

APPENDIX 'A'

GEOTECHNICAL REPORT

APPENDIX 'A' – 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 commence.

2021 to 2022 University Crescent Pavement Renewal Project

AECOM 60648764, 05-0049/City of Wpg File No. 21-C-02

Prepared for

Ryan Cunningham, P.Eng.
Senior Transportation Engineer
99 Commerce Dr, Winnipeg, MB R3P 0Y7

Date

March 29, 2021

HMCL Project Number: 112-2101

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Introduction

On February 11th, 2021, H. Manalo Consulting Ltd. (HMCL) received authorization from Mr. Ryan Cunningham, representing AECOM, to proceed with the scope of work as described in the email dated February 5th, 2021. The purpose of the work is to gather information about the existing subsurface soil conditions as well 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 February 18 and March 2, 2021. The test holes were augered using a truck mounted geotechnical test hole drill rig on March 1 and 2, 2021, 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 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.

The nine cores recovered at pavement transverse and longitudinal joints were used to help assess the condition of the concrete at the transverse and longitudinal joints. In general based

on what was observed at each location, the concrete condition at one or both sides of the joints was deteriorated. Retrieving a complete core was difficult at some locations with several attempts made. In some cases only the upper part of the slab was recovered as an intact or partially intact core and the lower section had to be chipped out to measure the slab thickness.

Closure

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

Fieldwork completed by:

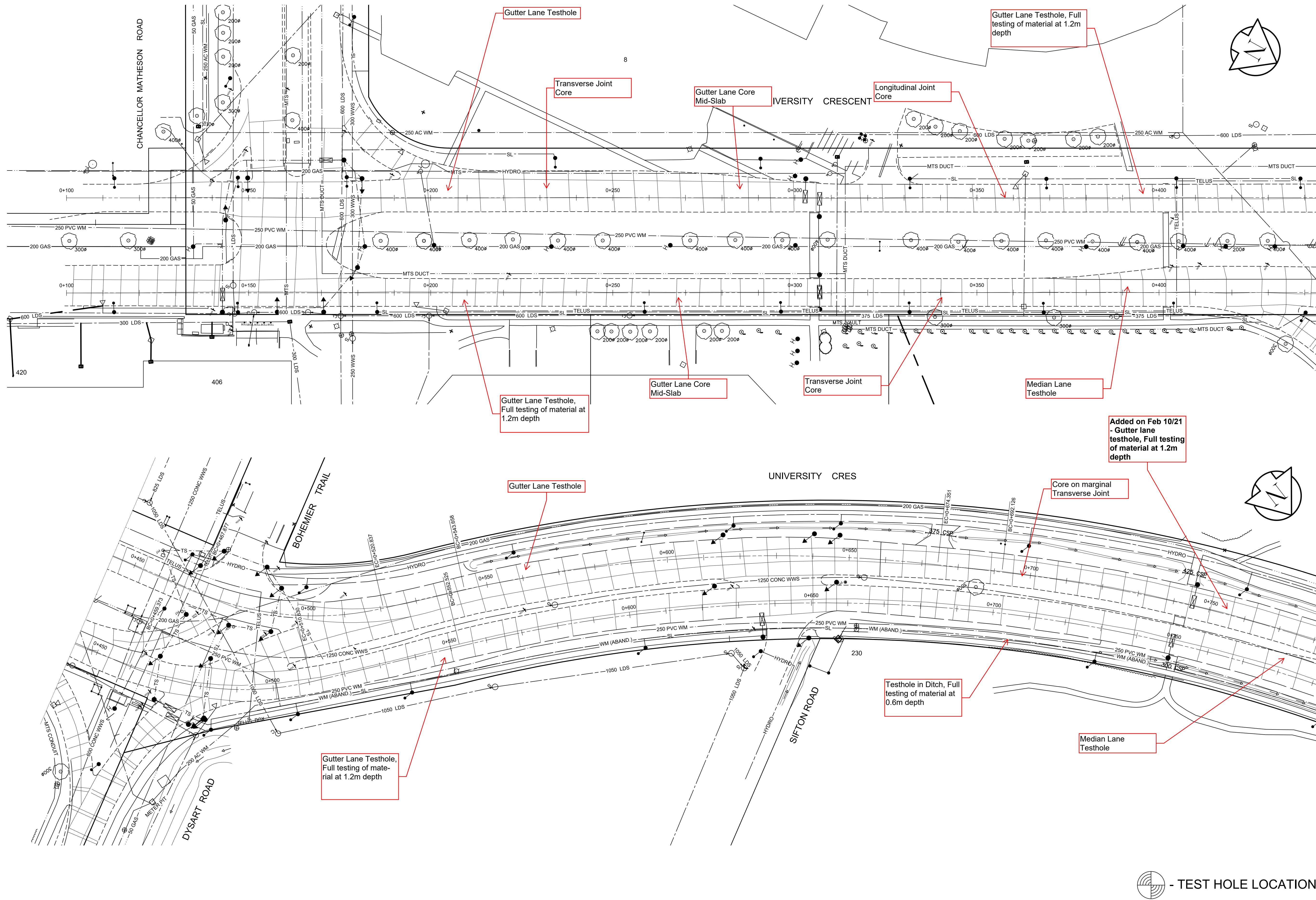


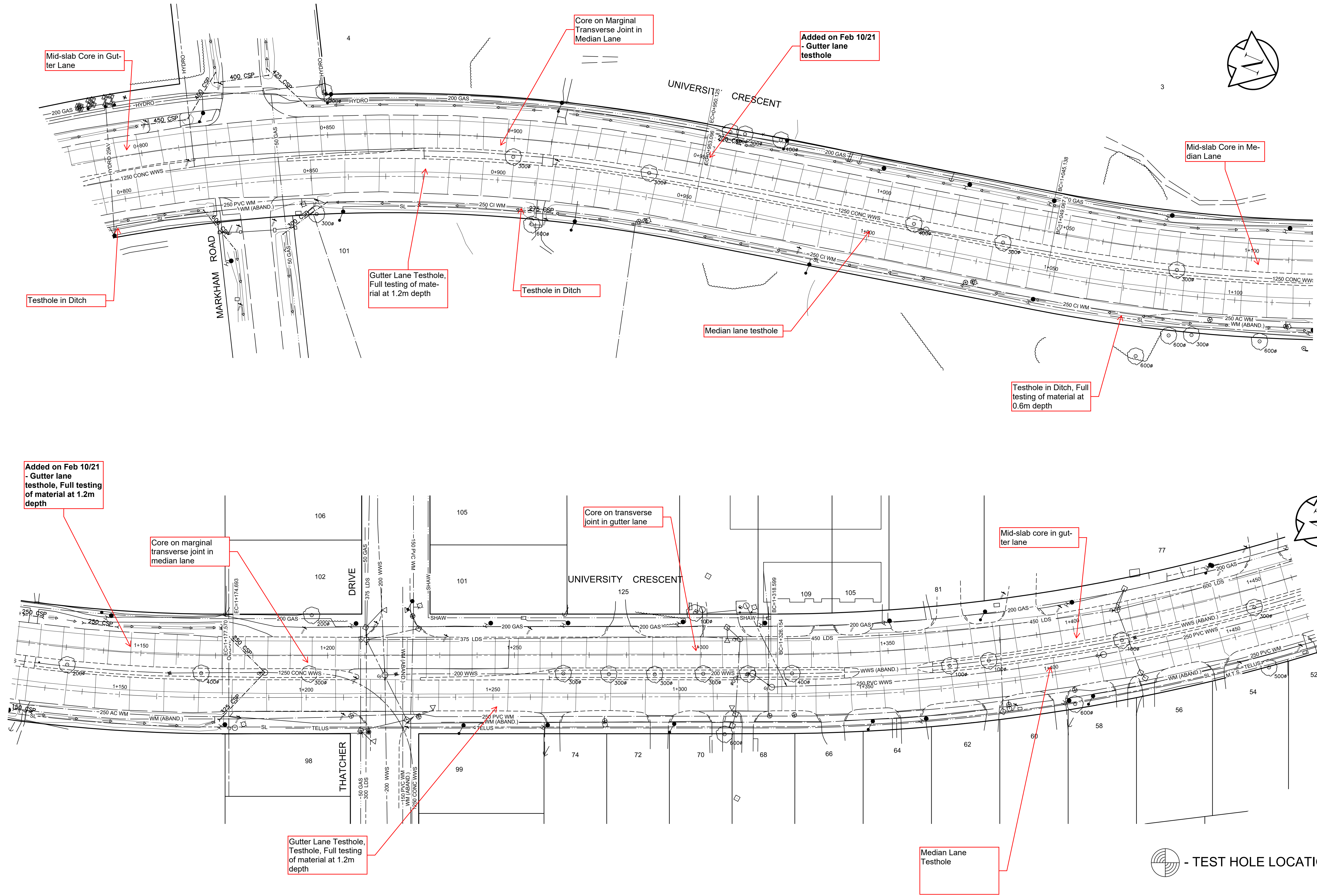
Edwin Timtiman, EIT
Materials Technologist

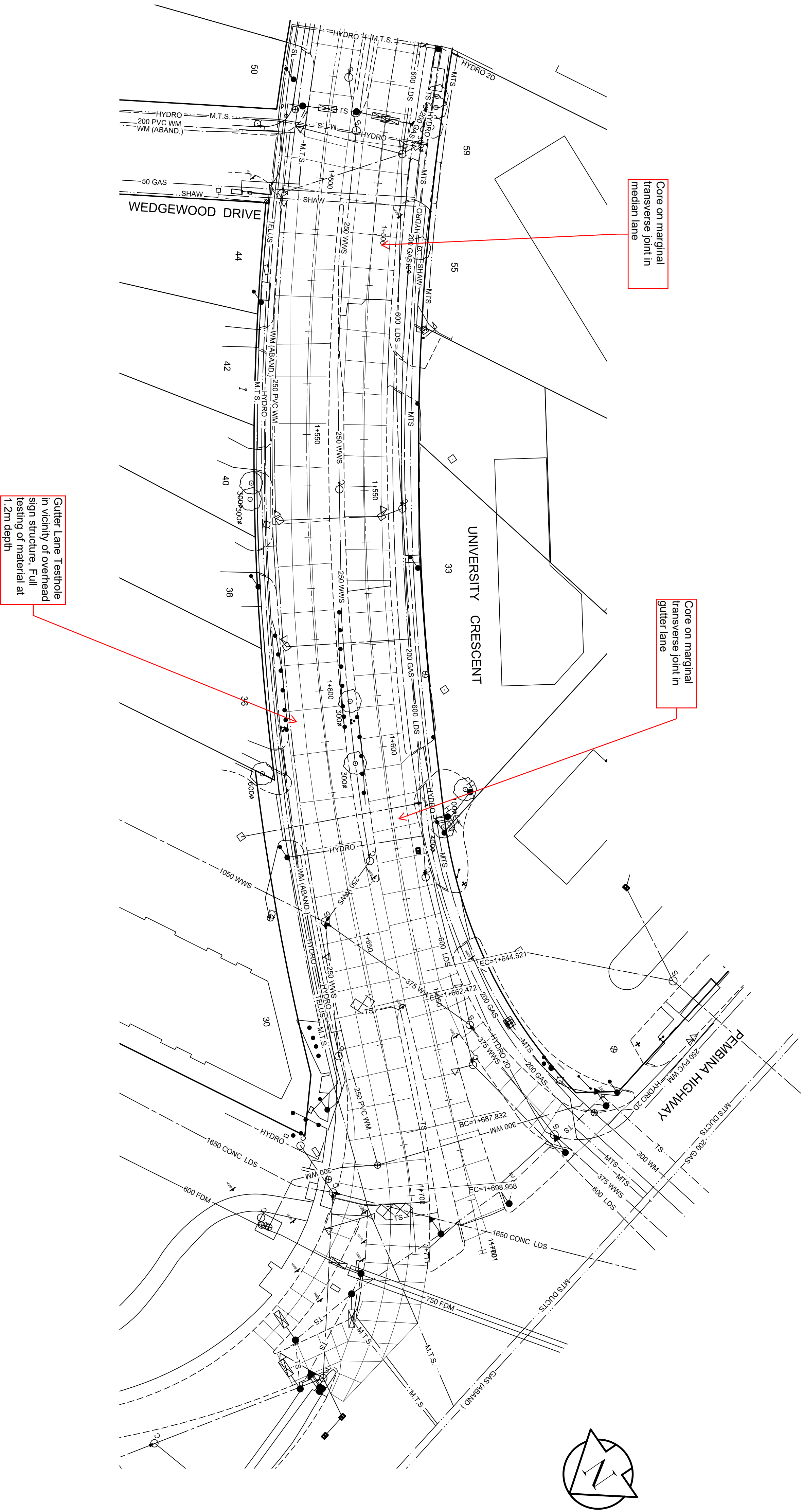
Reviewed by:



Paul Bevel
Manager, Field and Laboratory Services







CONCRETE CORE COMPRESSIVE STRENGTH TEST REPORT (CSA A23.2-14C)CLIENT: AECOM
99 Commerce Drive, Winnipeg
MB R3P 0Y7

ATTENTION: Ryan Cunningham

PROJECT: 2021-2022 University Crescent Pavement Renewals
University Crescent from Chancellor Matheson Road to Pembina Highway

STRUCTURE: N/P

DATE: February 21, 2021

FILE NO: 112-2101

REPORT NO: 21-001

TECHNOLOGIST: I.A.

DATE CORES TAKEN: February 18, 2021

DOCUMENT NO: HM-014

DATE RECEIVED IN LAB: February 18, 2021

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 C1, STA 1+400 SB. GUTTER LANE	141.16	69.64	136.47	1.96	1.00	1191.7		21-Feb	1	23.2	23.2
Core C2, STA 1+100 SB. MEDIAN LANE	199.85	69.64	139.00	1.99	1.00	1218.8		21-Feb	1	38.0	38.0
Core C3, STA 0+795 SB. GUTTER LANE	213.31	97.92	194.29	1.98	1.00	3381.1		23-Feb	1	27.8	27.8
Core C4, STA 0+285 SB. GUTTER LANE	198.40	97.92	180.00	1.83	1.00	3240.0		23-Feb	1	20.6	20.6
Core C5, STA 0+268 NB. GUTTER LANE	185.34	97.92	166.80	1.70	1.00	2926.8		23-Feb	1	22.3	22.3

Remarks:

Tested in accordance with CSA A23.2-14C, Wet condition

Reviewed by:

Irvin Araquil
Senior Technologist

Approved by:

Hermie Manalo
Principal

COMPRESSIVE STRENGTH CORES







South bound transverse joint cores



South bound transverse joint, Sta. 1+560



South bound transverse joint, Sta. 1+515



South bound transverse joint, Sta. 1+300



South bound transverse joint, Sta. 1+200



South bound transverse joint, Sta. 0+896



South bound transverse joint, Sta. 0+700



South bound longitudinal joint, Sta. 0+357



South bound transvers joint, Sta. 0+233. Could not extract concrete core due to crumbling



North bound transverse joint, Sta. 1+200

TEST HOLE PAVEMENT CORES



TH 1, south bound Sta. 1+150



TH 2, south bound Sta. 0+950



TH 3, south bound Sta. 0+756



TH 4, south bound Sta. 0+561



TH 5, south bound Sta. 0+395



TH 6, south bound Sta. 0+205



TH 7, north bound Sta. 0+210



TH 8, north bound Sta. 0+383



TH 9, north bound Sta. 0+547



TH 10, north bound Sta. 0+780



TH 11, north bound Sta. 0+870



TH 12, north bound Sta. 1+000, lower part of concrete core could not be recovered



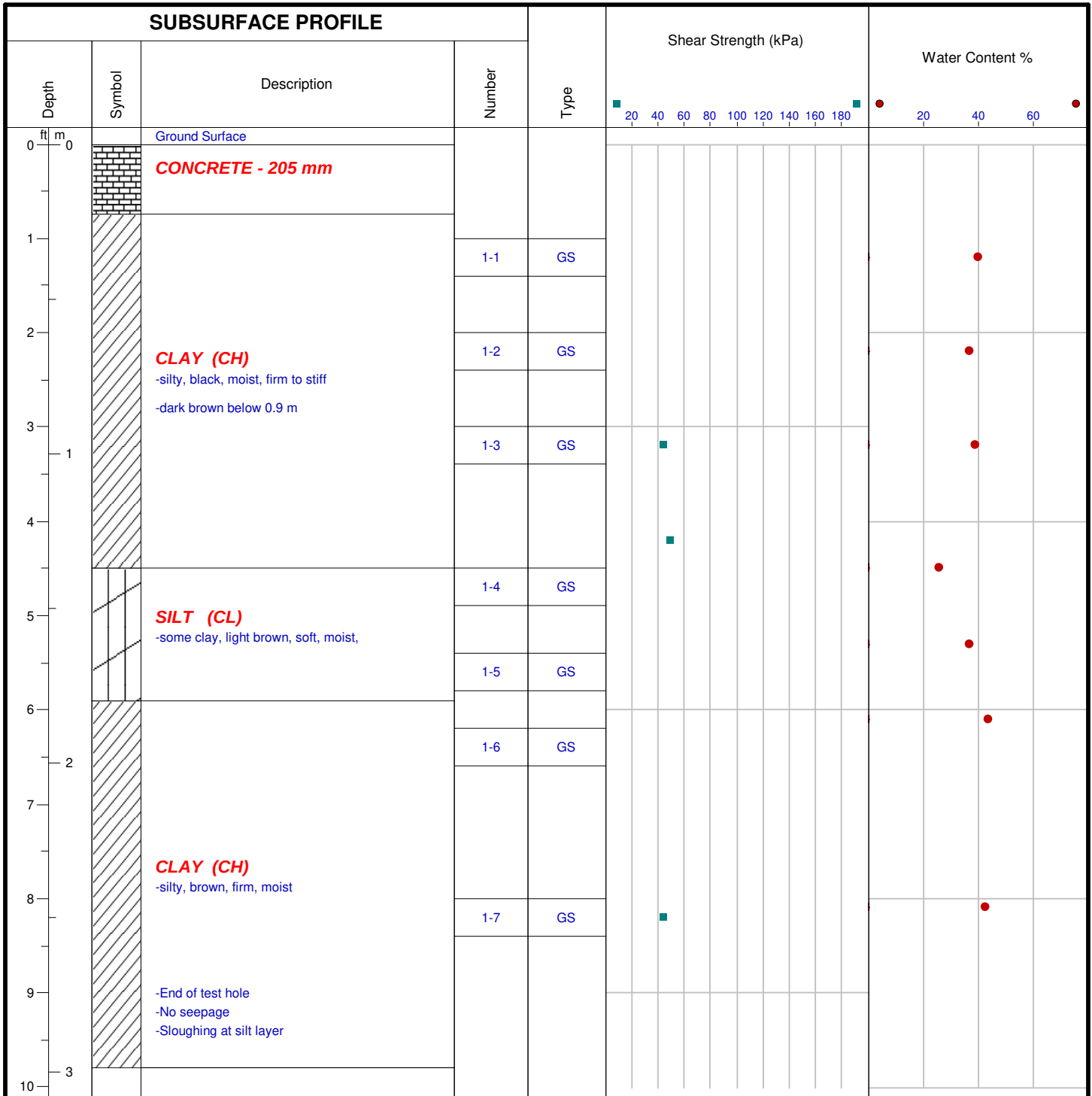
TH 13, north bound Sta. 1+250, concrete could not be recovered



TH 14, north bound Sta. 1+400



TH 15, north bound Sta. 1+605



Drill Method: Auger

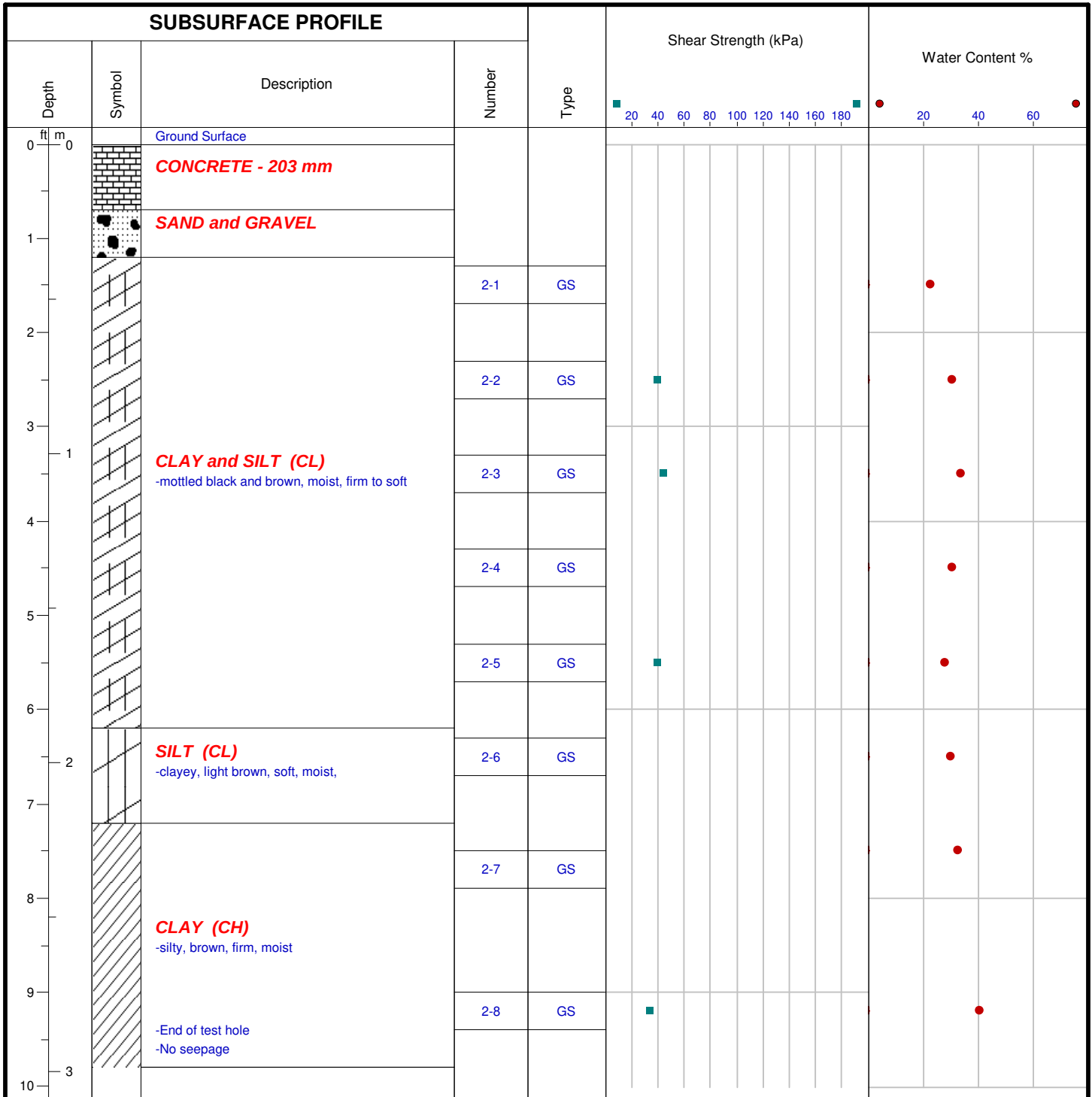
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Hole Size: 5 inch

Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

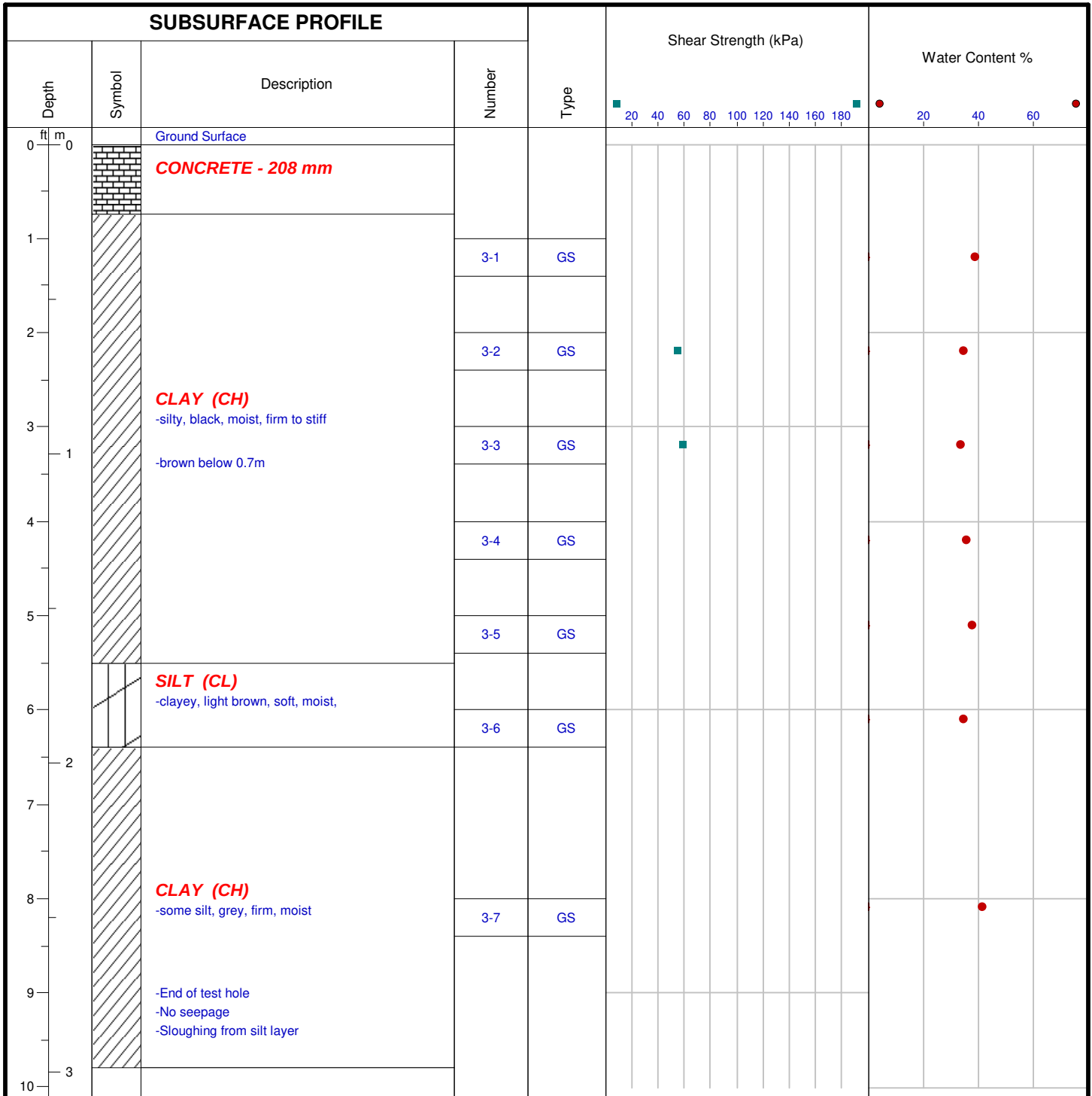
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Sheet: 1 of 1



Drill Method: Auger

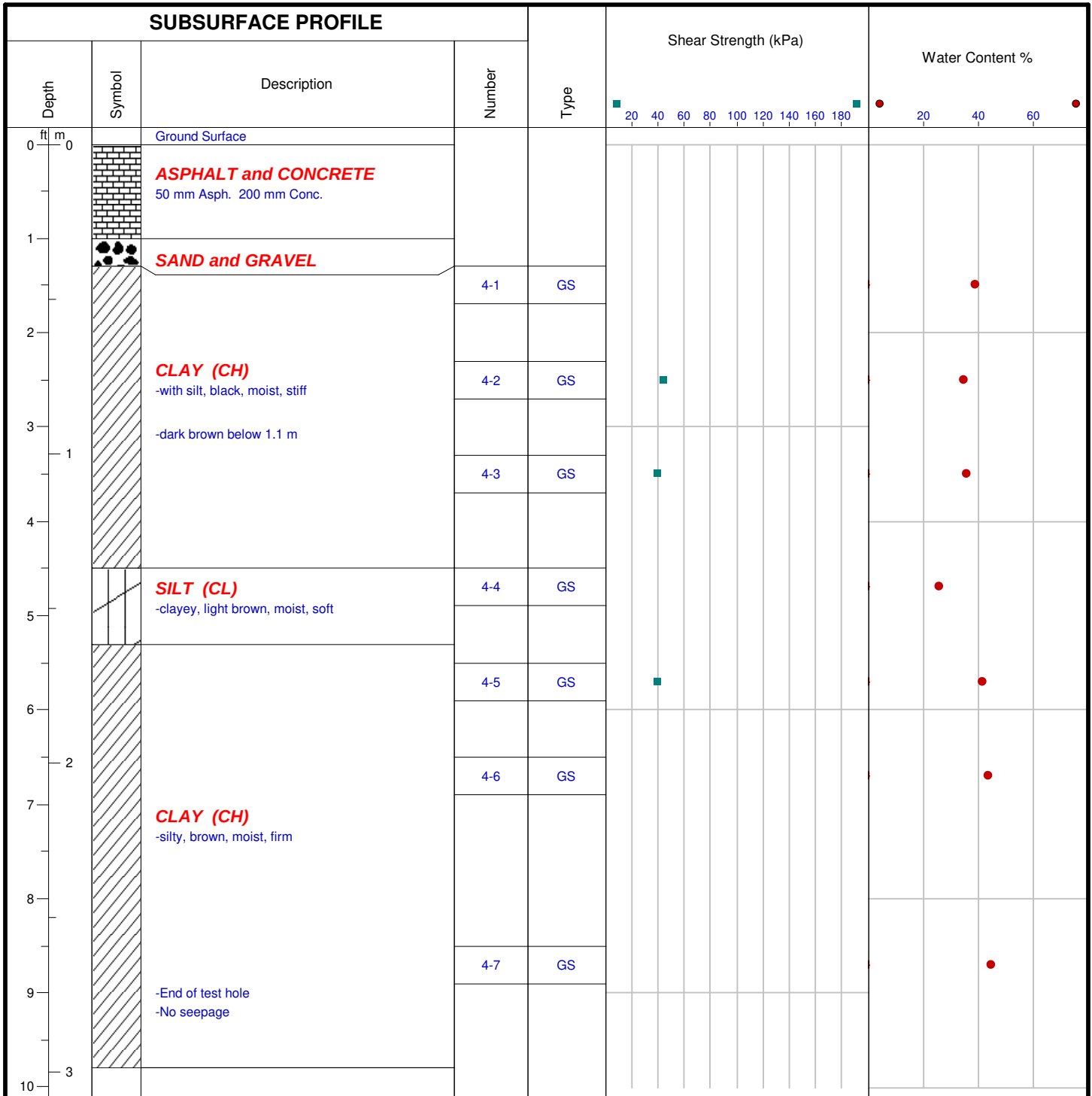
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Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

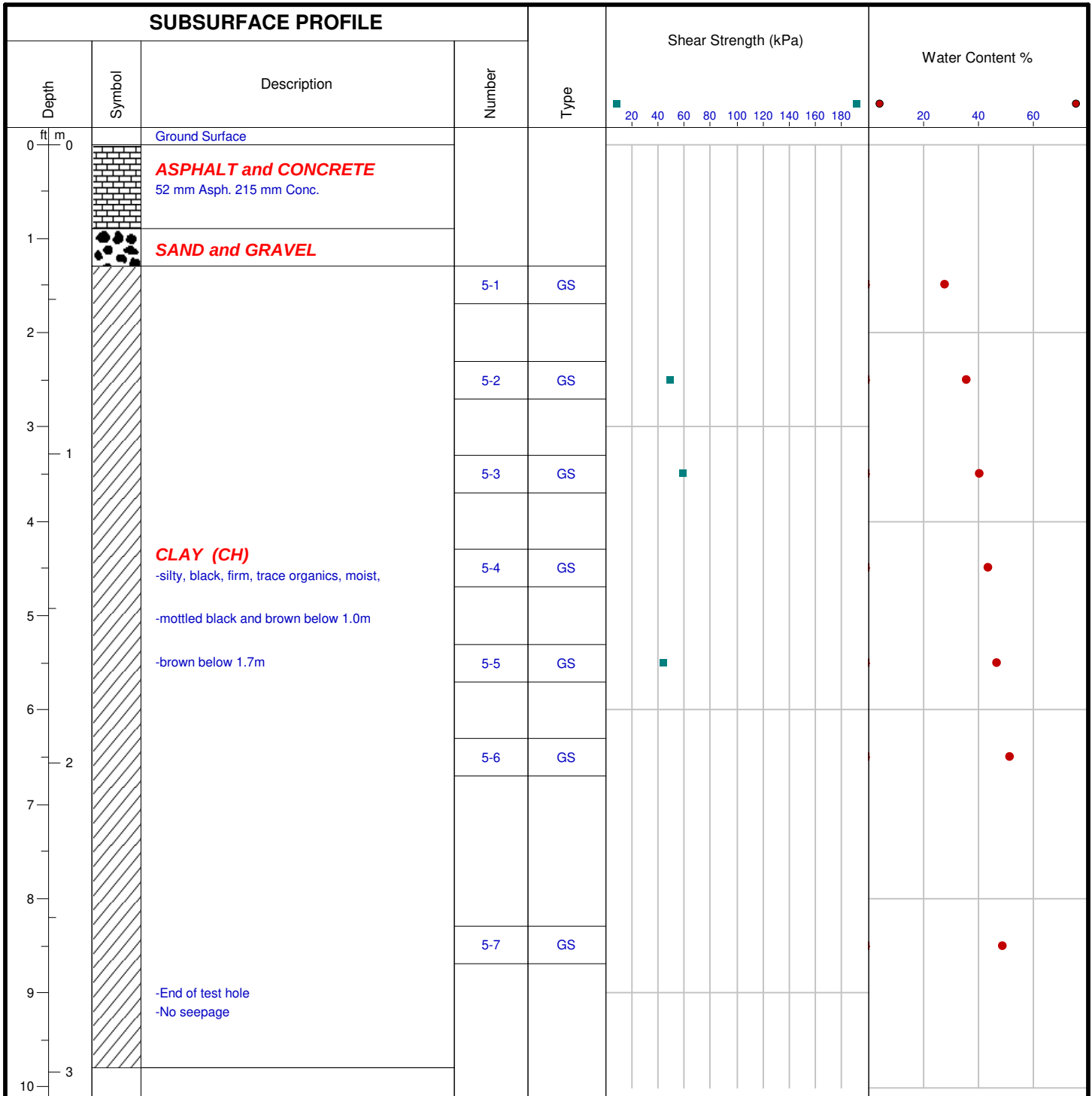
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Drill Method: Auger

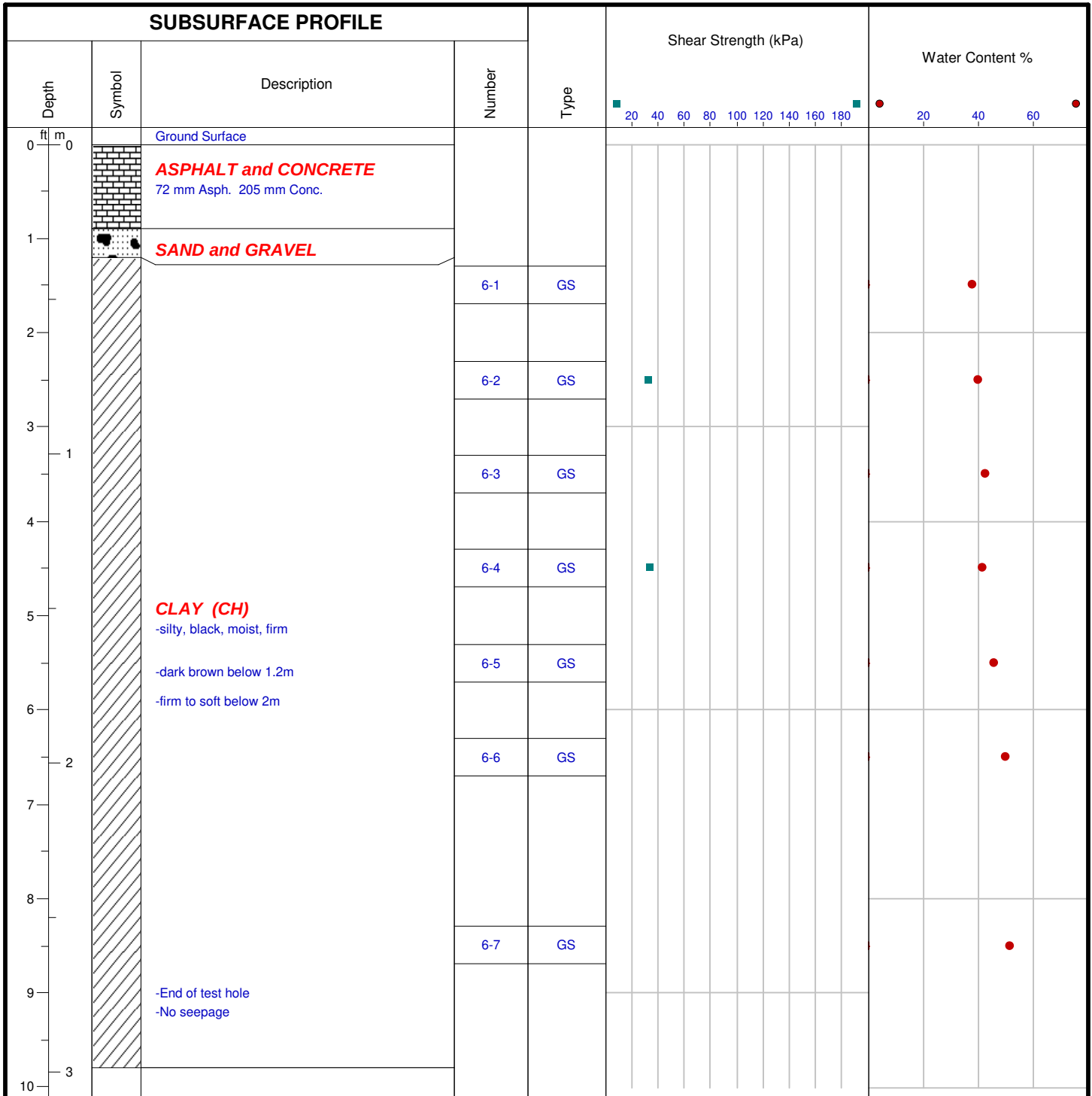
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Sheet: 1 of 1



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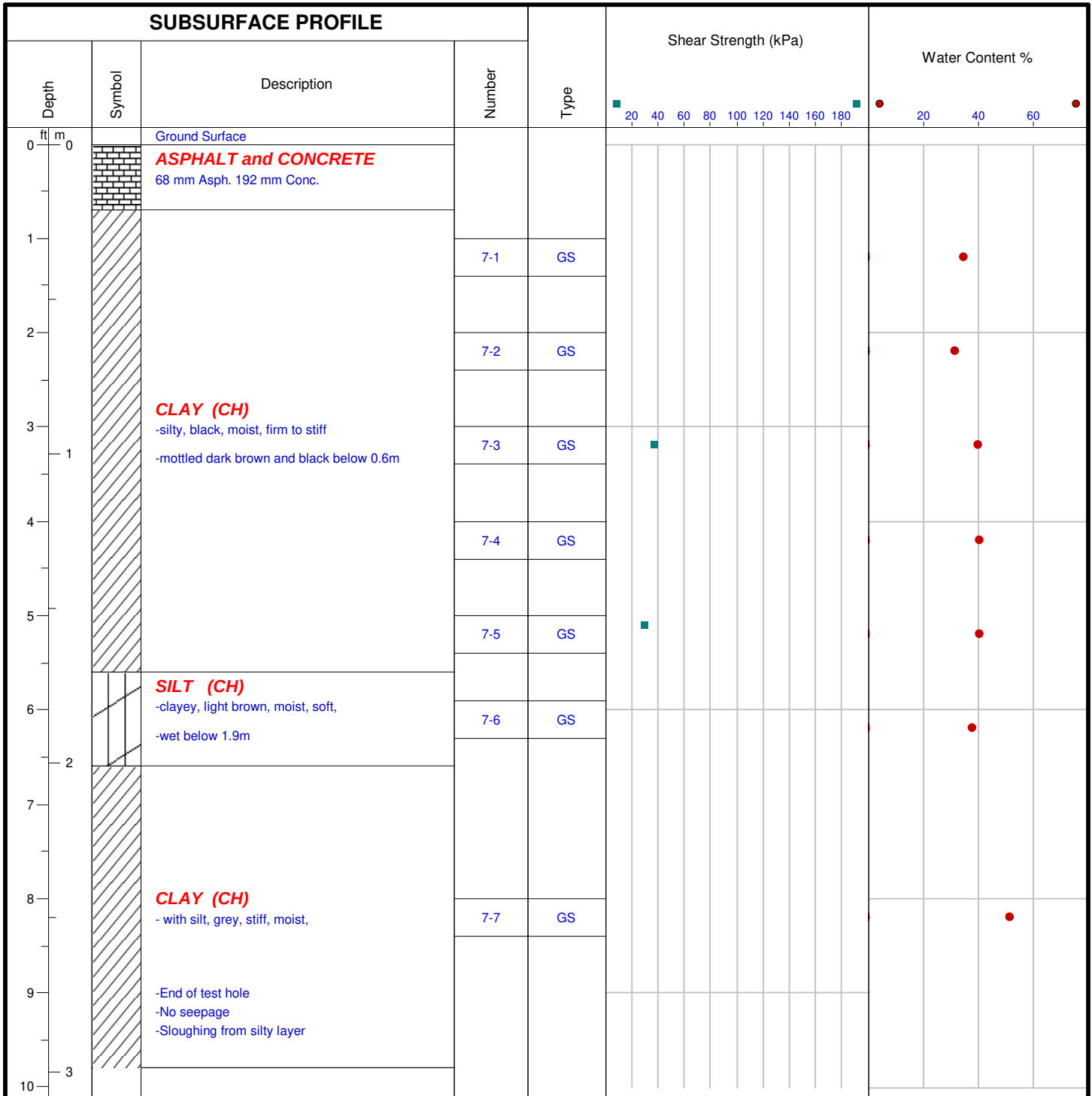
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Datum:

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Sheet: 1 of 1



Drill Method: Auger

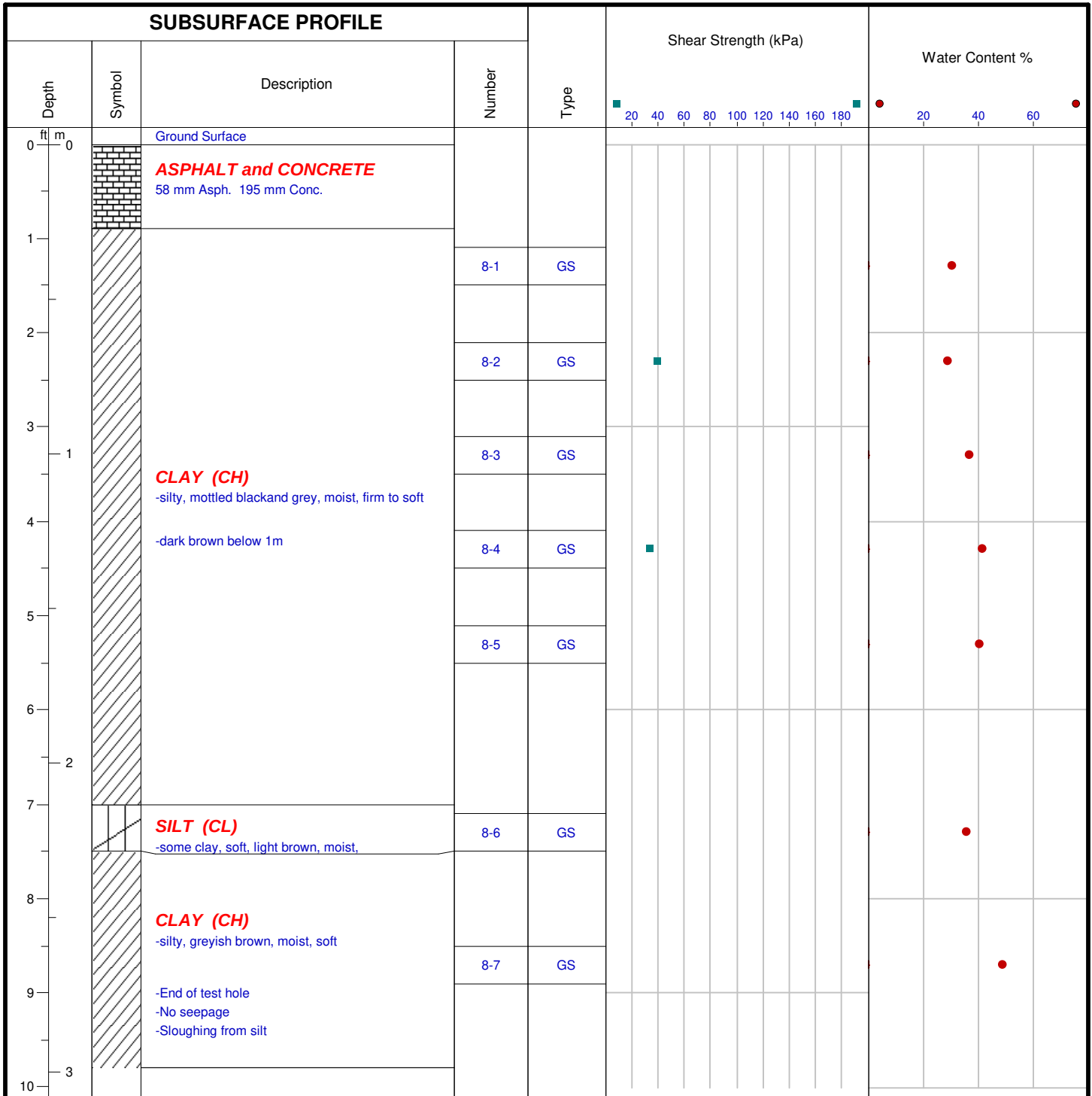
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Datum:

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Sheet: 1 of 1



Drill Method: Auger

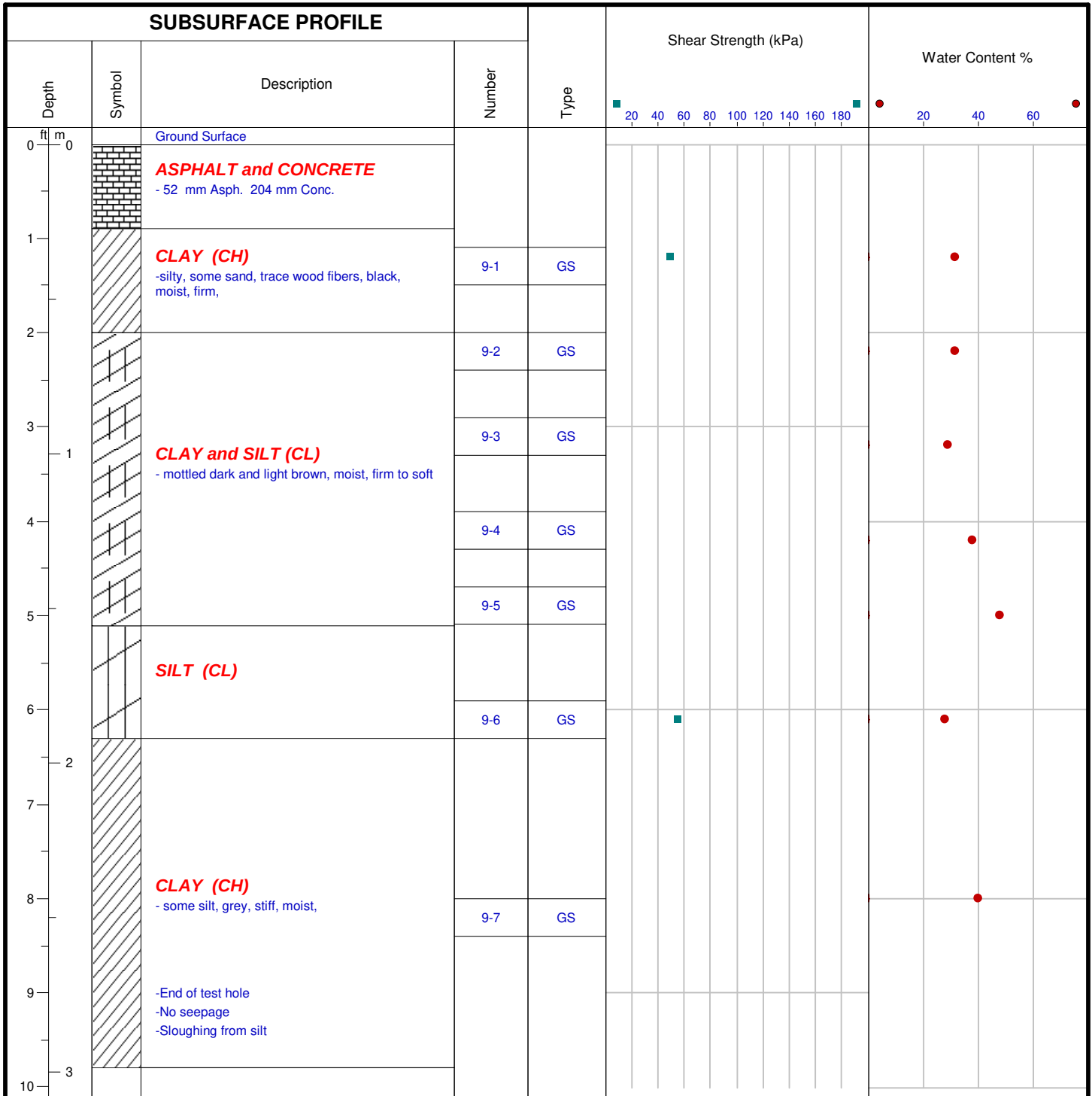
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Hole Size: 5 inch

Datum:

Checked by: PB

Sheet: 1 of 1



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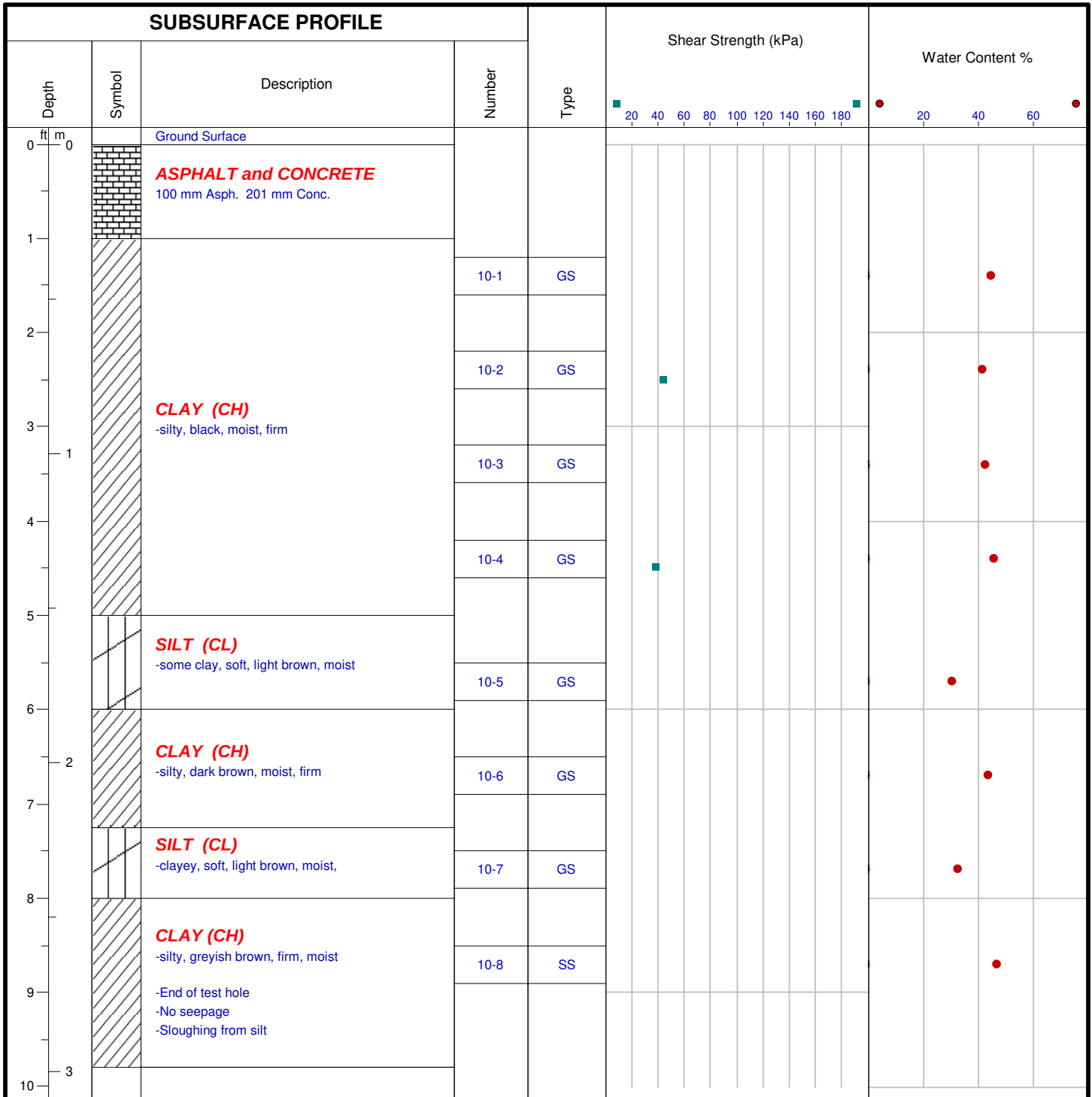
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Datum:

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Sheet: 1 of 1



Drill Method: Auger

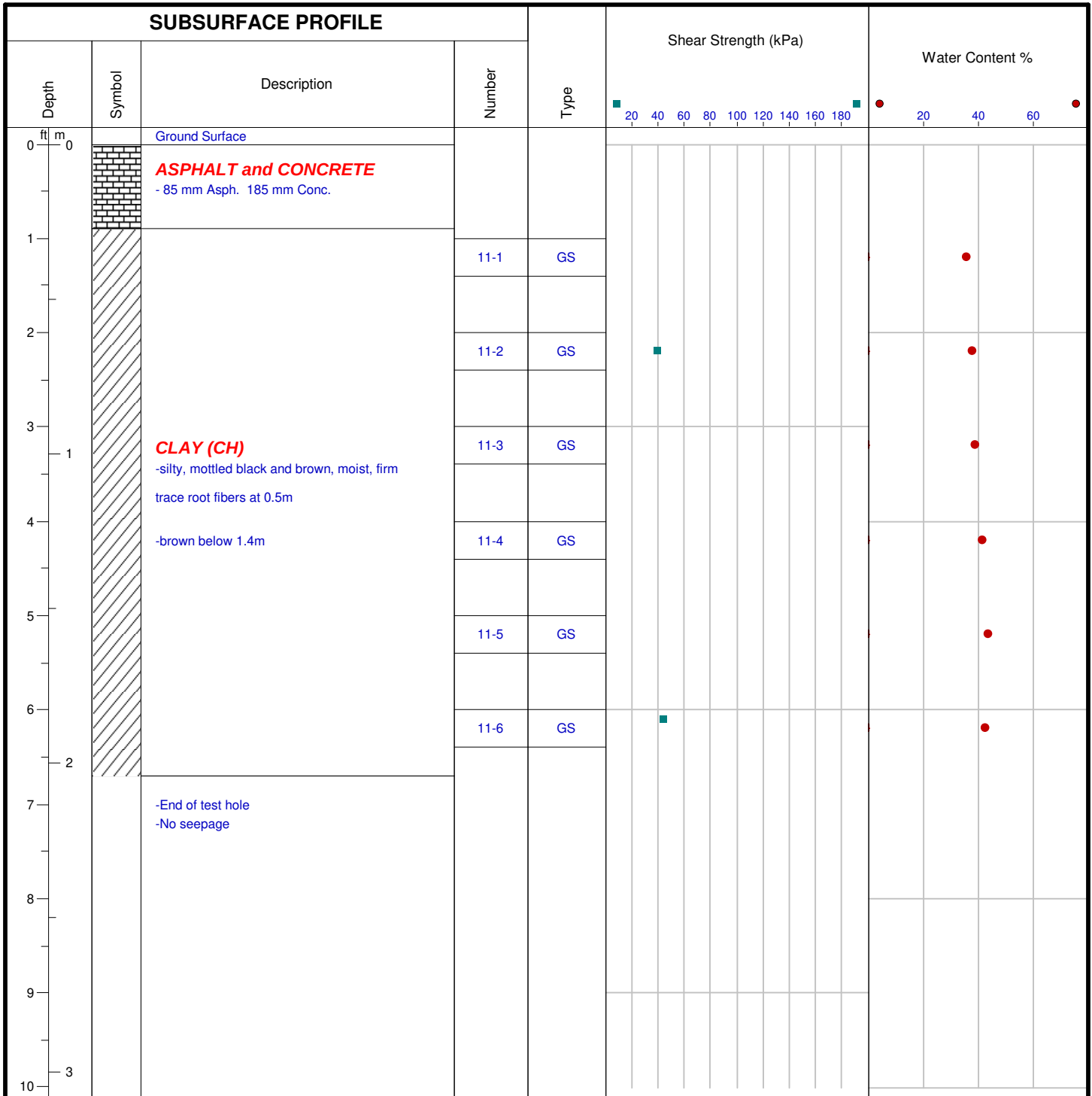
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Datum:

Checked by: PB

Sheet: 1 of 1



Drill Method: Auger

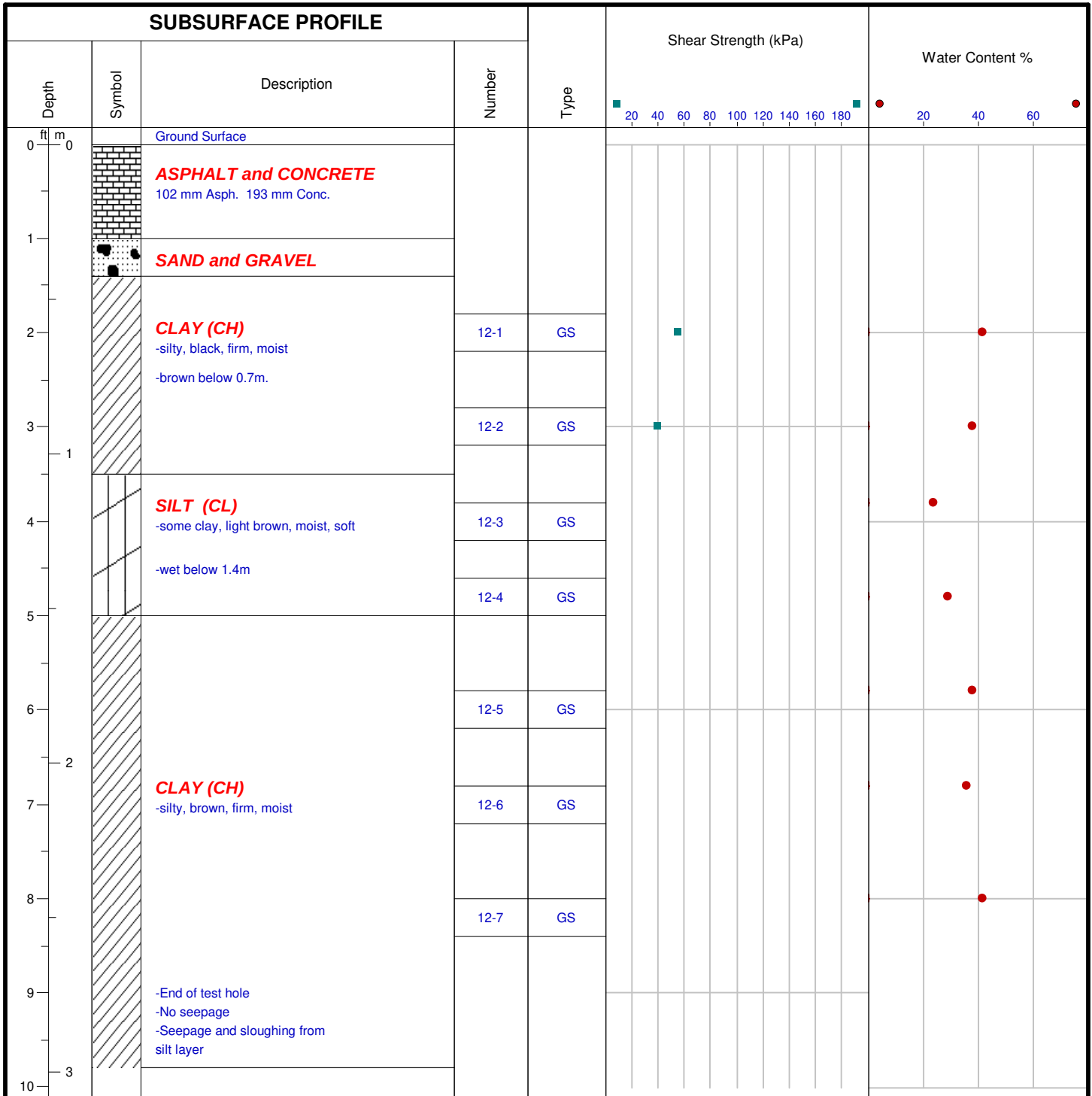
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Sheet: 1 of 1



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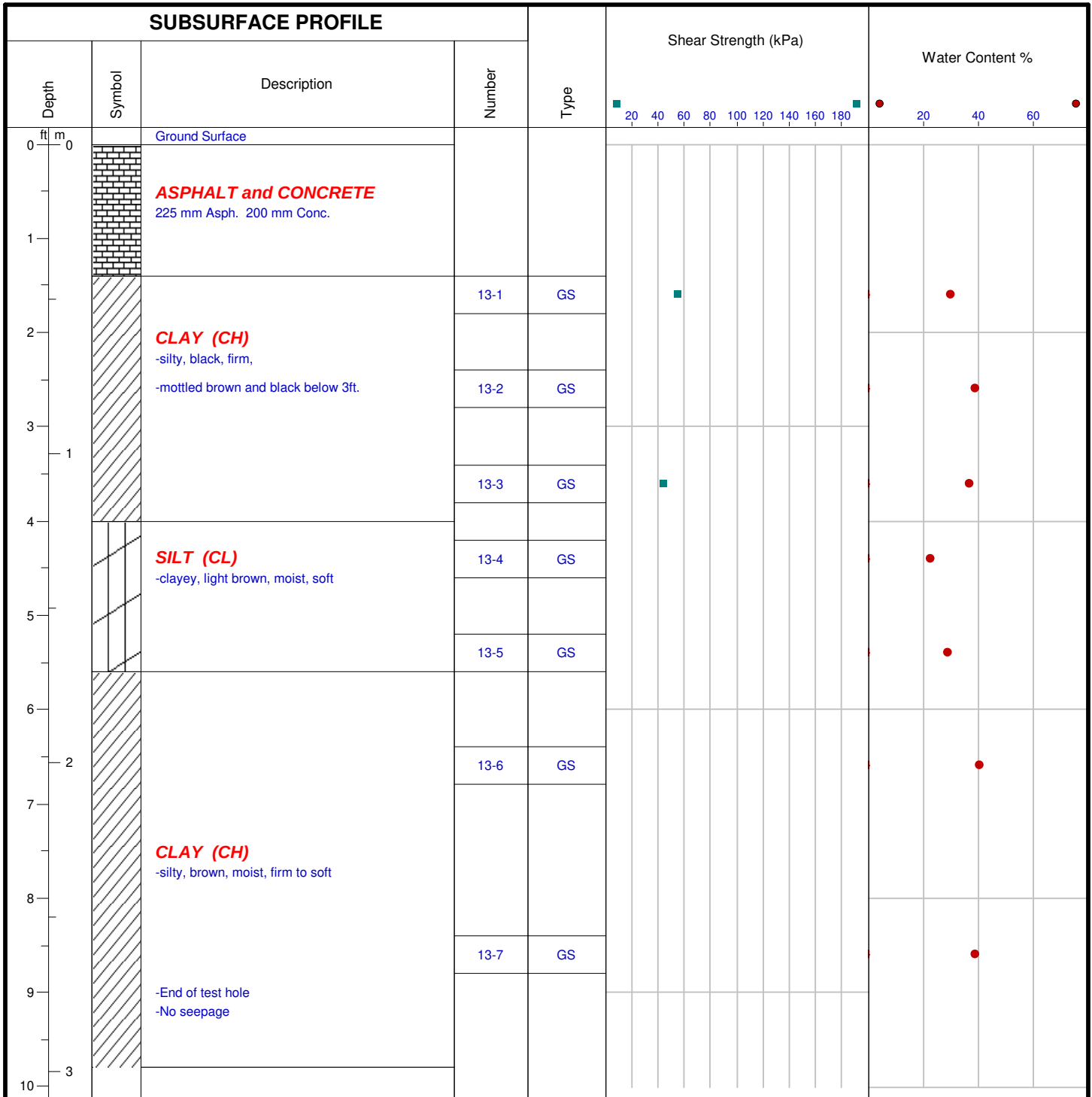
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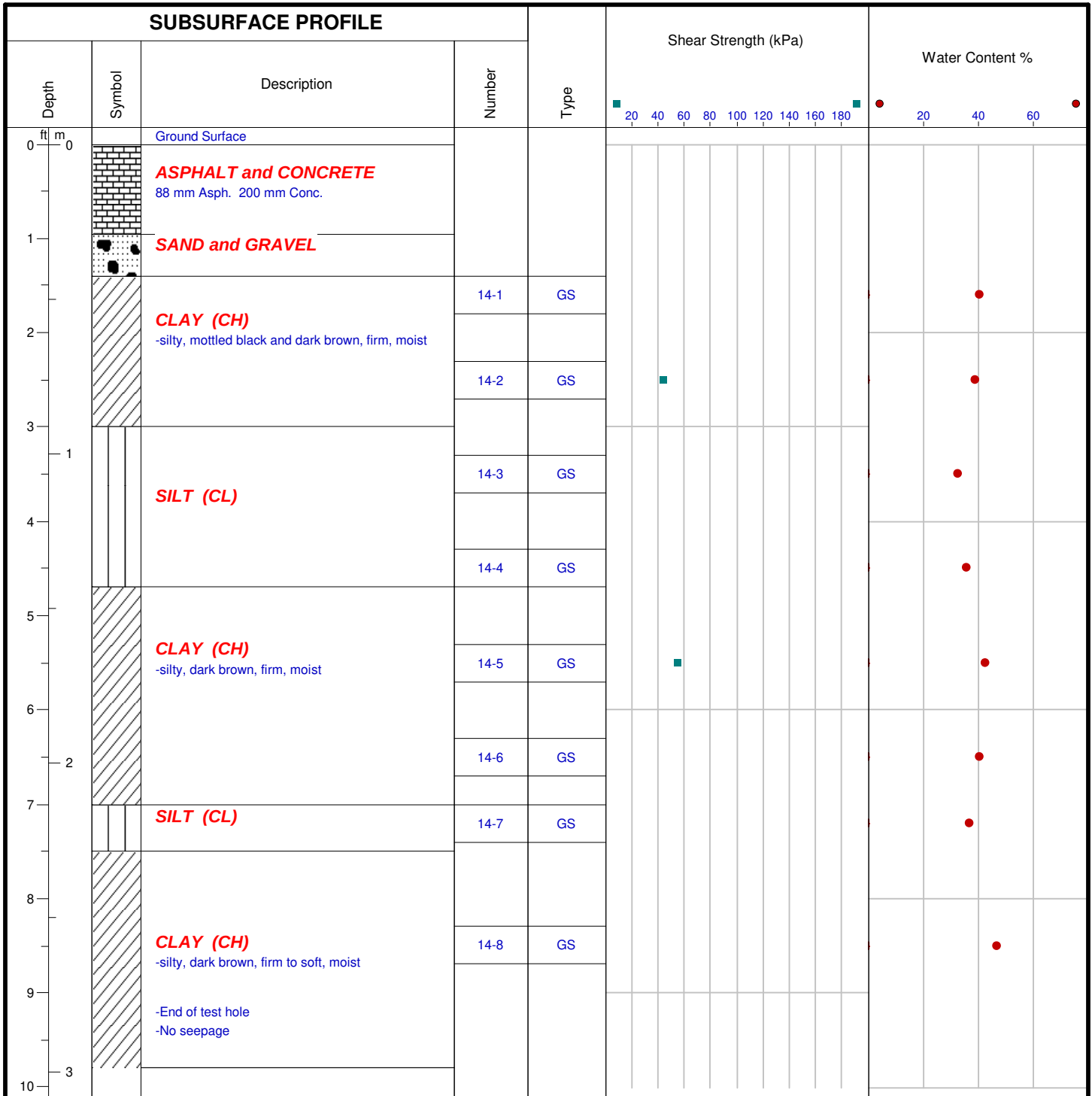
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Sheet: 1 of 1



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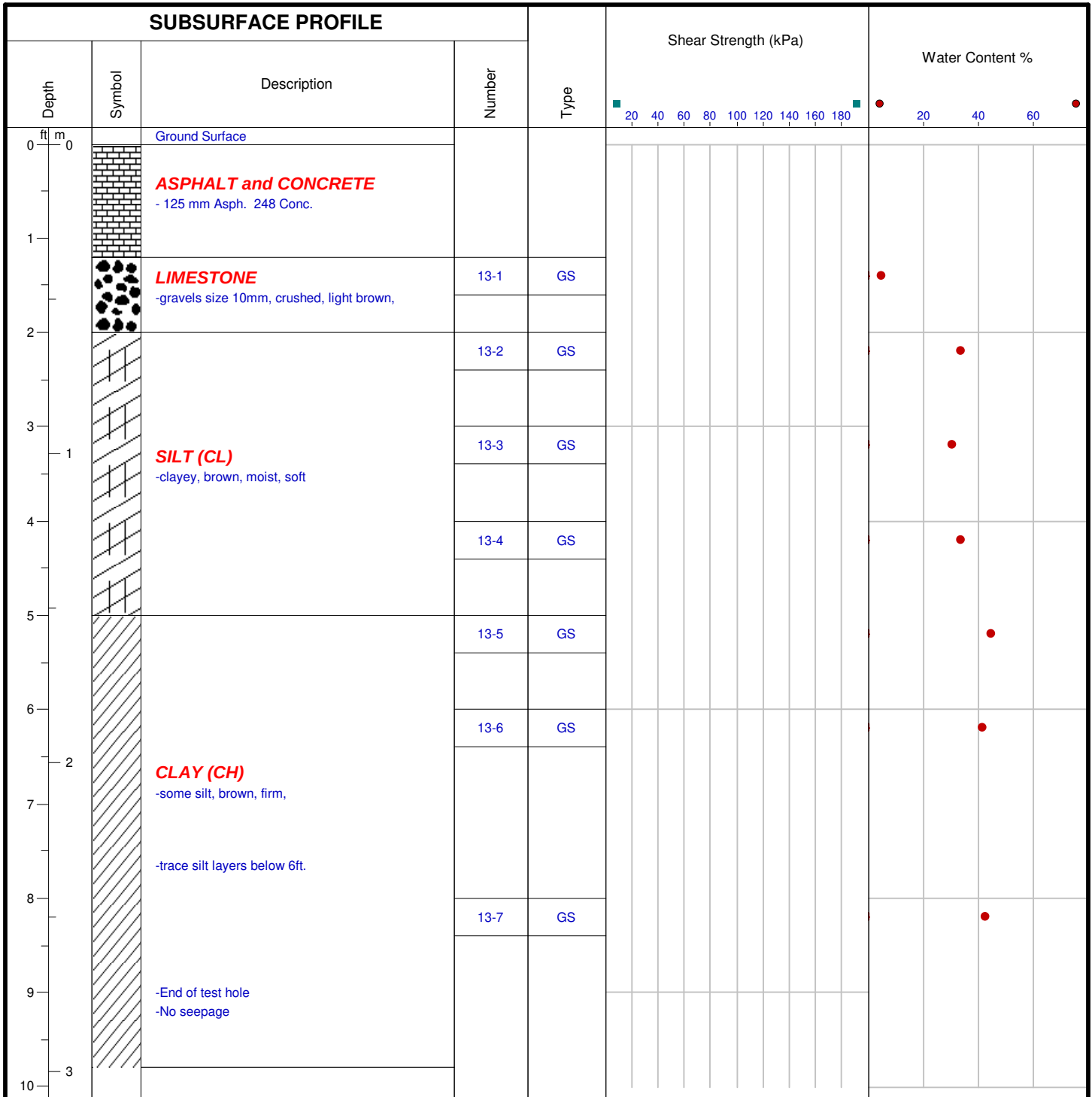
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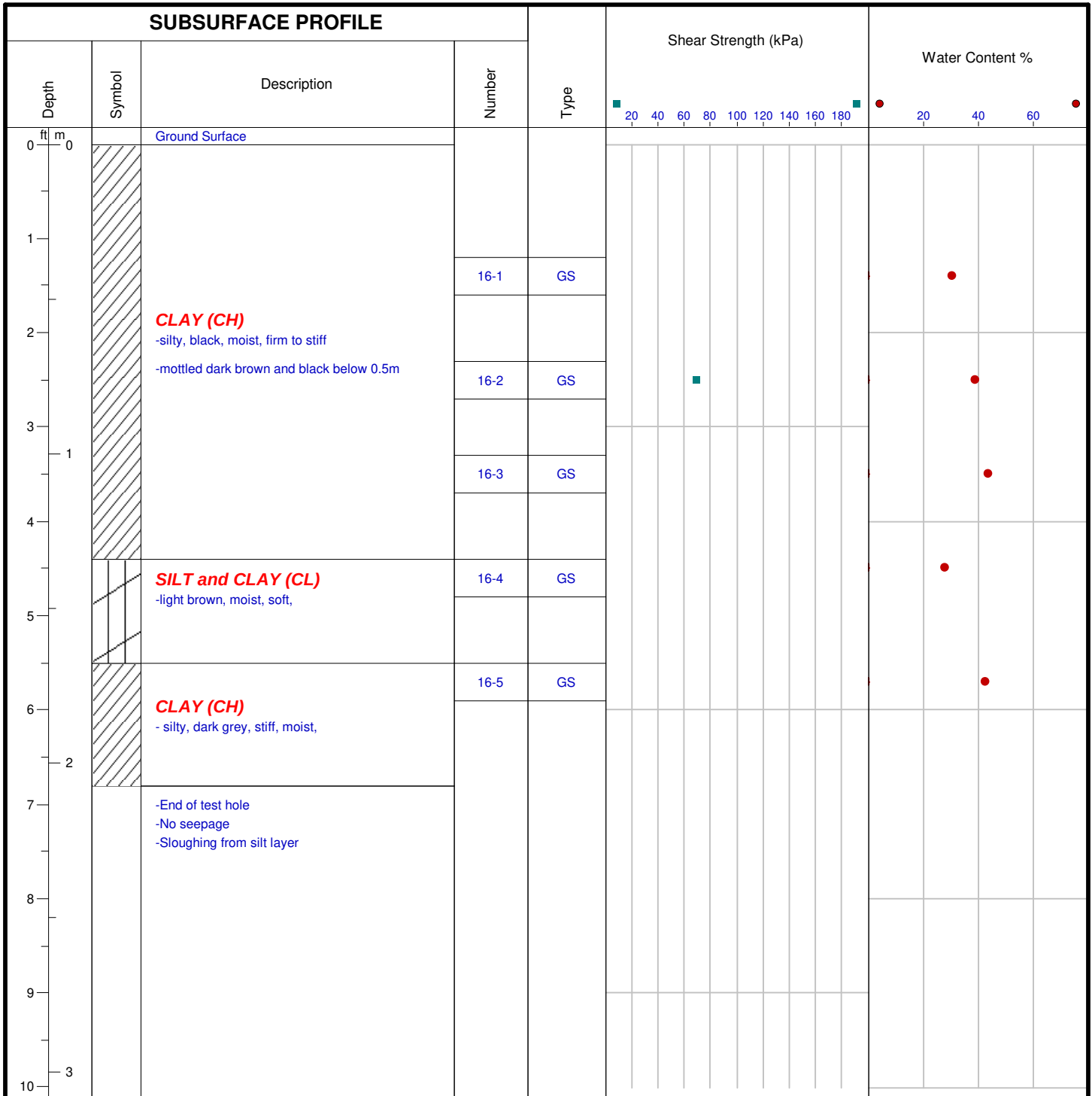
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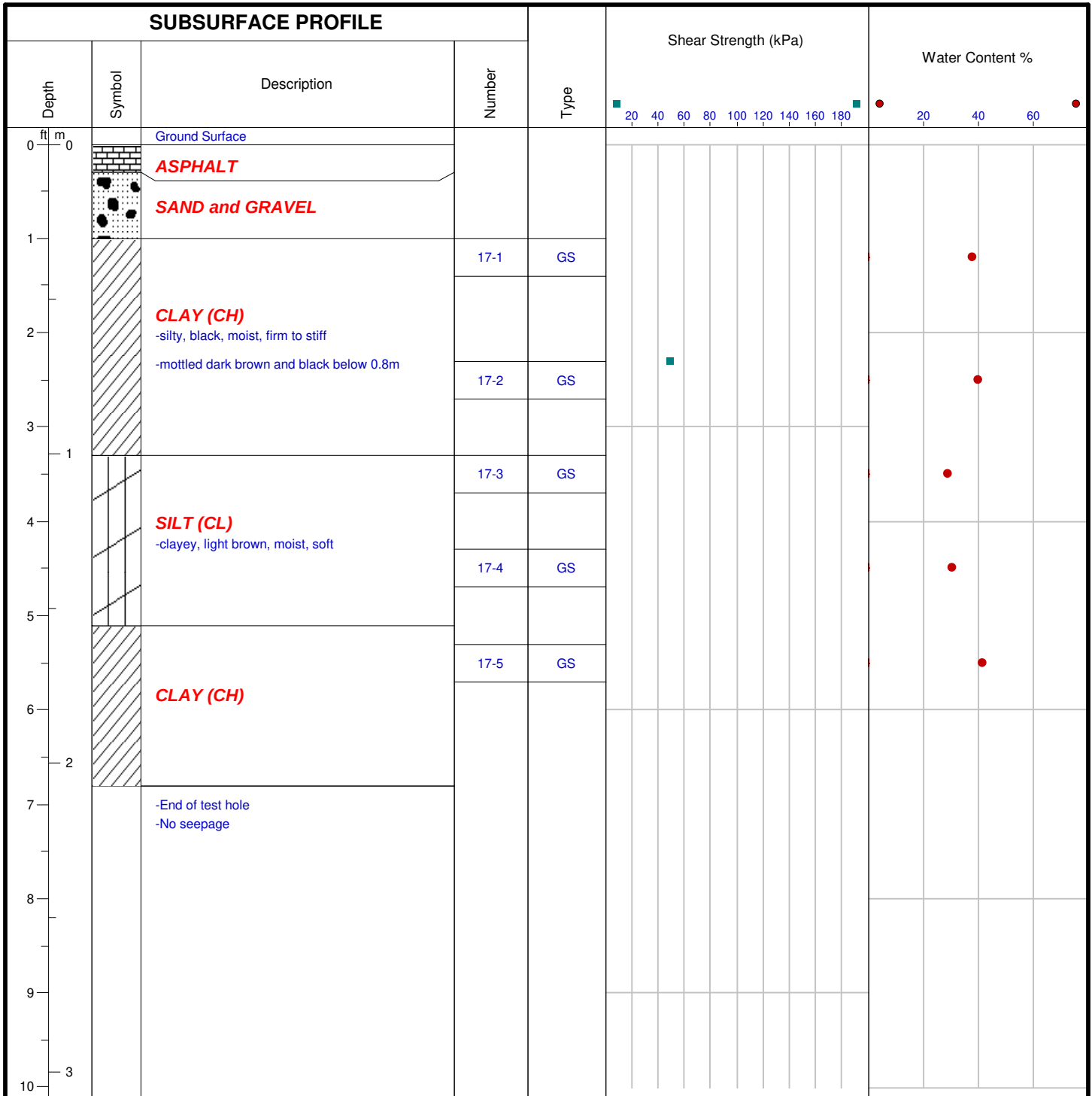
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Drill Method: Auger

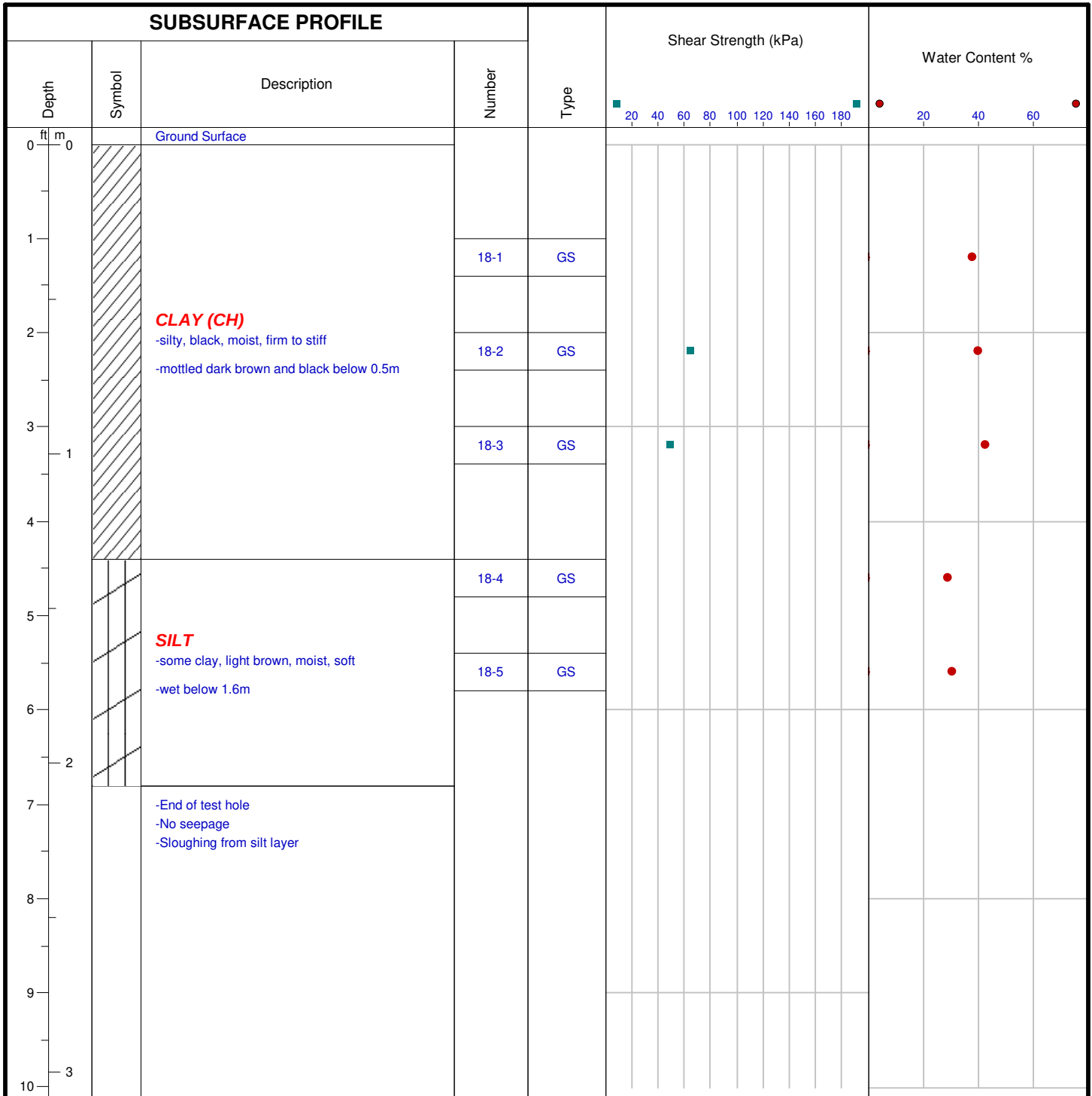
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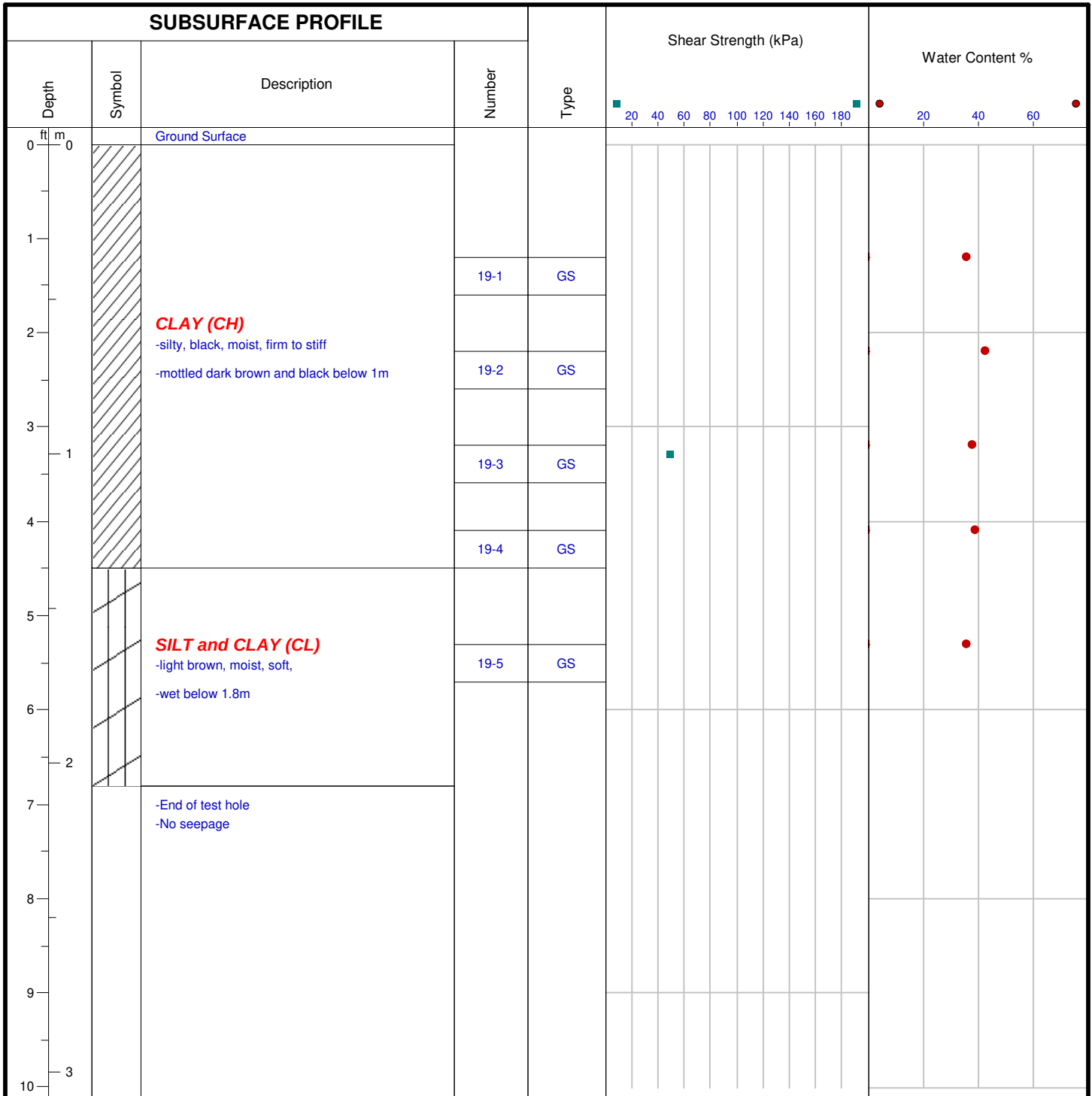
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Hole Size: 5 inch

Datum:

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Sheet: 1 of 1



Drill Method: Auger

Drill Date: Mar 2, 2021

Hole Size: 5 inch

Datum:

Checked by: PB

Sheet: 1 of 1

SUMMARY OF LAB TEST DATA

Test Hole Number	Material Zone		CBR At 95%	Grain Size				Atterberg Limits		
	Start Depth (m)	End Depth (m)		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	LL	PL	PI
TH 1	0.5	1.4	3.9	0	3	32	65	65	26	39
TH 3	0.5	1.6	4.1	0	2	30	68	69	29	41
TH 5	0.5	1.6	2.8	0	1	33	66	66	28	38
TH 7	0.5	1.6	3.8	0	2	27	71	78	31	47
TH 9	0.6	1.5	1.8	0	5	38	57	55	23	32
TH 11	0.5	1.6	3.1	0	2	35	63	67	26	41
TH 13	0.6	1.5	2.0	0	3	43	54	57	20	37
TH 15	0.3	1.5	1.6	0	8	59	33	38	13	26
TH 16	0.3	1.4	4.4	0	5	35	60	74	29	45
TH 19	0.3	1.2	3.3	0	6	37	57	71	28	43

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: Aecom	TEST NO: 1		PROJECT NO: 112-2101		
PROJECT: University Crescent	DATE SAMPLED: Mar 1 & 2		SAMPLED BY: ET		
PROJECT CONTACT: Ryan Cunningham	DATE TESTED: Mar 03, 2021		TESTED BY: GM/EI		
Test Hole No.	1	1	1	1	1
ID	1-1	1-2	1-3	1-4	1-5
Tare No.					
Wt Wet Sample + Tare	181.1	217.8	200.9	265.9	190
Wt Dry Sample + Tare	132.3	160	145.7	211.2	139.7
Wt Water	48.8	57.8	55.2	54.7	50.3
Wt Tare	4.9	4.3	4.6	4.2	4.5
Wt Dry Sample	127.4	155.7	141.1	207.0	135.2
Moisture Content (%)	38.3	37.1	39.1	26.4	37.2
Test Hole No.	1	1	2	2	2
ID	1-6	1-7	2-1	2-2	2-3
Tare No.					
Wt Wet Sample + Tare	179.1	253.6	157	188	211.7
Wt Dry Sample + Tare	126.2	178.3	128.5	144.2	159.7
Wt Water	52.9	75.3	28.5	43.8	52.0
Wt Tare	4.8	4.2	4.3	4.4	4.7
Wt Dry Sample	121.4	174.1	124.2	139.8	155.0
Moisture Content (%)	43.6	43.3	22.9	31.3	33.5
Test Hole No.	2	2	2	2	2
ID	2-4	2-5	2-6	2-7	2-8
Tare No.					
Wt Wet Sample + Tare	188	208.7	271.3	216.7	228.6
Wt Dry Sample + Tare	144.2	164.8	210.2	164	163.8
Wt Water	43.8	43.9	61.1	52.7	64.8
Wt Tare	4.3	5.3	4.5	4.4	4.4
Wt Dry Sample	139.9	159.5	205.7	159.6	159.4
Moisture Content (%)	31.3	27.5	29.7	33.0	40.7
Test Hole No.	3	3	3	3	3
ID	3-1	3-2	3-3	3-4	3-5
Tare No.					
Wt Wet Sample + Tare	224.4	194.4	204.3	194.4	209.3
Wt Dry Sample + Tare	162.8	144.3	153.2	144.3	153.2
Wt Water	61.6	50.1	51.1	50.1	56.1
Wt Tare	4.3	4.7	4.7	4.3	4.3
Wt Dry Sample	158.5	139.6	148.5	140.0	148.9
Moisture Content (%)	38.9	35.9	34.4	35.8	37.7

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	Aecom	TEST NO:	1	PROJECT NO:	112-2101
PROJECT:	University Crescent	DATE SAMPLED:	Mar 1 & 2	SAMPLED BY:	ET
PROJECT CONTACT:	Ryan Cunningham	DATE TESTED:	Mar 03, 2021	TESTED BY:	GM/EI
Test Hole No.	3	3	4	4	4
ID	3-6	3-7	4-1	4-2	4-3
Tare No.					
Wt Wet Sample + Tare	209.2	199.8	136.2	205.5	219.5
Wt Dry Sample + Tare	155.1	141.7	99.4	153.9	162.9
Wt Water	54.1	58.1	36.8	51.6	56.6
Wt Tare	4.1	4.2	4.7	4.3	4.2
Wt Dry Sample	151.0	137.5	94.7	149.6	158.7
Moisture Content (%)	35.8	42.3	38.9	34.5	35.7
Test Hole No.	4	4	4	4	5
ID	4-4	4-5	4-6	4-7	5-1
Tare No.					
Wt Wet Sample + Tare	175.4	207.2	205.2	199.6	233.1
Wt Dry Sample + Tare	139.4	147.8	143.8	139.3	183.2
Wt Water	36.0	59.4	61.4	60.3	49.9
Wt Tare	4.3	5.2	4.3	4.3	4.3
Wt Dry Sample	135.1	142.6	139.5	135.0	178.9
Moisture Content (%)	26.6	41.7	44.0	44.7	27.9
Test Hole No.	5	5	5	5	5
ID	5-2	5-3	5-4	5-5	5-6
Tare No.					
Wt Wet Sample + Tare	158.3	176.2	208.7	205.7	202.7
Wt Dry Sample + Tare	117.2	126.2	146.6	141.6	134.5
Wt Water	41.1	50.0	62.1	64.1	68.2
Wt Tare	4.3	4.3	4.3	4.3	4.6
Wt Dry Sample	112.9	121.9	142.3	137.3	129.9
Moisture Content (%)	36.4	41.0	43.6	46.7	52.5
Test Hole No.	5	6	6	6	6
ID	5-7	6-1	6-2	6-3	6-4
Tare No.					
Wt Wet Sample + Tare	233.3	155	161.2	236.4	161.2
Wt Dry Sample + Tare	157.6	112.9	116.3	166.4	115
Wt Water	75.7	42.1	44.9	70.0	46.2
Wt Tare	4.6	4.2	4.4	4.3	4.4
Wt Dry Sample	153.0	108.7	111.9	162.1	110.6
Moisture Content (%)	49.5	38.7	40.1	43.2	41.8

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: Aecom	TEST NO: 1			PROJECT NO: 112-2101	
PROJECT: University Crescent	DATE SAMPLED: Mar 1 & 2			SAMPLED BY: ET	
PROJECT CONTACT: Ryan Cunningham	DATE TESTED: Mar 03, 2021			TESTED BY: GM/EI	
Test Hole No.	6	6	6	7	7
ID	6-5	6-6	6-7	7-1	7-2
Tare No.					
Wt Wet Sample + Tare	229.5	214	177.5	245.6	206
Wt Dry Sample + Tare	158	144.3	118.8	183.5	157.4
Wt Water	71.5	69.7	58.7	62.1	48.6
Wt Tare	4.9	5.1	4.8	4.6	4.4
Wt Dry Sample	153.1	139.2	114.0	178.9	153.0
Moisture Content (%)	46.7	50.1	51.5	34.7	31.8
Test Hole No.	7	7	7	7	7
ID	7-3	7-4	7-5	7-6	7-7
Tare No.					
Wt Wet Sample + Tare	235.1	264.3	208.1	228.1	201.3
Wt Dry Sample + Tare	169.6	187.9	149.1	166	134.3
Wt Water	65.5	76.4	59.0	62.1	67.0
Wt Tare	4.3	4.1	4.3	4.3	5.1
Wt Dry Sample	165.3	183.8	144.8	161.7	129.2
Moisture Content (%)	39.6	41.6	40.7	38.4	51.9
Test Hole No.	8	8	8	8	8
ID	8-1	8-2	8-3	8-4	8-5
Tare No.					
Wt Wet Sample + Tare	160.6	168.7	144.7	214	191.2
Wt Dry Sample + Tare	124	132	106.7	151.5	137.1
Wt Water	36.6	36.7	38.0	62.5	54.1
Wt Tare	4.2	4.2	4.4	4.5	5.5
Wt Dry Sample	119.8	127.8	102.3	147.0	131.6
Moisture Content (%)	30.6	28.7	37.1	42.5	41.1
Test Hole No.	8	8	9	9	9
ID	8-6	8-7	9-1	9-2	9-3
Tare No.					
Wt Wet Sample + Tare	167.4	189.8	195.5	200	197.7
Wt Dry Sample + Tare	124.1	128.1	149.5	153.2	154.7
Wt Water	43.3	61.7	46.0	46.8	43.0
Wt Tare	4.5	4.8	4.6	4.6	4.2
Wt Dry Sample	119.6	123.3	144.9	148.6	150.5
Moisture Content (%)	36.2	50.0	31.7	31.5	28.6

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: Aecom	TEST NO: 1	PROJECT NO: 112-2101
PROJECT: University Crescent	DATE SAMPLED: Mar 1 & 2	SAMPLED BY: ET
PROJECT CONTACT: Ryan Cunningham	DATE TESTED: Mar 03, 2021	TESTED BY: GM/EI

Test Hole No.	9	9	9	9	16
ID	9-4	9-5	9-6	9-7	16-1
Tare No.					
Wt Wet Sample + Tare	158.7	172.1	192.1	143.7	209.7
Wt Dry Sample + Tare	115.9	118	150.7	104	161.2
Wt Water	42.8	54.1	41.4	39.7	48.5
Wt Tare	4.3	4.2	4.2	4.3	4.6
Wt Dry Sample	111.6	113.8	146.5	99.7	156.6
Moisture Content (%)	38.4	47.5	28.3	39.8	31.0
Test Hole No.	16	16	16	16	13
ID	16-2	16-3	16-4	16-5	13-1
Tare No.					
Wt Wet Sample + Tare	143.7	157.9	205.7	264.9	164.1
Wt Dry Sample + Tare	104	110.5	161.2	186.2	127.7
Wt Water	39.7	47.4	44.5	78.7	36.4
Wt Tare	4.4	4.8	4.3	4.2	4.8
Wt Dry Sample	99.6	105.7	156.9	182.0	122.9
Moisture Content (%)	39.9	44.8	28.4	43.2	29.6
Test Hole No.	13	13	13	13	13
ID	13-2	13-3	13-4	13-5	13-6
Tare No.					
Wt Wet Sample + Tare	187.5	142.4	227.1	154.6	148.8
Wt Dry Sample + Tare	136.4	104.7	185.3	121.1	107.1
Wt Water	51.1	37.7	41.8	33.5	41.7
Wt Tare	4.9	5.0	4.3	4.4	4.5
Wt Dry Sample	131.5	99.7	181.0	116.7	102.6
Moisture Content (%)	38.9	37.8	23.1	28.7	40.6
Test Hole No.	13	15	15	15	15
ID	13-7	15-1	15-2	15-3	15-4
Tare No.					
Wt Wet Sample + Tare	232.4	185.6	169.4	149.1	189.1
Wt Dry Sample + Tare	168.5	176.7	127.7	114.6	141.8
Wt Water	63.9	8.9	41.7	34.5	47.3
Wt Tare	4.4	4.3	4.5	4.2	4.4
Wt Dry Sample	164.1	172.4	123.2	110.4	137.4
Moisture Content (%)	38.9	5.2	33.8	31.3	34.4

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: Aecom	TEST NO: 1			PROJECT NO: 112-2101	
PROJECT: University Crescent	DATE SAMPLED: Mar 1 & 2			SAMPLED BY: ET	
PROJECT CONTACT: Ryan Cunningham	DATE TESTED: Mar 03, 2021			TESTED BY: GM/EI	
Test Hole No.	15	15	15	10	10
ID	15-5	15-6	15-7	10-1	10-2
Tare No.				g79	
Wt Wet Sample + Tare	135.6	141.1	137.7	135.6	233.1
Wt Dry Sample + Tare	94.8	100.5	98.2	94.8	165.9
Wt Water	40.8	40.6	39.5	40.8	67.2
Wt Tare	4.4	4.3	5.9	4.5	4.3
Wt Dry Sample	90.4	96.2	92.3	90.3	161.6
Moisture Content (%)	45.1	42.2	42.8	45.2	41.6
Test Hole No.	10	10	10	10	10
ID	10-3	10-4	10-5	10-6	10-7
Tare No.					
Wt Wet Sample + Tare	142.1	219.9	153.6	186.4	175.9
Wt Dry Sample + Tare	100.5	152.7	124.3	131.2	134.6
Wt Water	41.6	67.2	29.3	55.2	41.3
Wt Tare	4.2	5.2	5.0	4.6	4.3
Wt Dry Sample	96.3	147.5	119.3	126.6	130.3
Moisture Content (%)	43.2	45.6	24.6	43.6	31.7
Test Hole No.	10	17	17	17	17
ID	10-8	17-1	17-2	17-3	17-4
Tare No.					
Wt Wet Sample + Tare	176.7	153.4	171.6	168.3	174.8
Wt Dry Sample + Tare	126.8	112.2	124	131.9	135
Wt Water	49.9	41.2	47.6	36.4	39.8
Wt Tare	4.2	4.4	4.4	4.2	4.3
Wt Dry Sample	122.6	107.8	119.6	127.7	130.7
Moisture Content (%)	40.7	38.2	39.8	28.5	30.5
Test Hole No.	17	18	18	18	18
ID	17-5	18-1	18-2	18-3	18-4
Tare No.					
Wt Wet Sample + Tare	169.9	241.2	268.2	252.9	159.6
Wt Dry Sample + Tare	120.6	175.8	192.8	178.1	125.1
Wt Water	49.3	65.4	75.4	74.8	34.5
Wt Tare	4.3	4.1	4.6	4.5	4.5
Wt Dry Sample	116.3	171.7	188.2	173.6	120.6
Moisture Content (%)	42.4	38.1	40.1	43.1	28.6

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	Aecom	TEST NO:	1	PROJECT NO:	112-2101
PROJECT:	University Crescent	DATE SAMPLED:	Mar 1 & 2	SAMPLED BY:	ET
PROJECT CONTACT:	Ryan Cunningham	DATE TESTED:	Mar 03, 2021	TESTED BY:	GM/EI
Test Hole No.	18	12	12	12	12
Depth	18-5	12-1	12-2	12-3	12-4
Tare No.					
Wt Wet Sample + Tare	214.4	169.9	168.4	161.4	186.5
Wt Dry Sample + Tare	164.9	120.6	122.9	125.1	150.9
Wt Water	49.5	49.3	45.5	36.3	35.6
Wt Tare	4.2	4.5	4.2	4.4	4.5
Wt Dry Sample	160.7	116.1	118.7	120.7	146.4
Moisture Content (%)	30.8	42.5	38.3	30.1	24.3
Test Hole No.	12	12	12	19	19
Depth	12-5	12-6	12-7	19-1	19-2
Tare No.					
Wt Wet Sample + Tare	209.4	234.2	249.9	161.9	282.3
Wt Dry Sample + Tare	154.7	172.3	175.3	120.2	184.8
Wt Water	54.7	61.9	74.6	41.7	97.5
Wt Tare	4.3	3.3	4.3	4.4	4.2
Wt Dry Sample	150.4	169.0	171.0	115.8	180.6
Moisture Content (%)	36.4	36.6	43.6	36.0	54.0
Test Hole No.	19	19	19	14	14
Depth	19-3	19-4	19-5	14-1	14-2
Tare No.					
Wt Wet Sample + Tare	228.4	301.2	154.4	145.4	168
Wt Dry Sample + Tare	157.7	198.6	115.3	104.2	122.2
Wt Water	70.7	102.6	39.1	41.2	45.8
Wt Tare	4.3	4.4	4.3	4.3	4.2
Wt Dry Sample	153.4	194.2	111.0	99.9	118.0
Moisture Content (%)	46.1	52.8	35.2	41.2	38.8
Test Hole No.					
Depth	14-3	14-4	14-5	14-6	14-7
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

MOISTURE CONTENT OF SOIL (ASTM D2216)

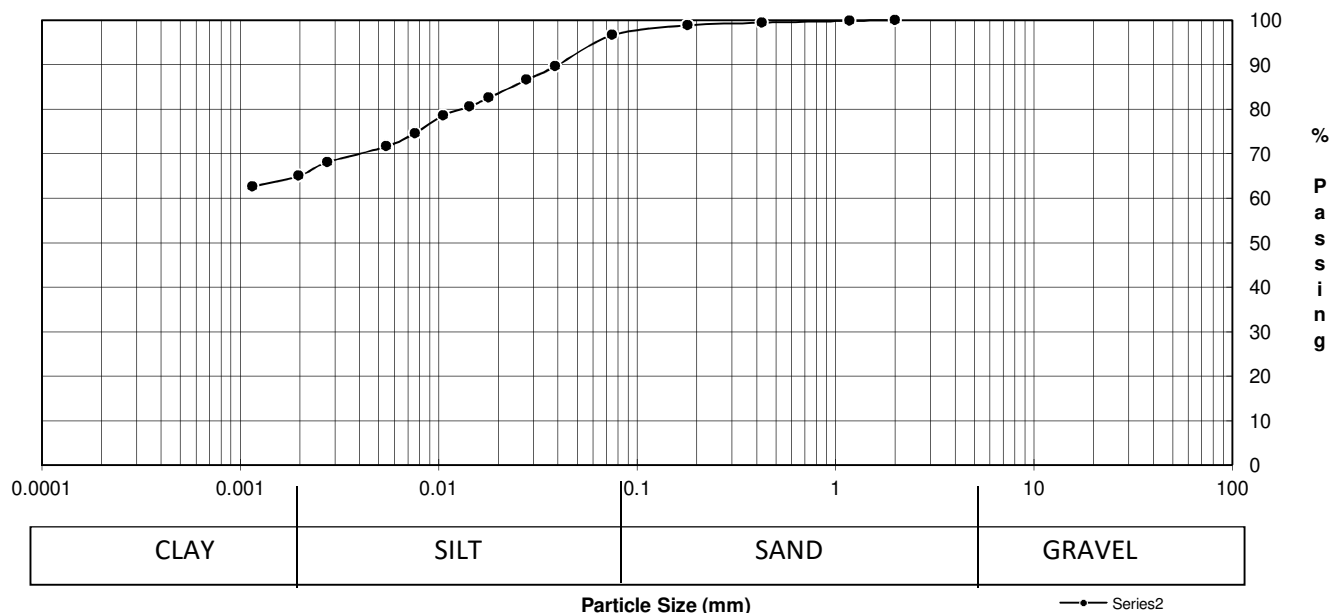
CLIENT:	Aecom	TEST NO:	1	PROJECT NO:	112-2101
PROJECT:	University Crescent	DATE SAMPLED:	Mar 1 & 2	SAMPLED BY:	ET
PROJECT CONTACT:	Ryan Cunningham	DATE TESTED:	Mar 03, 2021	TESTED BY:	GM/EI
Test Hole No.	14	11	11	11	11
Depth	14-8	11-1	11-2	11-3	11-4
Tare No.					
Wt Wet Sample + Tare	214.4	238.1	168.4	294.3	246.2
Wt Dry Sample + Tare	164.9	176.9	122.9	213.2	175.1
Wt Water	49.5	61.2	45.5	81.1	71.1
Wt Tare	4.2	4.5	4.2	4.4	4.5
Wt Dry Sample	160.7	172.4	118.7	208.8	170.6
Moisture Content (%)	30.8	35.5	38.3	38.8	41.7
Test Hole No.	11	11			
Depth	11-5	11-6			
Tare No.					
Wt Wet Sample + Tare	218.4	239.2			
Wt Dry Sample + Tare	153.3	168.3			
Wt Water	65.1	70.9			
Wt Tare	4.3	3.3			
Wt Dry Sample	149.0	165.0			
Moisture Content (%)	43.7	43.0			
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	1
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled: 1-Mar-21	Date Received: 1-Mar-21	Sieve Analysis		Hydrometer Analysis	
Sampled By: PB/ET	Date Tested: 11-Mar-21	Sieve (mm) % Passing		Diameter	% Finer
Material Identification B.H./T.H. No. TH 1 Depth 0.5 to 1.4 m Sample Source Specific Gravity of Material: 2.65		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0387	89.6
		9.50	100.0	0.0278	86.6
		4.75	100.0	0.0179	82.6
		2.00	100.0	0.0143	80.6
		1.18	99.8	0.0105	78.6
		0.425	99.4	0.0076	74.6
		0.180	98.8	0.0054	71.6
		0.075	96.6	0.0012	62.6

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
			D30	
	3.4	Gravel	D60	0.00117
	31.6	Sand	Cu	
	65.0	Silt	Cc	
		Clay		

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



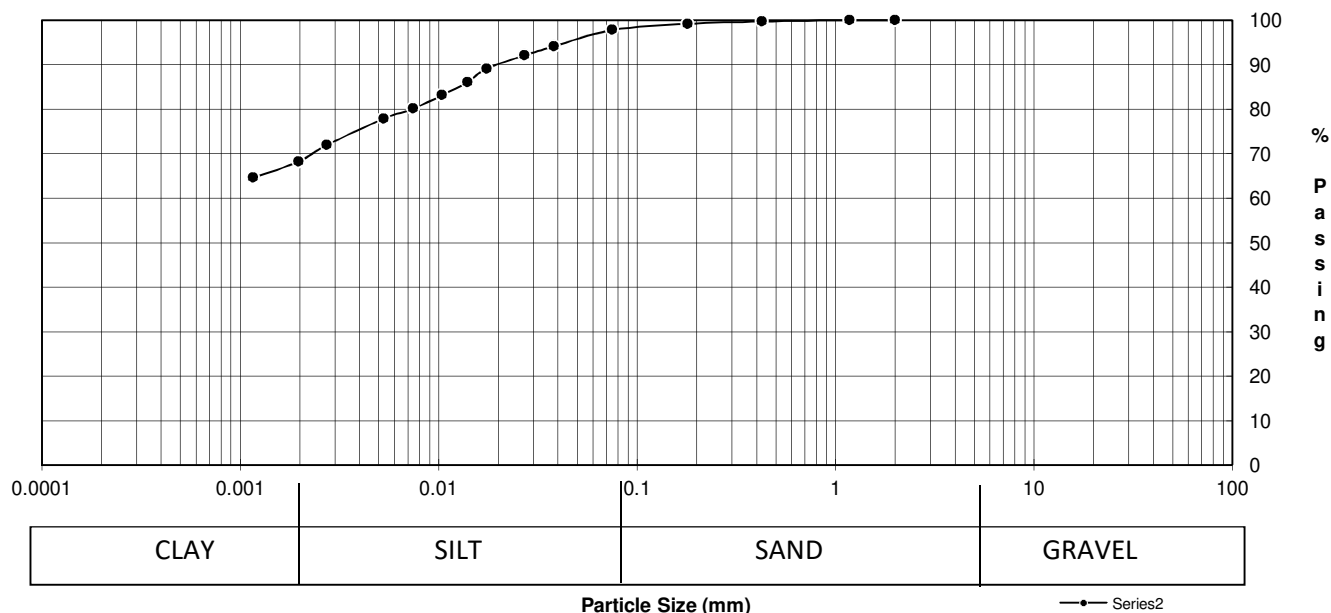
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	2
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021-1B
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled:	1-Mar-21	Date Received:	1-Mar-21	Sieve Analysis	Hydrometer Analysis
Sampled By:	PB/ET	Date Tested:	11-Mar-21	Sieve (mm) % Passing	Diameter % Finer
Material Identification B.H./T.H. No. TH 3 Depth 0.5-1.6 m Sample Source Specific Gravity of Material: 2.65				50.00 100.0	
				37.50 100.0	
				25.00 100.0	
				19.00 100.0	
				16.00 100.0	
				12.50 100.0	0.0380 94.1
				9.50 100.0	0.0272 92.1
				4.75 100.0	0.0174 89.1
				2.00 100.0	0.0140 86.1
				1.18 100.0	0.0104 83.1
				0.425 99.7	0.0074 80.1
				0.180 99.2	0.0053 77.9
				0.075 97.8	0.0012 64.5

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
			D30	
	2.22	Gravel	D60	
	29.78	Sand	Cu	
	68.00	Silt	Cc	
		Clay		

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



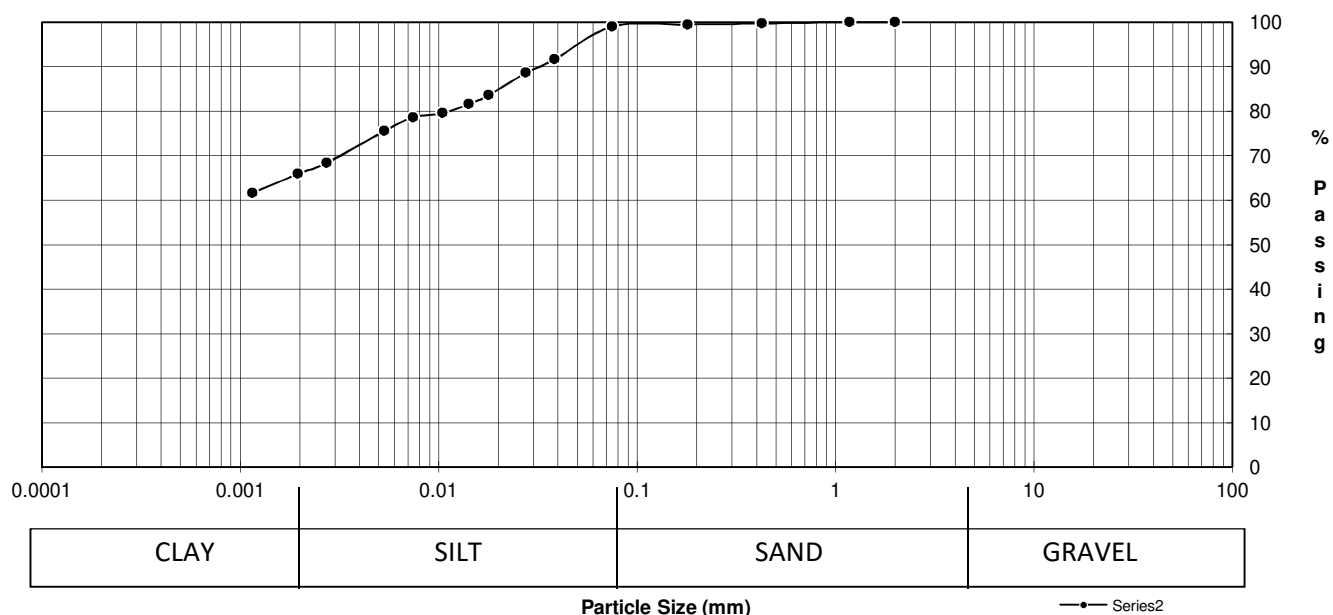
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	3
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled:	1-Mar-21	Date Received:	1-Mar-21	Sieve Analysis	Hydrometer Analysis
Sampled By:	PB/ET	Date Tested:	11-Mar-21	Sieve (mm) % Passing	Diameter % Finer
Material Identification B.H./T.H. No. TH 5 Depth 0.5-1.6 m Sample Source Specific Gravity of Material: 2.65				50.00 100.0	
				37.50 100.0	
				25.00 100.0	
				19.00 100.0	
				16.00 100.0	
				12.50 100.0	0.0384 91.6
				9.50 100.0	0.0275 88.6
				4.75 100.0	0.0178 83.6
				2.00 100.0	0.0142 81.6
				1.18 100.0	0.0105 79.6
				0.425 99.7	0.0075 78.6
				0.180 99.5	0.0053 75.6
				0.075 99.0	0.0012 61.6

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
			D30	
	1.0	Gravel	D60	
	33.0	Sand	Cu	
	66.0	Silt	Cc	
		Clay		

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



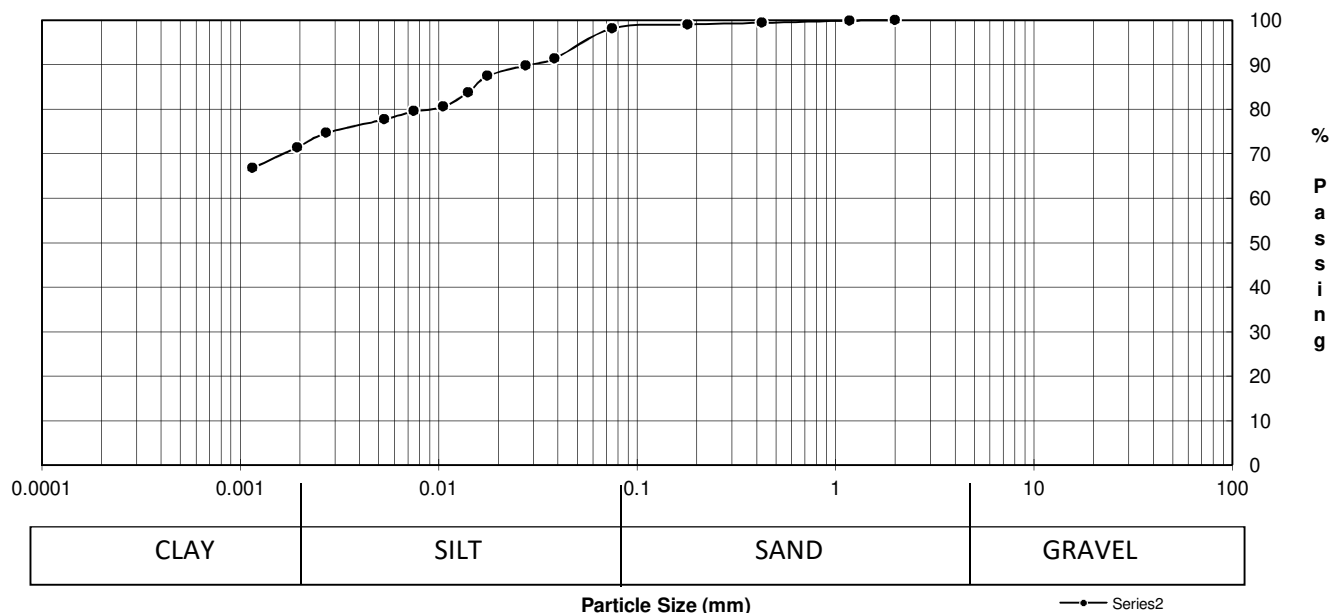
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	4
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled:	1-Mar-21	Date Received:	1-Mar-21	Sieve Analysis		Hydrometer Analysis	
Sampled By:	PB/ET	Date Tested:	11-Mar-21	Sieve (mm) % Passing		Diameter	% Finer
Material Identification B.H./T.H. No. TH 7 Depth 0.5-1.5 Sample Source Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0385	91.4
				9.50	100.0	0.0274	89.8
				4.75	100.0	0.0176	87.4
				2.00	100.0	0.0141	83.8
				1.18	99.9	0.0105	80.5
				0.425	99.4	0.0075	79.5
				0.180	99.0	0.0053	77.7
				0.075	98.1	0.0012	66.7

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
			D30	
	1.9	Sand	D60	
	26.7	Silt	Cu	
	71.4	Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



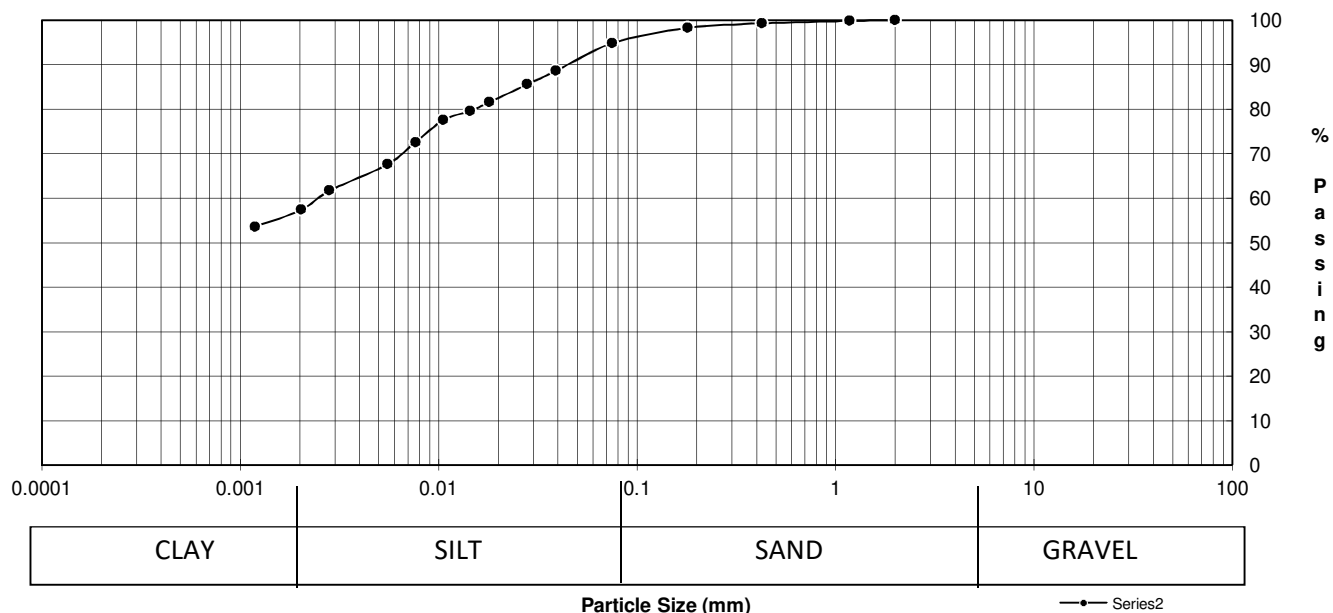
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	5
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled: 1-Mar-21	Date Received: 1-Mar-21	Sieve Analysis		Hydrometer Analysis	
Sampled By: PB/ET	Date Tested: 11-Mar-21	Sieve (mm) % Passing		Diameter	% Finer
Material Identification B.H./T.H. No. TH 9 Depth 0.6-1.5 m Sample Source Specific Gravity of Material: 2.65		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0389	88.6
		9.50	100.0	0.0279	85.6
		4.75	100.0	0.0180	81.6
		2.00	100.0	0.0144	79.6
		1.18	99.8	0.0106	77.6
		0.425	99.3	0.0077	72.6
		0.180	98.3	0.0055	67.6
		0.075	94.8	0.0012	53.6

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
	5.2	Gravel	D30	
	37.5	Sand	D60	0.00117
	57.3	Silt	Cu	
		Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



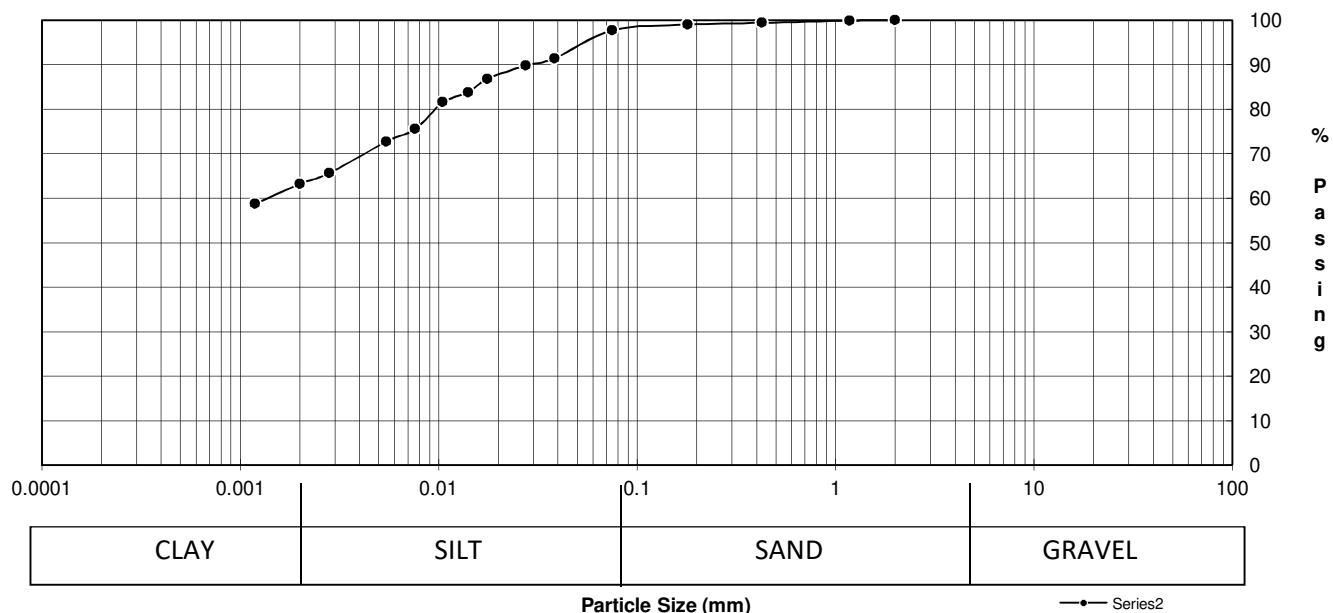
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	6
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled: 2-Mar-21	Date Received: 2-Mar-21	Sieve Analysis		Hydrometer Analysis	
Sampled By: PB/ET	Date Tested: 11-Mar-21	Sieve (mm) % Passing		Diameter	% Finer
Material Identification B.H./T.H. No. TH 11 Depth 0.6-1.6 Sample Source Specific Gravity of Material: 2.65		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0385	91.4
		9.50	100.0	0.0274	89.8
		4.75	100.0	0.0176	86.8
		2.00	100.0	0.0141	83.8
		1.18	99.9	0.0105	81.5
		0.425	99.4	0.0076	75.5
		0.180	99.0	0.0055	72.7
		0.075	97.7	0.0012	58.7

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
			D30	
	2.3	Gravel	D60	
	34.5	Sand	Cu	
	63.2	Silt	Cc	
		Clay		

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



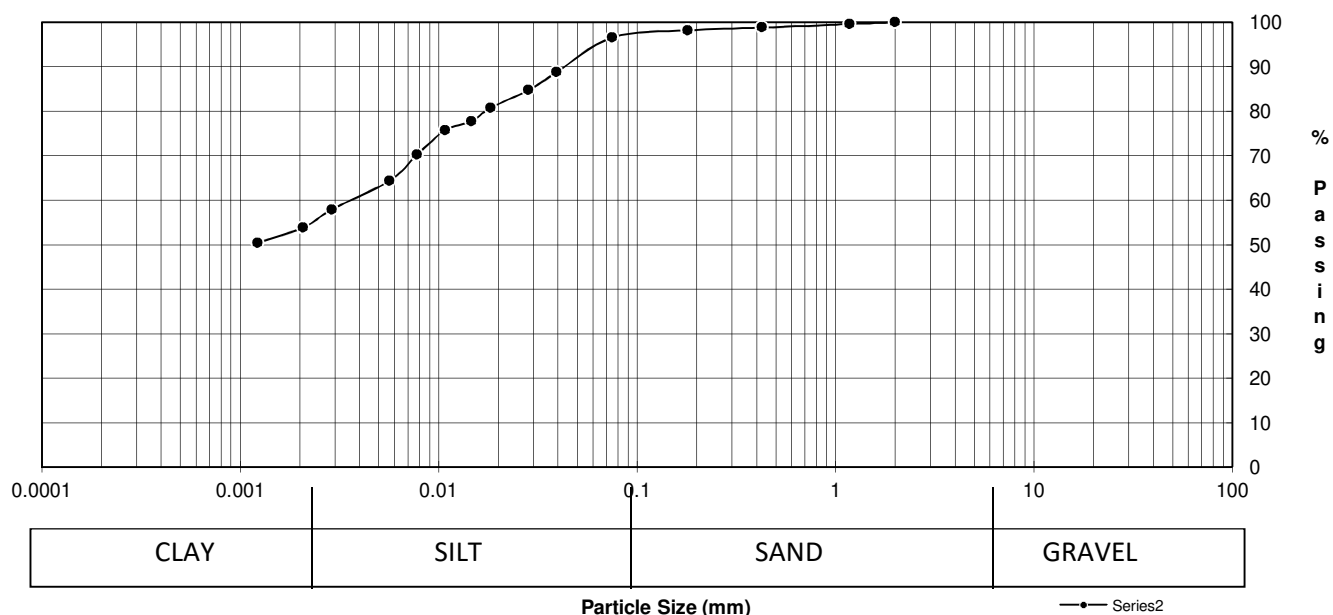
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	7
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled:	2-Mar-21	Date Received:	2-Mar-21	Sieve Analysis		Hydrometer Analysis	
Sampled By:	PB/ET	Date Tested:	11-Mar-21	Sieve (mm) % Passing		Diameter	% Finer
Material Identification B.H./T.H. No. TH 13 Depth 0.5-1.5 Sample Source Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0392	88.7
				9.50	100.0	0.0283	84.7
				4.75	100.0	0.0182	80.7
				2.00	100.0	0.0146	77.7
				1.18	99.6	0.0108	75.7
				0.425	98.8	0.0078	70.2
				0.180	98.2	0.0056	64.3
				0.075	96.6	0.0012	50.4

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	0.00203
			D30	
	3.4	Gravel	D60	
	42.6	Sand	Cu	
	54.0	Silt	Cc	
		Clay		

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



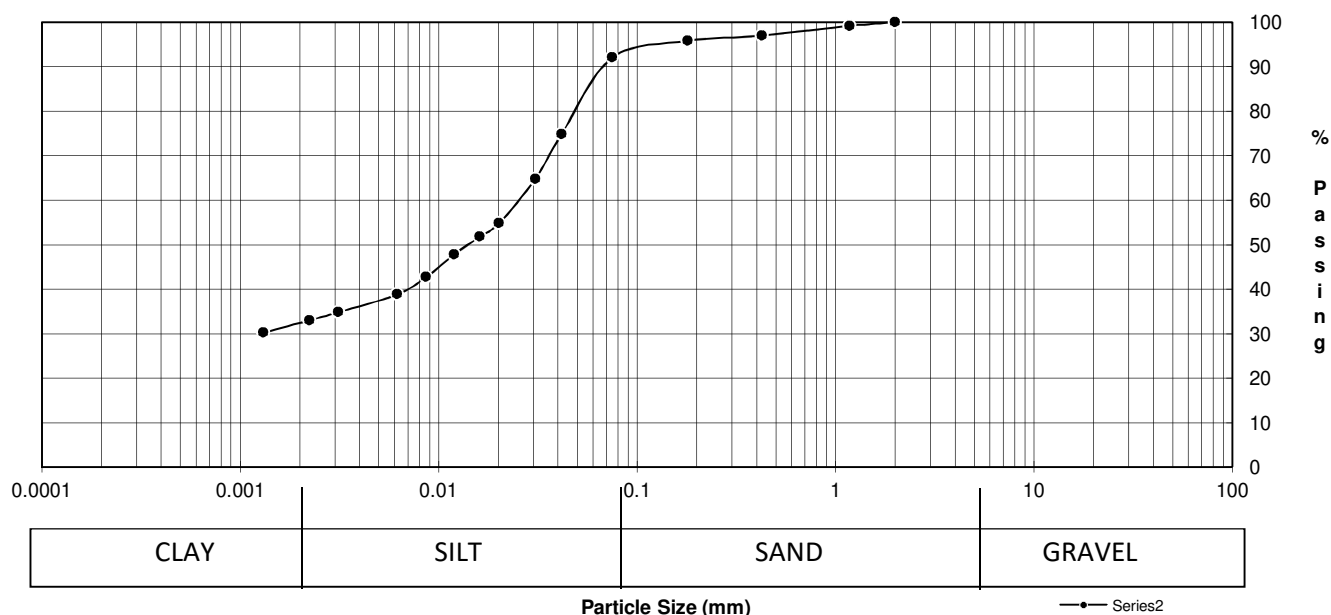
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	8
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled:	2-Mar-21	Date Received:	2-Mar-21	Sieve Analysis	Hydrometer Analysis
Sampled By:	PB/ET	Date Tested:	11-Mar-21	Sieve (mm) % Passing	Diameter % Finer
Material Identification B.H./T.H. No. TH 15 Depth 0.6-1.5 m Sample Source Specific Gravity of Material: 2.65				50.00	100.0
				37.50	100.0
				25.00	100.0
				19.00	100.0
				16.00	100.0
				12.50	100.0
				9.50	100.0
				4.75	100.0
				2.00	100.0
				1.18	99.2
				0.425	97.0
				0.180	95.8
				0.075	92.0
				0.0416	74.8
				0.0307	64.8
				0.0202	54.8
				0.0161	51.8
				0.0119	47.8
				0.0087	42.7
				0.0062	38.8
				0.0013	30.2

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
	8.0	Gravel	D30	0.00226
	59.2	Sand	D60	0.02018
	32.8	Silt	Cu	
		Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



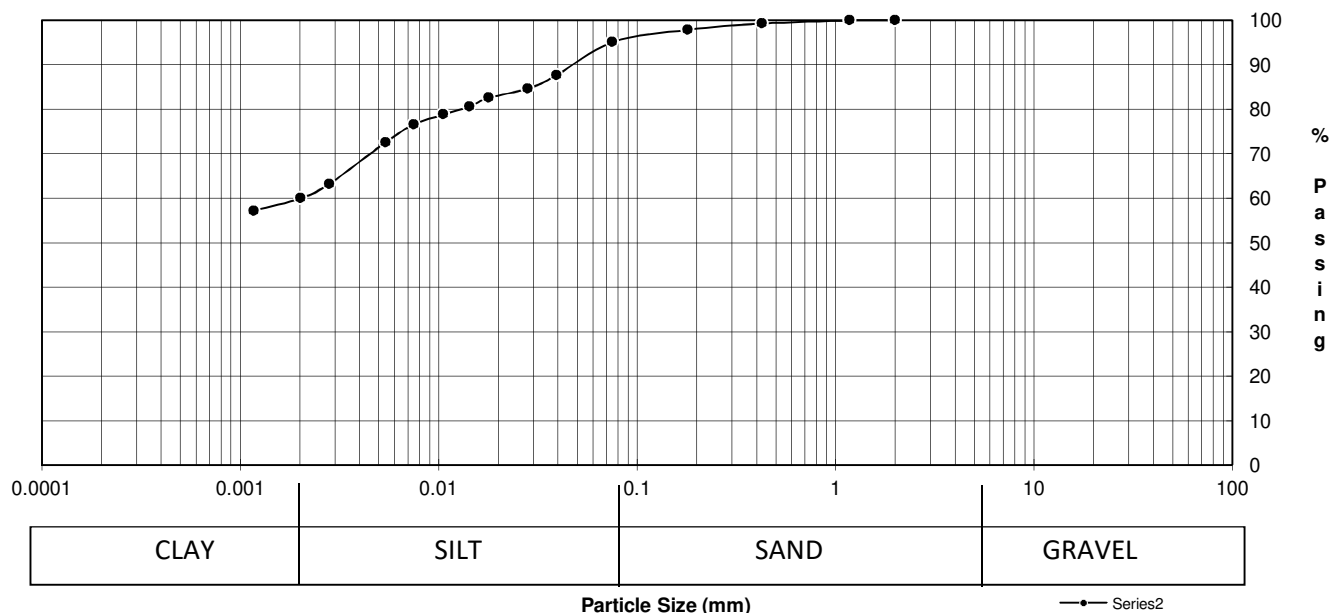
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	9
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled: 2-Mar-21	Date Received: 2-Mar-21	Sieve Analysis		Hydrometer Analysis	
Sampled By: PB/ET	Date Tested: 11-Mar-21	Sieve (mm) % Passing		Diameter	% Finer
Material Identification B.H./T.H. No. TH 16 Depth 0.3-1.4 m Sample Source Specific Gravity of Material: 2.65		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0391	87.6
		9.50	100.0	0.0281	84.6
		4.75	100.0	0.0179	82.6
		2.00	100.0	0.0143	80.6
		1.18	99.9	0.0105	78.8
		0.425	99.2	0.0075	76.6
		0.180	97.8	0.0054	72.6
		0.075	95.0	0.0012	57.2

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
			D30	
	5.0	Sand	D60	
	35.0	Silt	Cu	
	60.0	Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



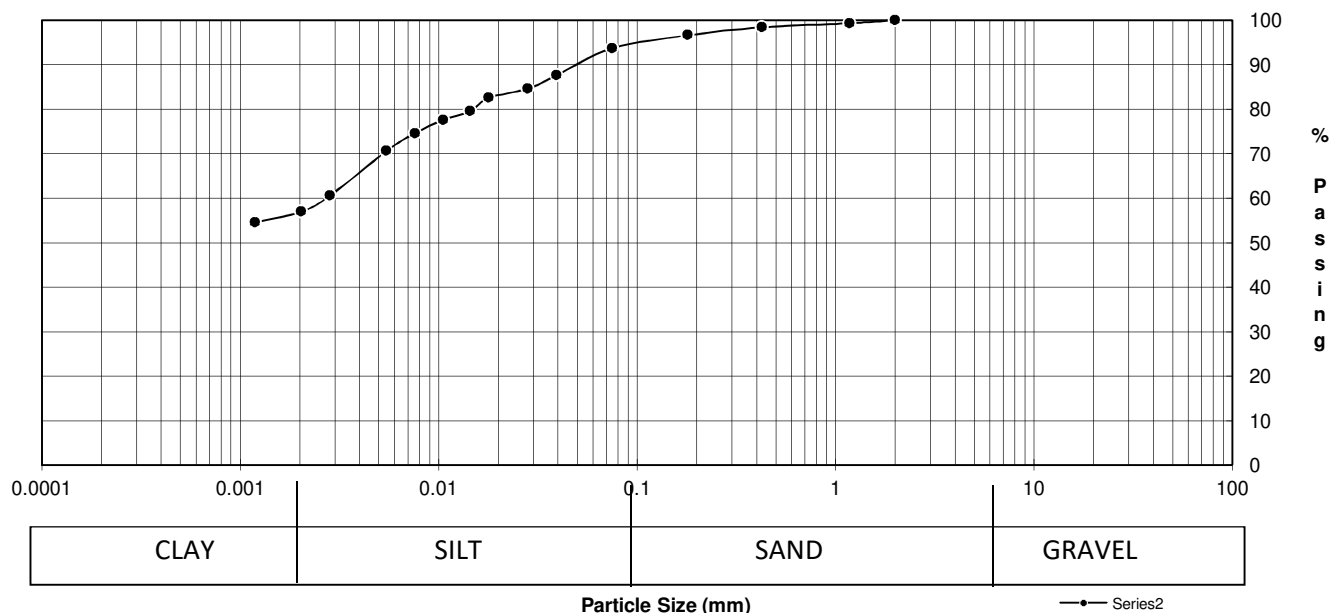
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM	PROJECT No.:	112-2101
	99 Commerce Drive	PSA Test No.:	10
	Winnipeg MB R3P 0Y7	LAB No.:	HM 021
ATTENTION:	Ryan Cunningham		
PROJECT:	2021-22 University Cr. Pavement Renewals		
	University Crescent from Chancellor Matheson to Pembina Highway		

Date Sampled:	2-Mar-21	Date Received:	2-Mar-21	Sieve Analysis	Hydrometer Analysis
Sampled By:	PB/ET	Date Tested:	11-Mar-21	Sieve (mm) % Passing	Diameter % Finer
Material Identification B.H./T.H. No. TH 19 Depth 0.3-1.2 m Sample Source Specific Gravity of Material: 2.65				50.00 100.0	
				37.50 100.0	
				25.00 100.0	
				19.00 100.0	
				16.00 100.0	
				12.50 100.0	0.0391 87.6
				9.50 100.0	0.0281 84.6
				4.75 100.0	0.0179 82.6
				2.00 100.0	0.0144 79.6
				1.18 99.3	0.0106 77.6
				0.425 98.4	0.0076 74.6
				0.180 96.6	0.0055 70.6
				0.075 93.7	0.0012 54.6

Grain Size Analysis



SOIL DESCRIPTION	% Composition		D10	
			D30	
	6.3	Sand	D60	
	36.5	Silt	Cu	
	57.2	Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: IA



Reviewed by: Paul Bevel

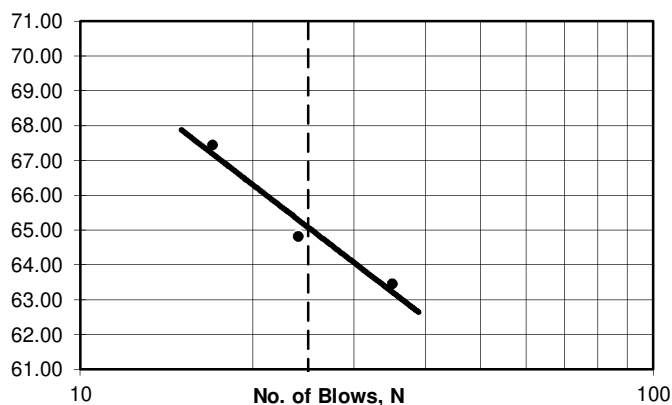
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No.: 3 Lab No.: HM 021 Date Received: 1-Mar-21 Date Tested / By: 15-Mar-21 / GM
--	---

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	13.44	14.32	14.41		
Dry Soil + Dish:	9.95	10.45	10.35		
Moisture:	3.49	3.87	4.06		
Dish:	4.45	4.48	4.33		
Dry Soil:	5.5	5.97	6.02		
% Moisture:	63.45	64.82	67.44		
No. of Blows:	35	24	17		
Liquid Limit:					65

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 1**

Depth:

Liquid Limit, %: **65**
Plastic Limit, %: **26**
Plasticity Index: **39**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3	
Wet Soil + Dish:	13.79	13.58	13.95	
Dry Soil + Dish:	11.85	11.73	12.03	
Moisture:	1.94	1.85	1.92	
Dish:	4.33	4.46	4.71	
Dry Soil:	7.52	7.27	7.32	
% Moisture:	25.80	25.45	26.23	
Average:				26

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

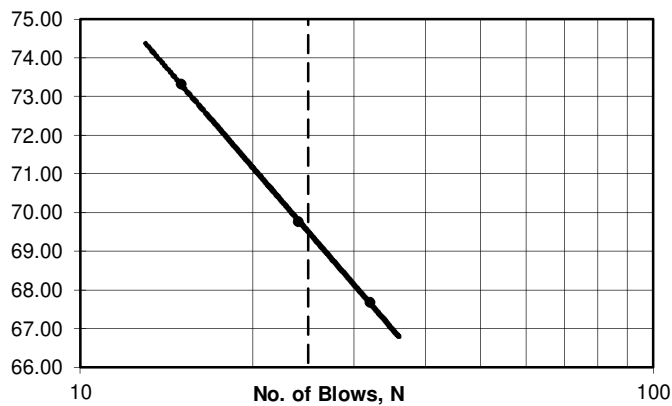
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No.: 2 Lab No.: HM 021 Date Received: 1-Mar-21 Date Tested / By: 15-Mar-21 / GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	12.98	12.58	12.01		
Dry Soil + Dish:	9.44	9.14	8.74		
Moisture:	3.54	3.44	3.27		
Dish:	4.21	4.21	4.28		
Dry Soil:	5.23	4.93	4.46		
% Moisture:	67.69	69.78	73.32		
No. of Blows:	32	24	15		
Liquid Limit:					69

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 3**

Depth:

Liquid Limit, %: **69**
Plastic Limit, %: **29**
Plasticity Index: **41**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.85	11.26	11.04		
Dry Soil + Dish:	9.38	9.72	9.52		
Moisture:	1.47	1.54	1.52		
Dish:	4.27	4.29	4.32		
Dry Soil:	5.11	5.43	5.2		
% Moisture:	28.77	28.36	29.23		
Average:					29

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

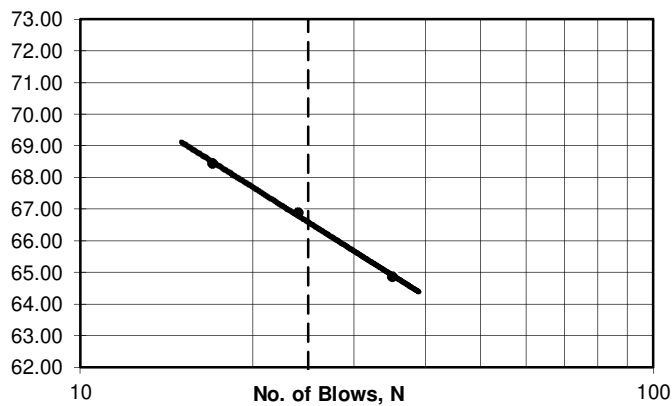
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No. 3 Lab No.: HM 021 Date Received: Feb. 2021 Date Tested / By: 2021-03-15/GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	12.82	14.56	12.23		
Dry Soil + Dish:	9.57	10.52	9.02		
Moisture:	3.25	4.04	3.21		
Dish:	4.56	4.48	4.33		
Dry Soil:	5.01	6.04	4.69		
% Moisture:	64.87	66.89	68.44		
No. of Blows:	35	24	17		
Liquid Limit:					66

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 5**

Depth:

Liquid Limit, %: **66**
Plastic Limit, %: **28**
Plasticity Index: **38**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	12.77	12.92	13.32		
Dry Soil + Dish:	10.91	10.99	11.44		
Moisture:	1.86	1.93	1.88		
Dish:	4.25	4.31	4.74		
Dry Soil:	6.66	6.68	6.7		
% Moisture:	27.93	28.89	28.06		
Average:					28

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

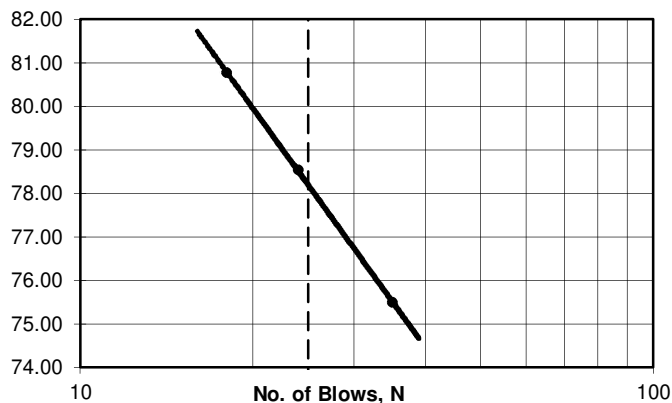
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No.: 4 Lab No.: HM 021 Date Received: 1-Mar-21 Date Tested / By: 15-Mar-21 /GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	11.20	13.31	11.31		
Dry Soil + Dish:	8.21	9.54	8.16		
Moisture:	2.99	3.77	3.15		
Dish:	4.25	4.74	4.26		
Dry Soil:	3.96	4.8	3.9		
% Moisture:	75.51	78.54	80.77		
No. of Blows:	35	24	18		
Liquid Limit:					78

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 7**

Depth:

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

Plastic Limit Determination

Dish No.:	1	2	3	
Wet Soil + Dish:	10.93	11.55	11.42	
Dry Soil + Dish:	9.37	9.8	9.76	
Moisture:	1.56	1.75	1.66	
Dish:	4.25	4.47	4.25	
Dry Soil:	5.12	5.33	5.51	
% Moisture:	30.47	32.83	30.13	
Average:				31

Test Method : ASTM: D4318, D2216



Reviewed by: Paul Bevel

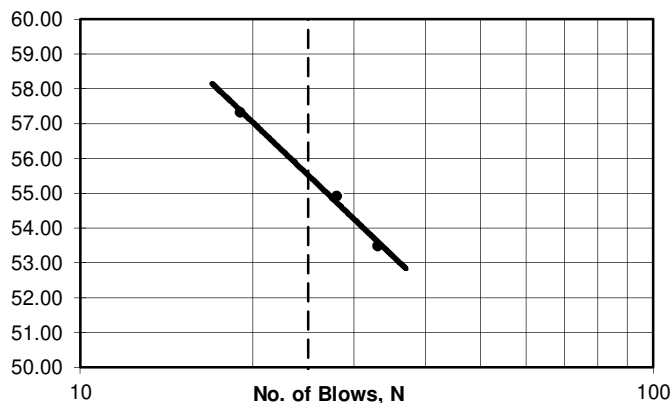
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No. 5 Lab No.: HM 021 Date Received: 1-Mar-21 Date Tested / By: 15-Mar-21 / GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	15.32	13.54	12.49		
Dry Soil + Dish:	11.64	10.25	9.48		
Moisture:	3.68	3.29	3.01		
Dish:	4.76	4.26	4.23		
Dry Soil:	6.88	5.99	5.25		
% Moisture:	53.49	54.92	57.33		
No. of Blows:	33	28	19		
Liquid Limit:					55

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 9**

Depth:

Liquid Limit, %: **55**
Plastic Limit, %: **23**
Plasticity Index: **32**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.25	10.27	10.55		
Dry Soil + Dish:	9.15	9.11	9.37		
Moisture:	1.1	1.16	1.18		
Dish:	4.28	4.27	4.2		
Dry Soil:	4.87	4.84	5.17		
% Moisture:	22.59	23.97	22.82		
Average:					23

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

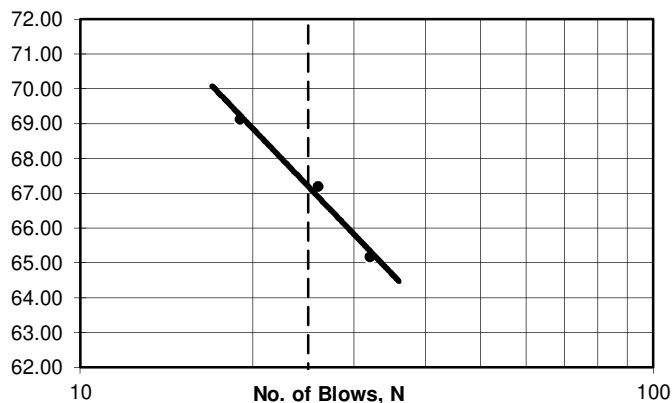
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No.: 6 Lab No.: HM 021 Date Received: 2-Mar-21 Date Tested / By: 15-Mar-21 / GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	12.46	11.55	11.88		
Dry Soil + Dish:	9.41	8.60	8.88		
Moisture:	3.05	2.95	3		
Dish:	4.73	4.21	4.54		
Dry Soil:	4.68	4.39	4.34		
% Moisture:	65.17	67.20	69.12		
No. of Blows:	32	26	19		
Liquid Limit:					67

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 6**

Depth:

Liquid Limit, %: **67**
Plastic Limit, %: **26**
Plasticity Index: **41**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	11.34	11.47	12.05		
Dry Soil + Dish:	9.91	10.03	10.53		
Moisture:	1.43	1.44	1.52		
Dish:	4.55	4.32	4.77		
Dry Soil:	5.36	5.71	5.76		
% Moisture:	26.68	25.22	26.39		
Average:					26

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

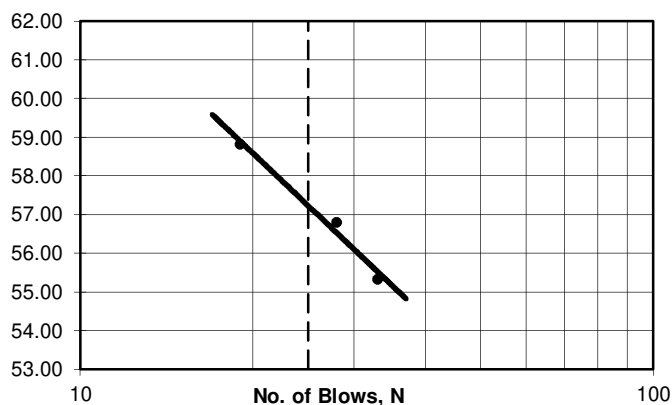
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No.: 7 Lab No.: HM 021 Date Received: 1-Mar-21 Date Tested / By: 15-Mar-21 / GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	15.82	13.59	14.49		
Dry Soil + Dish:	11.88	10.21	10.69		
Moisture:	3.94	3.38	3.8		
Dish:	4.76	4.26	4.23		
Dry Soil:	7.12	5.95	6.46		
% Moisture:	55.34	56.81	58.82		
No. of Blows:	33	28	19		
Liquid Limit:					57

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 13**

Depth:

Liquid Limit, %: **57**
Plastic Limit, %: **20**
Plasticity Index: **37**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.65	10.42	10.51		
Dry Soil + Dish:	9.6	9.4	9.45		
Moisture:	1.05	1.02	1.06		
Dish:	4.28	4.27	4.2		
Dry Soil:	5.32	5.13	5.25		
% Moisture:	19.74	19.88	20.19		
Average:					20

Test Method : ASTM: D4318, D2216



Reviewed by: Paul Bevel

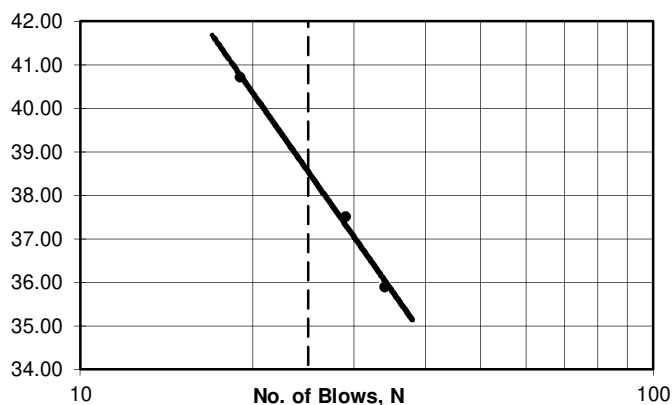
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No. 8 Lab No.: HM 021 Date Received: 2-Mar-21 Date Tested / By: 15-Mar-21 /GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	14.70	13.7	14.45		
Dry Soil + Dish:	11.95	11.13	11.49		
Moisture:	2.75	2.57	2.96		
Dish:	4.29	4.28	4.22		
Dry Soil:	7.66	6.85	7.27		
% Moisture:	35.90	37.52	40.72		
No. of Blows:	34	29	19		
Liquid Limit:					38

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 15**

Depth:

Liquid Limit, %: **38**
Plastic Limit, %: **13**
Plasticity Index: **26**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	11.46	11.37	11.34		
Dry Soil + Dish:	10.69	10.53	10.55		
Moisture:	0.77	0.84	0.79		
Dish:	4.26	4.23	4.42		
Dry Soil:	6.43	6.3	6.13		
% Moisture:	11.98	13.33	12.89		
Average:					13

Test Method : ASTM: D4318, D2216



Reviewed by: Paul Bevel

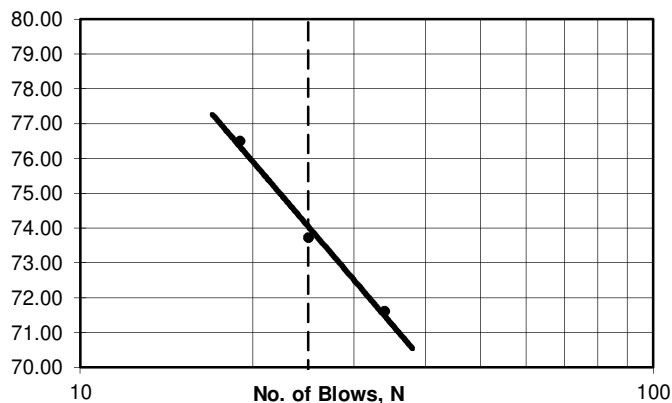
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No.: 9 Lab No.: HM 021 Date Received: Feb. 2021 Date Tested / By: 2021-03-15/GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	13.62	13.57	13.68		
Dry Soil + Dish:	9.91	9.95	9.74		
Moisture:	3.71	3.62	3.94		
Dish:	4.73	5.04	4.59		
Dry Soil:	5.18	4.91	5.15		
% Moisture:	71.62	73.73	76.50		
No. of Blows:	34	25	19		
Liquid Limit:					74

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 16**

Depth:

Liquid Limit, %: **74**
Plastic Limit, %: **29**
Plasticity Index: **45**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3	
Wet Soil + Dish:	13.11	12.74	12.47	
Dry Soil + Dish:	11.22	10.85	10.62	
Moisture:	1.89	1.89	1.85	
Dish:	4.81	4.28	4.24	
Dry Soil:	6.41	6.57	6.38	
% Moisture:	29.49	28.77	29.00	
Average:				29

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

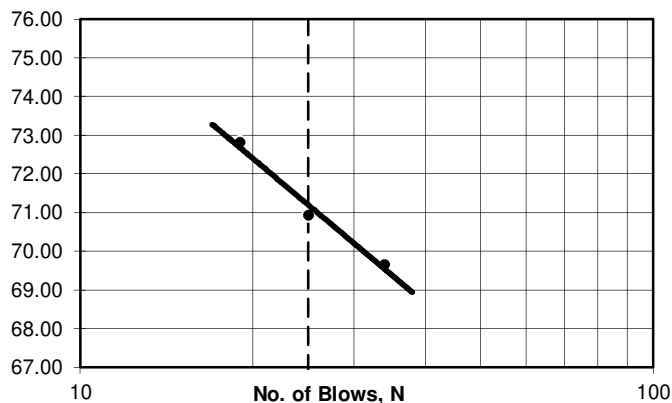
Atterberg Limits (ASTM D4318)

Client: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Cunningham Project: 2021-22 University Cr. Pavement Renewal University Crescent from Chancellor Matheson to Pembina Highway	Project No.: 112-2101 Test No.: 10 Lab No.: HM 021 Date Received: 2-Mar-21 Date Tested / By: 15-Mar-21 / GM
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Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	13.62	13.57	13.68		
Dry Soil + Dish:	9.97	10.03	9.85		
Moisture:	3.65	3.54	3.83		
Dish:	4.73	5.04	4.59		
Dry Soil:	5.24	4.99	5.26		
% Moisture:	69.66	70.94	72.81		
No. of Blows:	34	25	19		
Liquid Limit:					71

Liquid Limit



Material Identification:

T.H./B.H. No. **TH 19**

Depth:

Liquid Limit, %: **71**
Plastic Limit, %: **28**
Plasticity Index: **43**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	13.11	12.74	12.47		
Dry Soil + Dish:	11.28	10.88	10.69		
Moisture:	1.83	1.86	1.78		
Dish:	4.81	4.28	4.24		
Dry Soil:	6.47	6.6	6.45		
% Moisture:	28.28	28.18	27.60		
Average:					28

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

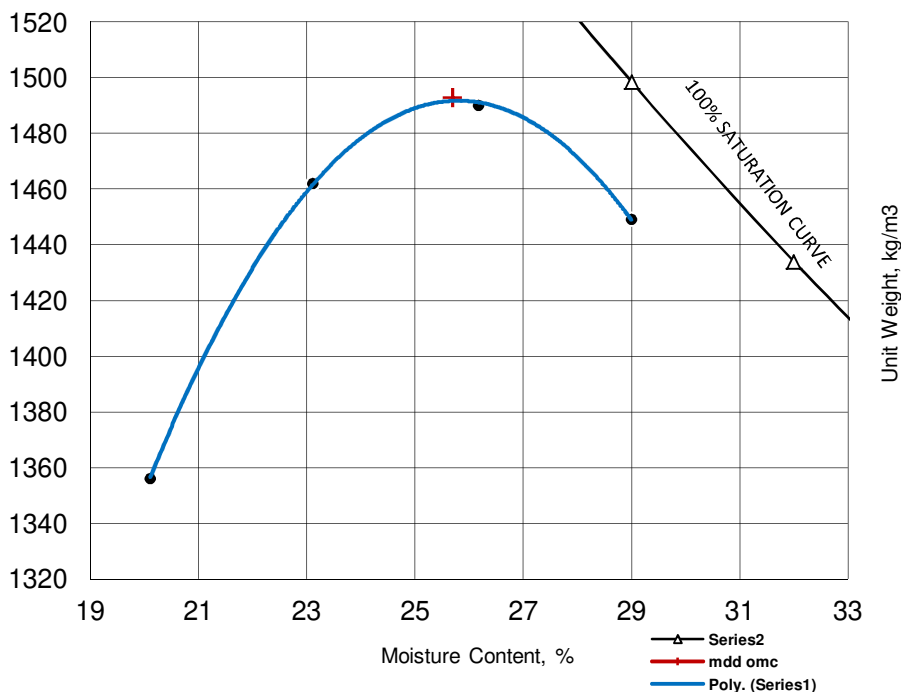
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	1
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	1-Mar-21	Date Received:	1-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	11-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use - Material Supplier - Maximum Size: - Material Source TH 1				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
Wet Density		1629	1800	1880	1870	0	
Moisture Content		20.1	23.1	26.2	29.0	0.0	
Dry Density		1356	1462	1490	1449	0	

Moisture - Density Relationship



Maximum Dry Density (MDD):
1493 kg/m³
Optimum Moisture Content
25.7 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
25.7 %
Corrected Maximum Dry Density:
1493 kg/m³

Remarks:

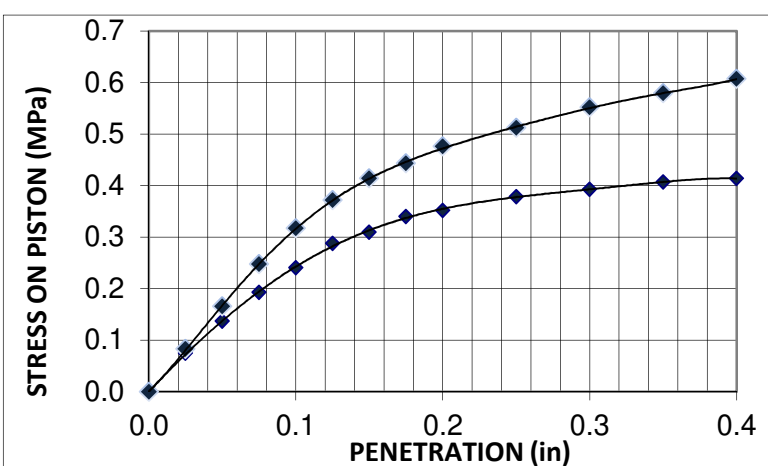
Tested by: ia

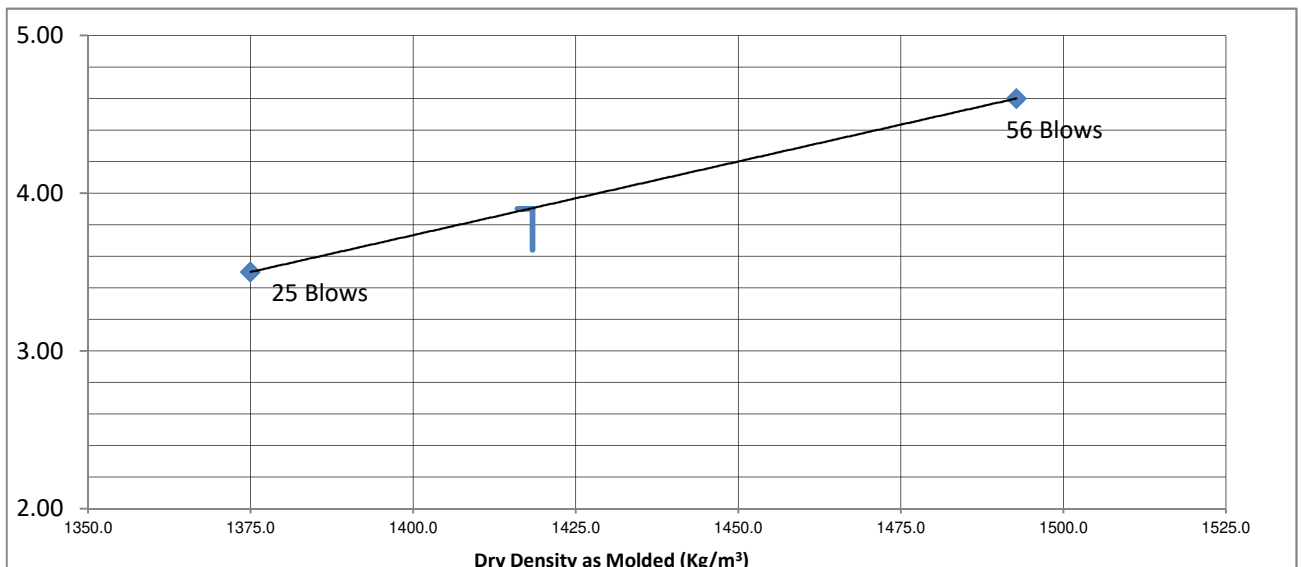
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	1
PROJECT:	2021-2022 University Crescent Pavement Renewals	DATE RECEIVED :	1-Mar-21
		DATE TESTED :	16-Mar-21
		TESTED BY:	ia

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH1	Moisture Content (MC), %	25.5	-
Sampled by:	ET/PB	MC of top 25mm layer, %	-	40
Optimum Moisture Content:	25.7%	Dry Density, kg/m ³	1496	
Maximum Dry Density kg/m ³ :	1493	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	ia	Swell, %	2.683	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0		0.000	0.000	
0.64	0.025		0.075	0.083	
1.27	0.050		0.137	0.166	
1.91	0.075		0.193	0.248	
2.54	0.100		0.241	0.317	
3.18	0.125		0.288	0.372	
3.81	0.150		0.310	0.414	
4.45	0.175		0.340	0.443	
5.08	0.200		0.352	0.476	
6.35	0.250		0.379	0.512	
7.62	0.300		0.393	0.552	
8.89	0.350		0.407	0.579	
10.16	0.400		0.414	0.607	



CBR @ 95% MDD = 3.9

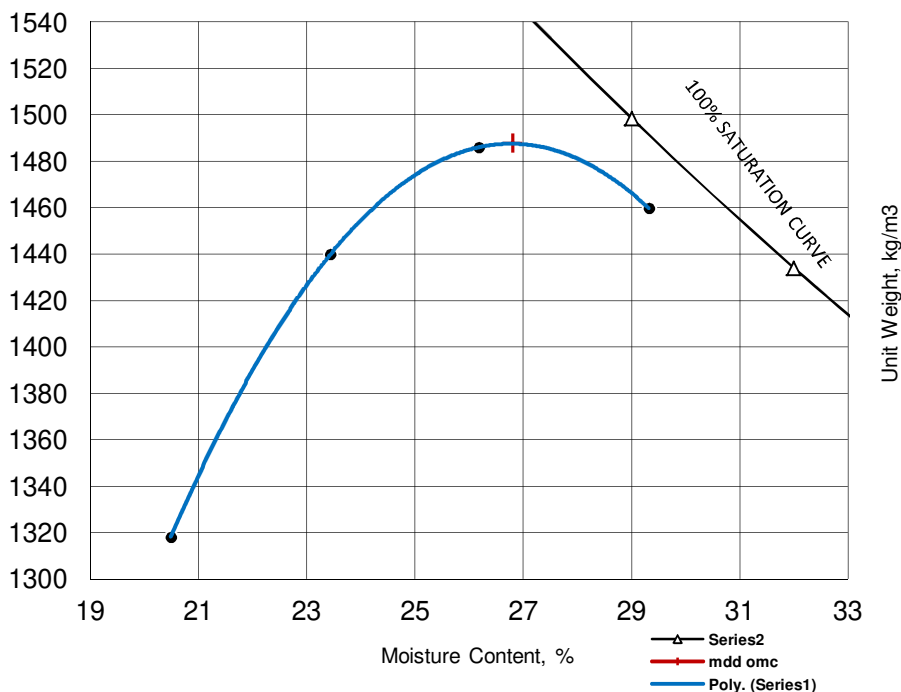
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	2
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	1-Mar-21	Date Received:	1-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	16-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use Maximum Size: . Material Supplier TH3 Material Source				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
Wet Density		1588	1778	1875	1888	0	
Moisture Content		20.5	23.4	26.2	29.3	0.0	
Dry Density		1318	1440	1486	1460	0	

Moisture - Density Relationship



Maximum Dry Density (MDD):
1488 kg/m³
Optimum Moisture Content
26.8 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
26.8 %
Corrected Maximum Dry Density:
1488 kg/m³

Remarks:

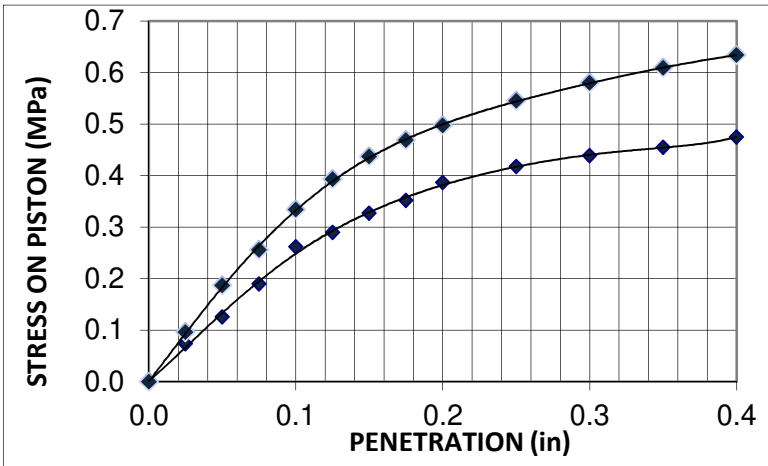
Tested by: ia

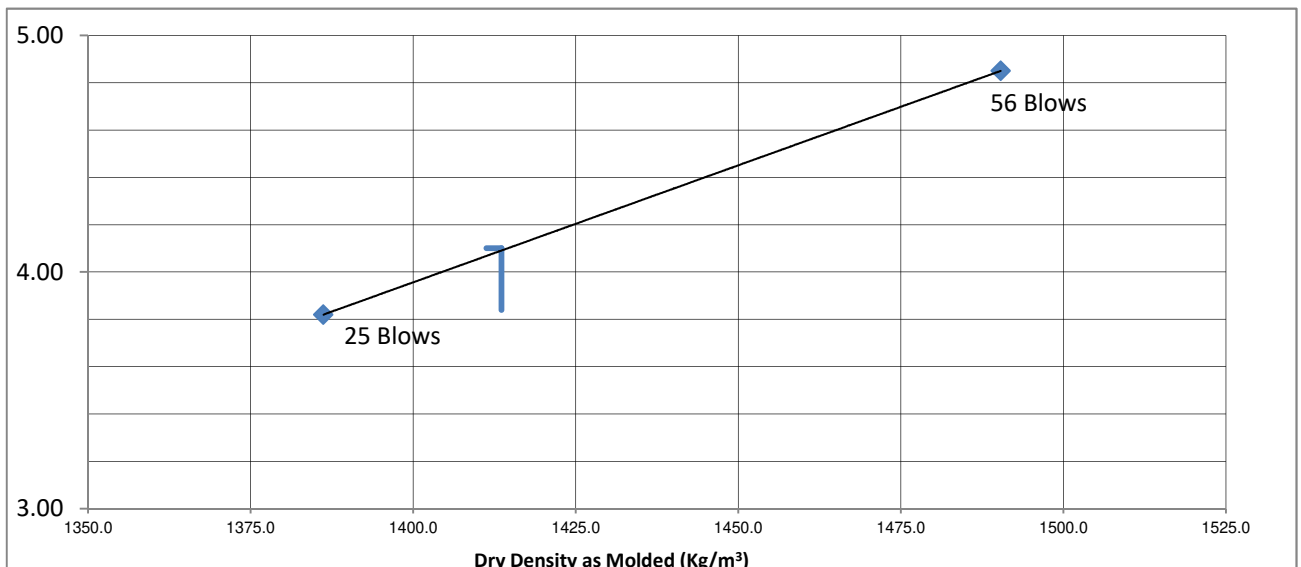
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	2
PROJECT:	2021-2022 University Crescent Pavement Renewals	DATE RECEIVED :	1-Mar-21
		DATE TESTED :	20-Mar-21
		TESTED BY:	ia

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 3	Moisture Content (MC), %	27.0	-
Sampled by:	ET/PB	MC of top 25mm layer, %	-	33.4
Optimum Moisture Content:	26.8%	Dry Density, kg/m ³	1490	
Maximum Dry Density kg/m ³ :	1488	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	ia	Swell, %	2.378	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0		0.000	0.000	
0.64	0.025		0.074	0.096	
1.27	0.050		0.126	0.187	
1.91	0.075		0.190	0.256	
2.54	0.100		0.262	0.334	
3.18	0.125		0.290	0.393	
3.81	0.150		0.327	0.437	
4.45	0.175		0.352	0.469	
5.08	0.200		0.387	0.497	
6.35	0.250		0.418	0.545	
7.62	0.300		0.439	0.580	
8.89	0.350		0.455	0.609	
10.16	0.400		0.475	0.634	



CBR @ 95% MDD = 4.1

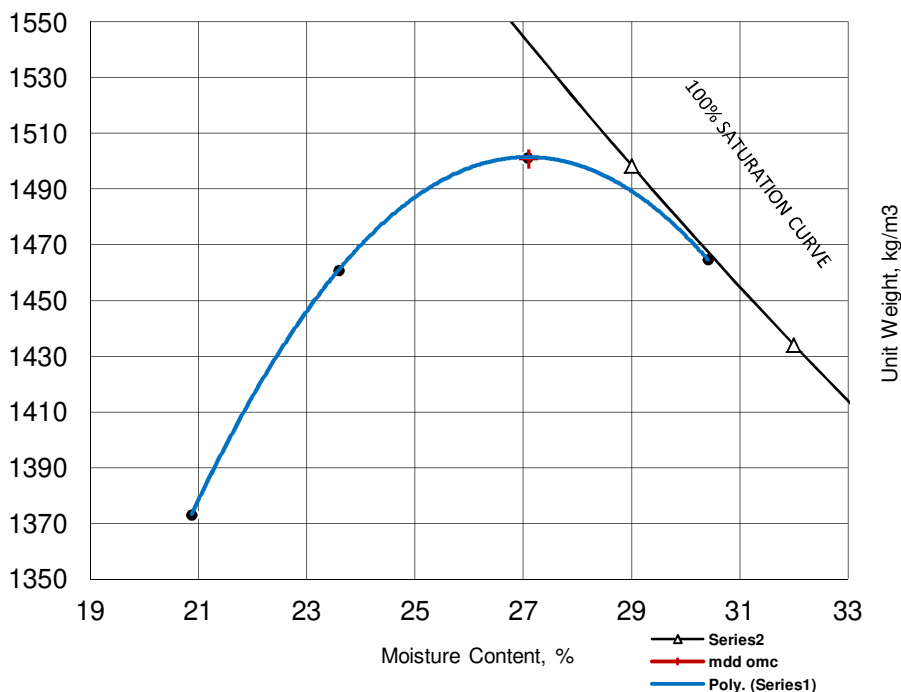
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	3
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	1-Mar-21	Date Received:	1-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	16-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use Maximum Size: . Material Supplier TH5 Material Source				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
	Wet Density	1660	1805	1908	1910		
	Moisture Content	20.9	23.6	27.1	30.4		
	Dry Density	1373	1461	1501	1465		

Moisture - Density Relationship



Maximum Dry Density (MDD):
1501 kg/m³
Optimum Moisture Content
27.1 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
27.1 %
Corrected Maximum Dry Density:
1501 kg/m³

Remarks:

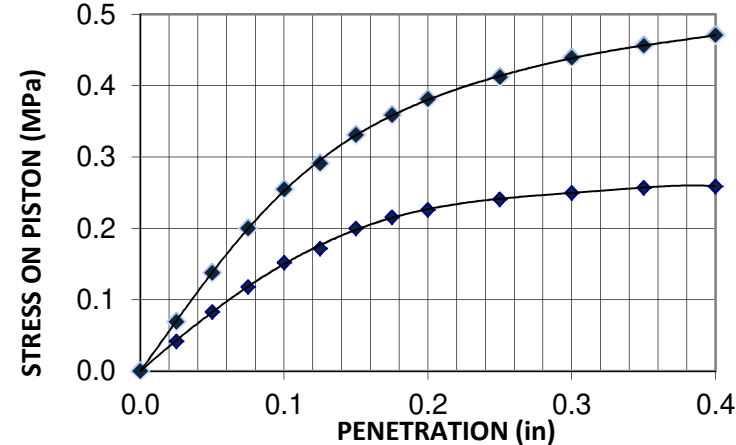
Tested by: ia

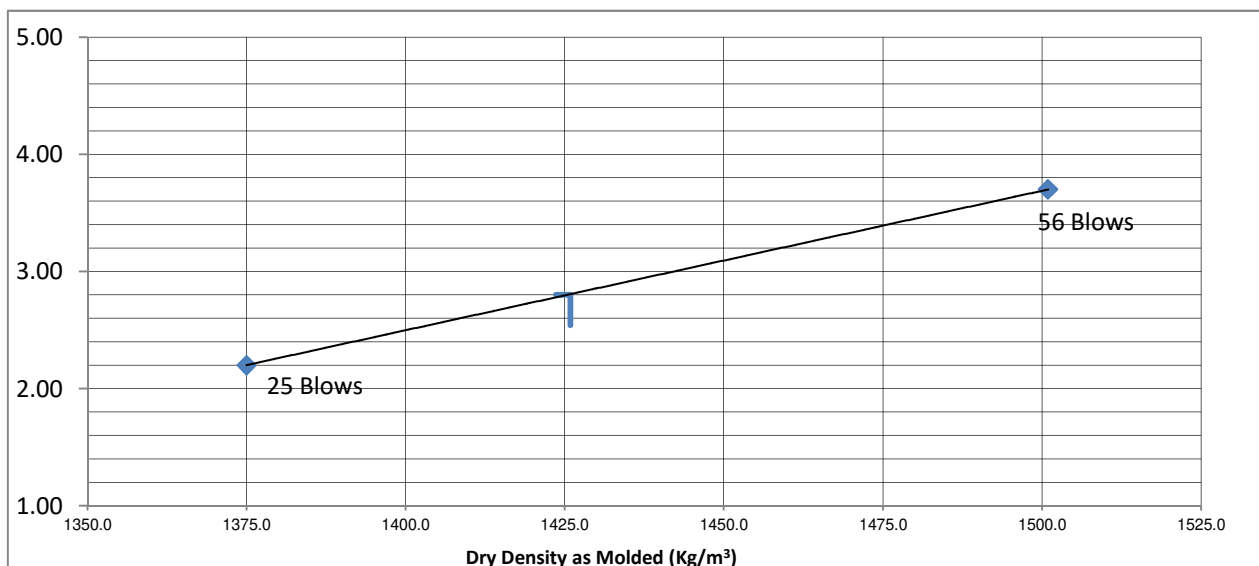
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	3
PROJECT:	2021-2022 University Crescent Pavement Renewals	DATE RECEIVED :	1-Mar-21
		DATE TESTED :	20-Mar-21
		TESTED BY:	ia

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 5	Moisture Content (MC), %	27.0	-
Sampled by:	ET/PB	MC of top 25mm layer, %	-	38.8
Optimum Moisture Content:	27.1%	Dry Density, kg/m ³	1505	
Maximum Dry Density kg/m ³ :	1501	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	ia	Swell, %	2.487	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0				
0.64	0.025	0.000	0.000	0.000	
1.27	0.050	0.042	0.069	0.138	
1.91	0.075	0.083	0.138	0.200	
2.54	0.100	0.118	0.200	0.255	
3.18	0.125	0.152	0.255	0.291	
3.81	0.150	0.172	0.291	0.331	
4.45	0.175	0.200	0.331	0.359	
5.08	0.200	0.216	0.359	0.381	
6.35	0.250	0.226	0.381	0.412	
7.62	0.300	0.241	0.412	0.439	
8.89	0.350	0.250	0.439	0.456	
10.16	0.400	0.257	0.456	0.471	
		0.259	0.471		



CBR @ 95% MDD = 2.8

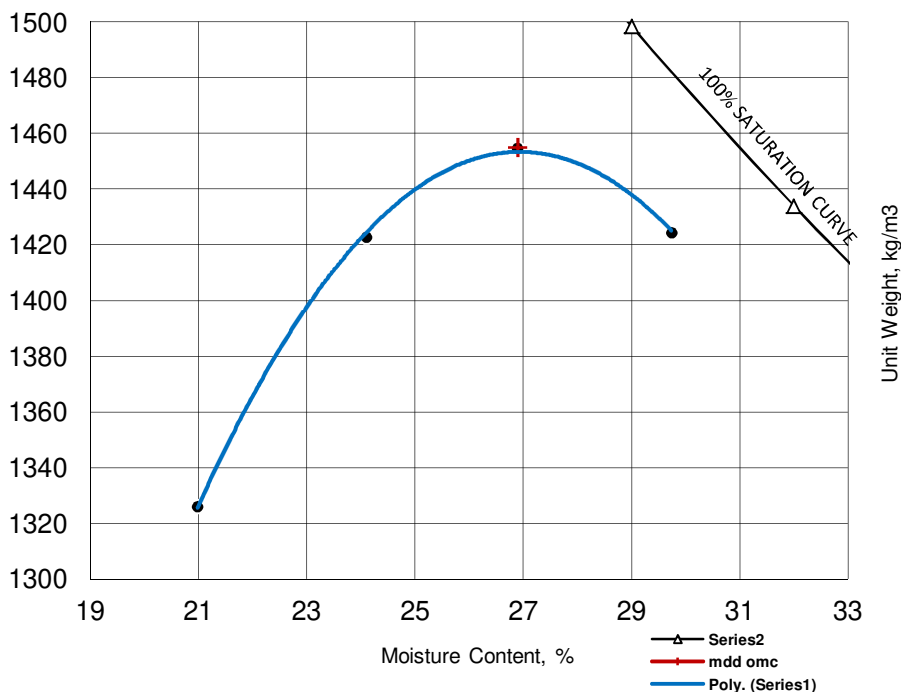
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	4
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	1-Mar-21	Date Received:	1-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	11-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use Maximum Size: . Material Supplier . Material Source TH 7				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
Wet Density		1604	1766	1846	1848		
Moisture Content		21.0	24.1	26.9	29.7		
Dry Density		1326	1423	1455	1425		

Moisture - Density Relationship



Maximum Dry Density (MDD):
1455 kg/m³
Optimum Moisture Content
26.9 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
26.9 %
Corrected Maximum Dry Density:
1455 kg/m³

Remarks:

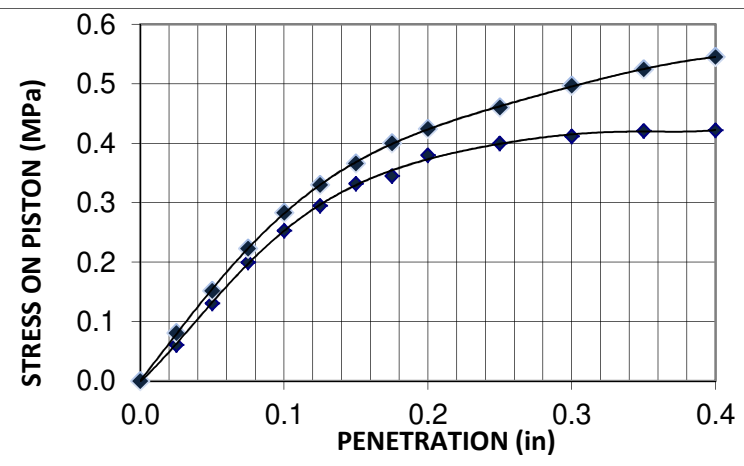
Tested by: ia

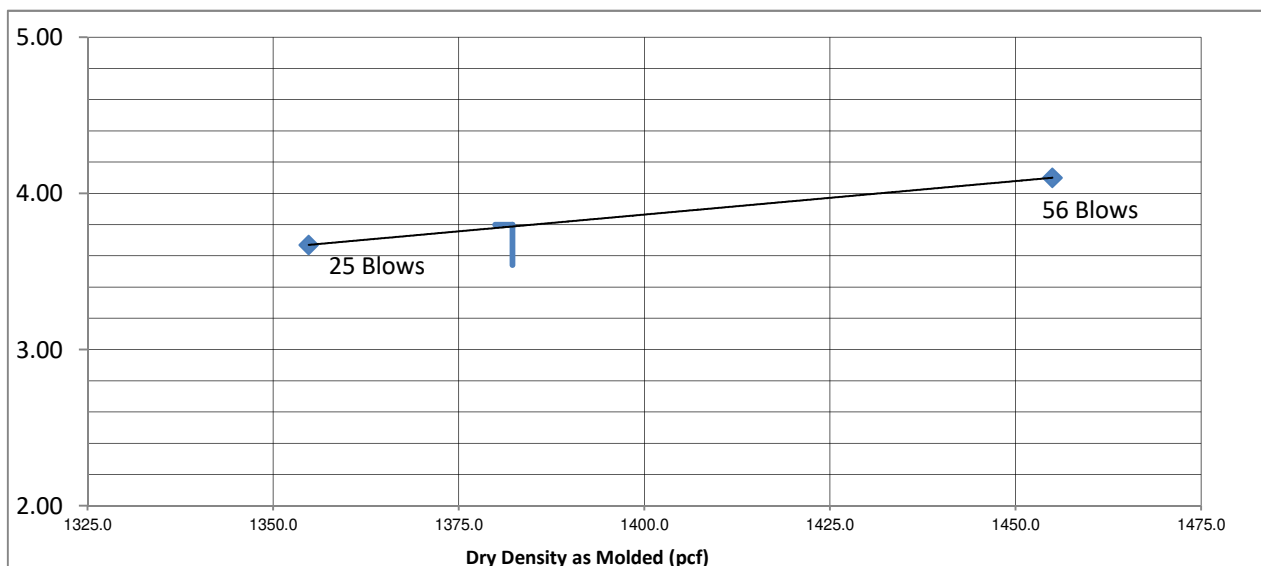
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	4
PROJECT:	2021-2022 University Crescent Pavement Renewals	DATE RECEIVED :	1-Mar-21
		DATE TESTED :	16-Mar-21
		TESTED BY:	

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 7	Moisture Content (MC), %	27	-
Sampled by:	ET/PB	MC of top 25mm layer, %	-	40.1
Optimum Moisture Content:	26.9%	Dry Density, kg/m ³	1458	
Maximum Dry Density kg/m ³ :	1455	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	ia	Swell, %	2.727	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0	0.000	0.000	0.000	
0.64	0.025	0.061	0.081	0.131	
1.27	0.050	0.131	0.152	0.200	
1.91	0.075	0.200	0.223	0.253	
2.54	0.100	0.253	0.283	0.295	
3.18	0.125	0.295	0.330	0.332	
3.81	0.150	0.332	0.366	0.345	
4.45	0.175	0.345	0.400	0.380	
5.08	0.200	0.380	0.424	0.400	
6.35	0.250	0.400	0.460	0.412	
7.62	0.300	0.412	0.497	0.421	
8.89	0.350	0.421	0.524	0.422	
10.16	0.400	0.422	0.545		



CBR @95% MDD - 3.8

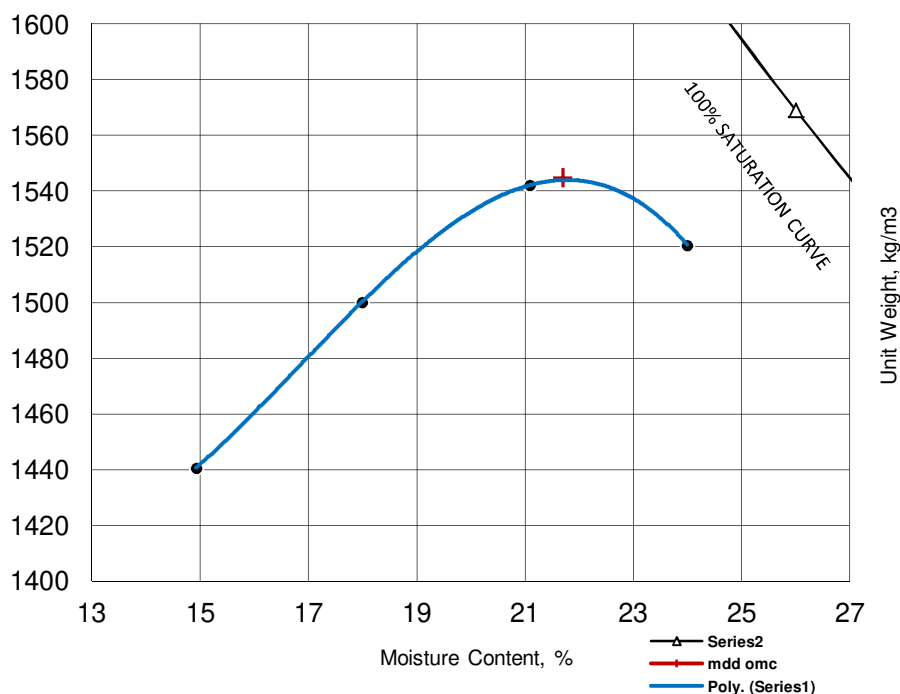
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	5
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	1-Mar-21	Date Received:	1-Mar-21	PROCEDURE	A
Sampled By:	PB	Date Tested	11-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use Maximum Size: . Material Supplier TH 9 Material Source				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
Wet Density		1656	1770	1867	1886		
Moisture Content		14.9	18.0	21.1	24.0		
Dry Density		1441	1500	1542	1521		

Moisture - Density Relationship



Maximum Dry Density (MDD):
1545 kg/m³
Optimum Moisture Content
21.7 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
21.7 %
Corrected Maximum Dry Density:
1545 kg/m³

Remarks:

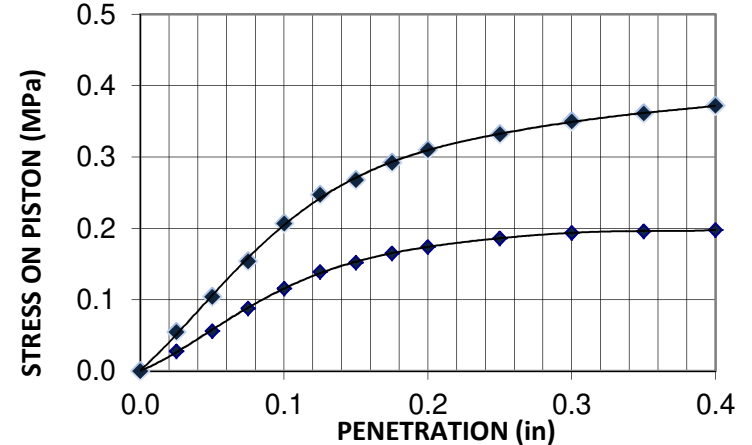
Tested by: ia

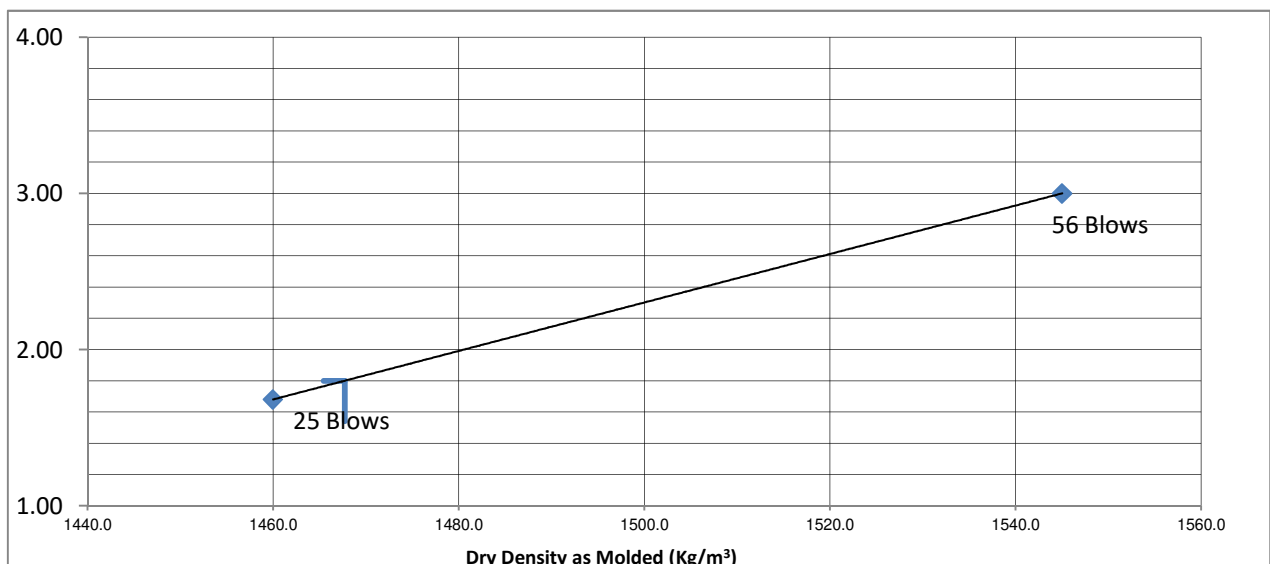
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	5
PROJECT:	2021-2022 University Crescent	DATE RECEIVED :	1-Mar-21
LOCATION	Pavement Renewals	DATE TESTED :	16-Mar-21
		TESTED BY:	IA/ET

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 9	Moisture Content (MC), %	21.9	-
Sampled by:	PB	MC of top 25mm layer, %	-	44
Optimum Moisture Content:	21.7%	Dry Density, kg/m ³	1545	
Maximum Dry Density kg/m ³ :	1545	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	IA	Swell, %	2.574	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0				
0.64	0.025	0.000	0.000	0.000	
1.27	0.050	0.028	0.055	0.104	
1.91	0.075	0.056	0.104	0.154	
2.54	0.100	0.088	0.154	0.207	
3.18	0.125	0.116	0.207	0.247	
3.81	0.150	0.139	0.247	0.268	
4.45	0.175	0.152	0.268	0.292	
5.08	0.200	0.165	0.292	0.310	
6.35	0.250	0.174	0.310	0.332	
7.62	0.300	0.186	0.332	0.350	
8.89	0.350	0.194	0.350	0.361	
10.16	0.400	0.196	0.361	0.372	
		0.198	0.372		



CBR @ 95% MDD = 1.8

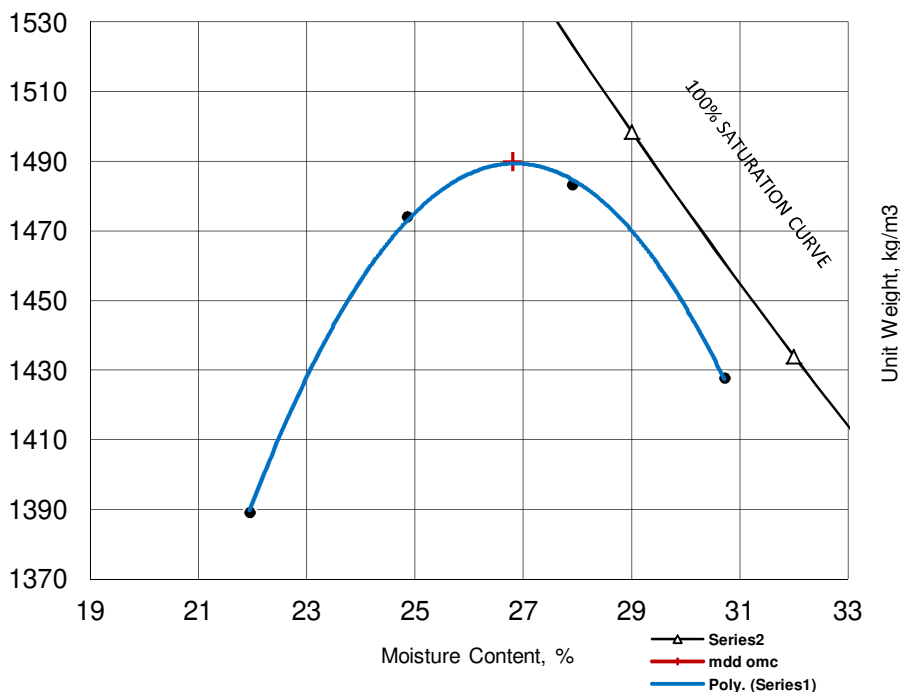
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	6
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	2-Mar-21	Date Received:	2-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	16-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use Maximum Size: . Material Supplier TH11 Material Source				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
	Wet Density	1694	1841	1897	1866	0	
	Moisture Content	21.9	24.9	27.9	30.7	0.0	
	Dry Density	1389	1474	1483	1428	0	

Moisture - Density Relationship



Maximum Dry Density (MDD):
1490 kg/m³
Optimum Moisture Content
26.8 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
26.8 %
Corrected Maximum Dry Density:
1490 kg/m³

Remarks:

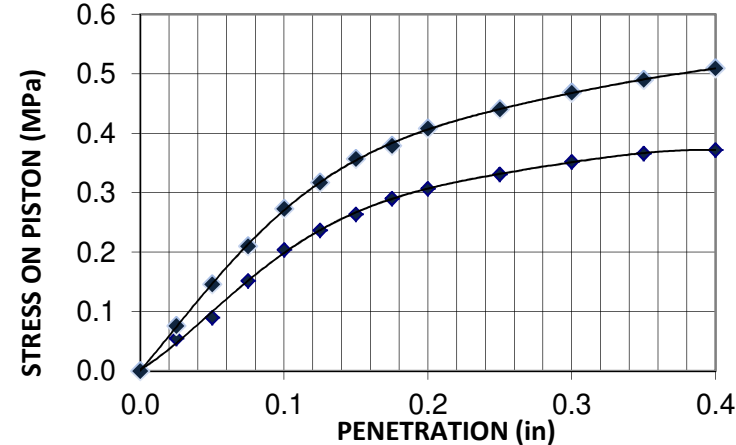
Tested by: ia

Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	6
PROJECT:	2021-2022 University Crescent	DATE RECEIVED :	2-Mar-21
LOCATION	Pavement Renewals	DATE TESTED :	20-Mar-21
		TESTED BY:	ia

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 11	Moisture Content (MC), %	27.0	-
Sampled by:	ET/PB	MC of top 25mm layer, %	-	35.6
Optimum Moisture Content:	26.8%	Dry Density, kg/m ³	1490	
Maximum Dry Density kg/m ³ :	1490	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	ia	Swell, %	2.400	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0				
0.64	0.025	0.000	0.000	0.000	
1.27	0.050	0.055	0.076	0.146	
1.91	0.075	0.090	0.146	0.210	
2.54	0.100	0.152	0.210	0.273	
3.18	0.125	0.204	0.273	0.317	
3.81	0.150	0.237	0.317	0.357	
4.45	0.175	0.264	0.357	0.379	
5.08	0.200	0.290	0.379	0.408	
6.35	0.250	0.307	0.408	0.440	
7.62	0.300	0.331	0.440	0.468	
8.89	0.350	0.352	0.468	0.490	
10.16	0.400	0.366	0.490	0.509	
		0.372	0.509		



CBR @ 95% MDD = 3.1

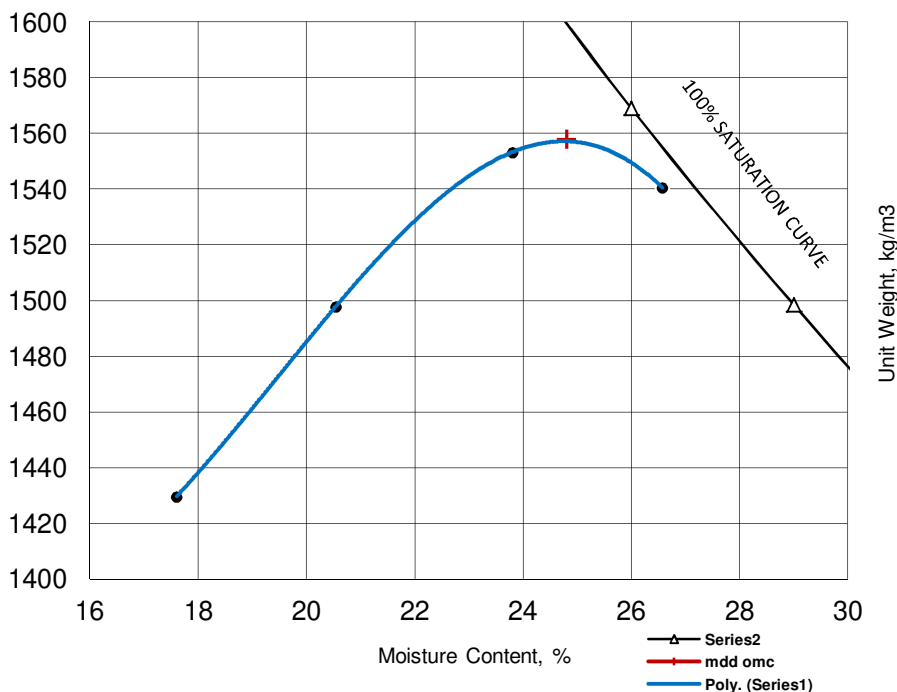
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	7
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	2-Mar-21	Date Received:	2-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	16-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
Material Type:	Clay	Material Supplier	.	WEIGHT OF HAMMER	2.5 kg
Material Use		Material Source	TH 13		
Maximum Size:	.				

	Test No.	1	2	3	4	5	
	Wet Density	1681	1805	1923	1950	0	
	Moisture Content	17.6	20.5	23.8	26.6	0.0	
	Dry Density	1430	1498	1553	1540	0	

Moisture - Density Relationship



Maximum Dry Density (MDD):
1558 kg/m³
Optimum Moisture Content
24.8 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
24.8 %
Corrected Maximum Dry Density:
1558 kg/m³

Remarks:

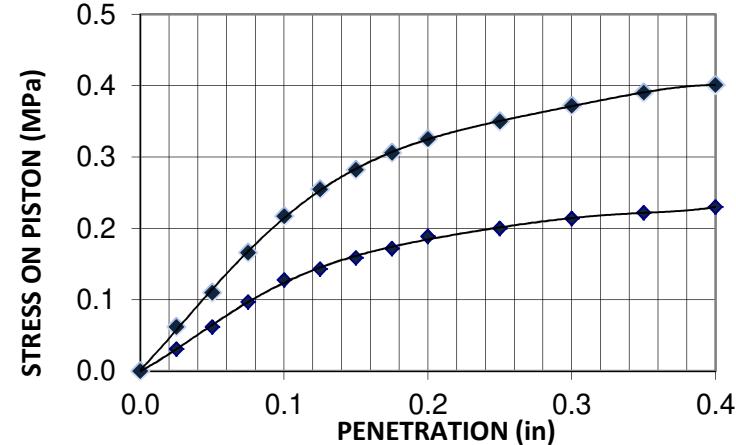
Tested by: ia

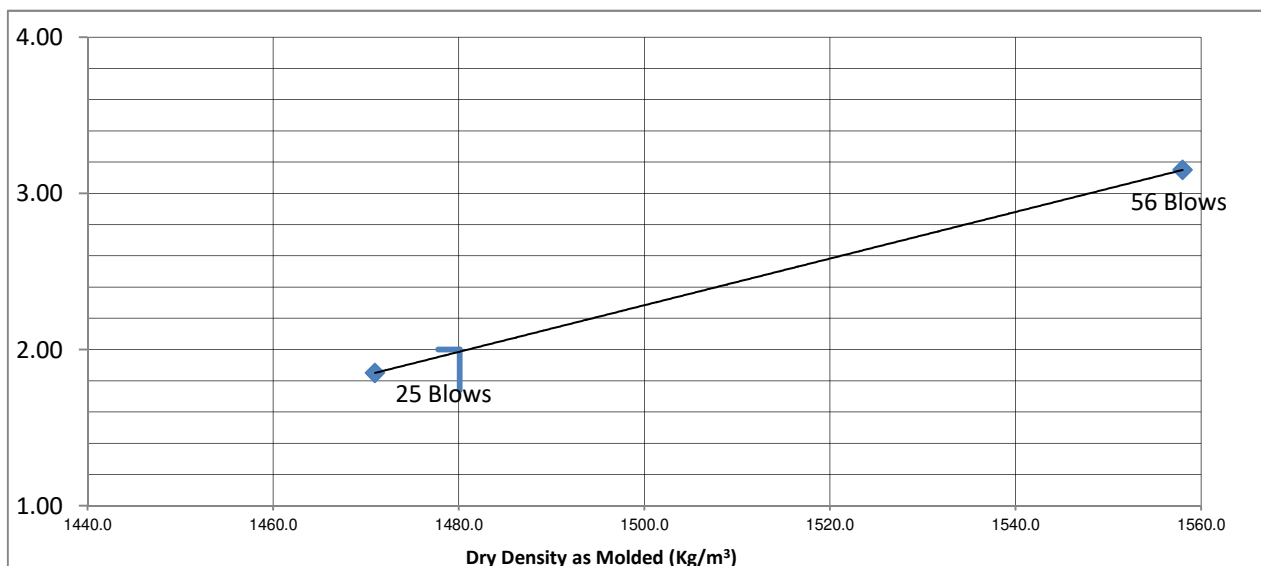
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM	PROJECT NO.:	112-2101
	99 Commerce Drive	TEST NO.:	7
	Winnipeg, MB R3P 0Y7		
ATTENTION:	Ryan Cunningham	DATE RECEIVED :	2-Mar-21
PROJECT:	2021-2022 University Crescent	DATE TESTED :	20-Mar-21
LOCATION	Pavement Renewals	TESTED BY:	IA

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 13	Moisture Content (MC), %	24.6	-
Sampled by:	ET/PB	MC of top 25mm layer, %	-	35.3
Optimum Moisture Content:	24.8%	Dry Density, kg/m ³	1558	
Maximum Dry Density kg/m ³ :	1558	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	IA	Swell, %	2.334	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0				
0.64	0.025	0.000	0.000	0.000	
1.27	0.050	0.031	0.062	0.110	
1.91	0.075	0.062	0.110	0.166	
2.54	0.100	0.097	0.166	0.217	
3.18	0.125	0.128	0.217	0.255	
3.81	0.150	0.143	0.255	0.282	
4.45	0.175	0.159	0.282	0.306	
5.08	0.200	0.172	0.306	0.325	
6.35	0.250	0.189	0.325	0.350	
7.62	0.300	0.200	0.350	0.372	
8.89	0.350	0.214	0.372	0.390	
10.16	0.400	0.222	0.390	0.401	
		0.230	0.401		



CBR @ 95% MDD = 2.0

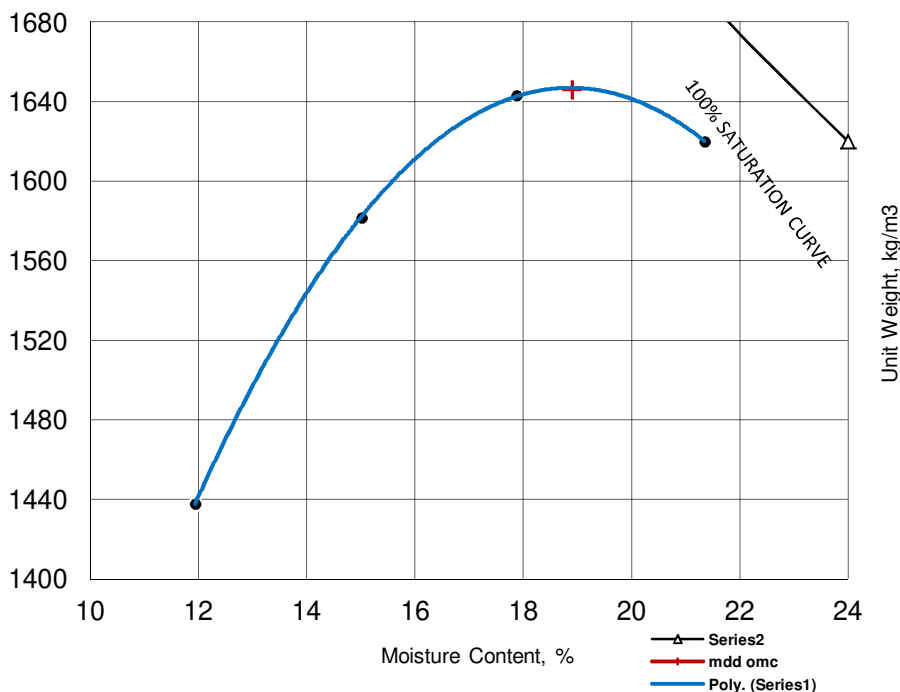
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	8
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	Date Received:	PROCEDURE	A
Sampled By: PB	Date Tested 11-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION		COMPACTION METHOD	Manual
		BLOWS PER LAYER	25
		NO. OF LAYERS	3
		MOLD SIZE	100
		MOLD VOLUME	935
Material Type: Clay	Material Supplier .	WEIGHT OF HAMMER	2.5 kg
Material Use	Material Source TH15		
Maximum Size: .			

	Test No.	1	2	3	4	5	
	Wet Density	1610	1819	1937	1966		
	Moisture Content	11.9	15.0	17.9	21.4		
	Dry Density	1438	1582	1643	1620		

Moisture - Density Relationship



Maximum Dry Density (MDD):
1646 kg/m³
Optimum Moisture Content
18.9 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
18.9 %
Corrected Maximum Dry Density:
1646 kg/m³

Remarks:

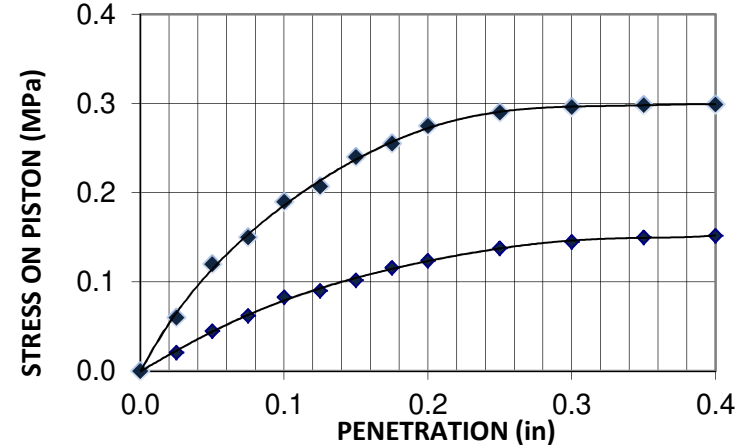
Tested by: ia

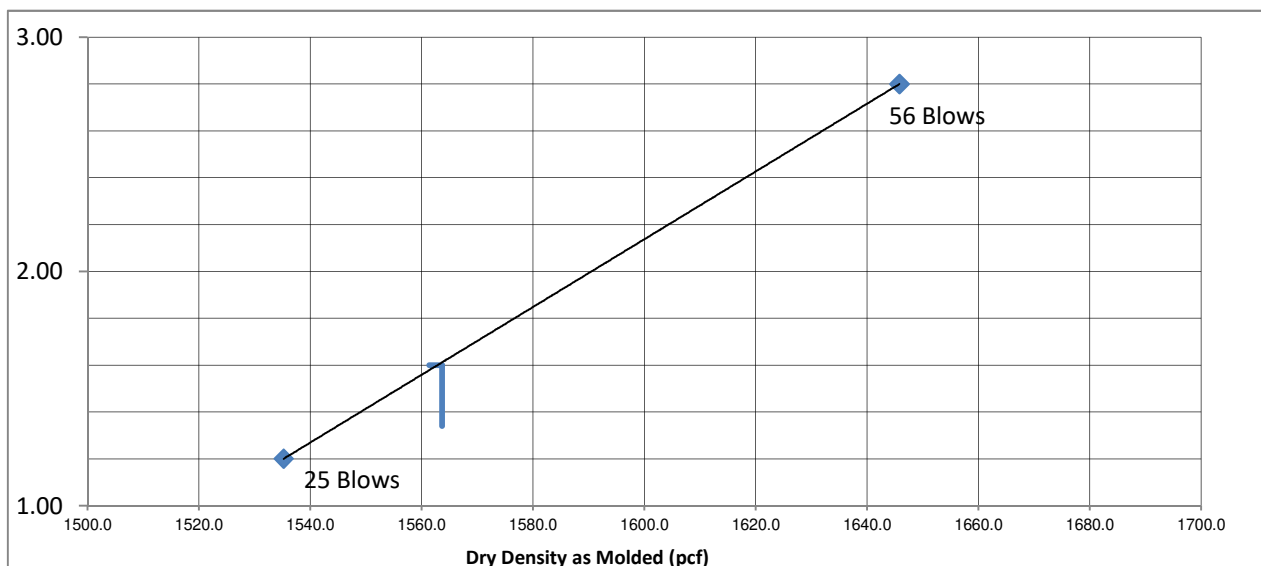
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM	PROJECT NO.:	112-2101
	99 Commerce Drive	TEST NO.:	8
	Winnipeg, MB R3P 0Y7		
ATTENTION:	Ryan Cunningham	DATE RECEIVED :	2-Mar-21
PROJECT:	2021-2022 University Crescent	DATE TESTED :	16-Mar-21
LOCATION	Pavement Renewals	TESTED BY:	IA

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 15	Moisture Content (MC), %	19	-
Sampled by:	PB	MC of top 25mm layer, %	-	23.6
Optimum Moisture Content:	18.9%	Dry Density, kg/m ³	1648	
Maximum Dry Density kg/m ³ :	1646	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	IA	Swell, %	2.312	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0				
0.64	0.025	0.000	0.000	0.000	
1.27	0.050	0.021	0.060	0.060	
1.91	0.075	0.045	0.120	0.120	
2.54	0.100	0.062	0.150	0.150	
3.18	0.125	0.083	0.190	0.190	
3.81	0.150	0.090	0.207	0.207	
4.45	0.175	0.102	0.240	0.240	
5.08	0.200	0.116	0.255	0.255	
6.35	0.250	0.124	0.275	0.275	
7.62	0.300	0.138	0.290	0.290	
8.89	0.350	0.145	0.296	0.296	
10.16	0.400	0.150	0.298	0.298	
		0.152	0.299	0.299	



CBR @95% MDD = 1.6

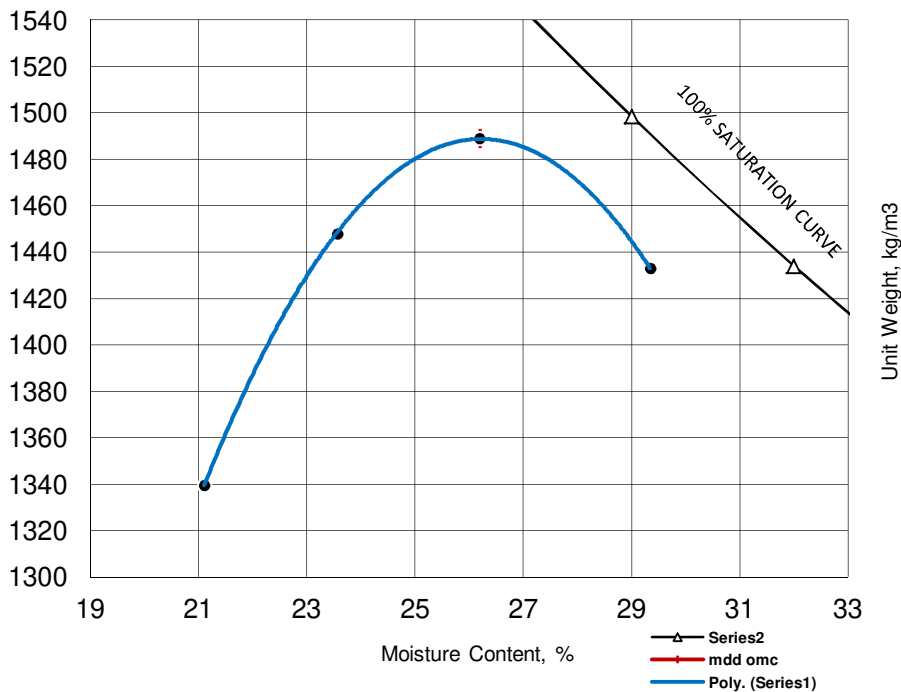
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	9
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	2-Mar-21	Date Received:	2-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	16-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use - Material Supplier TH 16 Maximum Size: - Material Source -				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
Wet Density		1622	1789	1879	1853	0	
Moisture Content		21.1	23.6	26.2	29.3	0.0	
Dry Density		1340	1448	1489	1433	0	

Moisture - Density Relationship



Maximum Dry Density (MDD):
1489 kg/m³
Optimum Moisture Content
26.2 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
26.2 %
Corrected Maximum Dry Density:
1489 kg/m³

Remarks:

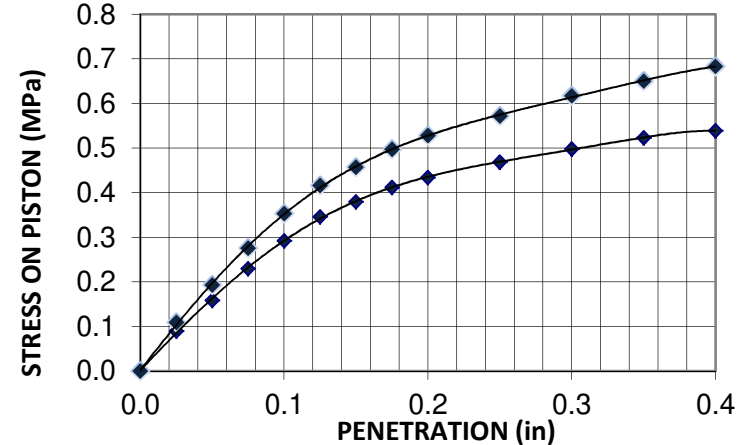
Tested by: ia

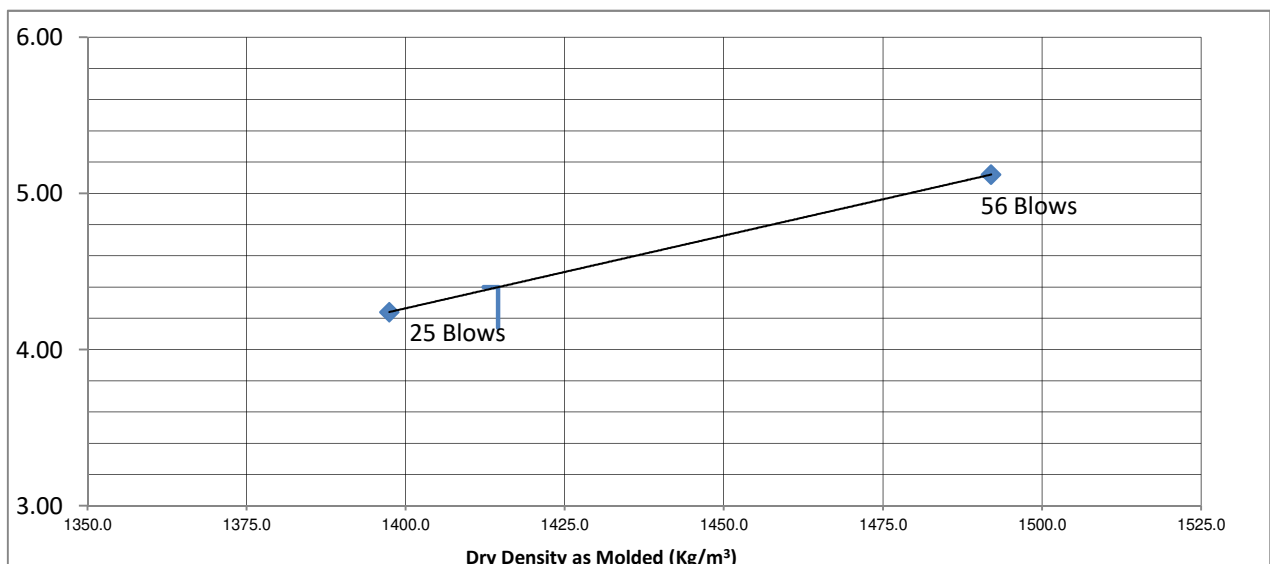
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	9
PROJECT:	2021-2022 University Crescent	DATE RECEIVED :	2-Mar-21
LOCATION	Pavement Renewals	DATE TESTED :	20-Mar-21
		TESTED BY:	IA

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH 16	Moisture Content (MC), %	26.4	-
Sampled by:	ET/PB	MC of top 25mm layer, %	-	31.7
Optimum Moisture Content:	26.2%	Dry Density, kg/m ³	1492	
Maximum Dry Density kg/m ³ :	1489	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	ia	Swell, %	2.334	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0				
0.64	0.025	0.000	0.000	0.000	
1.27	0.050	0.090	0.109	0.109	
1.91	0.075	0.159	0.193	0.193	
2.54	0.100	0.230	0.276	0.276	
3.18	0.125	0.292	0.353	0.353	
3.81	0.150	0.346	0.416	0.416	
4.45	0.175	0.380	0.457	0.457	
5.08	0.200	0.412	0.497	0.497	
5.62	0.225	0.434	0.528	0.528	
6.35	0.250	0.469	0.572	0.572	
7.62	0.300	0.498	0.617	0.617	
8.89	0.350	0.523	0.650	0.650	
10.16	0.400	0.539	0.683	0.683	



CBR @ 95% MDD = 4.4

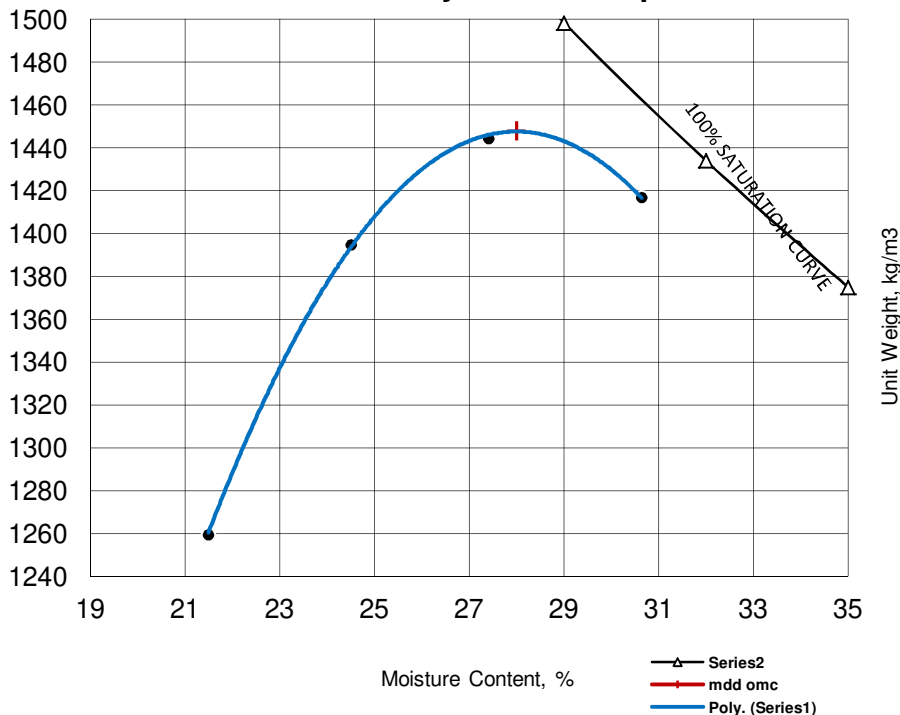
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive Winnipeg, MB. R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	10
PROJECT:	2021-2022 University Crescent Pavement Renewals		

Date Sampled	2-Mar-21	Date Received:	2-Mar-21	PROCEDURE	A
Sampled By:	ET/PB	Date Tested	16-Mar-21	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use Maximum Size: . Material Supplier Material Source TH 19				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4	5	
Wet Density		1530	1737	1841	1851		
Moisture Content		21.5	24.5	27.4	30.6		
Dry Density		1260	1395	1445	1417		

Moisture - Density Relationship



Maximum Dry Density (MDD):
1448 kg/m³
Optimum Moisture Content
28.0 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75 mm sieve:
0 %
Corrected Moisture:
28.0 %
Corrected Maximum Dry Density:
1448 kg/m³

Remarks:

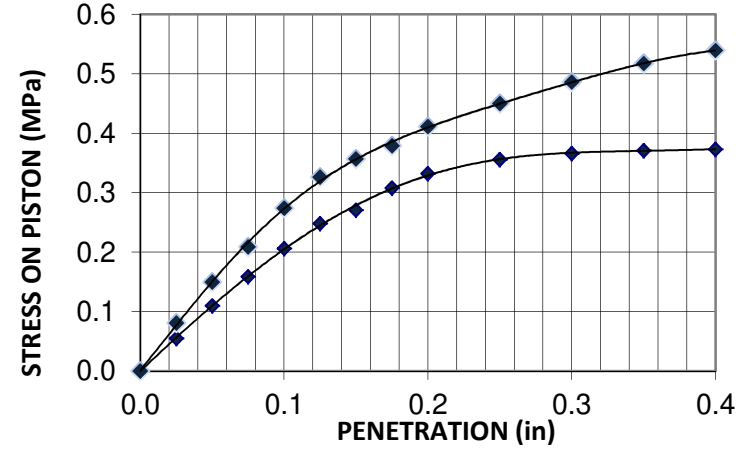
Tested by: ia

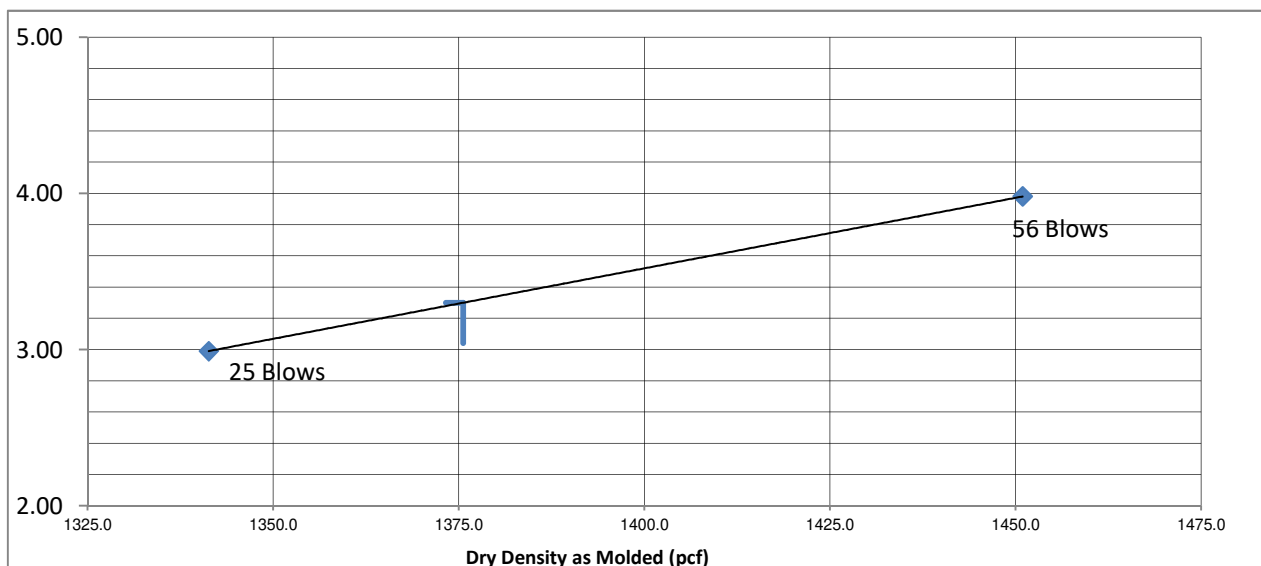
Reviewed By: Hermie Manalo

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

CLIENT:	AECOM 99 Commerce Drive Winnipeg, MB R3P 0Y7	PROJECT NO.:	112-2101
ATTENTION:	Ryan Cunningham	TEST NO.:	10
PROJECT:	2021-2022 University Crescent	DATE RECEIVED :	2-Mar-21
LOCATION	Pavement Renewals	DATE TESTED :	20-Mar-21
		TESTED BY:	IA

SAMPLE DATA		SPECIMEN DATA		
Sample ID:	CLAY	DESCRIPTION	Before Soaking	After Testing
Source:	TH/19	Moisture Content (MC), %	28	-
Sampled by:	PB	MC of top 25mm layer, %	-	38.4
Optimum Moisture Content:	28.0%	Dry Density, kg/m ³	1451	
Maximum Dry Density kg/m ³ :	1448	Compaction, %		
Method of Compaction:	Standard Proctor	Surcharge Weight, grams	4506	
Proctor Tested by:	ia	Swell, %	2.640	

DISPLACEMENT		STRESS			LOAD PENETRATION CURVE
mm	in	10 Blows	25 Blows	56 Blows	
0	0				
0.64	0.025	0.000	0.000	0.000	
1.27	0.050	0.055	0.081	0.110	
1.91	0.075	0.110	0.150	0.159	
2.54	0.100	0.159	0.209	0.206	
3.18	0.125	0.206	0.274	0.248	
3.81	0.150	0.248	0.326	0.271	
4.45	0.175	0.271	0.357	0.308	
5.08	0.200	0.308	0.379	0.332	
6.35	0.250	0.332	0.411	0.356	
7.62	0.300	0.356	0.450	0.366	
8.89	0.350	0.366	0.486	0.371	
10.16	0.400	0.371	0.517	0.373	
		0.373	0.539		



CBR @95% MDD - 3.8

CITY OF WINNIPEG UNIVERSITY CRESCENT

Prepared for

Blair Cockrell,
AECOM
99 Commerce Drive,
Winnipeg, Canada. R3P 0Y7

March 11, 2024

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INTRODUCTION

On February 2, 2024, H. Manalo Consulting Ltd. (HMCL) received authorization from Blair Cockrell, representing AECOM, to proceed with the scope of work of Soil Classification at University Crescent between Thatcher Drive and Dysart Road.

FIELD WORK PROGRAM

The investigation program was performed following the general guidelines for road renewal construction. On February 2, 2024, six test hole locations, from Thatcher Drive and Dysart Road were marked by Kade Cote from AECOM. Prior to any subsurface work, underground services were located and traffic lane closure was requested. At some location, the desired test hole location had to be moved from 1.2m to 3m to comply with the safe zones of the underground utilities. The test holes were augured using a truck mounted geotechnical test hole drill rig on February 27, 2024. During the drilling, the soil profile was logged by Jaehang Jeong, EIT. Samples up to 6 meters depth were collected at every 0.3m and at every change of soil type. The test holes were back filled with bentonite clay, auger cuttings and gravel. All soil samples were returned to HMCL Laboratory for further review.

SAMPLE REVIEW AND DATA REPORTING

The top soil thickness is around 600 mm. The general profile below the surface consists of silt and clay material followed silty, high plastic clay. At some locations, traces of granular material are also found. The details of the soil profile and moisture content can be found on the test hole logs attached in Appendix B and Appendix C, respectively.

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

Prepared By:



Mayumi Kawano

Material Technologist

Reviewed by:

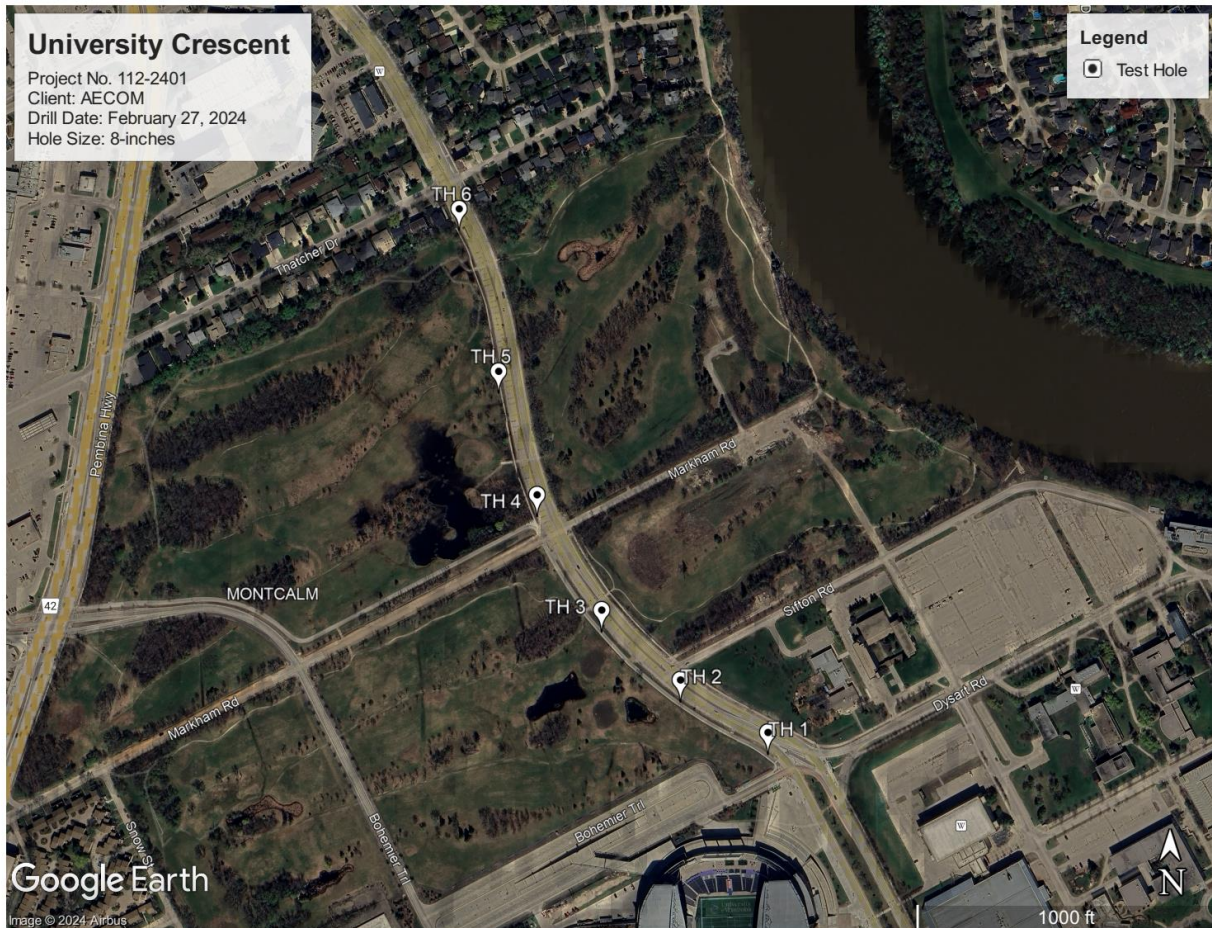


Paul Bevel

Field and Laboratory Manager

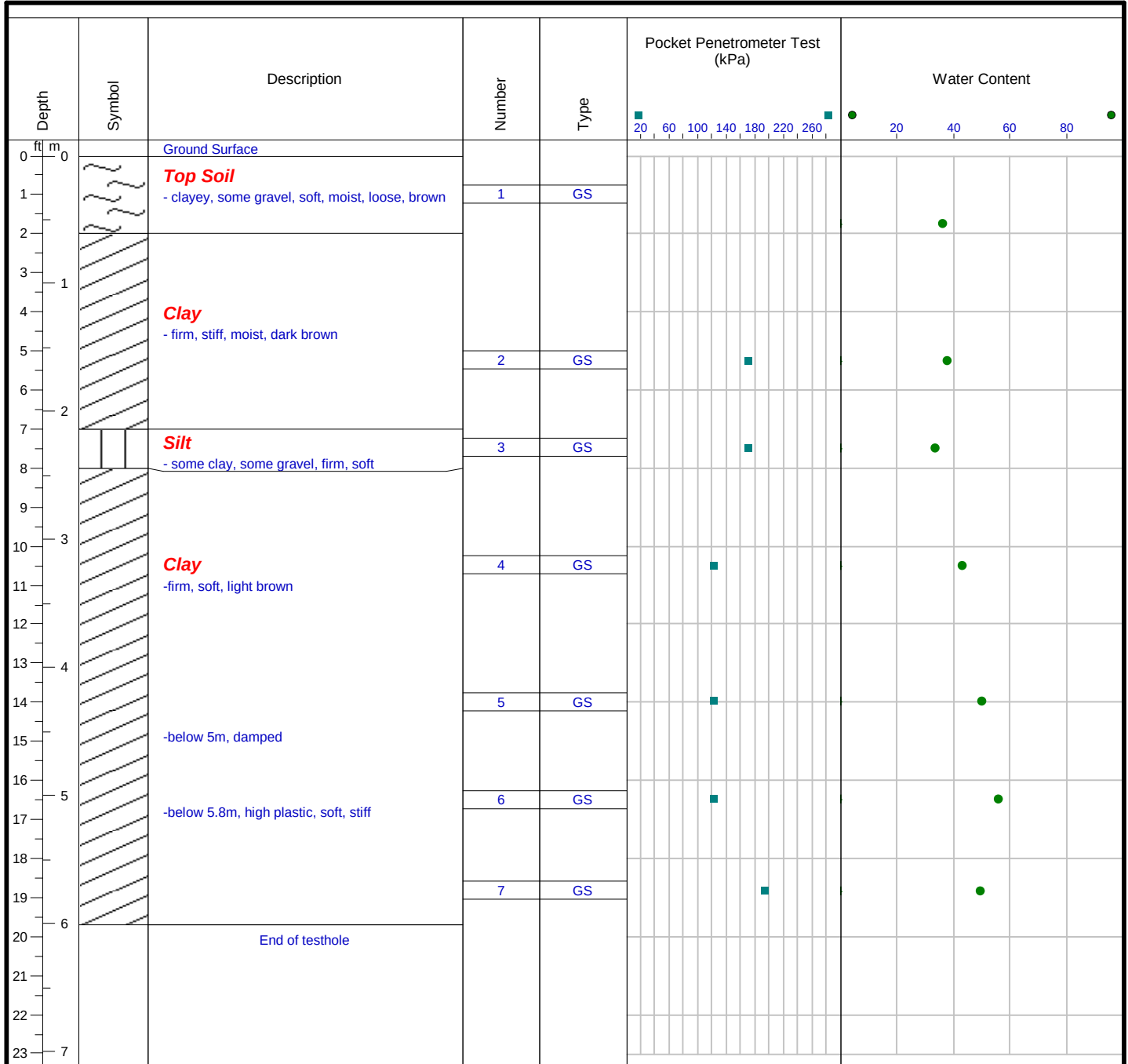
Appendix A

Test Hole Location



Appendix B

Test Hole Logs



Drill Method: Augering Boring

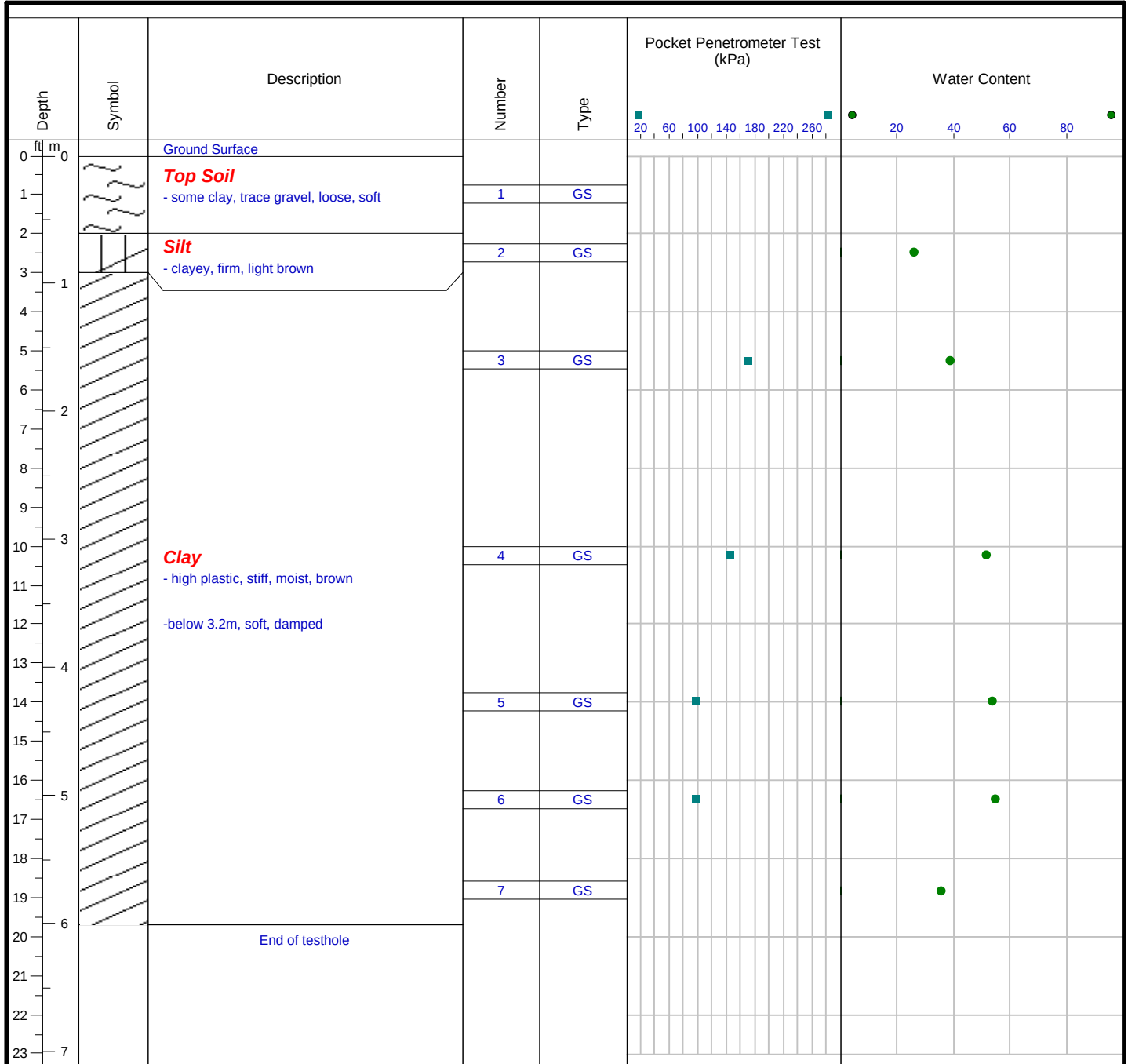
Drill Date: February 27, 2024

Hole Size: 8 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger Boring

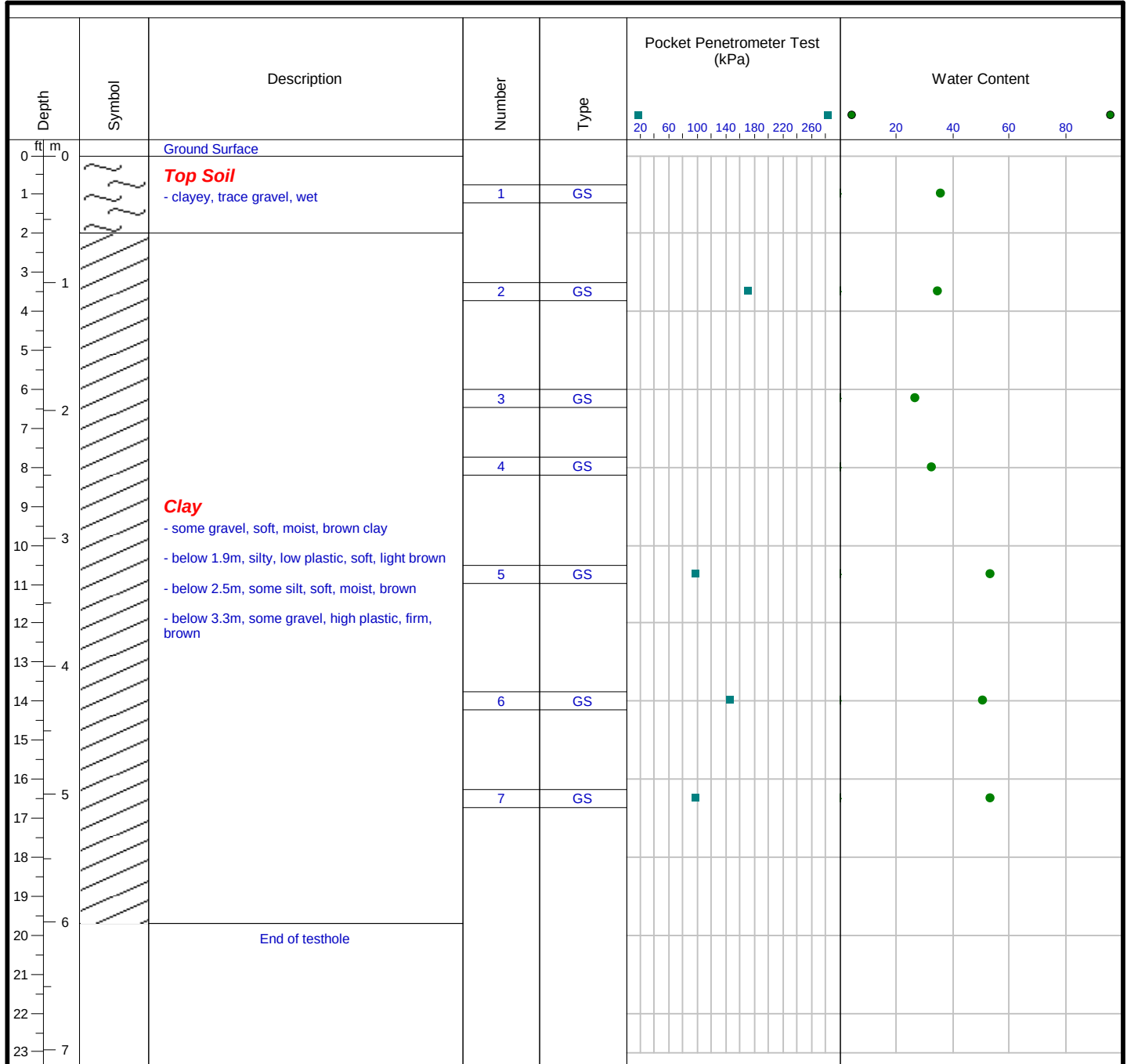
Drill Date: February 27, 2024

Hole Size: 8 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger Boring

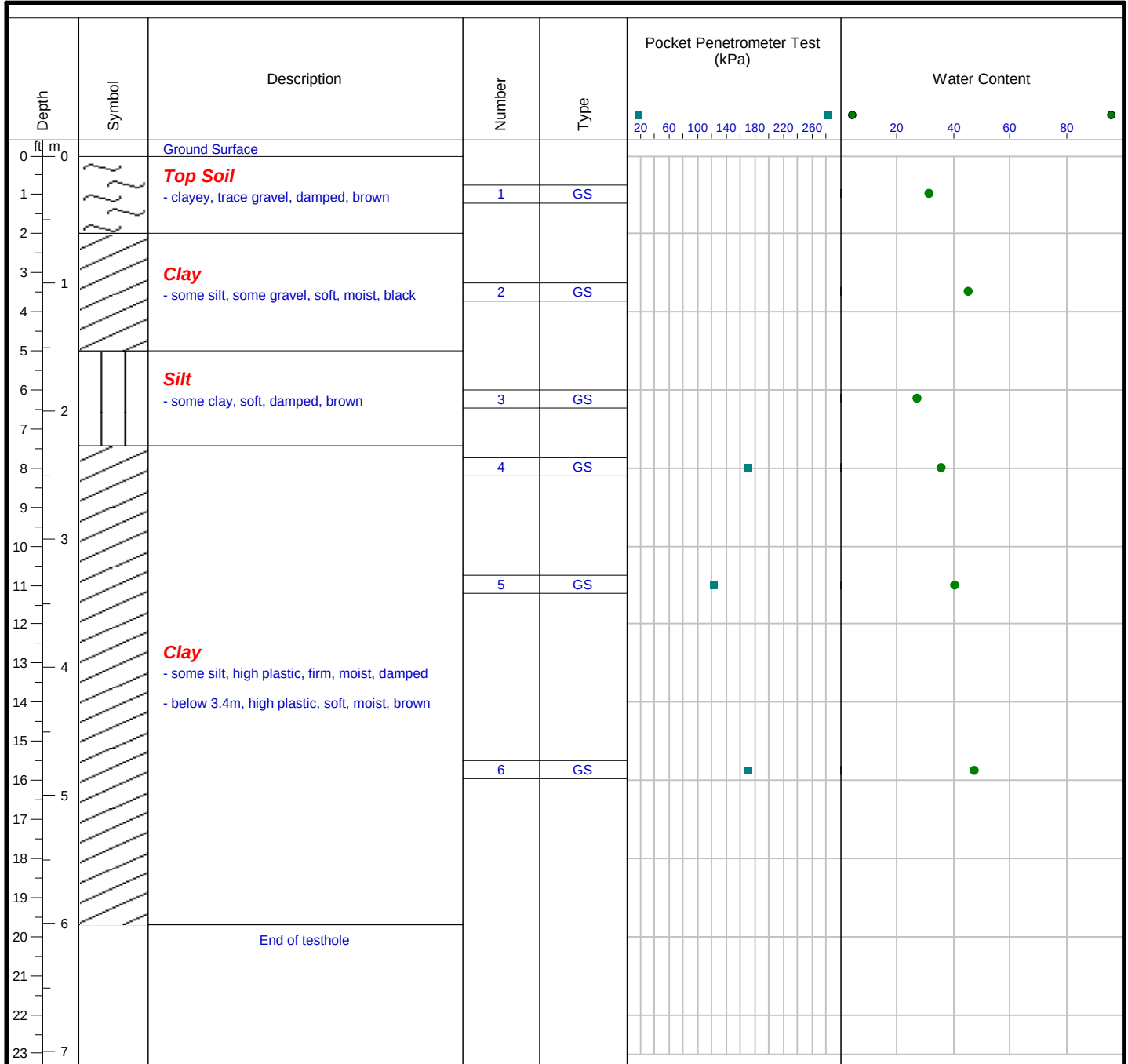
Drill Date: February 27, 2024

Hole Size: 8 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger Boring

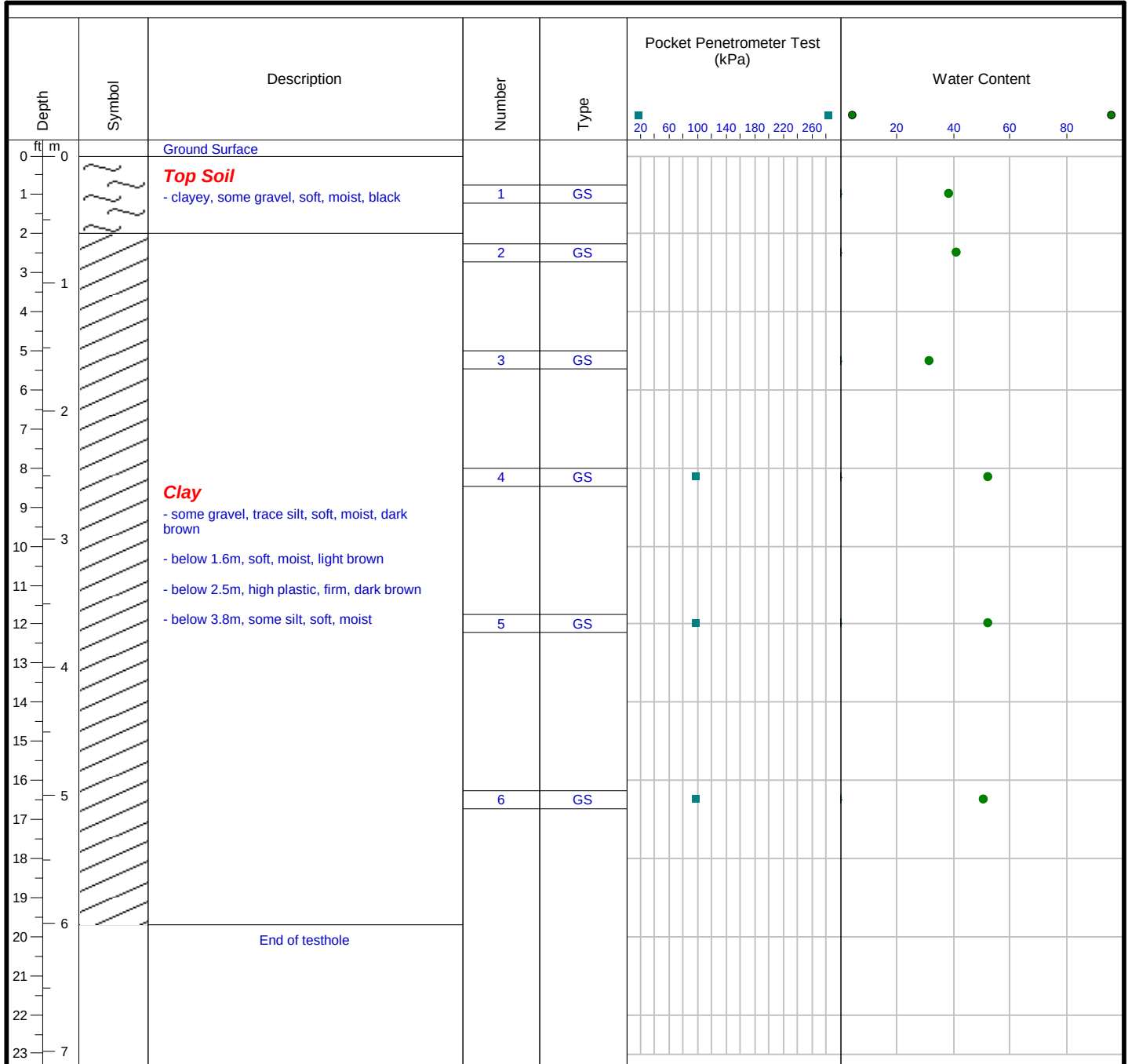
Drill Date: February 27 2024

Hole Size: 8 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger Boring

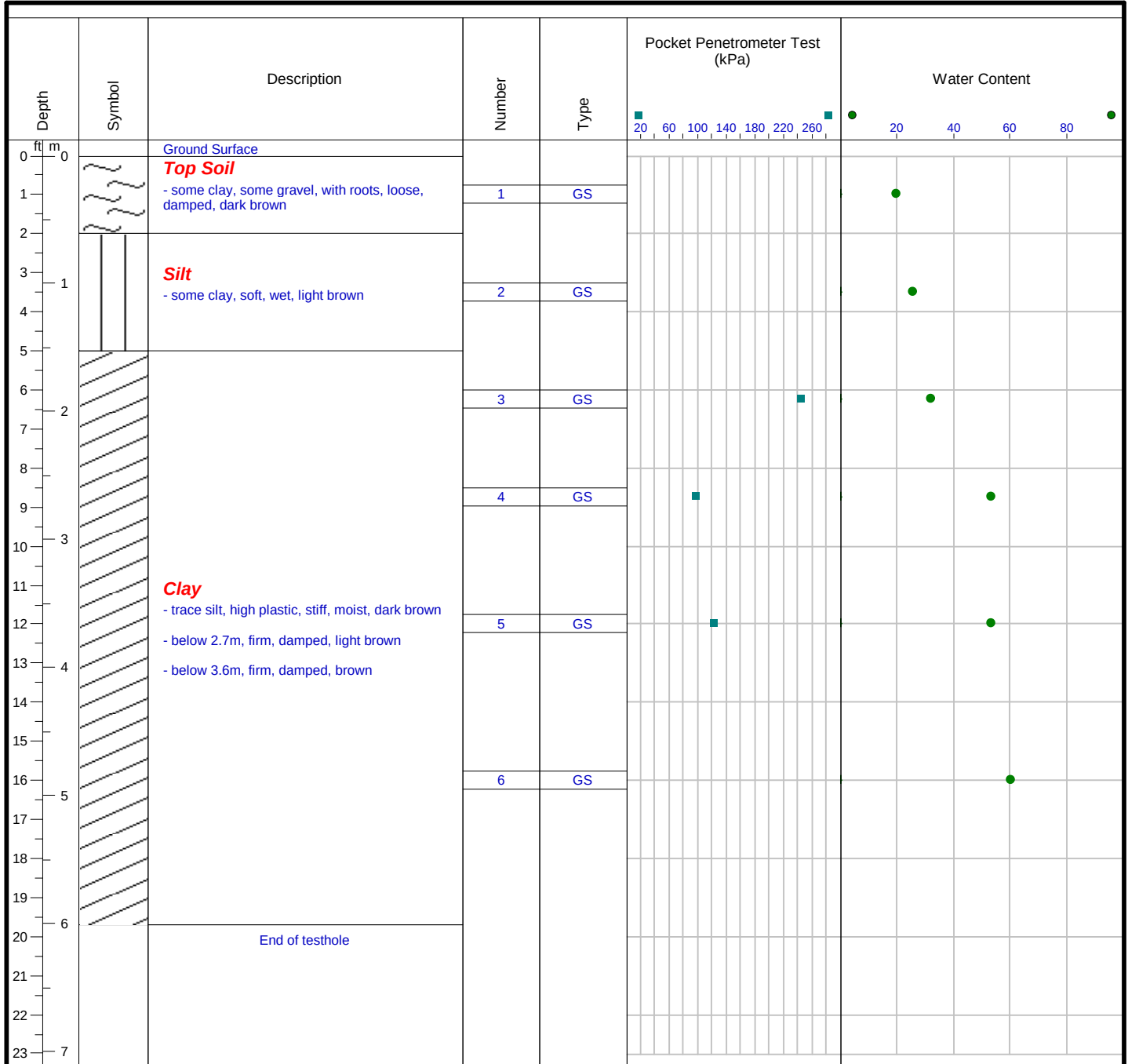
Drill Date: February 27, 2024

Hole Size: 8 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger Boring

Drill Date: February 27, 2024

Hole Size: 8 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1

Appendix C

Laboratory Testing – Moisture Content

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No:	112-2401
Attention:	Blair Cockrell	Test No.:	1
Project:	Test Holes on University Crescent	Lab No.:	HM 59
		Date Sampled/By:	Feb. 27, 2024 ECS & JJ
		Date Received:	Feb. 27, 2024
		Date Tested / By:	Feb. 29, 2024 M. Kawano

Test Hole No.	TH 1	TH 1	TH 1	TH 1	TH 1
Depth	2'	3.5'	7'	8'	13'
Tare No.	59	M15	M12	M51	M44
Wt Wet Sample + Tare	154.6	252.5	213.8	195.2	222.3
Wt Dry Sample + Tare	114.5	184.3	160.7	137.7	149.4
Wt Water	40.1	68.2	53.1	57.5	72.9
Wt Tare	4.4	4.6	4.5	5.1	4.7
Wt Dry Sample	110.1	179.7	156.2	132.6	144.7
Moisture Content (%)	36.4	38.0	34.0	43.4	50.4
Test Hole No.	TH 1	TH 1	TH 1	TH 2	TH 2
Depth	15'	18'	2'	3'	7.5'
Tare No.	BR22	KP1	M42	C	T200
Wt Wet Sample + Tare	199.8	229.9	238.6	241	224.3
Wt Dry Sample + Tare	129.7	155	187.2	191.5	162.7
Wt Water	70.1	74.9	51.4	49.5	61.6
Wt Tare	4.7	4.4	4.7	4.3	4.7
Wt Dry Sample	125.0	150.6	182.5	187.2	158.0
Moisture Content (%)	56.1	49.7	28.2	26.4	39.0
Test Hole No.	TH 2	TH 2	TH 2	TH 3	TH 3
Depth	13'	15'	18'	2'	5'
Tare No.	J100	M31	M18	J102	A23
Wt Wet Sample + Tare	235	227.7	266.2	209.6	244.5
Wt Dry Sample + Tare	156.2	149.7	173.1	155.5	182.5
Wt Water	78.8	78.0	93.1	54.1	62.0
Wt Tare	3.9	4.7	4.4	3.9	4.6
Wt Dry Sample	152.3	145.0	168.7	151.6	177.9
Moisture Content (%)	51.7	53.8	55.2	35.7	34.9
Test Hole No.	TH 3	TH 3	TH 3	TH 3	TH 3
Depth	7.5'	8.5'	13'	15'	18'
Tare No.	M9	90	M54	M12	SE7
Wt Wet Sample + Tare	242.7	156.8	154.8	181.5	160.3
Wt Dry Sample + Tare	192.6	119.1	102.7	122	106.1
Wt Water	50.1	37.7	52.1	59.5	54.2
Wt Tare	4.8	4.3	4.7	5.0	4.3
Wt Dry Sample	187.8	114.8	98.0	117.0	101.8
Moisture Content (%)	26.7	32.8	53.2	50.9	53.2
Test Hole No.	TH 4	TH 4	TH 4	TH 4	TH 4

Depth	2'	5'	7.5'	8.5'	15'
Tare No.	M39	SE6	6	2B	T40
Wt Wet Sample + Tare	170.9	184.7	241.1	178.2	165.4
Wt Dry Sample + Tare	130.8	128.3	190.2	132.3	119
Wt Water	40.1	56.4	50.9	45.9	46.4
Wt Tare	4.7	4.4	4.4	4.2	4.3
Wt Dry Sample	126.1	123.9	185.8	128.1	114.7
Moisture Content (%)	31.8	45.5	27.4	35.8	40.5
Test Hole No.	TH 4	TH 5	TH 5	TH 5	TH 5
Depth	18'	2'	3'	7.5'	9'
Tare No.	M14	M20	M13	60	M25
Wt Wet Sample + Tare	175	145.2	157.1	160.9	129.8
Wt Dry Sample + Tare	120.1	106.2	112.7	123.1	86.7
Wt Water	54.9	39.0	44.4	37.8	43.1
Wt Tare	4.7	4.6	5.0	4.4	4.4
Wt Dry Sample	115.4	101.6	107.7	118.7	82.3
Moisture Content (%)	47.6	38.4	41.2	31.8	52.4
Test Hole No.	TH 5	TH 5	TH 6	TH 6	TH 6
Depth	15'	18'	2'	5'	7.5'
Tare No.	M36	M6	M46	KD5	BR37
Wt Wet Sample + Tare	168.9	170.8	162.5	148	186.8
Wt Dry Sample + Tare	112.5	114.87	136.1	118.5	142.5
Wt Water	56.4	55.9	26.4	29.5	44.3
Wt Tare	4.8	4.6	5.0	4.5	4.3
Wt Dry Sample	107.7	110.3	131.1	114.0	138.2
Moisture Content (%)	52.4	50.7	20.1	25.9	32.1
Test Hole No.	TH 6	TH 6	TH 6		
Depth	10'	14'	18'		
Tare No.	M1	M50	M4		
Wt Wet Sample + Tare	208.9	177.8	188.7		
Wt Dry Sample + Tare	137.9	117.3	119.4		
Wt Water	71.0	60.5	69.3		
Wt Tare	4.7	4.5	4.7		
Wt Dry Sample	133.2	112.8	114.7		
Moisture Content (%)	53.3	53.6	60.4		