

APPENDIX 'G'

GEOTECHNICAL REPORT

APPENDIX 'G' - GEOTECHNICAL REPORT

The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities. The nature and extent of variations may not become evident until construction commences.

2023 LOCAL STREET RENEWAL PROGRAM

74-2022.4

Prepared for

Thomas Findlay, P. Eng.
99 Commerce Drive, Winnipeg, Canada. R3P 0Y7

Date

February 16, 2023

HMCL Project Number: 112-2217

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Introduction

On December 1, 2022, H. Manalo Consulting Ltd. (HMCL) received authorization from Mr. Thomas Findlay, representing AECOM, to proceed with the scope of work as described in the email dated December 1, 2023. The purpose of the work is to gather information about the existing subsurface soil conditions as well as obtain pavement cores to help assess the existing pavement.

Field Work Program

The investigation program was performed following the guidelines listed in the City of Winnipeg document titled Site Investigation Requirements for Public Works Street Projects, dated January 2021. Prior to any subsurface work, the underground services were located. At some locations, the desired test hole location had to be moved based on the underground utilities. Pavement core samples were obtained between December and January 2023. The test holes were augured using a truck mounted geotechnical test hole drill rig on December 19, 2022, and January 19, 2023, with the soil profile logged and samples collected at every 0.3 m. The test holes were back filled with bentonite clay, auger cuttings and then gravel. The pavement section was backfilled with asphalt cold mix. All pavement and soil samples were returned to HMCL's laboratory for further review.

Sample Review and Data Reporting

The asphalt pavement thickness ranges from 50 mm to 225 mm and the concrete pavement thickness was typically 200 mm. The general sub surface profile below the concrete generally consisted of a minimal layer of granular fill, followed by a silty high plastic clay. There was typically a silt layer at a depth of approximately between 1 m to 2 m depth. The thickness of the silt layer ranged from 0.2 m to 0.5 m, the details can be found on the test hole logs. All samples were tested for moisture content, and selected samples were test for Atterberg limits, Grain size analysis (mechanical sieve and hydrometer methods) and CBR testing. A lab summary is attached as well as the lab testing reports.

Closure

We appreciate the opportunity to assist you in this project. Please call the undersigned if you require further information.

Fieldwork completed by:

Handwritten signature of Timothy Senoye in black ink, featuring a stylized 'T' and 'S' with a long horizontal stroke extending to the right.

Timothy Senoye, EIT
Materials Technologist

Reviewed by:

Handwritten signature of Paul Bevel in black ink, written in a cursive style.

Paul Bevel
Manager, Field and Laboratory Services

De L'Eglise Avenue



De l'eglise Ave

Camp eau St

Camp eau St

La Barriere St

De l'eglise Ave

De l'eglise Ave

St Pierre St

St Therese Ave

St Therese Ave

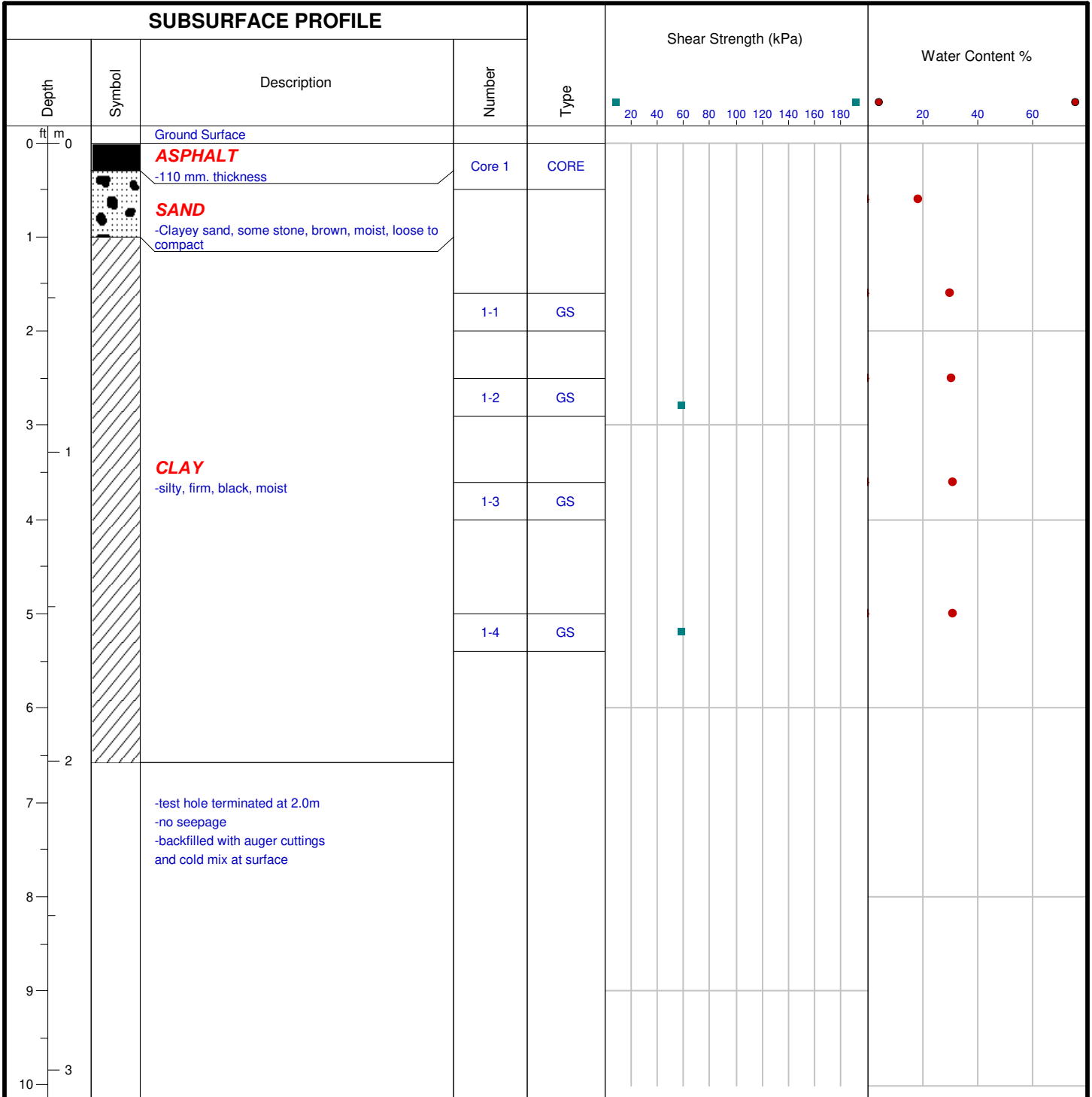
St Therese Ave

TH4

TH3

TH2

TH1



Drill Method: Auger

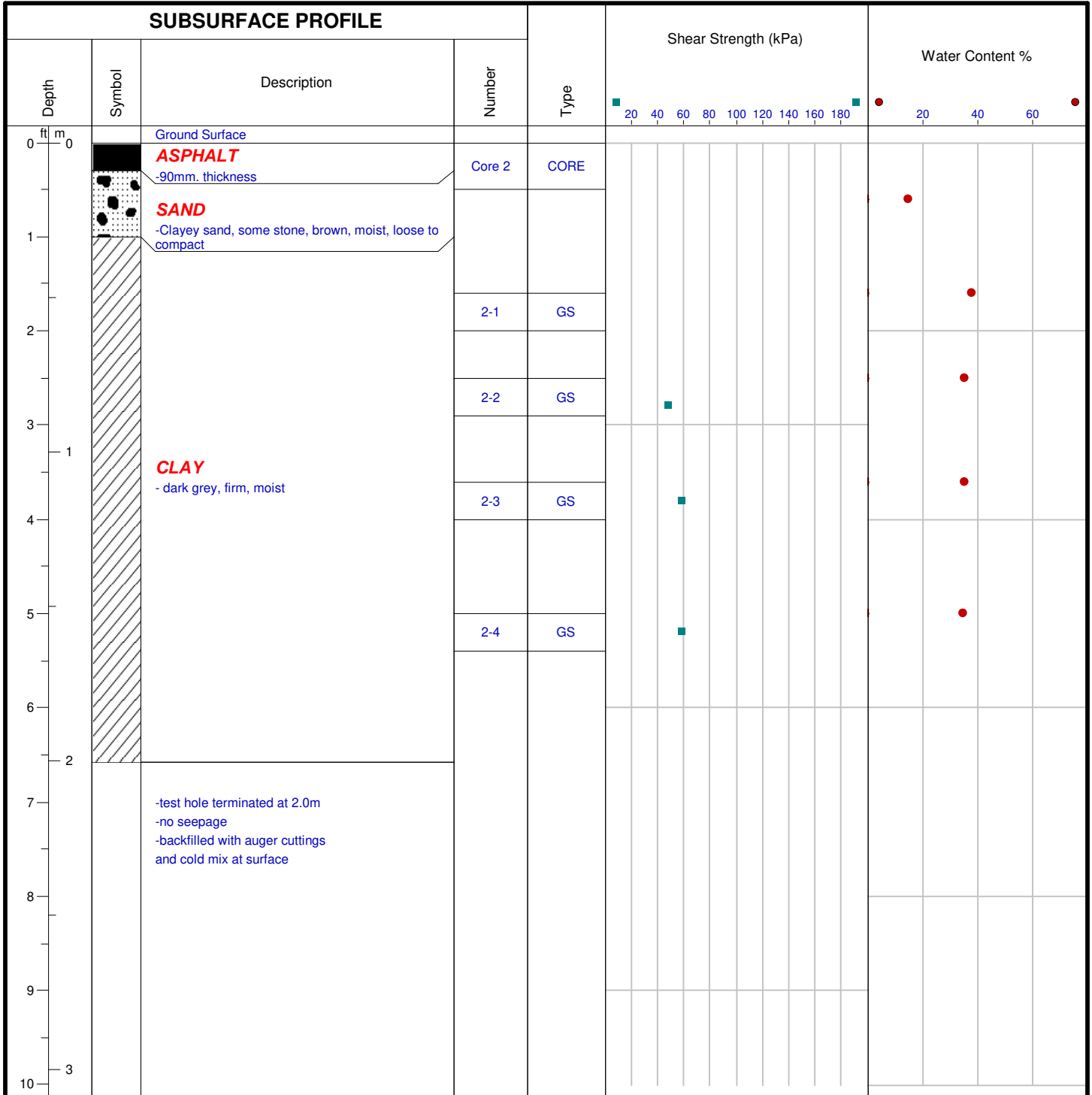
Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

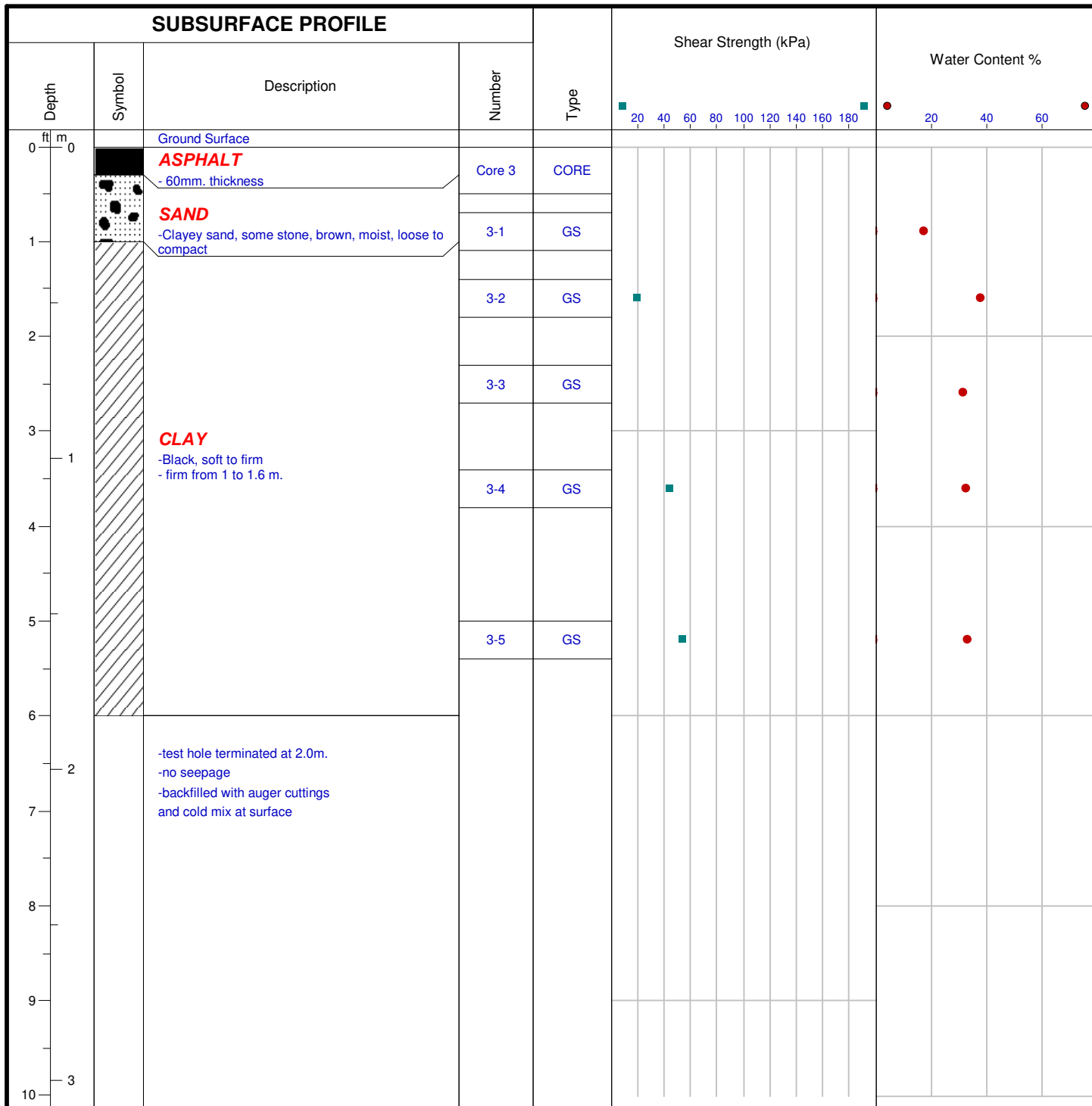
Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

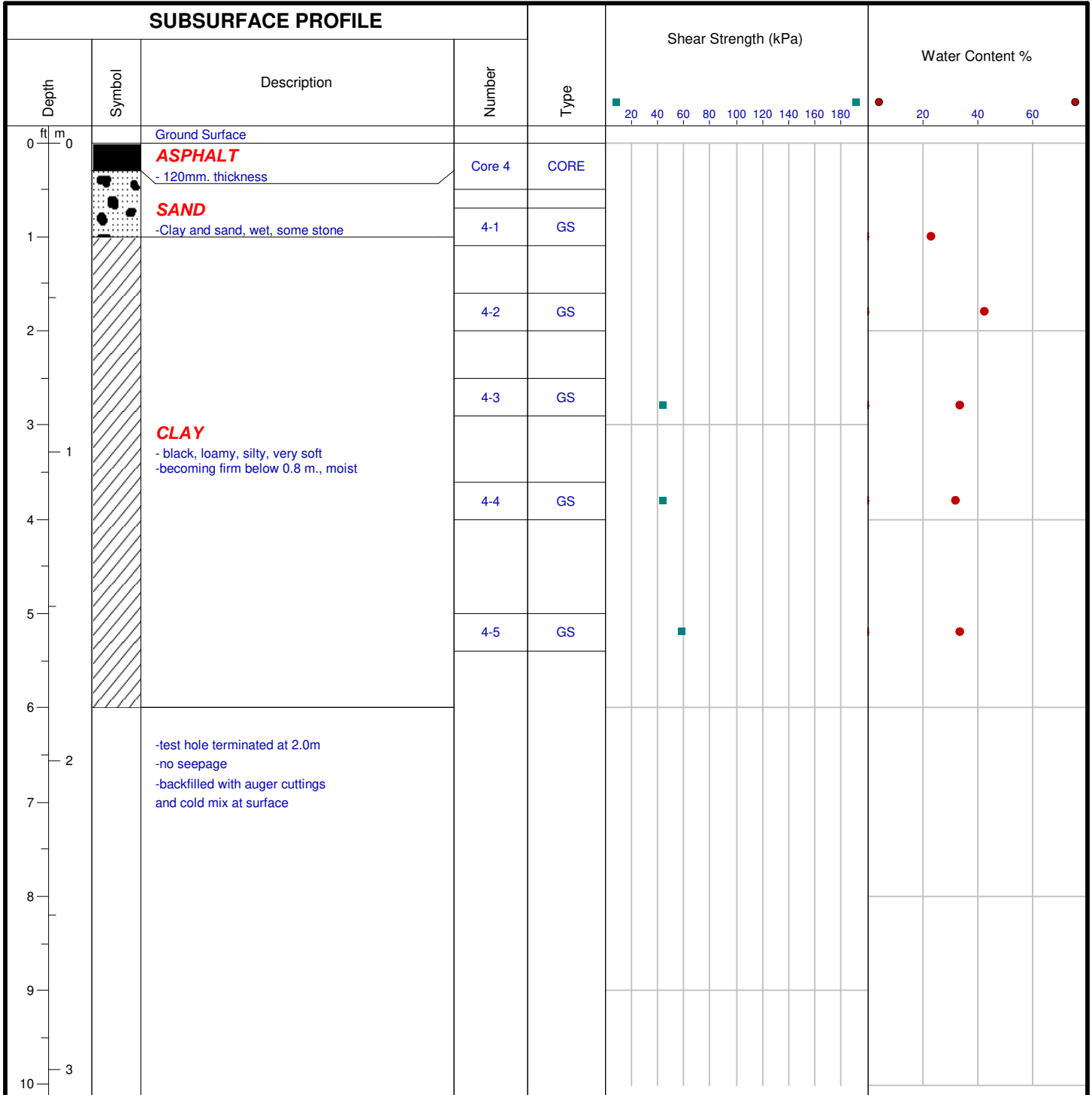
Drill Date: Dec 19, 2023

Hole Size: 6 inch

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1

DE LEGLISE AVENUE - SUMMARY TABLE				
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE		SUBGRADE
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)	DEPTH FROM SURFACE (m) AND MATERIAL TYPE
TH 1	839 De Leglise Avenue	110	-	0.11 - 0.3 Clayey Sand and stone 0.3 - 1.5 Firm moist black clay
TH 2	871 De Leglise Avenue	90	-	0.09 - 0.3 Clayey Sand and stone 0.3 - 1.5 Firm dark gray clay
TH 3	902 De Leglise Avenue	60	-	0.06 - 0.3 Clayey Sand with stone 0.3 - 0.9 Firm brittle black clay 0.9 - 1.5 Firm black clay
TH 4	925 De Leglise Avenue	120	-	0.12 - 0.3 Wet clay and Sand with stone 0.3 - 0.6 Loose loamy black clay 0.6 - 1.5 Firm moist black clay

LABORATORY TESTING								
CBR At 2.5mm	CBR At 5.1mm	GRAIN SIZE				ATTERBERG LIMITS		
		GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LL	PL	PI
4.2	3.7	0	7	33.2	59.8	66	31	36



TH1 - 839 De Leglise Ave



TH2 - 871 De Leglise Av

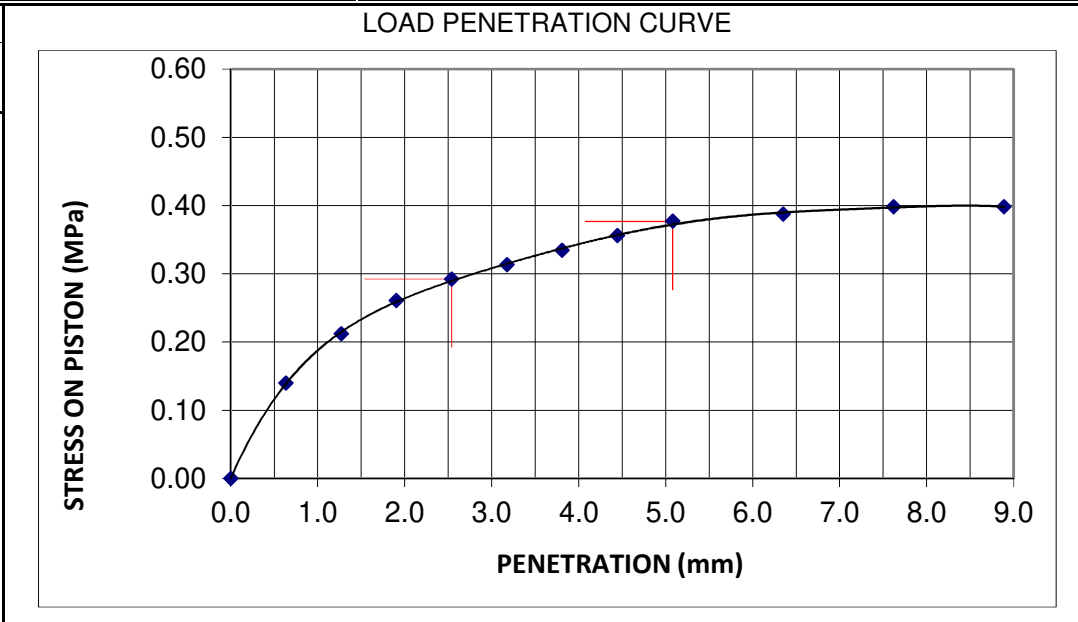


CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2217
Attention: Thomas Findlay	Lab No: HM 5
Project 23-R-04 2023 Residential Streets - Test Hole Investigati	Date sampled: December 19, 2022
Location: -De Leglise Avenue	Date Received: January 10, 2023
	Date Tested /By: January 19, 2023 ES

SAMPLE DATA		SPECIMEN DATA		
Sample Type: Clay/Soil		DESCRIPTION	Before Soaking	After Testing
Source: Test holes		Moisture Content (MC), %	29.8	34.7
Sampled by: Edwin T & Timothy Soneye		MC of top 25mm layer, %		
Optimum Moisture Content: 29.4 %		Dry Density, kg/m ³	1388	1355
Maximum Dry Density: 1448 kg/cm ³		Compaction, %	96%	
Method of Compaction: Standard Proctor		CBR, %	4.2	3.7
Tested by: Date Tested:		Swell, %		0.8

LOAD DATA	
PENETRATION mm	STRESS MPa
0	0.00
0.64	0.14
1.27	0.21
1.91	0.26
2.54	0.29
3.18	0.31
3.81	0.33
4.45	0.36
5.08	0.38
6.35	0.39
7.62	0.40
8.89	0.40



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.29	0.29	4.2	-
5.08	10.3	0.38	0.38	-	3.7

Remarks:

Reviewed by:

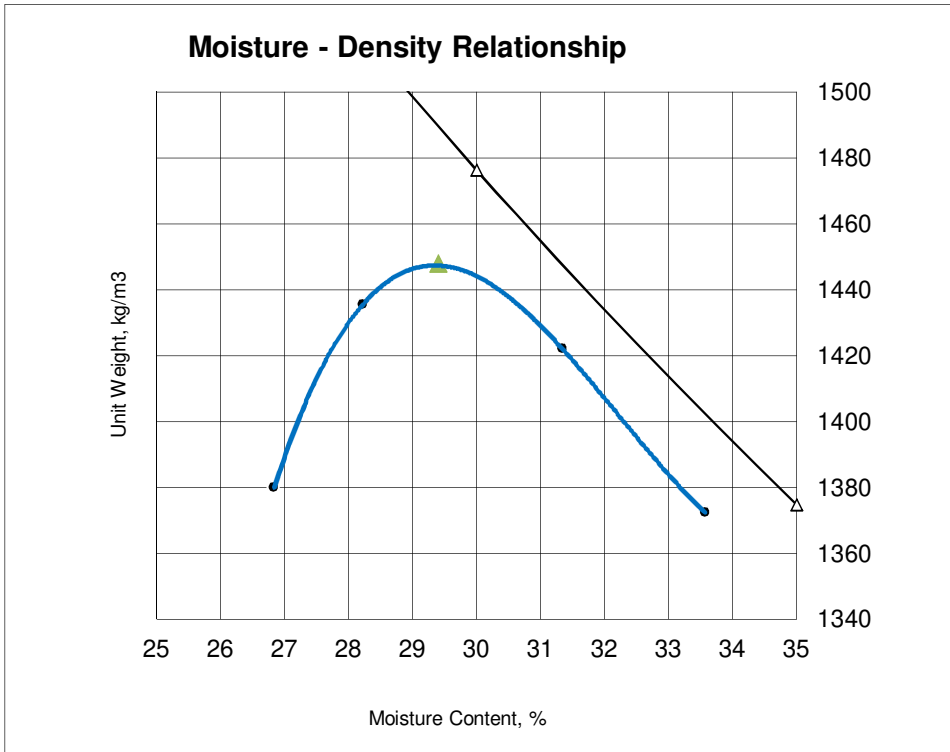
P. Bevil

MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
ATTENTION:	Thomas Findlay	Lab No.:	HM 5
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation -De Leglise avenue	Proctor Test No.:	1

Date Sampled:	December 19,	Date Received:	January 10, 2023	PROCEDURE	A
Sampled By:	Edwin T & Tin	Date Tested:	January 12, 2023	PREPARATION	Dry
MATERIAL INFORMATION				COMPACTION METHOD	Manual
Material Type:	Clay/Soil			BLOWS PER LAYER	25
Material Use:	Subgrade	Material Supplier:		NO. OF LAYERS	3
Maximum Size:	5	Material Source:	Test holes	MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4
	Wet Density	1750	1841	1868	1833
	Moisture Content	26.8	28.2	31.3	33.6
	Dry Density	1380	1436	1422	1372



Maximum Dry Density (MDD):
_____ 1448 kg/m³
Optimum Moisture Content
_____ 29.4 %

STONE CORRECTION (ASTM D 4718)

4.75mm
_____ 0 %
Corrected Moisture:
_____ 29.4 %
Corrected Maximum Dry Density:
_____ 1448 kg/m³

Remarks:

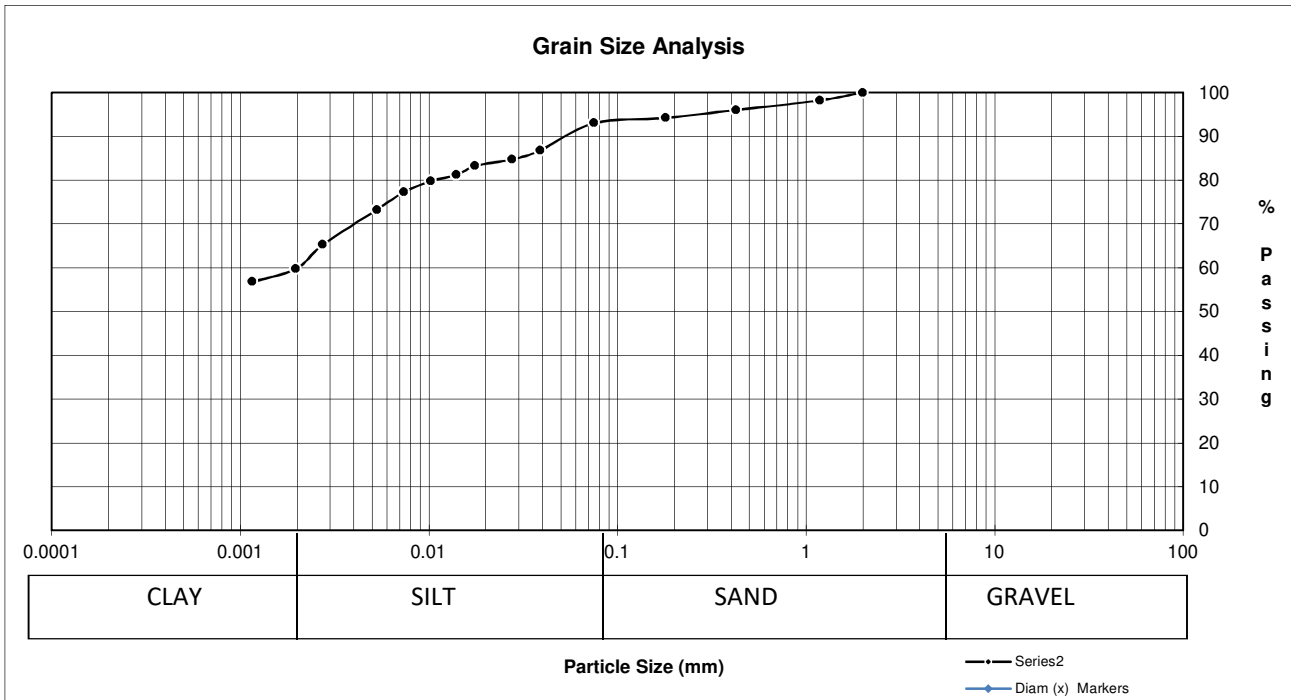
Tested by: Jaehang Jeong

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Thomas Findlay PROJECT: 23-R-04 2023 Residential Streets - Test Hole Investigation -De Leglise Avenue	Project No.: 112-2217 PSA Test No.: 1 Lab No.: HM 5
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Date Sampled: December 19, 2023	Date Received: January 10, 2024	Sieve Analysis		Hydrometer Analysis	
Sampled By: Edwin T & Tim	Date Tested:	Sieve (mm)	% Passing	Diameter	% Finer
		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
Material Identification		12.50	100.0	0.0388	86.7
B.H./T.H. No.		9.50	100.0	0.0277	84.7
Depth		4.75	100.0	0.0176	83.2
Sample Source		2.00	100.0	0.0140	81.2
Specific Gravity of Material:		1.18	98.2	0.0103	79.7
		0.425	96.0	0.0074	77.2
		0.180	94.2	0.0053	73.2
		0.075	93.0	0.0012	56.8



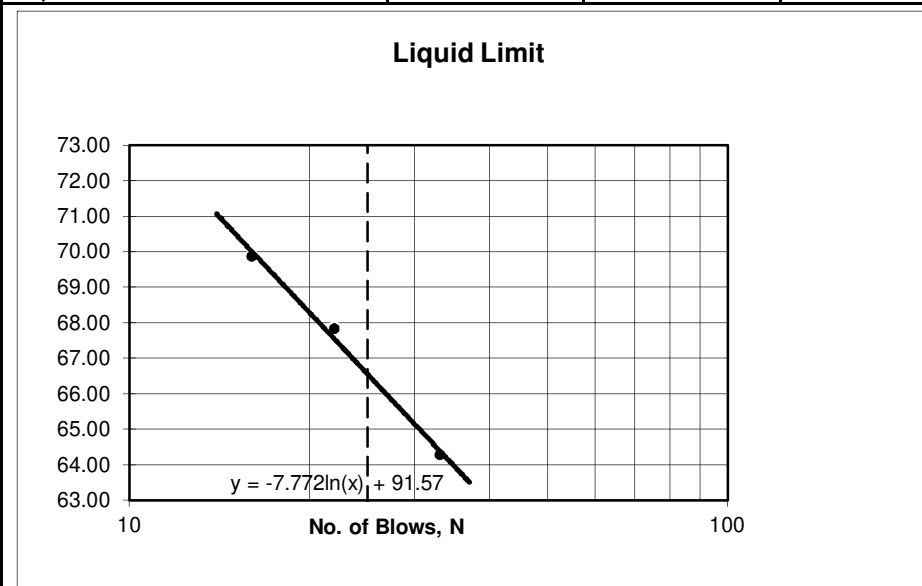
	% Composition	
	Gravel	D10
	Sand	D30
	7.0	D60
	33.2	Cu
	59.8	Cc

Remarks:

Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
Attention.:	Thomas Findlay	PI Test No.:	1
Project:	23-R-04 2023 Residential Streets - Test Hc -De Leglise Avenue	Lab No.:	HM 5
		Date Sampled/By:	December ET & TS
		Date Received:	January 10, 2023
		Date Tested / By:	

Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	1	2	3		
Wet Soil + Dish:	13.79	12.55	13.40		
Dry Soil + Dish:	10.12	9.24	9.76		
Moisture:	3.67	3.31	3.64		
Dish:	4.41	4.36	4.55		
Dry Soil:	5.71	4.88	5.21		
% Moisture:	64.27	67.83	69.87		
No. of Blows:	33	22	16		
Liquid Limit:					



Material Identification:

Depth:

Liquid Limit, %: **66**
 Plastic Limit, %: **31**
 Plasticity Index: **36**
 (LL-PL)

Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	10.75	11	10.9		
Dry Soil + Dish:	9.25	9.4	9.40		
Moisture:	1.5	1.60	1.5		
Dish:	4.3	4.4	4.29		
Dry Soil:	4.95	5	5.11		
% Moisture:	30.30	32.00	29.35		
				Average:	31

Test Method : ASTM: D4318, D2216

Remarks:

Reviewed by: Paul Bevel

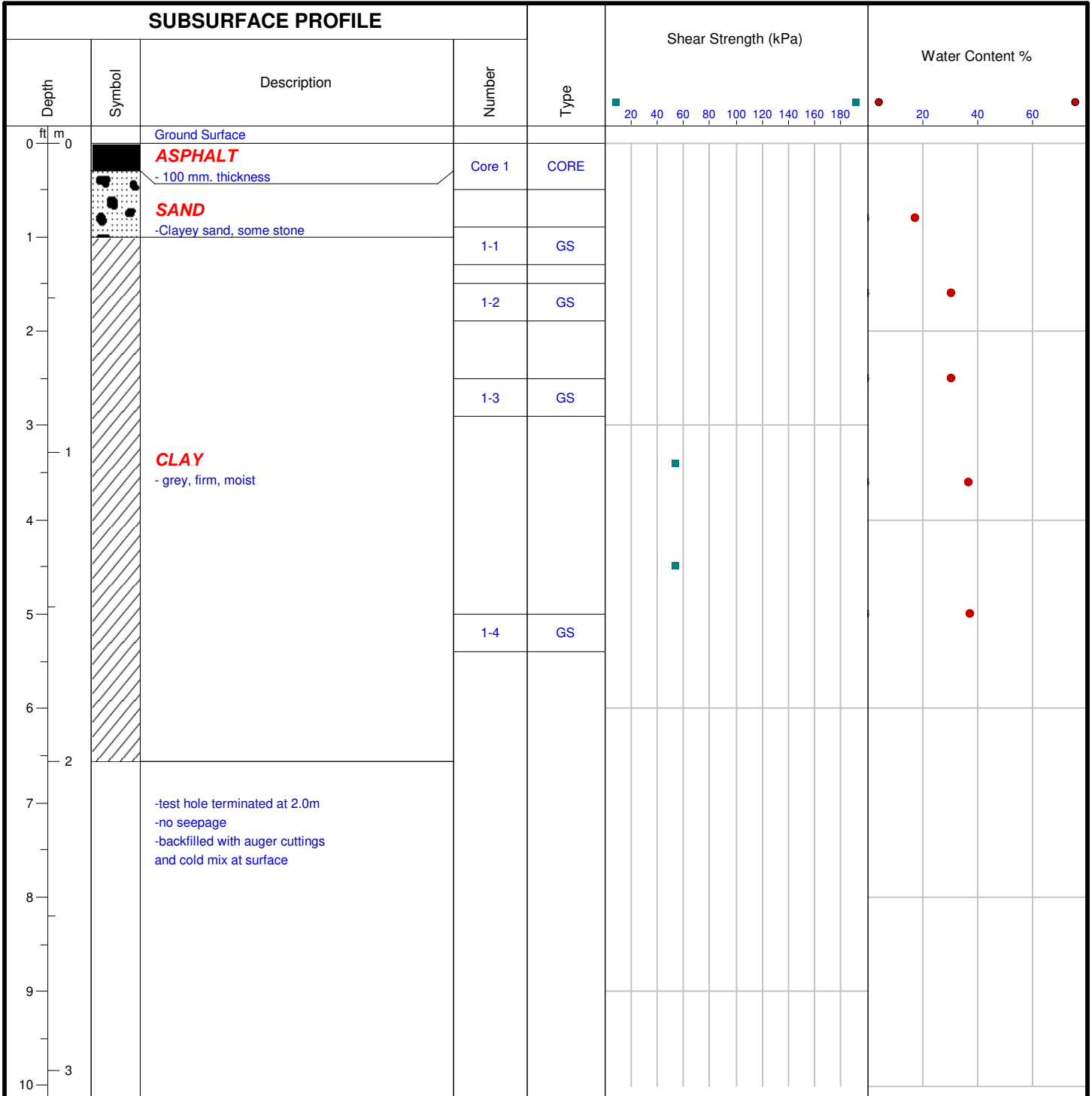
MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No:	112-2217
Attention:	Thomas Findlay	Test No.:	1
Project:	23-R-04 2023 Residential Str De Leglise Avenue	Lab No.:	HM005
		Date Sampled / By:	19-Dec-22 ET & TS
		Date Received:	20-Dec-22
		Date Tested / By:	23-Dec-22 ET

Test Hole No.	TH 1	TH 1	TH 1	TH 1	TH 1
Depth	1'	2'	3'	4'	5'
Tare No.	76	SE10	T44	KD22	BR27
Wt Wet Sample + Tare	102.5	108.8	110.7	113	120.7
Wt Dry Sample + Tare	87.2	84.7	85.7	87	93.1
Wt Water	15.3	24.1	25.0	26.0	27.6
Wt Tare	4.8	4.6	4.4	4.3	4.5
Wt Dry Sample	82.4	80.1	81.3	82.7	88.6
Moisture Content (%)	18.6	30.1	30.8	31.4	31.2
Test Hole No.	TH 2	TH 2	TH 2	TH 2	TH 2
Depth	1'	2'	3'	4'	5'
Tare No.	SE13	T09	C2	58	68
Wt Wet Sample + Tare	128.2	101.7	107.3	133.4	139.3
Wt Dry Sample + Tare	112	74.9	80.5	99.7	104.4
Wt Water	16.2	26.8	26.8	33.7	34.9
Wt Tare	4.4	4.4	4.7	4.4	4.4
Wt Dry Sample	107.6	70.5	75.8	95.3	100.0
Moisture Content (%)	15.1	38.0	35.4	35.4	34.9
Test Hole No.	TH 3	TH 3	TH 3	TH 3	TH 3
Depth	1'	2'	3'	4'	5'
Tare No.	BR39	A8	2	PV24	KP15
Wt Wet Sample + Tare	135	101	139.9	107.1	140.1
Wt Dry Sample + Tare	115.6	74.4	107	81.6	106.1
Wt Water	19.4	26.6	32.9	25.5	34.0
Wt Tare	4.4	4.2	4.5	4.5	4.5
Wt Dry Sample	111.2	70.2	102.5	77.1	101.6
Moisture Content (%)	17.4	37.9	32.1	33.1	33.5
Test Hole No.	TH 4	TH 4	TH 4	TH 4	TH 4
Depth	1'	2'	3'	4'	5'
Tare No.	22	A38	BR57	47	68A
Wt Wet Sample + Tare	158.2	112.7	120.4	118.1	134.8
Wt Dry Sample + Tare	129.1	80.2	91	90.3	102
Wt Water	29.1	32.5	29.4	27.8	32.8
Wt Tare	4.6	4.3	4.5	4.3	4.8
Wt Dry Sample	124.5	75.9	86.5	86.0	97.2
Moisture Content (%)	23.4	42.8	34.0	32.3	33.7

Chancellor Drive





Drill Method: Auger

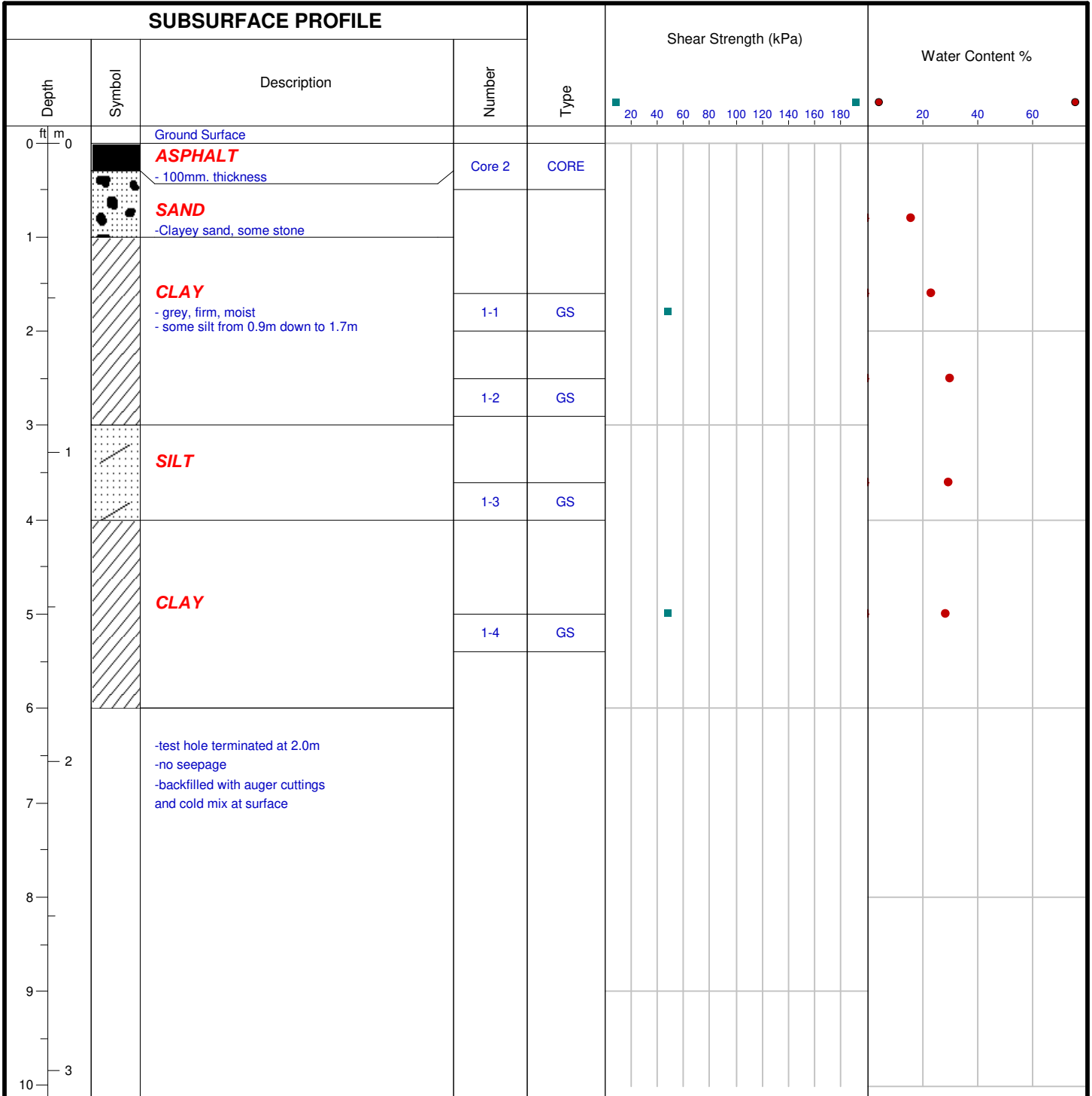
Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

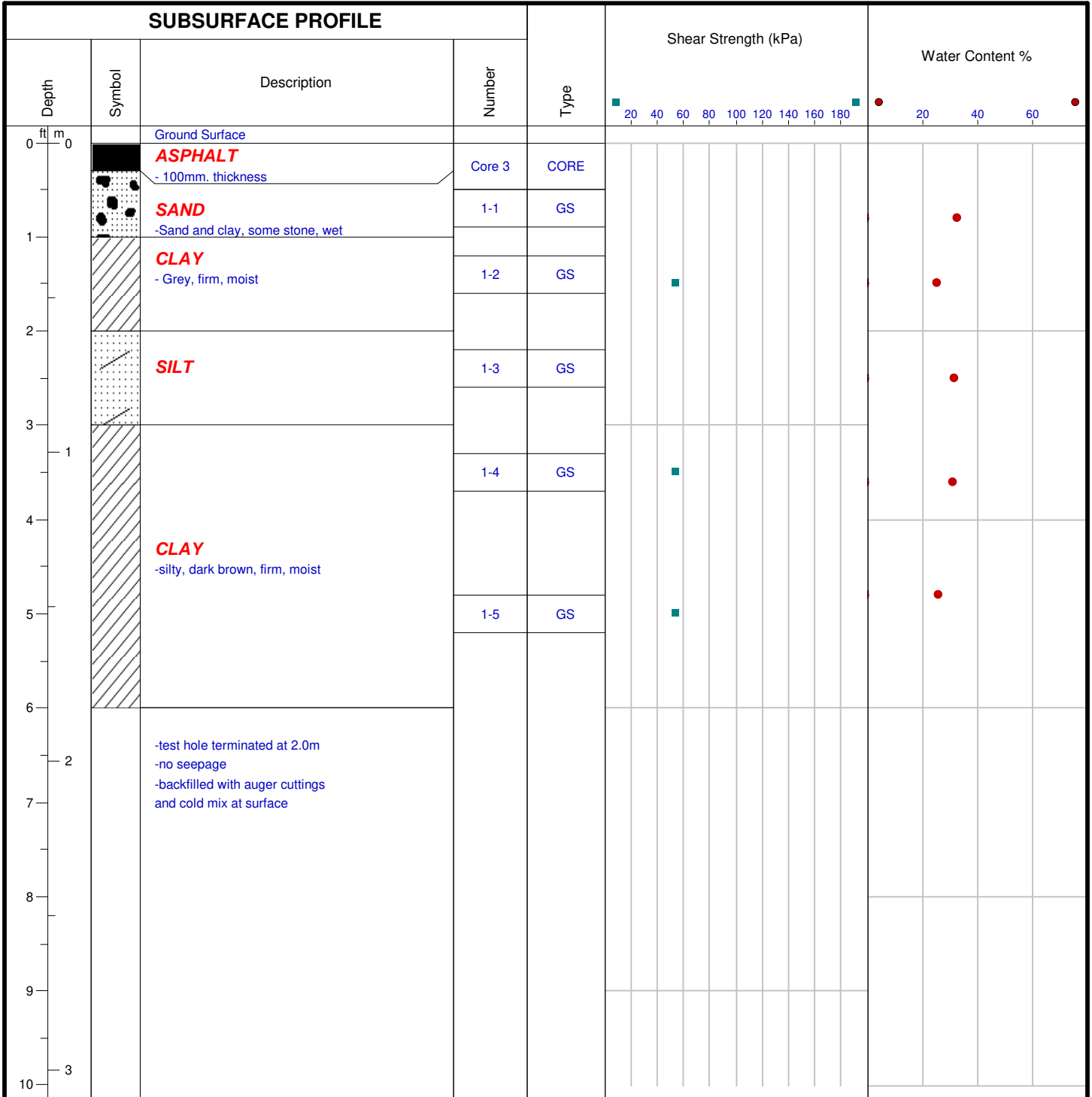
Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

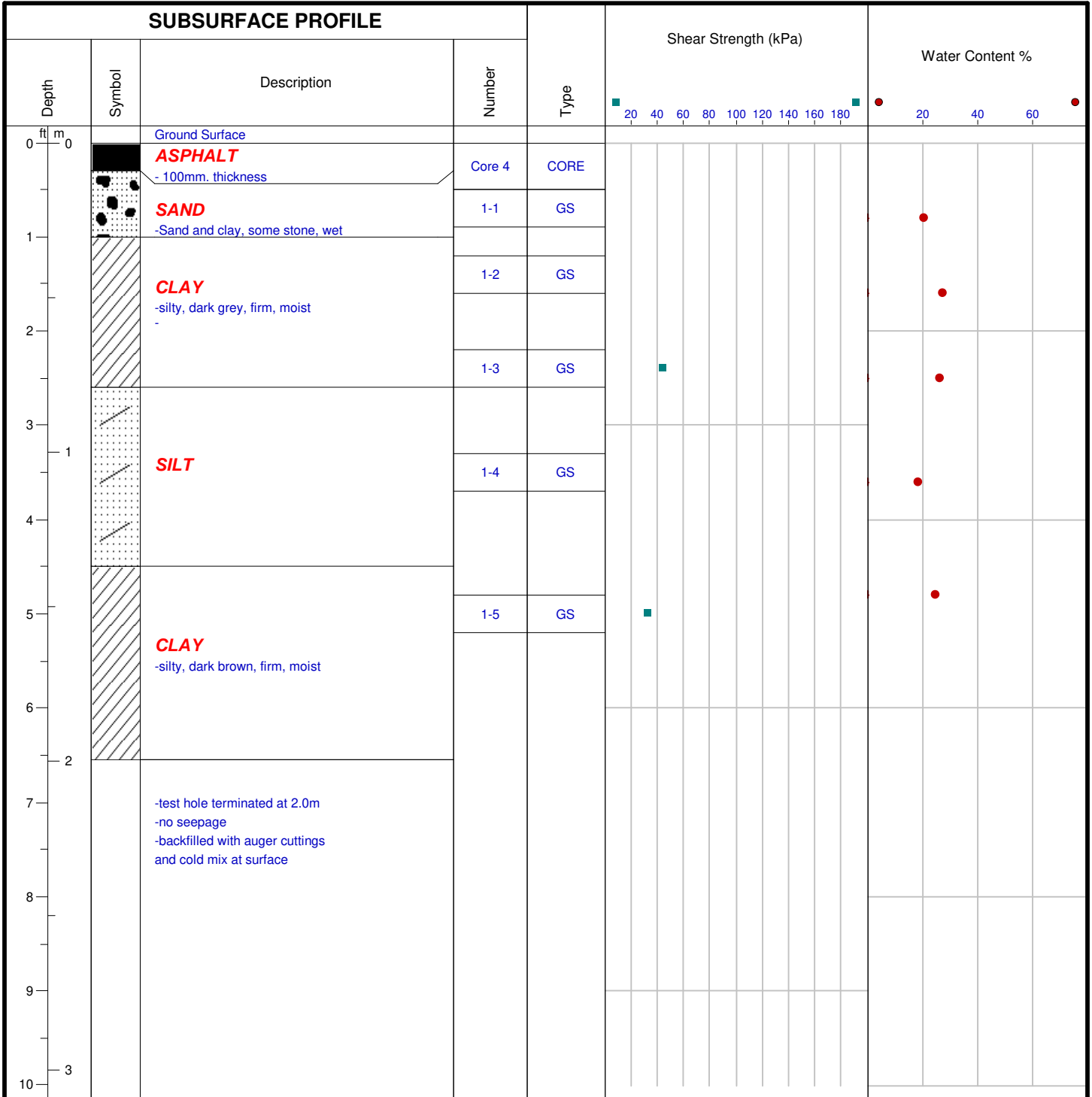
Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1

CHANCELLOR DRIVE - SUMMARY TABLE				
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE		SUBGRADE
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)	DEPTH FROM SURFACE (m) AND MATERIAL TYPE
TH 1	1844 Chancellor Drive	100	-	0.1 - 0.3 Clayey Sand and stone 0.3 - 0.6 Moist brittle gray clay 0.6 -1.5 Firm moist Gray clay
TH 2	Near #2 Syracuse Crescent	100	-	0.1 - 0.3 Clayey Sand and stone 0.3 - 0.6 Firm gray clay 0.6 - 1.5 Firm Gray clay with traces of silt
TH 3	Near #3 Syracuse Crescent	100	-	0.1 - 0.3 Wet Sand with stone and clay 0.3 - 0.9 Firm moist silty gray clay 0.9 - 1.5 Firm Gray clay with traces of silt
TH 4	1810 Chancellor and Markham Road	100	-	0.1 - 0.3 Moist Sand with stone and clay 0.3 - 1.2 Firm moist gray clay 1.2 - 1.5 Moist dark Gray clay with traces of silt

LABORATORY TESTING								
CBR At 2.5mm	CBR At 5.1mm	GRAIN SIZE				ATTERBERG LIMITS		
		GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LL	PL	PI
3.2	2.6	0	5.1	21.4	73.6	75	32	43



TH 1- 1844 Chancellor Drive (Core 5 – De Leglise, Chancellor & Markham)



TH 2 - Near #2 Syracuse Crescent (Core 6 – De Leglise, Chancellor & Markham)



TH 3 - Near #3 Syracuse Crescent (Core 7 – De Leglise, Chancellor & Markham)



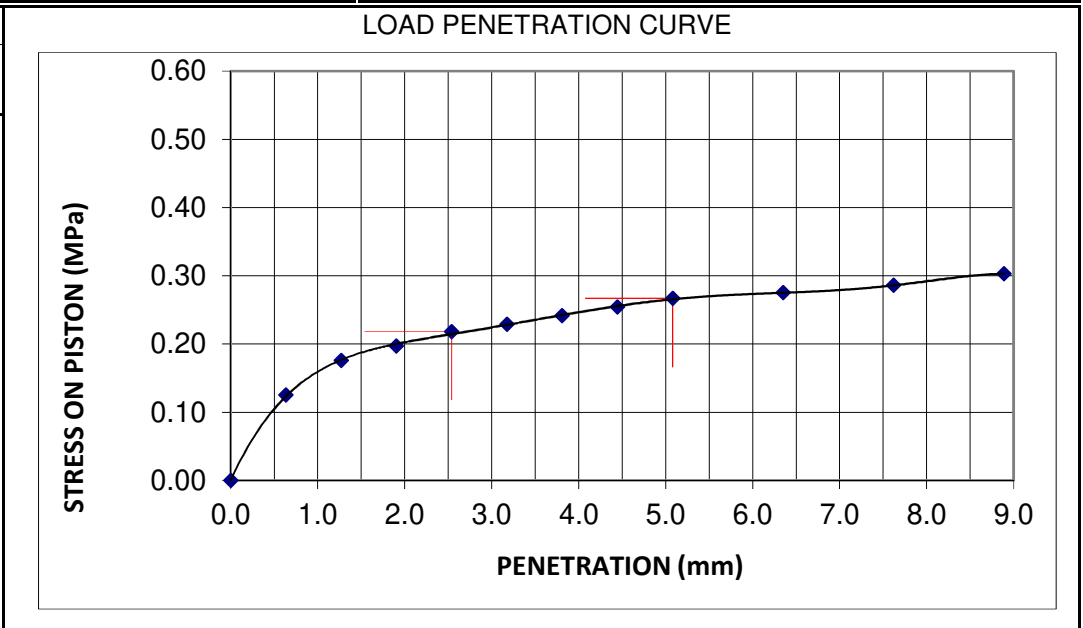
TH 4 - 1810 Chancellor and Markham Road (Core 8 – De Leglise, Chancellor & Markham)

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2217
Attention: Thomas Findlay	Lab No: HM 6
Project 23-R-04 2023 Residential Streets - Test Hole Investigati	Date sampled: December 19, 2022
Location: Chancellor drive	Date Received: January 10, 2023
	Date Tested /By: January 19, 2023 ES

SAMPLE DATA		SPECIMEN DATA	
Sample Type: Clay/Soil		DESCRIPTION	Before Soaking After Testing
Source: Test holes		Moisture Content (MC), %	26.9 26.9
Sampled by: Edwin T & Timothy Soneye		MC of top 25mm layer, %	
Optimum Moisture Content: 24.5 %		Dry Density, kg/m ³	1436 1456
Maximum Dry Density: 1514 kg/cm ³		Compaction, %	95%
Method of Compaction: Standard Proctor		CBR, %	3.2 2.6
Tested by: Date Tested:		Swell, %	1.1

LOAD DATA	
PENETRATION mm	STRESS MPa
0	0.00
0.64	0.13
1.27	0.18
1.91	0.20
2.54	0.22
3.18	0.23
3.81	0.24
4.45	0.25
5.08	0.27
6.35	0.28
7.62	0.29
8.89	0.30



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.22	0.22	3.2	-
5.08	10.3	0.27	0.27	-	2.6

Remarks:

Reviewed by: *P. Bevil*

MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
ATTENTION:	Thomas Findlay	Lab No.:	HM 6
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation Chancellor Drive	Proctor Test No.:	2

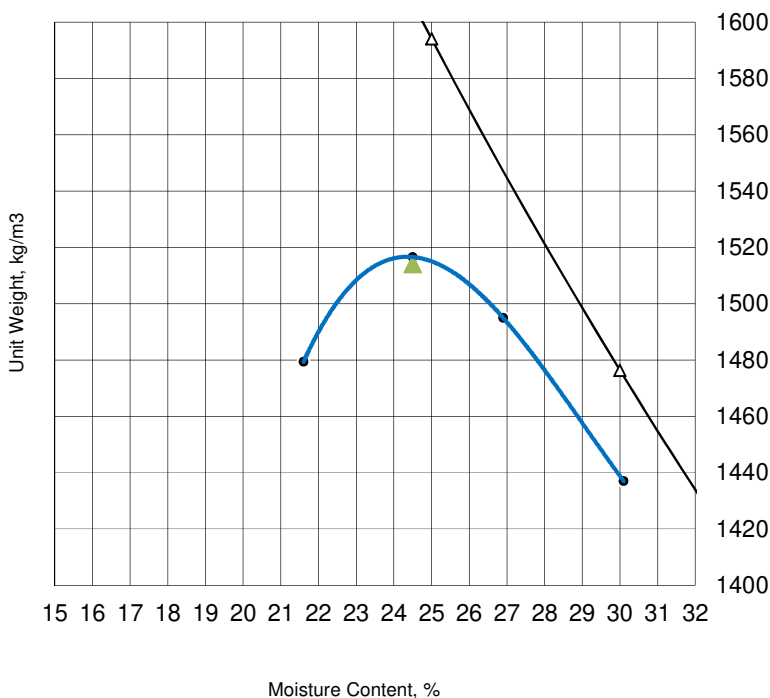
Date Sampled:	December 19,	Date Received:	January 10, 2023	PROCEDURE	A
Sampled By:	Edwin T & Tirr	Date Tested:	January 12, 2023	PREPARATION	Dry
				COMPACTION METHOD	Manual

MATERIAL INFORMATION

Material Type:	Clay/Soil	Material Supplier:		BLOWS PER LAYER	25
Material Use:		Material Source:	Test holes	NO. OF LAYERS	3
Maximum Size:				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4
Wet Density		1799	1888	1897	1870
Moisture Content		21.6	24.5	26.9	30.1
Dry Density		1479	1517	1495	1437

Moisture - Density Relationship



Maximum Dry Density (MDD):
1514 kg/m³
Optimum Moisture Content
24.5 %

STONE CORRECTION (ASTM D 4718)

4.75mm
0 %
Corrected Moisture:
24.5 %
Corrected Maximum Dry Density:
1514 kg/m³

Remarks:

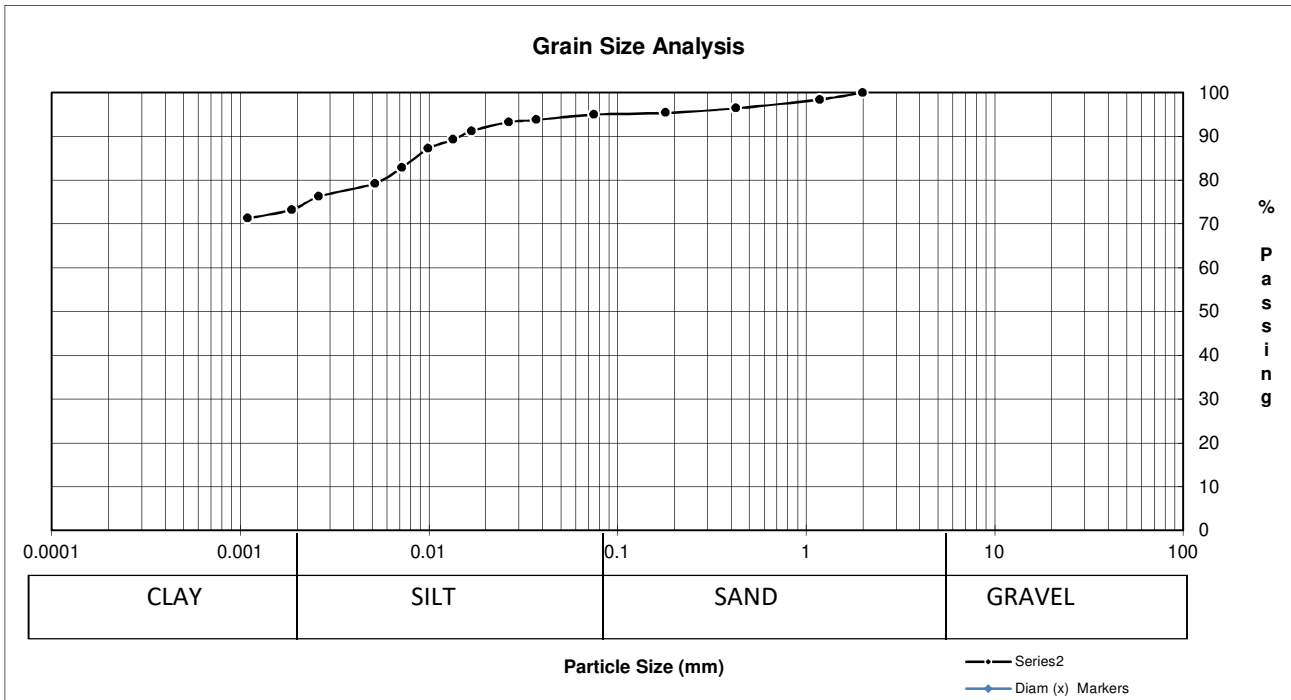
Tested by: Jaehang Jeong

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Thomas Findlay PROJECT: 23-R-04 2023 Residential Streets - Test Hole Investigation Chancellor Drive	Project No.: 112-2217 PSA Test No.: 2 Lab No.: HM 6
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Date Sampled: December 19, 2023	Date Received: January 10, 2024	Sieve Analysis		Hydrometer Analysis	
Sampled By: Edwin T & Tim	Date Tested:	Sieve (mm)	% Passing	Diameter	% Finer
		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
Material Identification		12.50	100.0	0.0372	93.7
B.H./T.H. No.		9.50	100.0	0.0265	93.2
Depth		4.75	100.0	0.0169	91.2
Sample Source		2.00	100.0	0.0135	89.2
Specific Gravity of Material:		1.18	98.4	0.0100	87.2
		0.425	96.4	0.0072	82.8
		0.180	95.3	0.0052	79.2
		0.075	94.9	0.0011	71.2



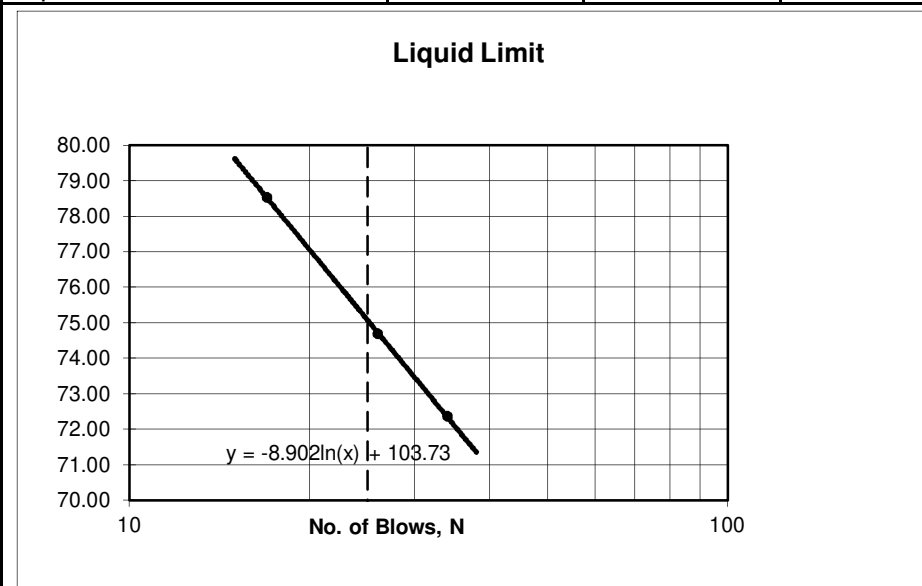
	% Composition	
	Gravel	D10
	Sand	D30
	Silt	D60
	Clay	Cu
		Cc

Remarks:

Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
Attention.:	Thomas Findlay	PI Test No.:	2
Project:	23-R-04 2023 Residential Streets - Test Hc Chancellor Drive	Lab No.:	HM 6
		Date Sampled/By:	December ET & TS
		Date Received:	January 10, 2023
		Date Tested / By:	ES

Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	1	2	3		
Wet Soil + Dish:	11.90	12.66	13.10		
Dry Soil + Dish:	8.81	9.09	9.37		
Moisture:	3.09	3.57	3.73		
Dish:	4.54	4.31	4.62		
Dry Soil:	4.27	4.78	4.75		
% Moisture:	72.37	74.69	78.53		
No. of Blows:	34	26	17		
Liquid Limit:					



Material Identification:

Depth:

Liquid Limit, %: **75**
 Plastic Limit, %: **32**
 Plasticity Index: **43**
 (LL-PL)

Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	11.02	11.05	11.64		
Dry Soil + Dish:	9.45	9.54	9.89		
Moisture:	1.57	1.51	1.75		
Dish:	4.68	4.66	4.32		
Dry Soil:	4.77	4.88	5.57		
% Moisture:	32.91	30.94	31.42		
				Average:	32

Test Method : ASTM: D4318, D2216

Remarks:

Reviewed by: Paul Bevel

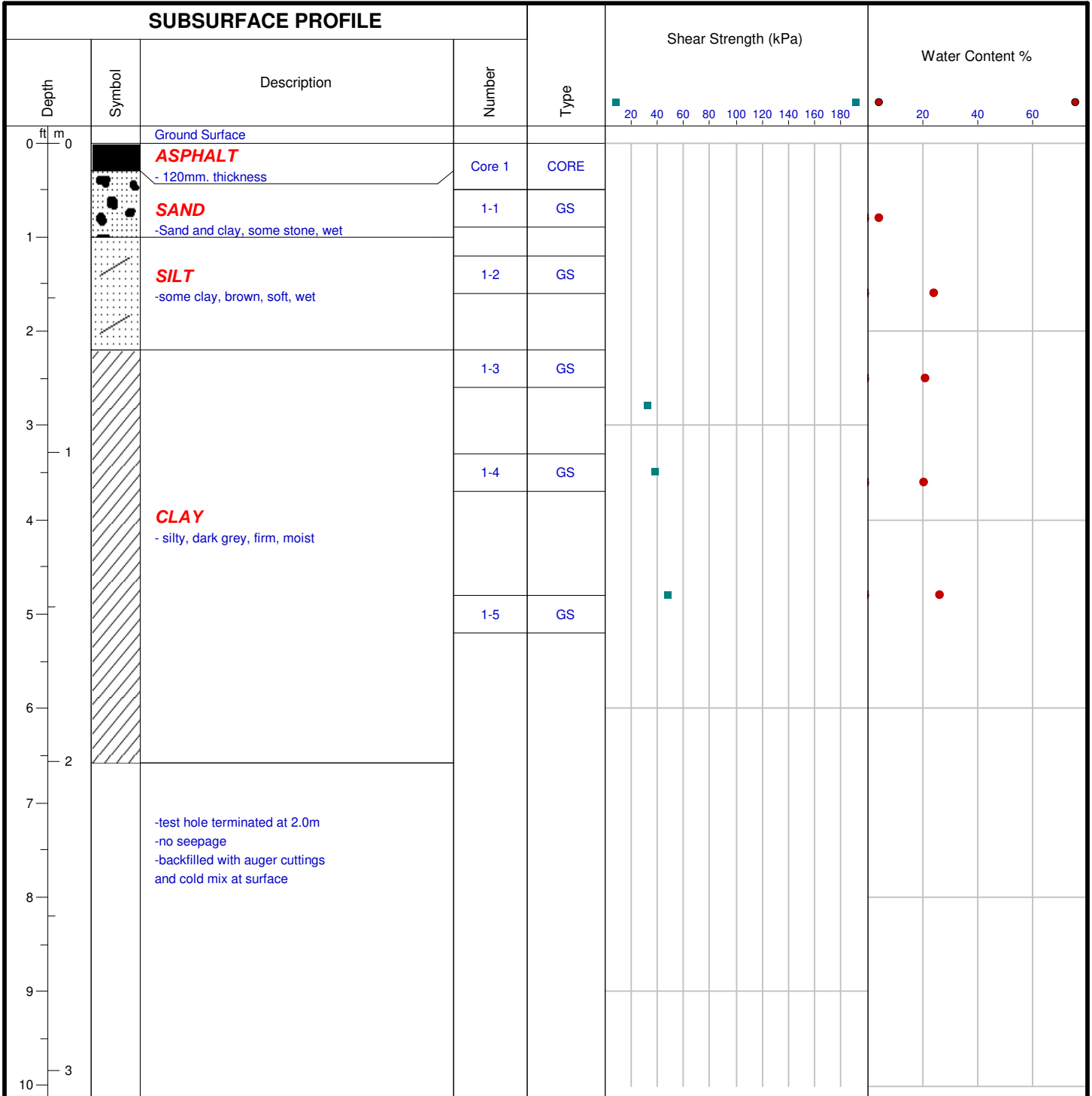
MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No:	112-2217
Attention:	Thomas Findlay	Test No.:	2
Project:	23-R-04 2023 Residential Str Chancellor Drive	Lab No.:	HM006
		Date Sampled / By:	19-Dec-22 ET & TS
		Date Received:	20-Dec-22
		Date Tested / By:	23-Dec-22 ET

Test Hole No.	TH 1	TH 1	TH 1	TH 1	TH 1
Depth	1'	2'	3'	4'	5'
Tare No.	59	130	304	T01	57
Wt Wet Sample + Tare	113.6	128.7	106.8	116.4	147.8
Wt Dry Sample + Tare	97.4	99.6	82.7	85.9	108.5
Wt Water	16.2	29.1	24.1	30.5	39.3
Wt Tare	4.3	4.8	4.3	4.2	4.5
Wt Dry Sample	93.1	94.8	78.4	81.7	104.0
Moisture Content (%)	17.4	30.7	30.7	37.3	37.8
Test Hole No.	TH 2	TH 2	TH 2	TH 2	TH 2
Depth	1'	2'	3'	4'	5'
Tare No.	KD10	116	301	11	87
Wt Wet Sample + Tare	122.9	101.9	109.8	130.1	140.9
Wt Dry Sample + Tare	106.4	83.4	85.2	101.5	110.4
Wt Water	16.5	18.5	24.6	28.6	30.5
Wt Tare	4.2	4.3	4.3	4.4	4.5
Wt Dry Sample	102.2	79.1	80.9	97.1	105.9
Moisture Content (%)	16.1	23.4	30.4	29.5	28.8
Test Hole No.	TH 3	TH 3	TH 3	TH 3	TH 3
Depth	1'	2'	3'	4'	5'
Tare No.	ER72	22X	69	S21	BR31
Wt Wet Sample + Tare	117.9	112.2	131.5	116	141.5
Wt Dry Sample + Tare	89.7	90.4	100.7	89.4	113.4
Wt Water	28.2	21.8	30.8	26.6	28.1
Wt Tare	4.3	4.3	4.6	4.6	4.7
Wt Dry Sample	85.4	86.1	96.1	84.8	108.7
Moisture Content (%)	33.0	25.3	32.0	31.4	25.9
Test Hole No.	TH 4	TH 4	TH 4	TH 4	TH 4
Depth	1'	2'	3'	4'	5'
Tare No.	321	KD2	12	65	302
Wt Wet Sample + Tare	107.9	106.9	112	109	118.7
Wt Dry Sample + Tare	90	84.6	89.4	92.4	95.9
Wt Water	17.9	22.3	22.6	16.6	22.8
Wt Tare	4.3	4.3	4.5	4.2	4.3
Wt Dry Sample	85.7	80.3	84.9	88.2	91.6
Moisture Content (%)	20.9	27.8	26.6	18.8	24.9

Markham Road





Drill Method: Auger

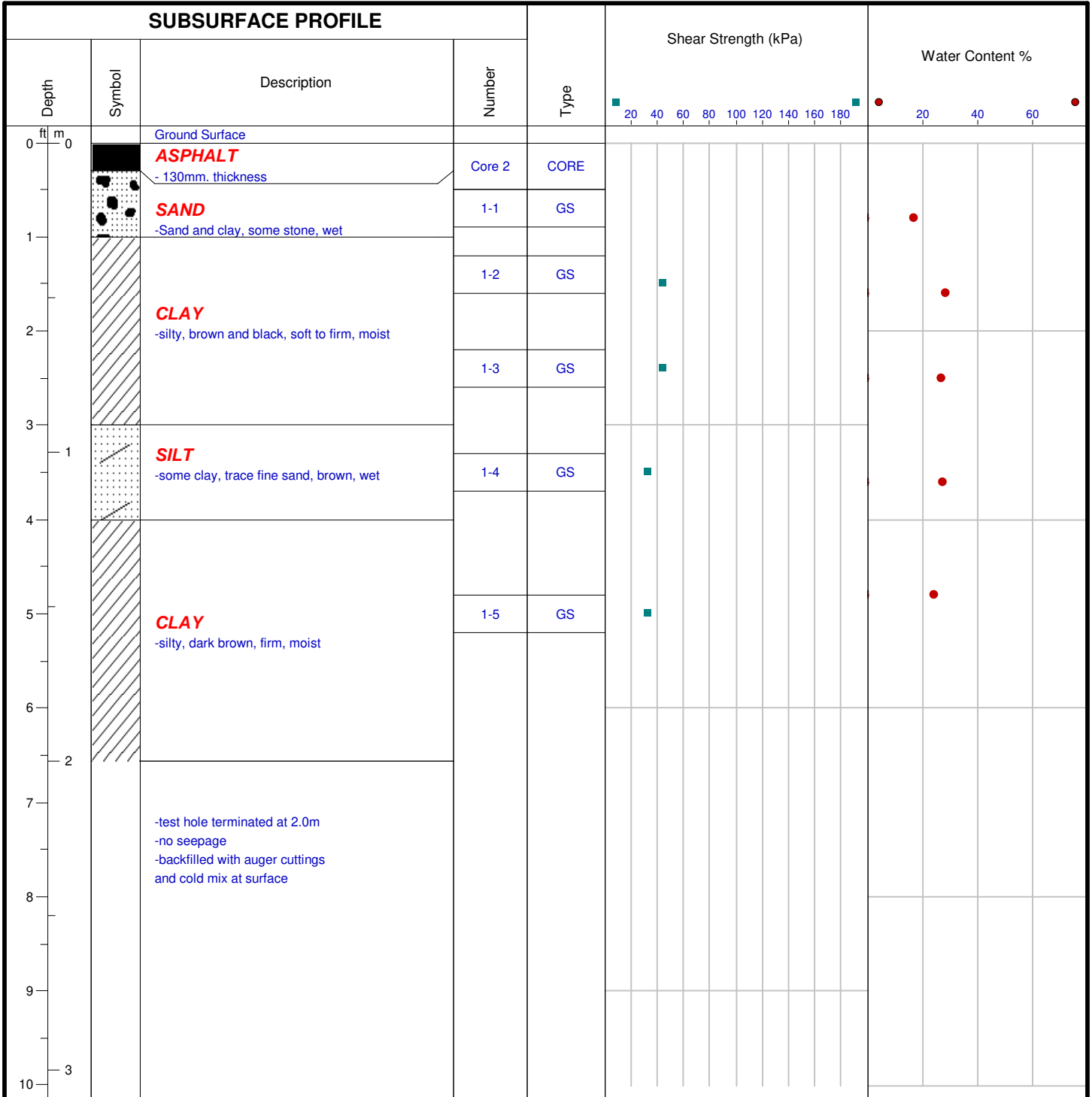
Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

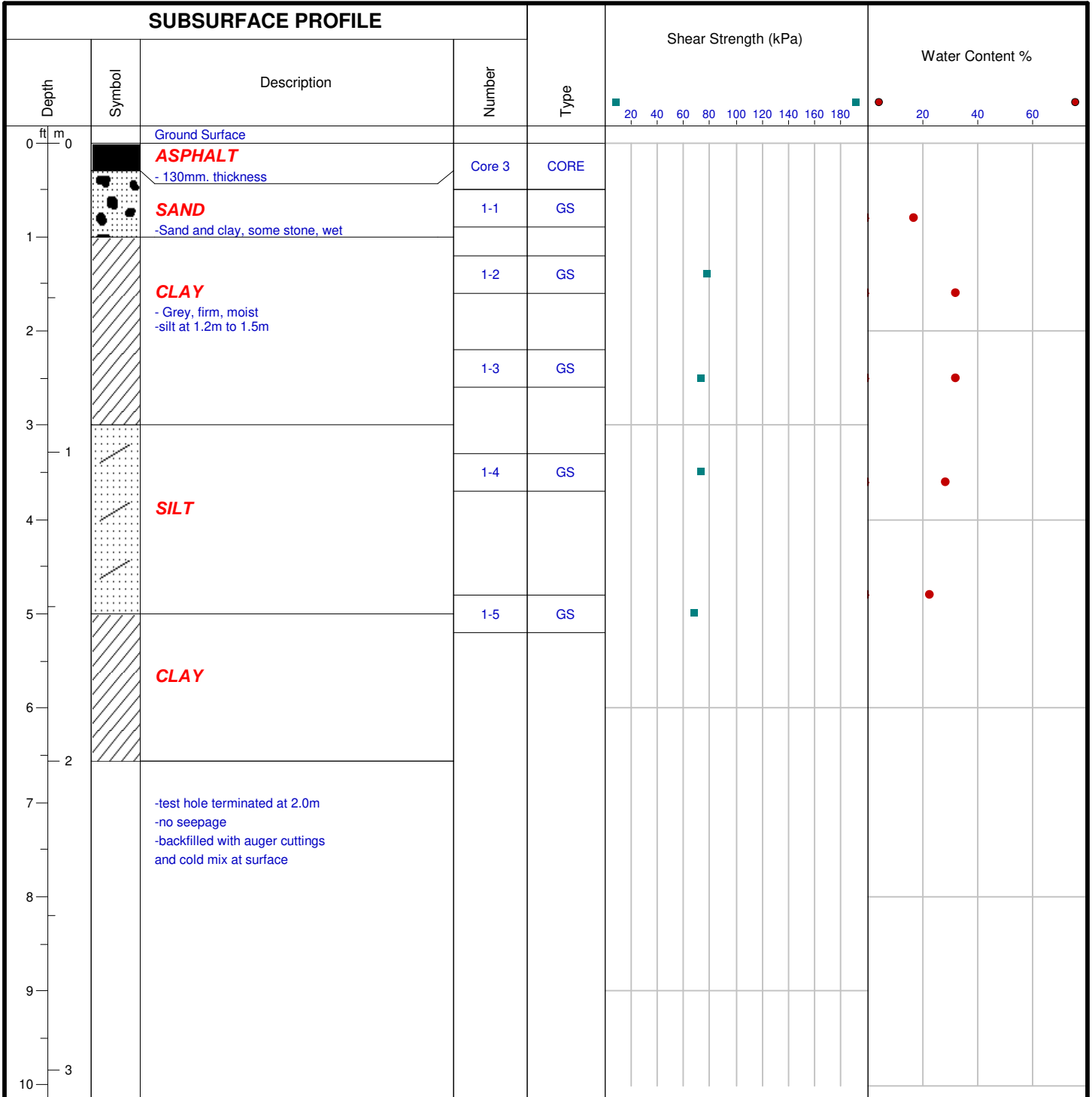
Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

Drill Date: December 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1

MARKHAM ROAD - SUMMARY TABLE

TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE		SUBGRADE
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)	DEPTH FROM SURFACE (m) AND MATERIAL TYPE
TH 1	1179 Markham Road	120	-	0.1 2 - 0.3 Sand and gravel 0.3 - 0.9 Moist gray clay with silt 0.9 -1.2 Moist Black clay with silt 1.2 - 1.5 Firm moist Gray clay
TH 2	1199 Markham Road	130	-	0.1 3- 0.3 Wet Sand and clay 0.3 - 0.9 Moist firm gray clay 0.9 - 1.2 Moist Gray clay with traces of silt 1.2 - 1.5 Moist Gray clay with silt
TH 3	1223 Markham Road	130	-	0.1 3- 0.3 Moist Sand with stone and clay 0.3 - 1.2 Moist firm gray clay 1.2 - 1.5 Moist Gray clay with traces of silt

LABORATORY TESTING

CBR At 2.5mm	CBR At 5.1mm	GRAIN SIZE				ATTERBERG LIMITS		
		GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LL	PL	PI
4.8	4.3	0	8.2	38.2	53.6	59	28	31



TH 1 - 1179 Markham Road (Core 9, De leglise, Chancellor & Markham)



TH 2 - 1199 Markham Road (Core 10, De leglise, Chancellor & Markham)



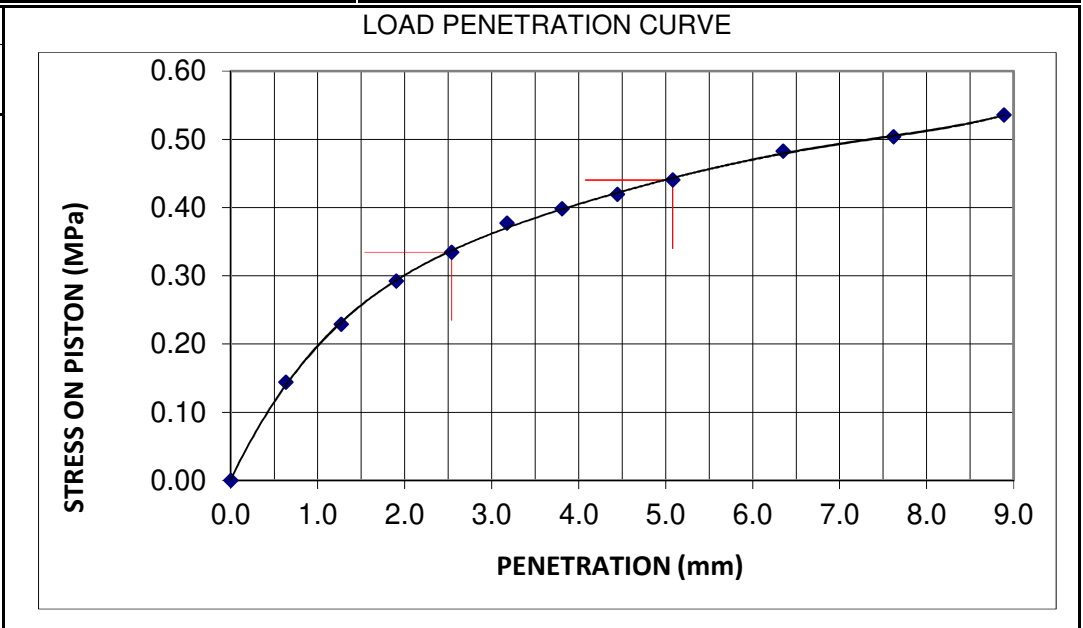
TH 3 - 1223 Markham Road (Core 11, De leglise, Chancellor & Markham)

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2217
Attention: Thomas Findlay	Lab No: HM 7
Project 23-R-04 2023 Residential Streets - Test Hole Investigati	Date sampled: December 19, 2022
Location: Markham Road	Date Received: January 10, 2023
	Date Tested /By: January 19, 2023 ES

SAMPLE DATA		SPECIMEN DATA	
Sample Type: Clay/Soil		DESCRIPTION	Before Soaking After Testing
Source: Test holes		Moisture Content (MC), %	23.6 25.0
Sampled by: Edwin T & Timothy Soneye		MC of top 25mm layer, %	
Optimum Moisture Content: 23.4 %		Dry Density, kg/m ³	1505 1514
Maximum Dry Density: 1600 kg/m ³		Compaction, %	94%
Method of Compaction: Standard Proctor		CBR, %	4.8 4.3
Tested by: ES		Swell, %	1.05

LOAD DATA	
PENETRATION mm	STRESS MPa
0	0.00
0.64	0.14
1.27	0.23
1.91	0.29
2.54	0.33
3.18	0.38
3.81	0.40
4.45	0.42
5.08	0.44
6.35	0.48
7.62	0.50
8.89	0.54



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.33	0.33	4.8	-
5.08	10.3	0.44	0.44	-	4.3

Remarks:

Reviewed by:

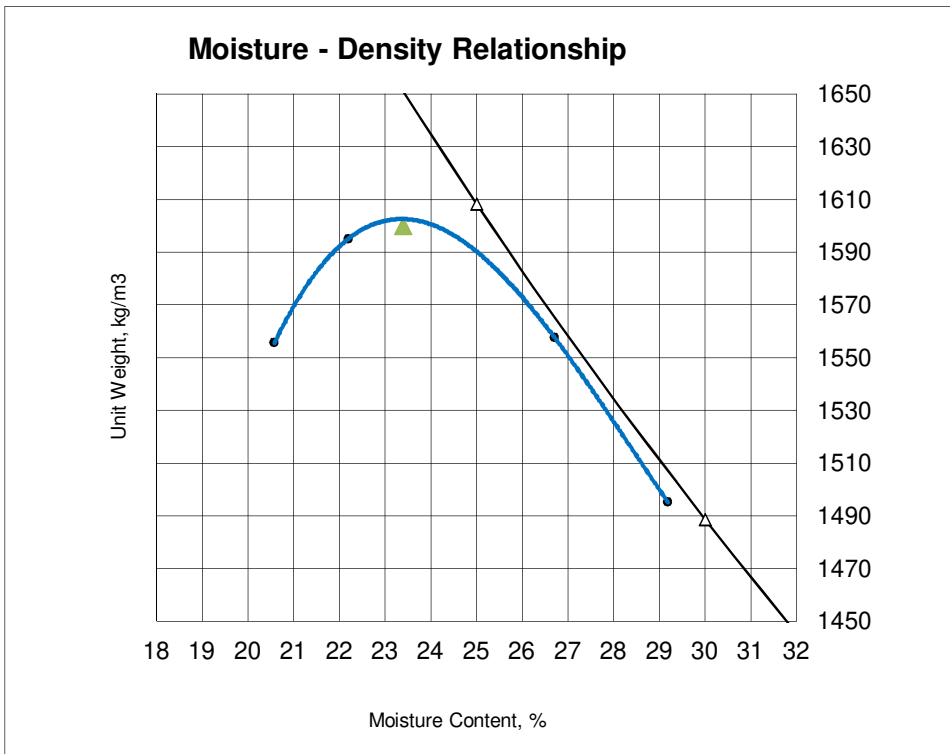
P. Bevil

MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
ATTENTION:	Thomas Findlay	Lab No.:	HM 7
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation Markham Road.	Proctor Test No.:	3

Date Sampled:	December 19,	Date Received:	January 10, 2023	PROCEDURE	A
Sampled By:	Edwin T & Tin	Date Tested:	January 12, 2023	PREPARATION	Dry
MATERIAL INFORMATION				COMPACTION METHOD	Manual
Material Type:	Clay/Soil	BLOWS PER LAYER	25	NO. OF LAYERS	3
Material Use:	Material Supplier:	MOLD SIZE	100	MOLD VOLUME	935
Maximum Size:	Material Source: Test holes	WEIGHT OF HAMMER	2.5 kg		

	Test No.	1	2	3	4
Wet Density		1876	1949	1974	1932
Moisture Content		20.6	22.2	26.7	29.2
Dry Density		1556	1595	1558	1495



Maximum Dry Density (MDD):
1600 kg/m³
Optimum Moisture Content
23.4 %

STONE CORRECTION (ASTM D 4718)

4.75mm
0 %
Corrected Moisture:
23.4 %
Corrected Maximum Dry Density:
1600 kg/m³

Remarks:

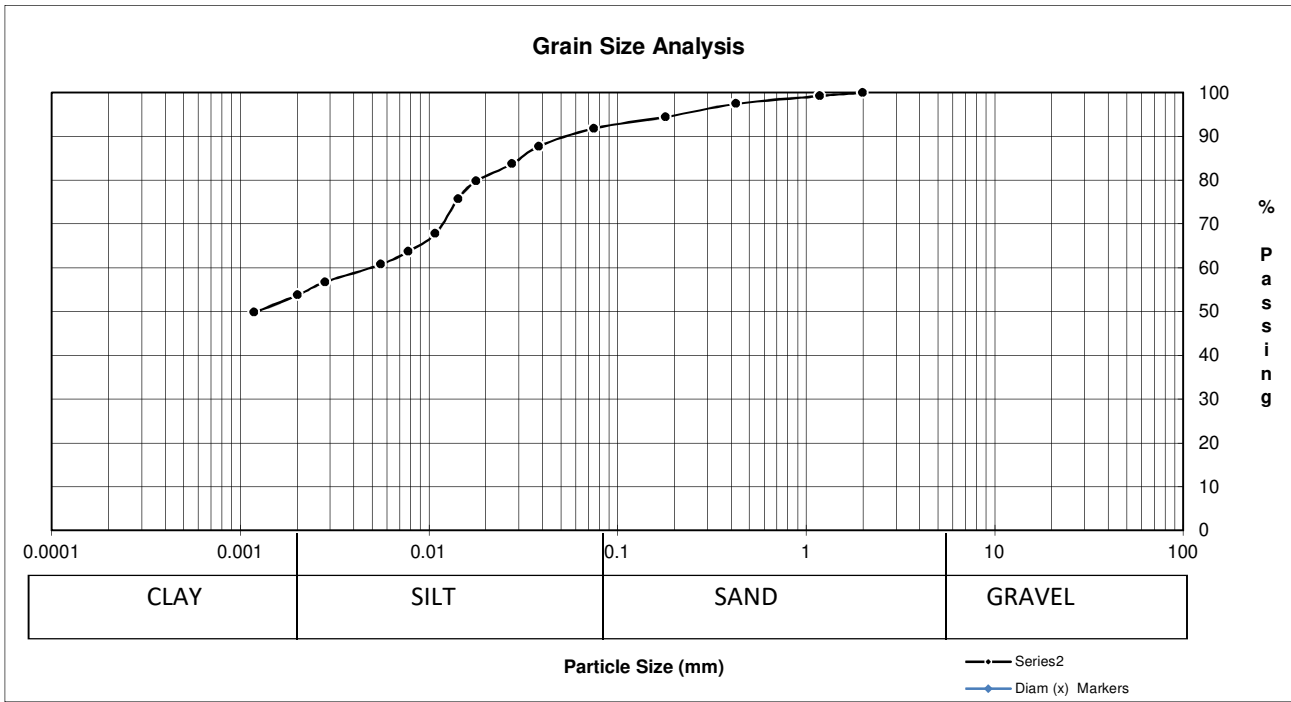
Tested by: Jaehang Jeong

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2217 PSA Test No.: 3 Lab No.: HM 7
ATTENTION: Thomas Findlay PROJECT: 23-R-04 2023 Residential Streets - Test Hole Investigation Markham Road.	

Date Sampled:	December 19, 2023	Date Received:	January 10, 2024	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Edwin T & Tim	Date Tested:		Sieve (mm)	% Passing	Diameter	% Finer
				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
Material Identification				12.50	100.0	0.0384	87.7
B.H./T.H. No.				9.50	100.0	0.0276	83.7
Depth				4.75	100.0	0.0178	79.7
Sample Source				2.00	100.0	0.0143	75.7
Specific Gravity of Material:				1.18	99.2	0.0108	67.7
				0.425	97.4	0.0078	63.7
				0.180	94.4	0.0056	60.7
				0.075	91.8	0.0012	49.7



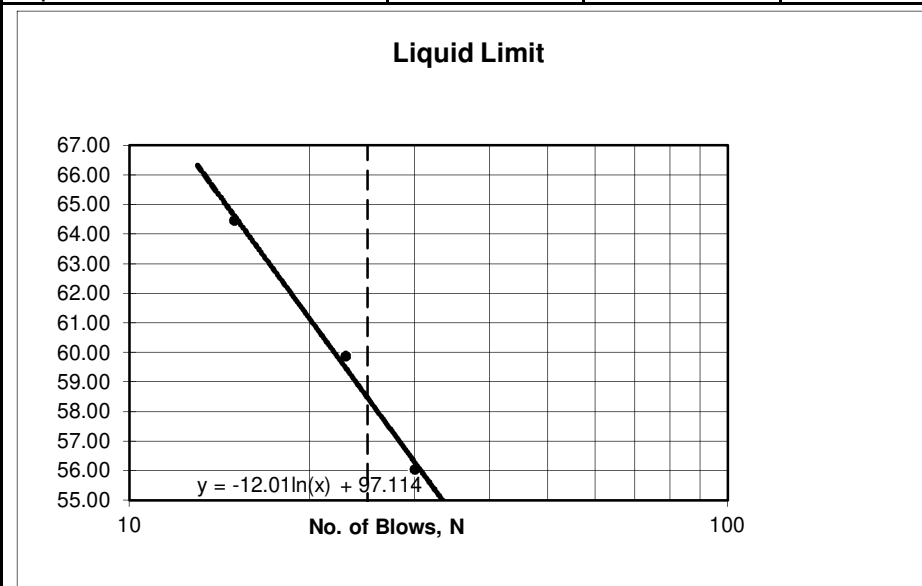
	% Composition	
	Gravel	D10
	Sand	D30
	Silt	D60
	Clay	Cu
		Cc

Remarks:

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7 Attention.: Thomas Findlay Project: 23-R-04 2023 Residential Streets - Test H Markham Road.	Project No.: 112-2217 PI Test No.: 3 Lab No.: HM 7 Date Sampled/By: December ET & TS Date Received: January 10, 2023 Date Tested / By: ES
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Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	1	2	3		
Wet Soil + Dish:	13.75	13.03	13.35		
Dry Soil + Dish:	10.41	9.78	9.76		
Moisture:	3.34	3.25	3.59		
Dish:	4.45	4.35	4.19		
Dry Soil:	5.96	5.43	5.57		
% Moisture:	56.04	59.85	64.45		
No. of Blows:	30	23	15		
Liquid Limit:					



Material Identification:

Depth:

Liquid Limit, %: **59**
 Plastic Limit, %: **28**
 Plasticity Index: **31**
 (LL-PL)

Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	10.68	11.39	10.83		
Dry Soil + Dish:	9.22	9.92	9.37		
Moisture:	1.46	1.47	1.46		
Dish:	4.13	4.49	4.31		
Dry Soil:	5.09	5.43	5.06		
% Moisture:	28.68	27.07	28.85		
				Average:	28

Test Method : ASTM: D4318, D2216

Remarks:

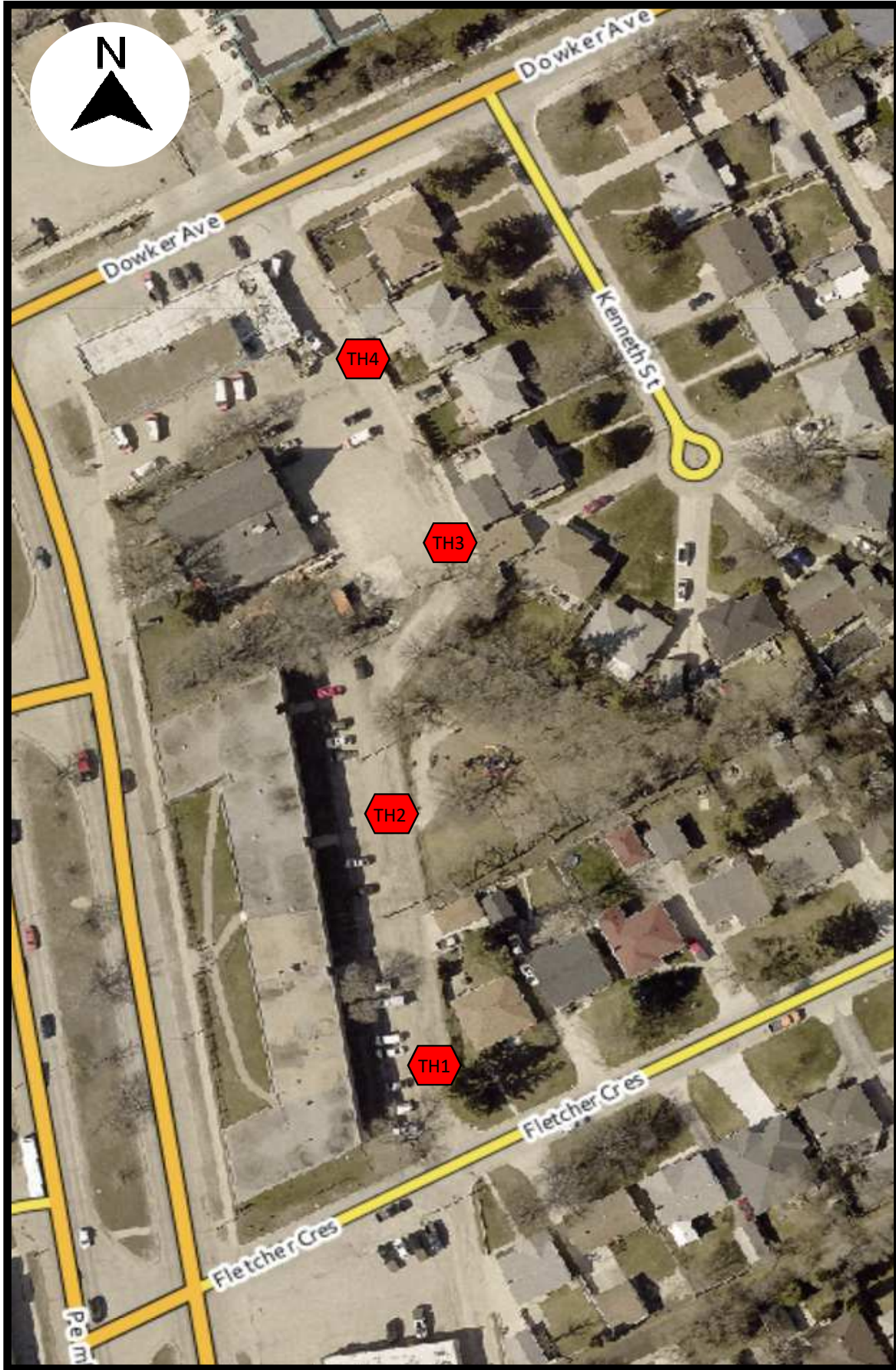
Reviewed by: Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipe MB R3P 0Y7	Project No:	112-2201
Attention:	Thomas Findlay	Test No.:	3
Project:	23-R-04 2023 Residential stre Markham Road	Lab No.:	HM007
		Date Sampled / By:	19-Dec-22 ET & TS
		Date Received:	20-Dec-22
		Date Tested / By:	23-Dec-22 ET

Test Hole No.	TH 1	TH 1	TH 1	TH 1	TH 1
Depth	1'	2'	3'	4'	5'
Tare No.	107	71	36	SE1	BR17
Wt Wet Sample + Tare	103.8	111.4	146	152.6	129.2
Wt Dry Sample + Tare	99.6	90.5	121.1	127.2	103.1
Wt Water	4.2	20.9	24.9	25.4	26.1
Wt Tare	4.3	4.4	4.5	4.3	4.5
Wt Dry Sample	95.3	86.1	116.6	122.9	98.6
Moisture Content (%)	4.4	24.3	21.4	20.7	26.5
Test Hole No.	TH 2	TH 2	TH 2	TH 2	TH 2
Depth	1'	2'	3'	4'	5'
Tare No.	T14	51	BR22	A28	6M
Wt Wet Sample + Tare	135.4	104.1	110.1	122.8	156.6
Wt Dry Sample + Tare	116.4	81.7	87.4	97.2	126.5
Wt Water	19.0	22.4	22.7	25.6	30.1
Wt Tare	4.7	4.3	4.3	4.2	4.4
Wt Dry Sample	111.7	77.4	83.1	93.0	122.1
Moisture Content (%)	17.0	28.9	27.3	27.5	24.7
Test Hole No.	TH 3	TH 3	TH 3	TH 3	TH 3
Depth	1'	2'	3'	4'	5'
Tare No.	1X	SE4	121	KD1	KD23
Wt Wet Sample + Tare	114	116.8	118.3	148.8	160.6
Wt Dry Sample + Tare	97.9	89.4	90.5	116.5	131.7
Wt Water	16.1	27.4	27.8	32.3	28.9
Wt Tare	4.2	4.2	4.6	4.5	4.4
Wt Dry Sample	93.7	85.2	85.9	112.0	127.3
Moisture Content (%)	17.2	32.2	32.4	28.8	22.7
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

**Back Lane to Pembina,
Fletcher Crescent to
Dowker Avenue**



Dowker Ave

Dowker Ave

Kenneth St

TH4

TH3

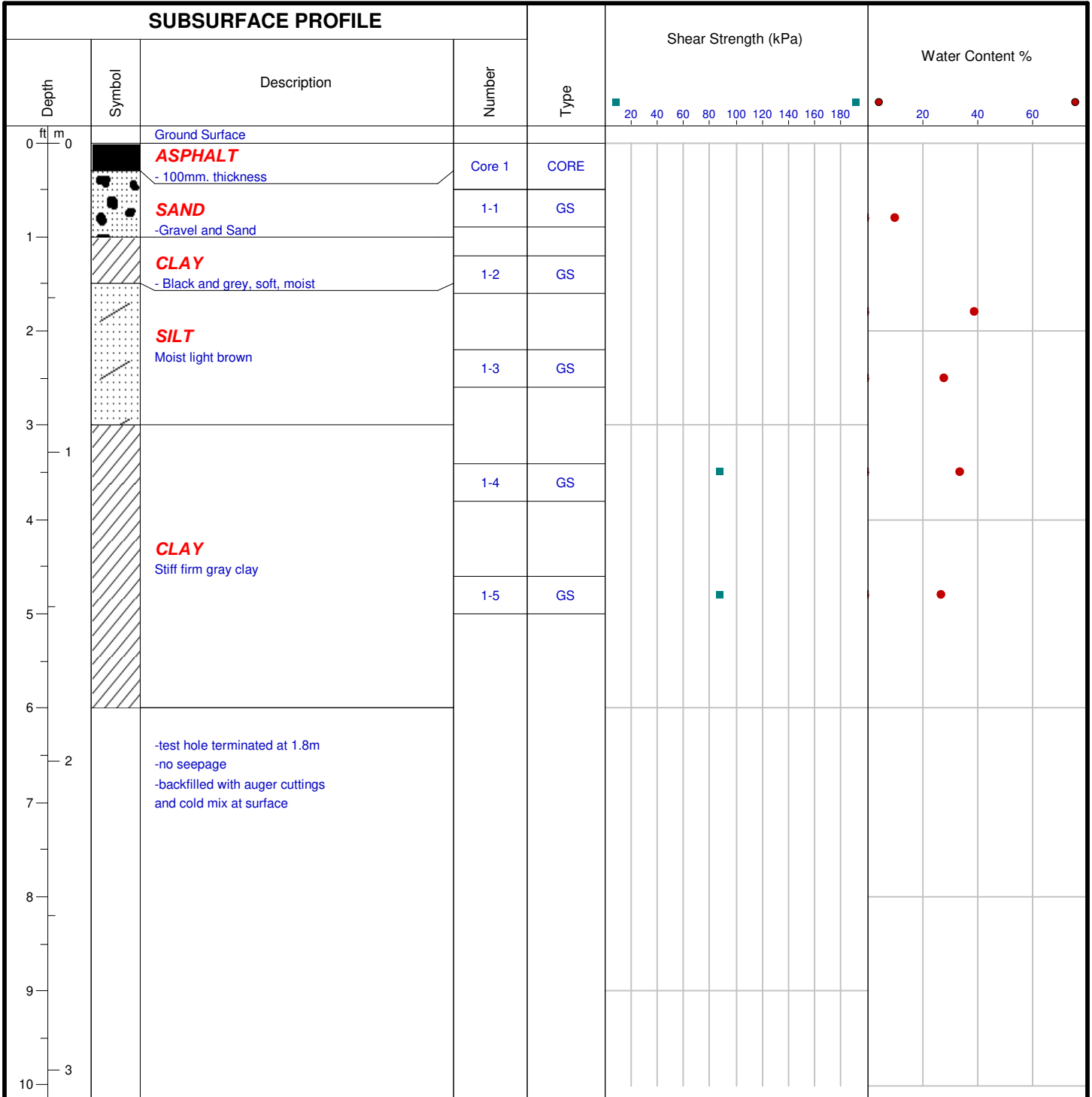
TH2

TH1

Fletcher Cres

Fletcher Cres

Palm



Drill Method: Auger

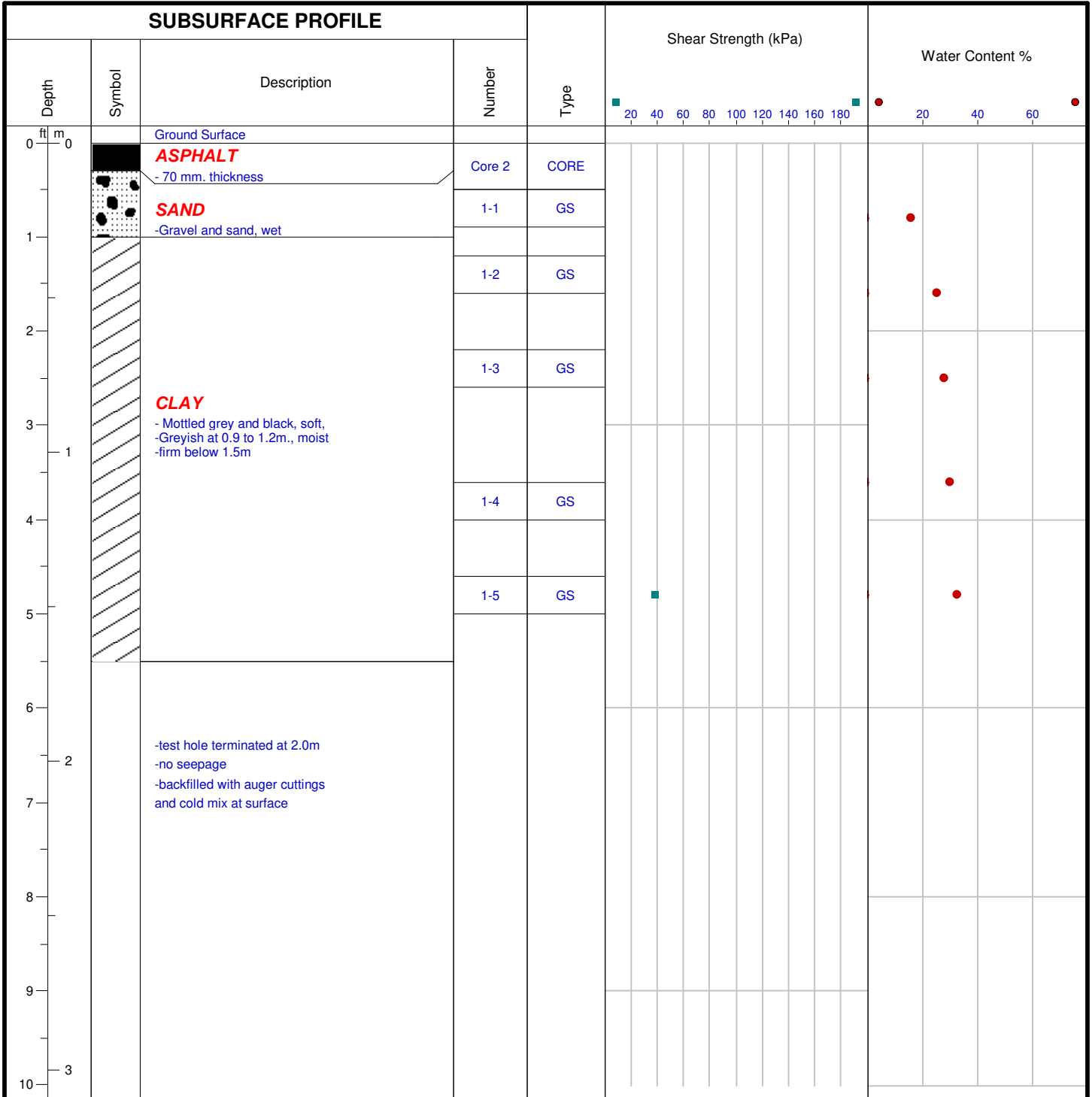
Drill Date: January 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

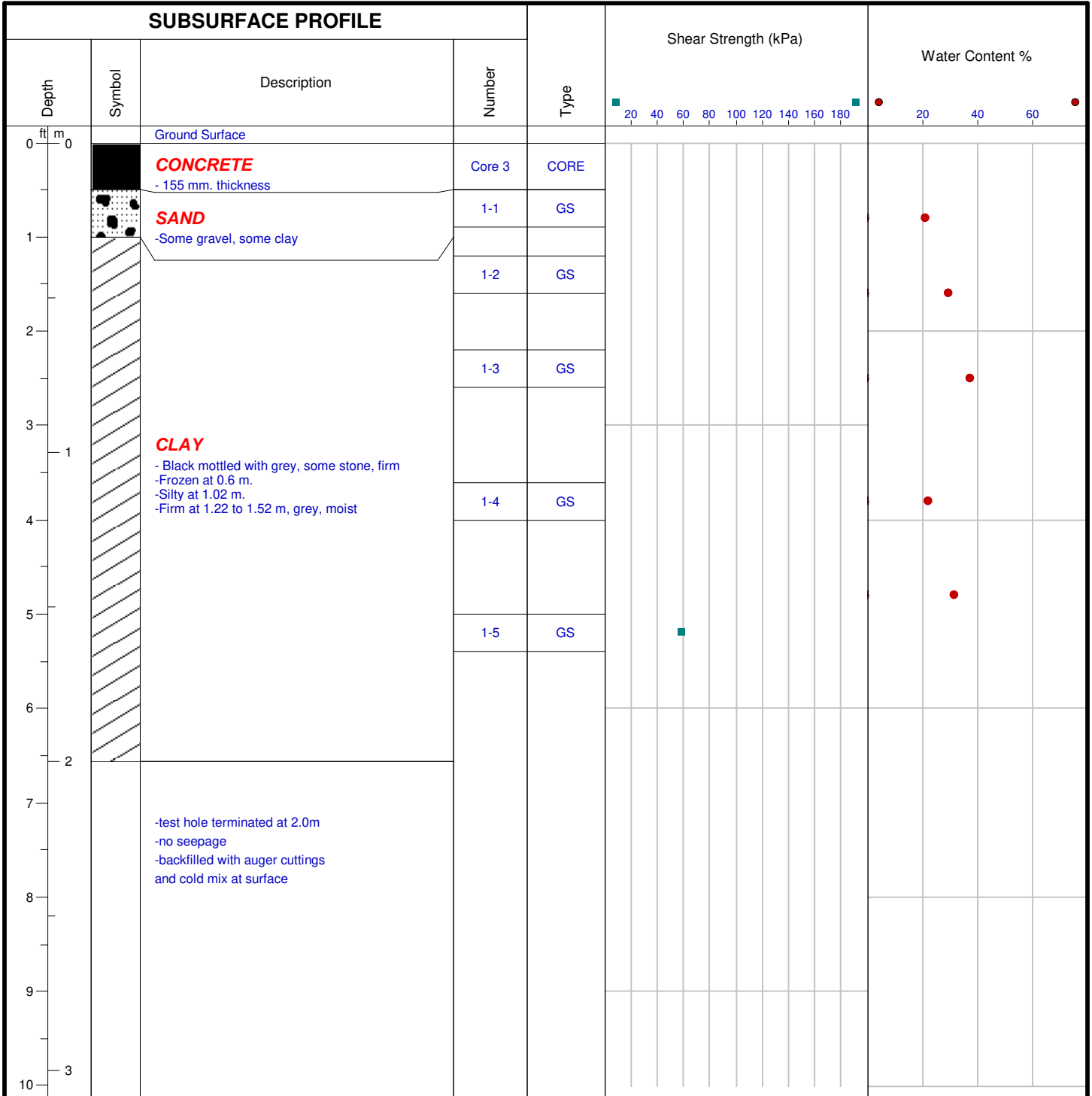
Drill Date: January 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

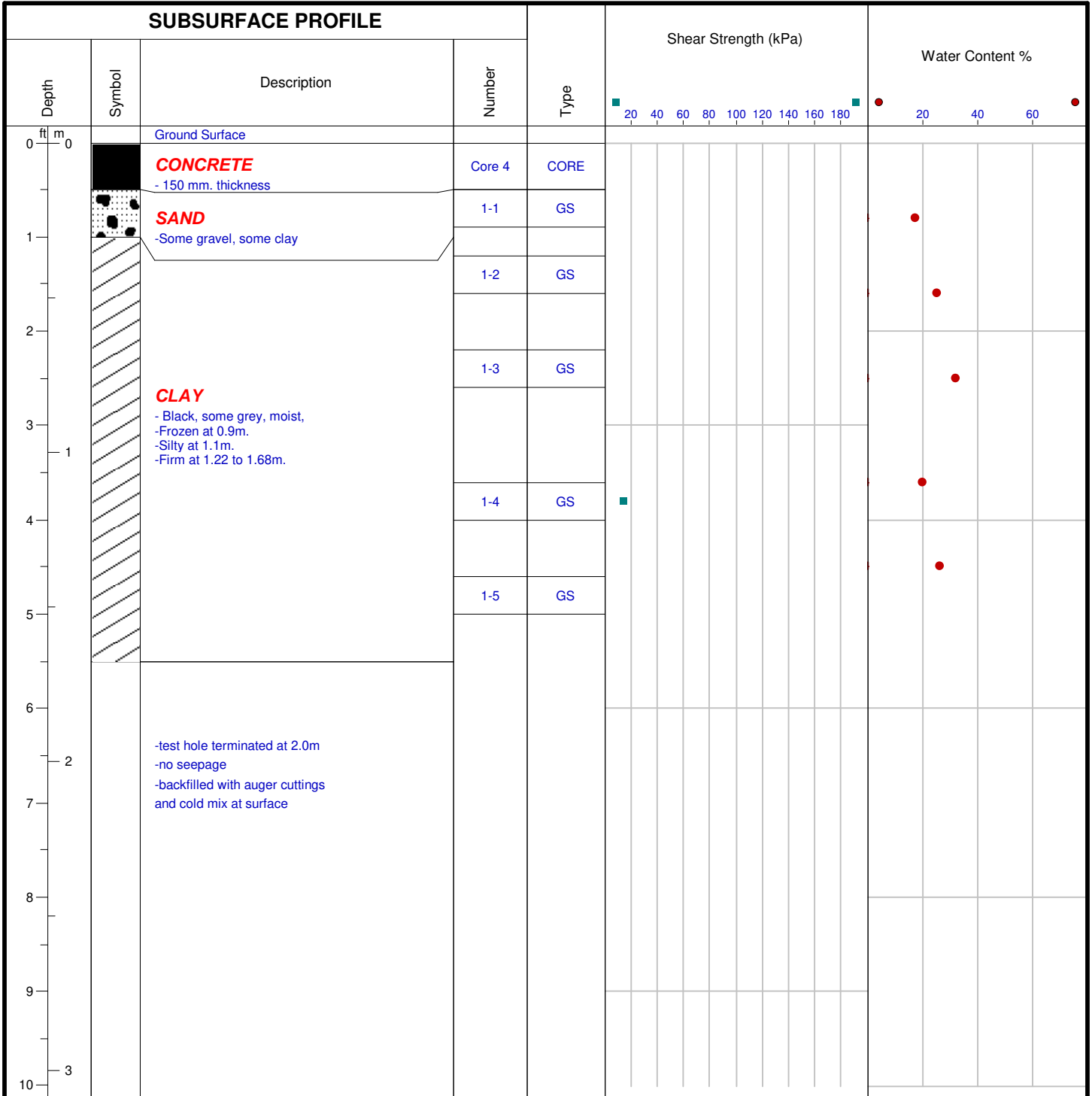
Drill Date: January 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

Drill Date: January 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1

FLETCHER BACK LANE - SUMMARY TABLE				
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE		SUBGRADE
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)	DEPTH FROM SURFACE (m) AND MATERIAL TYPE
TH 1	Back lane 85 Fletcher crescent	100	-	0.10 - 0.28 Moist Sand and Gravel 0.28 - 0.9 Soft moist silt with clay 0.9 - 1.5 Moist black and gray Clay
TH 2	1430 Pembina adjacent Fletcher Arms Park	70	-	0.07 - 0.3 Wet sand with gravel 0.3 - 0.6 Soft moist dark gray clay 0.6 - 0.675 Dry gray clay 0.675 - 1.2 Moist gray clay 1.2 -1.5 Moist firm gray clay
TH 3	Back lane 13 Kenneth street		155	0.155 - 0.3 Sand, stone with clay 0.3 - 0.6 Moist firm black and gray clay 0.6 - 1.5 Moist Firm silty gray clay
TH 4	Back lane 5 Kenneth street		150	0.15 - 0.3 Wet clay and Sand with stone 0.3 - 0.9 Moist firm black and gray clay 0.9- 1.2 Firm moist silty gray clay 1.2 - 1.5 Stiff firm black clay

LABORATORY TESTING								
CBR At 2.5mm	CBR At 5.1mm	GRAIN SIZE				ATTERBERG LIMITS		
		GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LL	PL	PI
2.9	2.6	0	12.1	63.2	24.7	41	18	23



TH 1 – Back lane 85 Fletcher crescent



TH 2 – 1430 Pembina, Adjacent Fletcher Arms Park



TH 3 – Back lane 13 Kenneth street



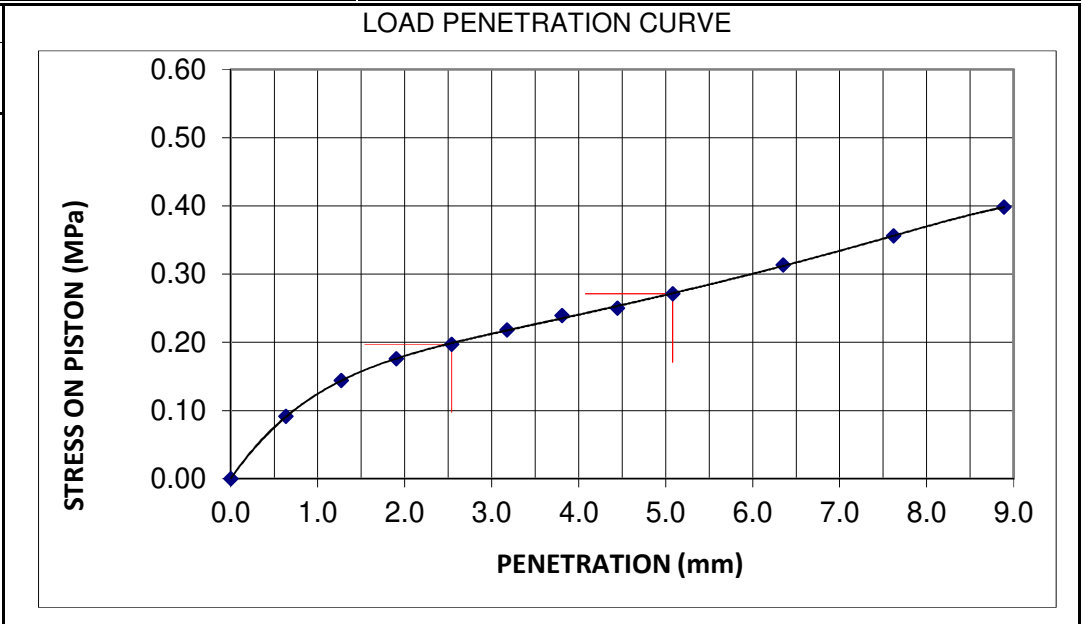
TH 4 – Back lane 5 Kenneth street

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2217
Attention: Thomas Findlay	Lab No: HM 11
Project 23-R-04 2023 Residential Streets - Test Hole Investigati	Date sampled: January 19, 2023
Location: -Pembina Highway Back Lane -Fletcher Cres	Date Received: January 19, 2023
	Date Tested /By: February 9, 2023

SAMPLE DATA		SPECIMEN DATA	
Sample Type: Clay		DESCRIPTION	Before Soaking / After Testing
Source:		Moisture Content (MC), %	21.0 / 22.4
Sampled by: EST/MK		MC of top 25mm layer, %	
Optimum Moisture Content: 21.0 %		Dry Density, kg/m ³	1589 / 1604
Maximum Dry Density: 1662 kg/m ³		Compaction, %	96%
Method of Compaction: Standard Proctor		CBR, %	2.9 / 2.6
Tested by:	Date Tested:	Swell, %	0.75

LOAD DATA	
PENETRATION mm	STRESS MPa
0	0.00
0.64	0.09
1.27	0.14
1.91	0.18
2.54	0.20
3.18	0.22
3.81	0.24
4.45	0.25
5.08	0.27
6.35	0.31
7.62	0.36
8.89	0.40



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.20	0.20	2.9	-
5.08	10.3	0.27	0.27	-	2.6

Remarks:

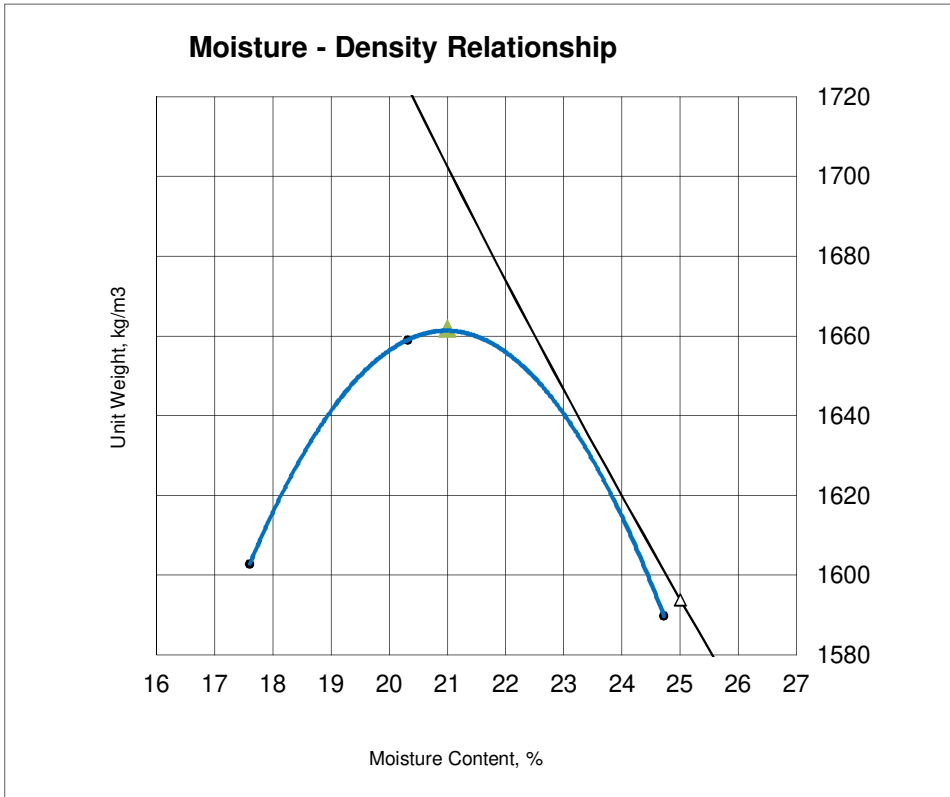
Reviewed by: *P. Bevil*

MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
ATTENTION:	Thomas Findlay	Lab No.:	HM 11
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation -Pembina Highway Back Lane -Fletcher Cres	Proctor Test No.:	4

Date Sampled:	January 19, 2023	Date Received:	January 19, 2023	PROCEDURE	A
Sampled By:	ET/MK	Date Tested:	January 30, 2023	PREPARATION	Dry
MATERIAL INFORMATION				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
Material Type:	Clay	NO. OF LAYERS	3	MOLD SIZE	100
Material Use:	Material Supplier:	MOLD VOLUME	935	WEIGHT OF HAMMER	2.5 kg
Maximum Size:	5	Material Source:			

Test No.	1	2	3
Wet Density	1885	1996	1983
Moisture Content	17.6	20.3	24.7
Dry Density	1603	1659	1590



Maximum Dry Density (MDD):
1662 kg/m³
Optimum Moisture Content
21.0 %

STONE CORRECTION (ASTM D 4718)

4.75mm
0 %
Corrected Moisture:
21.0 %
Corrected Maximum Dry Density:
1662 kg/m³

Remarks:

Tested by: Jaehang Jeong

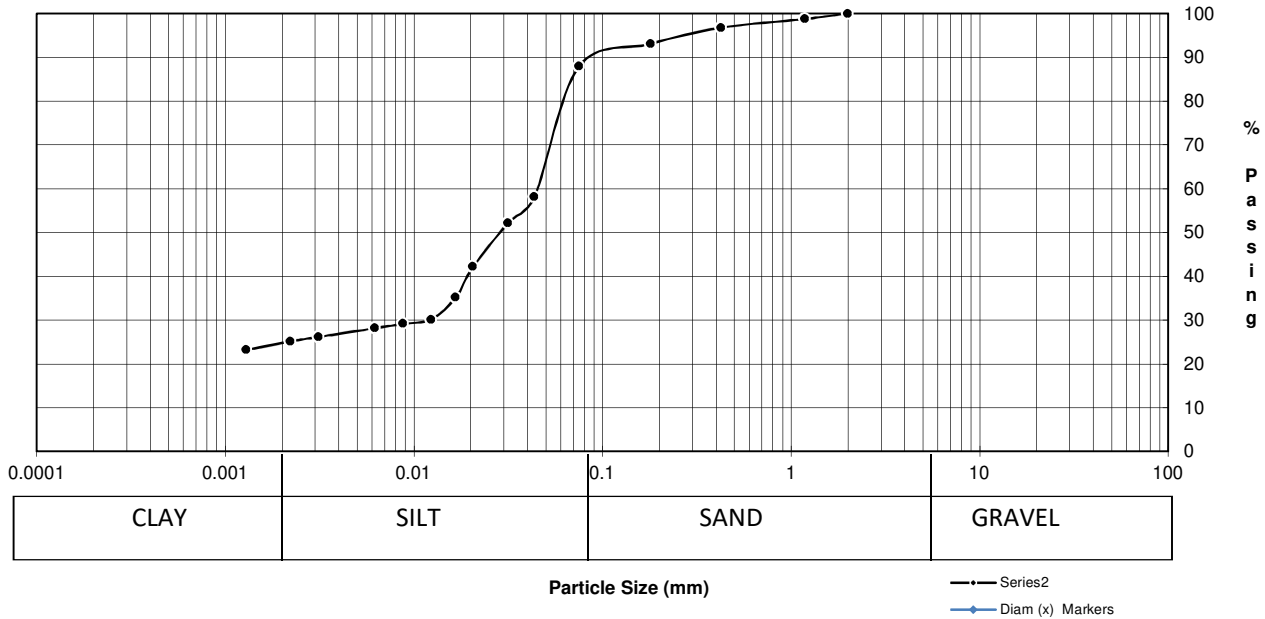
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Thomas Findlay PROJECT: 23-R-04 2023 Residential Streets - Test Hole Investigation -Pembina Highway Back Lane -Fletcher Cres	Project No.: 112-2217 PSA Test No.: 4 Lab No.: HM 11
--	---

Date Sampled:	January 19, 2023	Date Received:	January 19, 2023	Sieve Analysis		Hydrometer Analysis	
Sampled By:	EST/MK	Date Tested:	Feb 7, 2023	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH1-4 Depth 2.5' to 5' Sample Source Pembina Highway Back lane Specific Gravity of Material:		50.00	100.0				
		37.50	100.0				
		25.00	100.0				
		19.00	100.0				
		16.00	100.0				
		12.50	100.0	0.0435	58.1		
		9.50	100.0	0.0315	52.1		
		4.75	100.0	0.0206	42.1		
		2.00	100.0	0.0167	35.1		
		1.18	98.7	0.0124	30.1		
	0.425	96.8	0.0088	29.1			
	0.180	93.1	0.0062	28.1			
	0.075	87.9	0.0013	23.1			

Grain Size Analysis



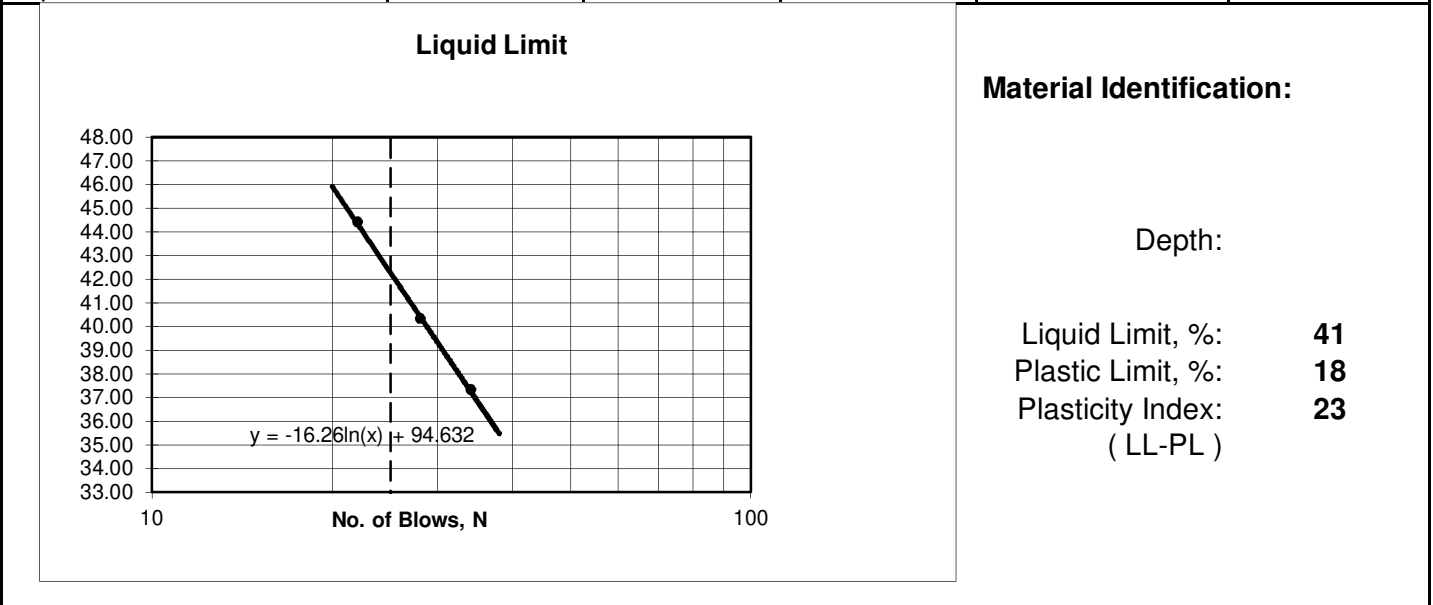
		% Composition	
		D10	
		D30	0.01193
		D60	0.04353
	12.1	Sand	
	63.2	Silt	
	24.7	Clay	
		Cu	
		Cc	

Remarks:

Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
Attention.:	Thomas Findlay	PI Test No.:	4
Project:	23-R-04 2023 Residential Streets - Test Hc -Pembina Highway Back Lane -Fletcher Cr	Lab No.:	HM 11
		Date Sampled/By:	January 19 ET/MK
		Date Received:	January 19, 2023
		Date Tested / By:	January 30 ES

Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	1	2	3		
Wet Soil + Dish:	26.24	28.31	33.11		
Dry Soil + Dish:	20.28	21.39	24.25		
Moisture:	5.96	6.92	8.86		
Dish:	4.32	4.23	4.3		
Dry Soil:	15.96	17.16	19.95		
% Moisture:	37.34	40.33	44.41		
No. of Blows:	34	28	22		
Liquid Limit:	38.76	40.88	43.73		



Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	15.31	15.13	15.91		
Dry Soil + Dish:	13.64	13.36	14.22		
Moisture:	1.67	1.77	1.69		
Dish:	4.43	4.35	4.34		
Dry Soil:	9.21	9.01	9.88		
% Moisture:	18.13	19.64	17.11		
				Average:	18

Test Method : ASTM: D4318, D2216

Remarks:

Reviewed by: Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No:	112-2217
Attention:	Thomas Findlay	Test No.:	4
Project:	23-R-04 2023 Residential Str -Pembina Highway Back Lane	Lab No.:	HM 11
		Date Sampled / By:	January 19, 202 EST/MK
		Date Received:	January 19, 2023
		Date Tested / By:	

Test Hole No.	TH 1	TH 1	TH 1	TH 1	TH 1
Depth	1'	2'	3'	4'	5'
Tare No.	154	56	A5	SE 6	BR 7
Wt Wet Sample + Tare	147.1	158	210	121.2	141.7
Wt Dry Sample + Tare	133.9	114.6	165	91.4	112.2
Wt Water	13.2	43.4	45.0	29.8	29.5
Wt Tare	5.0	4.4	4.3	4.3	4.3
Wt Dry Sample	128.9	110.2	160.7	87.1	107.9
Moisture Content (%)	10.2	39.4	28.0	34.2	27.3
Test Hole No.	TH 2	TH 2	TH 2	TH 2	TH 2
Depth	1'	2'	3'	4'	5'
Tare No.	A9	T2	C	SE 13	17
Wt Wet Sample + Tare	208	107.3	135.5	110.4	133.1
Wt Dry Sample + Tare	179.8	86.3	106.9	85.8	101.2
Wt Water	28.2	21.0	28.6	24.6	31.9
Wt Tare	4.3	4.3	4.3	4.3	4.4
Wt Dry Sample	175.5	82.0	102.6	81.5	96.8
Moisture Content (%)	16.1	25.6	27.9	30.2	33.0
Test Hole No.	TH 3	TH 3	TH 3	TH 3	TH 3
Depth	1'	2'	3'	4'	5'
Tare No.	152	64	23	96	A44
Wt Wet Sample + Tare	161	124.8	125.6	110.4	180.2
Wt Dry Sample + Tare	133.3	97.2	92.5	91	138
Wt Water	27.7	27.6	33.1	19.4	42.2
Wt Tare	4.5	4.4	4.4	4.5	4.4
Wt Dry Sample	128.8	92.8	88.1	86.5	133.6
Moisture Content (%)	21.5	29.7	37.6	22.4	31.6
Test Hole No.	TH 4	TH 4	TH 4	TH 4	TH 4
Depth	1'	2'	3'	4'	5'
Tare No.	BR 64	T09	47	304	A38
Wt Wet Sample + Tare	225.3	108.3	110.9	154.8	132.6
Wt Dry Sample + Tare	191.9	87.2	84.8	129.3	105.6
Wt Water	33.4	21.1	26.1	25.5	27.0
Wt Tare	4.6	4.4	4.4	4.4	4.4
Wt Dry Sample	187.3	82.8	80.4	124.9	101.2
Moisture Content (%)	17.8	25.5	32.5	20.4	26.7

Wildwood Park H



Wildwood H Pk

Wildwood H Pk

Wildwood H Pk

Wildwood H Pk

South Dr

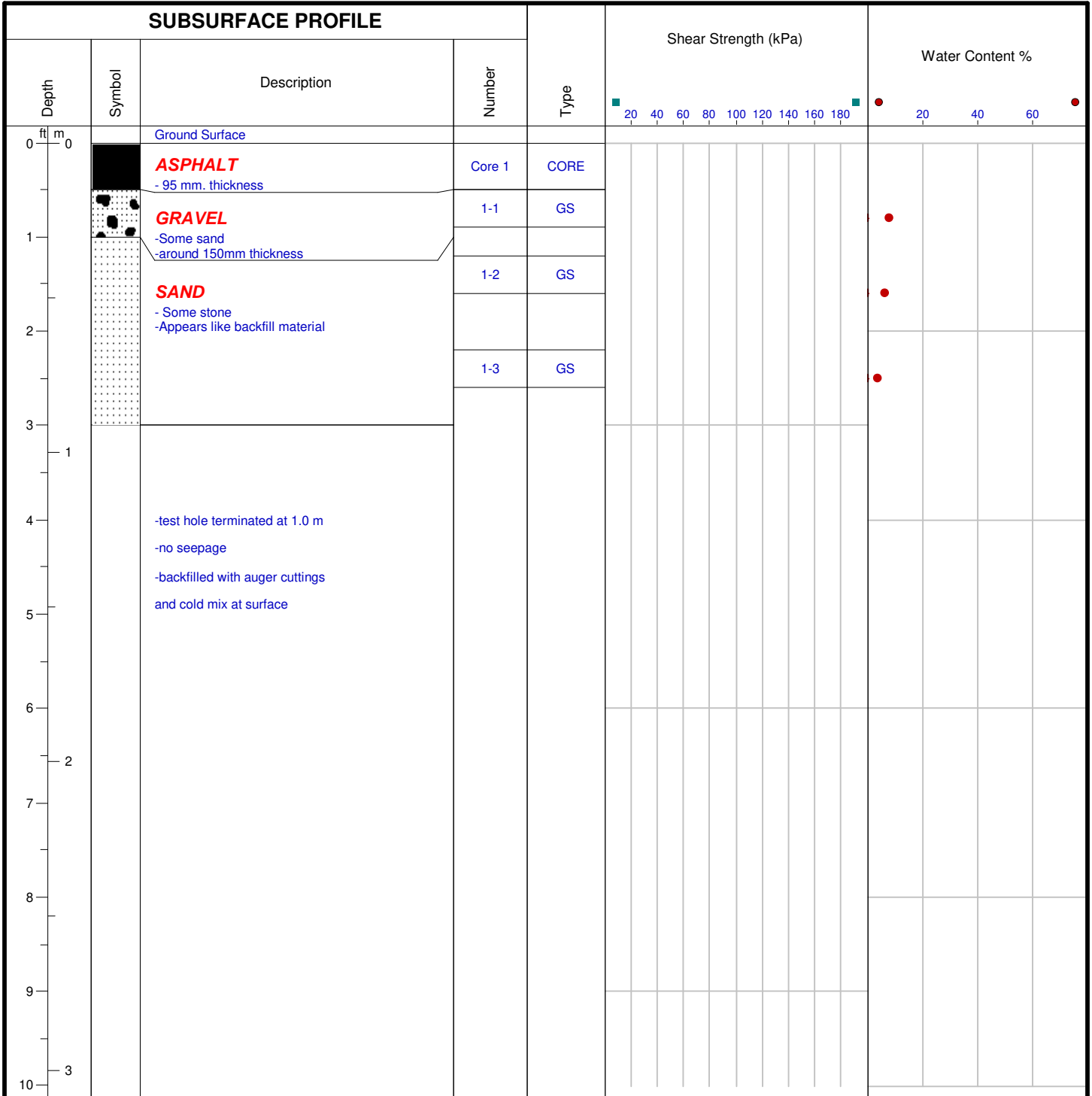
Wildwood H Pk

TH2

TH3

TH1

TH4



Drill Method: Auger

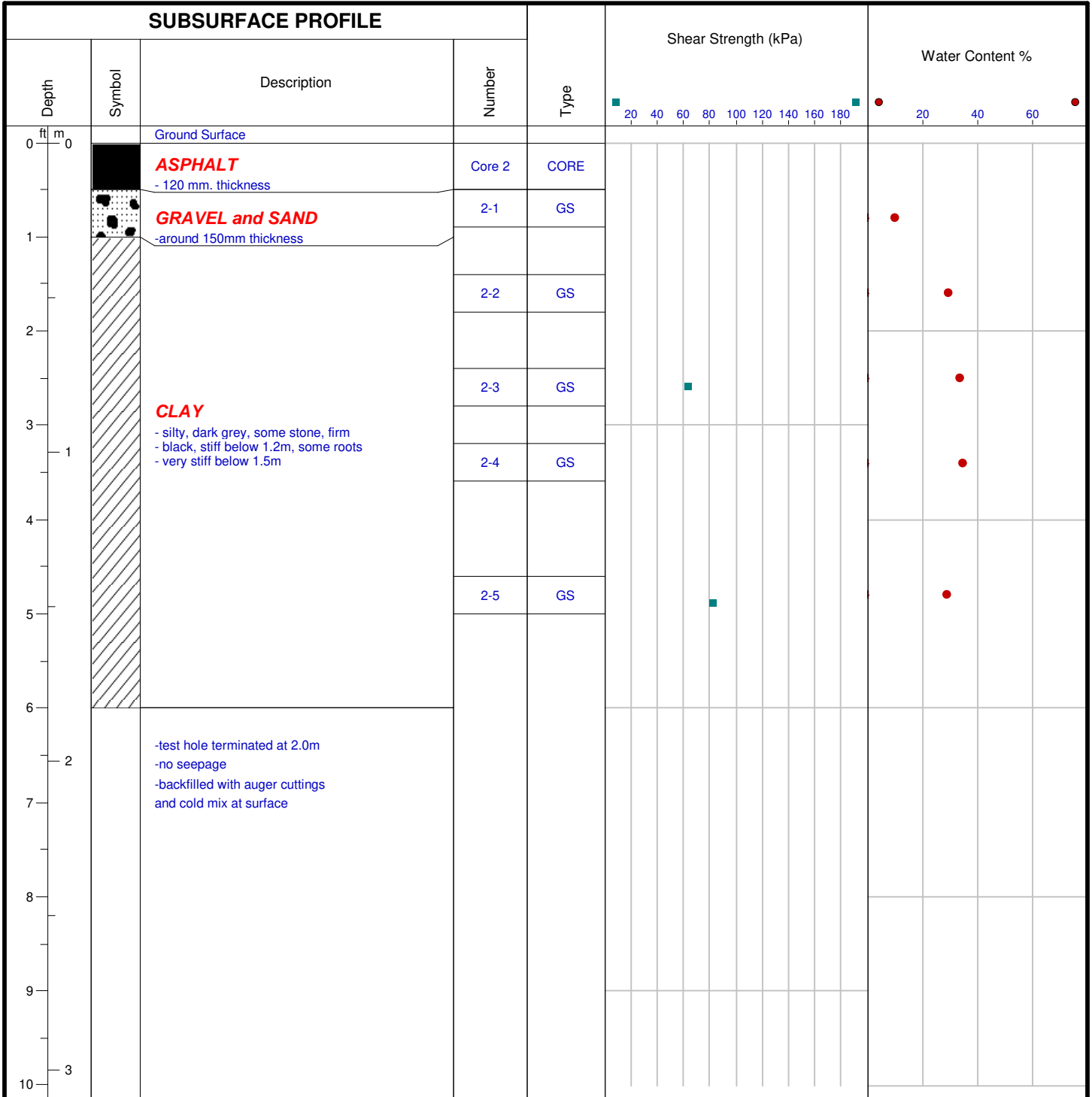
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Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

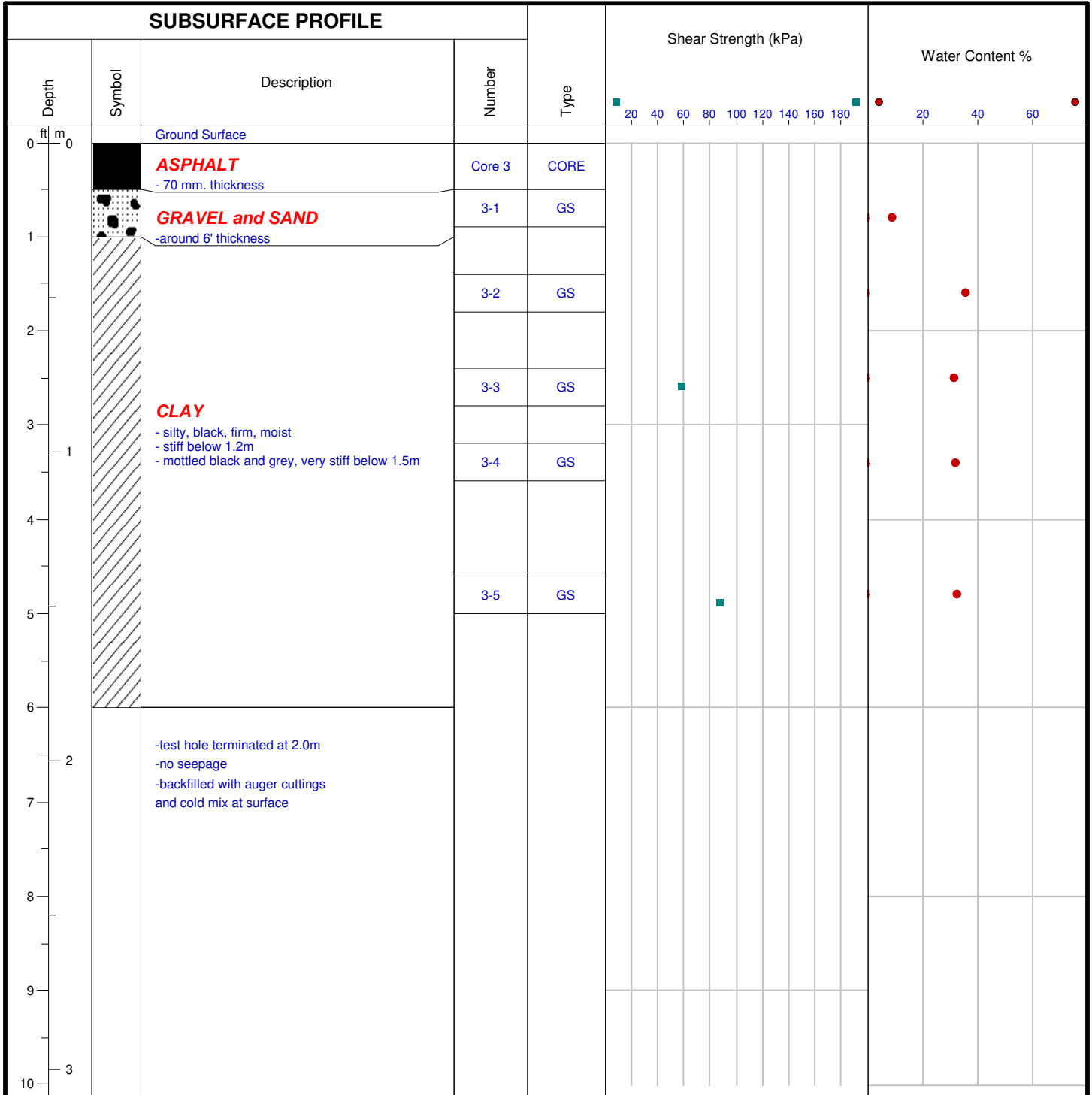
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Drill Date: January 19, 2022

Checked by: PB

Hole Size: 6 inches

Sheet: 1 of 1



Drill Method: Auger

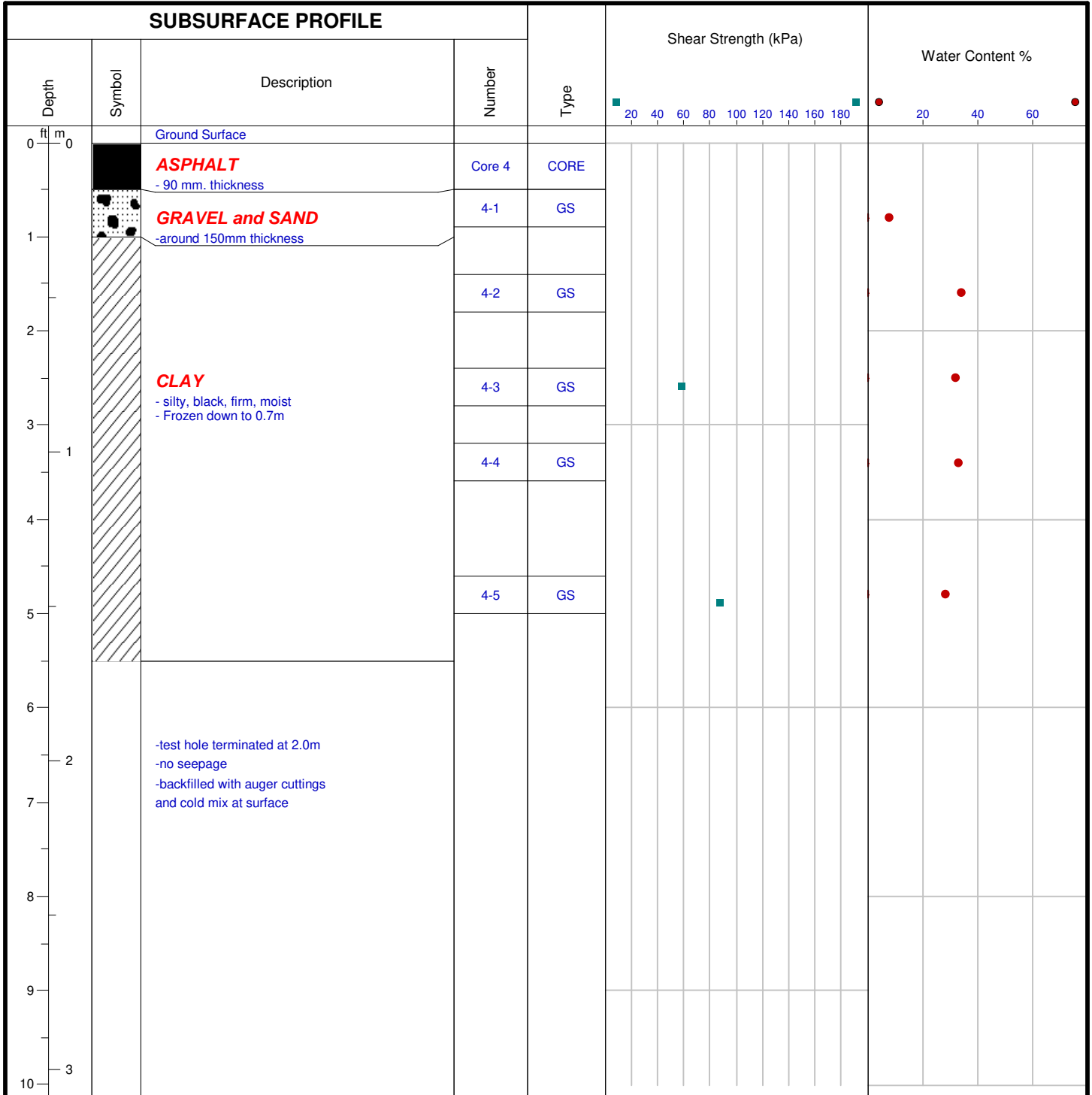
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Drill Date: January 19, 2022

Checked by: PB

Hole Size: 6 inches

Sheet: 1 of 1



Drill Method: Auger

Datum:

Drill Date: January 19, 2022

Checked by: PB

Hole Size: 6 inches

Sheet: 1 of 1

WILDWOOD PARK H - SUMMARY TABLE				
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE		SUBGRADE
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)	DEPTH FROM SURFACE (m) AND MATERIAL TYPE
TH 1	351 Wildwood Park H	95	-	0.095 - 0.3 Clayey Sand and stone 0.3 - 1.0 Stone with sand, looks like backfill material
TH 2	346 Wildwood Park H	120	-	0.12- 0.27 Moist gravel with Sand 0.27 - 0.6 Firm dark gray clay with stone 0.6 - 1.5 Stiff black clay
TH 3	325 Wildwood Park H	70	-	0.07 - 0.22 Moist sand and Gravel 0.22 - 1.2 Moist Firm silty black clay 0.9 - 1.5 Stiff mottled black and gray clay
TH 4	515 Wildwood Park H	90	-	0.09- 0.24 Wet Sand with gravel 0.24 - 0.6 Moist firm black clay 0.6 - 1.5 Firm black clay

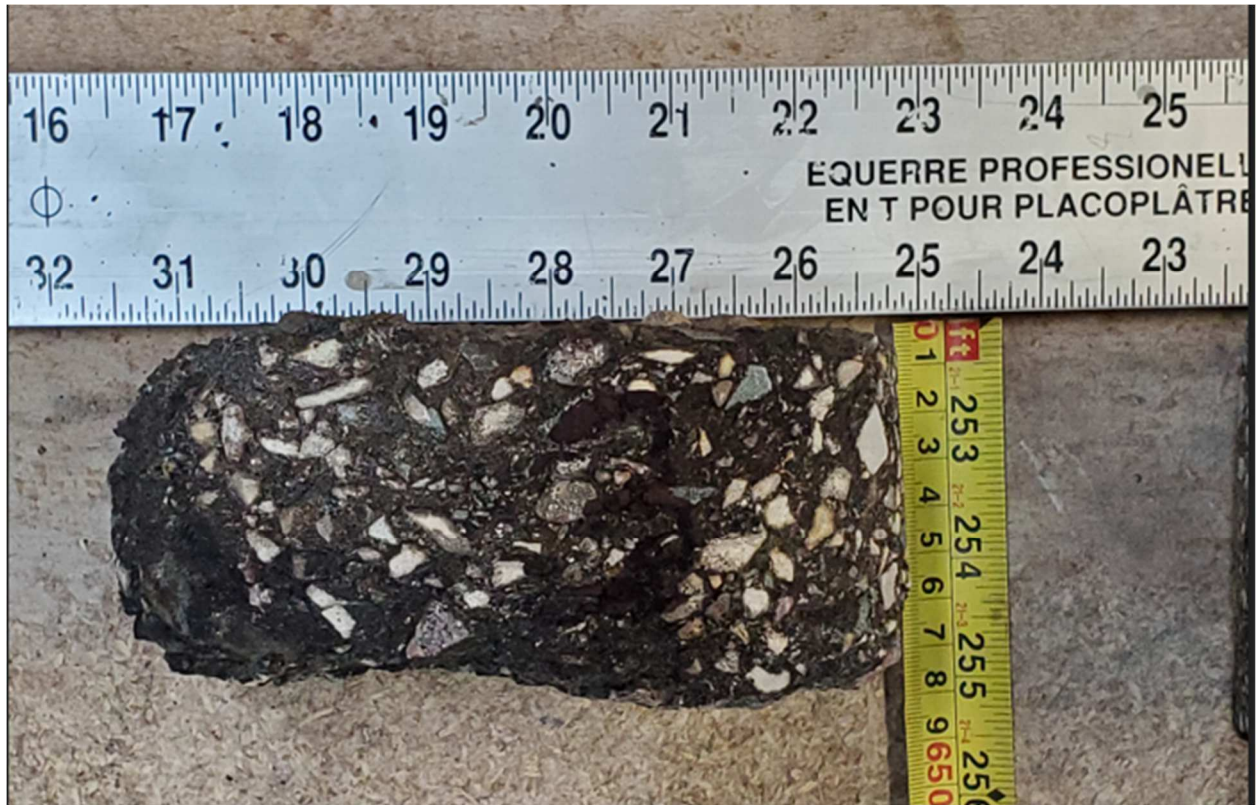
LABORATORY TESTING								
CBR At 2.5mm	CBR At 5.1mm	GRAIN SIZE				ATTERBERG LIMITS		
		GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LL	PL	PI
2.4	1.9	0	6.1	58	35.9	74	34	39



TH 1 – 351 Wildwood Park H



TH 2 – 346 Wildwood Park H



TH 3 – 325 Wildwood Park H



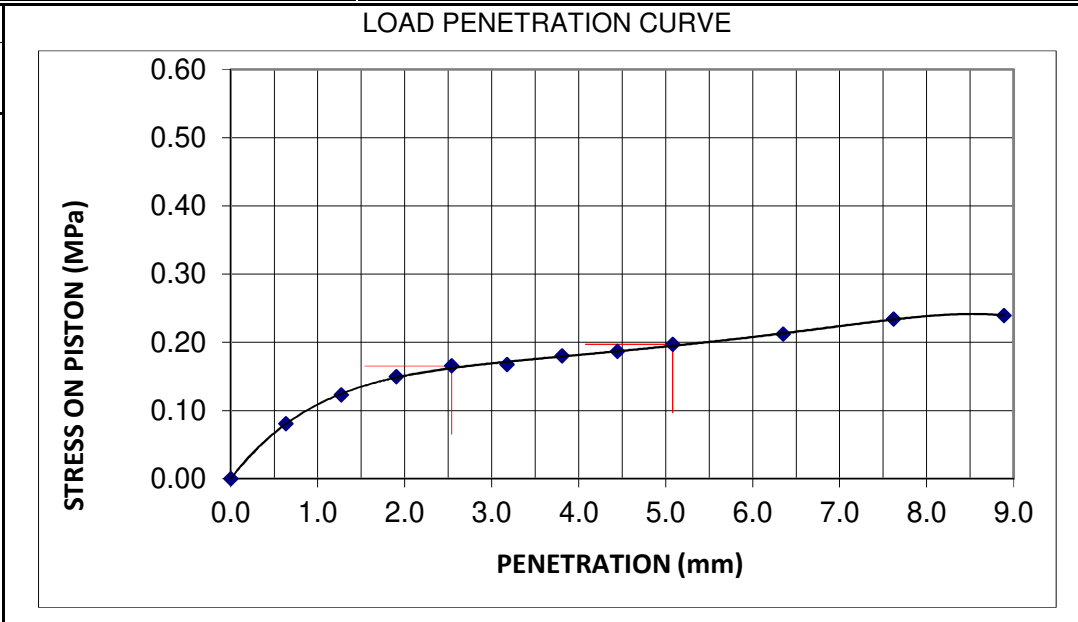
TH 4 – 515 Wildwood Park H

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2217
Attention: Thomas Findlay	Lab No: HM 12
Project 23-R-04 2023 Residential Streets - Test Hole Investigati	Date sampled: January 19, 2023
Location: -Wildwood 'H'	Date Received: January 19, 2023
	Date Tested /By: February 9, 2023

SAMPLE DATA		SPECIMEN DATA	
Sample Type: Clay		DESCRIPTION	Before Soaking After Testing
Source:		Moisture Content (MC), %	27.3 37.5
Sampled by: ET/MK		MC of top 25mm layer, %	
Optimum Moisture Content: 29.5 %		Dry Density, kg/m ³	1342 1275
Maximum Dry Density: 1425 kg/m ³		Compaction, %	94%
Method of Compaction: Standard Proctor			
Tested by: ES	Date Tested: Feb 13	Swell, %	1.35

LOAD DATA	
PENETRATION mm	STRESS MPa
0	0.00
0.64	0.08
1.27	0.12
1.91	0.15
2.54	0.17
3.18	0.17
3.81	0.18
4.45	0.19
5.08	0.20
6.35	0.21
7.62	0.23
8.89	0.24



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.17	0.17	2.4	-
5.08	10.3	0.20	0.20	-	1.9

Remarks:

Reviewed by:

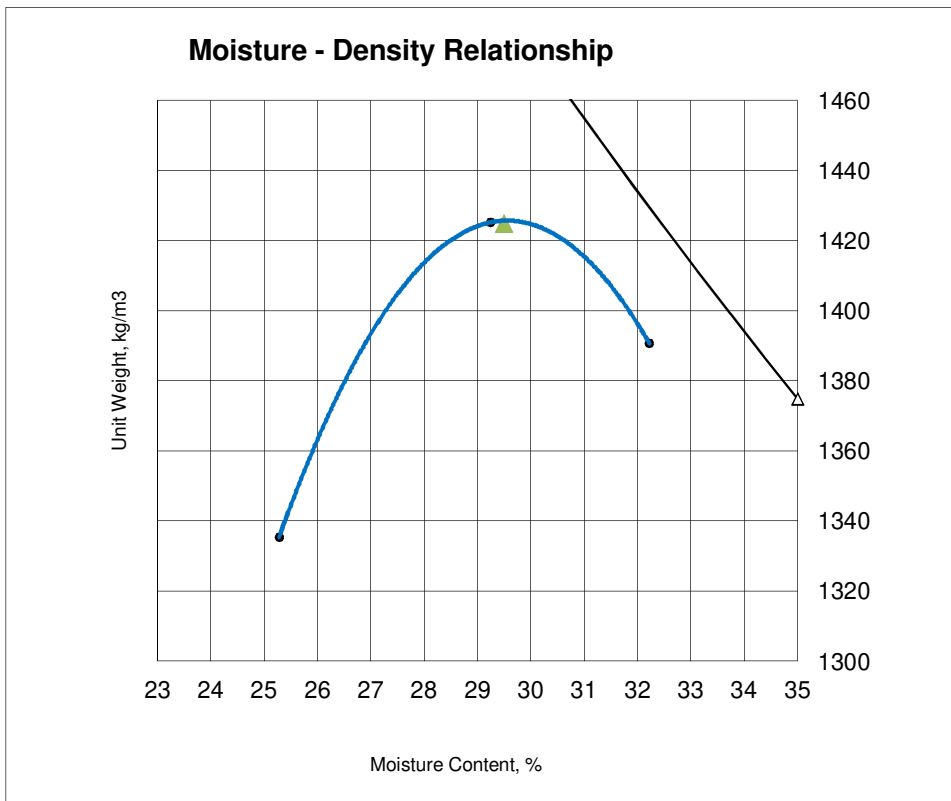
P. Bevil

MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
ATTENTION:	Thomas Findlay	Lab No.:	HM 12
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation -Wildwood 'H'	Proctor Test No.:	5

Date Sampled:	January 19, 2023	Date Received:	January 19, 2023	PROCEDURE	A	
Sampled By:	ET/MK	Date Tested:	January 30, 2023		PREPARATION	Dry
MATERIAL INFORMATION					COMPACTION METHOD	Manual
Material Type:	Clay	Material Supplier:			BLOWS PER LAYER	25
Material Use:		Material Source:		NO. OF LAYERS	3	
Maximum Size:				MOLD SIZE	100	
				MOLD VOLUME	935	
				WEIGHT OF HAMMER	2.5 kg	

	Test No.	1	2	3	4
Wet Density		1673	1842	1839	
Moisture Content		25.3	29.2	32.2	
Dry Density		1335	1425	1391	



Maximum Dry Density (MDD):
1425 kg/m³
Optimum Moisture Content
29.5 %

STONE CORRECTION (ASTM D 4718)

4.75mm 0 %
Corrected Moisture:
29.5 %
Corrected Maximum Dry Density:
1425 kg/m³

Remarks:

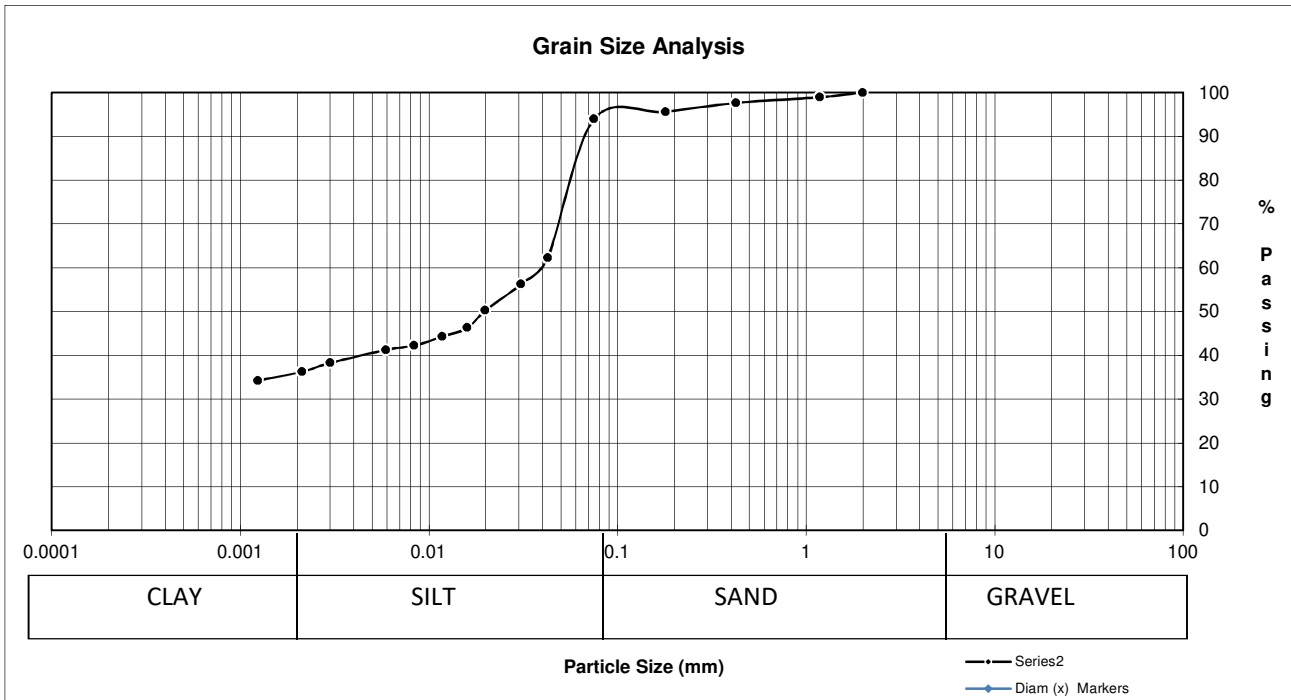
Tested by: Jaehang Jeong

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Thomas Findlay PROJECT: 23-R-04 2023 Residential Streets - Test Hole Investigation -Wildwood 'H'	Project No.: 112-2217 PSA Test No.: 5 Lab No.: HM 12
--	---

Date Sampled:	January 19, 2023	Date Received:	January 19, 2023	Sieve Analysis		Hydrometer Analysis	
Sampled By:	EST/MK	Date Tested:	January 26, 2023	Sieve (mm)	% Passing	Diameter	% Finer
				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
Material Identification				12.50	100.0	0.0426	62.2
B.H./T.H. No.	TH 5 to 8			9.50	100.0	0.0308	56.2
Depth	3' to 5'			4.75	100.0	0.0199	50.2
Sample Source	Wildwood "H"			2.00	100.0	0.0160	46.2
Specific Gravity of Material:				1.18	98.9	0.0117	44.2
				0.425	97.6	0.0084	42.2
				0.180	95.6	0.0059	41.2
				0.075	93.9	0.0012	34.2



	% Composition	D10	
	Gravel	D30	
	6.1 Sand	D60	0.04036
	58.0 Silt	Cu	
	35.9 Clay	Cc	

Remarks:

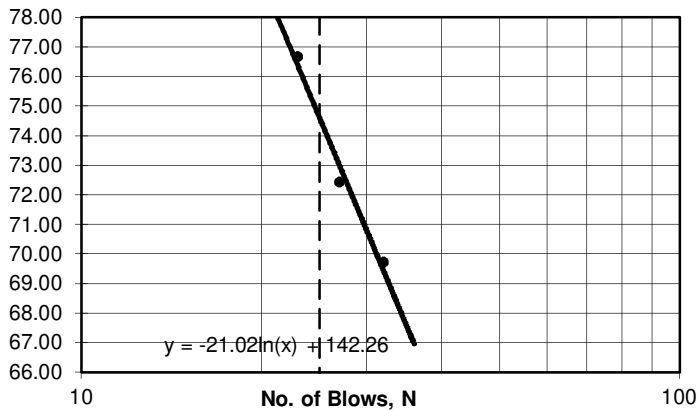
Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
Attention.:	Thomas Findlay	PI Test No.:	5
Project:	23-R-04 2023 Residential Streets - Test H -Wildwood 'H'	Lab No.:	HM 12
		Date Sampled/By:	January 19 EST/MK
		Date Received:	January 19, 2023
		Date Tested / By:	January 30 ES

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	32.76	29.58	33.49		
Dry Soil + Dish:	21.14	19.02	20.81		
Moisture:	11.62	10.56	12.68		
Dish:	4.47	4.44	4.27		
Dry Soil:	16.67	14.58	16.54		
% Moisture:	69.71	72.43	76.66		
No. of Blows:	32	27	23		
Liquid Limit:	71.82	73.11	75.89		

Liquid Limit



Material Identification:

Depth:

Liquid Limit, %: **74**
Plastic Limit, %: **34**
Plasticity Index: **39**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	22.15	24.31	23.01		
Dry Soil + Dish:	17.71	19.09	18.29		
Moisture:	4.44	5.22	4.72		
Dish:	4.29	4.42	4.6		
Dry Soil:	13.42	14.67	13.69		
% Moisture:	33.08	35.58	34.48		
				Average:	34

Test Method : ASTM: D4318, D2216

Remarks:

Reviewed by: Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No:	112-2217
Attention:	Thomas Findlay	Test No.:	5
Project:	23-R-04 2023 Residential Str -Wildwood 'H'	Lab No.:	HM 12
		Date Sampled / By:	January 19, 202 EST/MK
		Date Received:	January 19, 2023
		Date Tested / By:	

Test Hole No.	TH 1	TH 1	TH 1		
Depth	1'	2'	3'		
Tare No.	57	130	22		
Wt Wet Sample + Tare	146.4	116.7	110.9		
Wt Dry Sample + Tare	135.7	109.6	106.9		
Wt Water	10.7	7.1	4.0		
Wt Tare	4.4	4.4	4.4		
Wt Dry Sample	131.3	105.2	102.5		
Moisture Content (%)	8.1	6.7	3.9		
Test Hole No.	TH 2	TH 2	TH 2	TH 2	TH 2
Depth	1'	2'	3'	4'	5'
Tare No.	T01	69	11	BR 31	87
Wt Wet Sample + Tare	109.6	132.5	106.7	119.3	148.1
Wt Dry Sample + Tare	99.8	103.2	80.9	89.6	115.5
Wt Water	9.8	29.3	25.8	29.7	32.6
Wt Tare	4.3	4.5	4.5	4.6	4.8
Wt Dry Sample	95.5	98.7	76.4	85.0	110.7
Moisture Content (%)	10.3	29.7	33.8	34.9	29.4
Test Hole No.	TH 3	TH 3	TH 3	TH 3	TH 3
Depth	1'	2'	3'	4'	5'
Tare No.	22X	J21	116	BR 72	KD 10
Wt Wet Sample + Tare	152.9	114.4	120.4	118.8	138.9
Wt Dry Sample + Tare	140.5	85.3	92.5	90.9	105.8
Wt Water	12.4	29.1	27.9	27.9	33.1
Wt Tare	4.4	4.7	4.4	4.5	4.5
Wt Dry Sample	136.1	80.6	88.1	86.4	101.3
Moisture Content (%)	9.1	36.1	31.7	32.3	32.7
Test Hole No.	TH 4	TH 4	TH 4	TH 4	TH 4
Depth	1'	2'	3'	4'	5'
Tare No.	68A	BR 57	301	59	51
Wt Wet Sample + Tare	124.8	114.7	117	123.7	130.3
Wt Dry Sample + Tare	115.6	86.4	89.5	93.7	102.1
Wt Water	9.2	28.3	27.5	30.0	28.2
Wt Tare	4.7	4.5	4.4	4.3	4.3
Wt Dry Sample	110.9	81.9	85.1	89.4	97.8
Moisture Content (%)	8.3	34.6	32.3	33.6	28.8

Wildwood Park G



Wildwood Gpk

TH3

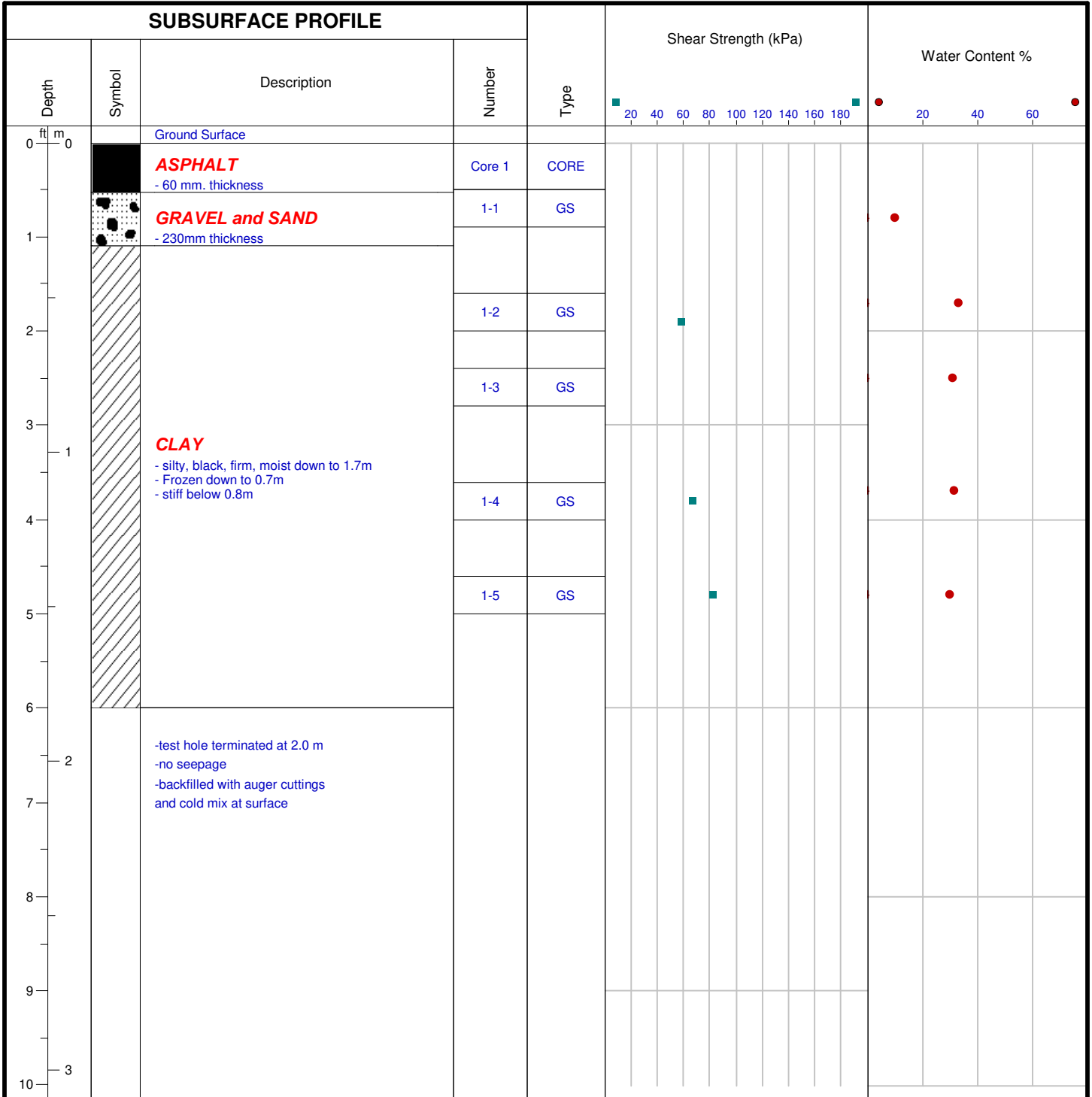
Wildwood Gpk

TH1

Wildwood Gpk

South Dr

South Dr



Drill Method: Auger

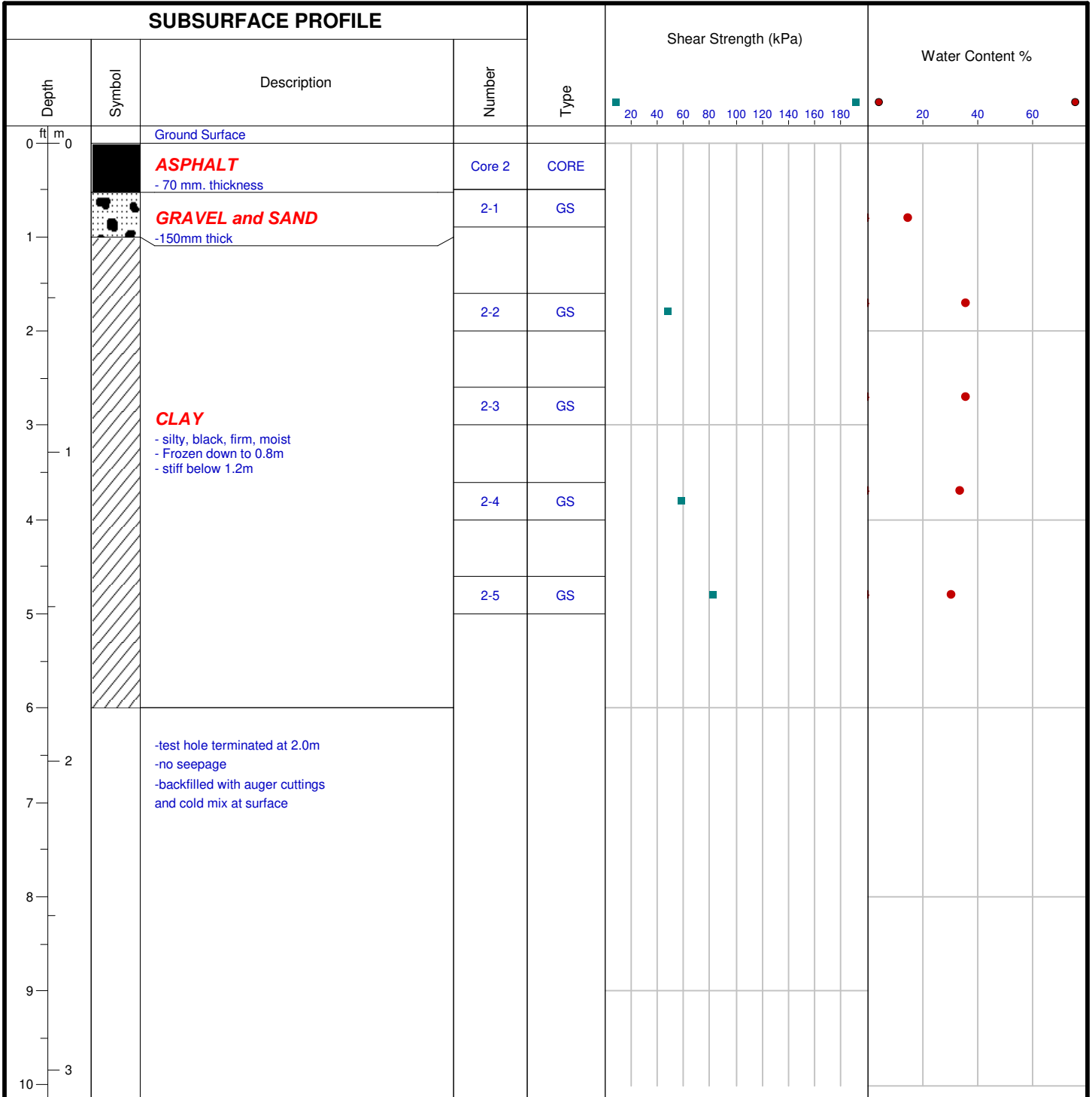
Drill Date: January 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

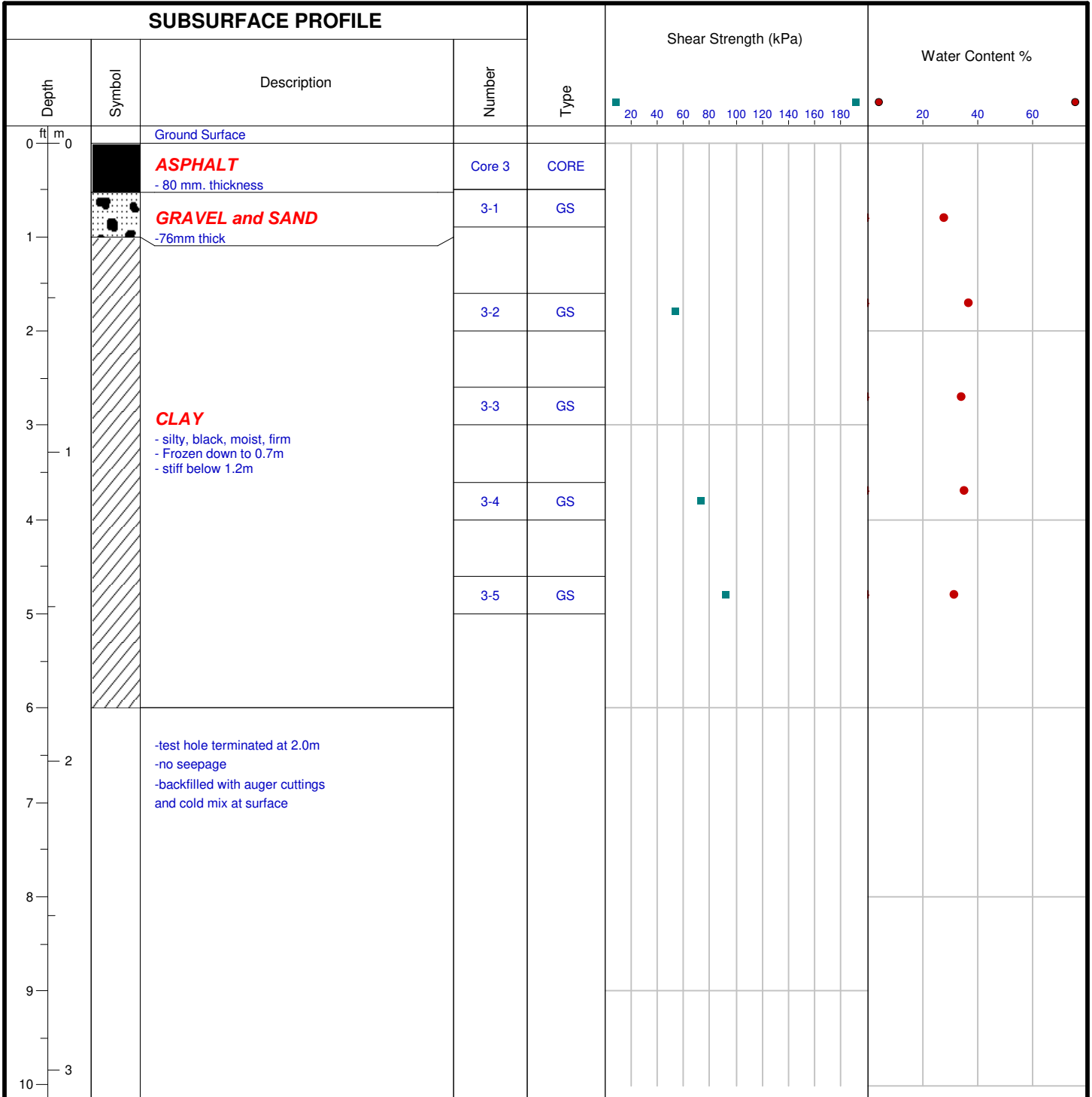
Drill Date: January 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

Drill Date: January 19, 2022

Hole Size: 6 inches

Datum:

Checked by: PB

Sheet: 1 of 1

WILDWOOD PARK G - SUMMARY TABLE				
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE		SUBGRADE
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)	DEPTH FROM SURFACE (m) AND MATERIAL TYPE
TH 1	575 Wildwood Park G	60	-	0.06 - 0.29 Gravel with sand 0.29- 0.8 Moist firm silty black clay 0.8 - 1.5 Stiff black clay
TH 2	371 Wildwood Park G	70	-	0.07- 0.22 Gravel with sand 0.22- 1.2 Moist firm silty black clay 1.2 - 1.5 Stiff dark brown clay
TH 3	366 Wildwood Park G	80	-	0.08 - 0.156 Sand with stone 0.156 - 1.2 Moist Firm silty black clay 1.2 - 1.5 Stiff brown clay

LABORATORY TESTING								
CBR At 2.5mm	CBR At 5.1mm	GRAIN SIZE				ATTERBERG LIMITS		
		GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	LL	PL	PI
1.9	1.7	0	3.9	52.2	43.9	78	31	47



TH 1 – 575 Wildwood Park G



TH 2 – 371 Wildwood Park G



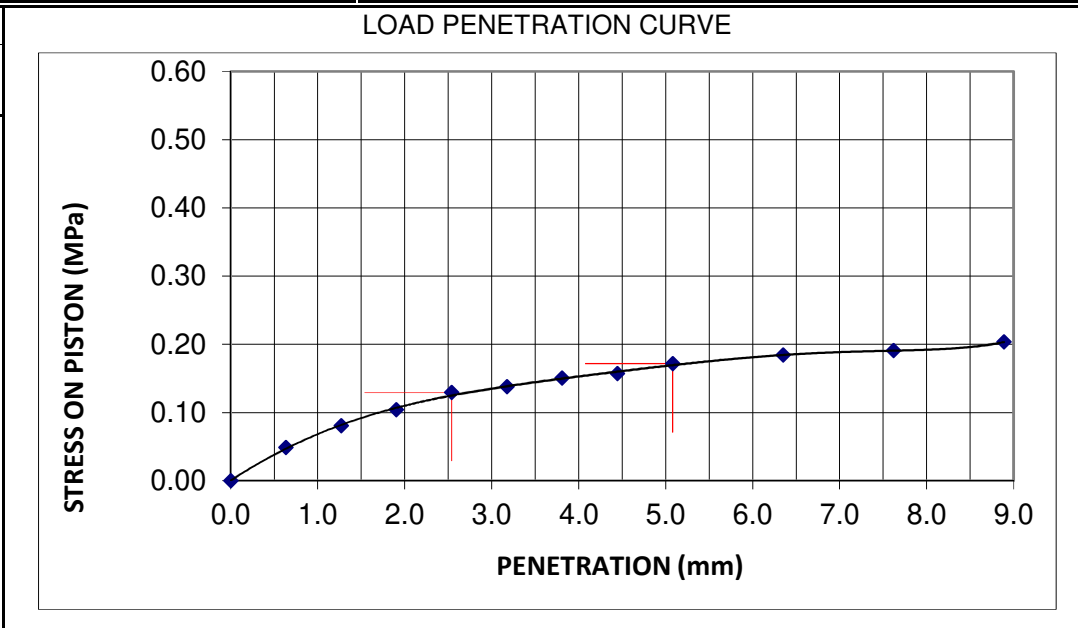
TH 3 – 366 Wildwood Park G

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2217
Attention: Thomas Findlay	Lab No: HM 13
Project 23-R-04 2023 Residential Streets - Test Hole Investigati	Date sampled: January 19, 2023
Location: -Wildwood 'G'	Date Received: January 19, 2023
	Date Tested /By: February 9, 2023

SAMPLE DATA		SPECIMEN DATA	
Sample Type: Clay		DESCRIPTION	Before Soaking After Testing
Source:		Moisture Content (MC), %	33.3 35.8
Sampled by: ET/MK		MC of top 25mm layer, %	
Optimum Moisture Content: 30.5 %		Dry Density, kg/m ³	1317 1269
Maximum Dry Density: 1400 kg/m ³		Compaction, %	94%
Method of Compaction: Standard Proctor			
Tested by: ES	Date Tested: Feb 13	Swell, %	1.40

LOAD DATA	
PENETRATION mm	STRESS MPa
0	0.00
0.64	0.05
1.27	0.08
1.91	0.10
2.54	0.13
3.18	0.14
3.81	0.15
4.45	0.16
5.08	0.17
6.35	0.18
7.62	0.19
8.89	0.20



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.13	0.13	1.9	-
5.08	10.3	0.17	0.17	-	1.7

Remarks:

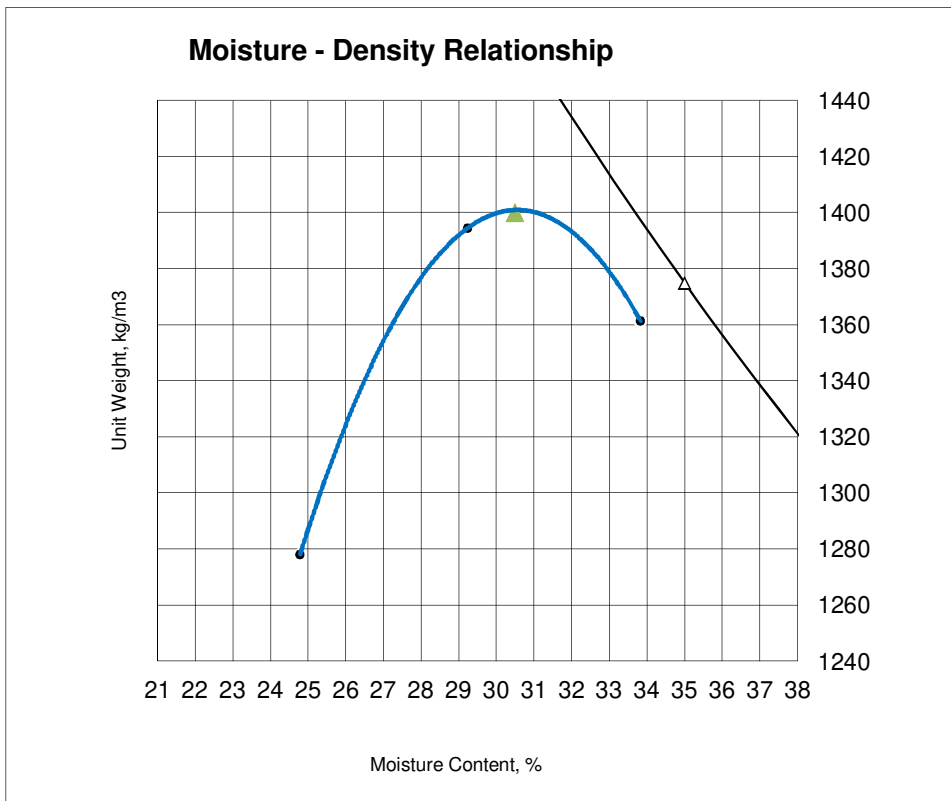
Reviewed by: *P. Bevil*

MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
ATTENTION:	Thomas Findlay	Lab No.:	HM 13
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation -Wildwood 'G'	Proctor Test No.:	6

Date Sampled:	January 19, 2023	Date Received:	January 19, 2023	PROCEDURE	A
Sampled By:	EST/MK	Date Tested:	January 30, 2023	PREPARATION	Dry
MATERIAL INFORMATION				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
Material Type:	Clay	NO. OF LAYERS	3	MOLD SIZE	100
Material Use:	Material Supplier:	MOLD VOLUME	935	WEIGHT OF HAMMER	2.5 kg
Maximum Size:	Material Source:				

	Test No.	1	2	3	4
Wet Density		1595	1802	1822	
Moisture Content		24.8	29.2	33.8	
Dry Density		1278	1395	1361	



Maximum Dry Density (MDD):
1400 kg/m³
Optimum Moisture Content
30.5 %

STONE CORRECTION (ASTM D 4718)

4.75mm 0 %
Corrected Moisture:
30.5 %
Corrected Maximum Dry Density:
1400 kg/m³

Remarks:

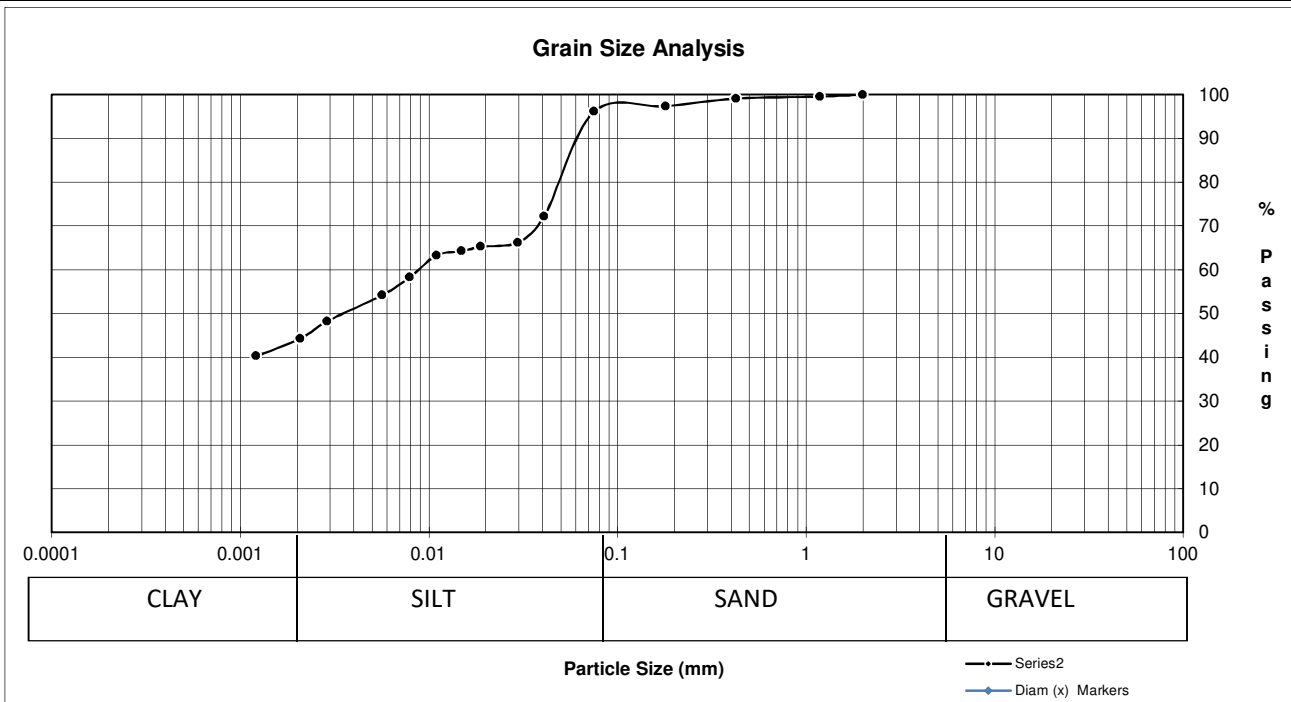
Tested by: Jaehang Jeong

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Thomas Findlay PROJECT: 23-R-04 2023 Residential Streets - Test Hole Investigation -Wildwood 'G'	Project No.: 112-2217 PSA Test No.: 6 Lab No.: HM 13
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Date Sampled:	January 19, 2023	Date Received:	January 19, 2023	Sieve Analysis		Hydrometer Analysis	
Sampled By:	EST/MK	Date Tested:	January 26, 2023	Sieve (mm)	% Passing	Diameter	% Finer
				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
Material Identification				12.50	100.0	0.0410	72.2
B.H./T.H. No.	TH 1 to 3			9.50	100.0	0.0297	66.2
Depth	2.5' to 5'			4.75	100.0	0.0188	65.2
Sample Source	Wildwood "G"			2.00	100.0	0.0150	64.2
Specific Gravity of Material:				1.18	99.5	0.0110	63.2
				0.425	99.1	0.0079	58.2
				0.180	97.4	0.0057	54.2
				0.075	96.1	0.0012	40.2



	% Composition	
	Gravel	D10
	Sand	D30
	Silt	D60
	Clay	Cu
		Cc

Remarks:

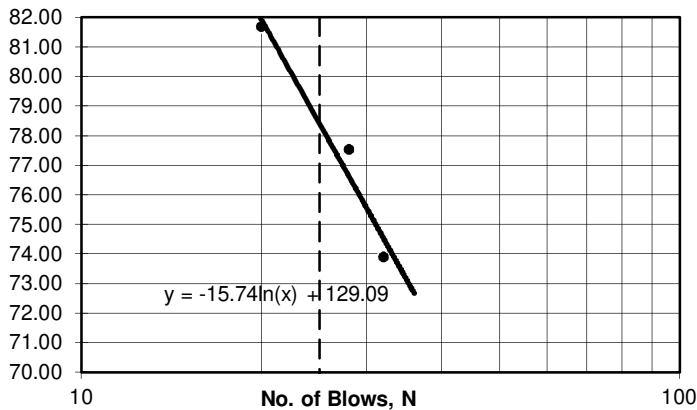
Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2217
Attention.:	Thomas Findlay	PI Test No.:	6
Project:	23-R-04 2023 Residential Streets - Test Hc -Wildwood 'G'	Lab No.:	HM 13
		Date Sampled/By:	January 19 ET/MK
		Date Received:	January 19, 2023
		Date Tested / By:	January 30 ES

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	26.11	27.3	31.11		
Dry Soil + Dish:	16.66	17.13	19.08		
Moisture:	9.45	10.17	12.03		
Dish:	3.87	4.01	4.35		
Dry Soil:	12.79	13.12	14.73		
% Moisture:	73.89	77.52	81.67		
No. of Blows:	32	28	20		
Liquid Limit:	76.13	78.59	79.49		

Liquid Limit



Material Identification:

Depth:

Liquid Limit, %: **78**
Plastic Limit, %: **31**
Plasticity Index: **47**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	22.46	22.87	22.95		
Dry Soil + Dish:	18.14	18.18	18.83		
Moisture:	4.32	4.69	4.12		
Dish:	3.89	3.91	4.95		
Dry Soil:	14.25	14.27	13.88		
% Moisture:	30.32	32.87	29.68		
				Average:	31

Test Method : ASTM: D4318, D2216

Remarks:

Reviewed by: Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client: Aecom Canada Ltd
99 Commerce Drive, Winnipeg
MB R3P 0Y7

Project No: 112-2217
Test No.: 6
Lab No.: HM 13

Attention: Thomas Findlay
2023 Residential street test

Date Sampled / By: 16-Jan-23 ET

Project: hole Investigation
Wildwood G

Date Received: January 19, 2023

Date Tested / By: ET

Test Hole No.	TH 1	TH 1	TH 1	TH 1	TH 1
Depth	1'	2'	3'	4'	5'
Tare No.	SE 1	12	SE 4	65	KD 2
Wt Wet Sample + Tare	126.7	109.1	107	164	139.8
Wt Dry Sample + Tare	115.4	82.8	82.4	125.3	108.5
Wt Water	11.3	26.3	24.6	38.7	31.3
Wt Tare	4.4	4.5	4.2	4.3	4.3
Wt Dry Sample	111.0	78.3	78.2	121.0	104.2
Moisture Content (%)	10.2	33.6	31.5	32.0	30.0
Test Hole No.	TH 2	TH 2	TH 2	TH 2	TH 2
Depth	1'	2'	3'	4'	5'
Tare No.	BR 22	71	IX	302	BR 17
Wt Wet Sample + Tare	149.9	115.6	123.4	141.8	161.8
Wt Dry Sample + Tare	131.1	86.1	91.8	106.9	124.6
Wt Water	18.8	29.5	31.6	34.9	37.2
Wt Tare	4.4	4.4	4.3	4.5	4.4
Wt Dry Sample	126.7	81.7	87.5	102.4	120.2
Moisture Content (%)	14.8	36.1	36.1	34.1	30.9
Test Hole No.	TH 3	TH 3	TH 3	TH 3	TH 3
Depth	1'	2'	3'	4'	5'
Tare No.	321	107	T14	A28	GM
Wt Wet Sample + Tare	136.1	128.1	116.4	119.3	151
Wt Dry Sample + Tare	107.1	94.7	87.6	89.3	115.7
Wt Water	29.0	33.4	28.8	30.0	35.3
Wt Tare	4.3	4.4	4.6	4.3	4.5
Wt Dry Sample	102.8	90.3	83.0	85.0	111.2
Moisture Content (%)	28.2	37.0	34.7	35.3	31.7
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

**Clare Avenue,
Eccles Street to
Casey Street**



Balfour Ave

Balfour Ave

Fisher St

Fisher St

Clare Ave

Clare Ave

Montgomery Ave

Montgomery Ave

Montgomery Ave

Church St

TH7

TH6

TH5

TH4

TH3

TH2

TH1

CLARE AVENUE - SUMMARY TABLE

TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH 1	124 Clare Avenue. (Joint)	-	250
TH 2	144 Clare Avenue. (slab)	-	190
TH 3	160 Clare Avenue. South side (Joint)	-	190
TH 4	171 Clare Avenue. (slab)	-	170
TH 5	184 Clare Avenue. South side (Joint)	-	175
TH 6	212 Clare Avenue. (Joint)	-	210
TH 7	232 Clare Avenue. (slab)	-	160





TH3 - 160 Clare Ave. Joint South side



TH4 - 171 Clare Ave. (slab)



TH5-184 Clare Ave. Joint South side



TH6 - 212 Clare Ave. (Joint)



TH7 - 232 Clare Ave. (slab)

CONCRETE CORE COMPRESSIVE STRENGTH TEST REPORT (CSA A23.2-14C)

CLIENT:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	DATE:	December 15, 2022
ATTENTION:	Blair Cockrell	FILE NO:	112-2217
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation Clare Avenue	REPORT NO:	22-001
STRUCTURE:	Slab and joint at Clare Ave.	TECHNOLOGIST:	E.S.
		DATE CORES TAKEN:	December 12, 2022
		DOCUMENT NO:	22-3859
		DATE RECEIVED IN LAB:	December 13, 2022

Core Location	Length as Drilled (mm)	Core Diameter (mm)	Core Length (mm)	Length / Diameter (mm)	Correction Factor	Mass (grams)	Age at Break (days)	Date of Break	Type of Fracture	Comp. Strength as Calculated (MPa)	Comp. Strength as Corrected (MPa)
Core 4 - Slab	170.00	94.00	150.00	1.59	0.96	2.4		16-Dec	3	44.6	43.1
Core 5 - Joint at southside	175.00	94.00	165.00	1.75	0.98	2.8		16-Dec	3	46.9	46.0

Remarks:

The core samples were tested in dry condition in accordance with CSA A23.2-14C.

Reviewed by:



Edel Santiago
Senior Technologist

Approved by:



Paul Bevel, Manager
Field & Lab Testing Services

**Fisher Street,
Oakwood Avenue to
Arnold Avenue**



FISHER STREET - SUMMARY TABLE

TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH 1	Adjacent to 231 Oakwood Avenue. (Slab)	-	160
TH 2	Adjacent to 15 Maplewood Avenue. (Joint)	-	120
TH 3	Adjacent to 196 Bartlet Avenue. (slab)	-	160
TH 4	Adjacent to 106 Morley Avenue. (slab)	-	160
TH 5	Adjacent to 96 Arnold Avenue. (Joint)	-	165





TH3 - 196 Bartlet Ave., Fisher st. (slab)



TH4 - 106 Morley Ave, Fisher st. (slab)



TH5 - 96 Arnold Ave, Fisher str. (Joint)

CONCRETE CORE COMPRESSIVE STRENGTH TEST REPORT (CSA A23.2-14C)

CLIENT: AECOM Canada Ltd.
99 Commerce Drive, Winnipeg
MB R3P 0Y7

DATE: December 16, 2022

FILE NO: 112-2217

REPORT NO: 22-002

ATTENTION: Thomas Findlay
PROJECT: 23-R-04 2023 Residential Streets - Test Hole Investigation
Fisher Street

TECHNOLOGIST: E.S.

DATE CORES TAKEN: December 12, 2022

DOCUMENT NO: 22-3860

STRUCTURE: Along Fisher Street

DATE RECEIVED IN LAB: December 13, 2022

Core Location	Length as Drilled (mm)	Core Diameter (mm)	Core Length (mm)	Length / Diameter (mm)	Correction Factor	Mass (grams)	Age at Break (days)	Date of Break	Type of Fracture	Comp. Strength as Calculated (MPa)	Comp. Strength as Corrected (MPa)
Core 1 - across house # 231 Oakwood Ave	160.00	94.00	145.00	1.54	0.96	2.4		16-Dec	3	59.1	56.9
Core 3 - across house # 196 Bartlet Ave	160.00	160.00	94.00	0.58	0.96	145.0		16-Dec	3	38.3	36.8
Core 4 - across house # 106 Morley Ave	160.00	94.00	147.00	1.56	0.96	2.4		16-Dec	3	52.3	50.5

Remarks:

The core samples were tested in dry condition in accordance with CSA A23.2-14C.

Reviewed by:



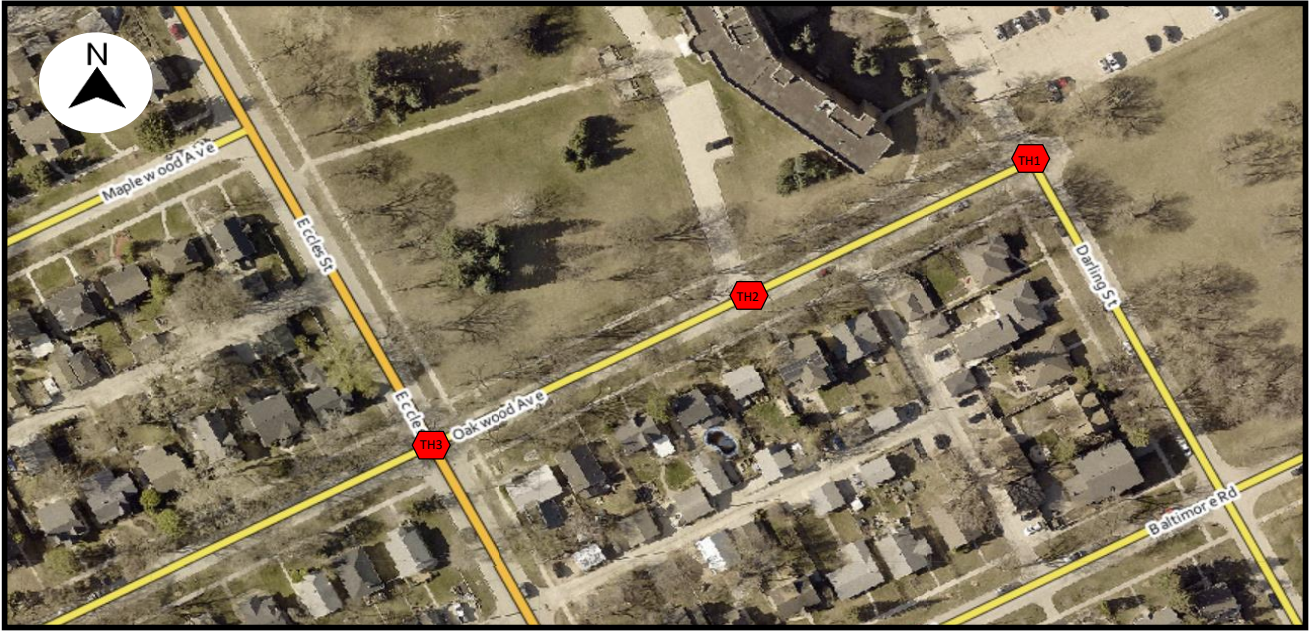
Edwin Timtiman
EIT

Approved by:



Paul Bevel, Manager
Field & Lab Testing Services

**Oakwood Avenue,
Eccles Street to
Darling Street**



OAKWOOD AVENUE - SUMMARY TABLE

TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH 1	Adjacent to 1 hour parking signpost approximately 1 meter from gutter. North side (slab)	-	160
TH 2	116 Oakwood Avenue. South side (Joint)	-	220
TH 3	Approximately 8 meters from Darling Street and 2.1 meters from gutter. North side (slab)	-	180



TH1 - Oakwood Ave, North side



TH 2 - 116 Oakwood Ave
(Joint) South side



TH3 - Oakwood Ave. 8 meters from Darling St.,
2.1 meters from gutter. North side slab

CONCRETE CORE COMPRESSIVE STRENGTH TEST REPORT (CSA A23.2-14C)

CLIENT:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	DATE:	December 16, 2022
ATTENTION:	Thomas Findlay	FILE NO:	112-2217
PROJECT:	23-R-04 2023 Residential Streets - Test Hole Investigation Oakwood Ave., Eccles to Darling Sts.	REPORT NO:	22-003
STRUCTURE:	Oakwood Ave., Eccles to Darling Sts.	TECHNOLOGIST:	E.S.
		DATE CORES TAKEN:	December 12, 2022
		DOCUMENT NO:	22-3878
		DATE RECEIVED IN LAB:	December 16, 2022

Core Location	Length as Drilled (mm)	Core Diameter (mm)	Core Length (mm)	Length / Diameter (mm)	Correction Factor	Mass (grams)	Age at Break (days)	Date of Break	Type of Fracture	Comp. Strength as Calculated (MPa)	Comp. Strength as Corrected (MPa)
Core 1 - Slab at northside	160.00	94.00	150.00	1.59	0.96	2.4		16-Dec	3	21.3	20.6
Core 3 - Slab at Northside (8m to Darling St, and .1m from gutter)	180.00	94.00	150.00	1.59	0.96	2.5		16-Dec	3	54.7	52.9

Remarks:

The core samples were tested in dry condition in accordance with CSA A23.2-14C.

Reviewed by:



 Edwin Timtiman
 EIT

Approved by:



 Paul Bevel, Manager
 Field & Lab Testing Services

**Baltimore Avenue,
Fisher Street to
Hay Street**



BALTIMORE AVENUE - SUMMARY TABLE

TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH 1	711 Fisher street, south side gutter	150	-
TH 2	249 Baltimore avenue. Center	85	-
TH 3	261 Baltimore avenue. North side, near gutter	60	-
TH 4	Intersection of Casey street and Baltimore avenue.	160	-
TH 5	286 Baltimore avenue. Center	110	-
TH 6	292 Baltimore avenue. South side	80	-
TH 7	297 Baltimore avenue, North side	100	-



TH1 - 711 Fisher st. South side Gutter



TH2 - 249 Baltimore Ave. (center)



TH3 - 261 Baltimore Ave. North side (near gutter)



TH4 - Intersection of Casey st & Baltimore Ave.



TH5 - 286 Baltimore Ave. (center)



TH6 - 292 Baltimore Ave. South side



TH7 - 297 Baltimore Ave. North side

**Warsaw Avenue,
Hugo Street to
Lilac Street**



WARSAW AVENUE - SUMMARY TABLE

TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH 1	670 Warsaw Avenue. South side	120	-
TH 2	679 Warsaw Avenue. North side	130	-
TH 3	707 Warsaw Avenue, east of Cockburn. (center)	130	-
TH 4	723 Warsaw Avenue. (center)	120	-
TH 5	729 Warsaw Avenue. North side	120	-
TH 6	768 Warsaw Avenue. (center)	90	-
TH 7	798 Warsaw Avenue. South side	90	-
TH 8	809 Warsaw Avenue. North side	100	-



TH1 - 670 Warsaw Ave, South Side



TH2 - 679 Warsaw Ave, North side







TH7 - 798 Warsaw Ave South side



TH8 - 809 Warsaw Ave. North side