CLAY	0.5	0.6	21							
						CLAY	0.6	0.8	20							
						SILT	1.2	1.4	21	0	7	77	16	17	23	6
						CLAY	1.4	1.5	35							
						CLAY	1.7	1.8	42							
						CLAY	2.1	2.3	49							
						CLAY	2.9	3.0	54							
TH15-04	Southbound median lane, 627m north from north curb of Portage Ave, 5.6m east from west curb	Asphalt	45	Concrete	175											
						SAND AND GRAVEL (FILL)	0.3	0.3	8							
						CLAY (FILL)	0.3	0.5	20							
						SILT	0.6	0.8	16							
						SILT	1.4	1.5	23	0	5	73	22	17	27	10
						CLAY	1.5	1.7	35							
						CLAY	2.1	2.3	51							
						CLAY	2.9	3.0	53							

St James Street Reconstruction
Maroons Road to Portage Avenue
Sub-Surface Investigation

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH15-05	Northbound median lane, 552m north from north curb of Portage Ave, 5.6m west from east curb	Asphalt	60	Concrete	195											
						SAND (FILL)	0.3	0.5	8							
						SAND (FILL)	0.9	1.1	7							
						SAND (FILL)	1.2	1.5	6							
						CLAY	2.1	2.3	41							
						CLAY	2.4	2.6	56							
						CLAY	2.9	3.0	57							
TH15-06	Southbound median lane, 477m north from north curb of Portage Ave, 5.6m east from west curb	Asphalt	43	Concrete	180											
						GRAVEL AND CLAY (FILL)	0.2	0.3	15							
						ORGANIC CLAY	0.5	0.6	27	0	14	34	52	17	69	52
						CLAY	0.8	0.9	29							
						CLAY	1.4	1.5	33							
						SILT AND CLAY	1.6	1.7	36							
						CLAY	2.0	2.1	44							
						CLAY	2.3	2.4	56							
						CLAY	2.9	3.0	49							
TH15-07	Northbound median lane, 402m north from north curb of Portage Ave, 5.6m west from east curb	Asphalt	105	N/A	N/A											
						SAND AND GRAVEL (FILL)	0.3	0.6	6							
						SAND AND GRAVEL (FILL)	1.1	1.2	6							
						SAND AND GRAVEL (FILL)	1.4	1.5	7							
						SAND AND GRAVEL (FILL)	2.1	2.3	7							
TH15-08	Southbound median lane, 327m north from north curb of Portage Ave, 5.6m east from west curb	Asphalt	103	Concrete	195											
						CLAY AND GRAVEL (FILL)	0.3	0.4	20							
						ORGANIC CLAY	0.6	0.8	29							
						ORGANIC CLAY	0.9	1.1	30							
						CLAY	1.4	1.5	34							
						CLAY	1.5	1.7	39							
						SILT	1.8	1.8	40							
						CLAY	2.1	2.3	46							
						CLAY	2.9	3.0	53							

St James Street Reconstruction
Maroons Road to Portage Avenue
Sub-Surface Investigation

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)		Moisture Content (%)	Grain Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Top (m)	Bottom (m)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic	Liquid	Plasticity Index
TH15-09	Northbound median lane, 252m north from north curb of Portage Ave, 5.6m west from east curb	Asphalt	70	Concrete	220											
						SAND AND GRAVEL (FILL)	0.3	0.5	8							
						ORGANIC CLAY	0.5	0.6	14							
						CLAY	0.6	0.8	23							
						CLAY	1.1	1.2	29	0	5	20	75	21	72	51
						CLAY	1.4	1.5	32							
						CLAY	1.8	1.8	45							
						CLAY	2.3	2.4	51							
						CLAY	2.9	3.0	55							
TH15-10	Southbound median lane, 177m north from north curb of Portage Ave, 5.6m east from west curb	Asphalt	50	Concrete	200											
						CLAY AND GRAVEL (FILL)	0.3	0.4	11							
						CLAY (FILL)	0.5	0.6	19							
						CLAY (FILL)	0.8	0.9	33							
						SILT	1.2	1.4	20							
						CLAY	1.7	1.8	38							
						CLAY	2.1	2.3	48							
						CLAY	2.7	2.9	50							
TH15-11	Northbound median lane, 102m north from north curb of Portage Ave, 5.6m west from east curb	Asphalt	58	Concrete	223											
						SAND AND GRAVEL (FILL)	0.3	0.6	10							
						CLAY (FILL)	0.6	0.8	18							
						CLAY (FILL)	0.9	1.1	26							
						CLAY (FILL)	1.4	1.5	25							
						CLAY	1.5	1.7	41							
						CLAY	1.8	1.9	40							
						CLAY	2.1	2.3	49							
						CLAY	2.9	3.0	53							
TH15-12	Southbound median lane, 27m north from north curb of Portage Ave, 5.6m east from west curb	Asphalt	44	Concrete	210											
						GRAVEL (FILL)	0.2	0.4	10							
						CLAY (FILL)	0.6	0.8	13							
						CLAY (FILL)	0.8	0.9	27							
						SILT	0.9	1.1	18	0	7	74	19	16	27	11
						SILT	1.2	1.4	21							
						SILT	1.5	1.7	23							
						CLAY	1.8	2.0	37							
						CLAY	2.3	2.4	46							
						SILT	2.6	2.7	25							
						CLAY	2.7	2.9	48							

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Moisture Content Report
ASTM D2216-98

Project No. 0035-026-00
Client Morrisons Hershfield
Project St. James St. Reconstruction

Sample Date 17-Nov-15
Test Date 19-Nov-15
Technician Daniel Wiebe

Test Pit	TH15-02	TH15-02	TH15-02	TH15-02	TH15-02	TH15-04
Depth (m)	0.3 - 0.5	0.5 - 0.6	1.1 - 1.2	2.1 - 2.3	2.9 - 3.0	0.3 - 0.3
Sample #	G01	G02	G03	G04	G05	G06
Tare ID	H73	N34	N104	P13	F117	Z13
Mass of tare	8.5	8.8	8.5	8.3	8.3	8.1
Mass wet + tare	291.1	351.8	365.1	392.2	366.2	189.2
Mass dry + tare	254.7	295.5	285.4	262.4	235.6	176.4
Mass water	36.4	56.3	79.7	129.8	130.6	12.8
Mass dry soil	246.2	286.7	276.9	254.1	227.3	168.3
Moisture %	14.8%	19.6%	28.8%	51.1%	57.5%	7.6%

Test Pit	TH15-04	TH15-04	TH15-04	TH15-04	TH15-04	TH15-04
Depth (m)	0.3 - 0.5	0.6 - 0.8	1.4 - 1.5	1.5 - 1.7	2.1 - 2.3	2.9 - 3.0
Sample #	G07	G08	G09	G10	G11	G12
Tare ID	Z103	E74	Z138	E9	H68	F96
Mass of tare	8.1	8.4	8.4	8.6	8.7	8.5
Mass wet + tare	359.2	366.4	411.9	353.4	372.9	360.7
Mass dry + tare	299.9	318.3	337.1	263.7	250.7	239.0
Mass water	59.3	48.1	74.8	89.7	122.2	121.7
Mass dry soil	291.8	309.9	328.7	255.1	242.0	230.5
Moisture %	20.3%	15.5%	22.8%	35.2%	50.5%	52.8%

Test Pit	TH15-06	TH15-06	TH15-06	TH15-06	TH15-06	TH15-06
Depth (m)	0.2 - 0.3	0.5 - 0.6	0.8 - 0.9	1.4 - 1.5	1.6 - 1.7	2.0 - 2.1
Sample #	G13	G14	G15	G16	G17	G18
Tare ID	W60	E129	E119	W19	P22	N92
Mass of tare	8.33	8.1	8.2	8.5	8.4	8.4
Mass wet + tare	361.0	378.6	379.5	354.8	291.0	373.3
Mass dry + tare	314.7	301.1	295.6	269.2	215.8	262.3
Mass water	46.3	77.5	83.9	85.6	75.2	111.0
Mass dry soil	306.4	293.0	287.4	260.7	207.4	253.9
Moisture %	15.1%	26.5%	29.2%	32.8%	36.3%	43.7%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-026-00
Client Morrisons Hershfield
Project St. James St. Reconstruction

Sample Date 17-Nov-15
Test Date 19-Nov-15
Technician Daniel Wiebe

Test Pit	TH15-06	TH15-06	TH15-08	TH15-08	TH15-08	TH15-08
Depth (m)	2.3 - 2.4	2.9 - 3.0	0.3 - 0.4	0.6 - 0.8	0.9 - 1.1	1.4 - 1.5
Sample #	G19	G20	G21	G22	G23	G24
Tare ID	K11	E108	D36	F40	Z34	A109
Mass of tare	8.6	8.4	8.5	8.3	8.4	8.4
Mass wet + tare	352.4	353.6	467.7	401.0	384.8	353.4
Mass dry + tare	228.7	240.7	390.0	313.9	297.9	266.9
Mass water	123.7	112.9	77.7	87.1	86.9	86.5
Mass dry soil	220.1	232.3	381.5	305.6	289.5	258.5
Moisture %	56.2%	48.6%	20.4%	28.5%	30.0%	33.5%

Test Pit	TH15-08	TH15-08	TH15-08	TH15-08	TH15-10	TH15-10
Depth (m)	1.5 - 1.7	1.8 - 1.8	2.1 - 2.3	2.9 - 3.0	0.3 - 0.4	0.5 - 0.6
Sample #	G25	G26	G27	G28	G29	G30
Tare ID	AB20	F78	N90	N79	D42	W48
Mass of tare	6.6	8.6	8.3	8.4	8.473	8.5
Mass wet + tare	352.1	353.1	389.8	419.1	157.3	399.3
Mass dry + tare	254.4	255.6	268.9	276.4	143.1	336.5
Mass water	97.7	97.5	120.9	142.7	14.2	62.8
Mass dry soil	247.8	247.0	260.6	268.0	134.6	328.0
Moisture %	39.4%	39.5%	46.4%	53.2%	10.5%	19.1%

Test Pit	TH15-10	TH15-10	TH15-10	TH15-10	TH15-10	TH15-12
Depth (m)	0.8 - 0.9	1.2 - 1.4	1.7 - 1.8	2.1 - 2.3	2.7 - 2.9	0.2 - 0.4
Sample #	G31	G32	G33	G34	G35	G36
Tare ID	F87	F114	P30	A16	E28	F51
Mass of tare	8.3	8.5	8.3	8.4	8.5	8.5
Mass wet + tare	354.8	362.8	358.4	386.3	358.0	364.5
Mass dry + tare	268.8	303.8	262.1	264.3	242.0	331.1
Mass water	86.0	59.0	96.3	122.0	116.0	33.4
Mass dry soil	260.5	295.3	253.8	255.9	233.5	322.6
Moisture %	33.0%	20.0%	37.9%	47.7%	49.7%	10.4%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-026-00
Client Morrisons Hershfield
Project St. James St. Reconstruction

Sample Date 17-Nov-15
Test Date 19-Nov-15
Technician Daniel Wiebe

Test Pit	TH15-12	TH15-12	TH15-12	TH15-12	TH15-12	TH15-12
Depth (m)	0.6 - 0.8	0.8 - 0.9	0.9 - 1.1	1.2 - 1.4	1.5 - 1.7	1.8 - 2.0
Sample #	G37	G38	G39	G40	G41	G42
Tare ID	W75	H3	F154	C3	H5	D13
Mass of tare	8.3	8.3	8.3	8.4	8.3	8.4
Mass wet + tare	354.2	402.4	407.4	359.2	397.0	367.1
Mass dry + tare	315.5	319.3	348.1	298.6	323.6	269.9
Mass water	38.7	83.1	59.3	60.6	73.4	97.2
Mass dry soil	307.2	311.0	339.8	290.2	315.3	261.5
Moisture %	12.6%	26.7%	17.5%	20.9%	23.3%	37.2%

Test Pit	TH15-12	TH15-12	TH15-12	TH15-11	TH15-11	TH15-11
Depth (m)	2.3 - 2.4	2.6 - 2.7	2.7 - 2.9	0.3 - 0.6	0.6 - 0.8	0.9 - 1.1
Sample #	G43	G44	G44B	G45	G46	G47
Tare ID	H46	P16	N03	Z73	A6	D46
Mass of tare	8.4	8.4	8.5	8.7	8.3	8.4
Mass wet + tare	387.9	337.5	356.6	448.5	372.8	352.8
Mass dry + tare	268.8	272.0	249.0	408.2	318.1	281.1
Mass water	119.1	65.5	107.6	40.3	54.7	71.7
Mass dry soil	260.4	263.6	240.5	399.5	309.8	272.7
Moisture %	45.7%	24.8%	44.7%	10.1%	17.7%	26.3%

Test Pit	TH15-11	TH15-11	TH15-11	TH15-11	TH15-11	TH15-09
Depth (m)	1.4 - 1.5	1.5 - 1.7	1.8 - 1.9	2.1 - 2.3	2.9 - 3.0	0.3 - 0.5
Sample #	G48	G49	G50	G51	G52	G53
Tare ID	N37	F122	F153	F78	E71	F12
Mass of tare	8.3	8.4	8.4	8.3	8.6	8.5
Mass wet + tare	370.8	355.0	226.0	412.1	393.3	357.5
Mass dry + tare	297.5	253.5	164.3	279.9	259.7	330.7
Mass water	73.3	101.5	61.7	132.2	133.6	26.8
Mass dry soil	289.2	245.1	155.9	271.6	251.1	322.2
Moisture %	25.3%	41.4%	39.6%	48.7%	53.2%	8.3%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-026-00
Client Morrisons Hershfield
Project St. James St. Reconstruction

Sample Date 17-Nov-15
Test Date 19-Nov-15
Technician Daniel Wiebe

Test Pit	TH15-09	TH15-09	TH15-09	TH15-09	TH15-09	TH15-09
Depth (m)	0.5 - 0.6	0.6 - 0.8	1.1 - 1.2	1.4 - 1.5	1.7 - 1.8	2.3 - 2.4
Sample #	G54	G55	G56	G57	G58	G59
Tare ID	AA17	AB60	AB75	AB48	AB01	Z02
Mass of tare	6.5	6.5	6.6	6.6	6.7	8.6
Mass wet + tare	373.5	363.8	398.6	352.6	391.3	348.9
Mass dry + tare	328.7	297.7	310.4	268.8	271.9	233.4
Mass water	44.8	66.1	88.2	83.8	119.4	115.5
Mass dry soil	322.2	291.2	303.8	262.2	265.2	224.8
Moisture %	13.9%	22.7%	29.0%	32.0%	45.0%	51.4%

Test Pit	TH15-09	TH15-07	TH15-07	TH15-07	TH15-07	TH15-05
Depth (m)	2.9 - 3.0	0.3 - 0.6	1.1 - 1.2	1.4 - 1.5	2.1 - 2.3	0.3 - 0.5
Sample #	G60	G61	G62	G63	G64	G65
Tare ID	W105	E131	A102	E24	Z100	F97
Mass of tare	8.4	8.6	8.3	8.5	8.3	8.4
Mass wet + tare	410.7	352.7	471.6	373.9	423.6	342.8
Mass dry + tare	268.8	333.8	445.9	350.2	395.3	319.4
Mass water	141.9	18.9	25.7	23.7	28.3	23.4
Mass dry soil	260.4	325.2	437.6	341.7	387.0	311.0
Moisture %	54.5%	5.8%	5.9%	6.9%	7.3%	7.5%

Test Pit	TH15-05	TH15-05	TH15-05	TH15-05	TH15-05	TH15-03
Depth (m)	0.9 - 1.1	1.2 - 1.5	2.1 - 2.3	2.4 - 2.6	2.9 - 3.0	0.3 - 0.5
Sample #	G66	G67	G68	G69	G70	G71
Tare ID	F69	N105	W111	Z42	W02	K26
Mass of tare	8.5	8.6	8.6	8.3	8.4	8.4
Mass wet + tare	369.9	375.5	364.9	367.9	458.8	372.4
Mass dry + tare	346.1	353.7	261.3	238.7	296.2	309.2
Mass water	23.8	21.8	103.6	129.2	162.6	63.2
Mass dry soil	337.6	345.1	252.7	230.4	287.8	300.8
Moisture %	7.0%	6.3%	41.0%	56.1%	56.5%	21.0%

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Moisture Content Report
ASTM D2216-98

Project No. 0035-026-00
Client Morrisons Hershfield
Project St. James St. Reconstruction

Sample Date 17-Nov-15
Test Date 19-Nov-15
Technician Daniel Wiebe

Test Pit	TH15-03	TH15-03	TH15-03	TH15-03	TH15-03	TH15-03
Depth (m)	0.5 - 0.6	0.6 - 0.8	1.2 - 1.4	1.4 - 1.5	1.7 - 1.8	2.1 - 2.3
Sample #	G72	G73	G74	G75	G76	G77
Tare ID	A51	F33	E103	H23	E48	E137
Mass of tare	8.5	8.6	8.4	8.5	8.4	8.4
Mass wet + tare	385.5	379.5	374.5	309.2	364.4	370.3
Mass dry + tare	319.8	317.3	311.2	231.8	258.7	251.1
Mass water	65.7	62.2	63.3	77.4	105.7	119.2
Mass dry soil	311.3	308.7	302.8	223.3	250.3	242.7
Moisture %	21.1%	20.1%	20.9%	34.7%	42.2%	49.1%

Test Pit	TH15-03	TH15-01	TH15-01	TH15-01	TH15-01	TH15-01
Depth (m)	2.9 - 3.0	0.3 - 0.6	0.9 - 1.1	1.2 - 1.4	1.8 - 2.0	2.1 - 2.3
Sample #	G78	G79	G80	G81	G82	G83
Tare ID	N64	D26	E59	N22	N77	H57
Mass of tare	8.5	8.9	8.5	8.5	8.4	8.4
Mass wet + tare	354.5	360.9	373.3	351.8	350.8	422.9
Mass dry + tare	233.0	323.0	309.0	289.1	255.6	284.7
Mass water	121.5	37.9	64.3	62.7	95.2	138.2
Mass dry soil	224.5	314.1	300.5	280.6	247.2	276.3
Moisture %	54.1%	12.1%	21.4%	22.3%	38.5%	50.0%

Test Pit	TH15-01					
Depth (m)	2.7 - 2.9					
Sample #	G84					
Tare ID	F110					
Mass of tare	8.1					
Mass wet + tare	433.1					
Mass dry + tare	284.1					
Mass water	149.0					
Mass dry soil	276.0					
Moisture %	54.0%					

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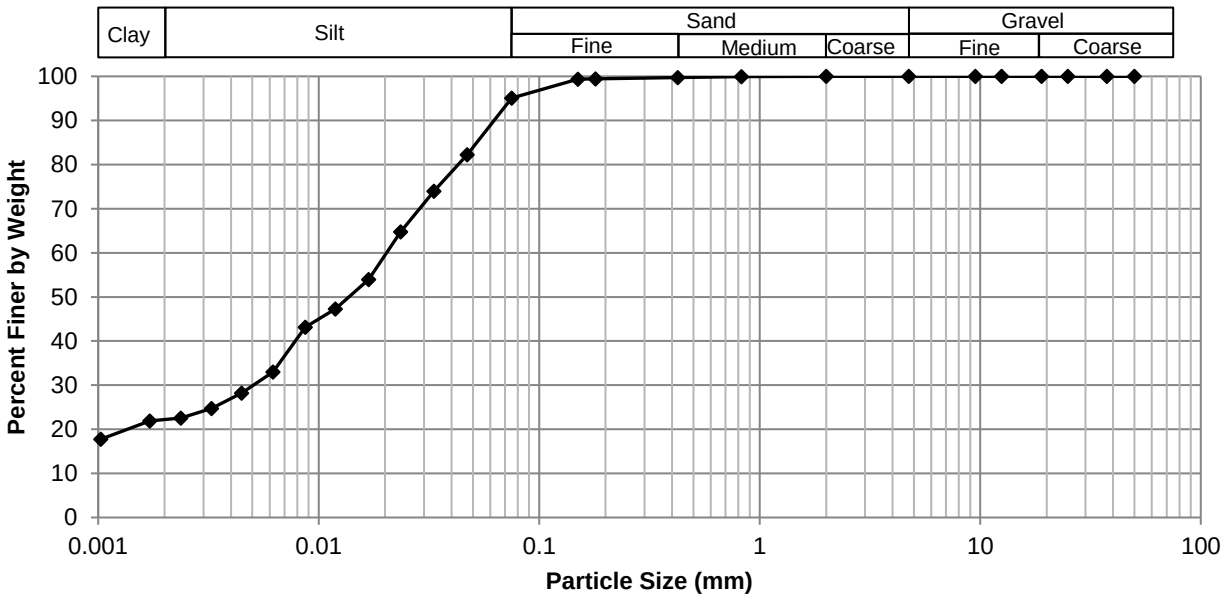
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-026-00
Client	Morrison Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-04
Sample #	G09
Depth (m)	1.4 - 1.5
Sample Date	17-Nov-15
Test Date	9-Dec-15
Technician	DW/MM

Gravel	0.0%
Sand	4.9%
Silt	73.0%
Clay	22.1%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	95.12
37.5	100.00	2.00	100.00	0.0471	82.22
25.0	100.00	0.825	99.92	0.0333	73.96
19.0	100.00	0.425	99.74	0.0236	64.75
12.5	100.00	0.180	99.41	0.0168	53.95
9.50	100.00	0.150	99.38	0.0119	47.28
4.75	100.00	0.075	95.12	0.0087	43.16
				0.0062	32.99
				0.0045	28.23
				0.0033	24.74
				0.0024	22.51
				0.0017	21.88
				0.0010	17.75

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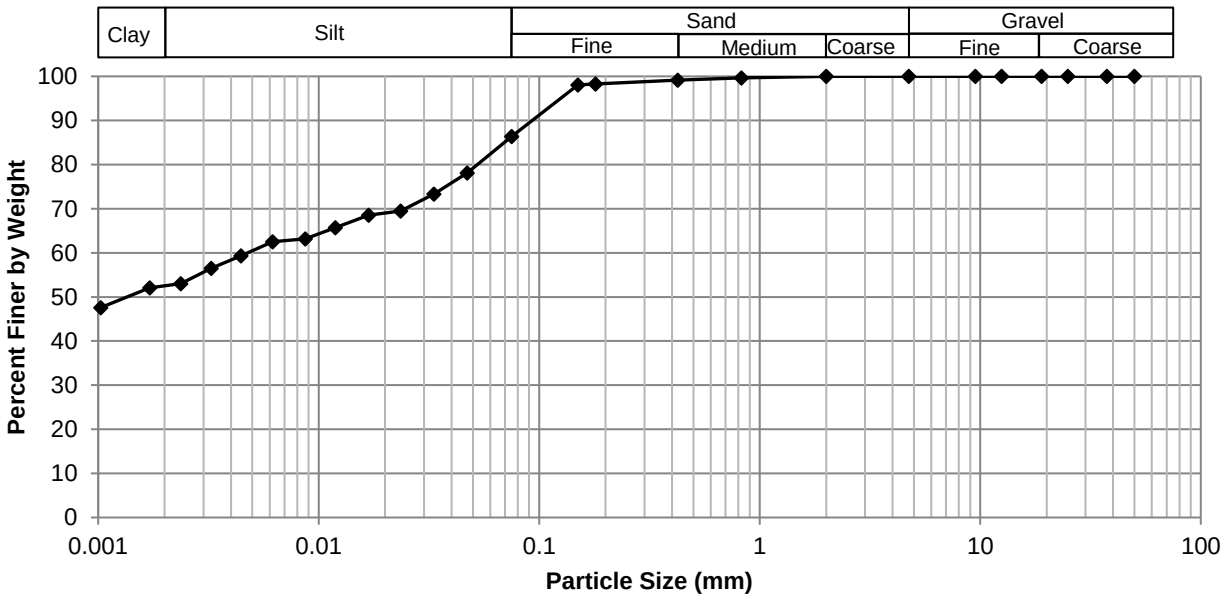
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-026-00
Client	Morrison Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-06
Sample #	G14
Depth (m)	0.5 - 0.6
Sample Date	17-Nov-15
Test Date	9-Dec-15
Technician	DW/MM

Gravel	0.0%
Sand	13.6%
Silt	33.9%
Clay	52.5%

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	86.39
37.5	100.00	2.00	100.00	0.0471	78.09
25.0	100.00	0.825	99.67	0.0333	73.32
19.0	100.00	0.425	99.17	0.0236	69.51
12.5	100.00	0.180	98.28	0.0168	68.56
9.50	100.00	0.150	98.04	0.0119	65.70
4.75	100.00	0.075	86.39	0.0087	63.16
				0.0062	62.52
				0.0044	59.34
				0.0033	56.49
				0.0024	53.00
				0.0017	52.05
				0.0010	47.60

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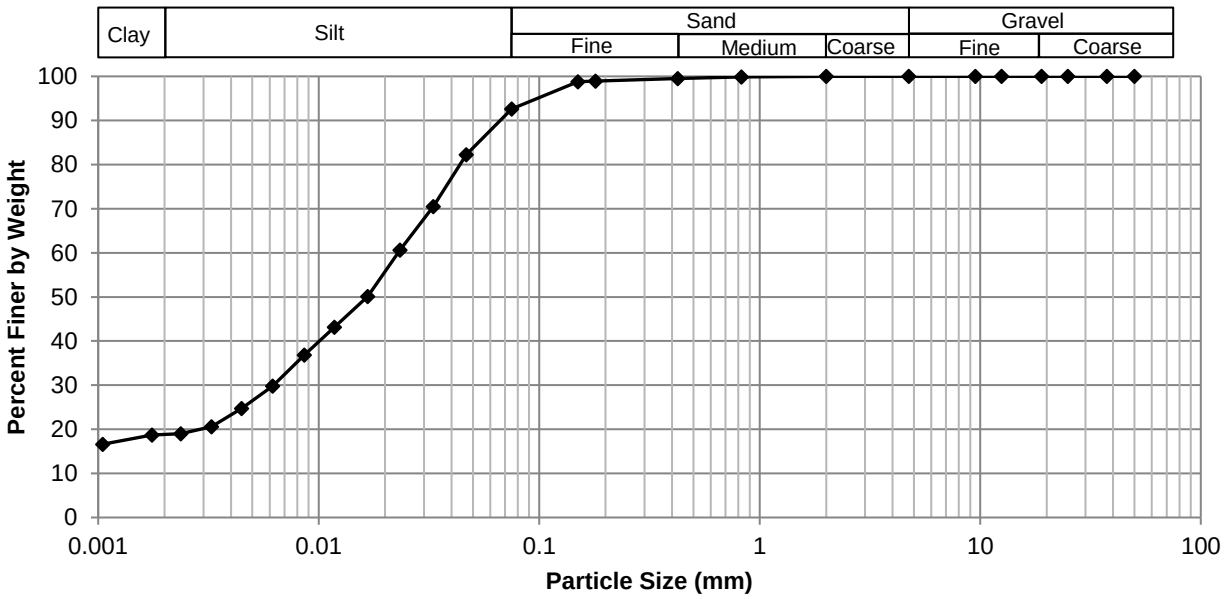
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-026-00
Client	Morrison Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-12
Sample #	G39
Depth (m)	0.9 - 1.1
Sample Date	17-Nov-15
Test Date	10-Dec-15
Technician	DW/MM

Gravel	0.0%
Sand	7.4%
Silt	73.8%
Clay	18.8%

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	92.59
37.5	100.00	2.00	100.00	0.0468	82.22
25.0	100.00	0.825	99.85	0.0331	70.47
19.0	100.00	0.425	99.50	0.0234	60.63
12.5	100.00	0.180	98.94	0.0167	50.15
9.50	100.00	0.150	98.81	0.0118	43.16
4.75	100.00	0.075	92.59	0.0086	36.81
				0.0062	29.81
				0.0045	24.74
				0.0033	20.61
				0.0024	19.02
				0.0018	18.70
				0.0010	16.61

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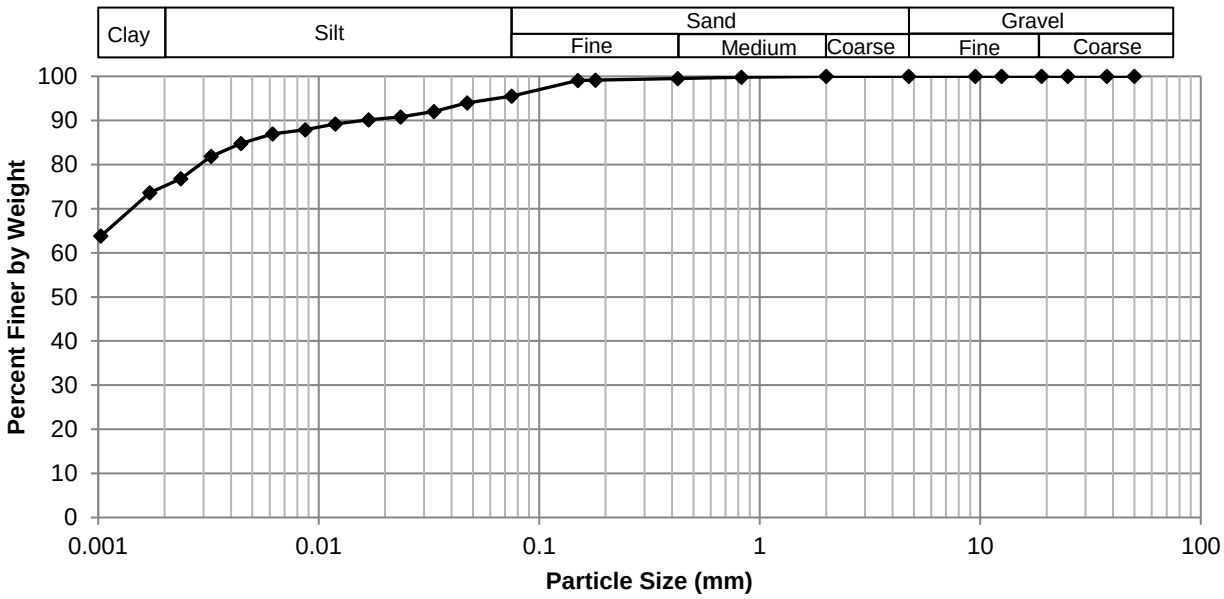
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-026-00
Client	Morrison Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-09
Sample #	G56
Depth (m)	1.1 - 1.2
Sample Date	17-Nov-15
Test Date	9-Dec-15
Technician	DW/MM

Gravel	0.0%
Sand	4.5%
Silt	20.5%
Clay	75.0%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	95.54
37.5	100.00	2.00	100.00	0.0471	93.97
25.0	100.00	0.825	99.77	0.0333	92.06
19.0	100.00	0.425	99.51	0.0236	90.79
12.5	100.00	0.180	99.17	0.0168	90.16
9.50	100.00	0.150	99.06	0.0119	89.20
4.75	100.00	0.075	95.54	0.0087	87.93
				0.0062	86.97
				0.0044	84.75
				0.0033	81.89
				0.0024	76.82
				0.0017	73.64
				0.0010	63.80

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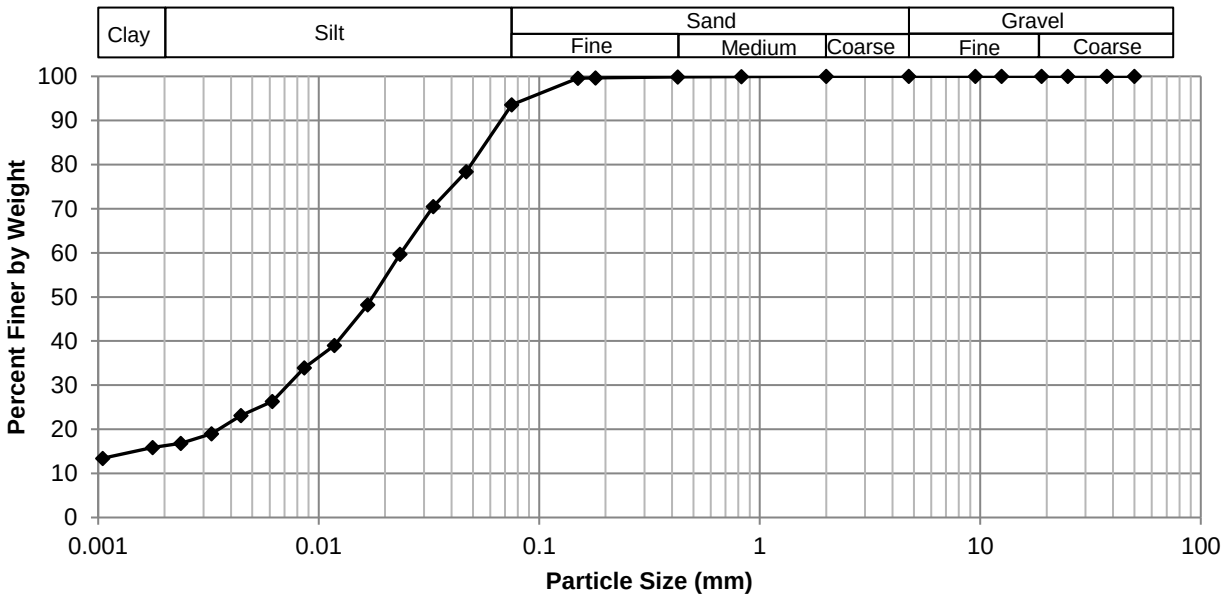
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-026-00
Client	Morrison Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-03
Sample #	G74
Depth (m)	1.2 - 1.4
Sample Date	17-Nov-15
Test Date	10-Dec-15
Technician	Daniel Wiebe

Gravel	0.0%
Sand	6.4%
Silt	77.4%
Clay	16.2%

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	93.56
37.5	100.00	2.00	100.00	0.0468	78.41
25.0	100.00	0.825	99.96	0.0331	70.47
19.0	100.00	0.425	99.87	0.0234	59.67
12.5	100.00	0.180	99.66	0.0167	48.24
9.50	100.00	0.150	99.55	0.0118	39.03
4.75	100.00	0.075	93.56	0.0086	33.95
				0.0062	26.33
				0.0044	23.14
				0.0033	19.02
				0.0024	16.80
				0.0018	15.85
				0.0010	13.43

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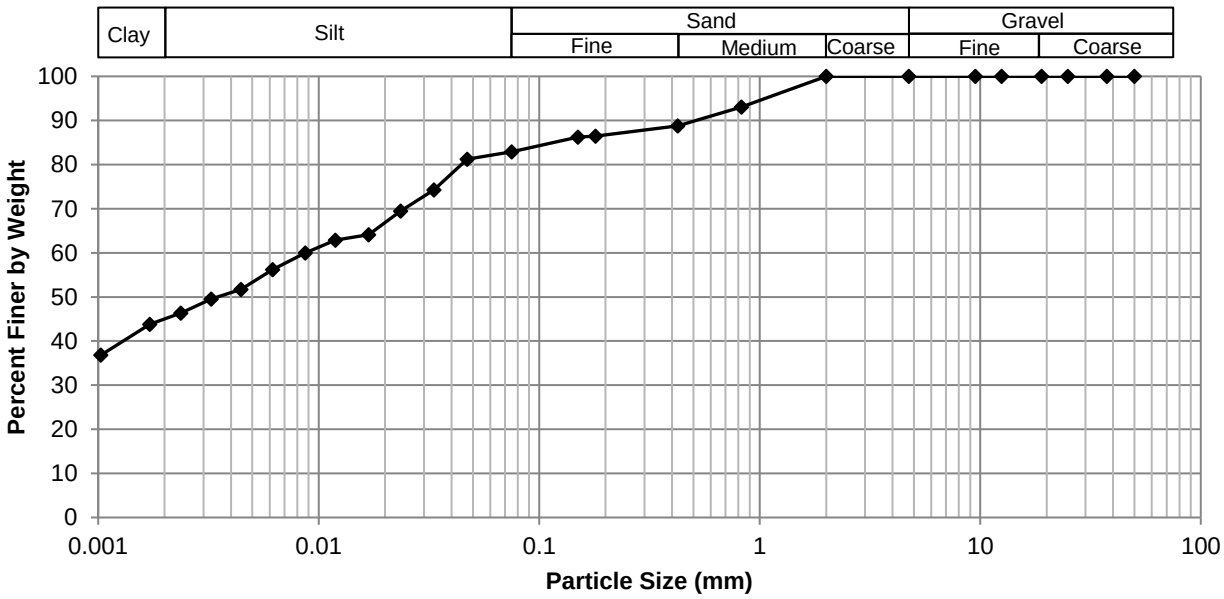
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-026-00
Client	Morrison Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-01
Sample #	G80
Depth (m)	0.9 - 1.1
Sample Date	17-Nov-15
Test Date	9-Dec-15
Technician	DW/MM

Gravel	0.0%
Sand	17.1%
Silt	38.0%
Clay	44.9%

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	82.87
37.5	100.00	2.00	100.00	0.0471	81.26
25.0	100.00	0.825	93.09	0.0333	74.28
19.0	100.00	0.425	88.79	0.0236	69.51
12.5	100.00	0.180	86.47	0.0168	64.12
9.50	100.00	0.150	86.20	0.0119	62.85
4.75	100.00	0.075	82.87	0.0087	59.99
				0.0062	56.17
				0.0044	51.72
				0.0033	49.50
				0.0024	46.33
				0.0017	43.79
				0.0010	36.80

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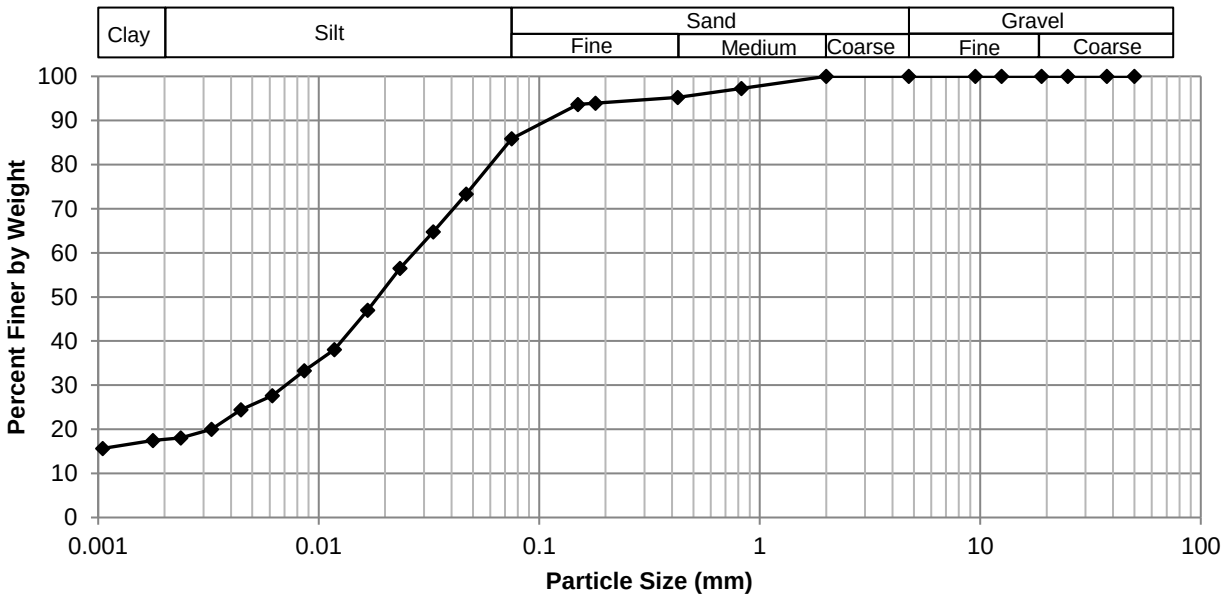
Grain Size Analysis (Hydrometer Method)
ASTM D422

Project No.	0035-026-00
Client	Morrison Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-01
Sample #	G81
Depth (m)	1.2 - 1.4
Sample Date	17-Nov-15
Test Date	10-Dec-15
Technician	Daniel Wiebe

Gravel	0.0%
Sand	14.1%
Silt	68.2%
Clay	17.7%

Particle Size Distribution Curve



Gravel		Sand		Silt and Clay	
Particle Size (mm)	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**	**Particle Size (mm)**	**Percent Passing**
50.0	100.00	4.75	100.00	0.0750	85.88
37.5	100.00	2.00	100.00	0.0468	73.33
25.0	100.00	0.825	97.26	0.0331	64.76
19.0	100.00	0.425	95.20	0.0234	56.50
12.5	100.00	0.180	93.93	0.0167	46.97
9.50	100.00	0.150	93.66	0.0118	38.08
4.75	100.00	0.075	85.88	0.0086	33.32
				0.0062	27.60
				0.0044	24.41
				0.0033	19.97
				0.0024	18.07
				0.0018	17.43
				0.0010	15.66

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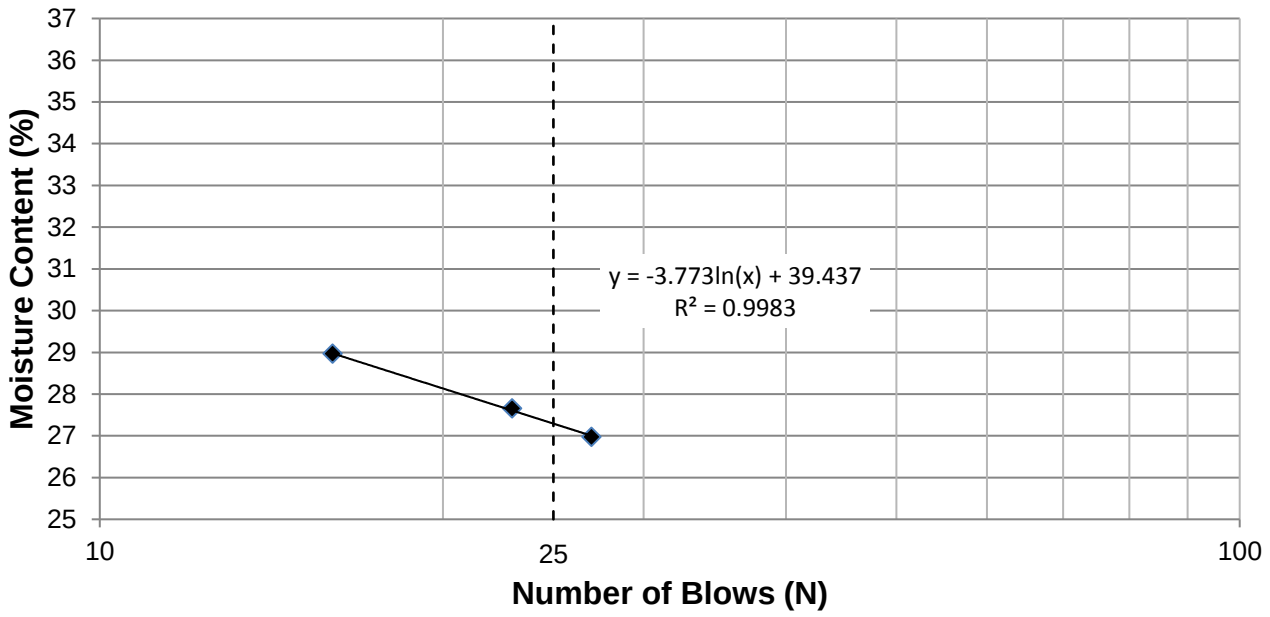
Atterberg Limits
ASTM D4318

Project No.	0035-026-00
Client	Morrisons Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-04
Sample #	G09
Depth (m)	1.4 - 1.5
Sample Date	17-Nov-15
Test Date	09-Dec-15
Technician	Daniel Wiebe

Liquid Limit	27
Plastic Limit	17
Plasticity Index	10

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	27	23	16		
Mass Wet Soil + Tare (g)	34.662	34.845	35.407		
Mass Dry Soil + Tare (g)	30.268	30.394	30.645		
Mass Tare (g)	13.976	14.299	14.203		
Mass Water (g)	4.394	4.451	4.762		
Mass Dry Soil (g)	16.292	16.095	16.442		
Moisture Content (%)	26.970	27.655	28.962		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.213	21.293			
Mass Dry Soil + Tare (g)	20.152	20.245			
Mass Tare (g)	14.024	14.049			
Mass Water (g)	1.061	1.048			
Mass Dry Soil (g)	6.128	6.196			
Moisture Content (%)	17.314	16.914			

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Atterberg Limits
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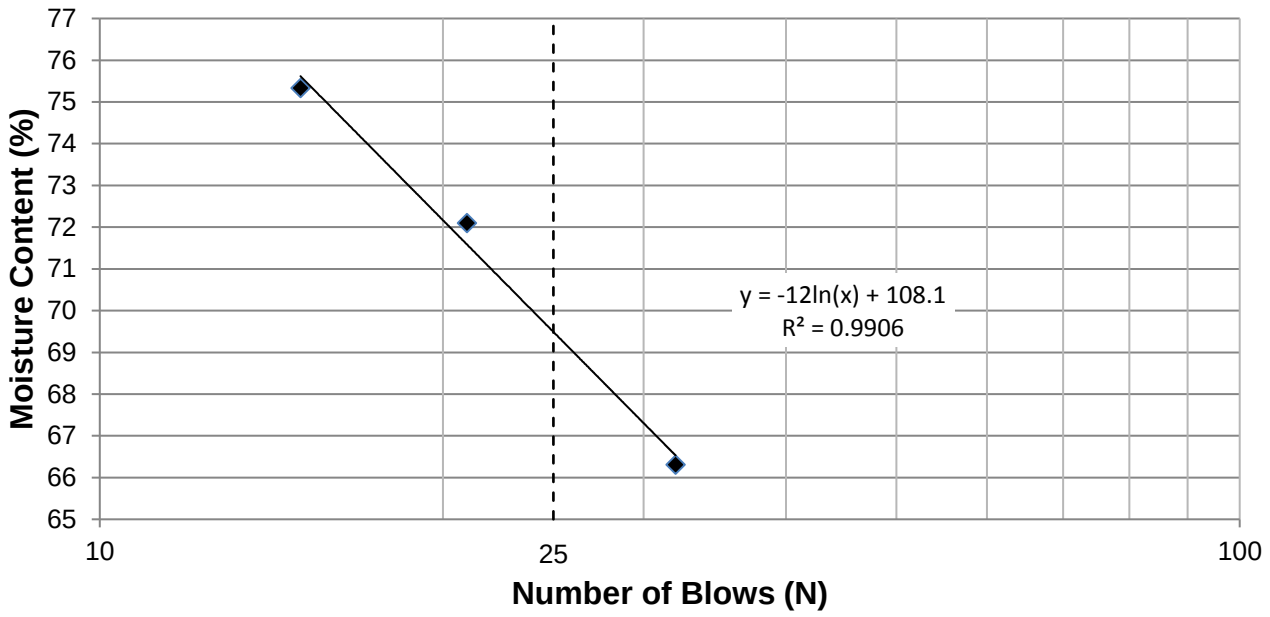
Project No.	0035-026-00
Client	Morrisons Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-06
Sample #	G14
Depth (m)	0.5 - 0.6
Sample Date	17-Nov-15
Test Date	11-Dec-15
Technician	Daniel Wiebe

Liquid Limit	69
Plastic Limit	17
Plasticity Index	52

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	32	21	15		
Mass Wet Soil + Tare (g)	34.905	35.359	36.663		
Mass Dry Soil + Tare (g)	26.600	26.420	27.058		
Mass Tare (g)	14.074	14.021	14.308		
Mass Water (g)	8.305	8.939	9.605		
Mass Dry Soil (g)	12.526	12.399	12.750		
Moisture Content (%)	66.302	72.095	75.333		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	20.728	21.520			
Mass Dry Soil + Tare (g)	19.800	20.453			
Mass Tare (g)	14.069	14.118			
Mass Water (g)	0.928	1.067			
Mass Dry Soil (g)	5.731	6.335			
Moisture Content (%)	16.193	16.843			

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Atterberg Limits
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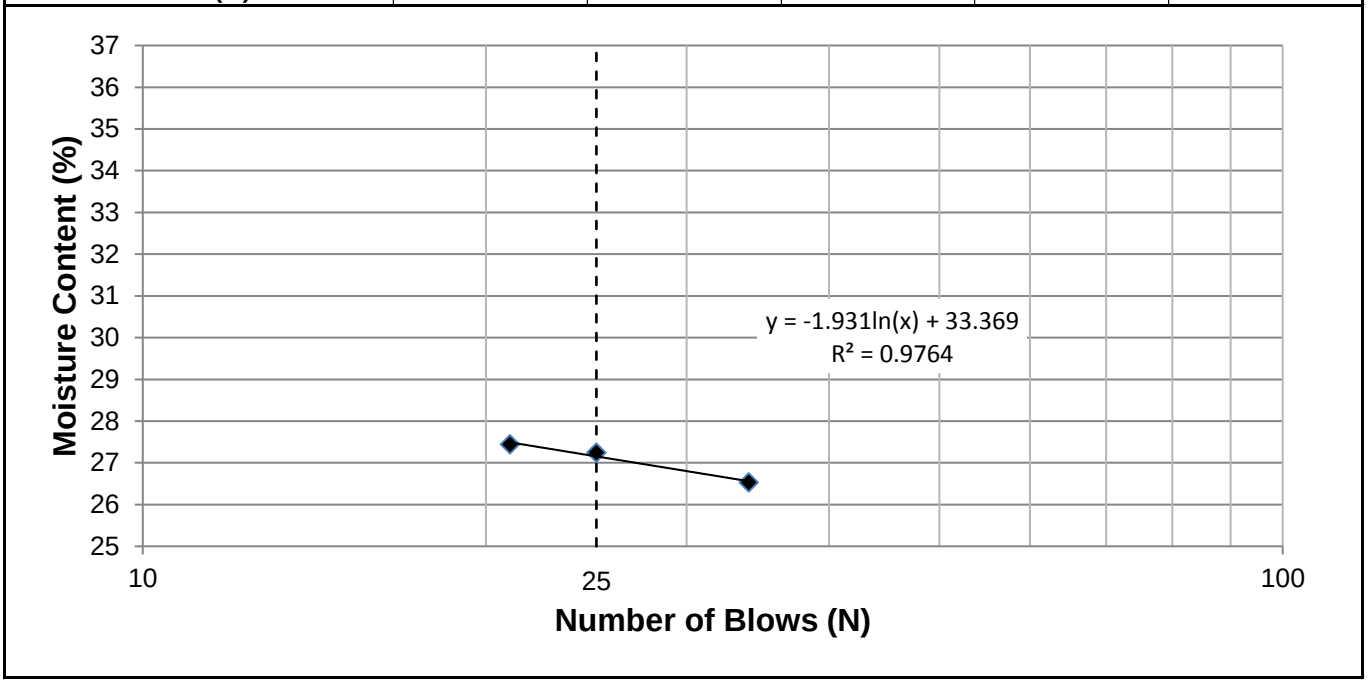
Project No.	0035-026-00
Client	Morrisons Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-12
Sample #	G39
Depth (m)	0.9 - 1.1
Sample Date	17-Nov-15
Test Date	10-Dec-15
Technician	Daniel Wiebe

Liquid Limit	27
Plastic Limit	16
Plasticity Index	11

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	21	25	34		
Mass Wet Soil + Tare (g)	37.007	35.831	40.421		
Mass Dry Soil + Tare (g)	32.102	31.242	34.908		
Mass Tare (g)	14.225	14.394	14.128		
Mass Water (g)	4.905	4.589	5.513		
Mass Dry Soil (g)	17.877	16.848	20.780		
Moisture Content (%)	27.437	27.238	26.530		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	21.132	21.026			
Mass Dry Soil + Tare (g)	20.167	20.049			
Mass Tare (g)	14.196	14.064			
Mass Water (g)	0.965	0.977			
Mass Dry Soil (g)	5.971	5.985			
Moisture Content (%)	16.161	16.324			

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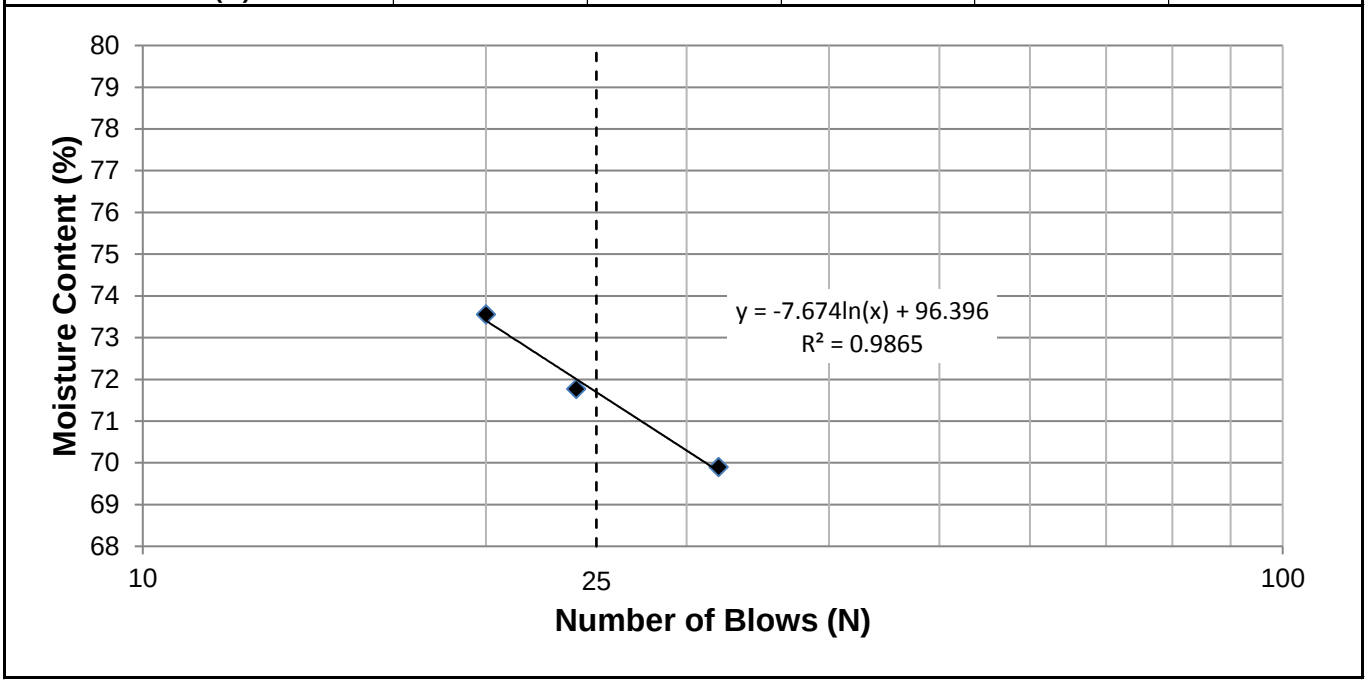
Atterberg Limits
ASTM D4318

Project No.	0035-026-00
Client	Morrisons Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-09
Sample #	G56
Depth (m)	1.1 - 1.2
Sample Date	17-Nov-15
Test Date	09-Dec-15
Technician	Daniel Wiebe

Liquid Limit	72
Plastic Limit	21
Plasticity Index	51

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	32	24	20		
Mass Wet Soil + Tare (g)	35.305	35.753	34.346		
Mass Dry Soil + Tare (g)	26.592	26.710	25.779		
Mass Tare (g)	14.126	14.109	14.132		
Mass Water (g)	8.713	9.043	8.567		
Mass Dry Soil (g)	12.466	12.601	11.647		
Moisture Content (%)	69.894	71.764	73.555		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	20.628	20.619			
Mass Dry Soil + Tare (g)	19.541	19.516			
Mass Tare (g)	14.309	14.165			
Mass Water (g)	1.087	1.103			
Mass Dry Soil (g)	5.232	5.351			
Moisture Content (%)	20.776	20.613			

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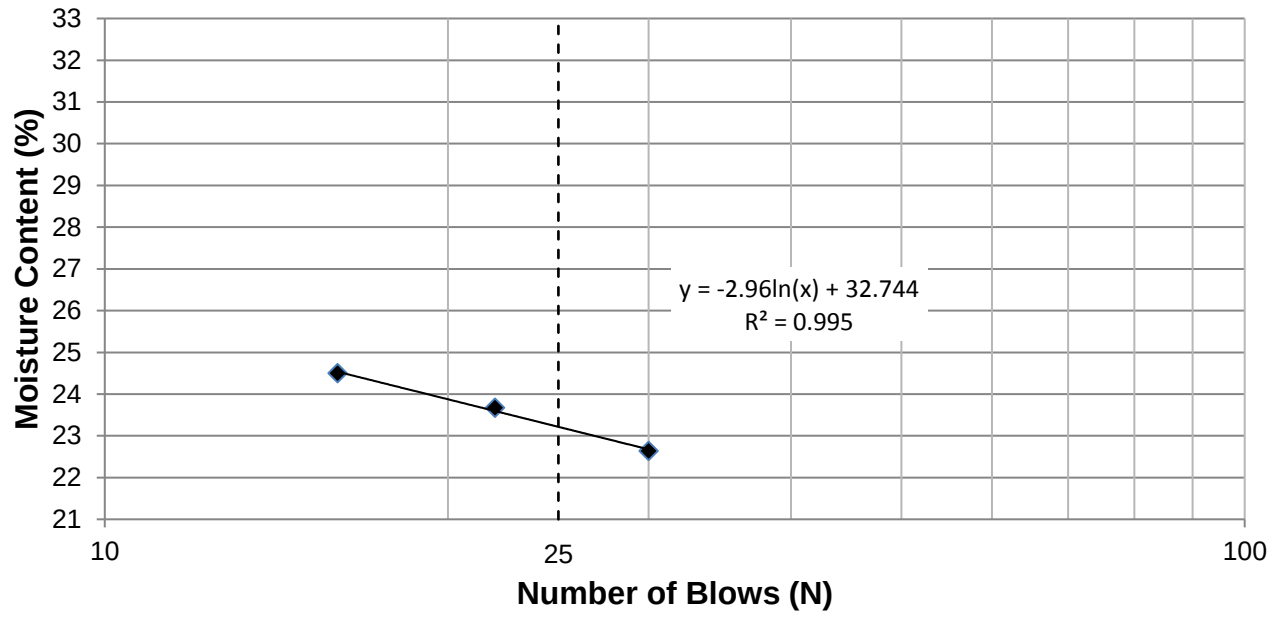
Atterberg Limits
ASTM D4318

Project No.	0035-026-00
Client	Morrisons Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-03
Sample #	G74
Depth (m)	1.2 - 1.4
Sample Date	17-Nov-15
Test Date	10-Dec-15
Technician	Daniel Wiebe

Liquid Limit	23
Plastic Limit	17
Plasticity Index	6

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	22	30	16		
Mass Wet Soil + Tare (g)	36.300	36.040	35.818		
Mass Dry Soil + Tare (g)	32.002	31.992	31.539		
Mass Tare (g)	13.844	14.110	14.073		
Mass Water (g)	4.298	4.048	4.279		
Mass Dry Soil (g)	18.158	17.882	17.466		
Moisture Content (%)	23.670	22.637	24.499		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	22.031	22.017			
Mass Dry Soil + Tare (g)	20.863	20.807			
Mass Tare (g)	14.046	13.863			
Mass Water (g)	1.168	1.210			
Mass Dry Soil (g)	6.817	6.944			
Moisture Content (%)	17.134	17.425			

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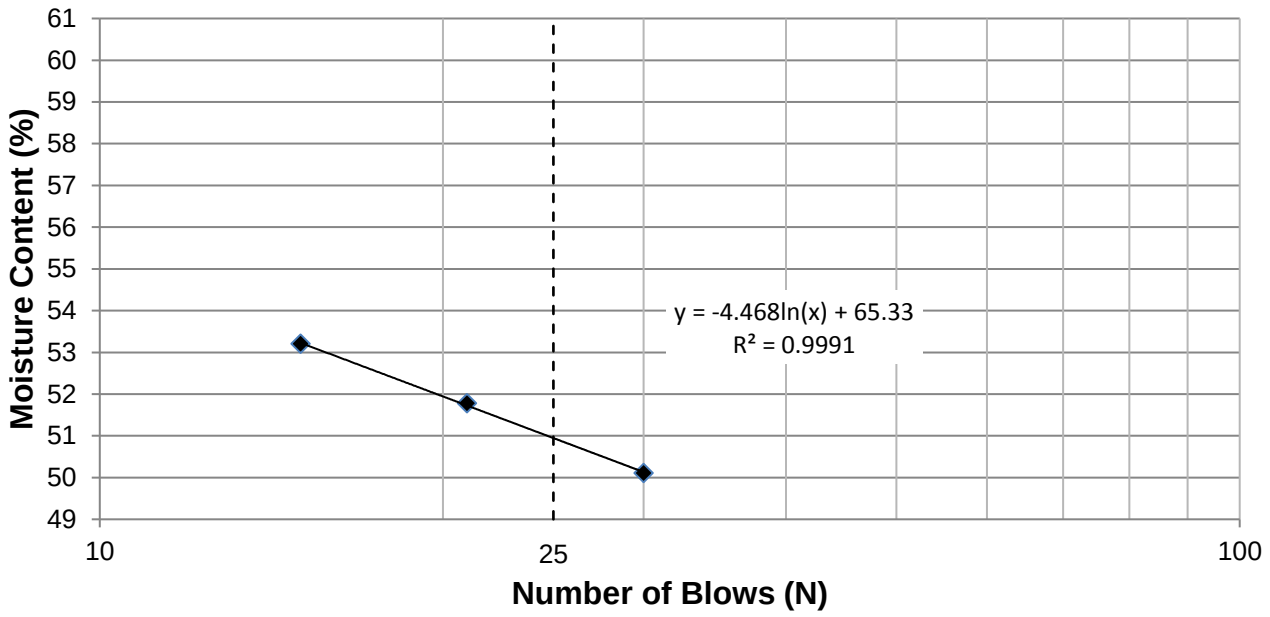
Project No.	0035-026-00
Client	Morrisons Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-01
Sample #	G80
Depth (m)	0.9 - 1.1
Sample Date	17-Nov-15
Test Date	09-Dec-15
Technician	Daniel Wiebe

Liquid Limit	51
Plastic Limit	15
Plasticity Index	36

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	30	21	15		
Mass Wet Soil + Tare (g)	35.730	34.518	36.699		
Mass Dry Soil + Tare (g)	28.440	27.573	28.824		
Mass Tare (g)	13.891	14.160	14.022		
Mass Water (g)	7.290	6.945	7.875		
Mass Dry Soil (g)	14.549	13.413	14.802		
Moisture Content (%)	50.107	51.778	53.202		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	20.656	20.290			
Mass Dry Soil + Tare (g)	19.783	19.478			
Mass Tare (g)	13.924	14.006			
Mass Water (g)	0.873	0.812			
Mass Dry Soil (g)	5.859	5.472			
Moisture Content (%)	14.900	14.839			

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Atterberg Limits
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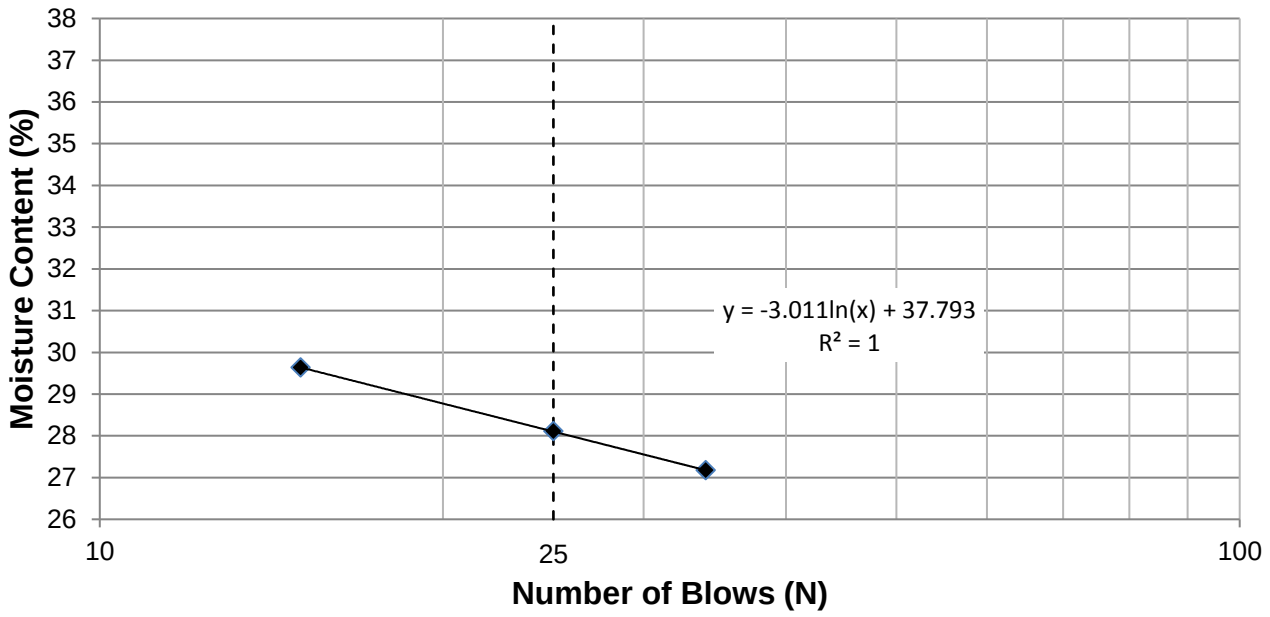
Project No.	0035-026-00
Client	Morrisons Hershfield
Project	St. James St. Reconstruction
Test Hole	TH15-01
Sample #	G81
Depth (m)	1.2 - 1.4
Sample Date	17-Nov-15
Test Date	09-Dec-15
Technician	Daniel Wiebe

Liquid Limit	28
Plastic Limit	16
Plasticity Index	12

Liquid Limit

Trial #	1	2	3	4	5
Number of Blows (N)	34	25	15		
Mass Wet Soil + Tare (g)	34.755	35.014	34.826		
Mass Dry Soil + Tare (g)	30.343	30.342	30.097		
Mass Tare (g)	14.106	13.721	14.141		
Mass Water (g)	4.412	4.672	4.729		
Mass Dry Soil (g)	16.237	16.621	15.956		
Moisture Content (%)	27.173	28.109	29.638		



Plastic Limit

Trial #	1	2	3	4	5
Mass Wet Soil + Tare (g)	20.807	20.624			
Mass Dry Soil + Tare (g)	19.874	19.717			
Mass Tare (g)	14.148	14.261			
Mass Water (g)	0.933	0.907			
Mass Dry Soil (g)	5.726	5.456			
Moisture Content (%)	16.294	16.624			

Appendix C

Photographs of Pavement Core Samples

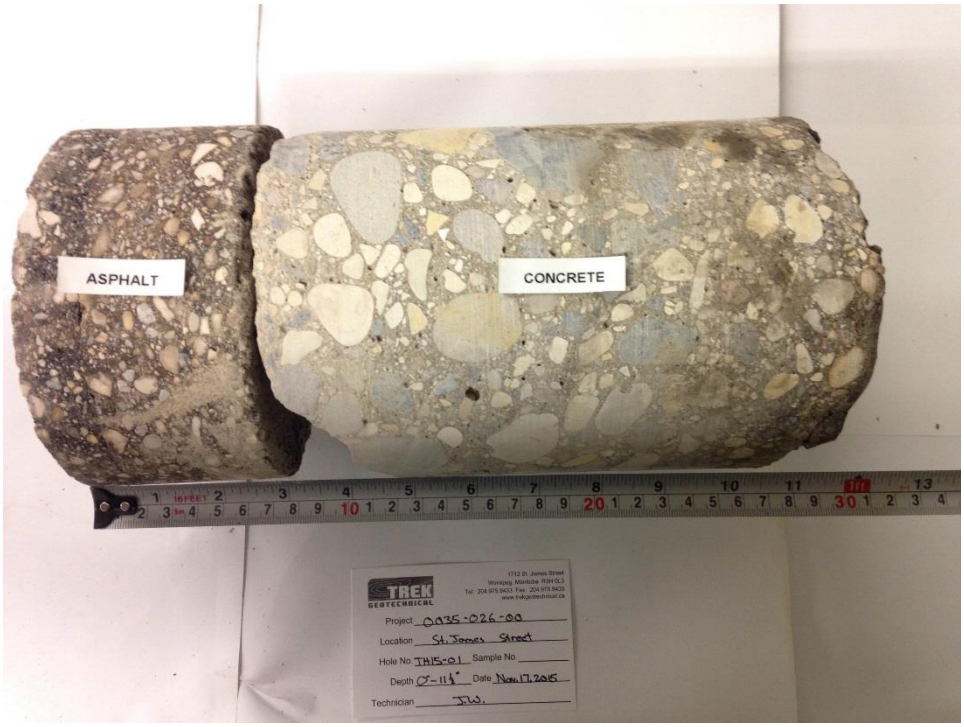


Photo 1: Concrete Core Sample From Test Hole TH15-01

Photo 2: Concrete Core Sample From Test Hole TH15-02

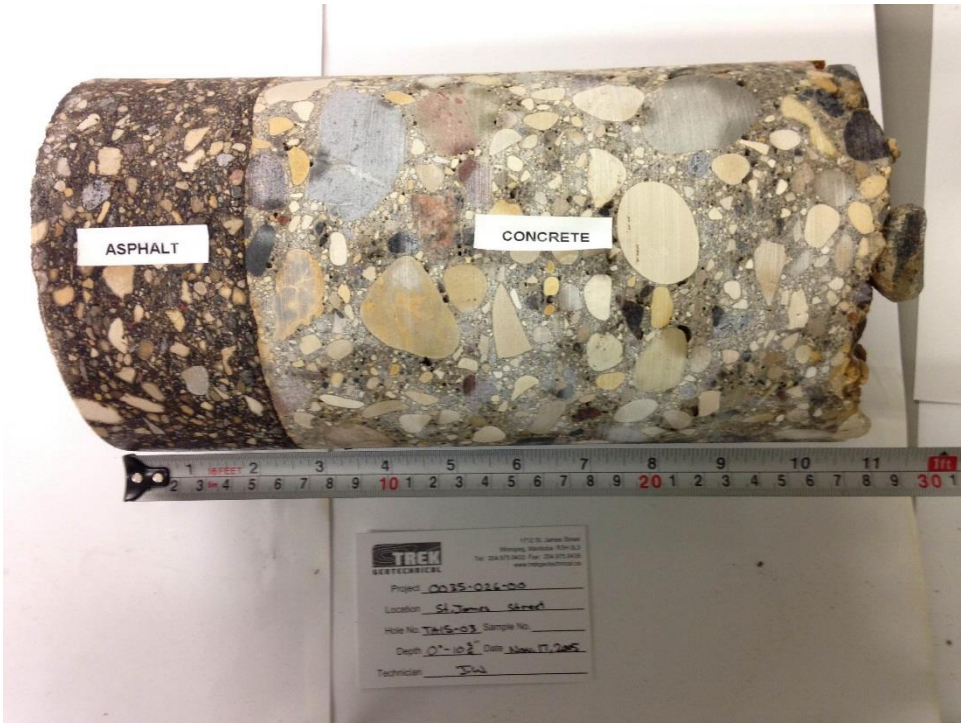


Photo 3: Concrete Core Sample From Test Hole TH15-03

Photo 4: Concrete Core Sample From Test Hole TH15-04

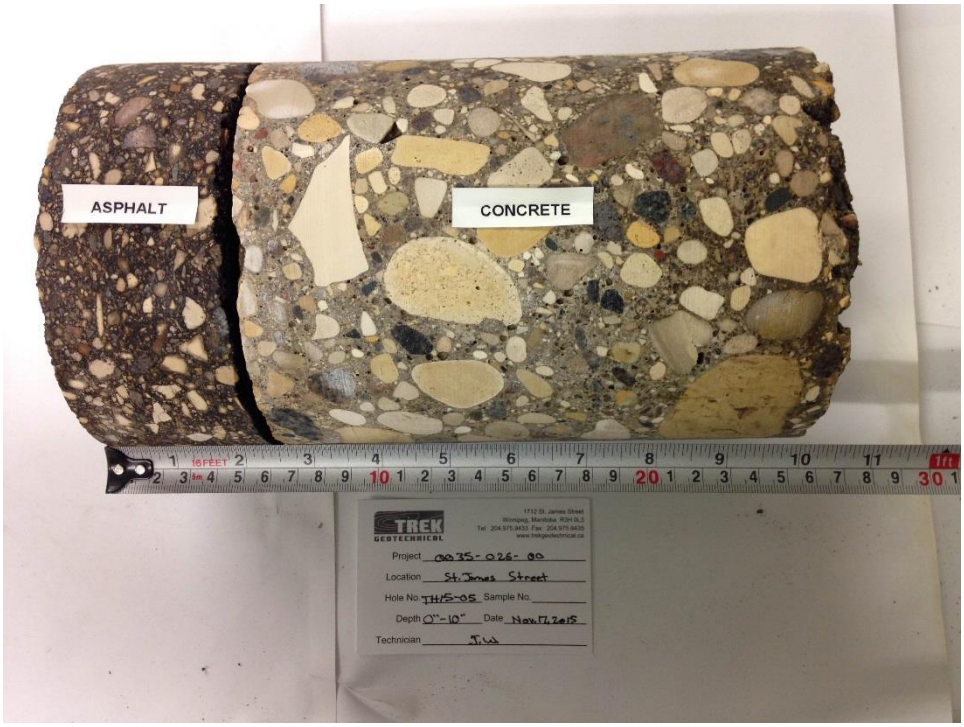


Photo 5: Concrete Core Sample From Test Hole TH15-05

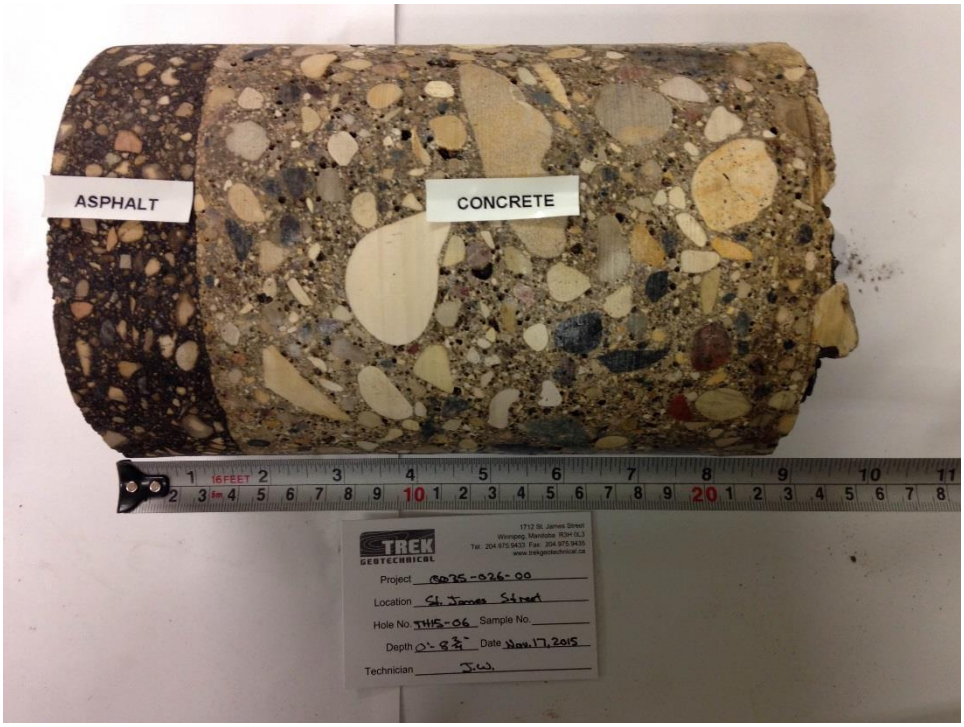


Photo 6: Concrete Core Sample From Test Hole TH15-06

Photo 7: Concrete Core Sample From Test Hole TH15-07

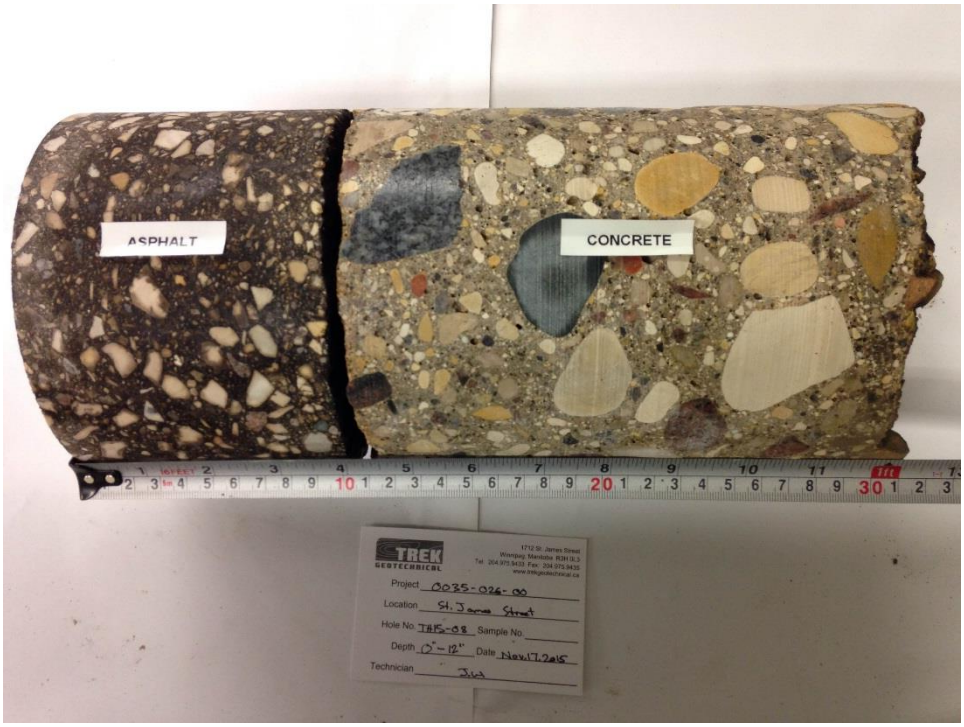


Photo 8: Concrete Core Sample From Test Hole TH15-08

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

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

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

Photo 12: Concrete Core Sample From Test Hole TH15-12