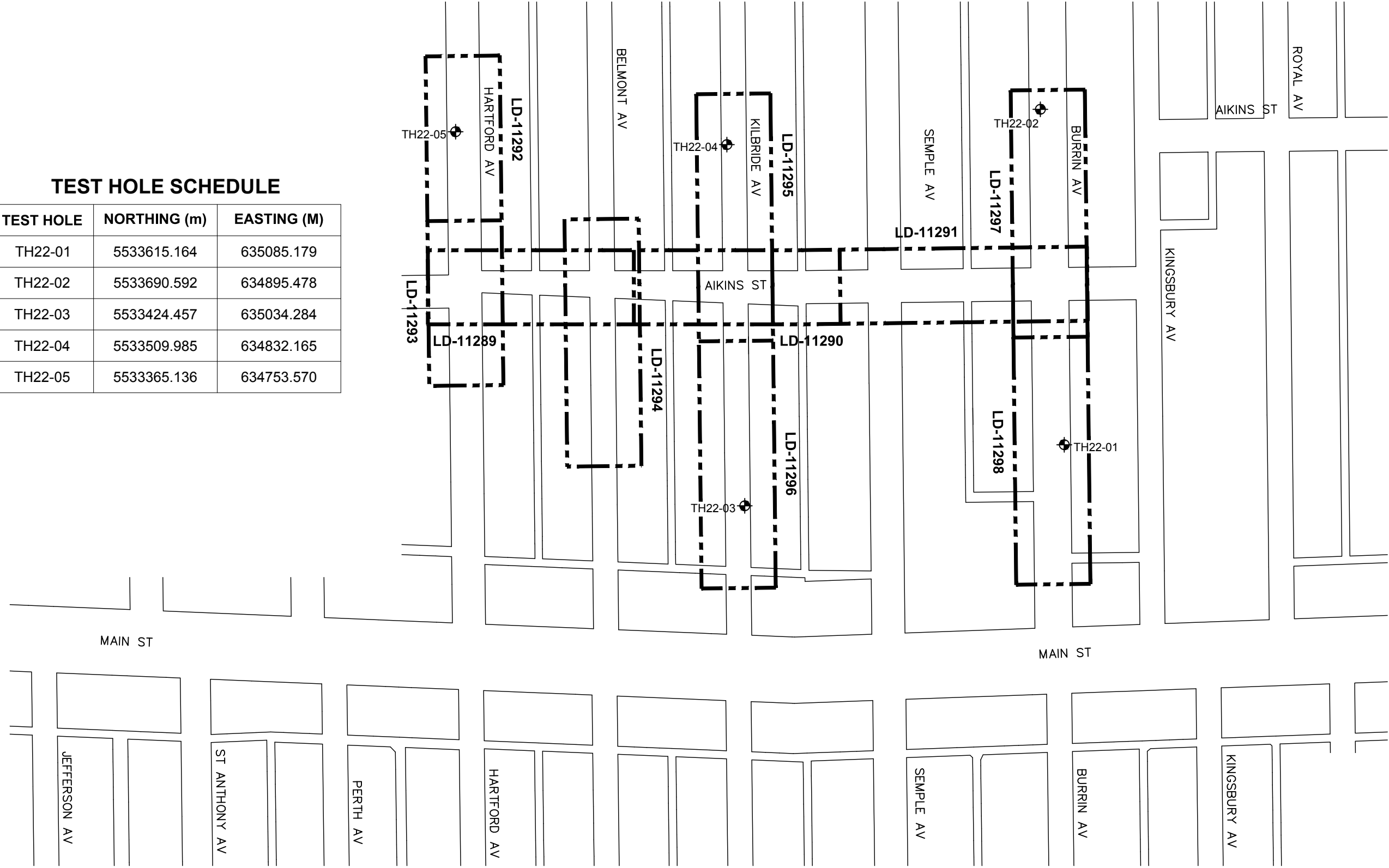


TEST HOLE SCHEDULE

TEST HOLE	NORTHING (m)	EASTING (M)
TH22-01	5533615.164	635085.179
TH22-02	5533690.592	634895.478
TH22-03	5533424.457	635034.284
TH22-04	5533509.985	634832.165
TH22-05	5533365.136	634753.570



AECOM Canada Ltd.

GENERAL STATEMENT

NORMAL VARIABILITY OF SUBSURFACE CONDITIONS

The scope of the investigation presented herein is limited to an investigation of the subsurface conditions as to suitability for the proposed project. This report has been prepared to aid in the evaluation of the site and to assist the engineer in the design of the facilities. Our description of the project represents our understanding of the significant aspects of the project relevant to the design and construction of earth work, foundations and similar. In the event of any changes in the basic design or location of the structures as outlined in this report or plan, we should be given the opportunity to review the changes and to modify or reaffirm in writing the conclusions and recommendations of this report.

The analysis and recommendations presented in this report are based on the data obtained from the borings and test pit excavations made at the locations indicated on the site plans and from other information discussed herein. This report is based on the assumption that the subsurface conditions everywhere are not significantly different from those disclosed by the borings and excavations. However, variations in soil conditions may exist between the excavations and, also, general groundwater levels and conditions may fluctuate from time to time. The nature and extent of the variations may not become evident until construction. If subsurface conditions differ from those encountered in the exploratory borings and excavations, are observed or encountered during construction, or appear to be present beneath or beyond excavations, we should be advised at once so that we can observe and review these conditions and reconsider our recommendations where necessary.

Since it is possible for conditions to vary from those assumed in the analysis and upon which our conclusions and recommendations are based, a contingency fund should be included in the construction budget to allow for the possibility of variations which may result in modification of the design and construction procedures.

In order to observe compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated, we recommend that all construction operations dealing with earth work and the foundations be observed by an experienced soils engineer. We can be retained to provide these services for you during construction. In addition, we can be retained to review the plans and specifications that have been prepared to check for substantial conformance with the conclusions and recommendations contained in our report.

EXPLANATION OF FIELD & LABORATORY TEST DATA

The field and laboratory test results, as shown for each hole, are described below.

1. NATURAL MOISTURE CONTENT

The relationship between the natural moisture content and depth is significant in determining the subsurface moisture conditions. The Atterberg Limits for a sample should be compared to its natural moisture content and plotted on the Plasticity Chart in order to determine the soil classification.

2. SOIL PROFILE AND DESCRIPTION

Each soil stratum is classified and described noting any special conditions. The Modified Unified Classification System (MUCS) is used. The soil profile refers to the existing ground level at the time the hole was done. Where available, the ground elevation is shown. The soil symbols used are shown in detail on the soil classification chart.

3. TESTS ON SOIL SAMPLES

Laboratory and field tests are identified by the following and are on the logs:

- N - Standard Penetration Test (SPT) Blow Count. The SPT is conducted in the field to assess the in-situ consistency of cohesive soils and the relative density of non-cohesive soils. The N value recorded is the number of blows from a 63.5 kg hammer dropped 760 mm which is required to drive a 51 mm split spoon sampler 300 mm into the soil.

- SO₄ - Water Soluble Sulphate Content. Expressed in percent. Conducted primarily to determine requirements for the use of sulphate resistant cement. Further details on the water-soluble sulphate content are given in Section 6.

- γ_D - Dry Unit Weight. Usually expressed in kN/m³.

- γ_T - Total Unit Weight. Usually expressed in kN/m³.

- Q_u - Unconfined Compressive Strength. Usually expressed in kPa and may be used in determining allowable bearing capacity of the soil.

- C_u - Undrained Shear Strength. Usually expressed in kPa. This value is determined by either a direct shear test or by an unconfined compression test and may also be used in determining the allowable bearing capacity of the soil.
- C_{PEN} - Pocket Penetrometer Reading. Usually expressed in kPa. Estimate of the undrained shear strength as determined by a pocket penetrometer.

The following tests may also be performed on selected soil samples and the results are given on separate sheets enclosed with the logs:

- Grain Size Analysis
- Standard or Modified Proctor Compaction Test
- California Bearing Ratio Test
- Direct Shear Test
- Permeability Test
- Consolidation Test
- Triaxial Test

4. SOIL DENSITY AND CONSISTENCY

The SPT test described above may be used to estimate the consistency of cohesive soils and the density of cohesionless soils. These approximate relationships are summarized in the following tables:

Table 1 Cohesive Soils

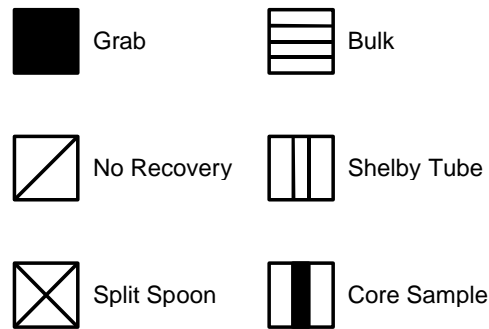
N	Consistency	C _u (kPa) approx.
0 - 1	Very Soft	<10
1 - 4	Soft	10 - 25
4 - 8	Firm	25 - 50
8 - 15	Stiff	50 - 100
15 - 30	Very Stiff	100 - 200
30 - 60	Hard	200 - 300
>60	Very Hard	>300

Table 2 Cohesionless Soils

N	Density
0 - 5	Very Loose
5 - 10	Loose
10 - 30	Compact
30 - 50	Dense
>50	Very Dense

5. SAMPLE CONDITION AND TYPE

The depth, type, and condition of samples are indicated on the logs by the following symbols:



6. WATER SOLUBLE SULPHATE CONCENTRATION

The following table, from CSA Standard A23.1-14, indicates the requirements for concrete subjected to sulphate attack based upon the percentage of water-soluble sulphate as presented on the logs. CSA Standard A23.1-14 should be read in conjunction with the table.

Table 3 Requirements for Concrete Subjected to Sulphate Attack*

Class of exposure	Degree of exposure	Water-soluble sulphate (SO ₄) [†] in soil sample, %	Sulphate (SO ₄) in groundwater samples, mg/L [‡]	Water soluble sulphate (SO ₄) in recycled aggregate sample, %	Cementing materials to be used ^{§††}	Performance requirements ^{§,§§}		
						Maximum expansion when tested using CSA A3004-C8 Procedure A at 23 °C, %		Maximum expansion when tested using CSA A3004-C8 Procedure B at 5 °C, % ^{†††}
						At 6 months	At 12 months ^{††}	At 18 months ^{‡‡}
S-1	Very severe	> 2.0	> 10 000	> 2.0	HS ^{**} , HSb, HSLb ^{***} or HSe	0.05	0.10	0.10
S-2	Severe	0.20–2.0	1500–10 000	0.60–2.0	HS ^{**} , HSb, HSLb ^{***} or HSe	0.05	0.10	0.10
S-3	Moderate (including seawater exposure*)	0.10–0.20	150–1500	0.20–0.60	MS, MSb, MSe, MSLb ^{***} , LH, LHb, HS ^{**} , HSb, HSLb ^{***} or HSe	0.10		0.10

*For sea water exposure, also see Clause 4.1.1.5.

[†]In accordance with CSA A23.2-3B.

[‡]In accordance with CSA A23.2-2B.

[§]Where combinations of supplementary cementing materials and portland or blended hydraulic cements are to be used in the concrete mix design instead of the cementing materials listed, and provided they meet the performance requirements demonstrating equivalent performance against sulphate exposure, they shall be designated as MS equivalent (MSe) or HS equivalent (HSe) in the relevant sulphate exposures (see Clauses 4.1.1.6.2, 4.2.1.1, and 4.2.1.3, and 4.2.1.4).

^{**}Type HS cement shall not be used in reinforced concrete exposed to both chlorides and sulphates, including seawater. See Clause 4.1.1.6.3.

††The requirement for testing at 5 °C does not apply to MS, HS, MSb, HSb, and MSe and HSe combinations made without portland limestone cement.

‡‡ If the increase in expansion between 12 and 18 months exceeds 0.03%, the sulphate expansion at 24 months shall not exceed 0.10% in order for the cement to be deemed to have passed the sulphate resistance requirement.

§§For demonstrating equivalent performance, use the testing frequency in Table 1 of CSA A3004-A1 and see the applicable notes to Table A3 in A3001 with regard to re-establishing compliance if the composition of the cementing materials used to establish compliance changes.

***Where MSLb or HSLb cements are proposed for use, or where MSe or HSe combinations include Portland-limestone cement, they must also contain a minimum of 25% Type F fly ash or 40% slag or 15% metakaolin (meeting Type N pozzolan requirements) or a combination of 5% Type SF silica fume with 25% slag or a combination of 5% Type SF silica fume with 20% Type F fly ash. For some proposed MSLb, HSLb, and MSe or HSe combinations that include Portland-limestone cement, higher SCM replacement levels may be required to meet the A3004-C8 Procedure B expansion limits. Due to the 18-month test period, SCM replacements higher than the identified minimum levels should also be tested. In addition, sulphate resistance testing shall be run on MSLb and HSLb cement and MSe or HSe combinations that include Portland-limestone cement at both 23 °C and 5 °C as specified in the table.

†††If the expansion is greater than 0.05% at 6 months but less than 0.10% at 1 year, the cementing materials combination under test shall be considered to have passed.

7. SOIL CORROSIVITY

The following table, from the Handbook of Corrosion Engineering (Roberge, 1999) indicates the corrosivity rating can be obtained from the soil resistivity, presented on the logs.

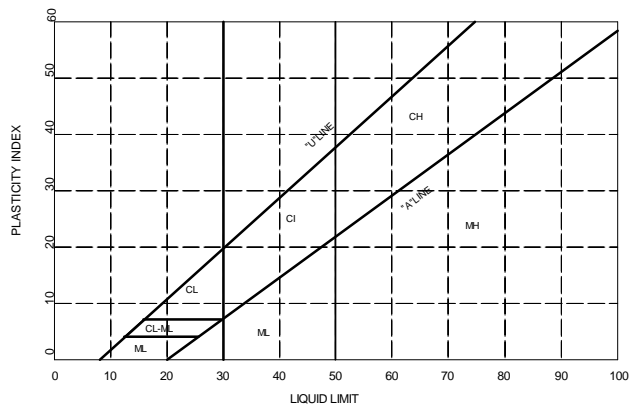
Table 4 Corrosivity Ratings Based on Soil Resistivity

Soil Resistivity (ohm-cm)	Corrosivity Rating
>20,000	Essentially non-corrosive
10,000 – 20,000	Mildly corrosive
5,000 – 10,000	Moderately corrosive
3,000 – 5,000	Corrosive
1,000 – 3,000	Highly corrosive
<1,000	Extremely corrosive

8. GROUNDWATER TABLE

The groundwater table is indicated by the equilibrium level of water in a standpipe installed in a testhole or test pit. This level is generally taken at least 24 hours after installation of the standpipe. The groundwater level is subject to seasonal variations and is usually highest in the spring. The symbol on the logs indicating the groundwater level is an inverted solid triangle (▼).

MAJOR DIVISION		LOG SYMBOLS	UCS	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA
COARSE GRAINED SOILS	GRAVELS (MORE THAN HALF COARSE GRAINS LARGER THAN 4.75 mm)	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL GRADED GRAVELS, LITTLE OR NO FINES	$C_u - \frac{D_{60}}{D_{10}} > 4$ $C_c - \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1$ to 3
		GRAVELS WITH FINES	GP	POORLY GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
			GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% ATTERBERG LIMITS BELOW 'A' LINE W_p LESS THAN 4 ATTERBERG LIMITS ABOVE 'A' LINE W_p MORE THAN 7
		GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES		
	SANDS (MORE THAN HALF COARSE GRAINS SMALLER THAN 4.75 mm)	CLEAN SANDS (LITTLE R NO FINES)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_u - \frac{D_{60}}{D_{10}} > 6$ $C_c - \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1$ to 3
			SP	POORLY GRADED SANDS, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		SANDS WITH FINES	SM	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% ATTERBERG LIMITS BELOW 'A' LINE W_p LESS THAN 4 ATTERBERG LIMITS ABOVE 'A' LINE W_p MORE THAN 7
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES	
FINE GRAINED SOILS	SILTS (BELOW 'A' LINE NEGLIGIBLE ORGANIC CONTENT)	$W_L < 50$	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW) WHENEVER THE NATURE OF THE FINE CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER 'F'. E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY
		$W_L > 50$	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS	
	CLAYS (ABOVE 'A' LINE NEGLIGIBLE ORGANIC CONTENT)	$W_L < 30$	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS	
		$30 < W_L < 50$	CI	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
		$W_L > 50$	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	ORGANIC SILTS & CLAYS (BELOW 'A' LINE)	$W_L < 50$	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
		$W_L > 50$	OH	ORGANIC CLAYS OF HIGH PLASTICITY	
	HIGHLY ORGANIC SOILS			Pt	
BEDROCK			BR	SEE REPORT DESCRIPTION	
FILL			FILL	SEE REPORT DESCRIPTION	



NOTE:
1. BOUNDARY CLASSIFICATION POSSESSING CHARACTERISTICS OF TWO GROUPS ARE GIVEN GROUP SYMBOLS, E.G. GW-GC IS A WELL GRADED GRAVEL MIXTURE WITH CLAY BINDER BETWEEN 5% AND 12%

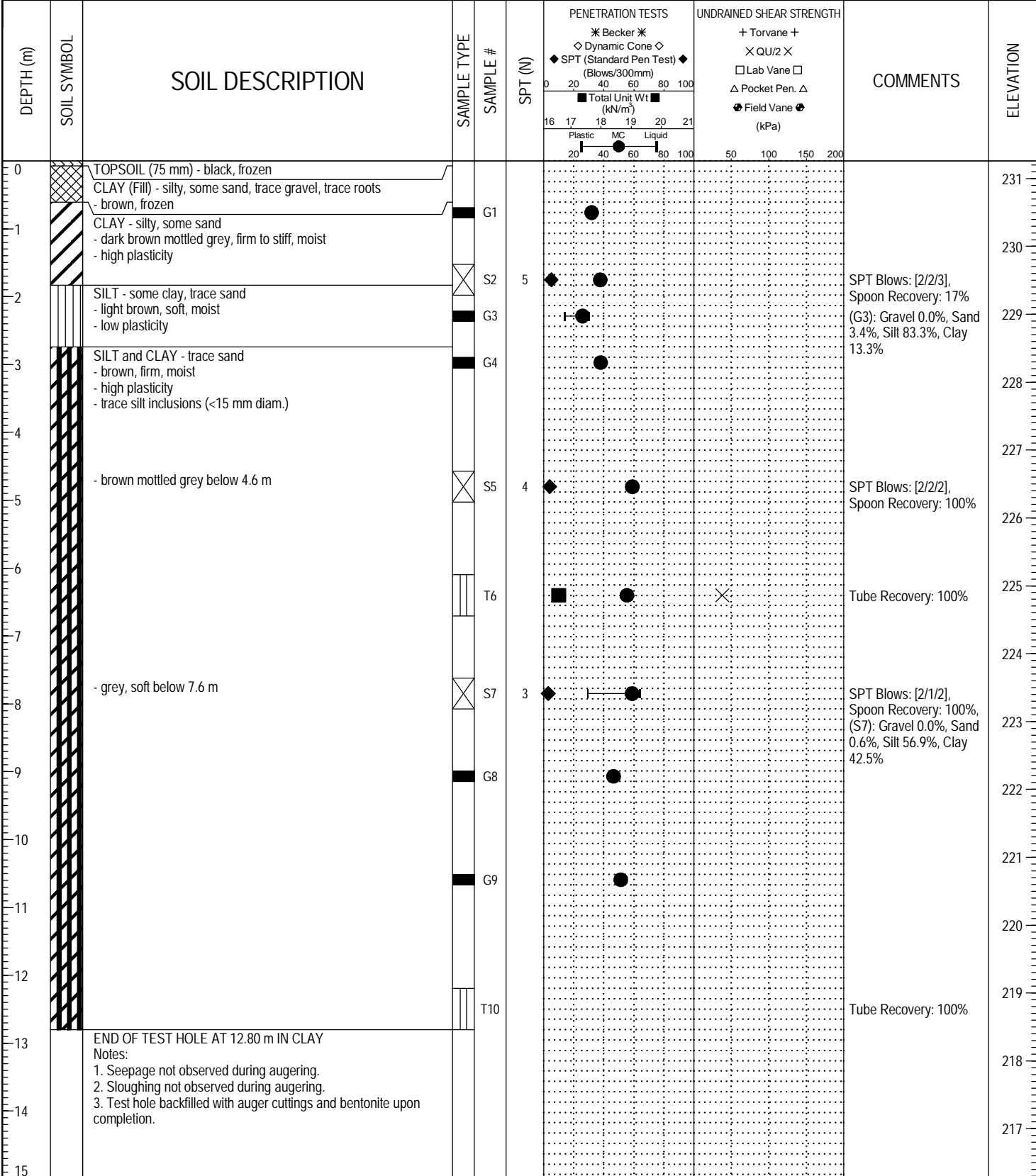
SOIL COMPONENTS					
FRACTION		SIEVE SIZE (mm)		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
		PASSING	RETAINED	PERCENT	IDENTIFIER
GRAVEL	COARSE	75	19	50 - 35	AND
	FINE	19	4.75		
SAND	COARSE	4.75	2.00	35 - 20	Y
	MEDIUM	2.00	0.425		
	FINE	0.425	0.080		
SILT (non-plastic) or CLAY (plastic)		0.080		20 - 10	SOME
				10 - 1	TRACE
OVERSIZE MATERIALS					
ROUNDED OR SUB-ROUNDED COBBLES 75 mm TO 200 mm BOULDERS >200 mm			ANGULAR ROCK FRAGMENTS ROCKS > 0.75 m3 IN VOLUME		

MODIFIED UNIFIED SOIL CLASSIFICATION SYSTEM

August 2015

PROJECT: Jefferson East CSR Works (Contract 6B) CLIENT: City of Winnipeg TESTHOLE NO: TH22-01
 LOCATION: UTM 14 - 5533614 m N, 635082 m E PROJECT NO.: 60599385
 CONTRACTOR: Paddock Drilling METHOD: Mobile B48 - 125 mm SSA ELEVATION (m): 231.26

SAMPLE TYPE GRAB SHELBY TUBE SPLIT SPOON BULK NO RECOVERY CORE



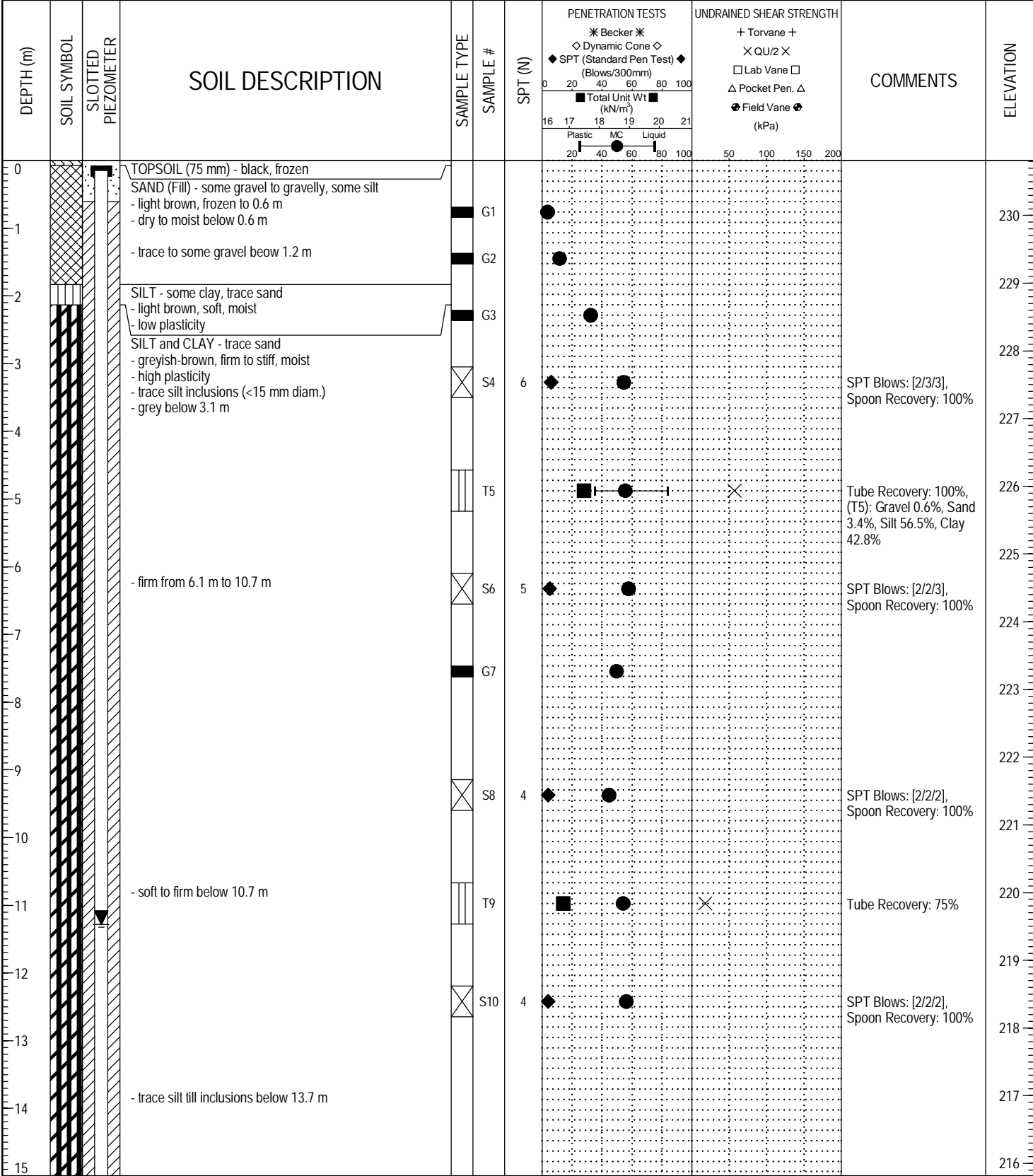
END OF TEST HOLE AT 12.80 m IN CLAY
 Notes:
 1. Seepage not observed during augering.
 2. Sloughing not observed during augering.
 3. Test hole backfilled with auger cuttings and bentonite upon completion.

LOG OF TEST HOLE 60599385 - TEST HOLE LOGS - CONTRACT 6B.GPJ UMA WINN.GDT 2/18/22



LOGGED BY: Ryan Harras COMPLETION DEPTH: 12.80 m
 REVIEWED BY: Faris Alobaidy COMPLETION DATE: 1/18/22
 PROJECT ENGINEER: Jordan Thompson Page 1 of 1

PROJECT: Jefferson East CSR Works (Contract 6B)		CLIENT: City of Winnipeg		TESTHOLE NO: TH22-02		
LOCATION: UTM 14 - 5533691 m N, 634896 m E				PROJECT NO.: 60599385		
CONTRACTOR: Paddock Drilling		METHOD: Mobile B48 - 125 mm SSA		ELEVATION (m): 230.81		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND

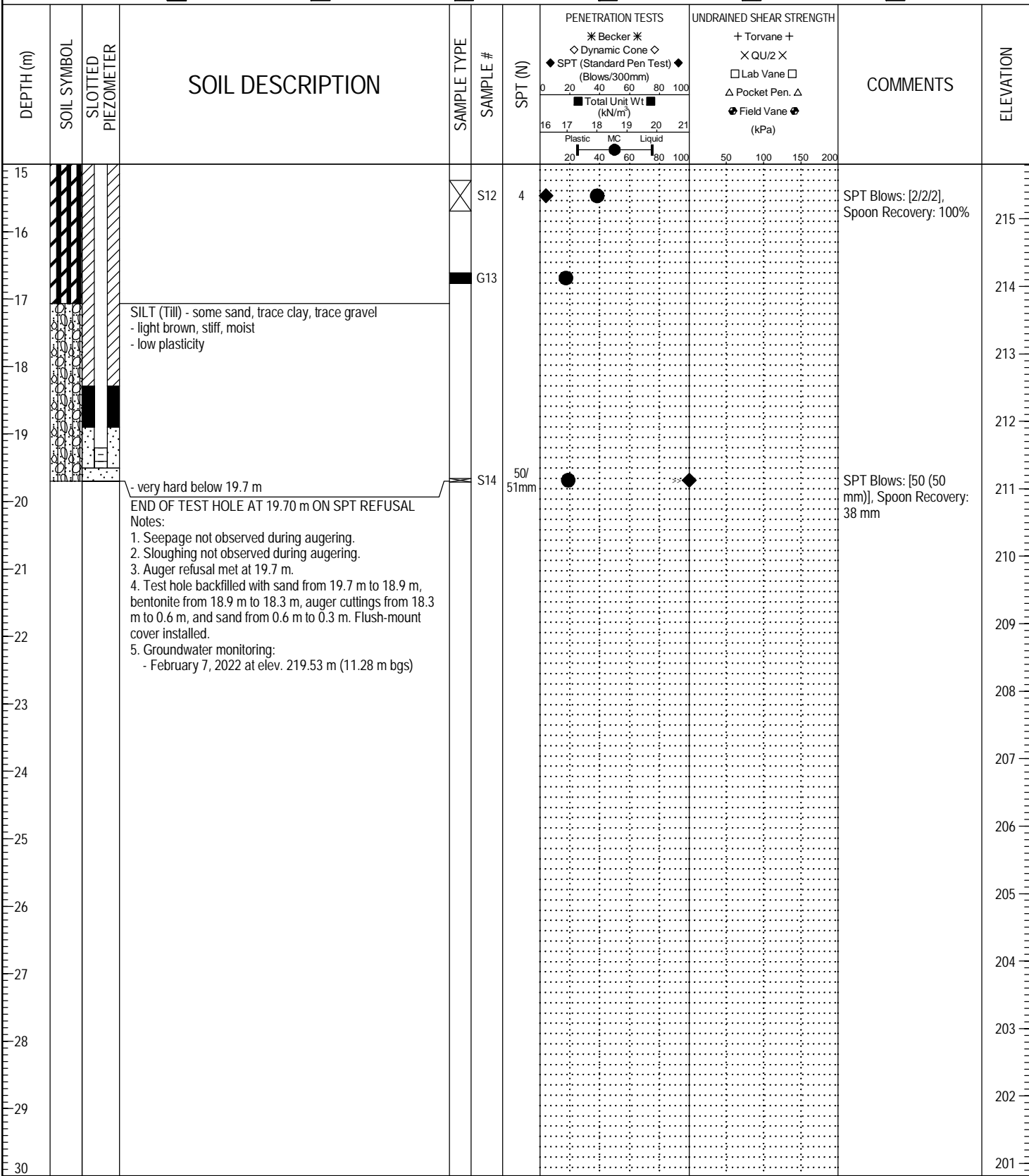


LOG OF TEST HOLE 60599385 - TEST HOLE LOGS - CONTRACT 6B.GPJ UMA WINN.GDT 2/18/22



LOGGED BY: Ryan Harras	COMPLETION DEPTH: 19.70 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/17/22
PROJECT ENGINEER: Jordan Thompson	Page 1 of 2

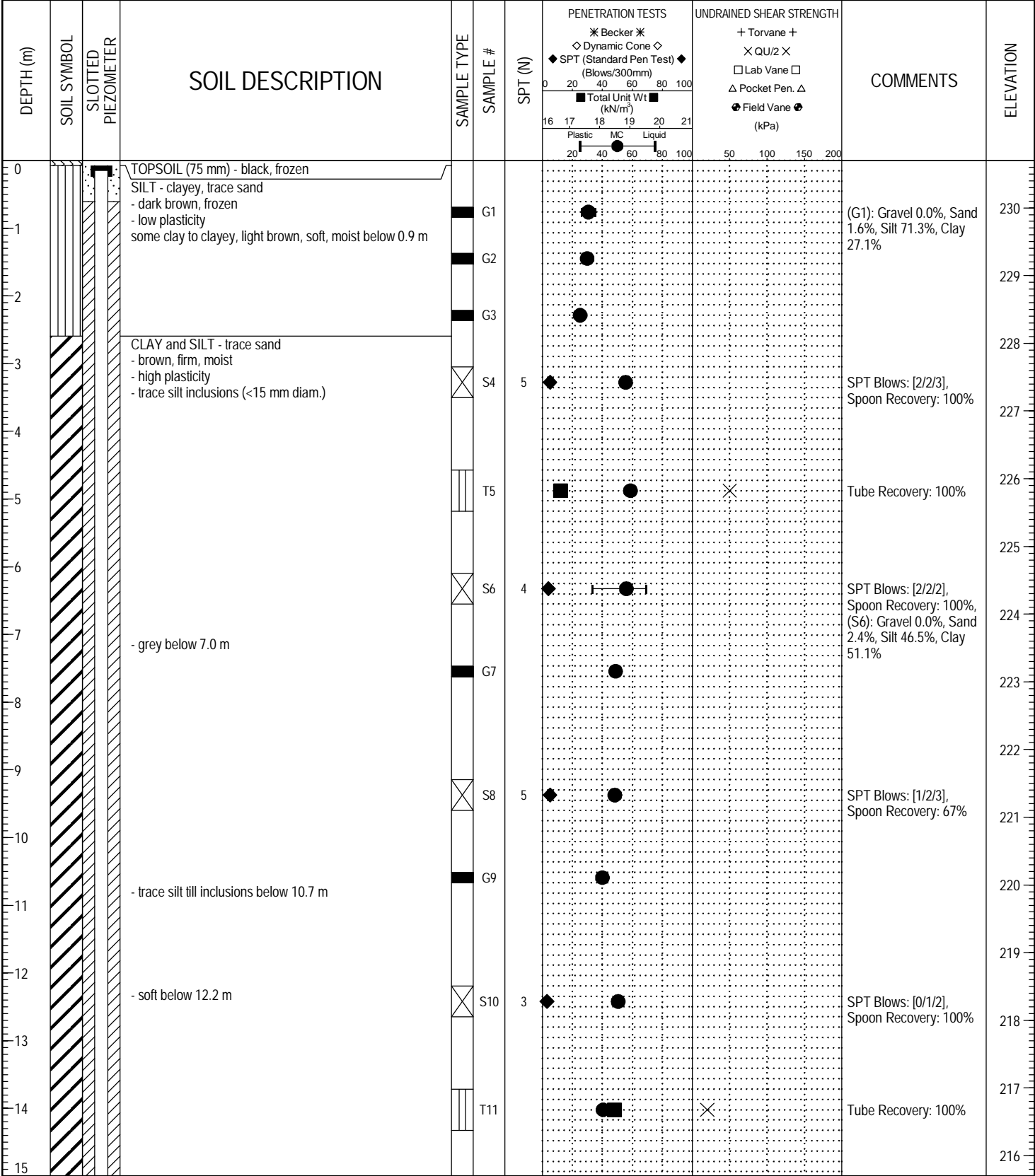
PROJECT: Jefferson East CSR Works (Contract 6B)		CLIENT: City of Winnipeg		TESTHOLE NO: TH22-02		
LOCATION: UTM 14 - 5533691 m N, 634896 m E				PROJECT NO.: 60599385		
CONTRACTOR: Paddock Drilling		METHOD: Mobile B48 - 125 mm SSA		ELEVATION (m): 230.81		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



LOGGED BY: Ryan Harras	COMPLETION DEPTH: 19.70 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/17/22
PROJECT ENGINEER: Jordan Thompson	Page 2 of 2

LOG OF TEST HOLE 60599385 - TEST HOLE LOGS - CONTRACT 6B.GPJ UMA WINN.GDT 2/8/22

PROJECT: Jefferson East CSR Works (Contract 6B)		CLIENT: City of Winnipeg		TESTHOLE NO: TH22-03		
LOCATION: UTM 14 - 5533424 m N, 635034 m E				PROJECT NO.: 60599385		
CONTRACTOR: Paddock Drilling		METHOD: Mobile B48 - 125 mm SSA		ELEVATION (m): 230.70		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND

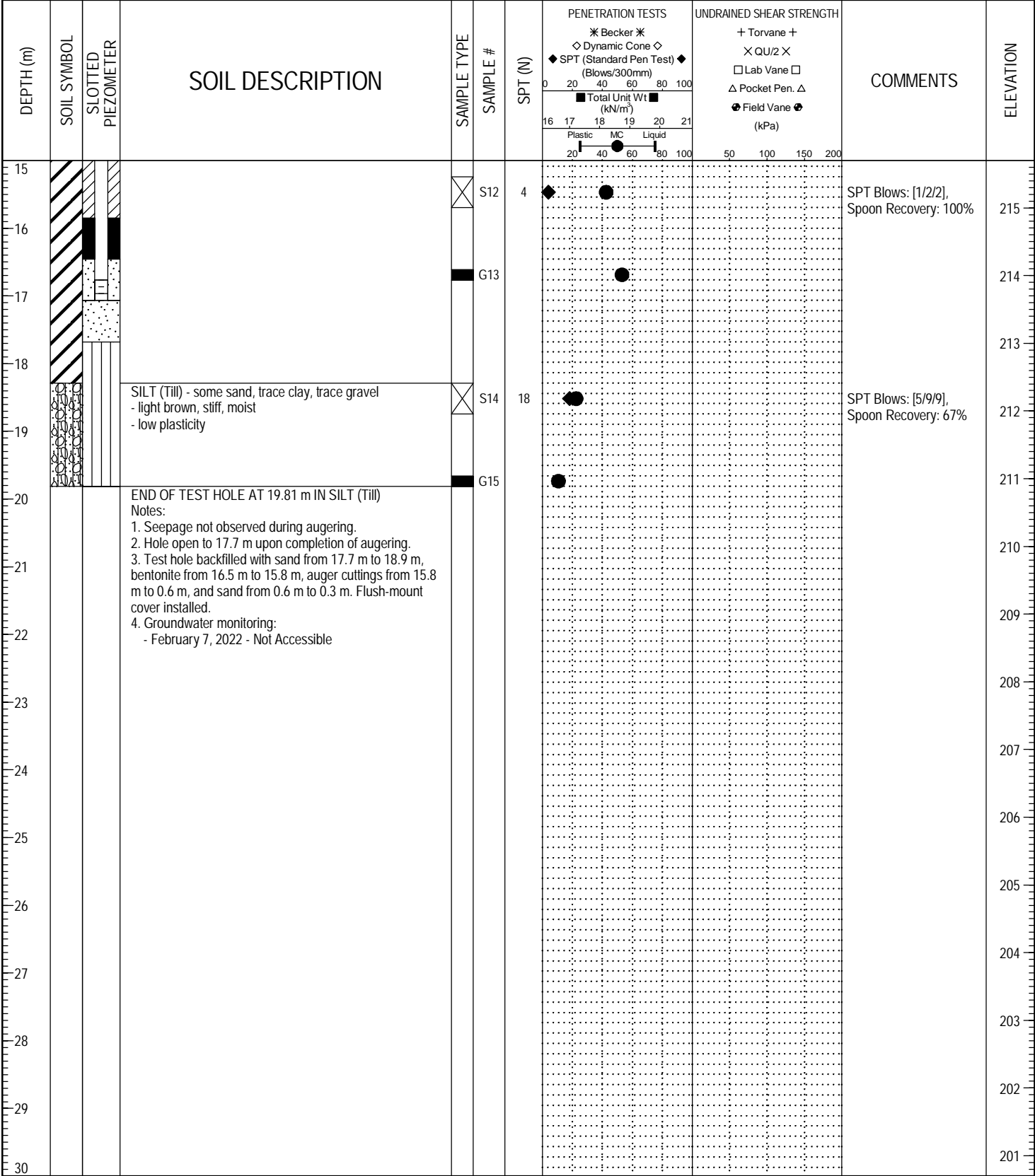


LOG OF TEST HOLE 60599385 - CONTRACT 6B.GPJ UMA WINNI.GDT 2/18/22



LOGGED BY: Ryan Harras	COMPLETION DEPTH: 19.81 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/19/22
PROJECT ENGINEER: Jordan Thompson	Page 1 of 2

PROJECT: Jefferson East CSR Works (Contract 6B)		CLIENT: City of Winnipeg		TESTHOLE NO: TH22-03		
LOCATION: UTM 14 - 5533424 m N, 635034 m E				PROJECT NO.: 60599385		
CONTRACTOR: Paddock Drilling		METHOD: Mobile B48 - 125 mm SSA		ELEVATION (m): 230.70		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



LOG OF TEST HOLE 60599385 - TEST HOLE LOGS - CONTRACT 6B.GPJ UMA WINN.GDT 2/18/22



LOGGED BY: Ryan Harras	COMPLETION DEPTH: 19.81 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/19/22
PROJECT ENGINEER: Jordan Thompson	Page 2 of 2

PROJECT: Jefferson East CSR Works (Contract 6B) CLIENT: City of Winnipeg TESTHOLE NO: TH22-04
 LOCATION: UTM 14 - 5533510 m N, 634832 m E PROJECT NO.: 60599385
 CONTRACTOR: Paddock Drilling METHOD: Mobile B48 - 125 mm SSA ELEVATION (m): 230.74

SAMPLE TYPE GRAB SHELBY TUBE SPLIT SPOON BULK NO RECOVERY CORE

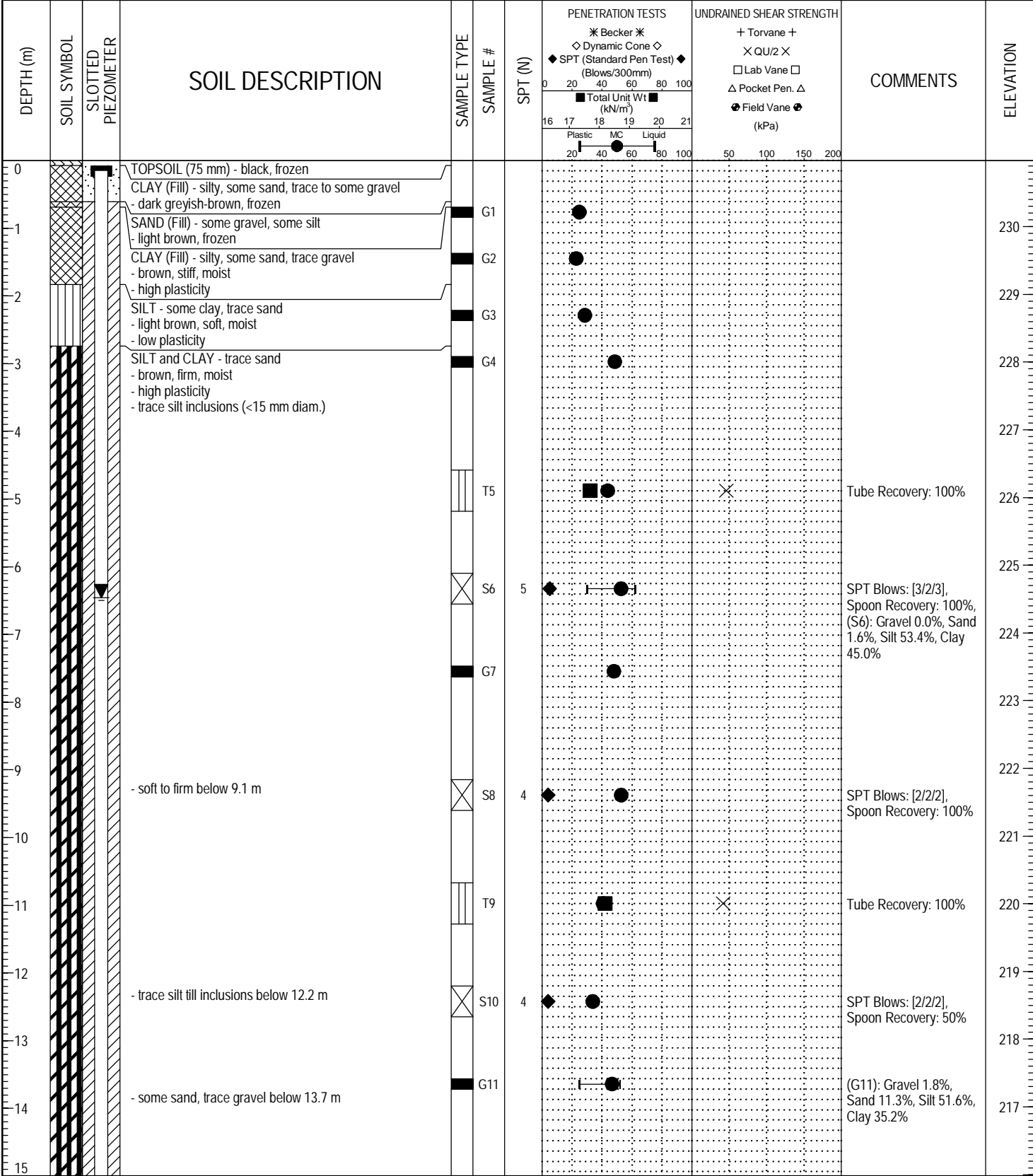
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS		UNDRAINED SHEAR STRENGTH	COMMENTS	ELEVATION
						* Becker * ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) ■ Total Unit Wt (kN/m³)	+ Torvane + × QU/2 × □ Lab Vane □ △ Pocket Pen. △ ● Field Vane ● (kPa)			
0		TOPSOIL (50 mm) - black, frozen								
0-0.6		CLAY - silty, some sand - dark brown, frozen to 0.6 m - stiff, moist, high plasticity below 0.6 m		G1						230
0.6-2.2				G2						229
2.2-3.1		SILT - some clay, trace sand - light brown, soft, moist - low plasticity		G3					(G3): Gravel 0.0%, Sand 1.7%, Silt 86.4%, Clay 11.9%	228
3.1-5.5		SILT and CLAY - trace sand - brown, firm, moist - high plasticity - trace silt inclusions (<15 mm diam.)		G4						227
5.5-6.1				T5					Tube Recovery: 100%	226
6.1-7.6		- grey below 6.1 m		G6						225
7.6-12.2		- soft from 7.6 m to 12.2 m		S7	4				SPT Blows: [1/2/2], Spoon Recovery: 100%	223
12.2-12.8				G8						222
12.8-13.1				S9	3				SPT Blows: [1/2/1], Spoon Recovery: 100%	220
13.1-12.8				T10					Tube Recovery: 100%	218
12.8-13		END OF TEST HOLE AT 12.80 m IN CLAY Notes: 1. Seepage observed at depths below 3.1 m during augering. 2. Sloughing not observed during augering. 3. Test hole backfilled with auger cuttings and bentonite upon completion.								217

LOG OF TEST HOLE 60599385 - TEST HOLE LOGS - CONTRACT 6B.GPJ UMA WINN.GDT 2/18/22



LOGGED BY: Ryan Harras COMPLETION DEPTH: 12.80 m
 REVIEWED BY: Faris Alobaidy COMPLETION DATE: 1/20/22
 PROJECT ENGINEER: Jordan Thompson Page 1 of 1

PROJECT: Jefferson East CSR Works (Contract 6B)		CLIENT: City of Winnipeg		TESTHOLE NO: TH22-05		
LOCATION: UTM 14 - 5533366 m N, 634755 m E				PROJECT NO.: 60599385		
CONTRACTOR: Paddock Drilling		METHOD: Mobile B48 - 125 mm SSA		ELEVATION (m): 230.98		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND

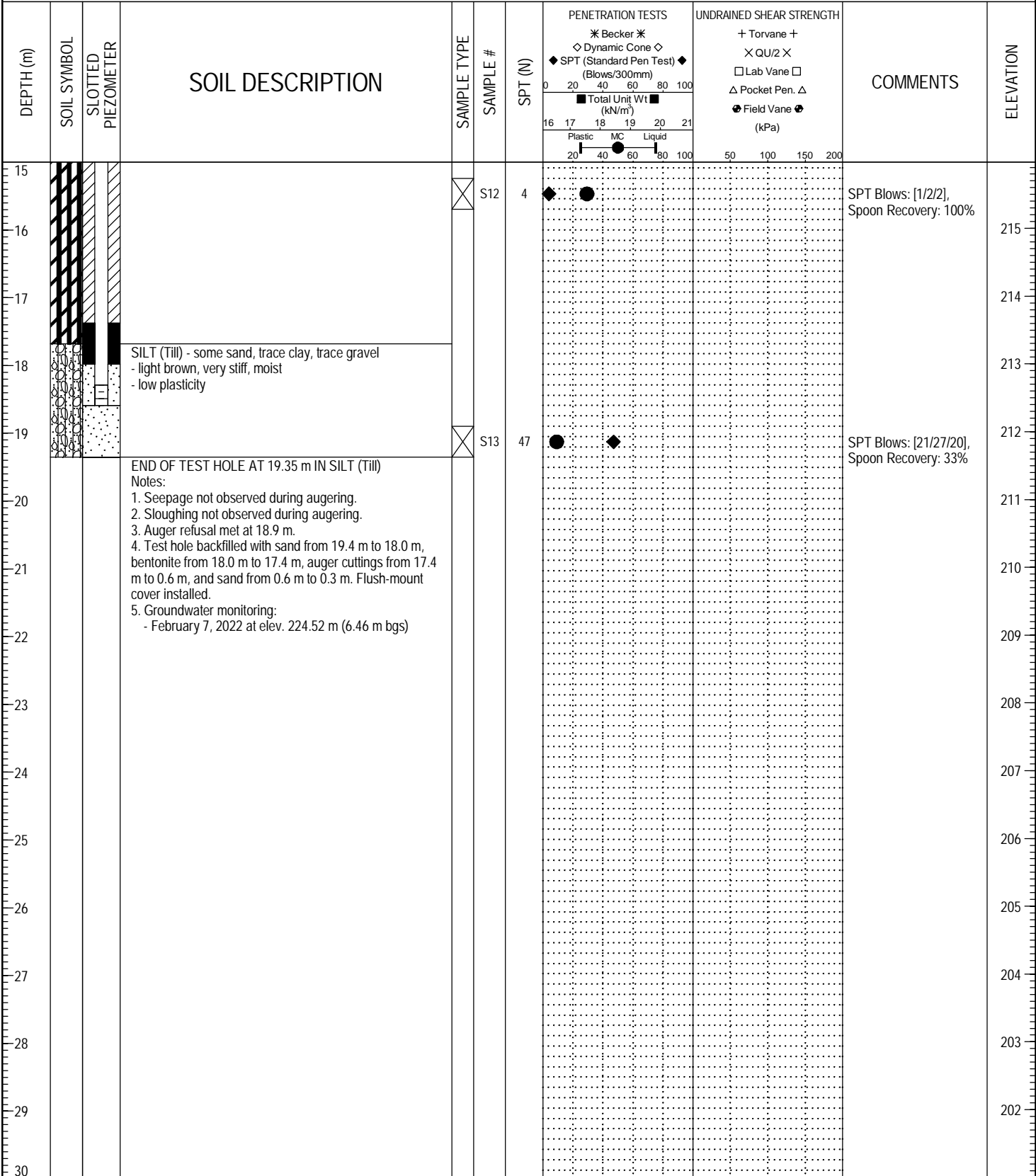


LOG OF TEST HOLE 60599385 - TEST HOLE LOGS - CONTRACT 6B.GPJ UMA WINNI.GDT 2/18/22



LOGGED BY: Ryan Harras	COMPLETION DEPTH: 19.35 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/20/22
PROJECT ENGINEER: Jordan Thompson	Page 1 of 2

PROJECT: Jefferson East CSR Works (Contract 6B)		CLIENT: City of Winnipeg		TESTHOLE NO: TH22-05		
LOCATION: UTM 14 - 5533366 m N, 634755 m E				PROJECT NO.: 60599385		
CONTRACTOR: Paddock Drilling			METHOD: Mobile B48 - 125 mm SSA		ELEVATION (m): 230.98	
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



LOG OF TEST HOLE 60599385 - TEST HOLE LOGS - CONTRACT 6B.GPJ UMA WINN.GDT 2/18/22



LOGGED BY: Ryan Harras	COMPLETION DEPTH: 19.35 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/20/22
PROJECT ENGINEER: Jordan Thompson	Page 2 of 2

SOIL SAMPLES TEST SUMMARY

CLIENT:	AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7	PROJECT No.:	112-2203
ATTENTION:	Ryan Harras	Date Sampled:	Jan 17 to 20, 2022
PROJECT:	Jefferson CSR Phase 3 Contract 6B Job No. 60599385	Date Received:	21-Jan-22
		Sampled By:	Client
		Date Tested:	Jan 22 to 31, 2022

Lab No.				Testing Required								Soil Description	
Hole No.	Sample No.	Depth	Sampling Method	Moisture Content (%)	Particle Size Analysis				Atterberg Limits			Unconfined Compressive Strength Qu (kPa)	
					Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plastic Index		
17% rec. TH22-01	G1	2.5	Auger	31.9									SILTY CLAY
	S2	5	Split Spoon	37.6									SILT
	G3	7.5	Auger	25.9		3.4	83.3	13.3	30	14	16		
	G4	10	Auger	37.9									
	S5	15	Split Spoon	59.0									
	T6	20	Shelby Tube	55.4								76.9	
	S7	25	Split Spoon	58.9		0.6	56.9	42.5	64	29	36		
	G8	30	Auger	46.5									
	G9	35	Auger	51.3									
	T10	40	Shelby Tube										
TH22-02	G1	2.5	Auger	3.6									SAND (FILL)
	G2	5	Auger	11.6									
	G3	7.5	Auger	32.4									
	S4	10	Split Spoon	54.5									
	T5	15	Shelby Tube	55.5		0.6	56.5	42.8	84	35	49	113.1	
	S6	20	Split Spoon	57.7									
	G7	25	Auger	49.7									
	S8	30	Split Spoon	44.7									
	T9	35	Shelby Tube	54.1								36.1	
	S10	40	Split Spoon	56.2									
	S12	50	Split Spoon	38.3									
	G13	55	Auger	17.3									
	S14	64.5	Split Spoon	18.9									
	TH22-03	G1	2.5	Auger	30.6		1.6	71.3	27.1	61	26	35	
G2		5	Auger	29.8									SILT
G3		7.5	Auger	25.1									
S4		10	Split Spoon	55.5									
T5		15	Shelby Tube	58.7								99.3	
S6		20	Split Spoon	56.0		2.4	46.5	51.1	69	33	36		CLAY

Lab No.				Testing Required								Soil Description	
Hole No.	Sample No.	Depth	Sampling Method	Moisture Content (%)	Particle Size Analysis				Atterberg Limits			Unconfined Compressive Strength Qu (kPa)	
					Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plastic Index		
TH22-03 (cont'd)	G7	25	Auger	48.8									CLAY
	S8	30	Split Spoon	48.3									
	G9	35	Auger	40.0									
	S10	40	Split Spoon	50.5									
	T11	45	Shelby Tube	40.5							40.6		
	S12	50	Split Spoon	42.5									
	G13	55	Auger	53.1									
	S14	60	Split Spoon	22.5									
	G15	65	Auger	10.6									GLACIAL TILL
TH22-04 0% rec.	G1	2.5	Auger	30.3									SILTY CLAY
	G2	5	Auger	30.0									
	G3	7.5	Auger	25.1		1.7	86.4	11.9	23	15	8		SILT
	G4	10	Auger	40.0									
	T5	15	Shelby Tube										
	G6	20	Auger	55.6									
	S7	25	Split Spoon	44.7									
	G8	30	Auger	52.7									
	S9	35	Split Spoon	41.9									
	T10	40	Shelby Tube	49.6								114.5	
TH22-05	G1	2.5	Auger	24.8									CLAY (FILL)
	G2	5	Auger	22.7									
	G3	7.5	Auger	28.5									
	G4	10	Auger	48.5									
	T5	15	Shelby Tube	43.8								91.4	
	S6	20	Split Spoon	52.7		1.6	53.4	45.0	62	30	33		
	G7	25	Auger	47.9									
	S8	30	Split Spoon	52.8									
	T9	35	Shelby Tube	40.7								83.1	
	S10	40	Split Spoon	33.8									
	G11	45	Auger	46.7	1.8	11.3	51.6	35.2	52	25	27		
	S12	50	Split Spoon	29.3									
	S13	62	Split Spoon	9.1									

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: AECOM	TEST NO:			PROJECT NO: 112-2203	
PROJECT: Jefferson CSR-Contract 6B	DATE SAMPLED: Jan. 21, 2022			SAMPLED BY: Client	
PROJECT CONTACT:	DATE TESTED: Jan. 22, 2022			TESTED BY: G. Manalo	
Test Hole No. 22-01	G1	S2	G3	G4	S5
Depth	2.5'	5'	7.5'	10'	15'
Tare No.					
Wt Wet Sample + Tare	167.5	147	1526	181.3	157.7
Wt Dry Sample + Tare	128.1	108.1	1299.7	132.7	100.8
Wt Water	39.4	38.9	226.3	48.6	56.9
Wt Tare	4.7	4.7	426.3	4.4	4.4
Wt Dry Sample	123.4	103.4	873.4	128.3	96.4
Moisture Content (%)	31.9	37.6	25.9	37.9	59.0
Test Hole No. 22-01	S7	G8	G9		
Depth	25'	30'	35'		
Tare No.					
Wt Wet Sample + Tare	1189.2	178.3	211.1		
Wt Dry Sample + Tare	894.3	123.1	141		
Wt Water	294.9	55.2	70.1		
Wt Tare	393.2	4.4	4.3		
Wt Dry Sample	501.1	118.7	136.7		
Moisture Content (%)	58.9	46.5	51.3		
Test Hole No. 22-02	G1	G2	G3	S4	S6
Depth	2.5'	5'	7.5'	10'	20'
Tare No.					
Wt Wet Sample + Tare	199.9	184.6	183.9	192.3	188.9
Wt Dry Sample + Tare	193.1	165.9	139.9	126	121.4
Wt Water	6.8	18.7	44.0	66.3	67.5
Wt Tare	4.8	4.3	4.3	4.3	4.4
Wt Dry Sample	188.3	161.6	135.6	121.7	117.0
Moisture Content (%)	3.6	11.6	32.4	54.5	57.7
Test Hole No. 22-02	G7	S8	S10	S12	G13
Depth	25	30	40	50	55
Tare No.					
Wt Wet Sample + Tare	203.5	228.1	209.8	199.7	203.3
Wt Dry Sample + Tare	137.5	159	135.9	145.6	174
Wt Water	66.0	69.1	73.9	54.1	29.3
Wt Tare	4.8	4.3	4.3	4.3	4.4
Wt Dry Sample	132.7	154.7	131.6	141.3	169.6
Moisture Content (%)	49.7	44.7	56.2	38.3	17.3

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: AECOM		TEST NO:		PROJECT NO: 112-2203	
PROJECT: Jefferson CSR-Contract 6B		DATE SAMPLED: Jan. 21, 2022		SAMPLED BY: Client	
PROJECT CONTACT:		DATE TESTED: Jan. 22, 2022		TESTED BY: G. Manalo	
Test Hole No. 22-02	S4				
Depth	64.5'				
Tare No.					
Wt Wet Sample + Tare	225.8				
Wt Dry Sample + Tare	190.6				
Wt Water	35.2				
Wt Tare	4.6				
Wt Dry Sample	186.0				
Moisture Content (%)	18.9				
Test Hole No. 22-03	G1	G2	G3	S4	S6
Depth	2.5'	5'	7.5'	10'	20'
Tare No.					
Wt Wet Sample + Tare	1598.1	197.5	194.7	196.8	1158.3
Wt Dry Sample + Tare	1371.5	153.2	156.5	128.2	883.6
Wt Water	226.6	44.3	38.2	68.6	274.7
Wt Tare	631.4	4.3	4.4	4.6	393.4
Wt Dry Sample	740.1	148.9	152.1	123.6	490.2
Moisture Content (%)	30.6	29.8	25.1	55.5	56.0
Test Hole No. 22-03	G7	S8	G9	S10	S12
Depth	25'	30'	35'	40'	50'
Tare No.					
Wt Wet Sample + Tare	178.2	202.5	197.1	240.9	219.2
Wt Dry Sample + Tare	121.4	138	139.2	161.6	155.1
Wt Water	56.8	64.5	57.9	79.3	64.1
Wt Tare	5.1	4.4	4.4	4.6	4.4
Wt Dry Sample	116.3	133.6	134.8	157.0	150.7
Moisture Content (%)	48.8	48.3	43.0	50.5	42.5
Test Hole No. 22-03	G13	S14	G15		
Depth	55'	60'	65'		
Tare No.					
Wt Wet Sample + Tare	197	239.8	262.9		
Wt Dry Sample + Tare	130.2	196.5	238.1		
Wt Water	66.8	43.3	24.8		
Wt Tare	4.3	4.4	4.5		
Wt Dry Sample	125.9	192.1	233.6		
Moisture Content (%)	53.1	22.5	10.6		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: AECOM		TEST NO:			PROJECT NO: 112-2203	
PROJECT: Jefferson CSR-Contract 6B		DATE SAMPLED: Jan. 21, 2022			SAMPLED BY: Client	
PROJECT CONTACT:		DATE TESTED: Jan. 22, 2022			TESTED BY: G. Manalo	
Test Hole No. 22-04	G1	G2	G3	G4	G6	
Depth	2.5	5	7.5	10	20	
Tare No.						
Wt Wet Sample + Tare	211.9	192.7	1257.8	219.4	206.3	
Wt Dry Sample + Tare	163.7	149.2	1084.1	158	134.2	
Wt Water	48.2	43.5	173.7	61.4	72.1	
Wt Tare	4.5	4.2	392.5	4.6	4.6	
Wt Dry Sample	159.2	145.0	691.6	153.4	129.6	
Moisture Content (%)	30.3	30.0	25.1	40.0	55.6	
Test Hole No. 22-04	S7	G8	S9			
Depth	25	30	35			
Tare No.						
Wt Wet Sample + Tare	239.6	202.7	208.4			
Wt Dry Sample + Tare	166.9	134.2	148.2			
Wt Water	72.7	68.5	60.2			
Wt Tare	4.3	4.1	4.3			
Wt Dry Sample	162.6	130.1	143.9			
Moisture Content (%)	44.7	52.7	41.8			
Test Hole No. 22-05	G1	G2	G3	G4	S6	
Depth	2.5	5	7.5	10	20	
Tare No.						
Wt Wet Sample + Tare	219	200.2	211.9	215.9	1075.3	
Wt Dry Sample + Tare	176.3	164	165.9	146.8	896.3	
Wt Water	42.7	36.2	46.0	69.1	179.0	
Wt Tare	4.3	4.4	4.4	4.4	556.6	
Wt Dry Sample	172.0	159.6	161.5	142.4	339.7	
Moisture Content (%)	24.8	22.7	28.5	48.5	52.7	
Test Hole No. 22-05	G7	S8	S10	G11	S12	
Depth	25	30	40	45	50	
Tare No.						
Wt Wet Sample + Tare	233.9	183	184.9	1282.5	225.1	
Wt Dry Sample + Tare	159.5	121.2	139.4	1047.7	175	
Wt Water	74.4	61.8	45.5	234.8	50.1	
Wt Tare	4.3	4.2	4.7	544.7	4.1	
Wt Dry Sample	155.2	117.0	134.7	503.0	170.9	
Moisture Content (%)	47.9	52.8	33.8	46.7	29.3	

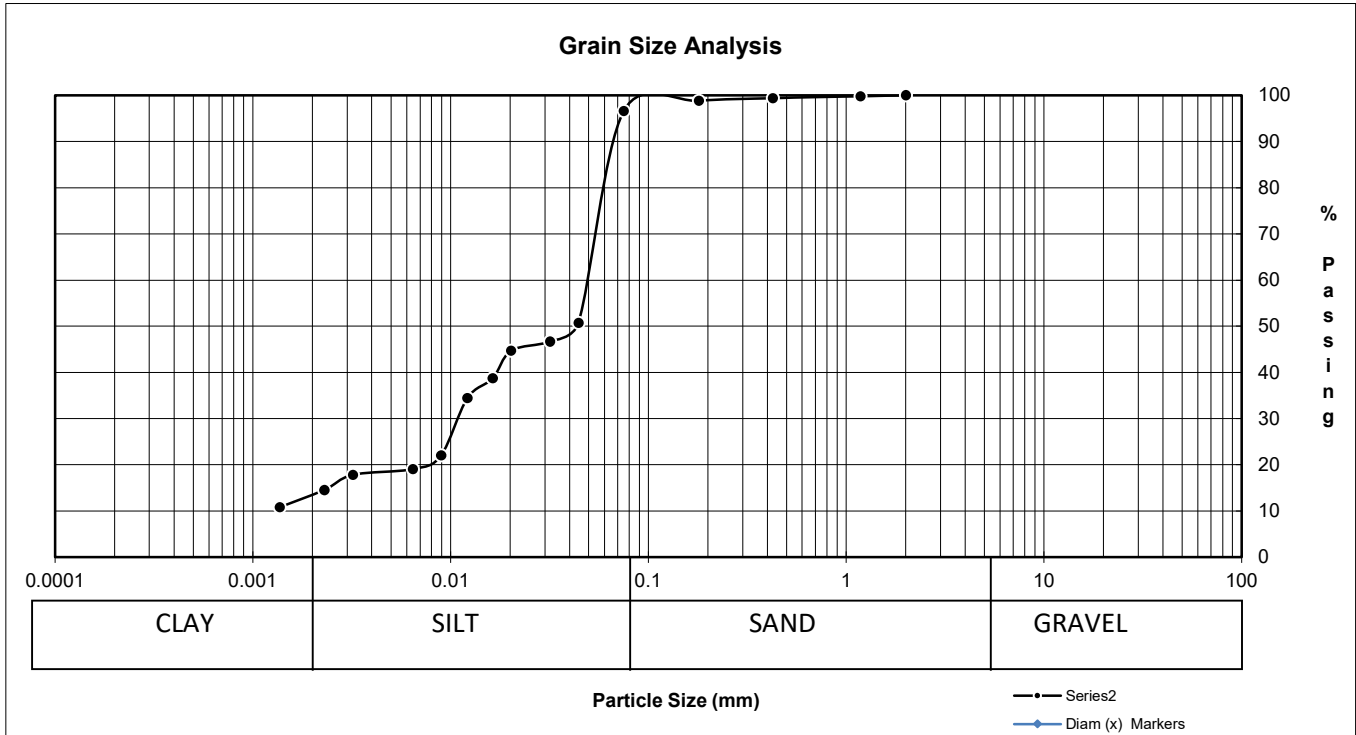
MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: AECOM		TEST NO:	PROJECT NO: 112-2203
PROJECT: Jefferson CSR-Contract 6B		DATE SAMPLED: Jan. 21, 2022	SAMPLED BY: Client
PROJECT CONTACT:		DATE TESTED: Jan. 22, 2022	TESTED BY: G. Manalo
Test Hole No. 22-05	S13		
Depth	62		
Tare No.	M2		
Wt Wet Sample + Tare	295.6		
Wt Dry Sample + Tare	271.2		
Wt Water	24.4		
Wt Tare	4.2		
Wt Dry Sample	267.0		
Moisture Content (%)	9.1		
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 (%)			
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 Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PSA Test No.: 1 LAB No.: HM 003A-1
---	---

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	25-Jan-22	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH22-01-G3 Depth 7.5 FT. 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	0.0443	50.7
				9.50	100.0	0.0318	46.7
				4.75	100.0	0.0202	44.7
				2.00	100.0	0.0163	38.7
				1.18	99.8	0.0121	34.4
0.425	99.4	0.0089	22.0				
0.180	98.8	0.0064	19.0				
0.075	96.6	0.0014	10.8				



		% Composition		D10	N/A
		3.4	Gravel	D30	0.011
		83.3	Sand	D60	0.049
		13.3	Silt	Cu	
			Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

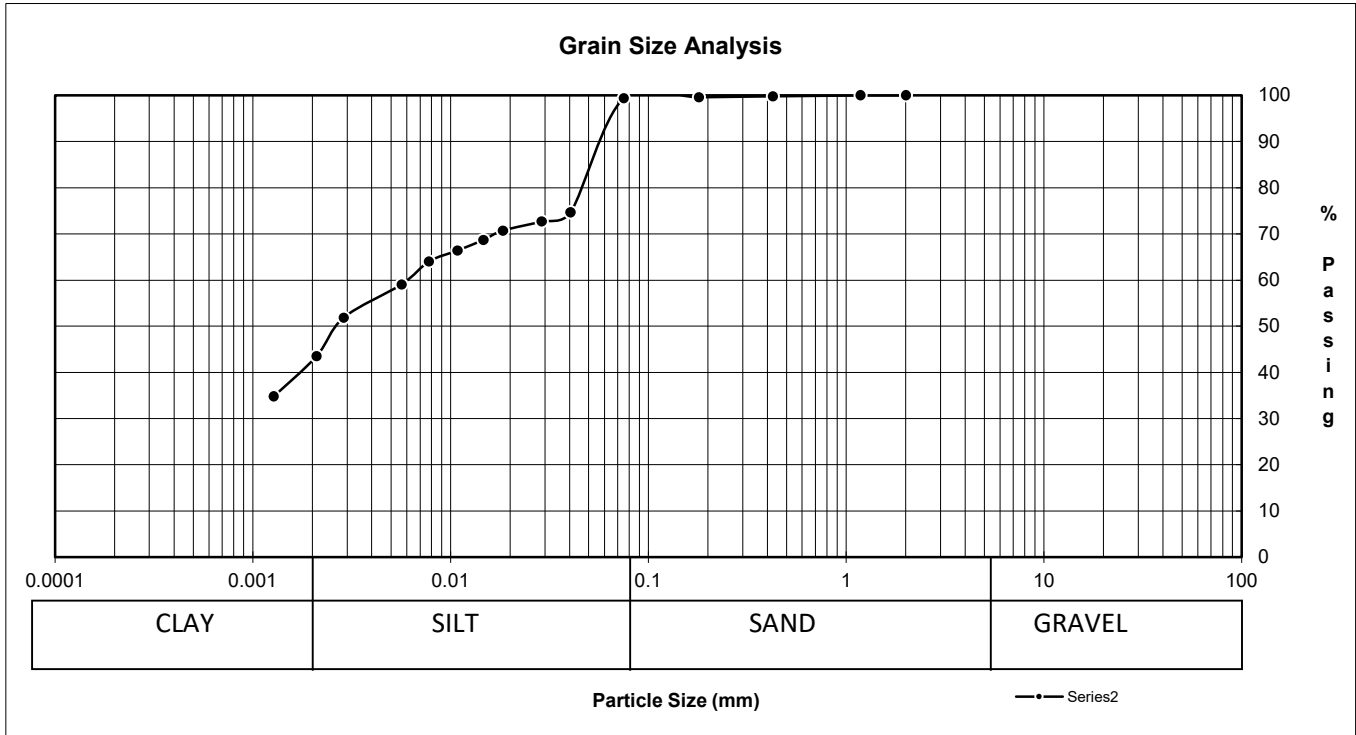
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PSA Test No.: 2 LAB No.: HM 003A-2
---	---

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis	Hydrometer Analysis	
Sampled By:	Client	Date Tested:	25-Jan-22	Sieve (mm) % Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH22-01-S7 Depth 25 FT. 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	0.0404	74.7	
		9.50	100.0	0.0288	72.7	
		4.75	100.0	0.0184	70.7	
		2.00	100.0	0.0146	68.7	
		1.18	100.0	0.0108	66.4	
	0.425	99.8	0.0078	64.0		
	0.180	99.6	0.0056	59.0		
	0.075	99.4	0.0013	34.8		



		% Composition		D10	N/A
		0.6	Gravel	D30	N/A
		56.9	Sand	D60	0.006
		42.5	Silt	Cu	
			Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

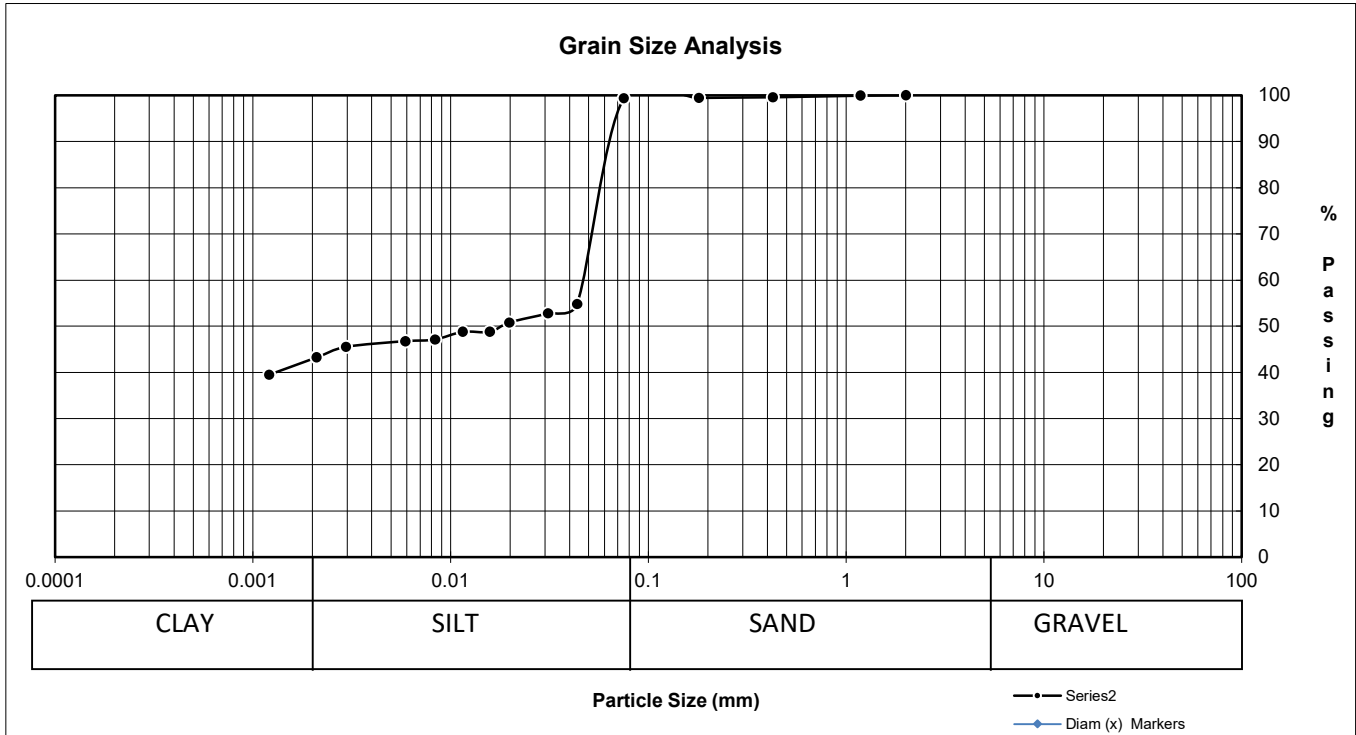
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PSA Test No.: 3 LAB No.: HM 003A-3
---	---

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis	Hydrometer Analysis	
Sampled By:	Client	Date Tested:	26-Jan-22	Sieve (mm) % Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH22-02-T5 Depth 15 FT. 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	0.0437	54.8	
		9.50	100.0	0.0311	52.8	
		4.75	100.0	0.0198	50.8	
		2.00	100.0	0.0158	48.8	
		1.18	99.9	0.0115	48.8	
	0.425	99.6	0.0083	47.1		
	0.180	99.5	0.0059	46.8		
	0.075	99.4	0.0012	39.5		



	% Composition	D10	N/A
	Gravel	D30	N/A
	0.6 Sand	D60	0.047
	56.5 Silt	Cu	
	42.8 Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

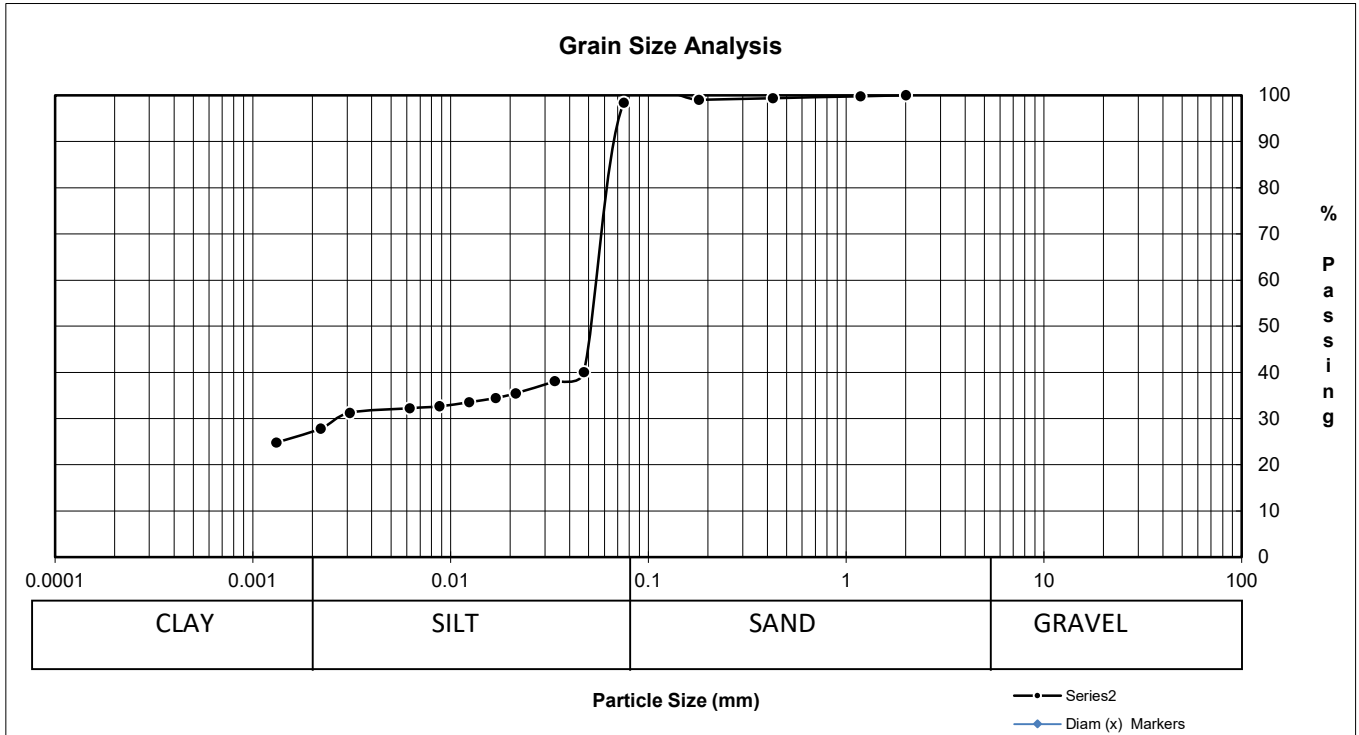
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PSA Test No.: 4 LAB No.: HM 003A-4
---	---

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	25-Jan-22	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH22-03-G1 Depth 2.5 FT. 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	0.0472	40.1
				9.50	100.0	0.0336	38.1
				4.75	100.0	0.0213	35.5
				2.00	100.0	0.0169	34.5
				1.18	99.8	0.0124	33.6
			0.425	99.4	0.0088	32.7	
			0.180	99.0	0.0062	32.3	
			0.075	98.4	0.0013	24.8	



		% Composition		D10	N/A
			Gravel	D30	0.00270
		1.6	Sand	D60	0.54580
		71.3	Silt	Cu	
		27.1	Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

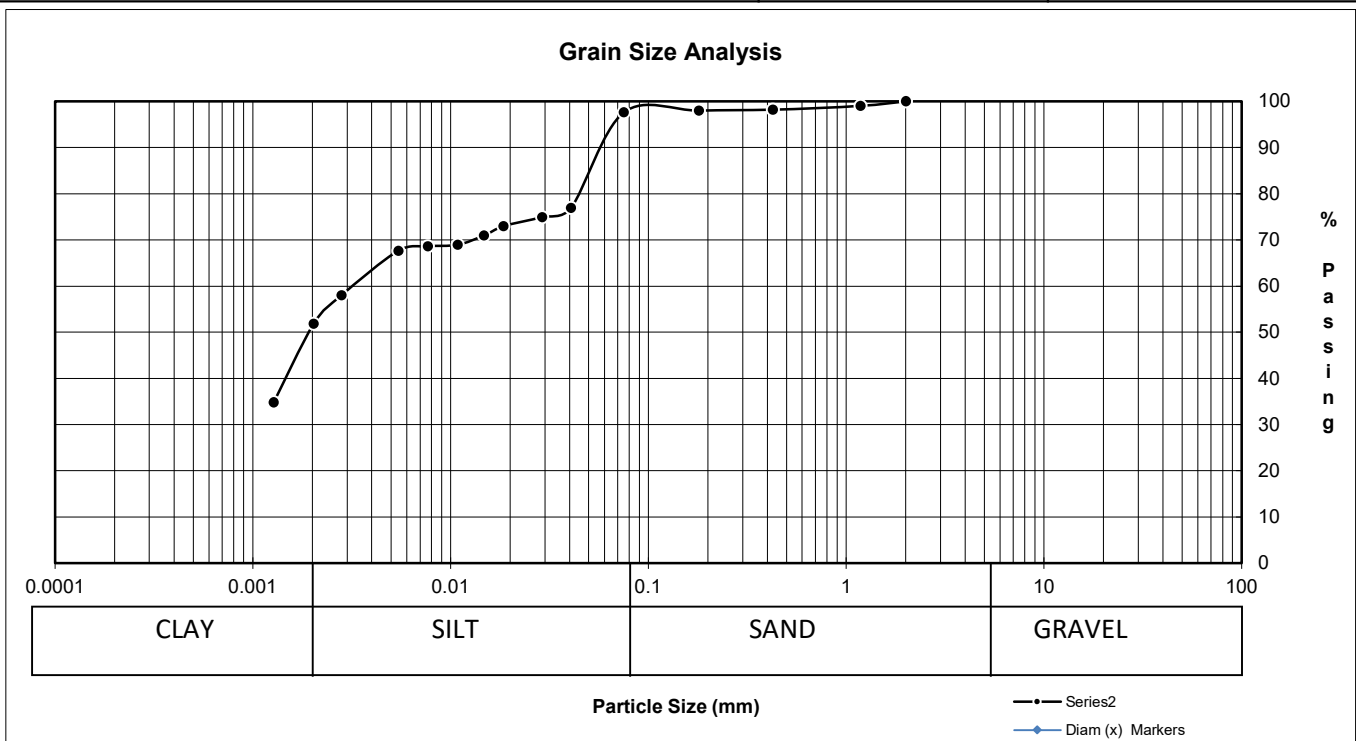
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PSA Test No.: 5 LAB No.: HM 003A-5
---	---

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	25-Jan-22	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH22-03-S6 Depth 20 FT. 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	0.0406	76.9
				9.50	100.0	0.0290	74.9
				4.75	100.0	0.0185	72.9
				2.00	100.0	0.0147	70.9
				1.18	99.0	0.0109	68.9
			0.425	98.2	0.0077	68.6	
			0.180	98.0	0.0054	67.6	
			0.075	97.6	0.0013	34.8	



	% Composition	D10	N/A
	Gravel		N/A
	2.4 Sand		0.00320
	46.5 Silt		
	51.1 Clay		
		D30	
		D60	
		Cu	
		Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

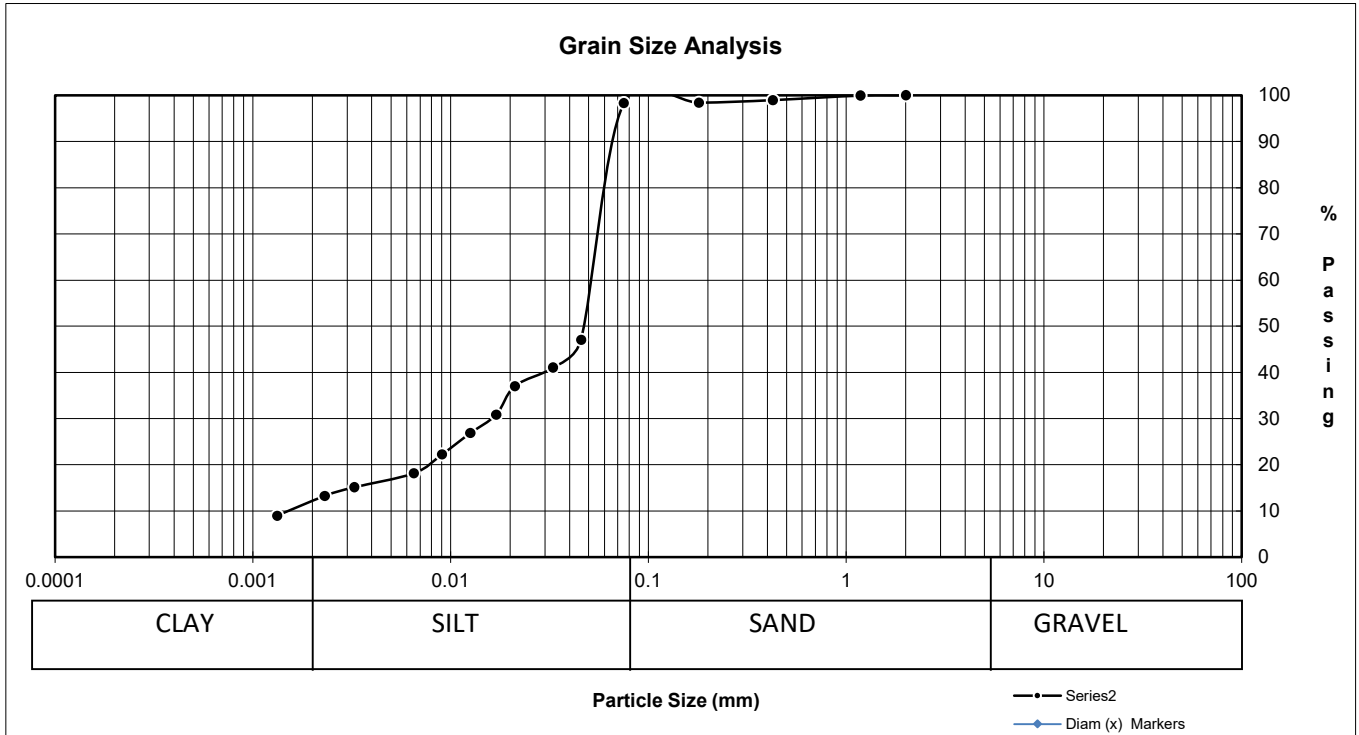
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PSA Test No.: 6 LAB No.: HM 003A-6
---	---

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	26-Jan-22	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH22-04-G3 Depth 7.5 FT. 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	0.0457	47.0
				9.50	100.0	0.0329	41.0
				4.75	100.0	0.0211	37.0
				2.00	100.0	0.0170	30.9
				1.18	99.9	0.0126	26.9
			0.425	99.0	0.0091	22.3	
			0.180	98.4	0.0065	18.2	
			0.075	98.3	0.0013	9.0	



	% Composition		D10	0.00146
		Gravel		D30
	1.7	Sand	D60	0.05120
	86.4	Silt	Cu	35.07
	11.9	Clay	Cc	3.87

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

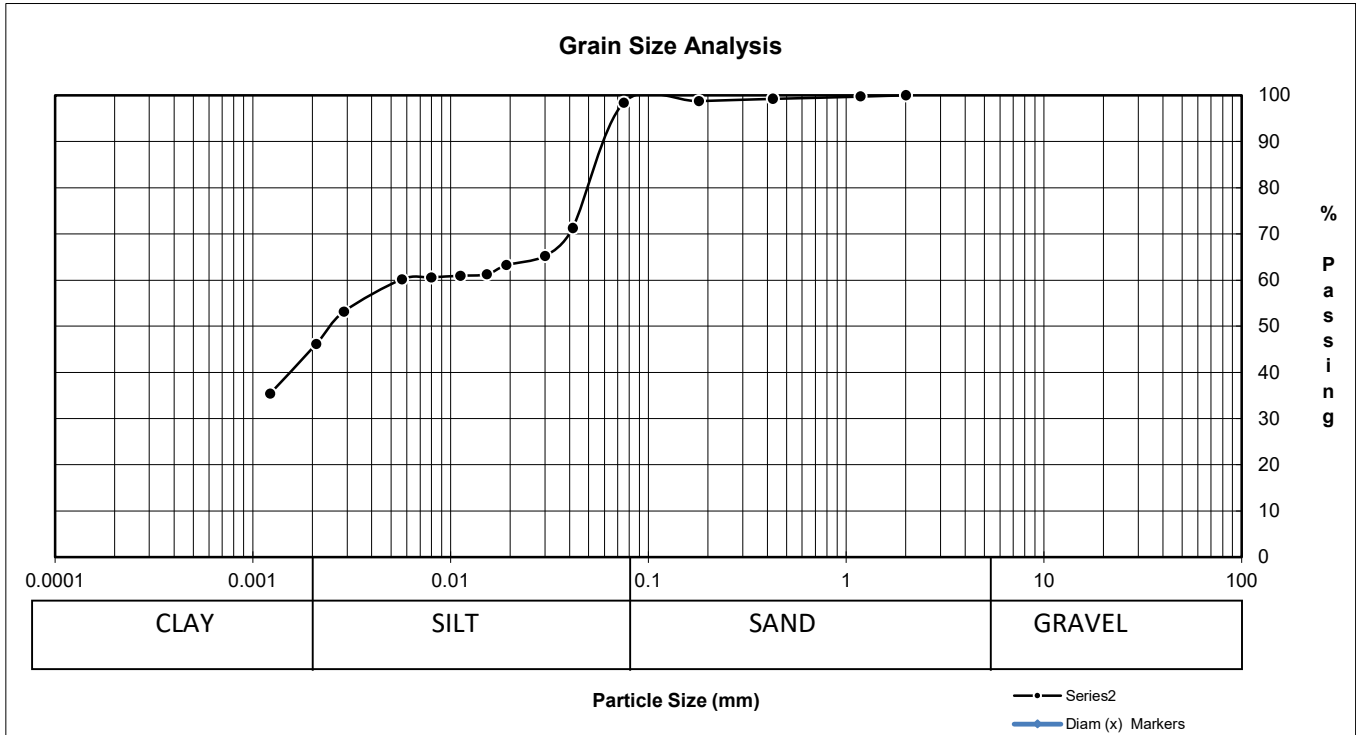
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PSA Test No.: 7 LAB No.: HM 003A-7
---	---

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	26-Jan-22	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH22-05-S6 Depth 20 FT. 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	0.0414	71.2
				9.50	100.0	0.0300	65.2
				4.75	100.0	0.0191	63.2
				2.00	100.0	0.0152	61.2
				1.18	99.7	0.0112	60.9
			0.425	99.2	0.0080	60.6	
			0.180	98.8	0.0057	60.2	
			0.075	98.4	0.0012	35.4	



	% Composition	D10	N/A
	Gravel	D30	N/A
	1.6 Sand	D60	0.00567
	53.4 Silt	Cu	
	45.0 Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

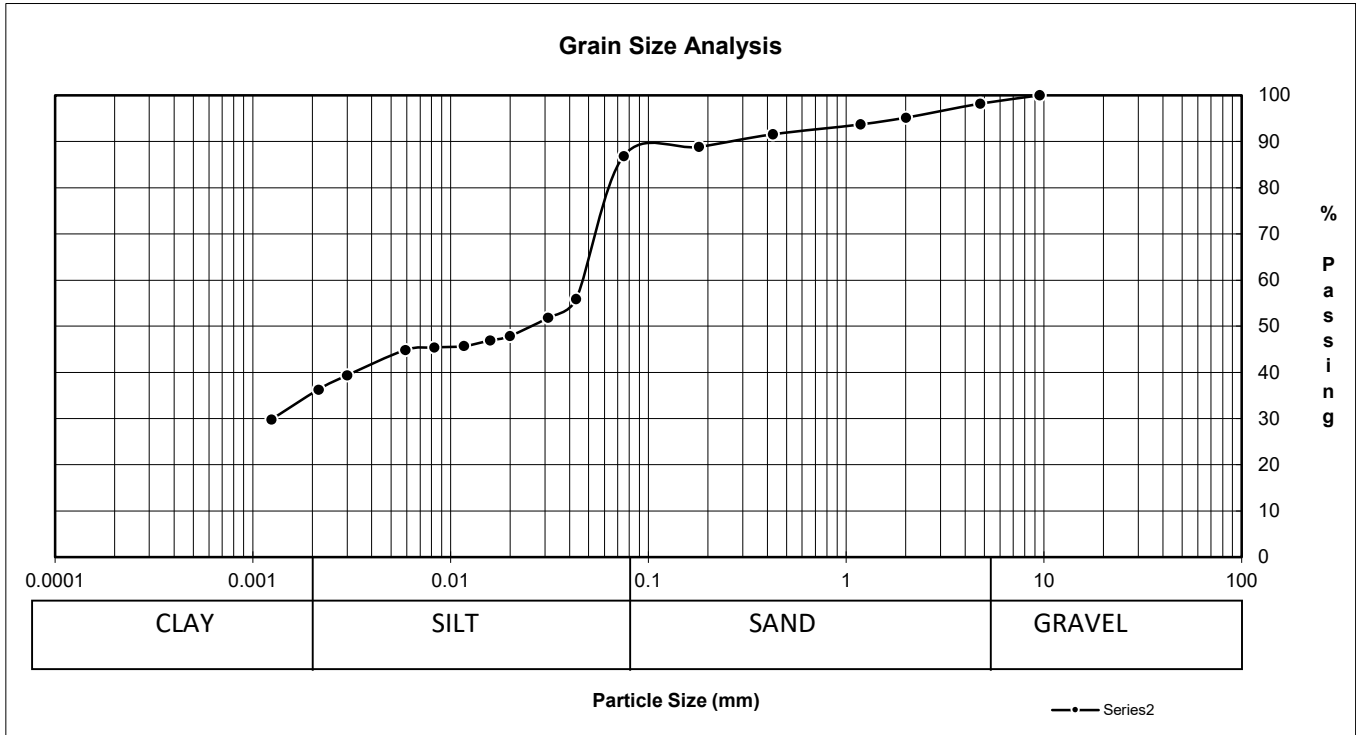
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7	PROJECT No.:	112-2203
ATTENTION:	Ryan Harras	PSA Test No.:	8
PROJECT:	Jefferson CSR Phase 3 Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	LAB No.:	HM 003A-8

Date Sampled:	Jan. 17-20, 2022	Date Received:	21-Jan-22	Sieve Analysis	Hydrometer Analysis
Sampled By:	Client	Date Tested:	26-Jan-22	Sieve (mm) % Passing	Diameter % Finer
Material Identification B.H./T.H. No. TH22-05-G11 Depth 45 FT. 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	0.0430	55.9
		9.50	100.0	0.0311	51.9
		4.75	98.2	0.0199	47.9
		2.00	95.2	0.0158	46.9
		1.18	93.7	0.0117	45.7
	0.425	91.6	0.0082	45.4	
	0.180	88.9	0.0059	44.9	
	0.075	86.9	0.0012	29.8	



		% Composition		D10	N/A
		1.8	Gravel	D30	0.00123
		11.3	Sand	D60	0.04680
		51.6	Silt	Cu	
		35.2	Clay	Cc	

Remarks: Test Method: ASTM D7928, D2216, D4318

Technician: E. Santiago/G. Manalo

P. Bevel

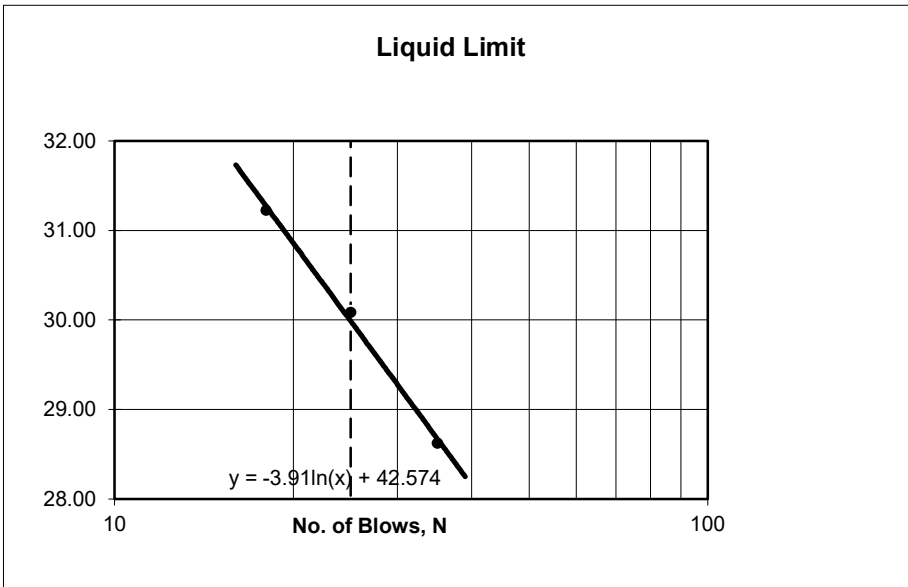
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 1 LAB No.: HM 003B-1 Date Received: Jan. 21, 2022 Date Tested / By: 2022-1-24/G. Manalo
--	--

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	14.65	13.64	13.77		
Dry Soil + Dish:	12.34	11.48	11.55		
Moisture:	2.31	2.16	2.22		
Dish:	4.27	4.3	4.44		
Dry Soil:	8.07	7.18	7.11		
% Moisture:	28.62	30.08	31.22		
No. of Blows:	35	25	18		
Liquid Limit:					30



Material Identification:

TH 22-01

Depth: **G3 @ 7.5 ft.**

Liquid Limit, %: **30**
 Plastic Limit, %: **14**
 Plasticity Index: **16**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	11.4	11.48	11.47		
Dry Soil + Dish:	10.53	10.61	10.62		
Moisture:	0.87	0.87	0.85		
Dish:	4.4	4.32	4.43		
Dry Soil:	6.13	6.29	6.19		
% Moisture:	14.19	13.83	13.73		
Average:					14

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

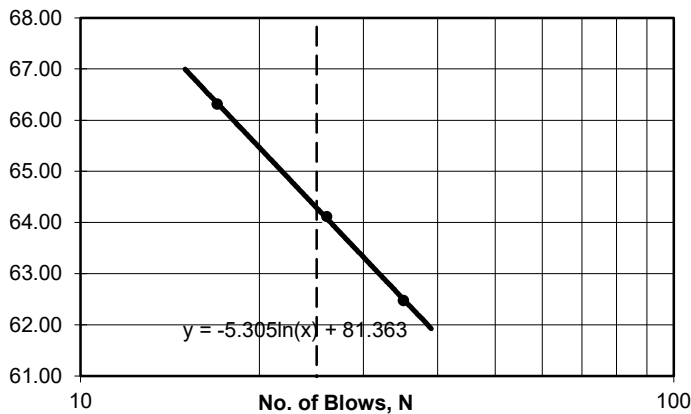
Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 2 LAB No.: HM 003B-2 Date Received: Jan.. 21, 2022 Date Tested / By: 2022-1-24/G. Manalo
--	---

Liquid Limit Determination

Dish No.:	1	2	3	
Wet Soil + Dish:	13.68	12.64	10.72	Liquid Limit 25 Blows
Dry Soil + Dish:	10.2	9.37	8.2	
Moisture:	3.48	3.27	2.52	
Dish:	4.63	4.27	4.4	
Dry Soil:	5.57	5.1	3.8	
% Moisture:	62.48	64.12	66.32	
No. of Blows:	35	26	17	
Liquid Limit:				

Liquid Limit



Material Identification:

TH 22-01

Depth: **S7 @ 25 ft.**

Liquid Limit, %: **64**
 Plastic Limit, %: **29**
 Plasticity Index: **36**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3	
Wet Soil + Dish:	10.1	10.64	10.28	
Dry Soil + Dish:	8.81	9.39	8.91	
Moisture:	1.29	1.25	1.37	
Dish:	4.42	4.83	4.27	
Dry Soil:	4.39	4.56	4.64	
% Moisture:	29.38	27.41	29.53	
Average:				29

Test Method : ASTM: D4318, D2216

P. Bevel

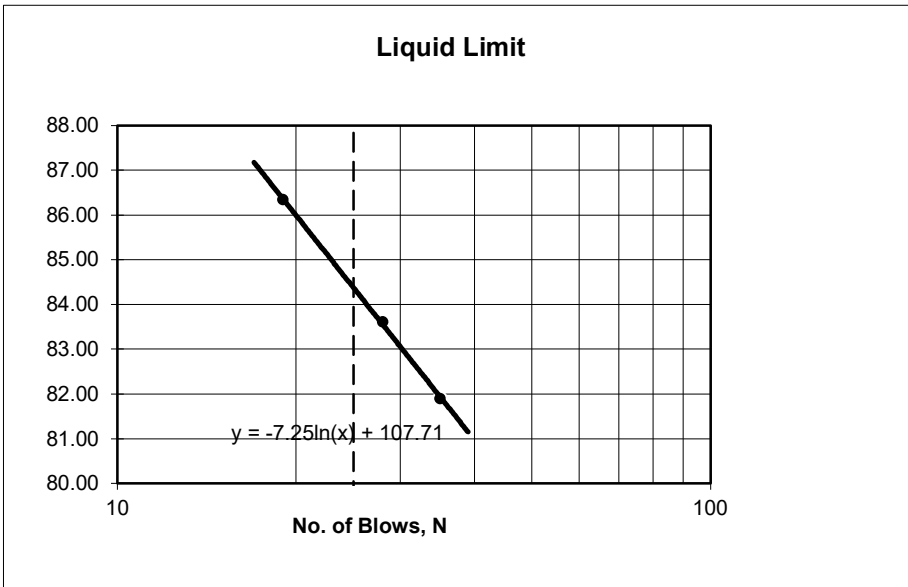
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 3 LAB No.: HM 003B-3 Date Received: Jan.. 21, 2022 Date Tested / By: 2022-1-25/G. Manalo
--	---

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	12.81	12.04	13.27		
Dry Soil + Dish:	9.19	8.52	9.16		
Moisture:	3.62	3.52	4.11		
Dish:	4.77	4.31	4.4		
Dry Soil:	4.42	4.21	4.76		
% Moisture:	81.90	83.61	86.34		
No. of Blows:	35	28	19		
Liquid Limit:					84



Material Identification:

TH 22-02

Depth: **T5 @ 15 ft.**

Liquid Limit, %: **84**
 Plastic Limit, %: **35**
 Plasticity Index: **49**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	9.57	9.8	9.87		
Dry Soil + Dish:	8.21	8.4	8.45		
Moisture:	1.36	1.40	1.42		
Dish:	4.37	4.39	4.41		
Dry Soil:	3.84	4.01	4.04		
% Moisture:	35.42	34.91	35.15		
Average:					35

Test Method : ASTM: D4318, D2216

P. Bevel

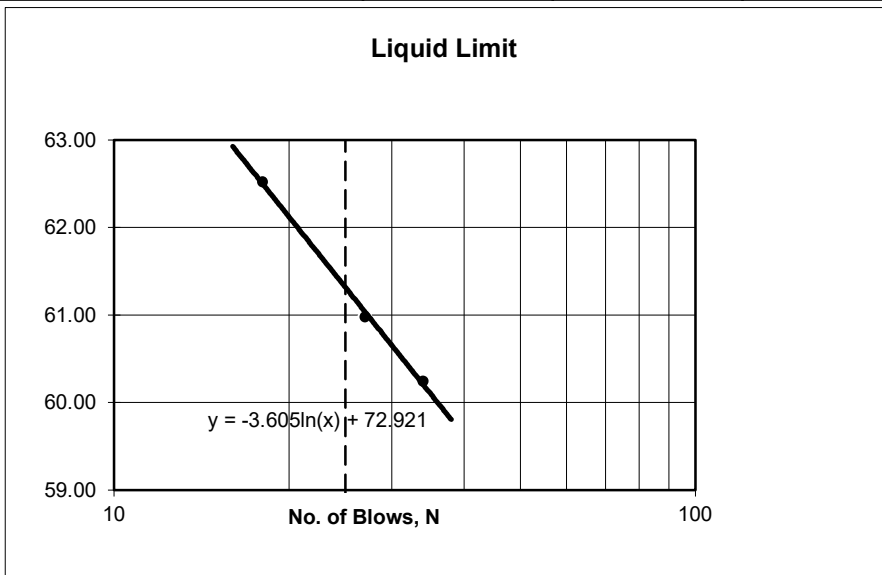
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 4 LAB No.: HM 003B-4 Date Received: Jan. 21, 2022 Date Tested / By: 2022-1-25/G. Manalo
--	--

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	13.98	12.49	13.69		
Dry Soil + Dish:	10.54	9.38	10.12		
Moisture:	3.44	3.11	3.57		
Dish:	4.83	4.28	4.41		
Dry Soil:	5.71	5.1	5.71		
% Moisture:	60.25	60.98	62.52		
No. of Blows:	34	27	18		
Liquid Limit:					



Material Identification:

TH 22-03

Depth: **G1 @ 2.5 ft.**

Liquid Limit, %: **61**
 Plastic Limit, %: **26**
 Plasticity Index: **35**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.25	10.52	10.39		
Dry Soil + Dish:	9.01	9.28	9.13		
Moisture:	1.24	1.24	1.26		
Dish:	4.28	4.4	4.28		
Dry Soil:	4.73	4.88	4.85		
% Moisture:	26.22	25.41	25.98		
Average:					26

Test Method : ASTM: D4318, D2216

P. Bevel

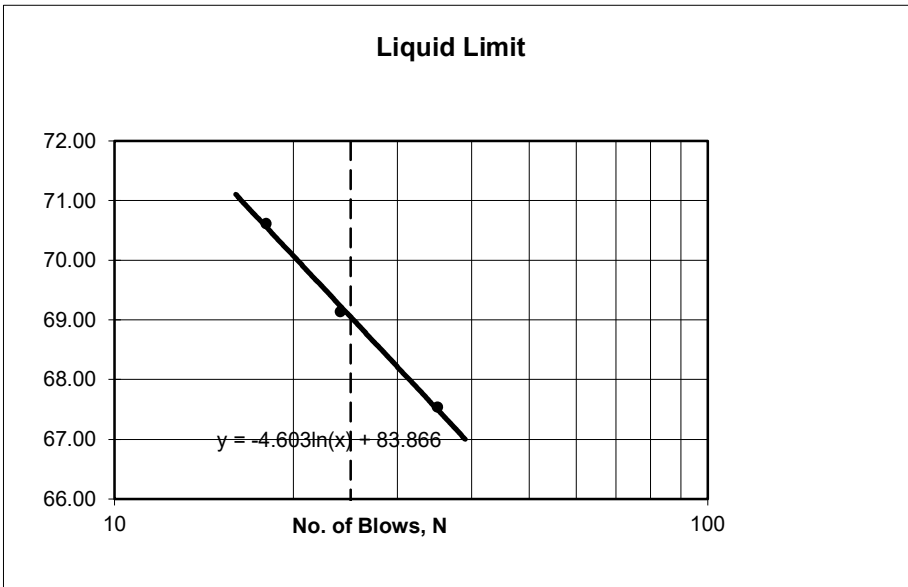
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 5 LAB No.: HM 003B-5 Date Received: Jan.. 21, 2022 Date Tested / By: 2022-1-26/G. Manalo
--	---

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	13.39	13.04	11.53		
Dry Soil + Dish:	9.79	9.50	8.55		
Moisture:	3.6	3.54	2.98		
Dish:	4.46	4.38	4.33		
Dry Soil:	5.33	5.12	4.22		
% Moisture:	67.54	69.14	70.62		
No. of Blows:	35	24	18		
Liquid Limit:					69



Material Identification:

TH 22-03

Depth: **S6 @ 20 ft.**

Liquid Limit, %: **69**
 Plastic Limit, %: **33**
 Plasticity Index: **36**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.32	10.59	10.35		
Dry Soil + Dish:	8.85	9.08	8.86		
Moisture:	1.47	1.51	1.49		
Dish:	4.35	4.43	4.31		
Dry Soil:	4.5	4.65	4.55		
% Moisture:	32.67	32.47	32.75		
Average:					33

Test Method : ASTM: D4318, D2216

P. Bevel

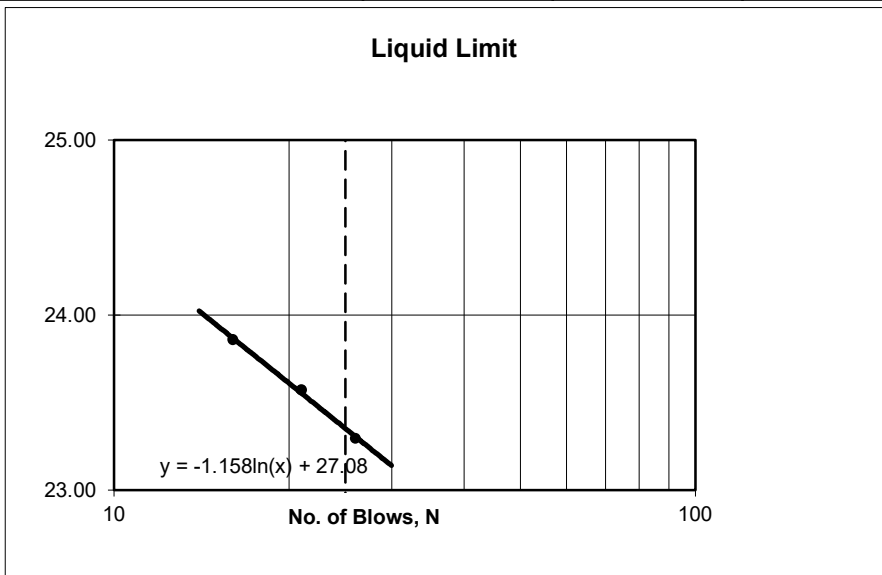
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 6 LAB No.: HM 003B-6 Date Received: Jan.. 21, 2022 Date Tested / By: 2022-1-26/G. Manalo
--	---

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	13.11	14.3	12.45		
Dry Soil + Dish:	11.47	12.40	10.88		
Moisture:	1.64	1.9	1.57		
Dish:	4.43	4.34	4.3		
Dry Soil:	7.04	8.06	6.58		
% Moisture:	23.30	23.57	23.86		
No. of Blows:	26	21	16		
Liquid Limit:					



Material Identification:

TH 22-04

Depth: **G3 @ 7.5 ft.**

Liquid Limit, %: **23**
 Plastic Limit, %: **15**
 Plasticity Index: **8**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.98	11.25	11.34		
Dry Soil + Dish:	10.09	10.38	10.44		
Moisture:	0.89	0.87	0.9		
Dish:	4.33	4.4	4.57		
Dry Soil:	5.76	5.98	5.87		
% Moisture:	15.45	14.55	15.33		
Average:					15

Test Method : ASTM: D4318, D2216

P. Bevel

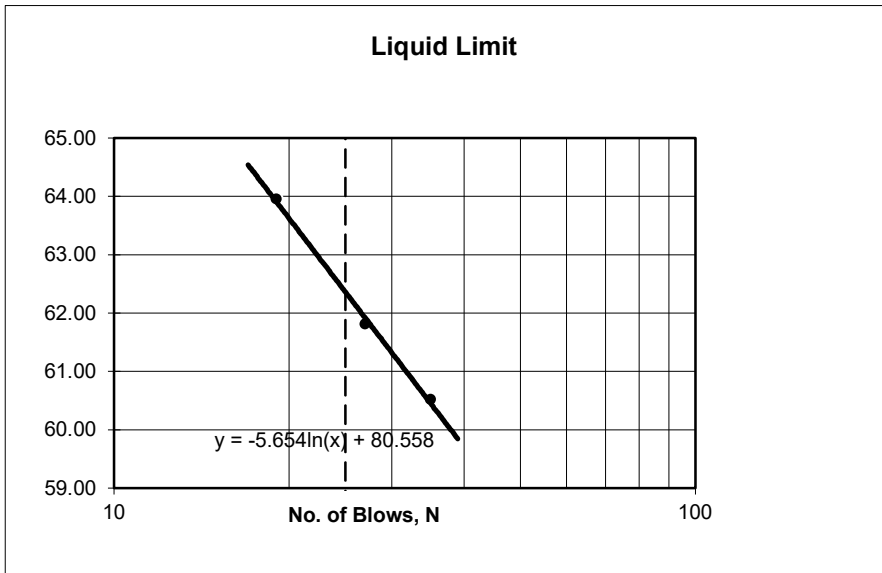
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 7 LAB No.: HM 003B-7 Date Received: Jan., 21, 2022 Date Tested / By: 2022-1-27/G. Manalo
--	---

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	12.57	12.95	12.11		
Dry Soil + Dish:	9.55	9.68	9.04		
Moisture:	3.02	3.27	3.07		
Dish:	4.56	4.39	4.24		
Dry Soil:	4.99	5.29	4.8		
% Moisture:	60.52	61.81	63.96		
No. of Blows:	35	27	19		
Liquid Limit:					



Material Identification:

TH 22-05

Depth: **S6 @ 20 ft.**

Liquid Limit, %: **62**
 Plastic Limit, %: **30**
 Plasticity Index: **33**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.23	10.72	10.44		
Dry Soil + Dish:	8.89	9.37	9.04		
Moisture:	1.34	1.35	1.4		
Dish:	4.41	4.78	4.39		
Dry Soil:	4.48	4.59	4.65		
% Moisture:	29.91	29.41	30.11		
Average:					30

Test Method : ASTM: D4318, D2216

P. Bevel

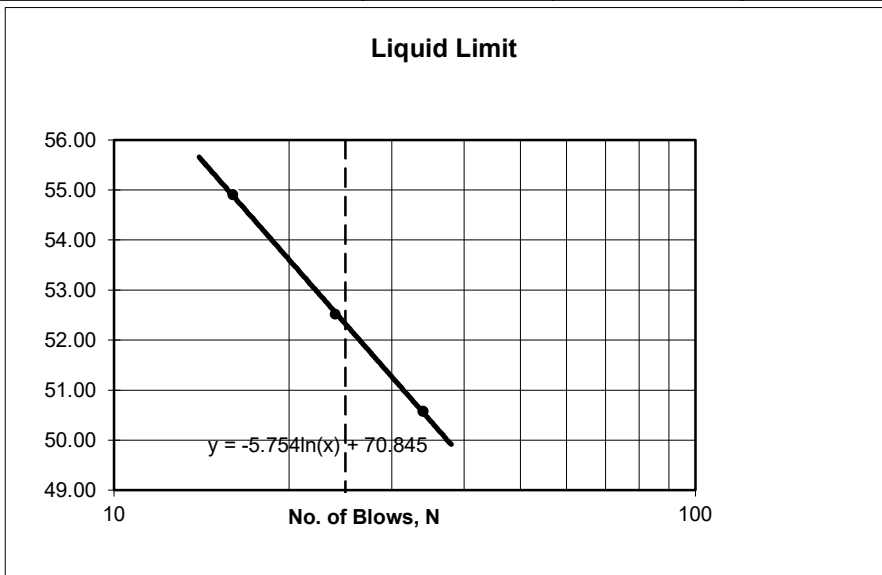
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive Winnipeg MB R3P 0Y7 Attention.: Ryan Harras Project: Jefferson CSR Phase 3, Contract 6B Burrin Ave., Kilbride Ave., Hartford Ave., WPG MB	PROJECT No.: 112-2203 PI Test No.: 8 LAB No.: HM 003B-8 Date Received: Jan., 21, 2022 Date Tested / By: 2022-1-28/G. Manalo
--	---

Liquid Limit Determination

Dish No.:	1	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	13.58	13.37	12.79		
Dry Soil + Dish:	10.5	10.24	9.77		
Moisture:	3.08	3.13	3.02		
Dish:	4.41	4.28	4.27		
Dry Soil:	6.09	5.96	5.5		
% Moisture:	50.57	52.52	54.91		
No. of Blows:	34	24	16		
Liquid Limit:					



Material Identification:

TH 22-05

Depth: **G11 @ 45 ft.**

Liquid Limit, %: **52**
 Plastic Limit, %: **25**
 Plasticity Index: **27**
 (LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	11.08	10.41	10.47		
Dry Soil + Dish:	9.82	9.17	9.23		
Moisture:	1.26	1.24	1.24		
Dish:	4.82	4.27	4.4		
Dry Soil:	5	4.9	4.83		
% Moisture:	25.20	25.31	25.67		
Average:					25

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 1 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	Sample ID: TH 22-01 T6 (20')
Sampled By: Client	Date Tested: 27-Jan-22	

Test Result: Unconfined Compressive Strength 76.9 kPa

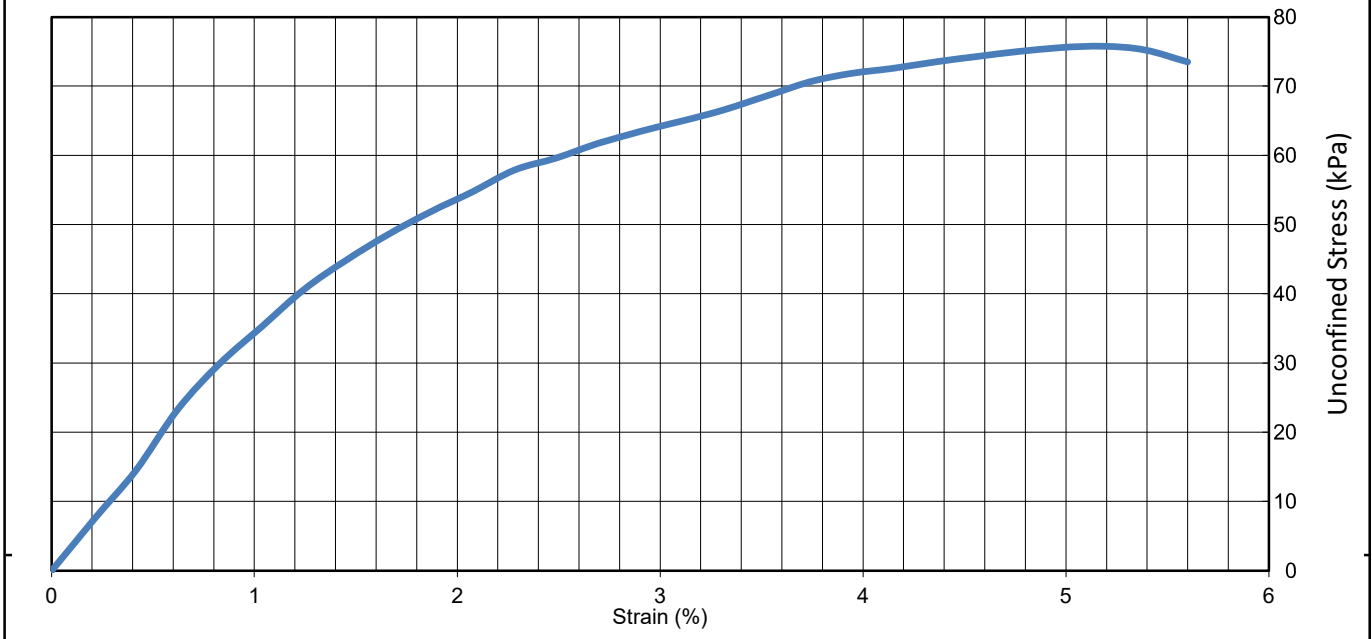
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m3)	Dry Density (kg/m3)	Strain rate (%/min)
1025.0	0.1470	0.0723	55.4	1696	1092	1.0

Test Sample Visual Description

CLAY, silty, dark brown, firm, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
Technician: ET

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 2 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	Sample ID: TH 22-02 T5 (15')
Sampled By: Client	Date Tested: 27-Jan-22	

Test Result: Unconfined Compressive Strength 113.1 kPa

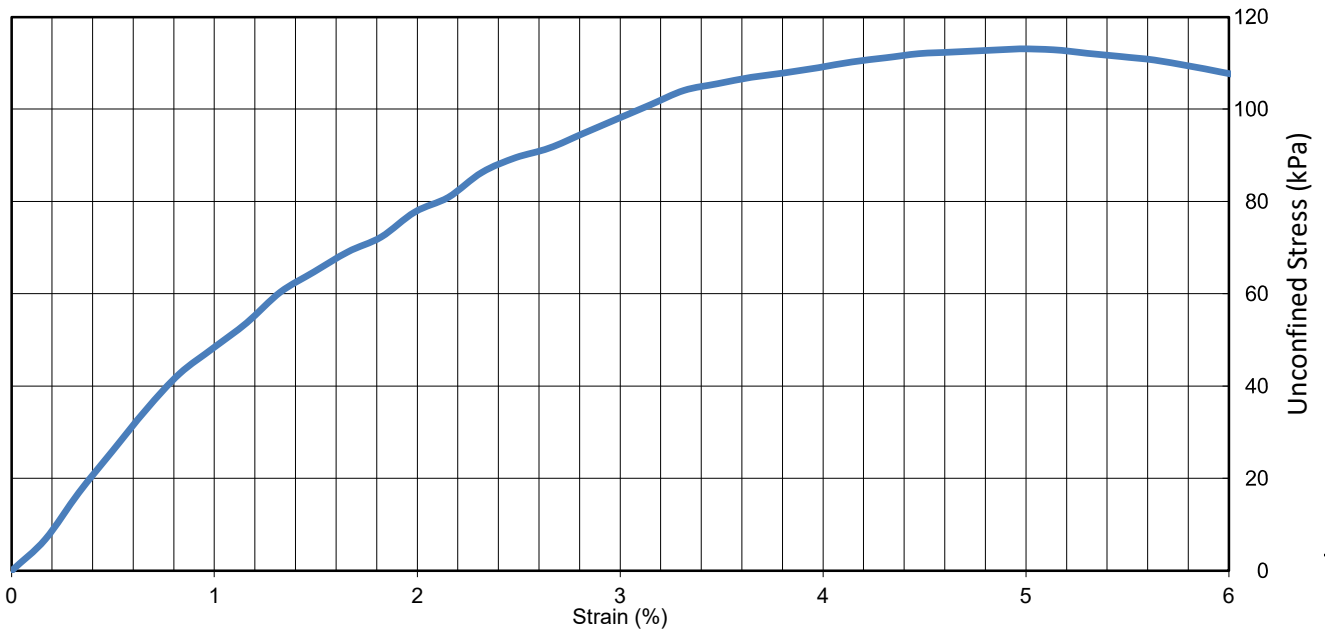
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m3)	Dry Density (kg/m3)	Strain rate (%/min)
1067.0	0.1457	0.0723	55.5	1784	1147	1.0

Test Sample Visual Description

CLAY, silty, dark brown, firm, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
Technician: ET

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 3 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	Sample ID: TH 22-02 T9 (35')
Sampled By: Client	Date Tested: 27-Jan-22	

Test Result: Unconfined Compressive Strength 36.1 kPa

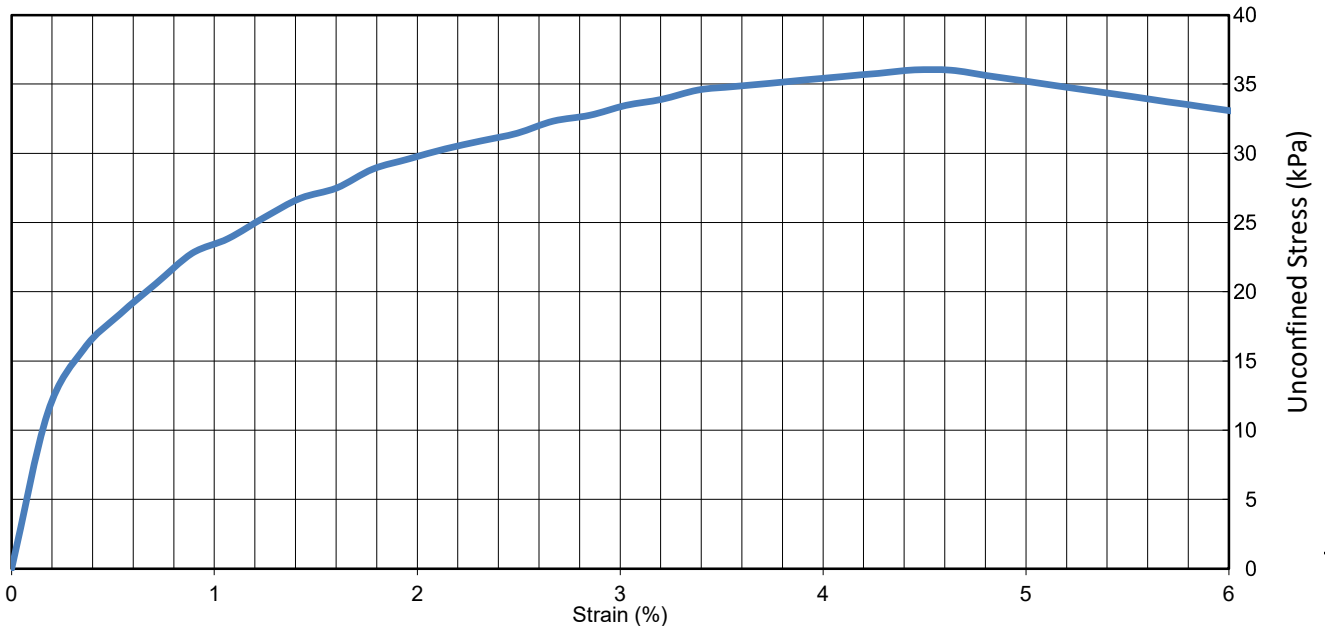
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m ³)	Dry Density (kg/m ³)	Strain rate (%/min)
1004.0	0.1427	0.0722	54.1	1718	1115	1.0

Test Sample Visual Description

CLAY, very silty, dark brown, soft, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
 Technician: ET

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 4 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	
Sampled By: Client	Date Tested: 27-Jan-22	Sample ID: TH 22-03 T5 (15')

Test Result: Unconfined Compressive Strength 99.3 kPa

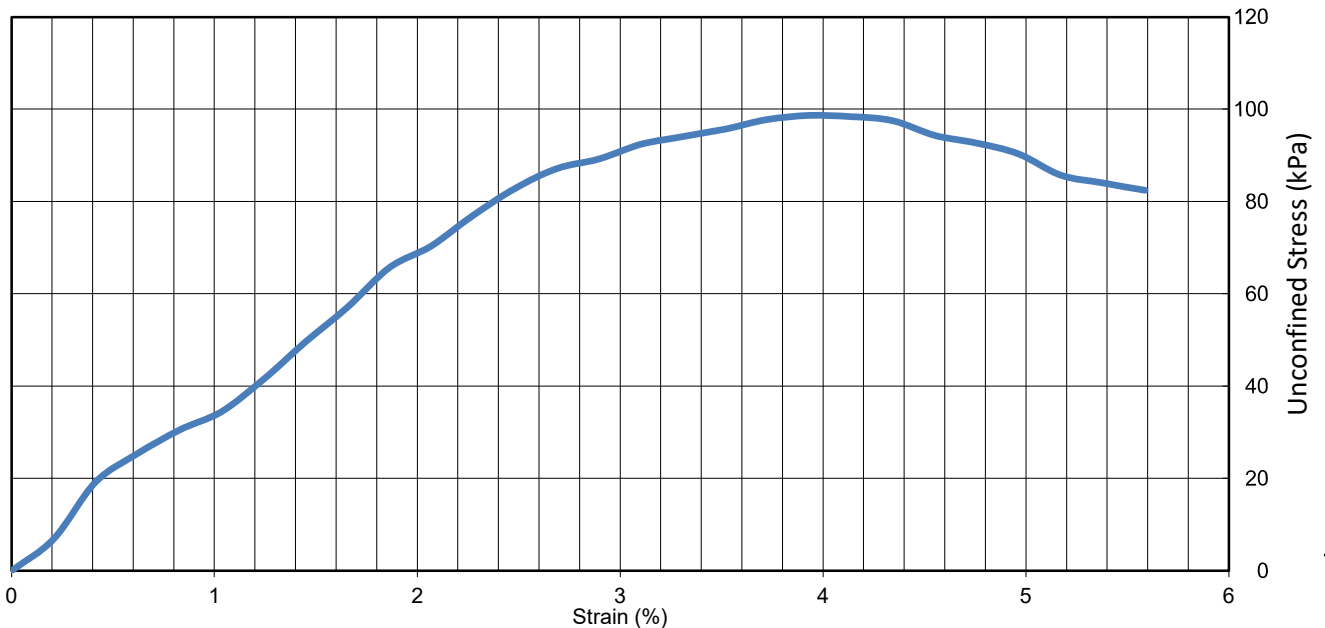
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m ³)	Dry Density (kg/m ³)	Strain rate (%/min)
1027.0	0.1473	0.0722	58.7	1702	1072	1.0

Test Sample Visual Description

CLAY, silty, dark brown, firm, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
Technician: ET

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 5 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	Sample ID: TH 22-03 T11 (45')
Sampled By: Client	Date Tested: 27-Jan-22	

Test Result: Unconfined Compressive Strength 40.6 kPa

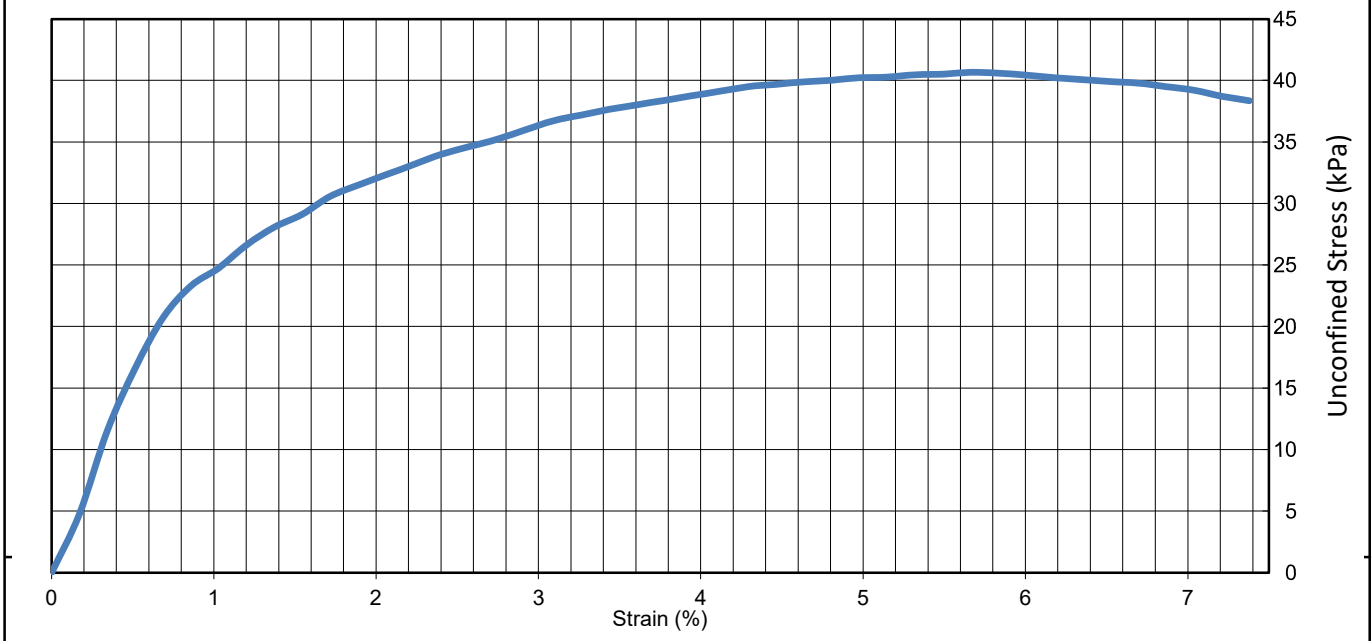
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m3)	Dry Density (kg/m3)	Strain rate (%/min)
1148.0	0.1480	0.0723	40.5	1887	1343	1.0

Test Sample Visual Description

CLAY and SILT, dark brown, soft, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
 Technician: ET

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 6 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	Sample ID: TH 22-04 T10 (40')
Sampled By: Client	Date Tested: 28-Jan-22	

Test Result: Unconfined Compressive Strength 114.5 kPa

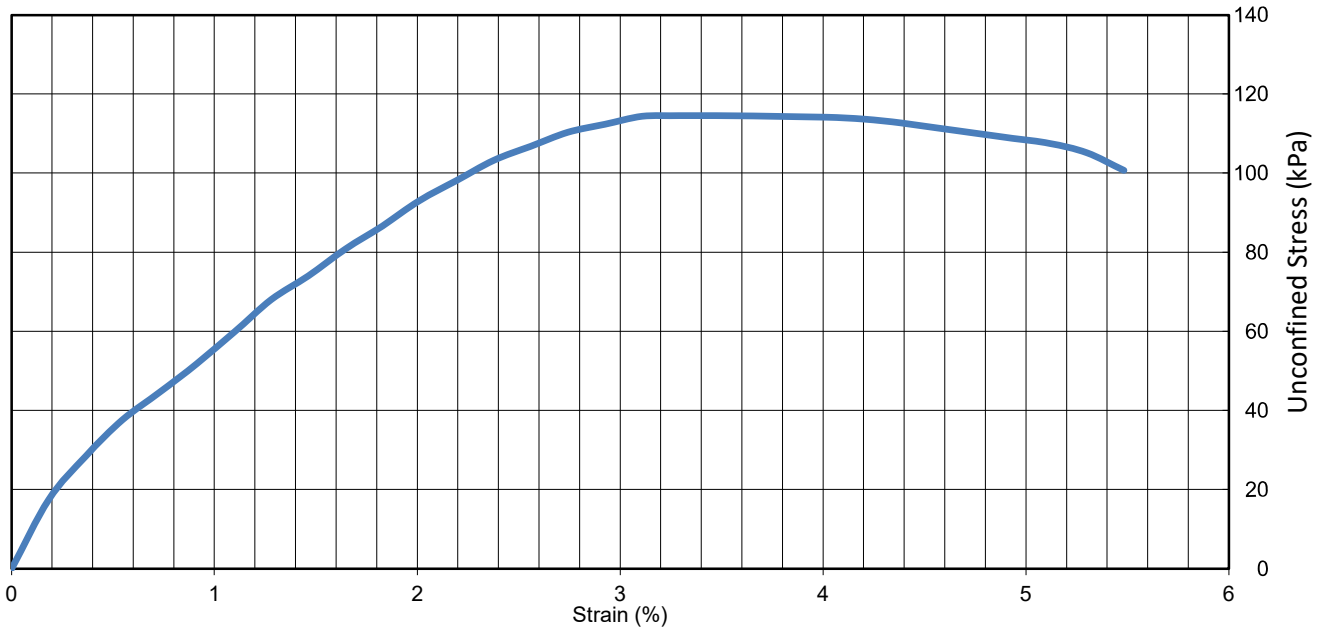
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m3)	Dry Density (kg/m3)	Strain rate (%/min)
1040.0	0.1390	0.0722	49.6	1827	1221	1.0

Test Sample Visual Description

CLAY, silty, dark brown, firm, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
 Technician: ET

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 7 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	Sample ID: TH 22-05 T5 (15')
Sampled By: Client	Date Tested: 28-Jan-22	

Test Result: Unconfined Compressive Strength 91.4 kPa

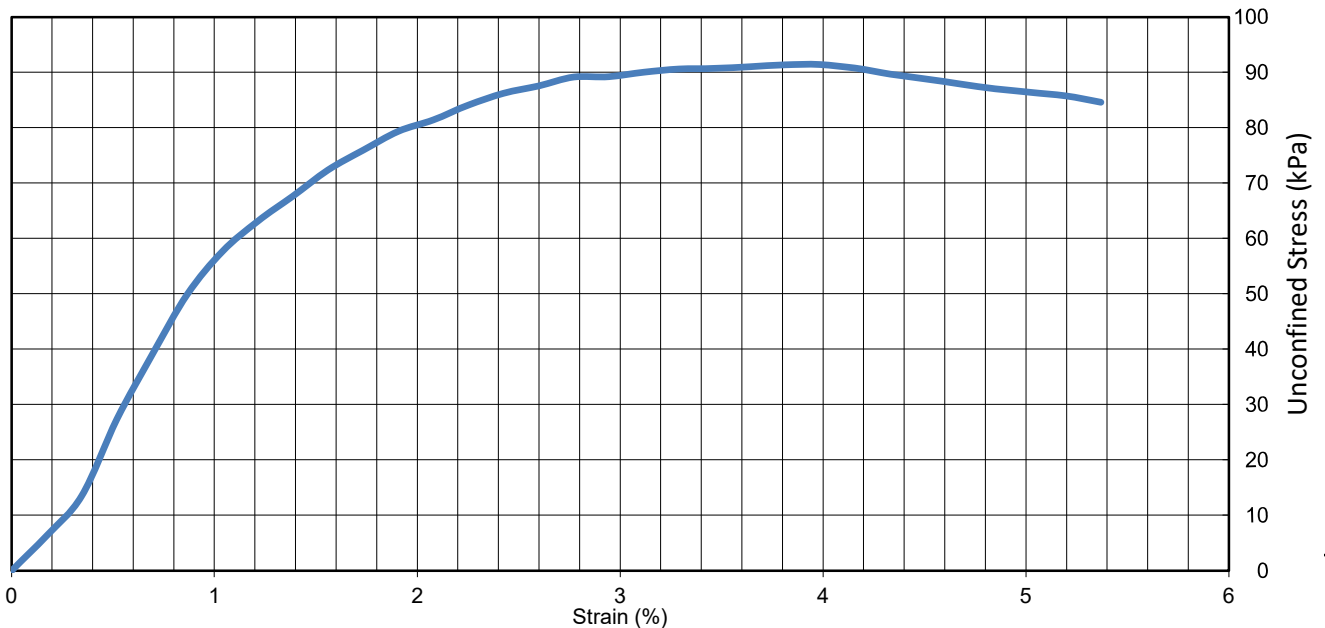
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m ³)	Dry Density (kg/m ³)	Strain rate (%/min)
1087.0	0.1467	0.0722	43.8	1810	1258	1.0

Test Sample Visual Description

CLAY, silty, dark brown, stiff, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
Technician: ET

P. Bevel

Reviewed by: Paul Bevel

UNCONFINED COMPRESSIVE STRENGTH TEST REPORT

CLIENT: AECOM 99 Commerce Drive Winnipeg MB R3P 0Y7 ATTENTION: Ryan Harras PROJECT: Jefferson CSR Phase 3 - Contract 6B	PROJECT NO.: 112-2203 Qu Test No.: 8 Lab No.: HM 03
---	---

Date Sampled: 17-20/Jan/22	Date Received: 21-Jan-22	Sample ID: TH 22-05 T9 (35')
Sampled By: Client	Date Tested: 28-Jan-22	

Test Result: Unconfined Compressive Strength 83.1 kPa

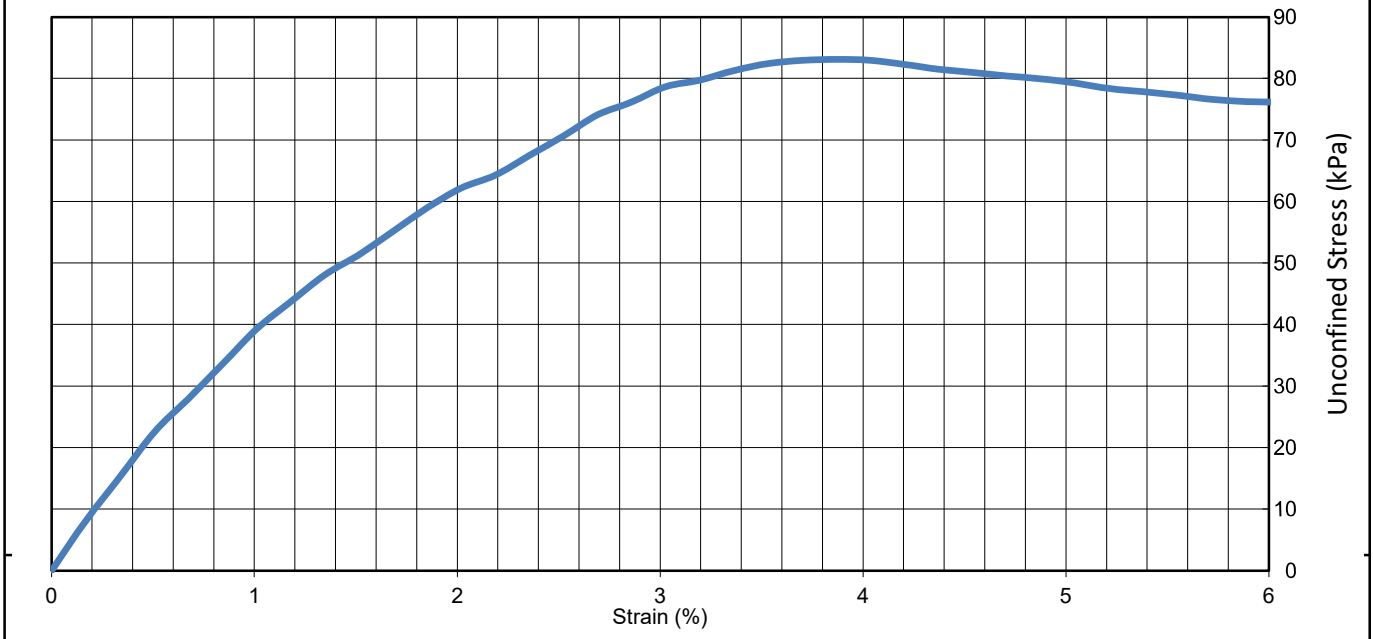
Test Sample Data

Sample Mass (g)	Average Height (m)	Average Diameter (m)	Moisture Content %	Wet Density (kg/m3)	Dry Density (kg/m3)	Strain rate (%/min)
1158.0	0.1510	0.0725	40.7	1859	1321	1.0

Test Sample Visual Description

CLAY, silty, dark brown, firm, moist

Unconfined Stress (kPa) vs Strain (%)



Remarks: Test Method: ASTM D2166
 Technician: ET

P. Bevel

Reviewed by: Paul Bevel